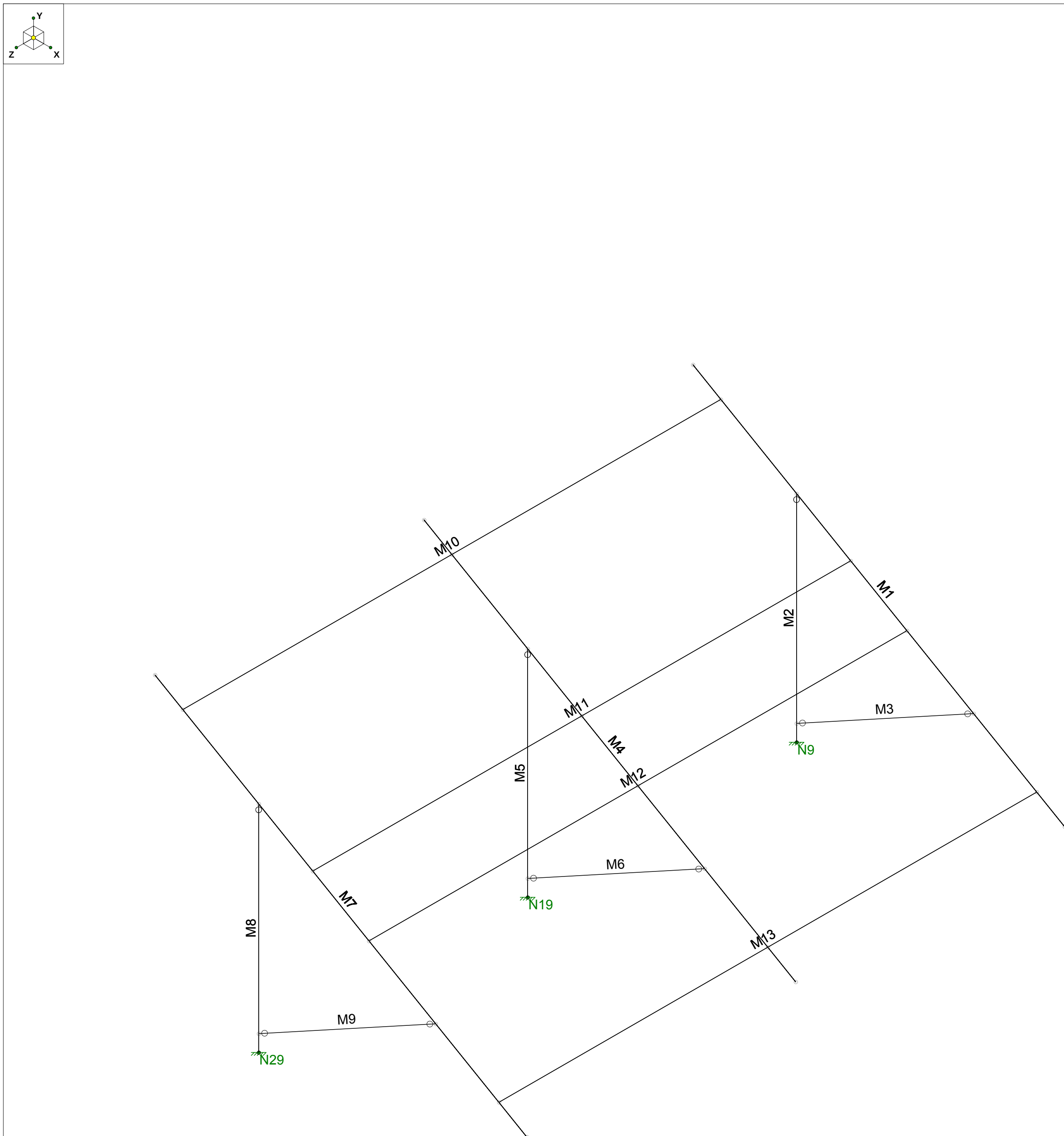


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

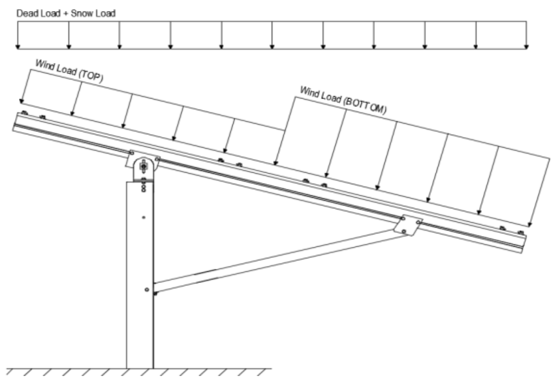
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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

PV modules are required to meet the following specifications:

	Maximum			Minimum	
Height =	1700	mm	Height =	1550	mm
Width =	1050	mm	Width =	970	mm
Dead Load =	3.00	psf	Dead Load =	1.75	psf

Modules Per Row =	2
Module Tilt =	30°
Maximum Height Above Grade =	3 ft



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

1.3 Technical Codes
- ASCE 7-05 - Chapter 6, Wind Loads
- ASCE 7-05 - Chapter 7, Snow Loads
- ASCE 7-05 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2003, 2006, 2009
- Aluminum Design Manual, Eighth Edition, 2005

2. LOAD ACTIONS

2.1 Permanent Loads

g_{MAX} =	3.00	psf	*Self-weight of the PV modules.*
g_{MIN} =	1.75	psf	

2.2 Snow Loads

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

2.3 Wind Loads

Design Wind Speed, V =	120	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z =	22.61	psf	*Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

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

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

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.8W
1.2D + 1.6W + 0.5S
0.9D + 1.6W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

Purlins	Location	**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

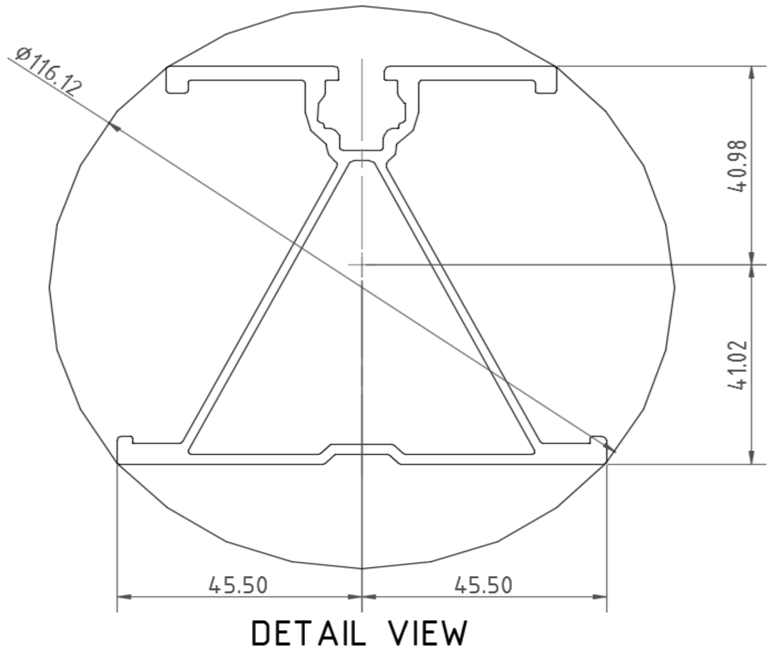
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

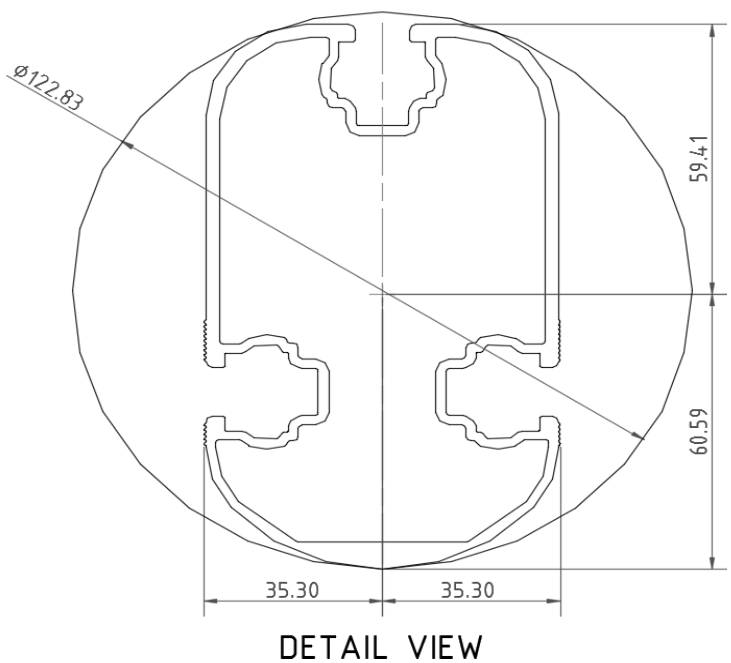
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	90	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.429	k-ft
M_z =	0.108	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	61%	



4.2 Girder Design

Loads from purlins are transferred to the posts using an inclined girder, which is connected to the steel post. Loads on the girder result from the support reactions of the purlins. See Appendix A.2 for detailed member calculations. Section units are in (mm).

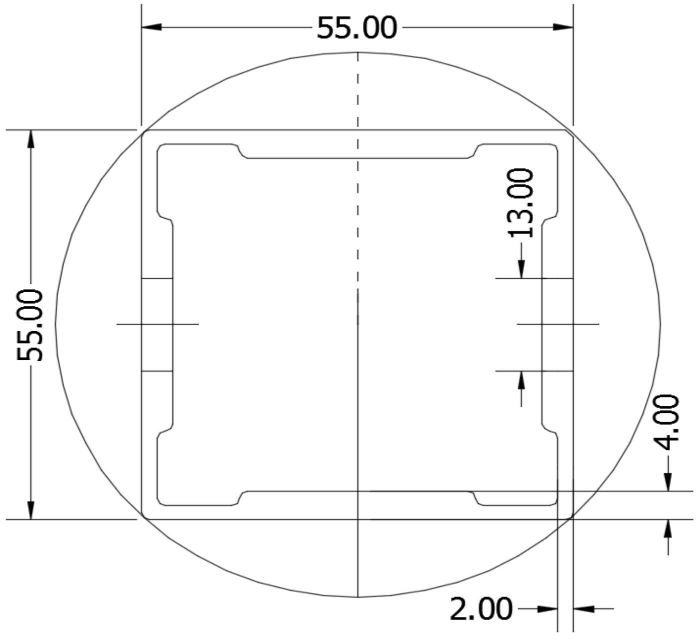
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.262	k-ft
M_z =	0.000	k-ft
P_n =	0.012	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	85%	



4.3 Strut Design

The aluminum strut connects a portion of the girder to the galvanized steel post. Girder forces are then transferred down through the strut into the post. The strut is attached with single M10 bolts at each end. See Appendix A.3 for detailed member calculations. Section units are in (mm).

Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	4.247	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	32%	

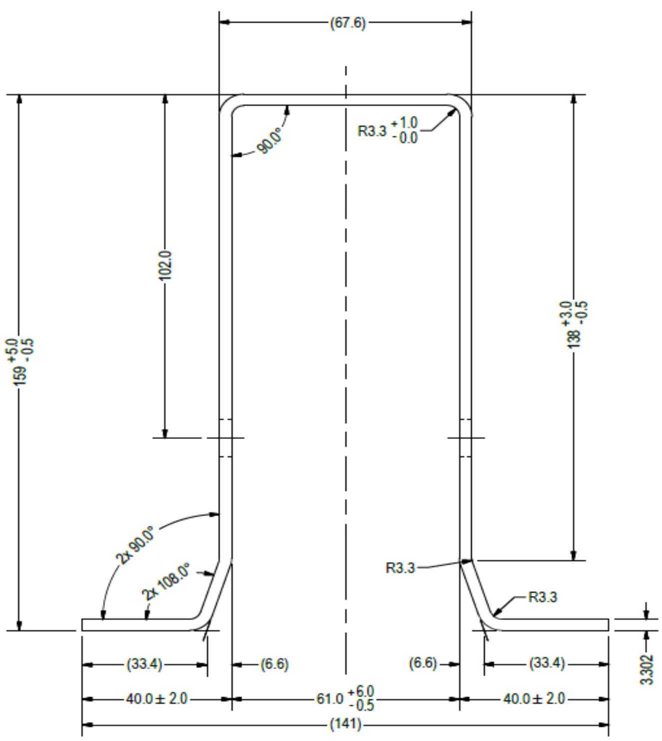


DETAIL VIEW

4.4 Post Design

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

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	79.31	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	12.928	k-ft
M_z =	0.000	k-ft
P_r =	-5.138	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	79%	



DETAIL VIEW

5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	6.64	k
Maximum Lateral Load =	3.76	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

Lateral Force @ Top of Pole, P =	0.86	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

Lateral Bearing @ Bottom = S_3

Lateral Bearing @ D/3 = S_1

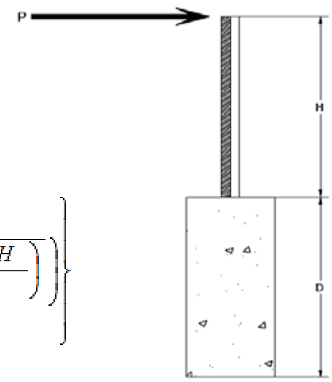
Required Depth = D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	0.86	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf
Constant $2.34P/(S_1B)$, A =	4.66	
Required Footing Depth, D =	8.57	ft
2nd Trial @ D_2 =	5.91	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.18	ksf
Constant $2.34P/(S_1B)$, A =	2.56	
Required Footing Depth, D =	5.76	ft
3rd Trial @ D_3 =	5.84	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.17	ksf
Constant $2.34P/(S_1B)$, A =	2.59	
Required Footing Depth, D =	5.81	ft
4th Trial @ D_4 =	5.82	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.16	ksf
Constant $2.34P/(S_1B)$, A =	2.60	
Required Footing Depth, D =	5.82	ft
5th Trial @ D_5 =	5.82	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.16	ksf
Constant $2.34P/(S_1B)$, A =	2.60	
Required Footing Depth, D =	6.00	ft

