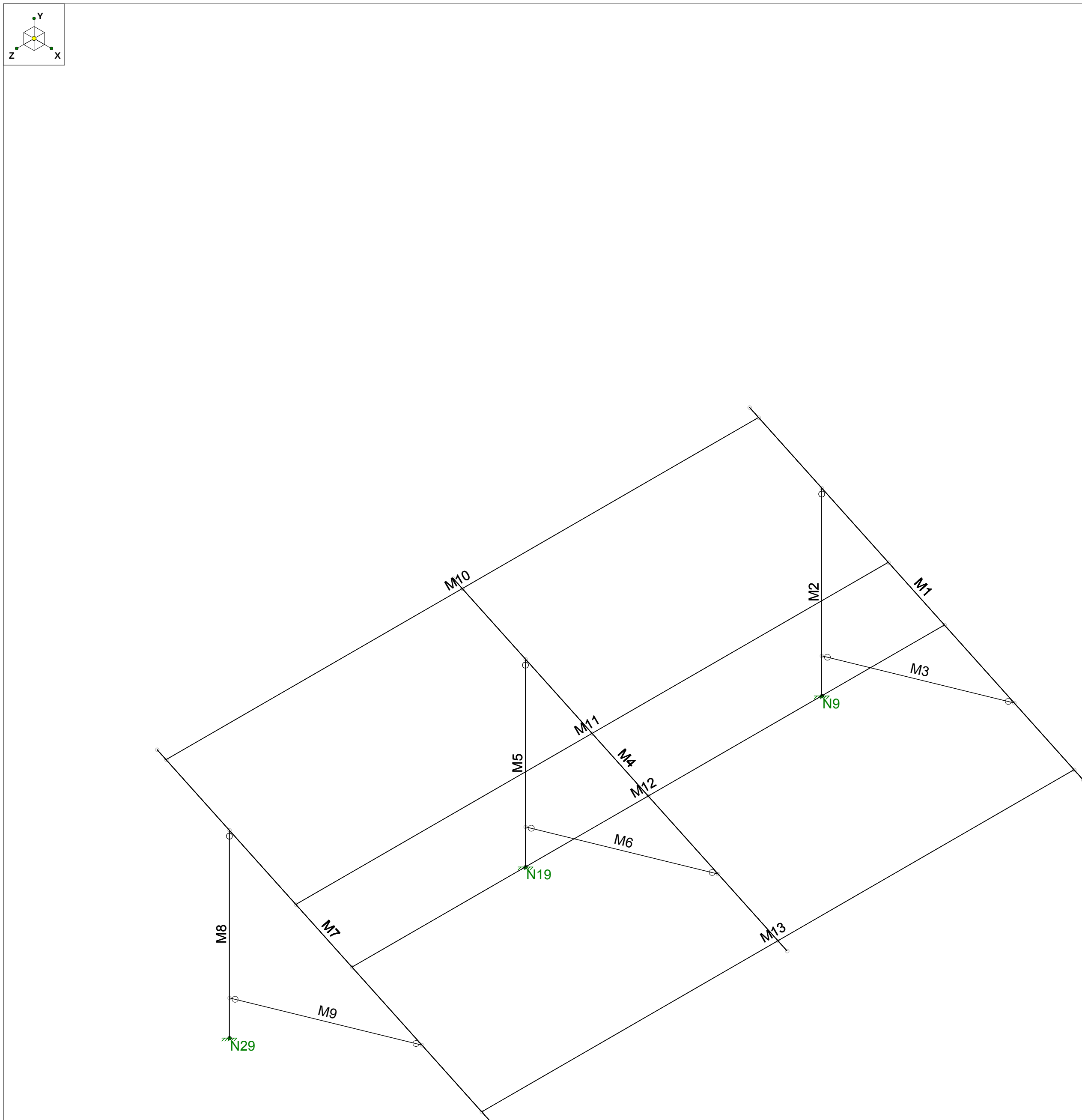


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

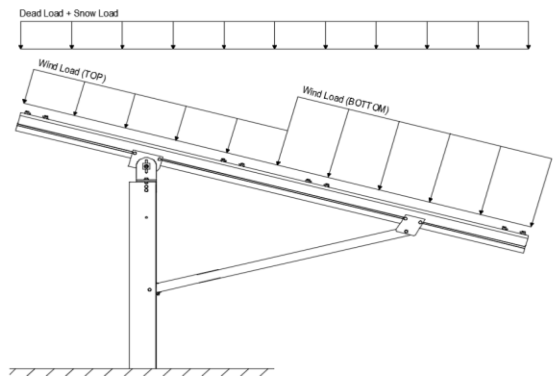
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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

PV modules are required to meet the following specifications:

	Maximum		Minimum
Height =	2000 mm	Height =	1900 mm
Width =	1050 mm	Width =	970 mm
Dead Load =	3.00 psf	Dead Load =	1.75 psf

Modules Per Row = 2
Module Tilt = 25°
Maximum Height Above Grade = 3 ft



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

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

2. LOAD ACTIONS

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

Self-weight of the PV modules.

2.2 Snow Loads
Ground Snow Load, P_g = 30.00 psf
Sloped Roof Snow Load, P_s = 18.56 psf *(ASCE 7-10, Eq. 7.4-1)*
I_s = 1.00
C_s = 0.82
C_e = 0.90
C_t = 1.20

2.3 Wind Loads
Design Wind Speed, V = 150 mph — Exposure Category = C
Height < 15 ft — Importance Category = II

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

Pressure Coefficients

$Cf+_{TOP}$	=	1.1	*(Pressure)*
$Cf+_{BOTTOM}$	=	1.7	
$Cf-_{TOP}$	=	-2.2	*(Suction)*
$Cf-_{BOTTOM}$	=	-1	

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

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W ^{M}
1.54D + 1.3E + 0.2S ^{R}
0.56D + 1.3E ^{R}
1.54D + 1.25E + 0.2S ^{O}
0.56D + 1.25E ^{O}

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

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W ^{M}
1.238D + 0.875E ^{O}
1.1785D + 0.65625E + 0.75S ^{O}
0.362D + 0.875E ^{O}

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

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

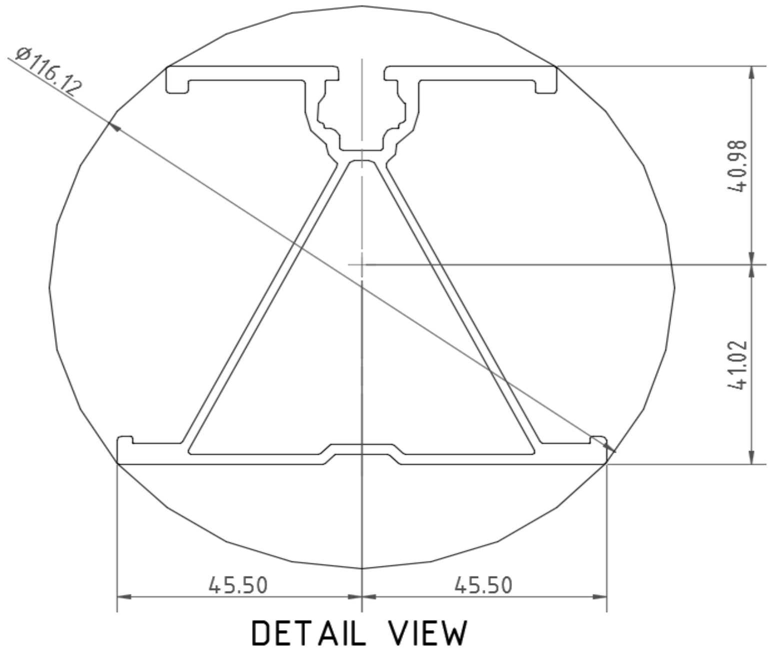
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

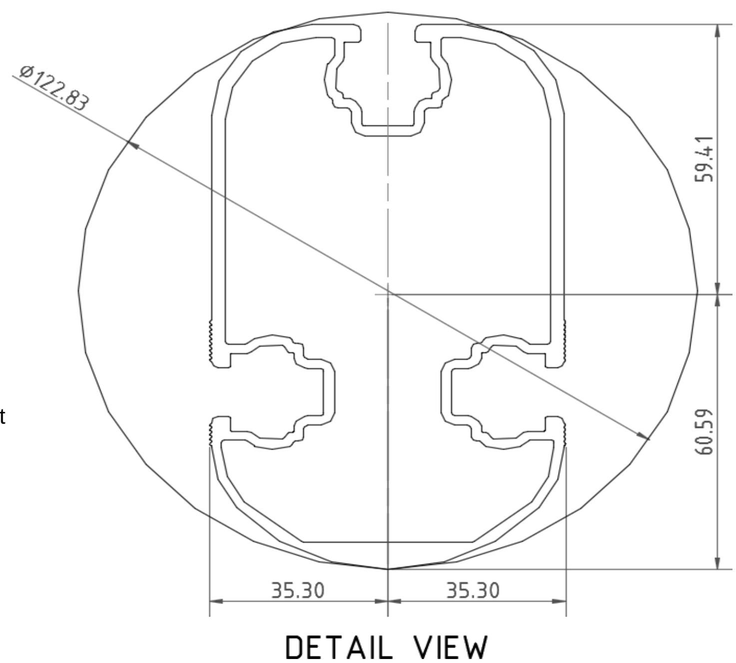
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	84	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.208	k-ft
M_z =	0.175	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	59%	



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).

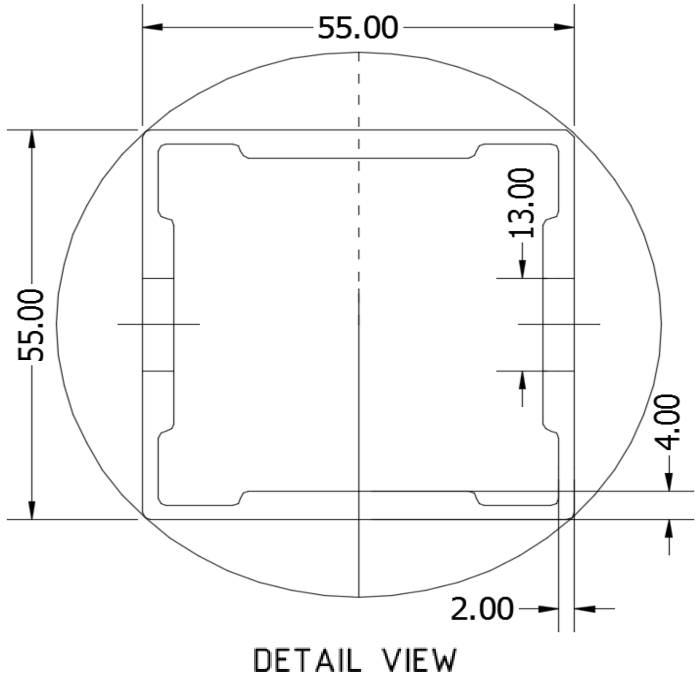
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.260	k-ft
M_z =	0.000	k-ft
P_n =	2.046	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	89%	



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).

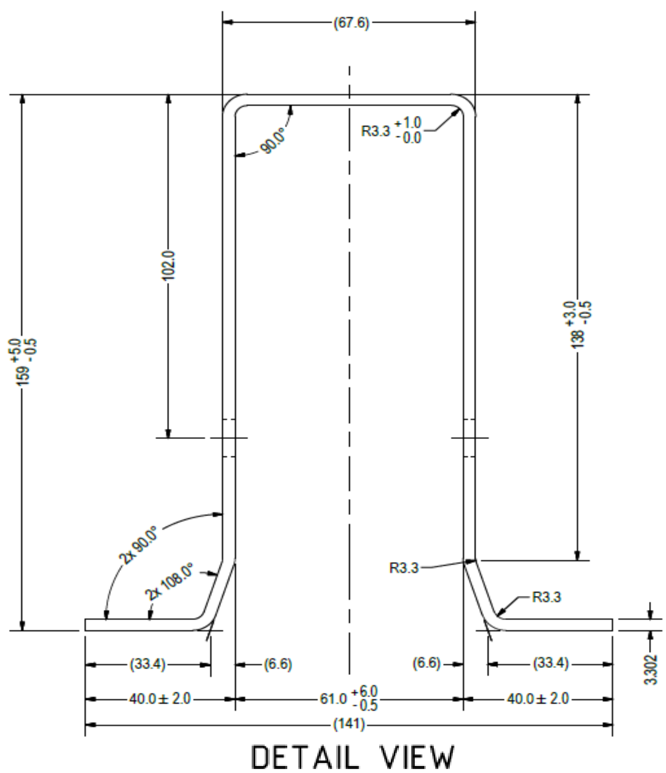
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.543	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	59%	



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 =	81.31	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	12.144	k-ft
M_z =	0.000	k-ft
P_r =	6.070	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	k
Utilization =	84%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	6.86	k
Maximum Lateral Load =	3.62	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)

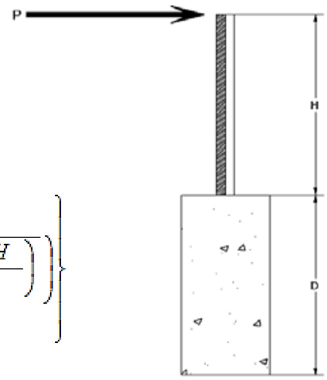
Lateral Force @ Top of Pole, P =	1.16	k
Height of Pole Above Grade, H =	5.78	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	1.16	k
Height of Pole Above Grade, H =	5.78	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 =	6.24	
Required Footing Depth, D =	10.12	ft

2nd Trial @ D_2 =	6.69	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 =	3.03	
Required Footing Depth, D =	6.14	ft

3rd Trial @ D_3 =	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 =	3.16	
Required Footing Depth, D =	6.31	ft

4th Trial @ D_4 =	6.36	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.27	ksf
Constant $2.34P/(S_1B)$, A =	3.19	
Required Footing Depth, D =	6.35	ft

5th Trial @ D_5 =	6.36	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.27	ksf
Constant $2.34P/(S_1B)$, A =	3.19	
Required Footing Depth, D =	6.50	ft

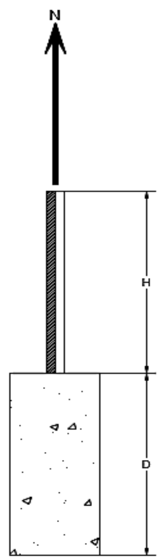
A 2ft diameter x 6.5ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.15	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	2.06	k
Required Concrete Volume, V =	14.23	ft^3
Required Footing Depth, D =	4.75	ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.81
2	0.4	0.2	118.10	6.71
3	0.6	0.2	118.10	6.60
4	0.8	0.2	118.10	6.50
5	1	0.2	118.10	6.40
6	1.2	0.2	118.10	6.29
7	1.4	0.2	118.10	6.19
8	1.6	0.2	118.10	6.08
9	1.8	0.2	118.10	5.98
10	2	0.2	118.10	5.88
11	2.2	0.2	118.10	5.77
12	2.4	0.2	118.10	5.67
13	2.6	0.2	118.10	5.57
14	2.8	0.2	118.10	5.46
15	3	0.2	118.10	5.36
16	3.2	0.2	118.10	5.26
17	3.4	0.2	118.10	5.15
18	3.6	0.2	118.10	5.05
19	3.8	0.2	118.10	4.94
20	4	0.2	118.10	4.84
21	4.2	0.2	118.10	4.74
22	4.4	0.2	118.10	4.63
23	4.6	0.2	118.10	4.53
24	0	0.0	0.00	4.53
25	0	0.0	0.00	4.53
26	0	0.0	0.00	4.53
27	0	0.0	0.00	4.53
28	0	0.0	0.00	4.53
29	0	0.0	0.00	4.53
30	0	0.0	0.00	4.53
31	0	0.0	0.00	4.53
32	0	0.0	0.00	4.53
33	0	0.0	0.00	4.53
34	0	0.0	0.00	4.53
Max	4.6	Sum	1.09	

5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.83	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

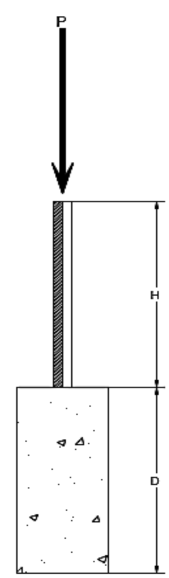
Weight of Concrete

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 =	6.79	k
Utilization =	64%	

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



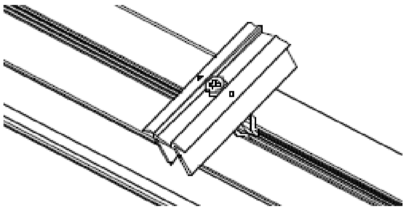
6. DESIGN OF JOINTS AND CONNECTIONS

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.

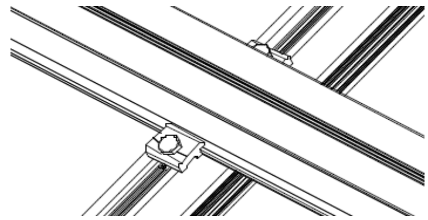
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.861 k
Allowable Uplift =	1.214 k
Utilization =	71%



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.149 k
Allowable Uplift =	2.180 k
Utilization =	99%

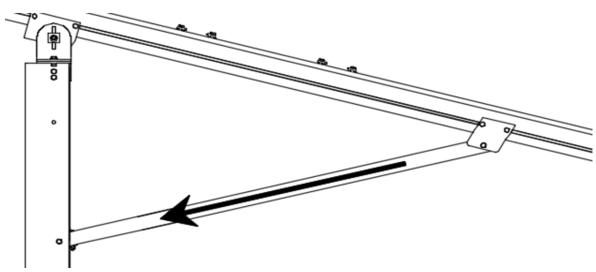


6.2 Strut Connections

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 =	5.543 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	62%

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

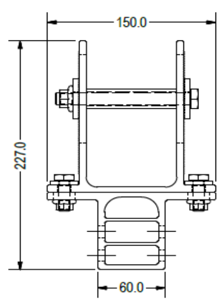


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

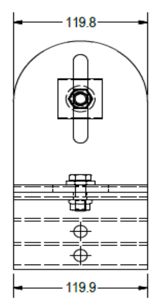
6.3 Girder to Post Connection

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.

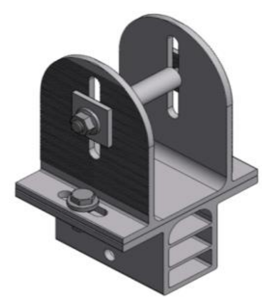
Maximum Tensile Load =	4.417 k
Allowable Load =	5.649 k
Utilization =	78%



FRONT VIEW



SIDE VIEW



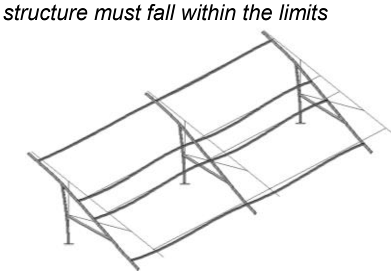
7. SEISMIC DESIGN

7.1 Seismic Drift

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

Mean Height, h_{sx} =	74.39 in
Allowable Story Drift for All Other Structures, Δ = {	$0.020h_{sx}$
	1.488 in
Max Drift, Δ_{MAX} =	0.75 in
$0.75 \le 1.488$, 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 = 84 in

J = 0.432

232.383

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 28.4 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

φF_LSt= 25.1 ksi

Ix = 897074 mm^4

2.155 in^4

y = 41.015 mm

Sx = 1.335 in³

M_{max}St = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 84

J = 0.432

147.782

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.4

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in³

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 = 81.7717 in
J = 1.98
105.231

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

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= 30.1 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 = 81.7717
J = 1.98
114.202

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

S1 = 0.51461

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

S2 = 1701.56
φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L= 29.9

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= 30.1 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

M_{max}St = 4.935 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 = 74.8031 in

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9 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 = 74.8031

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

φF_L= (φccFcy)/(λ²)

φF_L= 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L= φyFcy

φF_L= 33.25 ksi

φF_L= 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	81.31	in	
Pr =	6.07	k	(LRFD Factored Load)
Mr (Strong) =	12.14	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	116.99		
4.71√(E/Fy) =	103.55 =>	kL/r	> 4.71√(E/Fy)
Fcr =	18.34 ksi		
Fe =	20.91 ksi		
Pn =	40.9 k		

Torsional/Flexural Torsional Buckling:

Fcr =	13.8471 ksi
Fey =	53.3447 ksi
Fez =	17.7356 ksi
Pn =	30.879 k

Bending (Strong Axis):

Yielding:			
Mn =	21.95 k-ft		
Flange Local Buckling:			
Mn =	19.207 k-ft		
Pr/Pc =	0.2184 ≥	0.2	
Utilization =	0.84 <	1.0	OK

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.218 ≥	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 84%

APPENDIX B

B.1

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

Basic Load Cases

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

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-9.843	-9.843	0	0
2	M11	Y	-9.843	-9.843	0	0
3	M12	Y	-9.843	-9.843	0	0
4	M13	Y	-9.843	-9.843	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	-5.454	-5.454	0	0
2	M11	Y	-5.454	-5.454	0	0
3	M12	Y	-5.454	-5.454	0	0
4	M13	Y	-5.454	-5.454	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	-55.176	-55.176	0	0
2	M11	Y	-55.176	-55.176	0	0
3	M12	Y	-55.176	-55.176	0	0
4	M13	Y	-55.176	-55.176	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	-127.493	-127.493	0	0
2	M11	y	-127.493	-127.493	0	0
3	M12	y	-197.035	-197.035	0	0
4	M13	y	-197.035	-197.035	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	254.986	254.986	0	0
2	M11	y	254.986	254.986	0	0
3	M12	y	115.903	115.903	0	0
4	M13	y	115.903	115.903	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	7.874	7.874	0	0
2	M11	Z	7.874	7.874	0	0
3	M12	Z	7.874	7.874	0	0
4	M13	Z	7.874	7.874	0	0
5	M10	Z	0	0	0	0
6	M11	Z	0	0	0	0
7	M12	Z	0	0	0	0
8	M13	Z	0	0	0	0