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

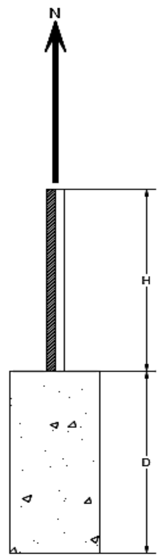
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.18	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 =	2.05	k
Required Concrete Volume, V =	14.13	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.88
2	0.4	0.2	118.10	6.78
3	0.6	0.2	118.10	6.67
4	0.8	0.2	118.10	6.57
5	1	0.2	118.10	6.47
6	1.2	0.2	118.10	6.36
7	1.4	0.2	118.10	6.26
8	1.6	0.2	118.10	6.16
9	1.8	0.2	118.10	6.05
10	2	0.2	118.10	5.95
11	2.2	0.2	118.10	5.84
12	2.4	0.2	118.10	5.74
13	2.6	0.2	118.10	5.64
14	2.8	0.2	118.10	5.53
15	3	0.2	118.10	5.43
16	3.2	0.2	118.10	5.33
17	3.4	0.2	118.10	5.22
18	3.6	0.2	118.10	5.12
19	3.8	0.2	118.10	5.01
20	4	0.2	118.10	4.91
21	4.2	0.2	118.10	4.81
22	4.4	0.2	118.10	4.70
23	4.6	0.2	118.10	4.60
24	4.8	0.2	118.10	4.50
25	0	0.0	0.00	4.50
26	0	0.0	0.00	4.50
27	0	0.0	0.00	4.50
28	0	0.0	0.00	4.50
29	0	0.0	0.00	4.50
30	0	0.0	0.00	4.50
31	0	0.0	0.00	4.50
32	0	0.0	0.00	4.50
33	0	0.0	0.00	4.50
34	0	0.0	0.00	4.50
Max	4.8	Sum	1.13	

A 2ft diameter x 4.5ft 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 =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.61	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	18.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

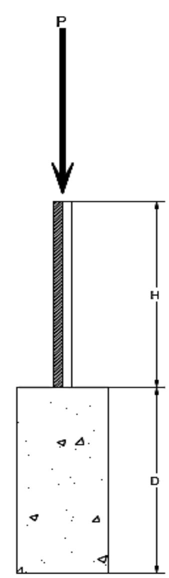
Weight of Concrete

Footing Volume	18.85	ft^3
Weight	2.73	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.83	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.05	k
Applied Force =	6.34	k
Utilization =	63%	

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



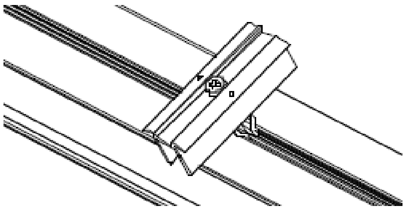
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

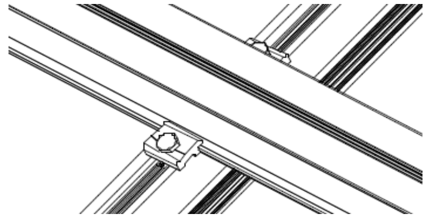
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.784 k
Allowable Uplift =	1.214 k
Utilization =	65%



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.104 k
Allowable Uplift =	2.180 k
Utilization =	97%

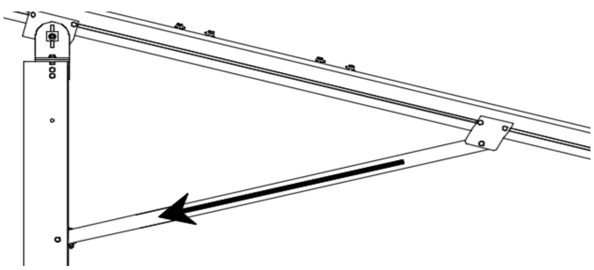


6.2 Strut Connections

The aluminum struts connect the front end of girder to a center section of the steel post. Single M10 bolts are used to attach each end of the strut to the girder and post. ASTM A193/A193M-86 equivalent stainless steel bolts are used.

Maximum Axial Load =	4.247 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	48%

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

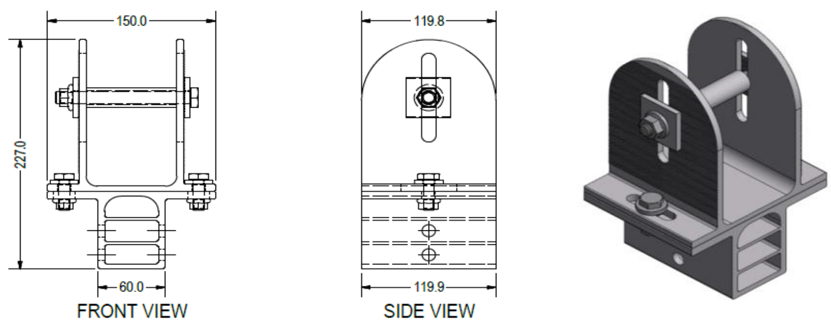


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

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 =	4.439 k
Allowable Load =	5.649 k
Utilization =	79%



7. SEISMIC DESIGN

7.1 Seismic Drift

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

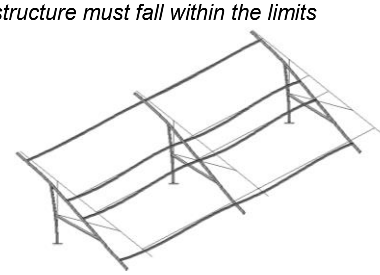
Mean Height, h_{sx} = 74.11 in

Allowable Story Drift for All Other Structures, Δ = { $0.020h_{sx}$ 1.482 in

Max Drift, Δ_{MAX} = 0.486 in

$0.486 \leq 1.482$, OK.

The racking structure's reaction to seismic loads is shown to the right. The deflections have been magnified to provide a clear portrayal of potential story drift.



APPENDIX A

A.1 Design of Aluminum Purlins - Aluminum Design Manual, 2005 Edition

Purlin = **S1.5**

Strong Axis:

3.4.14

L_b = 90 in

J = 0.432

248.982

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

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= 28.2 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 in^3

M_{max}St = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 90

J = 0.432

158.338

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

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= 29.3

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 in^3

M_{max}Wk = 1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L= φyFcy
φF_L= 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$S2 = C_t$

S2 = 141.0

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

$\varphi F_L =$ 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

$\varphi F_L = 1.3\varphi yFcy$

$\varphi F_L =$ 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

$\varphi F_L = 1.3\varphi yFcy$

$\varphi F_L =$ 43.2 ksi

$\varphi F_L St$ =	30.5	ksi
Ix =	1970917	mm^4
	4.735	in^4
y =	61.046	mm
Sx =	1.970	in^3
$M_{max}St$ =	5.001	k-ft

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

$\varphi F_L = \varphi yFcy$

$\varphi F_L =$ 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

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

$\varphi F_L =$ 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

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

$\varphi F_L =$ 30.80 ksi

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

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

φF_L= (φccFcy)/(λ²)

φF_L= 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L= φyFcy

φF_L= 33.25 ksi

φF_L= 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	79.31	in	
Pr =	-5.14	k	(LRFD Factored Load)
Mr (Strong) =	12.93	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	114.11		
4.71√(E/Fy) =	103.55 =>	kL/r	> 4.71√(E/Fy)
Fcr =	19.28	ksi	
Fe =	21.98	ksi	
Pn =	42.988	k	

Torsional/Flexural Torsional Buckling:

Fcr =	14.4957	ksi
Fey =	56.0686	ksi
Fez =	18.5443	ksi
Pn =	32.3254	k

Bending (Strong Axis):

Yielding:				
Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.1195 <	0.2		
Utilization =	0.79 <	1.0	OK	

Bending (Weak Axis):

Yielding:				
Mn =	14.65	k-ft		
Flange Local Buckling:				
Mn =	14.39	k-ft		
Pr/Pc =	0.120 <	0.2		
Utilization =	0.00 <	1.0	OK	

Combined Forces

Utilization = 79%

APPENDIX B

B.1

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

Basic Load Cases

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

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-8.366	-8.366	0	0
2	M11	Y	-8.366	-8.366	0	0
3	M12	Y	-8.366	-8.366	0	0
4	M13	Y	-8.366	-8.366	0	0

Member Distributed Loads (BLC 2 : Dead Load, Min)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-4.45	-4.45	0	0
2	M11	Y	-4.45	-4.45	0	0
3	M12	Y	-4.45	-4.45	0	0
4	M13	Y	-4.45	-4.45	0	0

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-39.836	-39.836	0	0
2	M11	Y	-39.836	-39.836	0	0
3	M12	Y	-39.836	-39.836	0	0
4	M13	Y	-39.836	-39.836	0	0

Member Distributed Loads (BLC 4 : Wind Load - Pressure)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-72.509	-72.509	0	0
2	M11	y	-72.509	-72.509	0	0
3	M12	y	-116.645	-116.645	0	0
4	M13	y	-116.645	-116.645	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	145.018	145.018	0	0
2	M11	y	145.018	145.018	0	0
3	M12	y	69.356	69.356	0	0
4	M13	y	69.356	69.356	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	824.032	2	2110.807	2	148.253	2	.195	2	.014	5	3.765	3
2		min	-1129.575	3	-1649.775	3	-274.514	5	-1.159	5	-.01	2	.485	15
3	N19	max	2891.631	2	5817.139	2	0	2	0	3	.015	4	6.753	3
4		min	-2885.827	3	-5087.756	3	-292.408	5	-1.206	4	0	10	.225	15
5	N29	max	824.032	2	2110.807	2	187.449	3	.281	3	.015	4	3.765	3
6		min	-1129.575	3	-1649.775	3	-297.275	4	-1.202	4	-.005	3	-.25	5
7	Totals:	max	4539.696	2	10038.753	2	0	2						
8		min	-5144.976	3	-8387.307	3	-849.946	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	2	.001	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-.261	15	-.452	15	0	12	0	1	0	12	0	6
4			min	-1.11	4	-1.922	6	-1.499	5	0	1	0	5	0	15
5		3	max	-18.685	12	310.489	3	-16.826	12	.049	3	.164	1	.295	2
6			min	-154.301	1	-673.378	2	-94.9	1	-.178	2	.035	10	-.133	3
7		4	max	-19.117	12	309.365	3	-16.826	12	.049	3	.105	1	.713	2
8			min	-155.166	1	-674.877	2	-94.9	1	-.178	2	.019	10	-.326	3
9		5	max	-19.55	12	308.241	3	-16.826	12	.049	3	.05	4	1.132	2