Load Combinations

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	545.285	2	2375.19	2	112.361	2	.175	1	.007	5	7.456	1
2		min	-890.548	3	-1788.035	3	-295.185	5	-1.32	5	-.004	2	.722	12
3	N19	max	2749.67	2	6077.668	2	0	3	0	1	.007	4	10.622	1
4		min	-2607.748	3	-5271.25	3	-310.132	5	-1.369	4	0	3	.331	15
5	N29	max	545.285	2	2375.19	2	130.718	3	.177	3	.008	4	7.456	1
6		min	-890.548	3	-1788.035	3	-316.926	4	-1.372	4	-.002	3	-.496	5
7	Totals:	max	3840.241	2	10828.049	2	0	3						
8		min	-4388.845	3	-8847.321	3	-907.975	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	.004	2	0	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-4.184	12	318.309	3	7.129	3	.048	3	.259	1	.275	2
4			min	-195.273	1	-739.293	2	-124.407	1	-.187	2	0	3	-.117	3
5		3	max	-4.571	12	317.065	3	7.129	3	.048	3	.178	1	.76	2
6			min	-196.046	1	-740.951	2	-124.407	1	-.187	2	.003	12	-.325	3
7		4	max	-4.958	12	315.822	3	7.129	3	.048	3	.096	1	1.247	2
8			min	-196.819	1	-742.609	2	-124.407	1	-.187	2	.006	12	-.533	3
9		5	max	661.71	3	674.767	2	19.43	3	-.007	9	.124	1	1.474	2
10			min	-1761.438	2	-272.14	3	-151.165	1	-.022	2	-.035	3	-.632	3
11		6	max	661.13	3	673.109	2	19.43	3	-.007	9	.036	2	1.032	2
12			min	-1762.211	2	-273.383	3	-151.165	1	-.022	2	-.028	5	-.453	3
13		7	max	660.551	3	671.451	2	19.43	3	-.007	9	-.006	12	.591	2
14			min	-1762.984	2	-274.627	3	-151.165	1	-.022	2	-.076	4	-.273	3
15		8	max	659.971	3	669.793	2	19.43	3	-.007	9	.003	3	.151	2
16			min	-1763.757	2	-275.871	3	-151.165	1	-.022	2	-.173	1	-.092	3
17		9	max	655.568	3	7.827	1	36.085	3	.016	5	.1	1	-.002	15
18			min	-1890.481	2	.372	15	-198.736	1	-.134	2	.008	12	-.056	2
19		10	max	654.988	3	6.169	1	36.085	3	.016	5	.036	3	-.002	15
20			min	-1891.254	2	-.183	5	-198.736	1	-.134	2	-.032	2	-.058	2
21		11	max	654.408	3	4.511	1	36.085	3	.016	5	.06	3	-.001	15
22			min	-1892.028	2	-1.346	13	-198.736	1	-.134	2	-.16	1	-.058	2
23		12	max	644.582	3	710.608	3	3.64	10	.174	3	.129	1	.098	2
24			min	-2012.916	2	-448.325	2	-179.499	4	-.166	2	.03	12	-.245	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	644.002	3	709.365	3	3.64	10	.174	3	.106	1	.392	2
26			min	-2013.69	2	-449.983	2	-181.085	4	-.166	2	-.03	3	-.711	3
27		14	max	643.422	3	708.121	3	3.64	10	.174	3	.084	1	.688	2
28			min	-2014.463	2	-451.641	2	-182.67	4	-.166	2	-.132	5	-1.176	3
29		15	max	642.842	3	706.877	3	3.64	10	.174	3	.081	2	.985	2
30			min	-2015.236	2	-453.299	2	-184.256	4	-.166	2	-.246	5	-1.64	3
31		16	max	196.961	1	452.65	2	59.753	5	.104	2	.016	3	.75	2
32			min	3.719	12	-744.939	3	-112.566	1	-.285	3	-.162	4	-1.252	3
33		17	max	196.187	1	450.992	2	58.167	5	.104	2	.015	3	.453	2
34			min	3.332	12	-746.182	3	-112.566	1	-.285	3	-.196	1	-.763	3
35		18	max	195.414	1	449.334	2	56.582	5	.104	2	.015	3	.158	2
36			min	2.946	12	-747.426	3	-112.566	1	-.285	3	-.27	1	-.273	3
37		19	max	0	1	0	15	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.007	2	0	4	0	1	0	1	0	1
40			min	0	1	-.002	3	0	1	0	1	0	1	0	1
41		2	max	19.408	10	902.521	3	0	1	.03	4	.221	4	.549	2
42			min	-214.67	1	-1802.931	2	-82.907	5	0	1	0	1	-.282	3
43		3	max	18.764	10	901.277	3	0	1	.03	4	.166	4	1.732	2
44			min	-215.443	1	-1804.589	2	-84.492	5	0	1	0	1	-.874	3
45		4	max	18.12	10	900.033	3	0	1	.03	4	.111	4	2.917	2
46			min	-216.217	1	-1806.247	2	-86.078	5	0	1	0	1	-1.465	3
47		5	max	2100.099	3	1831.43	2	0	1	0	1	.017	4	3.434	2
48			min	-4259.862	2	-960.429	3	-83.578	4	-.015	4	0	1	-1.713	3
49		6	max	2099.519	3	1829.772	2	0	1	0	1	0	1	2.233	2
50			min	-4260.635	2	-961.672	3	-85.164	4	-.015	4	-.039	5	-1.083	3
51		7	max	2098.939	3	1828.114	2	0	1	0	1	0	1	1.033	2
52			min	-4261.408	2	-962.916	3	-86.75	4	-.015	4	-.095	4	-.451	3
53		8	max	2098.359	3	1826.456	2	0	1	0	1	0	1	.181	3
54			min	-4262.181	2	-964.159	3	-88.335	4	-.015	4	-.153	4	-.166	2
55		9	max	2068.371	3	10.229	3	0	1	.012	4	.135	4	.484	3
56			min	-4254.846	2	-132.596	2	-198.382	4	0	1	0	1	-.718	2
57		10	max	2067.791	3	8.985	3	0	1	.012	4	.005	5	.477	3
58			min	-4255.619	2	-134.254	2	-199.967	4	0	1	0	1	-.63	2
59		11	max	2067.211	3	7.742	3	0	1	.012	4	0	1	.472	3
60			min	-4256.392	2	-135.912	2	-201.553	4	0	1	-.128	4	-.542	2
61		12	max	2048.07	3	2073.838	3	0	1	.114	4	.139	5	.023	9
62			min	-4260.727	2	-1555.188	2	-196.106	5	0	1	0	1	-.182	3
63		13	max	2047.49	3	2072.594	3	0	1	.114	4	.01	5	.994	2
64			min	-4261.501	2	-1556.846	2	-197.692	5	0	1	0	1	-1.542	3
65		14	max	2046.91	3	2071.351	3	0	1	.114	4	0	1	2.016	2
66			min	-4262.274	2	-1558.504	2	-199.277	5	0	1	-.121	4	-2.902	3
67		15	max	2046.331	3	2070.107	3	0	1	.114	4	0	1	3.039	2
68			min	-4263.047	2	-1560.162	2	-200.863	5	0	1	-.252	4	-4.26	3
69		16	max	215.934	1	1416.591	2	48.496	5	0	1	0	1	2.314	2
70			min	-18.572	10	-1990.037	3	0	1	-.105	4	-.136	5	-3.235	3
71		17	max	215.161	1	1414.933	2	46.911	5	0	1	0	1	1.385	2
72			min	-19.216	10	-1991.28	3	0	1	-.105	4	-.105	5	-1.929	3
73		18	max	214.388	1	1413.275	2	45.325	5	0	1	0	1	.457	2
74			min	-19.861	10	-1992.524	3	0	1	-.105	4	-.075	4	-.622	3
75		19	max	0	1	0	2	0	1	0	1	0	1	0	1
76			min	0	1	-.004	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.004	2	0	4	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	26.786	5	318.309	3	124.407	1	.187	2	.114	5	.275	2
80			min	-195.273	1	-739.293	2	-37.668	5	-.048	3	-.259	1	-.117	3
81		3	max	26.425	5	317.065	3	124.407	1	.187	2	.089	5	.76	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	-196.046	1	-740.951	2	-39.254	5	-.048	3	-.178	1	-.325	3
83		4	max	26.065	5	315.822	3	124.407	1	.187	2	.063	5	1.247	2
84			min	-196.819	1	-742.609	2	-40.839	5	-.048	3	-.096	1	-.533	3
85		5	max	661.71	3	674.767	2	151.165	1	.022	2	.035	3	1.474	2
86			min	-1761.438	2	-272.14	3	-36.359	5	-.012	5	-.124	1	-.632	3
87		6	max	661.13	3	673.109	2	151.165	1	.022	2	.022	3	1.032	2
88			min	-1762.211	2	-273.383	3	-37.945	5	-.012	5	-.036	2	-.453	3
89		7	max	660.551	3	671.451	2	151.165	1	.022	2	.074	1	.591	2
90			min	-1762.984	2	-274.627	3	-39.53	5	-.012	5	-.054	5	-.273	3
91		8	max	659.971	3	669.793	2	151.165	1	.022	2	.173	1	.151	2
92			min	-1763.757	2	-275.871	3	-41.116	5	-.012	5	-.081	5	-.092	3
93		9	max	655.568	3	7.827	1	198.736	1	.134	2	.06	5	-.003	15
94			min	-1890.481	2	1.031	15	-67.988	5	.014	15	-.1	1	-.056	2
95		10	max	654.988	3	6.169	1	198.736	1	.134	2	.032	2	-.004	15
96			min	-1891.254	2	.038	10	-69.574	5	.014	15	-.036	3	-.058	2
97		11	max	654.408	3	4.511	1	198.736	1	.134	2	.16	1	-.004	15
98			min	-1892.028	2	-1.343	10	-71.159	5	.014	15	-.06	3	-.058	2
99		12	max	644.582	3	710.608	3	120.167	3	.166	2	.081	5	.098	2
100			min	-2012.916	2	-448.325	2	-165.713	5	-.174	3	-.129	1	-.245	3
101		13	max	644.002	3	709.365	3	120.167	3	.166	2	.03	3	.392	2
102			min	-2013.69	2	-449.983	2	-167.299	5	-.174	3	-.106	1	-.711	3
103		14	max	643.422	3	708.121	3	120.167	3	.166	2	.109	3	.688	2
104			min	-2014.463	2	-451.641	2	-168.884	5	-.174	3	-.151	4	-1.176	3
105		15	max	642.842	3	706.877	3	120.167	3	.166	2	.188	3	.985	2
106			min	-2015.236	2	-453.299	2	-170.47	5	-.174	3	-.257	4	-1.64	3
107		16	max	196.961	1	452.65	2	112.566	1	.285	3	.122	1	.75	2
108			min	1.831	15	-744.939	3	1.217	12	-.104	2	-.13	5	-1.252	3
109		17	max	196.187	1	450.992	2	112.566	1	.285	3	.196	1	.453	2
110			min	1.598	15	-746.182	3	1.217	12	-.104	2	-.084	5	-.763	3
111		18	max	195.414	1	449.334	2	112.566	1	.285	3	.27	1	.158	2
112			min	1.365	15	-747.426	3	1.217	12	-.104	2	-.039	5	-.273	3
113		19	max	0	1	0	5	0	12	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	112.607	1	447.976	2	-1.139	15	.008	2	.308	1	.104	2
116			min	1.218	12	-748.631	3	-195.034	1	-.023	3	-.016	5	-.285	3
117		2	max	112.607	1	319.77	2	.211	15	.008	2	.169	1	.222	3
118			min	1.218	12	-554.724	3	-161.54	1	-.023	3	-.017	5	-.194	2
119		3	max	112.607	1	191.563	2	2.052	5	.008	2	.08	2	.578	3
120			min	1.218	12	-360.816	3	-128.046	1	-.023	3	-.016	5	-.393	2
121		4	max	112.607	1	63.357	2	4.141	5	.008	2	.019	2	.783	3
122			min	1.218	12	-166.908	3	-94.552	1	-.023	3	-.033	9	-.492	2
123		5	max	112.607	1	27	3	6.229	5	.008	2	-.006	10	.837	3
124			min	1.218	12	-64.85	2	-61.057	1	-.023	3	-.091	1	-.492	2
125		6	max	112.607	1	220.908	3	8.318	5	.008	2	-.003	15	.741	3
126			min	1.218	12	-193.056	2	-44.323	2	-.023	3	-.125	1	-.391	2
127		7	max	112.607	1	414.816	3	19.061	14	.008	2	.003	5	.494	3
128			min	1.218	12	-321.263	2	-30.779	2	-.023	3	-.134	1	-.191	2
129		8	max	112.607	1	608.723	3	39.577	9	.008	2	.012	5	.108	2
130			min	1.218	12	-449.47	2	-17.782	10	-.023	3	-.119	2	-.018	5
131		9	max	112.607	1	802.631	3	72.92	1	.008	2	.022	5	.508	2
132			min	-7.02	5	-577.676	2	-14.053	10	-.023	3	-.127	2	-.453	3
133		10	max	112.607	1	996.539	3	15.435	3	.023	3	.056	14	1.007	2
134			min	1.218	12	29.19	15	-106.414	1	-.003	14	-.125	2	-1.153	3
135		11	max	112.607	1	577.676	2	14.053	10	.023	3	.018	3	.508	2
136			min	1.218	12	-802.631	3	-72.92	1	-.008	2	-.127	2	-.453	3
137		12	max	112.607	1	449.47	2	17.782	10	.023	3	.008	3	.108	2
138			min	1.218	12	-608.723	3	-39.577	9	-.008	2	-.119	2	.017	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	112.607	1	321.263	2	30.779	2	.023	3	0	3	.494	3
140			min	-.156	15	-414.816	3	-17.711	9	-.008	2	-.134	1	-.191	2
141		14	max	112.607	1	193.056	2	44.323	2	.023	3	-.004	12	.741	3
142			min	-9.141	5	-220.908	3	-7.2	3	-.008	2	-.125	1	-.391	2
143		15	max	112.607	1	64.85	2	61.057	1	.023	3	0	15	.837	3
144			min	-18.319	5	-27	3	-5.142	3	-.008	2	-.091	1	-.492	2
145		16	max	112.607	1	166.908	3	94.552	1	.023	3	.019	2	.783	3
146			min	-27.497	5	-63.357	2	-3.083	3	-.008	2	-.033	9	-.492	2
147		17	max	112.607	1	360.816	3	128.046	1	.023	3	.08	2	.578	3
148			min	-36.675	5	-191.563	2	-1.025	3	-.008	2	-.016	3	-.393	2
149		18	max	112.607	1	554.724	3	161.54	1	.023	3	.169	1	.222	3
150			min	-45.853	5	-319.77	2	1.034	3	-.008	2	-.016	3	-.194	2
151		19	max	112.607	1	748.631	3	195.034	1	.023	3	.308	1	.104	2
152			min	-55.032	5	-447.976	2	2.559	12	-.008	2	-.014	3	-.285	3
153	M11	1	max	163.811	1	446.236	2	46.25	5	.004	3	.367	1	.091	4
154			min	-156.044	3	-709.033	3	-207.971	1	-.013	2	-.189	5	-.242	3
155		2	max	163.811	1	318.03	2	48.339	5	.004	3	.219	1	.234	3
156			min	-156.044	3	-515.125	3	-174.477	1	-.013	2	-.152	5	-.265	2
157		3	max	163.811	1	189.823	2	50.428	5	.004	3	.106	2	.559	3
158			min	-156.044	3	-321.217	3	-140.982	1	-.013	2	-.113	5	-.463	2
159		4	max	163.811	1	61.617	2	52.516	5	.004	3	.038	2	.733	3
160			min	-156.044	3	-127.309	3	-107.488	1	-.013	2	-.079	4	-.56	2
161		5	max	163.811	1	66.599	3	54.605	5	.004	3	0	3	.757	3
162			min	-156.044	3	-66.59	2	-73.994	1	-.013	2	-.071	1	-.558	2
163		6	max	163.811	1	260.506	3	56.694	5	.004	3	.012	5	.63	3
164			min	-156.044	3	-194.797	2	-52.927	2	-.013	2	-.116	1	-.457	2
165		7	max	163.811	1	454.414	3	62.592	4	.004	3	.056	5	.352	3
166			min	-156.044	3	-323.003	2	-39.383	2	-.013	2	-.134	1	-.255	2
167		8	max	163.811	1	648.322	3	71.963	4	.004	3	.103	5	.046	2
168			min	-156.044	3	-451.21	2	-25.838	2	-.013	2	-.127	1	-.077	3
169		9	max	163.811	1	842.23	3	81.334	4	.004	3	.151	5	.447	2
170			min	-156.044	3	-579.416	2	-17.705	10	-.013	2	-.141	2	-.657	3
171		10	max	163.811	1	220.547	14	93.477	1	.013	2	.213	4	.947	2
172			min	-156.044	3	-1036.138	3	-33.471	14	-.005	14	-.145	2	-1.387	3
173		11	max	163.811	1	579.416	2	52.51	5	.013	2	.009	3	.447	2
174			min	-156.044	3	-842.23	3	-59.983	1	-.004	3	-.161	4	-.657	3
175		12	max	163.811	1	451.21	2	54.599	5	.013	2	.004	3	.046	2
176			min	-156.044	3	-648.322	3	-32.558	9	-.004	3	-.13	4	-.077	3
177		13	max	163.811	1	323.003	2	56.687	5	.013	2	0	3	.352	3
178			min	-156.044	3	-454.414	3	-10.691	9	-.004	3	-.134	1	-.255	2
179		14	max	163.811	1	194.797	2	62.682	4	.013	2	0	3	.63	3
180			min	-156.044	3	-260.506	3	-1.013	3	-.004	3	-.116	1	-.457	2
181		15	max	163.811	1	66.59	2	73.994	1	.013	2	.022	5	.757	3
182			min	-156.044	3	-66.599	3	.825	12	-.004	3	-.071	1	-.558	2
183		16	max	163.811	1	127.309	3	107.488	1	.013	2	.07	5	.733	3
184			min	-156.044	3	-61.617	2	2.197	12	-.004	3	-.017	9	-.56	2
185		17	max	163.811	1	321.217	3	140.982	1	.013	2	.132	4	.559	3
186			min	-156.044	3	-189.823	2	3.57	12	-.004	3	.003	12	-.463	2
187		18	max	163.811	1	515.125	3	174.477	1	.013	2	.219	1	.234	3
188			min	-156.044	3	-318.03	2	4.942	12	-.004	3	.006	12	-.265	2
189		19	max	163.811	1	709.033	3	207.971	1	.013	2	.367	1	.048	1
190			min	-156.044	3	-446.236	2	6.314	12	-.004	3	.01	12	-.242	3
191	M12	1	max	25.105	5	663.069	2	43.488	5	0	12	.389	1	.112	2
192			min	-46.548	1	-284.218	3	-212.767	1	-.008	1	-.177	5	.022	15
193		2	max	16.735	3	480.774	2	45.577	5	0	12	.237	1	.239	3
194			min	-46.548	1	-198.486	3	-179.273	1	-.008	1	-.143	5	-.333	2
195		3	max	16.735	3	298.479	2	47.665	5	0	12	.121	2	.36	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	-46.548	1	-112.754	3	-145.778	1	-.008	1	-.106	5	-.636	2
197		4	max	16.735	3	116.184	2	49.754	5	0	12	.05	2	.414	3
198			min	-46.548	1	-27.022	3	-112.284	1	-.008	1	-.073	4	-.798	2
199		5	max	16.735	3	58.711	3	51.843	5	0	12	.003	10	.402	3
200			min	-46.548	1	-66.111	2	-78.79	1	-.008	1	-.064	1	-.817	2
201		6	max	16.735	3	144.443	3	53.932	5	0	12	.012	5	.323	3
202			min	-46.548	1	-248.405	2	-58.16	2	-.008	1	-.113	1	-.695	2
203		7	max	16.735	3	230.175	3	59.334	4	0	12	.055	5	.177	3
204			min	-46.548	1	-430.7	2	-44.616	2	-.008	1	-.135	1	-.431	2
205		8	max	16.735	3	315.907	3	68.705	4	0	12	.099	5	-.003	15
206			min	-49.198	4	-612.995	2	-31.072	2	-.008	1	-.131	2	-.035	1
207		9	max	16.735	3	401.639	3	78.076	4	0	12	.145	5	.523	2
208			min	-58.377	4	-795.29	2	-20.487	10	-.008	1	-.15	2	-.314	3
209		10	max	16.735	3	-11.225	15	89.524	14	0	3	.204	4	1.212	2
210			min	-67.555	4	-977.584	2	-16.757	10	-.008	1	-.158	2	-.66	3
211		11	max	41.724	5	795.29	2	50.116	5	.008	1	.018	3	.523	2
212			min	-46.548	1	-401.639	3	-55.187	1	-.001	5	-.157	4	-.314	3
213		12	max	32.546	5	612.995	2	52.204	5	.008	1	.009	3	.002	5
214			min	-46.548	1	-315.907	3	-30.771	9	-.001	5	-.131	2	-.035	1
215		13	max	23.368	5	430.7	2	54.293	5	.008	1	.001	3	.177	3
216			min	-46.548	1	-230.175	3	-8.905	9	-.001	5	-.135	1	-.431	2
217		14	max	16.735	3	248.405	2	60.983	4	.008	1	-.003	12	.323	3
218			min	-46.548	1	-144.443	3	-6.474	3	-.001	5	-.113	1	-.695	2
219		15	max	16.735	3	66.111	2	78.79	1	.008	1	.02	5	.402	3
220			min	-46.548	1	-58.711	3	-4.416	3	-.001	5	-.064	1	-.817	2
221		16	max	16.735	3	27.022	3	112.284	1	.008	1	.066	5	.414	3
222			min	-46.548	1	-116.184	2	-2.357	3	-.001	5	-.013	9	-.798	2
223		17	max	16.735	3	112.754	3	145.778	1	.008	1	.128	4	.36	3
224			min	-46.548	1	-298.479	2	-.298	3	-.001	5	-.012	3	-.636	2
225		18	max	16.735	3	198.486	3	179.273	1	.008	1	.237	1	.239	3
226			min	-46.548	1	-480.774	2	1.677	12	-.001	5	-.012	3	-.333	2
227		19	max	16.735	3	284.218	3	212.767	1	.008	1	.389	1	.112	2
228			min	-46.548	1	-663.069	2	3.049	12	-.001	5	-.01	3	-.029	5
229	M13	1	max	35.977	5	738.754	2	27.151	5	.01	3	.301	1	.187	2
230			min	-124.268	1	-319.594	3	-194.053	1	-.027	2	-.127	5	-.048	3
231		2	max	26.799	5	556.459	2	29.239	5	.01	3	.163	1	.167	3
232			min	-124.268	1	-233.862	3	-160.559	1	-.027	2	-.105	5	-.317	2
233		3	max	17.621	5	374.165	2	31.328	5	.01	3	.075	2	.316	3
234			min	-124.268	1	-148.13	3	-127.064	1	-.027	2	-.082	5	-.678	2
235		4	max	8.443	5	191.87	2	33.417	5	.01	3	.015	10	.398	3
236			min	-124.268	1	-62.398	3	-93.57	1	-.027	2	-.068	4	-.899	2
237		5	max	7.128	3	23.335	3	35.506	5	.01	3	-.004	12	.413	3
238			min	-124.268	1	3.243	10	-60.076	1	-.027	2	-.094	1	-.977	2
239		6	max	7.128	3	109.067	3	37.594	5	.01	3	0	15	.361	3
240			min	-124.268	1	-172.72	2	-43.532	2	-.027	2	-.128	1	-.913	2
241		7	max	7.128	3	194.799	3	45.905	4	.01	3	.029	5	.243	3
242			min	-124.268	1	-355.015	2	-29.988	2	-.027	2	-.136	1	-.708	2
243		8	max	7.128	3	280.531	3	55.276	4	.01	3	.061	5	.058	3
244			min	-124.268	1	-537.309	2	-17.397	10	-.027	2	-.121	2	-.361	2
245		9	max	7.128	3	366.263	3	73.901	1	.01	3	.094	5	.128	2
246			min	-124.268	1	-719.604	2	-13.667	10	-.027	2	-.128	2	-.193	3
247		10	max	7.128	3	901.899	2	88.283	14	.01	3	.146	4	.758	2
248			min	-124.268	1	-451.995	3	-107.395	1	-.027	2	-.125	2	-.511	3
249		11	max	25.58	5	719.604	2	32.011	5	.027	2	.016	3	.128	2
250			min	-124.268	1	-366.263	3	-73.901	1	-.01	3	-.128	2	-.193	3
251		12	max	16.402	5	537.309	2	34.1	5	.027	2	.008	3	.058	3
252			min	-124.268	1	-280.531	3	-40.407	1	-.01	3	-.121	2	-.361	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
253		13	max	7.224	5	355.015	2	36.189	5	.027	2	.002	3	.243	3
254			min	-124.268	1	-194.799	3	-18.194	9	-.01	3	-.136	1	-.708	2
255		14	max	7.128	3	172.72	2	43.532	2	.027	2	-.002	12	.361	3
256			min	-124.268	1	-109.067	3	-5.132	3	-.01	3	-.128	1	-.913	2
257		15	max	7.128	3	5.321	5	60.076	1	.027	2	.018	5	.413	3
258			min	-124.268	1	-23.335	3	-3.073	3	-.01	3	-.094	1	-.977	2
259		16	max	7.128	3	62.398	3	93.57	1	.027	2	.05	5	.398	3
260			min	-124.268	1	-191.87	2	-1.015	3	-.01	3	-.035	1	-.899	2
261		17	max	7.128	3	148.13	3	127.064	1	.027	2	.087	4	.316	3
262			min	-124.268	1	-374.165	2	1.044	3	-.01	3	-.008	3	-.678	2
263		18	max	7.128	3	233.862	3	160.559	1	.027	2	.163	1	.167	3
264			min	-124.268	1	-556.459	2	2.425	12	-.01	3	-.006	3	-.317	2
265		19	max	7.128	3	319.594	3	194.053	1	.027	2	.301	1	.187	2
266			min	-124.268	1	-738.754	2	3.797	12	-.01	3	-.003	3	-.048	3
267	M2	1	max	2375.19	2	890.109	3	112.559	2	.007	5	1.32	5	7.456	1
268			min	-1788.035	3	-541.227	2	-295.298	5	-.004	2	-.175	1	.722	12
269		2	max	2372.269	2	890.109	3	112.559	2	.007	5	1.226	5	7.491	1
270			min	-1790.227	3	-541.227	2	-292.766	5	-.004	2	-.141	1	.551	12
271		3	max	2369.347	2	890.109	3	112.559	2	.007	5	1.132	5	7.526	1
272			min	-1792.418	3	-541.227	2	-290.234	5	-.004	2	-.107	1	.379	12
273		4	max	2366.425	2	890.109	3	112.559	2	.007	5	1.04	5	7.561	1
274			min	-1794.609	3	-541.227	2	-287.702	5	-.004	2	-.073	1	.207	12
275		5	max	1778.567	2	1626.494	1	80.431	2	.001	2	.954	5	7.306	1
276			min	-1554.442	3	26.782	12	-272.917	5	0	3	-.076	1	.12	12
277		6	max	1775.645	2	1626.494	1	80.431	2	.001	2	.869	4	6.784	1
278			min	-1556.633	3	26.782	12	-270.384	5	0	3	-.051	1	.112	12
279		7	max	1772.723	2	1626.494	1	80.431	2	.001	2	.785	4	6.263	1
280			min	-1558.824	3	26.782	12	-267.852	5	0	3	-.048	3	.103	12
281		8	max	1769.801	2	1626.494	1	80.431	2	.001	2	.701	4	5.741	1
282			min	-1561.016	3	26.782	12	-265.32	5	0	3	-.087	3	.095	12
283		9	max	1766.88	2	1626.494	1	80.431	2	.001	2	.619	4	5.219	1
284			min	-1563.207	3	26.782	12	-262.788	5	0	3	-.125	3	.086	12
285		10	max	1763.958	2	1626.494	1	80.431	2	.001	2	.537	4	4.697	1
286			min	-1565.398	3	26.782	12	-260.256	5	0	3	-.163	3	.077	12
287		11	max	1761.036	2	1626.494	1	80.431	2	.001	2	.457	4	4.175	1
288			min	-1567.59	3	26.782	12	-257.724	5	0	3	-.201	3	.069	12
289		12	max	1758.114	2	1626.494	1	80.431	2	.001	2	.377	4	3.653	1
290			min	-1569.781	3	26.782	12	-255.191	5	0	3	-.239	3	.06	12
291		13	max	1755.193	2	1626.494	1	80.431	2	.001	2	.298	4	3.131	1
292			min	-1571.972	3	26.782	12	-252.659	5	0	3	-.277	3	.052	12
293		14	max	1752.271	2	1626.494	1	80.431	2	.001	2	.219	4	2.609	1
294			min	-1574.164	3	26.782	12	-250.127	5	0	3	-.315	3	.043	12
295		15	max	1749.349	2	1626.494	1	80.431	2	.001	2	.195	2	2.088	1
296			min	-1576.355	3	26.782	12	-247.595	5	0	3	-.353	3	.034	12
297		16	max	1746.428	2	1626.494	1	80.431	2	.001	2	.22	2	1.566	1
298			min	-1578.546	3	26.782	12	-245.063	5	0	3	-.392	3	.026	12
299		17	max	1743.506	2	1626.494	1	80.431	2	.001	2	.246	2	1.044	1
300			min	-1580.737	3	26.782	12	-242.531	5	0	3	-.43	3	.017	12
301		18	max	1740.584	2	1626.494	1	80.431	2	.001	2	.272	2	.522	1
302			min	-1582.929	3	26.782	12	-239.998	5	0	3	-.468	3	.009	12
303		19	max	1737.662	2	1626.494	1	80.431	2	.001	2	.298	2	0	1
304			min	-1585.12	3	26.782	12	-237.466	5	0	3	-.506	3	0	1
305	M5	1	max	6077.668	2	2605.282	3	0	1	.007	4	1.369	4	10.622	1
306			min	-5271.25	3	-2734.36	2	-310.326	5	0	1	0	1	.331	15
307		2	max	6074.746	2	2605.282	3	0	1	.007	4	1.27	4	11.16	1
308			min	-5273.442	3	-2734.36	2	-307.794	5	0	1	0	1	.336	15
309		3	max	6071.825	2	2605.282	3	0	1	.007	4	1.172	4	11.699	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
310			min	-5275.633	3	-2734.36	2	-305.262	5	0	1	0	1	.341	15
311		4	max	6068.903	2	2605.282	3	0	1	.007	4	1.075	4	12.238	1
312			min	-5277.824	3	-2734.36	2	-302.73	5	0	1	0	1	-.107	3
313		5	max	4609.114	2	2682.356	1	0	1	0	1	.986	4	12.049	1