10			min	-156.031	1	-676.375	2	-94.9	1	-.178	2	.002	10	-.517	3
11		6	max	259.476	3	575.335	2	-4.759	12	.023	2	.066	2	1.093	2
12			min	-843.988	2	-172.698	3	-128.97	1	-.04	3	-.024	3	-.532	3
13		7	max	258.827	3	573.837	2	-4.759	12	.023	2	.005	10	.736	2
14			min	-844.854	2	-173.822	3	-128.97	1	-.04	3	-.055	4	-.425	3
15		8	max	258.179	3	572.338	2	-4.759	12	.023	2	-.021	12	.38	2
16			min	-845.719	2	-174.946	3	-128.97	1	-.04	3	-.103	1	-.317	3
17		9	max	227.515	3	108.062	3	-11.332	12	.014	5	.066	1	.17	2
18			min	-924.887	2	-61.21	2	-146.152	1	-.118	2	.005	10	-.269	3
19		10	max	226.866	3	106.938	3	-11.332	12	.014	5	.036	3	.209	2
20			min	-925.752	2	-62.709	2	-146.152	1	-.118	2	-.031	2	-.336	3
21		11	max	226.217	3	105.814	3	-11.332	12	.014	5	.025	3	.248	2
22			min	-926.617	2	-64.207	2	-146.152	1	-.118	2	-.116	1	-.402	3
23		12	max	191.35	3	807.46	3	76.405	2	.231	3	.097	1	.456	2
24			min	-1057.409	1	-479.867	2	-234.516	3	-.181	2	-.023	5	-.742	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	190.701	3	806.336	3	76.405	2	.231	3	.107	1	.754	2
26			min	-1058.274	1	-481.365	2	-234.516	3	-.181	2	-.119	5	-1.243	3
27		14	max	156.575	1	455.664	2	55.594	5	.164	2	.076	3	1.04	2
28			min	6.808	15	-746.269	3	-70.382	1	-.345	3	-.13	4	-1.722	3
29		15	max	155.71	1	454.166	2	54.094	5	.164	2	.035	3	.758	2
30			min	6.547	15	-747.393	3	-70.382	1	-.345	3	-.107	4	-1.258	3
31		16	max	154.844	1	452.667	2	52.594	5	.164	2	-.004	12	.477	2
32			min	6.286	15	-748.517	3	-70.382	1	-.345	3	-.131	1	-.794	3
33		17	max	153.979	1	451.168	2	51.095	5	.164	2	-.017	15	.196	2
34			min	6.025	15	-749.641	3	-70.382	1	-.345	3	-.175	1	-.329	3
35		18	max	1.11	4	1.923	6	1.5	4	0	1	0	12	0	6
36			min	.261	15	.452	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.003	2	0	1	0	1	0	1	0	1
38			min	0	1	-.007	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.015	2	.001	4	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	4
42			min	-1.11	6	-1.921	4	-1.499	5	0	1	0	5	0	15
43		3	max	13.765	3	967.202	3	0	1	.032	4	.159	4	.715	2
44			min	-263.453	1	-1870.728	2	-78.11	5	0	1	0	1	-.374	3
45		4	max	13.116	3	966.078	3	0	1	.032	4	.11	4	1.876	2
46			min	-264.318	1	-1872.227	2	-79.609	5	0	1	0	1	-.974	3
47		5	max	12.467	3	964.954	3	0	1	.032	4	.06	4	3.039	2
48			min	-265.183	1	-1873.725	2	-81.109	5	0	1	0	1	-1.573	3
49		6	max	1080.005	3	1755.572	2	0	1	0	1	0	1	2.87	2
50			min	-2320.824	2	-780.83	3	-70.695	4	-.026	4	-.022	5	-1.532	3
51		7	max	1079.356	3	1754.074	2	0	1	0	1	0	1	1.781	2
52			min	-2321.689	2	-781.954	3	-72.194	4	-.026	4	-.066	4	-1.047	3
53		8	max	1078.707	3	1752.575	2	0	1	0	1	0	1	.693	2
54			min	-2322.554	2	-783.078	3	-73.694	4	-.026	4	-.111	4	-.561	3
55		9	max	1097.896	3	238.208	3	0	1	.01	4	.077	4	.055	1
56			min	-2405.03	2	-207.71	2	-159.999	4	0	1	0	1	-.309	3
57		10	max	1097.247	3	237.084	3	0	1	.01	4	0	1	.169	1
58			min	-2405.895	2	-209.209	2	-161.498	4	0	1	-.023	4	-.456	3
59		11	max	1096.598	3	235.96	3	0	1	.01	4	0	1	.298	2
60			min	-2406.76	2	-210.707	2	-162.998	4	0	1	-.124	4	-.603	3
61		12	max	1124.196	3	2232.799	3	0	1	.119	4	0	1	.953	2
62			min	-2496.553	2	-1547.66	2	-171.056	4	0	1	-.008	4	-1.548	3
63		13	max	1123.547	3	2231.675	3	0	1	.119	4	0	1	1.914	2
64			min	-2497.418	2	-1549.159	2	-172.555	4	0	1	-.115	4	-2.933	3
65		14	max	266.692	1	1265.579	2	54.749	5	0	1	0	1	2.837	2
66			min	-12.041	3	-1901.842	3	0	1	-.081	4	-.105	5	-4.262	3
67		15	max	265.827	1	1264.08	2	53.249	5	0	1	0	1	2.052	2
68			min	-12.69	3	-1902.966	3	0	1	-.081	4	-.072	5	-3.081	3
69		16	max	264.961	1	1262.582	2	51.749	5	0	1	0	1	1.268	2
70			min	-13.339	3	-1904.09	3	0	1	-.081	4	-.039	5	-1.9	3
71		17	max	264.096	1	1261.083	2	50.249	5	0	1	0	1	.485	2
72			min	-13.988	3	-1905.214	3	0	1	-.081	4	-.008	4	-.718	3
73		18	max	1.11	6	1.924	6	1.5	5	0	1	0	1	0	6
74			min	.261	15	.452	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.008	2	0	1	0	1	0	1	0	1
76			min	0	1	-.014	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	.002	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	4
80			min	-1.11	6	-1.922	4	-1.499	5	0	1	0	5	0	15
81		3	max	15.379	5	310.489	3	94.9	1	.178	2	.078	5	.295	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	-154.301	1	-673.378	2	-36.342	5	-.049	3	-.164	1	-.133	3
83		4	max	14.975	5	309.365	3	94.9	1	.178	2	.055	5	.713	2
84			min	-155.166	1	-674.877	2	-37.842	5	-.049	3	-.105	1	-.326	3
85		5	max	14.571	5	308.241	3	94.9	1	.178	2	.031	5	1.132	2
86			min	-156.031	1	-676.375	2	-39.341	5	-.049	3	-.046	1	-.517	3
87		6	max	259.476	3	575.335	2	128.97	1	.04	3	.024	3	1.093	2
88			min	-843.988	2	-172.698	3	-28.116	5	-.023	4	-.066	2	-.532	3
89		7	max	258.827	3	573.837	2	128.97	1	.04	3	.028	3	.736	2
90			min	-844.854	2	-173.822	3	-29.616	5	-.023	4	-.043	5	-.425	3
91		8	max	258.179	3	572.338	2	128.97	1	.04	3	.103	1	.38	2
92			min	-845.719	2	-174.946	3	-31.116	5	-.023	4	-.062	5	-.317	3
93		9	max	227.515	3	108.062	3	146.152	1	.118	2	.023	5	.17	2
94			min	-924.887	2	-61.21	2	-64.686	5	.012	15	-.066	1	-.269	3
95		10	max	226.866	3	106.938	3	146.152	1	.118	2	.031	2	.209	2
96			min	-925.752	2	-62.709	2	-66.186	5	.012	15	-.036	3	-.336	3
97		11	max	226.217	3	105.814	3	146.152	1	.118	2	.116	1	.248	2
98			min	-926.617	2	-64.207	2	-67.686	5	.012	15	-.059	5	-.402	3
99		12	max	191.35	3	807.46	3	234.516	3	.181	2	-.021	12	.456	2
100			min	-1057.409	1	-479.867	2	-150.299	5	-.231	3	-.097	1	-.742	3
101		13	max	190.701	3	806.336	3	234.516	3	.181	2	.112	3	.754	2
102			min	-1058.274	1	-481.365	2	-151.799	5	-.231	3	-.146	4	-1.243	3
103		14	max	156.575	1	455.664	2	82.82	4	.345	3	.05	2	1.04	2
104			min	9.716	15	-746.269	3	7.72	10	-.164	2	-.121	5	-1.722	3
105		15	max	155.71	1	454.166	2	81.321	4	.345	3	.087	1	.758	2
106			min	9.455	15	-747.393	3	7.72	10	-.164	2	-.081	5	-1.258	3
107		16	max	154.844	1	452.667	2	79.821	4	.345	3	.131	1	.477	2
108			min	9.194	15	-748.517	3	7.72	10	-.164	2	-.041	5	-.794	3
109		17	max	153.979	1	451.168	2	78.321	4	.345	3	.175	1	.196	2
110			min	8.933	15	-749.641	3	7.72	10	-.164	2	-.002	5	-.329	3
111		18	max	1.11	6	1.924	4	1.5	5	0	1	0	1	0	4
112			min	.261	15	.452	15	0	1	0	1	0	5	0	15
113		19	max	0	1	.003	2	0	15	0	1	0	1	0	1
114			min	0	1	-.007	3	0	1	0	1	0	1	0	1
115	M10	1	max	75.342	4	447.92	2	-8.414	15	.013	2	.203	1	.164	2
116			min	7.719	10	-751.849	3	-152.344	1	-.026	3	.015	15	-.345	3
117		2	max	70.39	1	328.319	2	-6.926	15	.013	2	.089	1	.203	3
118			min	7.719	10	-562.359	3	-120.852	1	-.026	3	.009	15	-.159	2
119		3	max	70.39	1	208.718	2	-5.437	15	.013	2	.031	3	.592	3
120			min	7.719	10	-372.869	3	-89.359	1	-.026	3	-.005	9	-.383	2
121		4	max	70.39	1	89.117	2	-3.948	15	.013	2	.013	3	.824	3
122			min	7.719	10	-183.379	3	-57.867	1	-.026	3	-.06	1	-.507	2
123		5	max	70.39	1	12.792	5	-2.459	15	.013	2	-.003	12	.898	3
124			min	7.719	10	-30.611	1	-26.375	1	-.026	3	-.095	1	-.532	2
125		6	max	70.39	1	195.601	3	6.717	9	.013	2	-.004	15	.814	3
126			min	7.719	10	-150.085	2	-16.665	3	-.026	3	-.104	1	-.456	2
127		7	max	70.39	1	385.091	3	36.61	1	.013	2	-.005	15	.572	3
128			min	4.749	15	-269.686	2	-14.432	3	-.026	3	-.086	1	-.281	2
129		8	max	70.39	1	574.581	3	68.103	1	.013	2	-.004	15	.172	3
130			min	-1.26	5	-389.287	2	-12.199	3	-.026	3	-.043	1	-.015	5
131		9	max	70.39	1	764.071	3	99.595	1	.013	2	.028	9	.367	2
132			min	-9.815	5	-508.888	2	-9.966	3	-.026	3	-.052	3	-.386	3
133		10	max	70.39	1	167.661	14	131.087	1	0	15	.123	1	.841	2
134			min	7.719	10	-953.561	3	-75.886	14	-.026	3	-.059	3	-1.101	3
135		11	max	70.39	1	508.888	2	9.966	3	.026	3	.028	9	.367	2
136			min	7.719	10	-764.071	3	-99.595	1	-.013	2	-.052	3	-.386	3
137		12	max	70.39	1	389.287	2	12.199	3	.026	3	0	5	.172	3
138			min	7.719	10	-574.581	3	-68.103	1	-.013	2	-.043	1	-.007	10