314			min	-4499.986	3	-109.102	3	-291.076	4	0	4	0	1	-.49	3
315		6	max	4606.192	2	2682.356	1	0	1	0	1	.893	4	11.189	1
316			min	-4502.178	3	-109.102	3	-288.544	4	0	4	0	1	-.455	3
317		7	max	4603.27	2	2682.356	1	0	1	0	1	.801	4	10.328	1
318			min	-4504.369	3	-109.102	3	-286.012	4	0	4	0	1	-.42	3
319		8	max	4600.348	2	2682.356	1	0	1	0	1	.71	4	9.467	1
320			min	-4506.56	3	-109.102	3	-283.48	4	0	4	0	1	-.385	3
321		9	max	4597.427	2	2682.356	1	0	1	0	1	.619	4	8.607	1
322			min	-4508.752	3	-109.102	3	-280.947	4	0	4	0	1	-.35	3
323		10	max	4594.505	2	2682.356	1	0	1	0	1	.529	4	7.746	1
324			min	-4510.943	3	-109.102	3	-278.415	4	0	4	0	1	-.315	3
325		11	max	4591.583	2	2682.356	1	0	1	0	1	.44	4	6.885	1
326			min	-4513.134	3	-109.102	3	-275.883	4	0	4	0	1	-.28	3
327		12	max	4588.661	2	2682.356	1	0	1	0	1	.352	4	6.025	1
328			min	-4515.325	3	-109.102	3	-273.351	4	0	4	0	1	-.245	3
329		13	max	4585.74	2	2682.356	1	0	1	0	1	.265	4	5.164	1
330			min	-4517.517	3	-109.102	3	-270.819	4	0	4	0	1	-.21	3
331		14	max	4582.818	2	2682.356	1	0	1	0	1	.179	4	4.303	1
332			min	-4519.708	3	-109.102	3	-268.287	4	0	4	0	1	-.175	3
333		15	max	4579.896	2	2682.356	1	0	1	0	1	.093	4	3.443	1
334			min	-4521.899	3	-109.102	3	-265.754	4	0	4	0	1	-.14	3
335		16	max	4576.974	2	2682.356	1	0	1	0	1	.008	4	2.582	1
336			min	-4524.091	3	-109.102	3	-263.222	4	0	4	0	1	-.105	3
337		17	max	4574.053	2	2682.356	1	0	1	0	1	0	1	1.721	1
338			min	-4526.282	3	-109.102	3	-260.69	4	0	4	-.076	4	-.07	3
339		18	max	4571.131	2	2682.356	1	0	1	0	1	0	1	.861	1
340			min	-4528.473	3	-109.102	3	-258.158	4	0	4	-.159	4	-.035	3
341		19	max	4568.209	2	2682.356	1	0	1	0	1	0	1	0	1
342			min	-4530.665	3	-109.102	3	-255.626	4	0	4	-.242	4	0	1
343	M8	1	max	2375.19	2	890.109	3	130.56	3	.008	4	1.372	4	7.456	1
344			min	-1788.035	3	-541.227	2	-317.295	4	-.002	3	-.177	3	-.496	5
345		2	max	2372.269	2	890.109	3	130.56	3	.008	4	1.271	4	7.491	1
346			min	-1790.227	3	-541.227	2	-314.763	4	-.002	3	-.136	3	-.447	5
347		3	max	2369.347	2	890.109	3	130.56	3	.008	4	1.17	4	7.526	1
348			min	-1792.418	3	-541.227	2	-312.231	4	-.002	3	-.094	3	-.397	5
349		4	max	2366.425	2	890.109	3	130.56	3	.008	4	1.07	4	7.561	1
350			min	-1794.609	3	-541.227	2	-309.698	4	-.002	3	-.052	3	-.348	5
351		5	max	1778.567	2	1626.494	1	118.822	3	0	3	.983	4	7.306	1
352			min	-1554.442	3	-69.587	5	-291.947	4	-.001	2	-.028	3	-.313	5
353		6	max	1775.645	2	1626.494	1	118.822	3	0	3	.89	4	6.784	1
354			min	-1556.633	3	-69.587	5	-289.415	4	-.001	2	.006	12	-.29	5
355		7	max	1772.723	2	1626.494	1	118.822	3	0	3	.798	4	6.263	1
356			min	-1558.824	3	-69.587	5	-286.882	4	-.001	2	.004	10	-.268	5
357		8	max	1769.801	2	1626.494	1	118.822	3	0	3	.706	4	5.741	1
358			min	-1561.016	3	-69.587	5	-284.35	4	-.001	2	-.014	2	-.246	5
359		9	max	1766.88	2	1626.494	1	118.822	3	0	3	.615	4	5.219	1
360			min	-1563.207	3	-69.587	5	-281.818	4	-.001	2	-.04	2	-.223	5
361		10	max	1763.958	2	1626.494	1	118.822	3	0	3	.525	4	4.697	1
362			min	-1565.398	3	-69.587	5	-279.286	4	-.001	2	-.066	2	-.201	5
363		11	max	1761.036	2	1626.494	1	118.822	3	0	3	.438	5	4.175	1
364			min	-1567.59	3	-69.587	5	-276.754	4	-.001	2	-.091	2	-.179	5
365		12	max	1758.114	2	1626.494	1	118.822	3	0	3	.354	5	3.653	1
366			min	-1569.781	3	-69.587	5	-274.222	4	-.001	2	-.117	2	-.156	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	1755.193	2	1626.494	1	118.822	3	0	3	.277	3	3.131	1
368			min	-1571.972	3	-69.587	5	-271.689	4	-.001	2	-.143	2	-.134	5
369		14	max	1752.271	2	1626.494	1	118.822	3	0	3	.315	3	2.609	1
370			min	-1574.164	3	-69.587	5	-269.157	4	-.001	2	-.169	2	-.112	5
371		15	max	1749.349	2	1626.494	1	118.822	3	0	3	.353	3	2.088	1
372			min	-1576.355	3	-69.587	5	-266.625	4	-.001	2	-.195	2	-.089	5
373		16	max	1746.428	2	1626.494	1	118.822	3	0	3	.392	3	1.566	1
374			min	-1578.546	3	-69.587	5	-264.093	4	-.001	2	-.22	2	-.067	5
375		17	max	1743.506	2	1626.494	1	118.822	3	0	3	.43	3	1.044	1
376			min	-1580.737	3	-69.587	5	-261.561	4	-.001	2	-.246	2	-.045	5
377		18	max	1740.584	2	1626.494	1	118.822	3	0	3	.468	3	.522	1
378			min	-1582.929	3	-69.587	5	-259.029	4	-.001	2	-.272	2	-.022	5
379		19	max	1737.662	2	1626.494	1	118.822	3	0	3	.506	3	0	1
380			min	-1585.12	3	-69.587	5	-256.496	4	-.001	2	-.298	2	0	1
381	M3	1	max	2165.708	2	5.879	6	31.508	2	.016	3	.007	4	0	1
382			min	-888.409	3	1.382	15	-12.81	5	-.038	2	-.002	3	0	1
383		2	max	2165.561	2	5.226	6	31.508	2	.016	3	.016	2	0	15
384			min	-888.519	3	1.228	15	-12.351	5	-.038	2	-.007	3	-.002	6
385		3	max	2165.414	2	4.572	6	31.508	2	.016	3	.027	2	0	15
386			min	-888.629	3	1.075	15	-12.291	3	-.038	2	-.011	3	-.004	6
387		4	max	2165.268	2	3.919	6	31.508	2	.016	3	.039	2	-.001	15
388			min	-888.739	3	.921	15	-12.291	3	-.038	2	-.015	3	-.005	6
389		5	max	2165.121	2	3.266	6	31.508	2	.016	3	.05	2	-.002	15
390			min	-888.849	3	.768	15	-12.291	3	-.038	2	-.02	3	-.007	6
391		6	max	2164.975	2	2.613	6	31.508	2	.016	3	.061	2	-.002	15
392			min	-888.959	3	.614	15	-12.291	3	-.038	2	-.024	3	-.008	6
393		7	max	2164.828	2	1.96	6	31.508	2	.016	3	.072	2	-.002	15
394			min	-889.069	3	.461	15	-12.291	3	-.038	2	-.028	3	-.008	6
395		8	max	2164.681	2	1.306	6	31.508	2	.016	3	.084	2	-.002	15
396			min	-889.179	3	.307	15	-12.291	3	-.038	2	-.033	3	-.009	6
397		9	max	2164.535	2	.653	6	31.508	2	.016	3	.095	2	-.002	15
398			min	-889.289	3	.154	15	-12.291	3	-.038	2	-.037	3	-.009	6
399		10	max	2164.388	2	0	1	31.508	2	.016	3	.106	2	-.002	15
400			min	-889.399	3	0	1	-12.291	3	-.038	2	-.042	3	-.009	6
401		11	max	2164.242	2	-.154	15	31.508	2	.016	3	.117	2	-.002	15
402			min	-889.509	3	-.653	4	-12.291	3	-.038	2	-.046	3	-.009	6
403		12	max	2164.095	2	-.307	15	31.508	2	.016	3	.129	2	-.002	15
404			min	-889.619	3	-1.306	4	-12.291	3	-.038	2	-.05	3	-.009	6
405		13	max	2163.948	2	-.461	15	31.508	2	.016	3	.14	2	-.002	15
406			min	-889.729	3	-1.96	4	-12.291	3	-.038	2	-.055	3	-.008	6
407		14	max	2163.802	2	-.614	15	31.508	2	.016	3	.151	2	-.002	15
408			min	-889.839	3	-2.613	4	-12.291	3	-.038	2	-.059	3	-.008	6
409		15	max	2163.655	2	-.768	15	31.508	2	.016	3	.162	2	-.002	15
410			min	-889.949	3	-3.266	4	-12.291	3	-.038	2	-.064	3	-.007	6
411		16	max	2163.508	2	-.921	15	31.508	2	.016	3	.174	2	-.001	15
412			min	-890.059	3	-3.919	4	-12.291	3	-.038	2	-.068	3	-.005	6
413		17	max	2163.362	2	-1.075	15	31.508	2	.016	3	.185	2	0	15
414			min	-890.169	3	-4.572	4	-12.291	3	-.038	2	-.072	3	-.004	6
415		18	max	2163.215	2	-1.228	15	31.508	2	.016	3	.196	2	0	15
416			min	-890.279	3	-5.226	4	-12.291	3	-.038	2	-.077	3	-.002	6
417		19	max	2163.069	2	-1.382	15	31.508	2	.016	3	.207	2	0	1
418			min	-890.389	3	-5.879	4	-12.291	3	-.038	2	-.081	3	0	1
419	M6	1	max	5543.312	2	5.879	4	0	1	.008	4	.006	4	0	1
420			min	-2826.101	3	1.382	15	-14.012	4	0	1	0	1	0	1
421		2	max	5543.165	2	5.226	4	0	1	.008	4	0	4	0	15
422			min	-2826.211	3	1.228	15	-13.553	4	0	1	0	1	-.002	4
423		3	max	5543.019	2	4.572	4	0	1	.008	4	0	1	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	-2826.32	3	1.075	15	-13.094	4	0	1	-.004	4	-.004	4
425		4	max	5542.872	2	3.919	4	0	1	.008	4	0	1	-.001	15
426			min	-2826.43	3	.921	15	-12.635	4	0	1	-.009	4	-.005	4
427		5	max	5542.726	2	3.266	4	0	1	.008	4	0	1	-.002	15
428			min	-2826.54	3	.768	15	-12.176	4	0	1	-.013	4	-.007	4
429		6	max	5542.579	2	2.613	4	0	1	.008	4	0	1	-.002	15
430			min	-2826.65	3	.614	15	-11.717	4	0	1	-.017	4	-.008	4
431		7	max	5542.432	2	1.96	4	0	1	.008	4	0	1	-.002	15
432			min	-2826.76	3	.461	15	-11.258	4	0	1	-.021	4	-.008	4
433		8	max	5542.286	2	1.306	4	0	1	.008	4	0	1	-.002	15
434			min	-2826.87	3	.307	15	-10.799	4	0	1	-.025	4	-.009	4
435		9	max	5542.139	2	.653	4	0	1	.008	4	0	1	-.002	15
436			min	-2826.98	3	.154	15	-10.34	4	0	1	-.029	4	-.009	4
437		10	max	5541.992	2	0	1	0	1	.008	4	0	1	-.002	15
438			min	-2827.09	3	0	1	-9.881	4	0	1	-.033	4	-.009	4
439		11	max	5541.846	2	-.154	15	0	1	.008	4	0	1	-.002	15
440			min	-2827.2	3	-.653	6	-9.422	4	0	1	-.036	4	-.009	4
441		12	max	5541.699	2	-.307	15	0	1	.008	4	0	1	-.002	15
442			min	-2827.31	3	-1.306	6	-8.963	4	0	1	-.039	4	-.009	4
443		13	max	5541.553	2	-.461	15	0	1	.008	4	0	1	-.002	15
444			min	-2827.42	3	-1.96	6	-8.504	4	0	1	-.043	4	-.008	4
445		14	max	5541.406	2	-.614	15	0	1	.008	4	0	1	-.002	15
446			min	-2827.53	3	-2.613	6	-8.045	4	0	1	-.045	4	-.008	4
447		15	max	5541.259	2	-.768	15	0	1	.008	4	0	1	-.002	15
448			min	-2827.64	3	-3.266	6	-7.585	4	0	1	-.048	4	-.007	4
449		16	max	5541.113	2	-.921	15	0	1	.008	4	0	1	-.001	15
450			min	-2827.75	3	-3.919	6	-7.126	4	0	1	-.051	4	-.005	4
451		17	max	5540.966	2	-1.075	15	0	1	.008	4	0	1	0	15
452			min	-2827.86	3	-4.572	6	-6.667	4	0	1	-.053	4	-.004	4
453		18	max	5540.82	2	-1.228	15	0	1	.008	4	0	1	0	15
454			min	-2827.97	3	-5.226	6	-6.208	4	0	1	-.056	4	-.002	4
455		19	max	5540.673	2	-1.382	15	0	1	.008	4	0	1	0	1
456			min	-2828.08	3	-5.879	6	-5.749	4	0	1	-.058	4	0	1
457	M9	1	max	2165.708	2	5.879	6	12.291	3	.038	2	.006	5	0	1
458			min	-888.409	3	1.382	15	-31.508	2	-.016	3	-.005	2	0	1
459		2	max	2165.561	2	5.226	6	12.291	3	.038	2	.007	3	0	15
460			min	-888.519	3	1.228	15	-31.508	2	-.016	3	-.016	2	-.002	6
461		3	max	2165.414	2	4.572	6	12.291	3	.038	2	.011	3	0	15
462			min	-888.629	3	1.075	15	-31.508	2	-.016	3	-.027	2	-.004	6
463		4	max	2165.268	2	3.919	6	12.291	3	.038	2	.015	3	-.001	15
464			min	-888.739	3	.921	15	-31.508	2	-.016	3	-.039	2	-.005	6
465		5	max	2165.121	2	3.266	6	12.291	3	.038	2	.02	3	-.002	15
466			min	-888.849	3	.768	15	-31.508	2	-.016	3	-.05	2	-.007	6
467		6	max	2164.975	2	2.613	6	12.291	3	.038	2	.024	3	-.002	15
468			min	-888.959	3	.614	15	-31.508	2	-.016	3	-.061	2	-.008	6
469		7	max	2164.828	2	1.96	6	12.291	3	.038	2	.028	3	-.002	15
470			min	-889.069	3	.461	15	-31.508	2	-.016	3	-.072	2	-.008	6
471		8	max	2164.681	2	1.306	6	12.291	3	.038	2	.033	3	-.002	15
472			min	-889.179	3	.307	15	-31.508	2	-.016	3	-.084	2	-.009	6
473		9	max	2164.535	2	.653	6	12.291	3	.038	2	.037	3	-.002	15
474			min	-889.289	3	.154	15	-31.508	2	-.016	3	-.095	2	-.009	6
475		10	max	2164.388	2	0	1	12.291	3	.038	2	.042	3	-.002	15
476			min	-889.399	3	0	1	-31.508	2	-.016	3	-.106	2	-.009	6
477		11	max	2164.242	2	-.154	15	12.291	3	.038	2	.046	3	-.002	15
478			min	-889.509	3	-.653	4	-31.508	2	-.016	3	-.117	2	-.009	6
479		12	max	2164.095	2	-.307	15	12.291	3	.038	2	.05	3	-.002	15
480			min	-889.619	3	-1.306	4	-31.508	2	-.016	3	-.129	2	-.009	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	2163.948	2	-.461	15	12.291	3	.038	2	.055	3	-.002	15
482			min	-889.729	3	-1.96	4	-31.508	2	-.016	3	-.14	2	-.008	6
483		14	max	2163.802	2	-.614	15	12.291	3	.038	2	.059	3	-.002	15
484			min	-889.839	3	-2.613	4	-31.508	2	-.016	3	-.151	2	-.008	6
485		15	max	2163.655	2	-.768	15	12.291	3	.038	2	.064	3	-.002	15
486			min	-889.949	3	-3.266	4	-31.508	2	-.016	3	-.162	2	-.007	6
487		16	max	2163.508	2	-.921	15	12.291	3	.038	2	.068	3	-.001	15
488			min	-890.059	3	-3.919	4	-31.508	2	-.016	3	-.174	2	-.005	6
489		17	max	2163.362	2	-1.075	15	12.291	3	.038	2	.072	3	0	15
490			min	-890.169	3	-4.572	4	-31.508	2	-.016	3	-.185	2	-.004	6
491		18	max	2163.215	2	-1.228	15	12.291	3	.038	2	.077	3	0	15
492			min	-890.279	3	-5.226	4	-31.508	2	-.016	3	-.196	2	-.002	6
493		19	max	2163.069	2	-1.382	15	12.291	3	.038	2	.081	3	0	1
494			min	-890.389	3	-5.879	4	-31.508	2	-.016	3	-.207	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	-.015	12	.113	3	.01	1	7.89e-3	3	NC	3	NC	1
2			min	-.499	1	-1.059	2	-.635	4	-2.242e-2	2	101.158	1	283.18	5
3		2	max	-.015	12	.075	3	0	3	7.579e-3	3	6295.767	12	NC	2
4			min	-.498	1	-.91	1	-.614	4	-2.121e-2	2	112.697	1	296.209	4
5		3	max	-.015	12	.039	3	0	3	6.968e-3	3	3219.459	12	NC	3
6			min	-.498	1	-.77	1	-.587	4	-1.882e-2	2	126.836	1	314.164	4
7		4	max	-.015	12	.007	3	.001	3	6.358e-3	3	2266.264	12	NC	3
8			min	-.498	1	-.639	1	-.554	4	-1.644e-2	2	143.603	1	338.87	4
9		5	max	-.015	12	-.011	12	.002	3	5.981e-3	3	1863.545	12	NC	3
10			min	-.498	1	-.525	1	-.518	4	-1.465e-2	2	162.4	1	371.29	4
11		6	max	-.015	12	-.019	12	.002	3	6.203e-3	3	1693.333	12	NC	2
12			min	-.497	1	-.43	1	-.48	4	-1.436e-2	2	182.291	1	411.916	4
13		7	max	-.016	12	-.023	12	.002	3	6.425e-3	3	1676.618	15	NC	1
14			min	-.497	1	-.348	1	-.443	4	-1.408e-2	2	203.792	1	460.958	4
15		8	max	-.016	12	-.024	12	0	1	6.647e-3	3	1825.983	15	NC	1
16			min	-.496	1	-.274	1	-.41	4	-1.379e-2	2	228.219	1	516.236	5
17		9	max	-.016	12	-.021	15	0	10	7.205e-3	3	2004.018	15	NC	1
18			min	-.496	1	-.201	1	-.38	4	-1.278e-2	2	258.437	1	579.741	5
19		10	max	-.016	12	-.014	15	.001	2	8.081e-3	3	2221.453	15	NC	1
20			min	-.495	1	-.127	1	-.348	4	-1.108e-2	2	298.405	1	666.747	5
21		11	max	-.016	12	-.007	15	.001	1	8.956e-3	3	2492.974	15	NC	1
22			min	-.494	1	-.053	1	-.315	4	-9.371e-3	2	353.628	1	786.731	5
23		12	max	-.016	12	.022	2	.003	3	8.336e-3	3	2841.475	15	NC	1
24			min	-.493	1	-.04	3	-.284	4	-7.468e-3	2	435.119	1	954.325	5
25		13	max	-.017	12	.096	1	.008	3	6.126e-3	3	3305.858	15	NC	1
26			min	-.493	1	-.037	3	-.25	4	-5.354e-3	2	562.465	1	1239.807	5
27		14	max	-.017	12	.164	1	.012	3	3.917e-3	3	3956.574	15	NC	1
28			min	-.492	1	-.023	3	-.215	4	-4.397e-3	4	770.242	1	1752.742	5
29		15	max	-.017	12	.221	1	.012	3	1.708e-3	3	4934.561	15	NC	1
30			min	-.491	1	.006	12	-.186	4	-5.353e-3	4	1123.758	1	2689.87	5
31		16	max	-.017	12	.265	1	.011	1	4.725e-3	3	6569.687	15	NC	2
32			min	-.491	1	.028	15	-.165	4	-4.652e-3	4	1719.413	1	4352.678	5
33		17	max	-.017	12	.298	1	.012	1	8.356e-3	3	9849.149	15	NC	2
34			min	-.491	1	.035	15	-.15	5	-3.758e-3	4	2845.63	1	7309.333	1
35		18	max	-.017	12	.324	1	.006	1	1.199e-2	3	NC	5	NC	2
36			min	-.491	1	.043	15	-.141	4	-4.753e-3	2	1202.299	3	9863.629	1
37		19	max	-.017	12	.348	1	0	12	1.384e-2	3	NC	1	NC	1
38			min	-.491	1	.05	15	-.136	4	-5.43e-3	2	673.834	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	0	3	.317	3	0	1	8.403e-4	4	NC	3	NC	1
40			min	-.801	1	-1.879	2	-.634	4	0	1	63.392	2	283.397	4
41		2	max	0	3	.23	3	0	1	6.481e-4	4	2741.78	12	NC	1
42			min	-.801	1	-1.593	2	-.616	4	0	1	72.709	2	294.5	4
43		3	max	0	3	.147	3	0	1	2.723e-4	5	2975.162	15	NC	1
44			min	-.801	1	-1.314	2	-.589	4	0	1	84.422	1	311.678	4
45		4	max	0	3	.077	3	0	1	0	1	3359.465	15	NC	1
46			min	-.801	1	-1.062	2	-.556	4	-1.057e-4	4	97.627	1	336.223	4
47		5	max	-.001	3	.031	3	0	1	0	1	3782.483	15	NC	1
48			min	-.8	1	-.867	1	-.518	4	-3.245e-4	4	112.345	1	369.123	4
49		6	max	-.002	3	.011	3	0	1	0	1	4217.977	15	NC	1
50			min	-.799	1	-.72	1	-.48	4	-1.367e-4	4	127.197	1	410.42	4
51		7	max	-.003	3	.008	3	0	1	5.255e-5	5	4683.345	15	NC	1
52			min	-.797	1	-.6	1	-.443	4	0	1	142.525	1	459.78	4
53		8	max	-.004	3	.012	3	0	1	2.387e-4	4	5221.006	15	NC	1
54			min	-.796	1	-.492	1	-.409	4	0	1	159.778	1	515.368	4
55		9	max	-.004	3	.013	3	0	1	2.521e-4	4	5920.698	15	NC	1
56			min	-.794	1	-.382	1	-.38	4	0	1	182.504	1	576.488	4
57		10	max	-.005	3	.006	3	0	1	1.013e-4	5	6914.305	15	NC	1
58			min	-.793	1	-.265	2	-.347	4	0	1	215.988	1	665.114	4
59		11	max	-.006	3	-.004	15	0	1	0	1	8407.178	15	NC	1
60			min	-.791	1	-.138	2	-.314	4	-4.974e-5	4	268.68	1	786.648	4
61		12	max	-.007	12	.004	9	0	1	0	1	NC	15	NC	1
62			min	-.79	1	-.031	3	-.285	4	-8.31e-4	4	362.285	1	941.762	4
63		13	max	-.007	12	.14	1	0	1	0	1	NC	15	NC	1
64			min	-.788	1	-.051	3	-.252	4	-2.282e-3	4	384.827	3	1207.531	4
65		14	max	-.008	12	.261	1	0	1	0	1	NC	5	NC	1
66			min	-.786	1	-.047	3	-.218	4	-3.732e-3	4	388.736	3	1689.783	4
67		15	max	-.008	12	.353	1	0	1	0	1	NC	5	NC	1
68			min	-.785	1	.001	3	-.189	4	-5.183e-3	4	448.507	3	2566.312	4
69		16	max	-.008	12	.401	1	0	1	0	1	NC	1	NC	1
70			min	-.785	1	.012	15	-.169	4	-4.135e-3	4	699.781	3	4107.091	4
71		17	max	-.008	12	.414	1	0	1	0	1	NC	4	NC	1
72			min	-.785	1	.013	15	-.154	4	-2.794e-3	4	3673.57	3	7347.259	4
73		18	max	-.008	12	.473	3	0	1	0	1	NC	1	NC	1
74			min	-.785	1	.013	15	-.143	4	-1.453e-3	4	913.15	3	NC	1
75		19	max	-.008	12	.675	3	0	1	0	1	NC	1	NC	1
76			min	-.785	1	.013	15	-.134	4	-7.685e-4	4	395.845	3	NC	1
77	M7	1	max	.024	5	.113	3	0	3	2.242e-2	2	NC	3	NC	1
78			min	-.499	1	-1.059	2	-.64	4	-7.89e-3	3	101.158	1	279.035	4
79		2	max	.024	5	.075	3	.008	1	2.121e-2	2	NC	5	NC	2
80			min	-.498	1	-.91	1	-.611	4	-7.579e-3	3	112.697	1	295.739	4
81		3	max	.024	5	.039	3	.017	1	1.882e-2	2	NC	5	NC	3
82			min	-.498	1	-.77	1	-.58	4	-6.968e-3	3	126.836	1	316.31	4
83		4	max	.024	5	.025	5	.018	1	1.644e-2	2	NC	5	NC	3
84			min	-.498	1	-.639	1	-.546	4	-6.358e-3	3	143.603	1	341.898	4
85		5	max	.024	5	.023	5	.016	1	1.465e-2	2	NC	5	NC	3
86			min	-.498	1	-.525	1	-.511	4	-5.981e-3	3	162.4	1	373.713	4
87		6	max	.024	5	.021	5	.01	1	1.436e-2	2	NC	5	NC	2
88			min	-.497	1	-.43	1	-.476	4	-6.203e-3	3	182.291	1	411.725	4
89		7	max	.024	5	.018	5	.004	2	1.408e-2	2	NC	5	NC	1
90			min	-.497	1	-.348	1	-.442	4	-6.425e-3	3	203.792	1	456.515	4
91		8	max	.024	5	.014	5	0	10	1.379e-2	2	NC	5	NC	1
92			min	-.496	1	-.274	1	-.41	4	-6.647e-3	3	228.219	1	509.18	4
93		9	max	.024	5	.011	5	0	3	1.278e-2	2	NC	5	NC	1
94			min	-.496	1	-.201	1	-.38	4	-7.205e-3	3	258.437	1	572.048	4
95		10	max	.024	5	.007	5	.001	3	1.108e-2	2	NC	5	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
96			min	-.495	1	-.127	1	-.348	4	-8.081e-3	3	298.405	1	656.161	4
97		11	max	.024	5	.004	5	0	3	9.371e-3	2	NC	5	NC	1
98			min	-.494	1	-.053	1	-.315	4	-8.956e-3	3	353.628	1	772.445	4
99		12	max	.024	5	.022	2	.004	1	7.468e-3	2	NC	5	NC	1
100			min	-.493	1	-.04	3	-.282	4	-8.336e-3	3	435.119	1	941.157	4
101		13	max	.024	5	.096	1	.005	2	5.354e-3	2	NC	4	NC	1
102			min	-.493	1	-.037	3	-.248	4	-6.126e-3	3	562.465	1	1221.294	4
103		14	max	.024	5	.164	1	.004	2	3.24e-3	2	NC	4	NC	1
104			min	-.492	1	-.023	3	-.215	4	-3.917e-3	3	770.242	1	1700.412	4
105		15	max	.024	5	.221	1	0	10	1.126e-3	2	NC	4	NC	1
106			min	-.491	1	-.011	5	-.189	4	-5.093e-3	5	1123.758	1	2499.218	4
107		16	max	.024	5	.265	1	-.003	10	2.094e-3	2	NC	4	NC	2
108			min	-.491	1	-.016	5	-.17	4	-4.725e-3	3	1719.413	1	3715.485	4
109		17	max	.024	5	.298	1	-.003	12	3.423e-3	2	NC	4	NC	2
110			min	-.491	1	-.023	5	-.156	4	-8.356e-3	3	2845.63	1	5888.607	4
111		18	max	.024	5	.324	1	0	12	4.753e-3	2	NC	4	NC	2
112			min	-.491	1	-.03	5	-.144	4	-1.199e-2	3	1202.299	3	9863.629	1
113		19	max	.024	5	.348	1	.009	1	5.43e-3	2	NC	1	NC	1
114			min	-.491	1	-.038	5	-.132	4	-1.384e-2	3	673.834	3	NC	1
115	M10	1	max	0	1	.336	1	.491	1	1.172e-2	3	NC	1	NC	1
116			min	-.138	4	-.034	5	-.024	5	-9.356e-4	5	NC	1	NC	1
117		2	max	0	1	.41	3	.524	1	1.327e-2	3	NC	4	NC	3
118			min	-.138	4	-.023	5	-.013	5	-8.274e-4	5	1278.551	3	5120.95	1
119		3	max	0	1	.531	3	.573	1	1.482e-2	3	NC	4	NC	3
120			min	-.138	4	-.016	5	-.005	5	-7.193e-4	5	664.657	3	2045.759	1
121		4	max	0	1	.626	3	.628	1	1.637e-2	3	NC	4	NC	3
122			min	-.138	4	-.01	5	0	15	-6.111e-4	5	484.152	3	1225.549	1
123		5	max	0	1	.683	3	.68	1	1.792e-2	3	NC	4	NC	3
124			min	-.138	4	-.006	5	.004	15	-5.03e-4	5	415.579	3	887.305	1
125		6	max	0	1	.701	3	.724	1	1.947e-2	3	NC	4	NC	3
126			min	-.138	4	-.002	5	.007	15	-4.962e-4	2	398.178	3	720.869	1
127		7	max	0	1	.683	3	.756	1	2.102e-2	3	NC	4	NC	3
128			min	-.138	4	.001	15	.01	15	-1.027e-3	2	415.199	3	634.199	1
129		8	max	0	1	.643	3	.775	1	2.257e-2	3	NC	1	NC	3
130			min	-.138	4	.005	15	.011	12	-1.559e-3	2	461.243	3	591.397	1
131		9	max	0	1	.598	3	.783	1	2.412e-2	3	NC	4	NC	3
132			min	-.138	4	.009	15	.009	12	-2.09e-3	2	525.238	3	572.986	2
133		10	max	0	1	.576	3	.785	1	2.567e-2	3	NC	4	NC	3
134			min	-.138	4	.013	15	.008	12	-2.621e-3	2	564.065	3	561.145	2
135		11	max	0	12	.598	3	.783	1	2.412e-2	3	NC	4	NC	3
136			min	-.138	4	.017	15	.009	12	-2.09e-3	2	525.238	3	572.986	2
137		12	max	0	12	.643	3	.775	1	2.257e-2	3	NC	1	NC	3
138			min	-.138	4	.018	15	.011	12	-1.559e-3	2	461.243	3	591.397	1
139		13	max	0	12	.683	3	.756	1	2.102e-2	3	NC	4	NC	3
140			min	-.138	4	.019	15	.013	12	-1.027e-3	2	415.199	3	634.199	1
141		14	max	0	12	.701	3	.724	1	1.947e-2	3	NC	5	NC	3
142			min	-.138	4	.02	15	.015	12	-4.962e-4	2	398.178	3	720.869	1
143		15	max	0	12	.683	3	.68	1	1.792e-2	3	NC	5	NC	3
144			min	-.138	4	.022	15	.017	12	-1.622e-4	10	415.579	3	887.305	1
145		16	max	0	12	.626	3	.628	1	1.637e-2	3	NC	5	NC	3
146			min	-.138	4	.025	15	.018	12	1.193e-4	10	484.152	3	1225.549	1
147		17	max	0	12	.531	3	.573	1	1.482e-2	3	NC	5	NC	3
148			min	-.138	4	.03	15	.019	12	4.009e-4	10	664.657	3	2045.759	1
149		18	max	0	12	.41	3	.524	1	1.327e-2	3	NC	4	NC	3
150			min	-.138	4	.037	15	.018	12	6.824e-4	10	1278.551	3	5120.95	1