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	70.39	1	269.686	2	14.432	3	.026	3	-.003	15	.572	3
140			min	2.028	15	-385.091	3	-36.61	1	-.013	2	-.086	1	-.281	2
141		14	max	70.39	1	150.085	2	16.665	3	.026	3	-.005	15	.814	3
142			min	-5.327	5	-195.601	3	-6.717	9	-.013	2	-.104	1	-.456	2
143		15	max	70.39	1	30.611	1	26.375	1	.026	3	-.003	12	.898	3
144			min	-13.882	5	-6.111	3	-.605	5	-.013	2	-.095	1	-.532	2
145		16	max	70.39	1	183.379	3	57.867	1	.026	3	.013	3	.824	3
146			min	-22.436	5	-89.117	2	1.038	15	-.013	2	-.06	1	-.507	2
147		17	max	70.39	1	372.869	3	89.359	1	.026	3	.031	3	.592	3
148			min	-30.99	5	-208.718	2	2.527	15	-.013	2	-.008	4	-.383	2
149		18	max	70.39	1	562.359	3	120.852	1	.026	3	.089	1	.203	3
150			min	-39.545	5	-328.319	2	4.015	15	-.013	2	-.002	5	-.159	2
151		19	max	70.39	1	751.849	3	152.344	1	.026	3	.203	1	.164	2
152			min	-48.099	5	-447.92	2	5.504	15	-.013	2	.002	15	-.345	3
153	M11	1	max	162.158	2	412.463	2	18.471	5	0	15	.239	1	.096	4
154			min	-217.393	3	-703.25	3	-159.519	1	-.004	1	-.098	5	-.323	3
155		2	max	162.158	2	292.861	2	20.774	5	0	15	.119	1	.184	3
156			min	-217.393	3	-513.759	3	-128.027	1	-.004	1	-.081	5	-.231	2
157		3	max	162.158	2	173.26	2	23.077	5	0	15	.052	3	.533	3
158			min	-217.393	3	-324.269	3	-96.534	1	-.004	1	-.063	5	-.425	2
159		4	max	162.158	2	53.659	2	25.38	5	0	15	.028	3	.724	3
160			min	-217.393	3	-134.779	3	-65.042	1	-.004	1	-.054	4	-.52	2
161		5	max	162.158	2	54.711	3	27.683	5	0	15	.007	3	.758	3
162			min	-217.393	3	-65.942	2	-33.549	1	-.004	1	-.083	1	-.515	2
163		6	max	162.158	2	244.201	3	30.787	4	0	15	.003	5	.633	3
164			min	-217.393	3	-185.543	2	-22.76	3	-.004	1	-.098	1	-.41	2
165		7	max	162.158	2	433.691	3	40.44	4	0	15	.029	5	.351	3
166			min	-217.393	3	-305.144	2	-20.527	3	-.004	1	-.086	1	-.206	2
167		8	max	162.158	2	623.181	3	60.928	1	0	15	.057	5	.099	2
168			min	-217.393	3	-424.745	2	-18.295	3	-.004	1	-.049	1	-.09	3
169		9	max	162.158	2	812.671	3	92.42	1	0	15	.094	4	.502	2
170			min	-217.393	3	-544.346	2	-16.062	3	-.004	1	-.062	3	-.688	3
171		10	max	162.158	2	1002.161	3	123.913	1	0	15	.148	4	1.006	2
172			min	-217.393	3	-663.947	2	-55.797	14	-.004	1	-.074	3	-1.444	3
173		11	max	162.158	2	544.346	2	22.611	5	.004	1	.021	9	.502	2
174			min	-217.393	3	-812.671	3	-92.42	1	0	5	-.082	5	-.688	3
175		12	max	162.158	2	424.745	2	24.914	5	.004	1	-.019	10	.099	2
176			min	-217.393	3	-623.181	3	-60.928	1	0	5	-.071	4	-.09	3
177		13	max	162.158	2	305.144	2	27.218	5	.004	1	-.019	10	.351	3
178			min	-217.393	3	-433.691	3	-29.435	1	0	5	-.086	1	-.206	2
179		14	max	162.158	2	185.543	2	29.521	5	.004	1	-.009	12	.633	3
180			min	-217.393	3	-244.201	3	-2.017	9	0	5	-.098	1	-.41	2
181		15	max	162.158	2	65.942	2	38.523	4	.004	1	.008	5	.758	3
182			min	-217.393	3	-54.711	3	9.768	10	0	5	-.083	1	-.515	2
183		16	max	162.158	2	134.779	3	65.042	1	.004	1	.036	5	.724	3
184			min	-217.393	3	-53.659	2	13.881	10	0	5	-.042	1	-.52	2
185		17	max	162.158	2	324.269	3	96.534	1	.004	1	.069	4	.533	3
186			min	-217.393	3	-173.26	2	17.993	10	0	5	.011	9	-.425	2
187		18	max	162.158	2	513.759	3	128.027	1	.004	1	.121	4	.184	3
188			min	-217.393	3	-292.861	2	20.316	12	0	5	.03	10	-.231	2
189		19	max	162.158	2	703.25	3	159.519	1	.004	1	.239	1	.067	1
190			min	-217.393	3	-412.463	2	21.805	12	0	5	.05	10	-.323	3
191	M12	1	max	32.01	5	630.543	2	22.682	5	0	15	.253	1	.141	2
192			min	-21.371	9	-284.514	3	-162.357	1	-.004	1	-.113	5	.019	9
193		2	max	23.456	5	452.094	2	24.985	5	0	15	.13	1	.252	3
194			min	-21.371	9	-195.907	3	-130.864	1	-.004	1	-.093	5	-.31	2
195		3	max	17.706	2	273.645	2	27.288	5	0	15	.039	3	.378	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	-21.371	9	-107.299	3	-99.372	1	-.004	1	-.071	5	-.613	2
197		4	max	17.706	2	95.196	2	29.591	5	0	15	.019	3	.43	3
198			min	-21.371	9	-18.692	3	-67.88	1	-.004	1	-.058	4	-.767	2
199		5	max	17.706	2	69.915	3	31.894	5	0	15	0	3	.409	3
200			min	-21.371	9	-83.253	2	-36.387	1	-.004	1	-.079	1	-.772	2
201		6	max	17.706	2	158.523	3	34.717	4	0	15	.006	5	.314	3
202			min	-22.012	14	-261.702	2	-18.837	3	-.004	1	-.096	1	-.628	2
203		7	max	17.706	2	247.13	3	44.37	4	0	15	.035	5	.145	3
204			min	-26.875	4	-440.151	2	-16.604	3	-.004	1	-.087	1	-.335	2
205		8	max	17.706	2	335.737	3	58.09	1	0	15	.067	5	.106	2
206			min	-35.429	4	-618.6	2	-14.371	3	-.004	1	-.051	1	-.098	3
207		9	max	17.706	2	424.345	3	89.582	1	0	15	.107	4	.696	2
208			min	-43.983	4	-797.049	2	-12.138	3	-.004	1	-.055	3	-.415	3
209		10	max	17.706	2	725.04	1	87.429	14	0	15	.164	4	1.434	2
210			min	-52.538	4	-975.498	2	-121.075	1	-.004	1	-.064	3	-.805	3
211		11	max	31.352	5	797.049	2	27.03	5	.004	1	.019	9	.696	2
212			min	-21.371	9	-424.345	3	-89.582	1	0	5	-.096	5	-.415	3
213		12	max	22.798	5	618.6	2	29.333	5	.004	1	-.021	10	.106	2
214			min	-21.371	9	-335.737	3	-58.09	1	0	5	-.081	4	-.098	3
215		13	max	17.706	2	440.151	2	31.636	5	.004	1	-.02	10	.145	3
216			min	-21.371	9	-247.13	3	-26.598	1	0	5	-.087	1	-.335	2
217		14	max	17.706	2	261.702	2	33.939	5	.004	1	-.011	12	.314	3
218			min	-21.371	9	-158.523	3	-1.107	9	0	5	-.096	1	-.628	2
219		15	max	17.706	2	83.253	2	43.306	4	.004	1	.01	5	.409	3
220			min	-21.371	9	-69.915	3	11.768	10	0	5	-.079	1	-.772	2
221		16	max	17.706	2	18.692	3	67.88	1	.004	1	.041	5	.43	3
222			min	-22.395	14	-95.196	2	14.89	12	0	5	-.035	1	-.767	2
223		17	max	17.706	2	107.299	3	99.372	1	.004	1	.079	4	.378	3
224			min	-27.577	4	-273.645	2	16.379	12	0	5	.013	9	-.613	2
225		18	max	17.706	2	195.907	3	130.864	1	.004	1	.135	4	.252	3
226			min	-36.132	4	-452.094	2	17.867	12	0	5	.038	10	-.31	2
227		19	max	17.706	2	284.514	3	162.357	1	.004	1	.253	1	.141	2
228			min	-44.686	4	-630.543	2	19.356	12	0	5	.055	12	-.035	5
229	M13	1	max	33.3	5	670.866	2	16.188	5	.008	3	.203	1	.178	2
230			min	-94.838	1	-312.768	3	-152.437	1	-.021	2	-.093	5	-.049	3
231		2	max	24.745	5	492.417	2	18.491	5	.008	3	.089	1	.174	3
232			min	-94.838	1	-224.161	3	-120.945	1	-.021	2	-.079	5	-.307	2
233		3	max	16.191	5	313.968	2	20.794	5	.008	3	.031	3	.324	3
234			min	-94.838	1	-135.553	3	-89.453	1	-.021	2	-.064	4	-.643	2
235		4	max	7.637	5	135.519	2	23.097	5	.008	3	.013	3	.4	3
236			min	-94.838	1	-46.946	3	-57.96	1	-.021	2	-.06	1	-.83	2
237		5	max	-.437	15	41.661	3	25.4	5	.008	3	-.002	12	.402	3
238			min	-94.838	1	-42.93	2	-26.468	1	-.021	2	-.096	1	-.869	2
239		6	max	-6.195	15	130.269	3	30.139	4	.008	3	-.001	15	.331	3
240			min	-94.838	1	-221.379	2	-16.428	3	-.021	2	-.104	1	-.759	2
241		7	max	-11.953	15	218.876	3	39.792	4	.008	3	.022	5	.185	3
242			min	-94.838	1	-399.828	2	-14.195	3	-.021	2	-.087	1	-.5	2
243		8	max	-16.825	12	307.483	3	68.009	1	.008	3	.048	5	-.007	15
244			min	-94.838	1	-578.277	2	-11.962	3	-.021	2	-.044	1	-.093	1
245		9	max	-16.825	12	396.091	3	99.502	1	.008	3	.086	4	.464	2
246			min	-94.838	1	-756.726	2	-9.729	3	-.021	2	-.051	3	-.327	3
247		10	max	-16.825	12	935.175	2	88.444	14	0	15	.139	4	1.169	2
248			min	-94.838	1	-149.851	14	-130.994	1	-.021	2	-.058	3	-.694	3
249		11	max	22.924	5	756.726	2	19.297	5	.021	2	.028	9	.464	2
250			min	-94.838	1	-396.091	3	-99.502	1	-.008	3	-.07	5	-.327	3
251		12	max	14.37	5	578.277	2	21.6	5	.021	2	-.019	10	.001	5
252			min	-94.838	1	-307.483	3	-68.009	1	-.008	3	-.06	4	-.093	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	5.815	5	399.828	2	23.903	5	.021	2	-.02	12	.185	3
254			min	-94.838	1	-218.876	3	-36.517	1	-.008	3	-.087	1	-.5	2
255		14	max	-1.658	15	221.379	2	26.206	5	.021	2	-.008	15	.331	3
256			min	-94.838	1	-130.269	3	-6.704	9	-.008	3	-.104	1	-.759	2
257		15	max	-7.416	15	42.93	2	33.519	4	.021	2	.01	5	.402	3
258			min	-94.838	1	-41.661	3	8.938	10	-.008	3	-.096	1	-.869	2
259		16	max	-13.174	15	46.946	3	57.96	1	.021	2	.035	5	.4	3
260			min	-94.838	1	-135.519	2	13.05	10	-.008	3	-.06	1	-.83	2
261		17	max	-16.825	12	135.553	3	89.453	1	.021	2	.061	5	.324	3
262			min	-94.838	1	-313.968	2	14.828	12	-.008	3	-.005	9	-.643	2
263		18	max	-16.825	12	224.161	3	120.945	1	.021	2	.108	4	.174	3
264			min	-94.838	1	-492.417	2	16.317	12	-.008	3	.026	10	-.307	2
265		19	max	-16.825	12	312.768	3	152.437	1	.021	2	.203	1	.178	2
266			min	-94.838	1	-670.866	2	17.805	12	-.008	3	.045	10	-.049	3
267	M2	1	max	2110.807	2	1128.925	3	148.355	2	.014	5	1.159	5	3.765	3
268			min	-1649.775	3	-823.655	2	-274.548	5	-.01	2	-.195	2	.485	15
269		2	max	2107.969	2	1128.925	3	148.355	2	.014	5	1.074	5	3.413	3
270			min	-1651.903	3	-823.655	2	-272.089	5	-.01	2	-.149	2	.462	15
271		3	max	1398.387	2	655.733	1	104.155	2	.001	2	.983	5	3.269	1
272			min	-1389.747	3	87.498	15	-252.552	5	0	3	-.122	2	.436	15
273		4	max	1395.55	2	655.733	1	104.155	2	.001	2	.905	5	3.065	1
274			min	-1391.876	3	87.498	15	-250.093	5	0	3	-.089	2	.409	15
275		5	max	1392.712	2	655.733	1	104.155	2	.001	2	.827	5	2.861	1
276			min	-1394.004	3	87.498	15	-247.634	5	0	3	-.057	1	.382	15
277		6	max	1389.875	2	655.733	1	104.155	2	.001	2	.75	5	2.656	1
278			min	-1396.132	3	87.498	15	-245.175	5	0	3	-.03	1	.354	15
279		7	max	1387.037	2	655.733	1	104.155	2	.001	2	.677	4	2.452	1
280			min	-1398.26	3	87.498	15	-242.716	5	0	3	-.036	3	.327	15
281		8	max	1384.2	2	655.733	1	104.155	2	.001	2	.604	4	2.248	1
282			min	-1400.388	3	87.498	15	-240.257	5	0	3	-.088	3	.3	15
283		9	max	1381.363	2	655.733	1	104.155	2	.001	2	.532	4	2.043	1
284			min	-1402.516	3	87.498	15	-237.798	5	0	3	-.141	3	.273	15
285		10	max	1378.525	2	655.733	1	104.155	2	.001	2	.461	4	1.839	1
286			min	-1404.644	3	87.498	15	-235.339	5	0	3	-.193	3	.245	15
287		11	max	1375.688	2	655.733	1	104.155	2	.001	2	.391	4	1.635	1
288			min	-1406.772	3	87.498	15	-232.88	5	0	3	-.246	3	.218	15
289		12	max	1372.85	2	655.733	1	104.155	2	.001	2	.322	4	1.43	1
290			min	-1408.9	3	87.498	15	-230.42	5	0	3	-.298	3	.191	15
291		13	max	1370.013	2	655.733	1	104.155	2	.001	2	.253	4	1.226	1
292			min	-1411.028	3	87.498	15	-227.961	5	0	3	-.35	3	.164	15
293		14	max	1367.175	2	655.733	1	104.155	2	.001	2	.235	2	1.022	1
294			min	-1413.156	3	87.498	15	-225.502	5	0	3	-.403	3	.136	15
295		15	max	1364.338	2	655.733	1	104.155	2	.001	2	.268	2	.817	1
296			min	-1415.284	3	87.498	15	-223.043	5	0	3	-.455	3	.109	15
297		16	max	1361.5	2	655.733	1	104.155	2	.001	2	.3	2	.613	1
298			min	-1417.412	3	87.498	15	-220.584	5	0	3	-.508	3	.082	15
299		17	max	1358.663	2	655.733	1	104.155	2	.001	2	.333	2	.409	1
300			min	-1419.541	3	87.498	15	-218.125	5	0	3	-.56	3	.055	15
301		18	max	1355.826	2	655.733	1	104.155	2	.001	2	.365	2	.204	1
302			min	-1421.669	3	87.498	15	-215.666	5	0	3	-.613	3	.027	15
303		19	max	1352.988	2	655.733	1	104.155	2	.001	2	.398	2	0	1
304			min	-1423.797	3	87.498	15	-213.207	5	0	3	-.665	3	0	1
305	M5	1	max	5817.139	2	2882.122	3	0	1	.015	4	1.206	4	6.753	3
306			min	-5087.756	3	-2890.277	2	-292.475	5	0	1	0	1	.225	15
307		2	max	5814.302	2	2882.122	3	0	1	.015	4	1.115	4	5.855	3
308			min	-5089.885	3	-2890.277	2	-290.016	5	0	1	0	1	.229	15
309		3	max	3784.624	2	1103.711	1	0	1	0	1	1.02	4	5.503	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	-4122.64	3	44.367	15	-270.42	4	0	4	0	1	.221	15
311		4	max	3781.786	2	1103.711	1	0	1	0	1	.936	4	5.159	1
312			min	-4124.768	3	44.367	15	-267.961	4	0	4	0	1	.207	15
313		5	max	3778.949	2	1103.711	1	0	1	0	1	.853	4	4.815	1
314			min	-4126.896	3	44.367	15	-265.502	4	0	4	0	1	.194	15
315		6	max	3776.111	2	1103.711	1	0	1	0	1	.771	4	4.471	1
316			min	-4129.024	3	44.367	15	-263.042	4	0	4	0	1	.18	15
317		7	max	3773.274	2	1103.711	1	0	1	0	1	.689	4	4.127	1
318			min	-4131.152	3	44.367	15	-260.583	4	0	4	0	1	.166	15
319		8	max	3770.437	2	1103.711	1	0	1	0	1	.608	4	3.783	1
320			min	-4133.28	3	44.367	15	-258.124	4	0	4	0	1	.152	15
321		9	max	3767.599	2	1103.711	1	0	1	0	1	.528	4	3.439	1
322			min	-4135.409	3	44.367	15	-255.665	4	0	4	0	1	.138	15
323		10	max	3764.762	2	1103.711	1	0	1	0	1	.449	4	3.095	1
324			min	-4137.537	3	44.367	15	-253.206	4	0	4	0	1	.124	15
325		11	max	3761.924	2	1103.711	1	0	1	0	1	.371	4	2.751	1
326			min	-4139.665	3	44.367	15	-250.747	4	0	4	0	1	.111	15
327		12	max	3759.087	2	1103.711	1	0	1	0	1	.293	4	2.407	1
328			min	-4141.793	3	44.367	15	-248.288	4	0	4	0	1	.097	15
329		13	max	3756.249	2	1103.711	1	0	1	0	1	.216	4	2.064	1
330			min	-4143.921	3	44.367	15	-245.829	4	0	4	0	1	.083	15
331		14	max	3753.412	2	1103.711	1	0	1	0	1	.14	4	1.72	1
332			min	-4146.049	3	44.367	15	-243.369	4	0	4	0	1	.069	15
333		15	max	3750.575	2	1103.711	1	0	1	0	1	.064	4	1.376	1
334			min	-4148.177	3	44.367	15	-240.91	4	0	4	0	1	.055	15
335		16	max	3747.737	2	1103.711	1	0	1	0	1	0	1	1.032	1
336			min	-4150.305	3	44.367	15	-238.451	4	0	4	-.011	5	.041	15
337		17	max	3744.9	2	1103.711	1	0	1	0	1	0	1	.688	1
338			min	-4152.433	3	44.367	15	-235.992	4	0	4	-.084	4	.028	15
339		18	max	3742.062	2	1103.711	1	0	1	0	1	0	1	.344	1
340			min	-4154.561	3	44.367	15	-233.533	4	0	4	-.158	4	.014	15
341		19	max	3739.225	2	1103.711	1	0	1	0	1	0	1	0	1
342			min	-4156.689	3	44.367	15	-231.074	4	0	4	-.23	4	0	1
343	M8	1	max	2110.807	2	1128.925	3	187.334	3	.015	4	1.202	4	3.765	3
344			min	-1649.775	3	-823.655	2	-297.397	4	-.005	3	-.281	3	-.25	5
345		2	max	2107.969	2	1128.925	3	187.334	3	.015	4	1.109	4	3.413	3
346			min	-1651.903	3	-823.655	2	-294.938	4	-.005	3	-.222	3	-.222	5
347		3	max	1398.387	2	655.733	1	168.201	3	0	3	1.013	4	3.269	1
348			min	-1389.747	3	-40.842	5	-270.531	4	-.001	2	-.174	3	-.204	5
349		4	max	1395.55	2	655.733	1	168.201	3	0	3	.929	4	3.065	1
350			min	-1391.876	3	-40.842	5	-268.072	4	-.001	2	-.121	3	-.191	5
351		5	max	1392.712	2	655.733	1	168.201	3	0	3	.846	4	2.861	1
352			min	-1394.004	3	-40.842	5	-265.613	4	-.001	2	-.069	3	-.178	5
353		6	max	1389.875	2	655.733	1	168.201	3	0	3	.764	4	2.656	1
354			min	-1396.132	3	-40.842	5	-263.154	4	-.001	2	-.016	3	-.165	5
355		7	max	1387.037	2	655.733	1	168.201	3	0	3	.682	4	2.452	1
356			min	-1398.26	3	-40.842	5	-260.695	4	-.001	2	-.008	2	-.153	5
357		8	max	1384.2	2	655.733	1	168.201	3	0	3	.601	4	2.248	1
358			min	-1400.388	3	-40.842	5	-258.236	4	-.001	2	-.041	2	-.14	5
359		9	max	1381.363	2	655.733	1	168.201	3	0	3	.522	5	2.043	1
360			min	-1402.516	3	-40.842	5	-255.777	4	-.001	2	-.073	2	-.127	5
361		10	max	1378.525	2	655.733	1	168.201	3	0	3	.446	5	1.839	1
362			min	-1404.644	3	-40.842	5	-253.318	4	-.001	2	-.105	2	-.115	5
363		11	max	1375.688	2	655.733	1	168.201	3	0	3	.371	5	1.635	1
364			min	-1406.772	3	-40.842	5	-250.858	4	-.001	2	-.138	2	-.102	5
365		12	max	1372.85	2	655.733	1	168.201	3	0	3	.298	3	1.43	1
366			min	-1408.9	3	-40.842	5	-248.399	4	-.001	2	-.17	2	-.089	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	1370.013	2	655.733	1	168.201	3	0	3	.35	3	1.226	1
368			min	-1411.028	3	-40.842	5	-245.94	4	-.001	2	-.203	2	-.076	5
369		14	max	1367.175	2	655.733	1	168.201	3	0	3	.403	3	1.022	1
370			min	-1413.156	3	-40.842	5	-243.481	4	-.001	2	-.235	2	-.064	5
371		15	max	1364.338	2	655.733	1	168.201	3	0	3	.455	3	.817	1
372			min	-1415.284	3	-40.842	5	-241.022	4	-.001	2	-.268	2	-.051	5
373		16	max	1361.5	2	655.733	1	168.201	3	0	3	.508	3	.613	1
374			min	-1417.412	3	-40.842	5	-238.563	4	-.001	2	-.3	2	-.038	5
375		17	max	1358.663	2	655.733	1	168.201	3	0	3	.56	3	.409	1
376			min	-1419.541	3	-40.842	5	-236.104	4	-.001	2	-.333	2	-.025	5
377		18	max	1355.826	2	655.733	1	168.201	3	0	3	.613	3	.204	1
378			min	-1421.669	3	-40.842	5	-233.645	4	-.001	2	-.365	2	-.013	5
379		19	max	1352.988	2	655.733	1	168.201	3	0	3	.665	3	0	1
380			min	-1423.797	3	-40.842	5	-231.186	4	-.001	2	-.398	2	0	1
381	M3	1	max	1470.843	2	4.384	6	43.906	2	.008	3	.018	5	0	1
382			min	-557.787	3	1.031	15	-19.419	3	-.015	2	-.005	2	0	1
383		2	max	1470.635	2	3.897	6	43.906	2	.008	3	.013	4	0	15
384			min	-557.944	3	.916	15	-19.419	3	-.015	2	-.004	3	-.001	6
385		3	max	1470.427	2	3.41	6	43.906	2	.008	3	.021	2	0	15
386			min	-558.1	3	.802	15	-19.419	3	-.015	2	-.01	3	-.002	6
387		4	max	1470.219	2	2.923	6	43.906	2	.008	3	.033	2	0	15
388			min	-558.256	3	.687	15	-19.419	3	-.015	2	-.015	3	-.003	6
389		5	max	1470.011	2	2.436	6	43.906	2	.008	3	.046	2	0	15
390			min	-558.412	3	.573	15	-19.419	3	-.015	2	-.021	3	-.004	6
391		6	max	1469.803	2	1.949	6	43.906	2	.008	3	.059	2	-.001	15
392			min	-558.568	3	.458	15	-19.419	3	-.015	2	-.027	3	-.005	6
393		7	max	1469.595	2	1.461	6	43.906	2	.008	3	.072	2	-.001	15
394			min	-558.724	3	.344	15	-19.419	3	-.015	2	-.032	3	-.005	6
395		8	max	1469.387	2	.974	6	43.906	2	.008	3	.085	2	-.001	15
396			min	-558.88	3	.229	15	-19.419	3	-.015	2	-.038	3	-.005	6
397		9	max	1469.179	2	.487	6	43.906	2	.008	3	.097	2	-.001	15
398			min	-559.036	3	.115	15	-19.419	3	-.015	2	-.044	3	-.006	6
399		10	max	1468.971	2	0	1	43.906	2	.008	3	.11	2	-.001	15
400			min	-559.192	3	0	1	-19.419	3	-.015	2	-.049	3	-.006	6
401		11	max	1468.763	2	-.115	15	43.906	2	.008	3	.123	2	-.001	15
402			min	-559.348	3	-.487	4	-19.419	3	-.015	2	-.055	3	-.006	6
403		12	max	1468.555	2	-.229	15	43.906	2	.008	3	.136	2	-.001	15
404			min	-559.504	3	-.974	4	-19.419	3	-.015	2	-.061	3	-.005	6
405		13	max	1468.346	2	-.344	15	43.906	2	.008	3	.149	2	-.001	15
406			min	-559.66	3	-1.461	4	-19.419	3	-.015	2	-.066	3	-.005	6
407		14	max	1468.138	2	-.458	15	43.906	2	.008	3	.162	2	-.001	15
408			min	-559.816	3	-1.949	4	-19.419	3	-.015	2	-.072	3	-.005	6
409		15	max	1467.93	2	-.573	15	43.906	2	.008	3	.174	2	0	15
410			min	-559.972	3	-2.436	4	-19.419	3	-.015	2	-.078	3	-.004	6
411		16	max	1467.722	2	-.687	15	43.906	2	.008	3	.187	2	0	15
412			min	-560.128	3	-2.923	4	-19.419	3	-.015	2	-.083	3	-.003	6
413		17	max	1467.514	2	-.802	15	43.906	2	.008	3	.2	2	0	15
414			min	-560.284	3	-3.41	4	-19.419	3	-.015	2	-.089	3	-.002	6
415		18	max	1467.306	2	-.916	15	43.906	2	.008	3	.213	2	0	15
416			min	-560.44	3	-3.897	4	-19.419	3	-.015	2	-.095	3	-.001	6
417		19	max	1467.098	2	-1.031	15	43.906	2	.008	3	.226	2	0	1
418			min	-560.596	3	-4.384	4	-19.419	3	-.015	2	-.1	3	0	1
419	M6	1	max	4246.708	2	4.384	4	0	1	0	1	.018	4	0	1
420			min	-2041.281	3	1.031	15	-19.717	4	0	4	0	1	0	1
421		2	max	4246.5	2	3.897	4	0	1	0	1	.012	4	0	15
422			min	-2041.438	3	.916	15	-19.342	4	0	4	0	1	-.001	4
423		3	max	4246.292	2	3.41	4	0	1	0	1	.006	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	-2041.594	3	.802	15	-18.967	4	0	4	0	1	-.002	4
425		4	max	4246.084	2	2.923	4	0	1	0	1	0	4	0	15
426			min	-2041.75	3	.687	15	-18.591	4	0	4	0	1	-.003	4
427		5	max	4245.876	2	2.436	4	0	1	0	1	0	1	0	15
428			min	-2041.906	3	.573	15	-18.216	4	0	4	-.004	4	-.004	4
429		6	max	4245.668	2	1.949	4	0	1	0	1	0	1	-.001	15
430			min	-2042.062	3	.458	15	-17.841	4	0	4	-.01	4	-.005	4
431		7	max	4245.46	2	1.461	4	0	1	0	1	0	1	-.001	15
432			min	-2042.218	3	.344	15	-17.466	4	0	4	-.015	4	-.005	4
433		8	max	4245.252	2	.974	4	0	1	0	1	0	1	-.001	15
434			min	-2042.374	3	.229	15	-17.091	4	0	4	-.02	4	-.005	4
435		9	max	4245.044	2	.487	4	0	1	0	1	0	1	-.001	15
436			min	-2042.53	3	.115	15	-16.716	4	0	4	-.025	4	-.006	4
437		10	max	4244.835	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2042.686	3	0	1	-16.34	4	0	4	-.03	4	-.006	4
439		11	max	4244.627	2	-.115	15	0	1	0	1	0	1	-.001	15
440			min	-2042.842	3	-.487	6	-15.965	4	0	4	-.034	4	-.006	4
441		12	max	4244.419	2	-.229	15	0	1	0	1	0	1	-.001	15
442			min	-2042.998	3	-.974	6	-15.59	4	0	4	-.039	4	-.005	4
443		13	max	4244.211	2	-.344	15	0	1	0	1	0	1	-.001	15
444			min	-2043.154	3	-1.461	6	-15.215	4	0	4	-.043	4	-.005	4
445		14	max	4244.003	2	-.458	15	0	1	0	1	0	1	-.001	15
446			min	-2043.31	3	-1.949	6	-14.84	4	0	4	-.048	4	-.005	4
447		15	max	4243.795	2	-.573	15	0	1	0	1	0	1	0	15
448			min	-2043.466	3	-2.436	6	-14.465	4	0	4	-.052	4	-.004	4
449		16	max	4243.587	2	-.687	15	0	1	0	1	0	1	0	15
450			min	-2043.622	3	-2.923	6	-14.09	4	0	4	-.056	4	-.003	4
451		17	max	4243.379	2	-.802	15	0	1	0	1	0	1	0	15
452			min	-2043.778	3	-3.41	6	-13.714	4	0	4	-.06	4	-.002	4
453		18	max	4243.171	2	-.916	15	0	1	0	1	0	1	0	15
454			min	-2043.934	3	-3.897	6	-13.339	4	0	4	-.064	4	-.001	4
455		19	max	4242.963	2	-1.031	15	0	1	0	1	0	1	0	1
456			min	-2044.09	3	-4.384	6	-12.964	4	0	4	-.068	4	0	1
457	M9	1	max	1470.843	2	4.384	6	19.419	3	.015	2	.018	4	0	1
458			min	-557.787	3	1.031	15	-43.906	2	-.008	3	-.002	3	0	1
459		2	max	1470.635	2	3.897	6	19.419	3	.015	2	.012	5	0	15
460			min	-557.944	3	.916	15	-43.906	2	-.008	3	-.008	2	-.001	6
461		3	max	1470.427	2	3.41	6	19.419	3	.015	2	.01	3	0	15
462			min	-558.1	3	.802	15	-43.906	2	-.008	3	-.021	2	-.002	6
463		4	max	1470.219	2	2.923	6	19.419	3	.015	2	.015	3	0	15
464			min	-558.256	3	.687	15	-43.906	2	-.008	3	-.033	2	-.003	6
465		5	max	1470.011	2	2.436	6	19.419	3	.015	2	.021	3	0	15
466			min	-558.412	3	.573	15	-43.906	2	-.008	3	-.046	2	-.004	6
467		6	max	1469.803	2	1.949	6	19.419	3	.015	2	.027	3	-.001	15
468			min	-558.568	3	.458	15	-43.906	2	-.008	3	-.059	2	-.005	6
469		7	max	1469.595	2	1.461	6	19.419	3	.015	2	.032	3	-.001	15
470			min	-558.724	3	.344	15	-43.906	2	-.008	3	-.072	2	-.005	6
471		8	max	1469.387	2	.974	6	19.419	3	.015	2	.038	3	-.001	15
472			min	-558.88	3	.229	15	-43.906	2	-.008	3	-.085	2	-.005	6
473		9	max	1469.179	2	.487	6	19.419	3	.015	2	.044	3	-.001	15
474			min	-559.036	3	.115	15	-43.906	2	-.008	3	-.097	2	-.006	6
475		10	max	1468.971	2	0	1	19.419	3	.015	2	.049	3	-.001	15
476			min	-559.192	3	0	1	-43.906	2	-.008	3	-.11	2	-.006	6
477		11	max	1468.763	2	-.115	15	19.419	3	.015	2	.055	3	-.001	15
478			min	-559.348	3	-.487	4	-43.906	2	-.008	3	-.123	2	-.006	6
479		12	max	1468.555	2	-.229	15	19.419	3	.015	2	.061	3	-.001	15
480			min	-559.504	3	-.974	4	-43.906	2	-.008	3	-.136	2	-.005	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	1468.346	2	-.344	15	19.419	3	.015	2	.066	3	-.001	15
482			min	-559.66	3	-1.461	4	-43.906	2	-.008	3	-.149	2	-.005	6
483		14	max	1468.138	2	-.458	15	19.419	3	.015	2	.072	3	-.001	15
484			min	-559.816	3	-1.949	4	-43.906	2	-.008	3	-.162	2	-.005	6
485		15	max	1467.93	2	-.573	15	19.419	3	.015	2	.078	3	0	15
486			min	-559.972	3	-2.436	4	-43.906	2	-.008	3	-.174	2	-.004	6
487		16	max	1467.722	2	-.687	15	19.419	3	.015	2	.083	3	0	15
488			min	-560.128	3	-2.923	4	-43.906	2	-.008	3	-.187	2	-.003	6
489		17	max	1467.514	2	-.802	15	19.419	3	.015	2	.089	3	0	15
490			min	-560.284	3	-3.41	4	-43.906	2	-.008	3	-.2	2	-.002	6
491		18	max	1467.306	2	-.916	15	19.419	3	.015	2	.095	3	0	15
492			min	-560.44	3	-3.897	4	-43.906	2	-.008	3	-.213	2	-.001	6
493		19	max	1467.098	2	-1.031	15	19.419	3	.015	2	.1	3	0	1
494			min	-560.596	3	-4.384	4	-43.906	2	-.008	3	-.226	2	0	1