151		19	max	0	12	.336	1	.491	1	1.172e-2	3	NC	1	NC	1
152			min	-.138	4	.046	15	.017	12	9.129e-4	15	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	.001	1	.003	5	.494	1	9.52e-3	1	NC	1	NC	1
154			min	-.299	4	-.04	3	-.024	5	-4.025e-4	5	NC	1	NC	1
155		2	max	0	1	.049	3	.517	1	1.038e-2	1	NC	4	NC	3
156			min	-.299	4	-.089	2	.002	15	-3.455e-4	3	1883.726	3	6257.324	4
157		3	max	0	1	.128	3	.561	1	1.124e-2	1	NC	4	NC	3
158			min	-.299	4	-.154	2	.012	15	-6.473e-4	3	1001.463	3	2493.576	1
159		4	max	0	1	.18	3	.615	1	1.21e-2	1	NC	5	NC	3
160			min	-.299	4	-.197	2	.012	12	-9.491e-4	3	763.305	3	1386.492	1
161		5	max	0	1	.198	3	.669	1	1.296e-2	1	NC	5	NC	3
162			min	-.299	4	-.214	2	.01	15	-1.251e-3	3	706.374	3	959.415	1
163		6	max	0	1	.18	3	.716	1	1.381e-2	1	NC	5	NC	3
164			min	-.299	4	-.204	2	.005	15	-1.553e-3	3	764.2	3	755.47	1
165		7	max	0	1	.132	3	.752	1	1.467e-2	1	NC	5	NC	3
166			min	-.299	4	-.173	2	.001	15	-1.854e-3	3	975.538	3	649.429	1
167		8	max	0	1	.068	3	.776	1	1.553e-2	1	NC	4	NC	3
168			min	-.299	4	-.13	2	0	15	-2.156e-3	3	1431.504	2	595.203	1
169		9	max	0	1	.009	3	.788	1	1.639e-2	1	NC	4	NC	5
170			min	-.299	4	-.089	2	.007	15	-2.458e-3	3	2189.189	2	568.217	2
171		10	max	0	1	-.002	15	.79	1	1.725e-2	1	NC	4	NC	5
172			min	-.299	4	-.07	2	.006	12	-2.76e-3	3	2898.732	2	554.884	2
173		11	max	0	3	.009	3	.788	1	1.639e-2	1	NC	4	NC	12
174			min	-.299	4	-.089	2	.007	12	-2.458e-3	3	2189.189	2	568.217	2
175		12	max	0	3	.068	3	.776	1	1.553e-2	1	NC	5	NC	3
176			min	-.299	4	-.13	2	.008	12	-2.156e-3	3	1431.504	2	595.203	1
177		13	max	0	3	.132	3	.752	1	1.467e-2	1	NC	5	NC	3
178			min	-.299	4	-.173	2	.009	12	-1.854e-3	3	975.538	3	649.429	1
179		14	max	0	3	.18	3	.716	1	1.381e-2	1	NC	5	NC	3
180			min	-.299	4	-.204	2	.01	12	-1.553e-3	3	764.2	3	755.47	1
181		15	max	0	3	.198	3	.669	1	1.296e-2	1	NC	5	NC	3
182			min	-.299	4	-.214	2	.011	12	-1.251e-3	3	706.374	3	959.415	1
183		16	max	0	3	.18	3	.615	1	1.21e-2	1	NC	5	NC	3
184			min	-.299	4	-.197	2	.012	12	-9.491e-4	3	763.305	3	1386.492	1
185		17	max	0	3	.128	3	.561	1	1.124e-2	1	NC	5	NC	3
186			min	-.299	4	-.154	2	.013	12	-6.473e-4	3	1001.463	3	2493.576	1
187		18	max	0	3	.049	3	.517	1	1.038e-2	1	NC	5	NC	3
188			min	-.299	4	-.089	2	.014	12	-3.455e-4	3	1883.726	3	7291.979	1
189		19	max	.001	3	-.003	15	.494	1	9.52e-3	1	NC	1	NC	1
190			min	-.299	4	-.04	3	.016	12	-4.372e-5	3	NC	1	NC	1
191	M12	1	max	0	3	.013	5	.496	1	9.246e-3	1	NC	1	NC	1
192			min	-.395	4	-.238	1	-.024	5	-4.339e-4	5	NC	1	NC	1
193		2	max	0	3	.022	3	.516	1	9.781e-3	1	NC	4	NC	2
194			min	-.395	4	-.349	2	.001	15	-3.155e-4	5	1333.397	2	6774.042	4
195		3	max	0	3	.071	3	.558	1	1.032e-2	1	NC	5	NC	3
196			min	-.395	4	-.459	2	.01	15	-1.971e-4	5	710.182	2	2689.509	1
197		4	max	0	3	.102	3	.612	1	1.085e-2	1	NC	5	NC	3
198			min	-.395	4	-.54	2	.012	15	-7.879e-5	5	529.721	2	1447.571	1
199		5	max	0	3	.115	3	.667	1	1.139e-2	1	NC	5	NC	3
200			min	-.395	4	-.583	2	.009	15	-1.999e-5	3	466.641	2	983.551	1
201		6	max	0	3	.108	3	.715	1	1.192e-2	1	NC	5	NC	3
202			min	-.395	4	-.587	2	.004	15	8.529e-7	3	461.236	2	765.177	1
203		7	max	0	3	.086	3	.754	1	1.246e-2	1	NC	5	NC	3
204			min	-.395	4	-.558	2	0	15	2.17e-5	3	500.481	2	652.063	1
205		8	max	0	3	.055	3	.779	1	1.299e-2	1	NC	5	NC	3
206			min	-.395	4	-.51	2	0	15	4.255e-5	3	585.339	2	593.789	1
207		9	max	0	3	.027	3	.792	1	1.353e-2	1	NC	5	NC	5
208			min	-.395	4	-.46	2	.005	3	6.339e-5	3	706.683	2	563.794	2
209		10	max	0	1	.014	3	.795	1	1.406e-2	1	NC	5	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	-.395	4	-.44	1	.004	3	8.424e-5	3	784.608	2	549.641	2
211		11	max	0	1	.027	3	.792	1	1.353e-2	1	NC	5	NC	12
212			min	-.395	4	-.46	2	.005	3	6.339e-5	3	706.683	2	563.794	2
213		12	max	0	1	.055	3	.779	1	1.299e-2	1	NC	5	NC	3
214			min	-.395	4	-.51	2	.007	12	4.255e-5	3	585.339	2	593.789	1
215		13	max	0	1	.086	3	.754	1	1.246e-2	1	NC	5	NC	3
216			min	-.395	4	-.558	2	.01	12	2.17e-5	3	500.481	2	652.063	1
217		14	max	0	1	.108	3	.715	1	1.192e-2	1	NC	5	NC	3
218			min	-.395	4	-.587	2	.012	12	8.529e-7	3	461.236	2	765.177	1
219		15	max	0	1	.115	3	.667	1	1.139e-2	1	NC	5	NC	3
220			min	-.395	4	-.583	2	.014	12	-1.999e-5	3	466.641	2	983.551	1
221		16	max	0	1	.102	3	.612	1	1.085e-2	1	NC	5	NC	3
222			min	-.395	4	-.54	2	.015	12	-4.084e-5	3	529.721	2	1447.571	1
223		17	max	0	1	.071	3	.558	1	1.032e-2	1	NC	5	NC	3
224			min	-.395	4	-.459	2	.016	12	-6.169e-5	3	710.182	2	2689.509	1
225		18	max	0	1	.022	3	.516	1	9.781e-3	1	NC	5	NC	2
226			min	-.395	4	-.349	2	.016	12	-8.253e-5	3	1333.397	2	8521.389	1
227		19	max	0	1	-.024	12	.496	1	9.246e-3	1	NC	1	NC	1
228			min	-.395	4	-.238	1	.016	12	-1.034e-4	3	NC	1	NC	1
229	M13	1	max	0	3	.095	3	.499	1	1.948e-2	2	NC	1	NC	1
230			min	-.626	4	-.984	2	-.024	5	-4.847e-3	3	NC	1	NC	1
231		2	max	0	3	.168	3	.534	1	2.135e-2	2	NC	5	NC	3
232			min	-.626	4	-1.193	2	0	15	-5.535e-3	3	802.747	2	4747.213	1
233		3	max	0	3	.233	3	.585	1	2.322e-2	2	NC	5	NC	3
234			min	-.626	4	-1.388	2	.008	15	-6.224e-3	3	415.907	2	1937.564	1
235		4	max	0	3	.283	3	.642	1	2.508e-2	2	NC	5	NC	3
236			min	-.626	4	-1.55	2	.012	15	-6.912e-3	3	296.51	2	1173.481	1
237		5	max	0	3	.314	3	.695	1	2.695e-2	2	NC	5	NC	3
238			min	-.626	4	-1.67	2	.011	12	-7.601e-3	3	244.656	2	855.031	1
239		6	max	0	3	.326	3	.739	1	2.882e-2	2	NC	15	NC	3
240			min	-.626	4	-1.744	2	.01	12	-8.289e-3	3	220.925	2	697.374	1
241		7	max	0	3	.321	3	.772	1	3.069e-2	2	NC	15	NC	3
242			min	-.626	4	-1.775	2	.007	12	-8.978e-3	3	212.412	2	614.995	1
243		8	max	0	3	.304	3	.791	1	3.256e-2	2	NC	15	NC	5
244			min	-.626	4	-1.772	2	.005	3	-9.666e-3	3	213.207	2	574.254	1
245		9	max	0	3	.285	3	.799	1	3.443e-2	2	NC	15	NC	5
246			min	-.626	4	-1.752	2	.002	3	-1.035e-2	3	218.681	2	554.276	2
247		10	max	0	1	.275	3	.801	1	3.63e-2	2	NC	15	NC	5
248			min	-.626	4	-1.739	2	0	3	-1.104e-2	3	222.454	2	543.114	2
249		11	max	0	1	.285	3	.799	1	3.443e-2	2	NC	15	NC	12
250			min	-.626	4	-1.752	2	.002	3	-1.035e-2	3	218.681	2	554.276	2
251		12	max	0	1	.304	3	.791	1	3.256e-2	2	NC	15	NC	12
252			min	-.626	4	-1.772	2	.005	3	-9.666e-3	3	213.207	2	574.254	1
253		13	max	0	1	.321	3	.772	1	3.069e-2	2	NC	15	NC	3
254			min	-.626	4	-1.775	2	.007	12	-8.978e-3	3	212.412	2	614.995	1
255		14	max	0	1	.326	3	.739	1	2.882e-2	2	NC	15	NC	3
256			min	-.626	4	-1.744	2	.01	12	-8.289e-3	3	220.925	2	697.374	1
257		15	max	0	1	.314	3	.695	1	2.695e-2	2	NC	15	NC	3
258			min	-.626	4	-1.67	2	.011	12	-7.601e-3	3	244.656	2	855.031	1
259		16	max	0	1	.283	3	.642	1	2.508e-2	2	NC	15	NC	3
260			min	-.626	4	-1.55	2	.013	12	-6.912e-3	3	296.51	2	1173.481	1
261		17	max	0	1	.233	3	.585	1	2.322e-2	2	NC	5	NC	3
262			min	-.626	4	-1.388	2	.014	12	-6.224e-3	3	415.907	2	1937.564	1
263		18	max	0	1	.168	3	.534	1	2.135e-2	2	NC	5	NC	3
264			min	-.626	4	-1.193	2	.015	12	-5.535e-3	3	802.747	2	4747.213	1
265		19	max	0	1	.095	3	.499	1	1.948e-2	2	NC	1	NC	1
266			min	-.626	4	-.984	2	.015	12	-4.847e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	5	1.405e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	1	-2.202e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.004	5	2.809e-3	2	NC	3	NC	1
272			min	0	2	-.008	1	0	1	-4.403e-3	5	8294.922	1	NC	1
273		4	max	0	3	-.002	12	.008	5	4.214e-3	2	NC	3	NC	1
274			min	0	2	-.019	1	0	1	-6.605e-3	5	3676.107	1	8676.748	5
275		5	max	0	3	-.003	12	.014	5	4.673e-3	2	NC	3	NC	1
276			min	0	2	-.034	1	-.002	1	-7.562e-3	5	2054.663	1	5027.085	5
277		6	max	0	3	-.003	12	.021	5	4.257e-3	2	NC	3	NC	1
278			min	0	2	-.053	1	-.002	1	-7.369e-3	5	1312.02	1	3310.078	5
279		7	max	0	3	-.004	12	.029	5	3.841e-3	2	NC	3	NC	1
280			min	0	2	-.076	1	-.003	1	-7.176e-3	5	915.33	1	2363.678	5
281		8	max	0	3	-.005	12	.039	5	3.425e-3	2	NC	12	NC	1
282			min	0	2	-.102	1	-.004	1	-6.983e-3	5	678.682	1	1785.586	5
283		9	max	0	3	-.006	12	.049	5	3.01e-3	2	NC	12	NC	1
284			min	0	2	-.132	1	-.005	1	-6.79e-3	5	526.09	1	1405.929	5
285		10	max	0	3	-.008	12	.061	5	2.594e-3	2	9142.988	12	NC	1
286			min	-.001	2	-.164	1	-.005	1	-6.596e-3	5	421.84	1	1142.752	5
287		11	max	0	3	-.009	12	.073	5	2.178e-3	2	7925.613	12	NC	1
288			min	-.001	2	-.199	1	-.006	1	-6.403e-3	5	347.431	1	952.674	5
289		12	max	.001	3	-.01	12	.085	5	1.762e-3	2	6967.254	12	NC	1
290			min	-.001	2	-.237	1	-.007	1	-6.21e-3	5	292.422	1	810.793	5
291		13	max	.001	3	-.011	12	.099	5	1.346e-3	2	6196.931	12	NC	1
292			min	-.001	2	-.277	1	-.007	1	-6.017e-3	5	250.583	1	702.027	5
293		14	max	.001	3	-.012	12	.112	4	9.303e-4	2	5567.034	12	NC	1
294			min	-.001	2	-.318	1	-.007	1	-5.824e-3	5	218.007	1	616.547	4
295		15	max	.001	3	-.014	12	.126	4	5.145e-4	2	5044.479	12	NC	1
296			min	-.002	2	-.361	1	-.007	1	-5.672e-3	4	192.141	1	548.084	4
297		16	max	.001	3	-.015	12	.141	4	5.072e-4	3	4605.709	12	NC	1
298			min	-.002	2	-.405	1	-.007	1	-5.521e-3	4	171.266	1	492.601	4
299		17	max	.002	3	-.016	12	.155	4	7.19e-4	3	4233.424	12	NC	1
300			min	-.002	2	-.45	1	-.007	1	-5.371e-3	4	154.181	1	447.052	4
301		18	max	.002	3	-.018	12	.169	4	9.308e-4	3	3914.691	12	NC	1
302			min	-.002	2	-.495	1	-.008	3	-5.221e-3	4	140.03	1	409.25	4
303		19	max	.002	3	-.019	12	.184	4	1.143e-3	3	3639.669	12	NC	1
304			min	-.002	2	-.541	1	-.012	3	-5.071e-3	4	128.189	1	377.593	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	4	0	1	NC	1	NC	1
308			min	0	2	-.003	1	0	1	-2.286e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.004	4	0	1	NC	3	NC	1
310			min	0	2	-.012	1	0	1	-4.571e-3	4	5875.424	1	NC	1
311		4	max	0	3	0	15	.008	4	0	1	NC	3	NC	1
312			min	-.001	2	-.027	1	0	1	-6.857e-3	4	2531.005	1	8375.11	4
313		5	max	.001	3	-.002	15	.014	4	0	1	NC	3	NC	1
314			min	-.001	2	-.05	1	0	1	-7.846e-3	4	1381.207	1	4853.747	4
315		6	max	.002	3	-.002	15	.022	4	0	1	NC	3	NC	1
316			min	-.002	2	-.08	1	0	1	-7.637e-3	4	865.996	1	3196.668	4
317		7	max	.002	3	-.003	15	.03	4	0	1	NC	3	NC	1
318			min	-.002	2	-.116	1	0	1	-7.428e-3	4	596.693	1	2283.389	4
319		8	max	.002	3	-.005	15	.04	4	0	1	NC	3	NC	1
320			min	-.002	2	-.158	1	0	1	-7.22e-3	4	438.49	1	1725.628	4
321		9	max	.002	3	-.006	15	.051	4	0	1	NC	3	NC	1
322			min	-.002	2	-.205	1	0	1	-7.011e-3	4	337.636	1	1359.396	4
323		10	max	.003	3	-.007	15	.063	4	0	1	NC	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