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	-.025	15	-.032	12	.015	1	6.281e-3	3	NC	3	NC	3
2			min	-.185	1	-.424	1	-.394	5	-1.639e-2	2	302.05	1	526.719	5
3		2	max	-.025	15	-.029	15	.004	1	6.281e-3	3	NC	12	NC	2
4			min	-.185	1	-.35	1	-.379	4	-1.639e-2	2	362.356	1	561.999	5
5		3	max	-.025	15	-.025	15	0	12	5.893e-3	3	7439.774	12	NC	1
6			min	-.185	1	-.276	1	-.364	4	-1.5e-2	2	452.868	1	604.748	5
7		4	max	-.025	15	-.02	15	-.002	12	5.298e-3	3	5163.835	12	NC	1
8			min	-.185	1	-.205	1	-.345	4	-1.286e-2	2	595.843	1	665.374	5
9		5	max	-.025	15	-.016	15	-.001	12	4.703e-3	3	NC	10	NC	1
10			min	-.185	1	-.141	1	-.322	4	-1.072e-2	2	830.734	1	749.82	5
11		6	max	-.025	15	-.013	15	0	3	4.747e-3	3	5773.169	2	NC	1
12			min	-.184	1	-.101	3	-.297	4	-1.001e-2	2	1197.142	14	865.346	5
13		7	max	-.025	15	-.009	15	0	3	5.233e-3	3	9957.493	11	NC	1
14			min	-.184	1	-.095	3	-.273	4	-1.028e-2	2	1413.645	14	1017.782	5
15		8	max	-.025	15	.004	10	0	3	5.719e-3	3	NC	11	NC	2
16			min	-.184	1	-.083	3	-.251	4	-1.056e-2	2	1564.241	2	1216.154	5
17		9	max	-.025	15	.022	2	0	10	6.429e-3	3	NC	1	NC	2
18			min	-.184	1	-.066	3	-.232	4	-1.022e-2	2	1255.562	2	1471.439	5
19		10	max	-.025	15	.041	2	0	2	7.534e-3	3	NC	3	NC	2
20			min	-.183	1	-.046	3	-.213	4	-8.798e-3	2	1066.748	2	1865.588	5
21		11	max	-.025	15	.06	1	0	3	8.64e-3	3	7116.357	12	NC	2
22			min	-.183	1	-.022	3	-.194	4	-7.378e-3	2	946.204	2	2515.522	5
23		12	max	-.025	15	.081	1	.004	3	7.26e-3	3	9836.904	9	NC	1
24			min	-.183	1	.006	12	-.178	4	-5.476e-3	2	868.45	2	3683.534	5
25		13	max	-.025	15	.097	1	.008	3	4.475e-3	3	NC	9	NC	1
26			min	-.182	1	.011	15	-.162	4	-3.333e-3	4	833.332	2	6503.581	5
27		14	max	-.024	15	.106	3	.007	3	1.843e-3	3	NC	9	NC	2
28			min	-.182	1	.014	15	-.149	4	-4.229e-3	4	854.318	2	8659.165	1
29		15	max	-.024	15	.187	3	.006	1	5.994e-3	3	NC	9	NC	2
30			min	-.182	1	.017	15	-.143	5	-3.66e-3	4	570.348	3	6587.21	1
31		16	max	-.024	15	.285	3	.008	1	1.015e-2	3	NC	4	NC	2
32			min	-.182	1	.005	10	-.14	5	-5.169e-3	2	402.437	3	6069.255	1
33		17	max	-.024	15	.394	3	.005	1	1.43e-2	3	NC	4	NC	2
34			min	-.182	1	-.017	10	-.139	5	-7.145e-3	2	303.181	3	7008.843	1
35		18	max	-.024	15	.507	3	0	10	1.7e-2	3	NC	4	NC	1
36			min	-.182	1	-.047	2	-.141	4	-8.433e-3	2	241.309	3	NC	1
37		19	max	-.024	15	.62	3	-.003	10	1.7e-2	3	NC	1	NC	1
38			min	-.182	1	-.085	2	-.144	4	-8.433e-3	2	200.448	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
39	M4	1	max	-.013	15	.048	3	0	1	2.457e-4	4	NC	3	NC	1
40			min	-.311	1	-.93	2	-.391	4	0	1	185.552	1	530.094	4
41		2	max	-.013	15	-.008	3	0	1	2.457e-4	4	5878.074	15	NC	1
42			min	-.311	1	-.744	2	-.379	4	0	1	237.178	1	557.622	4
43		3	max	-.013	15	-.017	15	0	1	0	1	7176.807	15	NC	1
44			min	-.311	1	-.556	2	-.365	4	-7.638e-6	4	328.975	1	591.836	4
45		4	max	-.013	15	-.013	15	0	1	0	1	9249.254	10	NC	1
46			min	-.311	1	-.386	1	-.346	4	-3.962e-4	4	522.365	1	646.648	4
47		5	max	-.013	15	-.009	15	0	1	0	1	NC	15	NC	1
48			min	-.311	1	-.254	1	-.323	4	-7.847e-4	4	669.959	3	727.935	4
49		6	max	-.013	15	-.006	15	0	1	0	1	NC	5	NC	1
50			min	-.31	1	-.168	3	-.298	4	-7.603e-4	4	622.585	3	842.788	4
51		7	max	-.012	15	-.004	15	0	1	0	1	NC	5	NC	1
52			min	-.31	1	-.161	3	-.273	4	-4.502e-4	4	542.149	2	995.672	4
53		8	max	-.012	15	.002	10	0	1	0	1	NC	5	NC	1
54			min	-.309	1	-.14	3	-.251	4	-1.402e-4	4	461.104	2	1190.693	4
55		9	max	-.012	15	.029	2	0	1	1.336e-5	5	NC	4	NC	1
56			min	-.308	1	-.112	3	-.232	4	0	1	412.232	2	1427.356	4
57		10	max	-.012	15	.064	2	0	1	0	1	NC	4	NC	1
58			min	-.307	1	-.079	3	-.213	4	-1.098e-4	4	372.738	2	1802.418	4
59		11	max	-.012	15	.1	1	0	1	0	1	NC	4	NC	1
60			min	-.306	1	-.04	3	-.194	4	-2.331e-4	4	342.172	2	2408.595	4
61		12	max	-.012	15	.139	1	0	1	0	1	NC	5	NC	1
62			min	-.306	1	.005	12	-.178	4	-1.192e-3	4	319.056	2	3370.687	4
63		13	max	-.012	15	.167	1	0	1	0	1	NC	5	NC	1
64			min	-.305	1	.006	15	-.163	4	-2.623e-3	4	307.64	2	5426.939	4
65		14	max	-.012	15	.182	3	0	1	0	1	NC	5	NC	1
66			min	-.304	1	.007	15	-.152	4	-4.001e-3	4	315.577	2	9735.778	4
67		15	max	-.012	15	.347	3	0	1	0	1	NC	5	NC	1
68			min	-.304	1	.007	15	-.146	4	-3.03e-3	4	356.95	2	NC	1
69		16	max	-.012	15	.556	3	0	1	0	1	NC	5	NC	1
70			min	-.304	1	-.014	10	-.143	4	-2.058e-3	4	263.925	3	NC	1
71		17	max	-.012	15	.79	3	0	1	0	1	NC	5	NC	1
72			min	-.304	1	-.093	2	-.142	4	-1.087e-3	4	180.548	3	NC	1
73		18	max	-.012	15	1.034	3	0	1	0	1	NC	4	NC	1
74			min	-.304	1	-.195	2	-.14	4	-4.54e-4	4	135.893	3	NC	1
75		19	max	-.012	15	1.278	3	0	1	0	1	NC	1	NC	1
76			min	-.304	1	-.296	2	-.138	4	-4.54e-4	4	109.007	3	NC	1
77	M7	1	max	.012	5	.004	5	-.003	12	1.639e-2	2	NC	3	NC	3
78			min	-.185	1	-.424	1	-.401	4	-6.281e-3	3	302.05	1	504.976	4
79		2	max	.012	5	.005	5	0	12	1.639e-2	2	NC	5	NC	2
80			min	-.185	1	-.35	1	-.382	4	-6.281e-3	3	362.356	1	545.484	4
81		3	max	.012	5	.006	5	.005	1	1.5e-2	2	NC	5	NC	1
82			min	-.185	1	-.276	1	-.362	4	-5.893e-3	3	452.868	1	594.008	4
83		4	max	.012	5	.006	5	.009	1	1.286e-2	2	NC	5	NC	1
84			min	-.185	1	-.205	1	-.34	5	-5.298e-3	3	595.843	1	656.568	4
85		5	max	.012	5	.006	5	.009	1	1.072e-2	2	NC	4	NC	1
86			min	-.185	1	-.141	1	-.318	5	-4.703e-3	3	830.734	1	738.448	4
87		6	max	.012	5	.006	5	.007	1	1.001e-2	2	NC	4	NC	1
88			min	-.184	1	-.101	3	-.294	4	-4.747e-3	3	1220.743	1	845.934	4
89		7	max	.012	5	.005	5	.003	2	1.028e-2	2	NC	4	NC	1
90			min	-.184	1	-.095	3	-.272	4	-5.233e-3	3	1594.878	9	982.528	4
91		8	max	.012	5	.004	5	0	2	1.056e-2	2	NC	4	NC	2
92			min	-.184	1	-.083	3	-.252	4	-5.719e-3	3	1564.241	2	1158.459	4
93		9	max	.012	5	.022	2	0	3	1.022e-2	2	NC	1	NC	2
94			min	-.184	1	-.066	3	-.232	4	-6.429e-3	3	1255.562	2	1391.546	4
95		10	max	.012	5	.041	2	0	3	8.798e-3	2	NC	3	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.183	1	-.046	3	-.213	4	-7.534e-3	3	1066.748	2	1738.02	4
97		11	max	.012	5	.06	1	0	2	7.378e-3	2	NC	5	NC	2
98			min	-.183	1	-.022	3	-.194	4	-8.64e-3	3	946.204	2	2293.665	4
99		12	max	.012	5	.081	1	.003	2	5.476e-3	2	NC	5	NC	1
100			min	-.183	1	-.002	5	-.177	4	-7.26e-3	3	868.45	2	3286.494	4
101		13	max	.012	5	.097	1	.004	2	3.301e-3	2	NC	5	NC	1
102			min	-.182	1	-.004	5	-.161	4	-4.475e-3	3	833.332	2	5310.227	4
103		14	max	.012	5	.106	3	.001	2	1.217e-3	2	NC	5	NC	2
104			min	-.182	1	-.007	5	-.151	4	-3.983e-3	5	854.318	2	8659.165	1
105		15	max	.012	5	.187	3	0	10	3.193e-3	2	NC	7	NC	2
106			min	-.182	1	-.01	5	-.146	4	-5.994e-3	3	570.348	3	6587.21	1
107		16	max	.012	5	.285	3	-.002	10	5.169e-3	2	NC	9	NC	2
108			min	-.182	1	-.015	5	-.144	4	-1.015e-2	3	402.437	3	6069.255	1
109		17	max	.011	5	.394	3	0	12	7.145e-3	2	NC	4	NC	2
110			min	-.182	1	-.02	5	-.142	4	-1.43e-2	3	303.181	3	7008.843	1
111		18	max	.011	5	.507	3	.004	1	8.433e-3	2	NC	4	NC	1
112			min	-.182	1	-.047	2	-.139	4	-1.7e-2	3	241.309	3	NC	1
113		19	max	.011	5	.62	3	.014	1	8.433e-3	2	NC	1	NC	1
114			min	-.182	1	-.085	2	-.138	5	-1.7e-2	3	200.448	3	NC	1
115	M10	1	max	0	1	.468	3	.182	1	1.521e-2	3	NC	1	NC	1
116			min	-.14	4	-.034	2	-.011	5	-5.048e-3	2	NC	1	NC	1
117		2	max	0	1	.642	3	.205	1	1.715e-2	3	NC	4	NC	2
118			min	-.14	4	-.119	2	-.009	5	-5.996e-3	2	1034.877	3	7857.388	1
119		3	max	0	1	.805	3	.238	1	1.909e-2	3	NC	4	NC	4
120			min	-.14	4	-.196	2	-.005	5	-6.945e-3	2	533.461	3	3217.6	1
121		4	max	0	1	.937	3	.271	1	2.103e-2	3	NC	4	NC	5
122			min	-.14	4	-.253	2	0	15	-7.893e-3	2	383.81	3	2013.348	1
123		5	max	0	1	1.023	3	.298	1	2.297e-2	3	NC	4	NC	5
124			min	-.14	4	-.282	2	.003	15	-8.841e-3	2	323.828	3	1545.081	1
125		6	max	0	1	1.062	3	.315	1	2.491e-2	3	NC	4	NC	5
126			min	-.14	4	-.282	2	.005	15	-9.789e-3	2	303.053	3	1349.912	1
127		7	max	0	1	1.056	3	.321	1	2.685e-2	3	NC	4	NC	5
128			min	-.14	4	-.258	2	.008	15	-1.074e-2	2	306.161	3	1295.407	1
129		8	max	0	1	1.019	3	.317	1	2.879e-2	3	NC	4	NC	5
130			min	-.141	4	-.218	2	.01	15	-1.169e-2	2	326.622	3	1330.818	1
131		9	max	0	1	.973	3	.309	1	3.073e-2	3	NC	4	NC	5
132			min	-.141	4	-.179	2	.011	15	-1.263e-2	2	356.082	3	1416.416	1
133		10	max	0	1	.95	3	.304	1	3.267e-2	3	NC	9	NC	5
134			min	-.141	4	-.16	2	.012	15	-1.358e-2	2	373.536	3	1465.348	3
135		11	max	0	10	.973	3	.309	1	3.073e-2	3	NC	13	NC	5
136			min	-.141	4	-.179	2	.014	15	-1.263e-2	2	356.082	3	1416.416	1
137		12	max	0	10	1.019	3	.317	1	2.879e-2	3	NC	13	NC	5
138			min	-.141	4	-.218	2	.017	15	-1.169e-2	2	326.622	3	1330.818	1
139		13	max	0	10	1.056	3	.321	1	2.685e-2	3	NC	4	NC	5
140			min	-.141	4	-.258	2	.019	15	-1.074e-2	2	306.161	3	1295.407	1
141		14	max	0	10	1.062	3	.315	1	2.491e-2	3	NC	4	NC	5
142			min	-.141	4	-.282	2	.022	15	-9.789e-3	2	303.053	3	1349.912	1
143		15	max	0	10	1.023	3	.298	1	2.297e-2	3	NC	4	NC	5
144			min	-.141	4	-.282	2	.023	15	-8.841e-3	2	323.828	3	1545.081	1
145		16	max	0	10	.937	3	.271	1	2.103e-2	3	NC	4	NC	5
146			min	-.141	4	-.253	2	.024	15	-7.893e-3	2	383.81	3	2013.348	1
147		17	max	0	10	.805	3	.238	1	1.909e-2	3	NC	14	NC	4
148			min	-.141	4	-.196	2	.025	15	-6.945e-3	2	533.461	3	3217.6	1
149		18	max	0	10	.642	3	.205	1	1.715e-2	3	NC	14	NC	2
150			min	-.141	4	-.119	2	.025	15	-5.996e-3	2	1034.877	3	7857.388	1
151		19	max	0	10	.468	3	.182	1	1.521e-2	3	NC	1	NC	1
152			min	-.141	4	-.034	2	.024	15	-5.048e-3	2	2970.119	4	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	.001	2	.068	1	.183	1	3.961e-3	3	NC	1	NC	1
154			min	-.188	4	-.011	3	-.012	5	-2.274e-4	5	NC	1	NC	1
155		2	max	.001	2	.083	3	.199	1	4.207e-3	3	NC	4	NC	1
156			min	-.188	4	-.005	10	.004	15	-1.648e-4	5	1915.676	3	9975.525	4
157		3	max	0	2	.167	3	.228	1	4.454e-3	3	NC	4	NC	3
158			min	-.188	4	-.06	2	.009	15	-1.023e-4	5	1008.33	3	3949.951	1
159		4	max	0	2	.223	3	.261	1	4.7e-3	3	NC	4	NC	15
160			min	-.188	4	-.092	2	.01	15	-3.969e-5	5	767.879	3	2304.445	1
161		5	max	0	2	.24	3	.289	1	4.946e-3	3	NC	4	NC	5
162			min	-.188	4	-.096	2	.008	15	8.321e-6	15	716.794	3	1694.204	1
163		6	max	0	2	.215	3	.308	1	5.192e-3	3	NC	4	NC	5
164			min	-.188	4	-.072	2	.004	15	5.005e-5	15	793.677	3	1435.115	1
165		7	max	0	2	.157	3	.317	1	5.438e-3	3	NC	4	NC	5
166			min	-.188	4	-.025	2	0	15	9.177e-5	15	1069.524	3	1343.185	1
167		8	max	0	2	.08	3	.316	1	5.684e-3	3	NC	1	NC	4
168			min	-.188	4	.002	15	0	15	1.335e-4	15	1973.616	3	1350.735	1
169		9	max	0	2	.095	1	.31	1	5.93e-3	3	NC	4	NC	4
170			min	-.188	4	.003	15	.003	15	1.752e-4	15	6704.462	1	1413.455	1
171		10	max	0	1	.115	1	.306	1	6.176e-3	3	NC	3	NC	5
172			min	-.188	4	-.024	3	.012	15	2.17e-4	15	3851.099	1	1459.323	1
173		11	max	0	3	.095	1	.31	1	5.93e-3	3	NC	4	NC	15
174			min	-.188	4	.004	15	.022	15	2.411e-4	15	6704.462	1	1413.455	1
175		12	max	0	3	.08	3	.316	1	5.684e-3	3	NC	1	NC	15
176			min	-.188	4	.003	15	.026	15	2.652e-4	15	1973.616	3	1350.735	1
177		13	max	0	3	.157	3	.317	1	5.438e-3	3	NC	4	NC	7
178			min	-.188	4	-.025	2	.026	15	2.894e-4	15	1069.524	3	1343.185	1
179		14	max	0	3	.215	3	.308	1	5.192e-3	3	NC	5	NC	5
180			min	-.188	4	-.072	2	.022	15	3.135e-4	15	793.677	3	1435.115	1
181		15	max	0	3	.24	3	.289	1	4.946e-3	3	NC	5	NC	5
182			min	-.188	4	-.096	2	.017	15	3.377e-4	15	716.794	3	1694.204	1
183		16	max	.001	3	.223	3	.261	1	4.7e-3	3	NC	5	NC	4
184			min	-.188	4	-.092	2	.013	15	3.618e-4	15	767.879	3	2304.445	1
185		17	max	.001	3	.167	3	.228	1	4.454e-3	3	NC	5	NC	3
186			min	-.188	4	-.06	2	.011	15	3.86e-4	15	1008.33	3	3949.951	1
187		18	max	.001	3	.083	3	.199	1	4.207e-3	3	NC	4	NC	1