324			min	-.003	2	-.257	1	0	1	-6.802e-3	4	269.332	1	1105.579	4
325		11	max	.003	3	-.009	12	.075	4	0	1	NC	3	NC	1
326			min	-.003	2	-.314	1	0	1	-6.593e-3	4	220.917	1	922.305	4
327		12	max	.003	3	-.009	12	.088	4	0	1	NC	3	NC	1
328			min	-.003	2	-.374	1	0	1	-6.384e-3	4	185.325	1	785.539	4
329		13	max	.003	3	-.009	12	.102	4	0	1	NC	3	NC	1
330			min	-.004	2	-.438	1	0	1	-6.175e-3	4	158.379	1	680.73	4
331		14	max	.004	3	-.01	12	.116	4	0	1	NC	3	NC	1
332			min	-.004	2	-.504	1	0	1	-5.966e-3	4	137.48	1	598.639	4
333		15	max	.004	3	-.01	12	.13	4	0	1	NC	3	NC	1
334			min	-.004	2	-.573	1	0	1	-5.757e-3	4	120.94	1	533.168	4
335		16	max	.004	3	-.01	12	.144	4	0	1	NC	3	NC	1
336			min	-.004	2	-.644	1	0	1	-5.548e-3	4	107.629	1	480.167	4
337		17	max	.004	3	-.01	12	.159	4	0	1	NC	3	NC	1
338			min	-.005	2	-.716	1	0	1	-5.339e-3	4	96.762	1	436.719	4
339		18	max	.005	3	-.01	12	.173	4	0	1	NC	3	NC	1
340			min	-.005	2	-.79	1	0	1	-5.131e-3	4	87.781	1	400.732	4
341		19	max	.005	3	-.01	12	.187	4	0	1	NC	3	NC	1
342			min	-.005	2	-.863	1	0	1	-4.922e-3	4	80.281	1	370.671	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	5.553e-4	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-2.428e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	1.111e-3	3	NC	3	NC	1
348			min	0	2	-.008	1	0	3	-4.855e-3	4	8294.922	1	NC	1
349		4	max	0	3	.001	5	.008	4	1.666e-3	3	NC	3	NC	1
350			min	0	2	-.019	1	0	3	-7.283e-3	4	3676.107	1	8366.63	4
351		5	max	0	3	.002	5	.014	4	1.823e-3	3	NC	3	NC	1
352			min	0	2	-.034	1	-.001	3	-8.311e-3	4	2054.663	1	4852.515	4
353		6	max	0	3	.003	5	.022	4	1.611e-3	3	NC	3	NC	1
354			min	0	2	-.053	1	-.002	3	-8.046e-3	4	1312.02	1	3197.558	4
355		7	max	0	3	.004	5	.03	4	1.399e-3	3	NC	3	NC	1
356			min	0	2	-.076	1	-.003	3	-7.78e-3	4	915.33	1	2284.896	4
357		8	max	0	3	.005	5	.04	4	1.187e-3	3	NC	5	NC	1
358			min	0	2	-.102	1	-.003	3	-7.515e-3	4	678.682	1	1727.294	4
359		9	max	0	3	.007	5	.051	4	9.754e-4	3	NC	5	NC	1
360			min	0	2	-.132	1	-.003	3	-7.249e-3	4	526.09	1	1361.066	4
361		10	max	0	3	.008	5	.063	4	7.636e-4	3	NC	13	NC	1
362			min	-.001	2	-.164	1	-.004	3	-6.984e-3	4	421.84	1	1107.203	4
363		11	max	0	3	.01	5	.075	4	5.518e-4	3	9791.512	15	NC	1
364			min	-.001	2	-.199	1	-.004	3	-6.718e-3	4	347.431	1	923.87	4
365		12	max	.001	3	.012	5	.088	4	3.4e-4	3	8328.51	15	NC	1
366			min	-.001	2	-.237	1	-.003	3	-6.453e-3	4	292.422	1	787.046	4
367		13	max	.001	3	.014	5	.102	4	1.282e-4	3	7199.608	15	NC	1
368			min	-.001	2	-.277	1	-.003	3	-6.187e-3	4	250.583	1	682.185	4
369		14	max	.001	3	.016	5	.116	4	-5.084e-5	12	6309.791	15	NC	1
370			min	-.001	2	-.318	1	-.002	3	-5.922e-3	4	218.007	1	600.052	4
371		15	max	.001	3	.018	5	.13	4	1.755e-5	9	5595.731	15	NC	1
372			min	-.002	2	-.361	1	0	3	-5.656e-3	4	192.141	1	534.548	4
373		16	max	.001	3	.02	5	.144	4	1.522e-4	9	5014.096	15	NC	1
374			min	-.002	2	-.405	1	.001	12	-5.408e-3	5	171.266	1	481.523	4
375		17	max	.002	3	.022	5	.158	4	5.094e-4	1	4534.167	15	NC	1
376			min	-.002	2	-.45	1	.002	10	-5.189e-3	5	154.181	1	438.06	4
377		18	max	.002	3	.024	5	.172	4	8.823e-4	1	4133.751	15	NC	1
378			min	-.002	2	-.495	1	0	10	-4.97e-3	5	140.03	1	402.065	4
379		19	max	.002	3	.026	5	.186	4	1.255e-3	1	3796.486	15	NC	1
380			min	-.002	2	-.541	1	0	10	-4.751e-3	5	128.189	1	372.006	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	.024	1	0	12	.011	5	1.227e-3	2	NC	1	NC	1
382			min	.002	12	-.007	1	-.001	1	-6.907e-4	5	NC	1	NC	1
383		2	max	.024	1	-.002	12	.044	5	1.772e-3	2	NC	1	NC	4
384			min	.002	12	-.05	1	-.021	2	-7.748e-4	5	NC	1	3667.116	2
385		3	max	.023	1	-.004	12	.077	5	2.317e-3	2	NC	1	NC	4
386			min	.002	12	-.092	1	-.041	2	-8.67e-4	3	NC	1	1856.812	2
387		4	max	.022	1	-.005	12	.111	5	2.862e-3	2	NC	1	NC	13
388			min	.003	15	-.135	1	-.06	2	-1.098e-3	3	NC	1	1261.263	2
389		5	max	.021	1	-.007	12	.144	5	3.407e-3	2	NC	1	7810.918	13
390			min	.003	15	-.177	1	-.077	2	-1.328e-3	3	NC	1	970.068	2
391		6	max	.021	1	-.008	12	.177	5	3.952e-3	2	NC	1	6368.887	13
392			min	.003	15	-.219	1	-.093	2	-1.559e-3	3	9670.313	6	801.398	2
393		7	max	.02	1	-.009	12	.209	5	4.496e-3	2	NC	1	5465.63	13
394			min	.003	15	-.261	1	-.107	2	-1.789e-3	3	8575.823	6	694.919	2
395		8	max	.019	1	-.01	12	.241	5	5.041e-3	2	NC	1	4877.191	13
396			min	.003	15	-.302	1	-.119	2	-2.02e-3	3	7918.965	6	625.114	2
397		9	max	.018	1	-.011	12	.272	5	5.586e-3	2	NC	3	4495.415	13
398			min	.003	15	-.344	1	-.127	2	-2.251e-3	3	7565.404	6	579.655	2
399		10	max	.018	1	-.012	12	.302	5	6.131e-3	2	NC	3	4265.151	13
400			min	.002	15	-.385	1	-.133	2	-2.481e-3	3	7453.555	6	552.289	2
401		11	max	.017	1	-.013	12	.331	5	6.676e-3	2	NC	3	4160.27	13
402			min	.002	15	-.426	1	-.135	2	-2.712e-3	3	7565.404	6	540.126	2
403		12	max	.016	1	-.014	12	.36	5	7.221e-3	2	NC	1	4174.801	13
404			min	.002	15	-.466	1	-.134	2	-2.942e-3	3	7918.965	6	514.782	14
405		13	max	.015	1	-.014	12	.387	5	7.765e-3	2	NC	1	4322.53	13
406			min	.002	15	-.507	1	-.128	2	-3.173e-3	3	8575.823	6	466.819	14
407		14	max	.015	1	-.015	12	.413	5	8.31e-3	2	NC	1	4645.677	13
408			min	.002	15	-.547	1	-.118	2	-3.403e-3	3	9670.313	6	425.993	14
409		15	max	.014	1	-.015	12	.437	5	8.855e-3	2	NC	1	5242.56	13
410			min	.002	15	-.587	1	-.103	2	-3.634e-3	3	NC	1	390.775	14
411		16	max	.013	1	-.016	12	.461	5	9.4e-3	2	NC	1	6354.819	13
412			min	.002	15	-.627	1	-.082	2	-3.865e-3	3	NC	1	360.045	14
413		17	max	.012	1	-.016	12	.482	5	9.945e-3	2	NC	1	8719.891	13
414			min	.002	15	-.667	1	-.056	2	-4.095e-3	3	NC	1	332.964	14
415		18	max	.012	1	-.016	12	.505	4	1.049e-2	2	NC	1	NC	4
416			min	.002	15	-.706	1	-.024	2	-4.326e-3	3	NC	1	308.894	14
417		19	max	.011	1	-.016	12	.528	4	1.103e-2	2	NC	1	NC	1
418			min	.002	10	-.746	1	-.002	3	-4.556e-3	3	NC	1	287.339	14
419	M6	1	max	.036	1	0	15	.011	4	0	1	NC	1	NC	1
420			min	.001	15	-.011	1	0	1	-7.218e-4	5	NC	1	NC	1
421		2	max	.034	1	0	3	.046	4	0	1	NC	1	NC	1
422			min	.001	15	-.08	1	0	1	-8.431e-4	4	NC	1	NC	1
423		3	max	.032	1	0	3	.08	4	0	1	NC	1	NC	1
424			min	.001	15	-.148	1	0	1	-9.648e-4	4	NC	1	6549.133	4
425		4	max	.03	1	.001	3	.115	4	0	1	NC	1	NC	1
426			min	0	15	-.216	1	0	1	-1.087e-3	4	NC	1	4394.829	4
427		5	max	.028	1	.002	3	.149	4	0	1	NC	1	NC	1
428			min	0	15	-.284	1	0	1	-1.208e-3	4	NC	1	3346.841	4
429		6	max	.026	1	.003	3	.183	4	0	1	NC	1	NC	1
430			min	0	15	-.352	1	0	1	-1.33e-3	4	9670.313	4	2742.919	4
431		7	max	.024	1	.004	3	.216	4	0	1	NC	1	NC	1
432			min	0	15	-.42	1	0	1	-1.452e-3	4	8575.823	4	2363.492	4
433		8	max	.023	1	.006	3	.249	4	0	1	NC	1	NC	1
434			min	0	15	-.487	1	0	1	-1.573e-3	4	7918.965	4	2115.75	4
435		9	max	.021	1	.007	3	.281	4	0	1	NC	5	NC	1
436			min	0	15	-.555	1	0	1	-1.695e-3	4	7565.404	4	1954.855	4
437		10	max	.019	1	.009	3	.312	4	0	1	NC	5	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	0	15	-.622	1	0	1	-1.817e-3	4	7453.555	4	1857.982	4
439		11	max	.018	3	.01	3	.341	4	0	1	NC	5	NC	1
440			min	0	15	-.688	1	0	1	-1.938e-3	4	6929.051	3	1814.42	4
441		12	max	.019	3	.012	3	.37	4	0	1	NC	1	NC	1
442			min	0	15	-.755	1	0	1	-2.06e-3	4	5884.926	3	1821.948	4
443		13	max	.02	3	.015	3	.397	4	0	1	NC	1	NC	1
444			min	0	15	-.821	1	0	1	-2.182e-3	4	5057.27	3	1886.775	4
445		14	max	.021	3	.017	3	.423	4	0	1	NC	1	NC	1
446			min	0	10	-.887	1	0	1	-2.303e-3	4	4393.579	3	2027.355	4
447		15	max	.023	3	.019	3	.448	4	0	1	NC	1	NC	1
448			min	-.002	10	-.953	1	0	1	-2.425e-3	4	3856.03	3	2286.414	4
449		16	max	.024	3	.022	3	.471	4	0	1	NC	1	NC	1
450			min	-.003	10	-1.019	1	0	1	-2.547e-3	4	3416.88	3	2768.796	4
451		17	max	.025	3	.025	3	.492	4	0	1	NC	1	NC	1
452			min	-.004	2	-1.085	1	0	1	-2.669e-3	4	3055.477	3	3794.297	4
453		18	max	.026	3	.027	3	.511	4	0	1	NC	1	NC	1
454			min	-.007	2	-1.15	1	0	1	-2.79e-3	4	2756.258	3	6969.29	4
455		19	max	.027	3	.03	3	.529	4	0	1	NC	1	NC	1
456			min	-.009	2	-1.216	1	0	1	-2.912e-3	4	2507.378	3	NC	1
457	M9	1	max	.024	1	0	5	.011	4	4.058e-4	3	NC	1	NC	1
458			min	-.002	5	-.007	1	-.001	3	-1.227e-3	2	NC	1	NC	1
459		2	max	.024	1	.002	5	.048	4	6.364e-4	3	NC	1	NC	5
460			min	-.002	5	-.05	1	-.009	3	-1.772e-3	2	NC	1	3667.116	2
461		3	max	.023	1	.003	5	.084	4	8.67e-4	3	NC	1	9253.369	15
462			min	-.002	5	-.092	1	-.017	3	-2.317e-3	2	NC	1	1856.812	2
463		4	max	.022	1	.004	5	.121	4	1.098e-3	3	NC	1	6210.178	15
464			min	-.002	5	-.135	1	-.025	3	-2.862e-3	2	NC	1	1261.263	2
465		5	max	.021	1	.005	5	.157	4	1.328e-3	3	NC	1	4729.502	15
466			min	-.002	5	-.177	1	-.032	3	-3.407e-3	2	NC	1	970.068	2
467		6	max	.021	1	.007	5	.192	4	1.559e-3	3	NC	1	3876.038	15
468			min	-.002	5	-.219	1	-.038	3	-3.952e-3	2	9670.313	6	801.398	2
469		7	max	.02	1	.008	5	.227	4	1.789e-3	3	NC	1	3339.671	15
470			min	-.002	5	-.261	1	-.044	3	-4.496e-3	2	8575.823	6	694.919	2
471		8	max	.019	1	.01	5	.26	4	2.02e-3	3	NC	1	2989.307	15
472			min	-.002	5	-.302	1	-.048	3	-5.041e-3	2	7918.965	6	625.114	2
473		9	max	.018	1	.011	5	.293	4	2.251e-3	3	NC	3	2761.607	15
474			min	-.002	5	-.344	1	-.052	3	-5.586e-3	2	7010.695	5	579.655	2
475		10	max	.018	1	.013	5	.324	4	2.481e-3	3	NC	3	2624.316	15
476			min	-.002	5	-.385	1	-.054	3	-6.131e-3	2	6032.963	5	552.289	2
477		11	max	.017	1	.015	5	.354	4	2.712e-3	3	NC	3	2562.281	15
478			min	-.002	5	-.426	1	-.055	3	-6.676e-3	2	5254.435	5	540.126	2
479		12	max	.016	1	.017	5	.382	4	2.942e-3	3	NC	1	2572.339	15
480			min	-.002	5	-.466	1	-.055	3	-7.221e-3	2	4623.218	5	542.666	2
481		13	max	.015	1	.019	5	.408	4	3.173e-3	3	NC	1	2663.205	15
482			min	-.002	5	-.507	1	-.053	3	-7.765e-3	2	4104.166	5	561.827	2
483		14	max	.015	1	.021	5	.433	4	3.403e-3	3	NC	1	2860.861	15
484			min	-.002	5	-.547	1	-.049	3	-8.31e-3	2	3672.527	5	603.08	2
485		15	max	.014	1	.024	5	.455	4	3.634e-3	3	NC	1	3225.486	15
486			min	-.002	5	-.587	1	-.043	3	-8.855e-3	2	3310.312	5	679	2
487		16	max	.013	1	.026	5	.475	4	3.865e-3	3	NC	1	3904.773	15
488			min	-.002	5	-.627	1	-.035	3	-9.4e-3	2	3004.112	5	820.363	2
489		17	max	.012	1	.029	5	.493	4	4.095e-3	3	NC	1	5349.242	15
490			min	-.002	5	-.667	1	-.025	3	-9.945e-3	2	2743.726	5	1120.981	2
491		18	max	.012	1	.031	5	.508	4	4.326e-3	3	NC	1	9821.948	15
492			min	-.002	5	-.706	1	-.013	3	-1.049e-2	2	2521.262	5	2051.997	2
493		19	max	.011	1	.034	5	.521	4	4.556e-3	3	NC	1	NC	1
494			min	-.002	5	-.746	1	-.017	1	-1.103e-2	2	2330.535	5	NC	1