188			min	-.188	4	-.005	10	.014	15	4.101e-4	15	1915.676	3	NC	1
189		19	max	.002	3	.068	1	.183	1	3.961e-3	3	NC	1	NC	1
190			min	-.188	4	-.011	3	.025	15	4.343e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.015	2	.184	1	3.746e-3	1	NC	1	NC	1
192			min	-.239	4	-.073	3	-.012	5	-1.874e-4	5	NC	1	NC	1
193		2	max	0	2	.004	5	.197	1	4.007e-3	1	NC	4	NC	1
194			min	-.239	4	-.092	2	.005	15	-1.242e-4	5	1692.878	2	9344.707	4
195		3	max	0	2	.027	3	.226	1	4.267e-3	1	NC	4	NC	10
196			min	-.239	4	-.181	2	.01	15	-6.097e-5	5	917.292	2	4306.769	1
197		4	max	0	2	.05	3	.258	1	4.528e-3	1	NC	5	NC	15
198			min	-.239	4	-.238	2	.011	15	-6.299e-6	15	711.344	2	2429.059	1
199		5	max	0	2	.049	3	.287	1	4.789e-3	1	NC	5	NC	5
200			min	-.239	4	-.254	2	.008	15	3.585e-5	15	670.903	2	1751.641	1
201		6	max	0	2	.026	3	.307	1	5.049e-3	1	NC	5	NC	5
202			min	-.239	4	-.227	2	.003	15	7.801e-5	15	744.678	2	1463.913	1
203		7	max	0	2	0	15	.317	1	5.31e-3	1	NC	4	NC	5
204			min	-.239	4	-.166	2	0	15	1.202e-4	15	993.253	2	1355.522	1
205		8	max	0	2	0	15	.317	1	5.571e-3	1	NC	3	NC	4
206			min	-.239	4	-.088	2	-.002	5	1.623e-4	15	1748.706	2	1350.76	1
207		9	max	0	2	0	15	.312	1	5.831e-3	1	NC	4	NC	4
208			min	-.239	4	-.103	3	.001	15	2.045e-4	15	5777.135	2	1403.294	1
209		10	max	0	1	.016	2	.308	1	6.092e-3	1	NC	1	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.239	4	-.122	3	.012	15	2.466e-4	15	3636.834	3	1444.189	1
211		11	max	0	9	-.002	15	.312	1	5.831e-3	1	NC	4	NC	15
212			min	-.239	4	-.103	3	.024	15	2.704e-4	15	5777.135	2	1403.294	1
213		12	max	0	9	-.004	15	.317	1	5.571e-3	1	NC	3	NC	15
214			min	-.239	4	-.088	2	.028	15	2.941e-4	15	1748.706	2	1350.76	1
215		13	max	0	9	-.007	15	.317	1	5.31e-3	1	NC	5	NC	15
216			min	-.239	4	-.166	2	.027	15	3.179e-4	15	993.253	2	1355.522	1
217		14	max	0	9	.026	3	.307	1	5.049e-3	1	NC	5	NC	5
218			min	-.239	4	-.227	2	.023	15	3.416e-4	15	744.678	2	1463.913	1
219		15	max	0	9	.049	3	.287	1	4.789e-3	1	NC	5	NC	5
220			min	-.239	4	-.254	2	.017	15	3.654e-4	15	670.903	2	1751.641	1
221		16	max	0	9	.05	3	.258	1	4.528e-3	1	NC	5	NC	4
222			min	-.239	4	-.238	2	.012	15	3.891e-4	15	711.344	2	2429.059	1
223		17	max	0	9	.027	3	.226	1	4.267e-3	1	NC	5	NC	4
224			min	-.239	4	-.181	2	.01	15	4.128e-4	15	917.292	2	4306.769	1
225		18	max	0	9	-.007	15	.197	1	4.007e-3	1	NC	4	NC	1
226			min	-.239	4	-.092	2	.013	15	4.366e-4	15	1692.878	2	NC	1
227		19	max	0	9	.015	2	.184	1	3.746e-3	1	NC	1	NC	1
228			min	-.239	4	-.073	3	.025	15	4.603e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.005	5	.185	1	1.094e-2	2	NC	1	NC	1
230			min	-.375	4	-.324	1	-.012	5	-1.987e-3	3	NC	1	NC	1
231		2	max	0	12	.001	15	.208	1	1.252e-2	2	NC	4	NC	2
232			min	-.375	4	-.476	2	.004	15	-2.596e-3	3	1099.209	2	7606.936	1
233		3	max	0	12	.046	3	.242	1	1.409e-2	2	NC	5	NC	10
234			min	-.375	4	-.623	2	.011	15	-3.205e-3	3	578.273	2	3136.199	1
235		4	max	0	12	.081	3	.276	1	1.566e-2	2	NC	5	NC	15
236			min	-.375	4	-.736	2	.012	15	-3.814e-3	3	424.492	2	1967.471	1
237		5	max	0	12	.094	3	.304	1	1.723e-2	2	NC	5	NC	5
238			min	-.375	4	-.804	2	.011	15	-4.423e-3	3	366.057	2	1510.796	1
239		6	max	0	12	.085	3	.321	1	1.88e-2	2	NC	5	NC	5
240			min	-.375	4	-.824	2	.008	15	-5.032e-3	3	351.412	2	1319.044	1
241		7	max	0	12	.059	3	.327	1	2.037e-2	2	NC	5	NC	5
242			min	-.375	4	-.804	2	.005	15	-5.641e-3	3	366.166	2	1263.524	1
243		8	max	0	12	.023	3	.324	1	2.195e-2	2	NC	5	NC	5
244			min	-.375	4	-.756	2	.003	15	-6.25e-3	3	405.338	2	1294.52	1
245		9	max	0	12	-.01	12	.316	1	2.352e-2	2	NC	5	NC	5
246			min	-.375	4	-.704	2	.005	15	-6.859e-3	3	458.996	2	1373.5	1
247		10	max	0	1	-.02	15	.311	1	2.509e-2	2	NC	5	NC	5
248			min	-.375	4	-.679	2	.013	15	-7.468e-3	3	491.142	2	1426.306	1
249		11	max	0	1	-.01	12	.316	1	2.352e-2	2	NC	5	NC	5
250			min	-.375	4	-.704	2	.021	15	-6.859e-3	3	458.996	2	1373.5	1
251		12	max	0	1	.023	3	.324	1	2.195e-2	2	NC	5	NC	5
252			min	-.375	4	-.756	2	.024	15	-6.25e-3	3	405.338	2	1294.52	1
253		13	max	0	1	.059	3	.327	1	2.037e-2	2	NC	5	NC	5
254			min	-.374	4	-.804	2	.023	15	-5.641e-3	3	366.166	2	1263.524	1
255		14	max	0	1	.085	3	.321	1	1.88e-2	2	NC	5	NC	5
256			min	-.374	4	-.824	2	.02	15	-5.032e-3	3	351.412	2	1319.044	1
257		15	max	0	1	.094	3	.304	1	1.723e-2	2	NC	5	NC	5
258			min	-.374	4	-.804	2	.015	15	-4.423e-3	3	366.057	2	1510.796	1
259		16	max	0	1	.081	3	.276	1	1.566e-2	2	NC	5	NC	4
260			min	-.374	4	-.736	2	.012	15	-3.814e-3	3	424.492	2	1967.471	1
261		17	max	0	1	.046	3	.242	1	1.409e-2	2	NC	5	NC	4
262			min	-.374	4	-.623	2	.011	15	-3.205e-3	3	578.273	2	3136.199	1
263		18	max	0	1	-.006	12	.208	1	1.252e-2	2	NC	5	NC	2
264			min	-.374	4	-.476	2	.014	15	-2.596e-3	3	1099.209	2	7606.936	1
265		19	max	0	1	-.027	15	.185	1	1.094e-2	2	NC	1	NC	1
266			min	-.374	4	-.324	1	.025	15	-1.987e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	5	3.216e-3	2	NC	1	NC	1
270			min	0	2	-.001	3	0	2	-4.319e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.003	5	4.176e-3	2	NC	1	NC	1
272			min	0	2	-.004	3	0	2	-5.783e-3	5	NC	1	NC	1
273		4	max	0	3	-.001	15	.007	5	3.842e-3	2	NC	2	NC	1
274			min	0	2	-.009	3	0	2	-5.609e-3	5	7850.392	3	NC	1
275		5	max	0	3	-.002	15	.011	5	3.508e-3	2	NC	4	NC	1
276			min	0	2	-.015	3	-.002	2	-5.435e-3	5	4584.377	3	5925.426	5
277		6	max	0	3	-.003	15	.017	5	3.174e-3	2	NC	5	NC	1
278			min	0	2	-.022	3	-.002	2	-5.261e-3	5	3024.881	3	3904.883	5
279		7	max	0	3	-.004	15	.024	5	2.841e-3	2	NC	5	NC	1
280			min	0	2	-.031	3	-.003	2	-5.087e-3	5	2159.066	3	2790.696	5
281		8	max	0	3	-.006	15	.032	5	2.507e-3	2	NC	15	NC	1
282			min	0	2	-.041	3	-.004	2	-4.913e-3	5	1627.449	3	2109.267	5
283		9	max	0	3	-.007	15	.041	5	2.173e-3	2	9399.224	15	NC	1
284			min	0	2	-.053	3	-.004	2	-4.739e-3	5	1277.59	3	1661.848	5
285		10	max	0	3	-.009	15	.05	5	1.839e-3	2	7599.507	15	NC	1
286			min	0	2	-.065	1	-.005	2	-4.565e-3	5	1034.312	1	1351.548	5
287		11	max	0	3	-.011	15	.06	5	1.505e-3	2	6300.938	15	NC	1
288			min	0	2	-.079	1	-.005	2	-4.391e-3	5	856.085	1	1127.38	5
289		12	max	0	3	-.013	15	.07	5	1.172e-3	2	5332.268	15	NC	1
290			min	0	2	-.093	1	-.006	2	-4.217e-3	5	723.474	1	960.005	5
291		13	max	0	3	-.015	15	.081	5	8.378e-4	2	4589.816	15	NC	1
292			min	-.001	2	-.108	1	-.006	1	-4.057e-3	4	622.04	1	831.65	5
293		14	max	.001	3	-.017	15	.092	5	5.04e-4	2	4008.207	15	NC	1
294			min	-.001	2	-.124	1	-.006	1	-3.913e-3	4	542.716	1	731.078	5
295		15	max	.001	3	-.019	15	.103	5	5.392e-4	3	3543.828	15	NC	1
296			min	-.001	2	-.14	1	-.005	1	-3.77e-3	4	479.47	1	650.811	5
297		16	max	.001	3	-.021	15	.115	5	7.392e-4	3	3167.299	15	NC	1
298			min	-.001	2	-.157	1	-.005	1	-3.626e-3	4	428.25	1	585.787	5
299		17	max	.001	3	-.024	15	.126	4	9.392e-4	3	2857.834	15	NC	1
300			min	-.001	2	-.174	1	-.004	1	-3.482e-3	4	386.198	1	532.146	4
301		18	max	.001	3	-.026	15	.138	4	1.139e-3	3	2600.554	15	NC	1
302			min	-.001	2	-.192	1	-.003	3	-3.339e-3	4	351.268	1	487.303	4
303		19	max	.001	3	-.028	15	.15	4	1.339e-3	3	2384.558	15	NC	1
304			min	-.001	2	-.209	1	-.007	3	-3.195e-3	4	321.967	1	449.747	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	4	0	1	NC	1	NC	1
308			min	0	2	-.002	3	0	1	-4.541e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	1	NC	1
310			min	0	2	-.007	3	0	1	-6.07e-3	4	9312.917	3	NC	1
311		4	max	0	3	0	15	.007	4	0	1	NC	4	NC	1
312			min	0	2	-.015	3	0	1	-5.871e-3	4	4483.708	3	9824.112	4
313		5	max	.001	3	0	15	.012	4	0	1	NC	4	NC	1
314			min	-.001	2	-.025	3	0	1	-5.673e-3	4	2645.739	3	5703.678	4
315		6	max	.001	3	-.001	15	.018	4	0	1	NC	5	NC	1
316			min	-.001	2	-.038	3	0	1	-5.474e-3	4	1756.139	3	3761.357	4
317		7	max	.002	3	-.002	15	.025	4	0	1	NC	5	NC	1
318			min	-.001	2	-.053	3	0	1	-5.276e-3	4	1258.277	3	2690.172	4
319		8	max	.002	3	-.003	15	.033	4	0	1	NC	5	NC	1
320			min	-.002	2	-.071	3	0	1	-5.077e-3	4	950.979	3	2034.98	4
321		9	max	.002	3	-.004	15	.042	4	0	1	NC	5	NC	1
322			min	-.002	2	-.09	3	0	1	-4.878e-3	4	747.992	3	1604.752	4
323		10	max	.002	3	-.004	15	.052	4	0	1	NC	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	2	-.111	3	0	1	-4.68e-3	4	606.608	3	1306.369	4
325		11	max	.002	3	-.005	15	.062	4	0	1	NC	15	NC	1
326			min	-.002	2	-.134	3	0	1	-4.481e-3	4	504.147	3	1090.818	4
327		12	max	.003	3	-.006	15	.072	4	0	1	NC	15	NC	1
328			min	-.003	2	-.157	3	0	1	-4.283e-3	4	427.451	3	929.896	4
329		13	max	.003	3	-.007	15	.083	4	0	1	9171.437	15	NC	1
330			min	-.003	2	-.183	3	0	1	-4.084e-3	4	368.501	3	806.52	4
331		14	max	.003	3	-.008	15	.095	4	0	1	8003.022	15	NC	1
332			min	-.003	2	-.209	3	0	1	-3.886e-3	4	322.215	3	709.884	4
333		15	max	.003	3	-.01	15	.106	4	0	1	7071.229	15	NC	1
334			min	-.003	2	-.236	3	0	1	-3.687e-3	4	285.186	3	632.803	4
335		16	max	.004	3	-.011	15	.118	4	0	1	6316.479	15	NC	1
336			min	-.003	2	-.264	3	0	1	-3.489e-3	4	255.112	3	570.408	4
337		17	max	.004	3	-.012	15	.13	4	0	1	5696.705	15	NC	1
338			min	-.004	2	-.292	3	0	1	-3.29e-3	4	230.359	3	519.269	4
339		18	max	.004	3	-.013	15	.141	4	0	1	5181.837	15	NC	1
340			min	-.004	2	-.321	3	0	1	-3.092e-3	4	209.755	3	476.929	4
341		19	max	.004	3	-.014	15	.152	4	0	1	4749.879	15	NC	1
342			min	-.004	2	-.35	3	0	1	-2.893e-3	4	192.437	3	441.58	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	0	4	1.457e-3	3	NC	1	NC	1
346			min	0	2	-.001	3	0	3	-4.742e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	1.861e-3	3	NC	1	NC	1
348			min	0	2	-.004	3	0	3	-6.327e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.007	4	1.661e-3	3	NC	2	NC	1
350			min	0	2	-.009	3	-.001	3	-6.101e-3	4	7850.392	3	9872.835	4
351		5	max	0	3	0	5	.012	4	1.461e-3	3	NC	4	NC	1
352			min	0	2	-.015	3	-.002	3	-5.876e-3	4	4584.377	3	5734.632	4
353		6	max	0	3	.001	5	.018	4	1.261e-3	3	NC	4	NC	1
354			min	0	2	-.022	3	-.003	3	-5.65e-3	4	3024.881	3	3783.132	4
355		7	max	0	3	.002	5	.025	4	1.061e-3	3	NC	4	NC	1
356			min	0	2	-.031	3	-.004	3	-5.424e-3	4	2159.066	3	2706.586	4
357		8	max	0	3	.003	5	.033	4	8.609e-4	3	NC	4	NC	1
358			min	0	2	-.041	3	-.005	3	-5.199e-3	4	1627.449	3	2047.985	4
359		9	max	0	3	.003	5	.042	4	6.609e-4	3	NC	5	NC	1
360			min	0	2	-.053	3	-.006	3	-4.973e-3	4	1277.59	3	1615.453	4
361		10	max	0	3	.004	5	.051	4	4.609e-4	3	NC	5	NC	1
362			min	0	2	-.065	1	-.007	3	-4.747e-3	4	1034.312	1	1315.441	4
363		11	max	0	3	.005	5	.061	4	2.609e-4	3	NC	5	NC	1
364			min	0	2	-.079	1	-.007	3	-4.522e-3	4	856.085	1	1098.695	4
365		12	max	0	3	.006	5	.072	4	6.086e-5	3	NC	5	NC	1
366			min	0	2	-.093	1	-.007	3	-4.296e-3	4	723.474	1	936.875	4
367		13	max	0	3	.007	5	.083	4	-1.388e-5	9	NC	7	NC	1
368			min	-.001	2	-.108	1	-.007	3	-4.07e-3	4	622.04	1	812.809	4
369		14	max	.001	3	.008	5	.094	4	7.407e-5	9	NC	15	NC	1
370			min	-.001	2	-.124	1	-.006	3	-3.852e-3	5	542.716	1	715.636	4
371		15	max	.001	3	.009	5	.105	4	1.62e-4	9	NC	15	NC	1
372			min	-.001	2	-.14	1	-.005	3	-3.659e-3	5	479.47	1	638.132	4
373		16	max	.001	3	.01	5	.117	4	3.823e-4	1	9541.236	15	NC	1
374			min	-.001	2	-.157	1	-.003	3	-3.465e-3	5	428.25	1	575.403	4
375		17	max	.001	3	.011	5	.128	4	6.549e-4	1	8613.514	15	NC	1
376			min	-.001	2	-.174	1	0	3	-3.272e-3	5	386.198	1	524	4
377		18	max	.001	3	.012	5	.14	4	9.275e-4	1	7841.556	15	NC	1
378			min	-.001	2	-.192	1	0	10	-3.078e-3	5	351.268	1	481.453	4
379		19	max	.001	3	.013	5	.151	4	1.2e-3	1	7192.964	15	NC	1
380			min	-.001	2	-.209	1	-.002	2	-2.884e-3	5	321.967	1	445.946	4

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
381	M3	1	max	.002	3	0	15	.001	5	2.039e-3	2	NC	1	NC	1
382			min	0	15	0	1	0	2	-2.36e-3	5	NC	1	NC	1
383		2	max	.002	3	-.002	15	.021	5	2.211e-3	2	NC	1	NC	3
384			min	0	10	-.014	1	-.014	2	-2.339e-3	5	NC	1	4495.271	2
385		3	max	.002	3	-.004	15	.04	5	2.383e-3	2	NC	1	NC	4
386			min	0	10	-.026	1	-.027	2	-2.317e-3	5	NC	1	2261.211	2
387		4	max	.002	3	-.005	15	.06	5	2.555e-3	2	NC	1	NC	4
388			min	0	2	-.039	1	-.04	2	-2.295e-3	5	NC	1	1526.838	2
389		5	max	.003	3	-.007	15	.079	5	2.727e-3	2	NC	1	NC	4
390			min	-.001	2	-.052	1	-.053	2	-2.274e-3	5	NC	1	1167.989	2
391		6	max	.003	3	-.009	15	.099	5	2.899e-3	2	NC	1	NC	13
392			min	-.002	2	-.064	1	-.064	2	-2.252e-3	5	NC	1	960.148	2
393		7	max	.003	3	-.011	15	.119	5	3.072e-3	2	NC	1	9161.388	13
394			min	-.002	2	-.077	1	-.074	2	-2.231e-3	5	NC	1	828.814	2
395		8	max	.003	3	-.012	15	.138	5	3.244e-3	2	NC	1	7869.805	13
396			min	-.003	2	-.089	1	-.083	2	-2.209e-3	5	NC	1	742.457	2
397		9	max	.003	3	-.014	15	.157	5	3.416e-3	2	NC	1	7013.291	13
398			min	-.003	2	-.101	1	-.089	2	-2.188e-3	5	NC	1	685.822	2
399		10	max	.004	3	-.015	15	.175	5	3.588e-3	2	NC	1	6455.881	13
400			min	-.004	2	-.113	1	-.094	2	-2.166e-3	5	NC	1	651.12	2
401		11	max	.004	3	-.017	15	.193	5	3.76e-3	2	NC	1	6126.885	13
402			min	-.004	2	-.125	1	-.096	2	-2.144e-3	5	NC	1	634.677	2
403		12	max	.004	3	-.019	15	.211	5	3.932e-3	2	NC	1	5995.988	13
404			min	-.005	2	-.137	1	-.095	2	-2.123e-3	5	NC	1	635.701	2
405		13	max	.004	3	-.02	15	.227	5	4.104e-3	2	NC	1	6066.076	13
406			min	-.005	2	-.149	1	-.092	2	-2.101e-3	5	NC	1	629.341	14
407		14	max	.004	3	-.022	15	.243	5	4.276e-3	2	NC	1	6380.643	13
408			min	-.006	2	-.161	1	-.085	2	-2.08e-3	5	NC	1	575.075	14
409		15	max	.004	3	-.023	15	.259	5	4.448e-3	2	NC	1	7056.583	13
410			min	-.006	2	-.173	1	-.075	2	-2.153e-3	3	NC	1	528.546	14
411		16	max	.005	3	-.025	15	.273	5	4.62e-3	2	NC	1	8392.459	13
412			min	-.007	2	-.185	1	-.061	2	-2.245e-3	3	NC	1	488.193	14
413		17	max	.005	3	-.026	15	.286	5	4.792e-3	2	NC	1	NC	13
414			min	-.007	2	-.196	1	-.043	2	-2.338e-3	3	NC	1	452.847	14
415		18	max	.005	3	-.027	15	.299	4	4.965e-3	2	NC	1	NC	4
416			min	-.008	2	-.208	1	-.021	2	-2.431e-3	3	NC	1	421.615	14
417		19	max	.005	3	-.029	15	.312	4	5.137e-3	2	NC	1	NC	1
418			min	-.008	2	-.219	1	0	12	-2.524e-3	3	NC	1	393.805	14
419	M6	1	max	.003	3	0	15	.002	4	0	1	NC	1	NC	1
420			min	0	15	-.001	3	0	1	-2.487e-3	4	NC	1	NC	1
421		2	max	.004	3	-.001	15	.022	4	0	1	NC	1	NC	1
422			min	0	2	-.023	1	0	1	-2.482e-3	4	NC	1	NC	1
423		3	max	.005	3	-.002	15	.042	4	0	1	NC	1	NC	1
424			min	-.002	2	-.044	1	0	1	-2.477e-3	4	NC	1	NC	1
425		4	max	.006	3	-.003	15	.063	4	0	1	NC	1	NC	1
426			min	-.003	2	-.065	1	0	1	-2.472e-3	4	NC	1	6781.37	4
427		5	max	.006	3	-.004	15	.083	4	0	1	NC	1	NC	1
428			min	-.005	2	-.086	1	0	1	-2.468e-3	4	NC	1	5005.477	4
429		6	max	.007	3	-.005	15	.104	4	0	1	NC	1	NC	1
430			min	-.006	2	-.107	1	0	1	-2.463e-3	4	NC	1	3990.87	4
431		7	max	.008	3	-.006	15	.124	4	0	1	NC	1	NC	1
432			min	-.008	2	-.128	1	0	1	-2.458e-3	4	NC	1	3355.414	4
433		8	max	.008	3	-.007	15	.144	4	0	1	NC	1	NC	1
434			min	-.009	2	-.149	1	0	1	-2.453e-3	4	NC	1	2937.97	4
435		9	max	.009	3	-.008	15	.163	4	0	1	NC	1	NC	1
436			min	-.011	2	-.17	1	0	1	-2.449e-3	4	NC	1	2660.467	4
437		10	max	.01	3	-.008	15	.182	4	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	-.012	2	-.191	1	0	1	-2.444e-3	4	NC	1	2482.389	4
439		11	max	.01	3	-.009	15	.201	4	0	1	NC	1	NC	1
440			min	-.013	2	-.212	1	0	1	-2.439e-3	4	NC	1	2383.199	4
441		12	max	.011	3	-.01	15	.218	4	0	1	NC	1	NC	1
442			min	-.015	2	-.232	1	0	1	-2.434e-3	4	NC	1	2355.426	4
443		13	max	.012	3	-.011	15	.235	4	0	1	NC	1	NC	1
444			min	-.016	2	-.253	1	0	1	-2.43e-3	4	NC	1	2403.285	4
445		14	max	.012	3	-.011	15	.251	4	0	1	NC	1	NC	1
446			min	-.018	2	-.273	1	0	1	-2.425e-3	4	NC	1	2546.506	4
447		15	max	.013	3	-.012	15	.266	4	0	1	NC	1	NC	1
448			min	-.019	2	-.293	1	0	1	-2.42e-3	4	NC	1	2834.172	4
449		16	max	.014	3	-.013	15	.279	4	0	1	NC	1	NC	1
450			min	-.021	2	-.313	1	0	1	-2.415e-3	4	NC	1	3389.232	4
451		17	max	.014	3	-.014	15	.292	4	0	1	NC	1	NC	1
452			min	-.022	2	-.334	1	0	1	-2.411e-3	4	NC	1	4589.087	4
453		18	max	.015	3	-.014	15	.303	4	0	1	NC	1	NC	1
454			min	-.023	2	-.354	1	0	1	-2.406e-3	4	NC	1	8332.634	4
455		19	max	.016	3	-.015	15	.312	4	0	1	NC	1	NC	1
456			min	-.025	2	-.374	1	0	1	-2.401e-3	4	NC	1	NC	1
457	M9	1	max	.002	3	0	5	.002	4	8.523e-4	3	NC	1	NC	1
458			min	0	5	0	1	0	3	-2.621e-3	4	NC	1	NC	1
459		2	max	.002	3	0	5	.023	4	9.451e-4	3	NC	1	NC	3
460			min	0	5	-.014	1	-.007	3	-2.617e-3	4	NC	1	4495.271	2
461		3	max	.002	3	0	5	.044	4	1.038e-3	3	NC	1	NC	5
462			min	0	10	-.026	1	-.013	3	-2.614e-3	4	NC	1	2261.211	2
463		4	max	.002	3	.001	5	.065	4	1.131e-3	3	NC	1	NC	15
464			min	0	2	-.039	1	-.019	3	-2.61e-3	4	NC	1	1526.838	2
465		5	max	.003	3	.002	5	.086	4	1.224e-3	3	NC	1	7588.126	15
466			min	-.001	2	-.052	1	-.025	3	-2.727e-3	2	NC	1	1167.989	2
467		6	max	.003	3	.003	5	.108	4	1.317e-3	3	NC	1	6043.821	15
468			min	-.002	2	-.064	1	-.03	3	-2.899e-3	2	NC	1	960.148	2
469		7	max	.003	3	.003	5	.128	4	1.41e-3	3	NC	1	5077.071	15
470			min	-.002	2	-.077	1	-.035	3	-3.072e-3	2	NC	1	828.814	2
471		8	max	.003	3	.004	5	.149	4	1.502e-3	3	NC	1	4442.134	15
472			min	-.003	2	-.089	1	-.039	3	-3.244e-3	2	NC	1	742.457	2
473		9	max	.003	3	.004	5	.169	4	1.595e-3	3	NC	1	4019.973	15
474			min	-.003	2	-.101	1	-.042	3	-3.416e-3	2	NC	1	685.822	2
475		10	max	.004	3	.005	5	.188	4	1.688e-3	3	NC	1	3748.797	15
476			min	-.004	2	-.113	1	-.044	3	-3.588e-3	2	NC	1	651.12	2
477		11	max	.004	3	.006	5	.206	4	1.781e-3	3	NC	1	3597.236	15
478			min	-.004	2	-.125	1	-.045	3	-3.76e-3	2	NC	1	634.677	2
479		12	max	.004	3	.007	5	.223	4	1.874e-3	3	NC	1	3553.772	15
480			min	-.005	2	-.137	1	-.045	3	-3.932e-3	2	9566.502	5	635.701	2
481		13	max	.004	3	.007	5	.24	4	1.967e-3	3	NC	1	3624.582	15
482			min	-.005	2	-.149	1	-.044	3	-4.104e-3	2	8484.266	5	656.256	2
483		14	max	.004	3	.008	5	.255	4	2.06e-3	3	NC	1	3839.266	15
484			min	-.006	2	-.161	1	-.041	3	-4.276e-3	2	7585.093	5	702.551	2
485		15	max	.004	3	.009	5	.268	4	2.153e-3	3	NC	1	4271.654	15
486			min	-.006	2	-.173	1	-.036	3	-4.448e-3	2	6831.249	5	789.001	2
487		16	max	.005	3	.01	5	.281	4	2.245e-3	3	NC	1	5106.825	15
488			min	-.007	2	-.185	1	-.03	3	-4.62e-3	2	6194.598	5	951.01	2
489		17	max	.005	3	.011	5	.291	4	2.338e-3	3	NC	1	6913.018	15
490			min	-.007	2	-.196	1	-.023	3	-4.792e-3	2	5653.732	5	1296.608	2
491		18	max	.005	3	.012	5	.301	4	2.431e-3	3	NC	1	NC	9
492			min	-.008	2	-.208	1	-.013	3	-4.965e-3	2	5192.091	5	2368.504	2
493		19	max	.005	3	.013	5	.308	5	2.524e-3	3	NC	1	NC	1
494			min	-.008	2	-.219	1	-.008	1	-5.137e-3	2	4796.702	5	NC	1