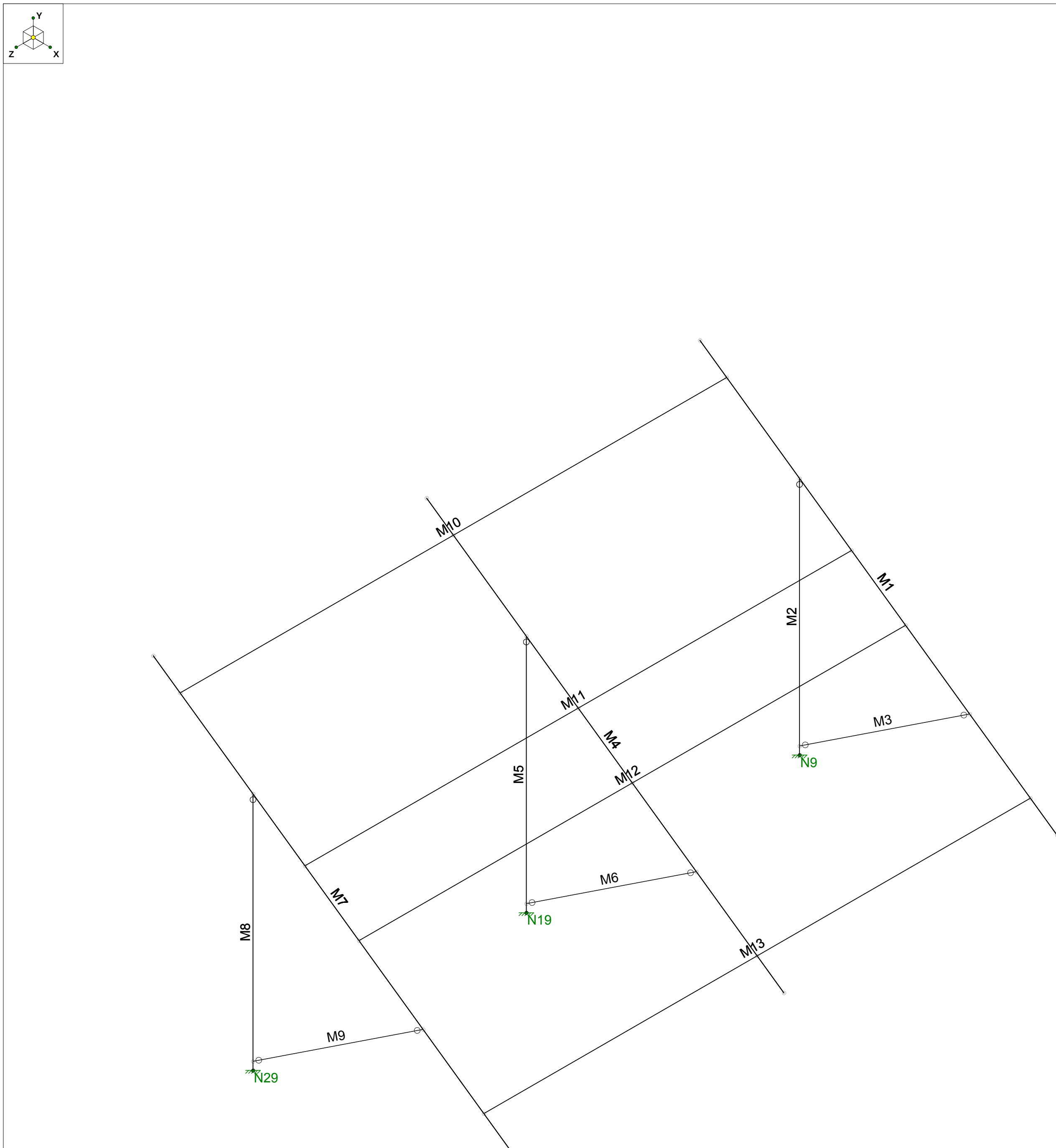


Schletter, Inc.	Standard FS Racking System	35° Tilt w/ Seismic Design
HCV	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

1.1 Project Description

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

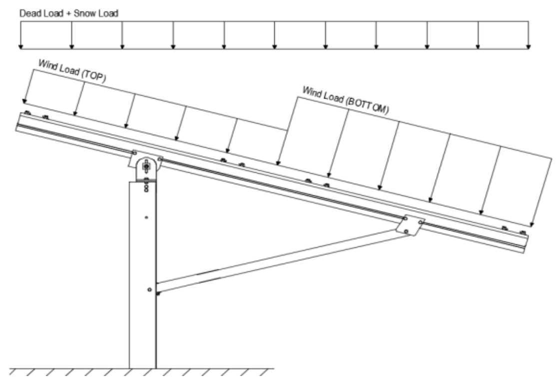
1.2 Construction

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

PV modules are required to meet the following specifications:

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

Modules Per Row = 2
Module Tilt = 35°
Maximum Height Above Grade = 3 ft



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

g_{MAX} = 3.00 psf
g_{MIN} = 1.75 psf

Self-weight of the PV modules.

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	14.43	psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.64		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V = 130 mph
Height < 15 ft

Exposure Category = C
Importance Category = II

Peak Velocity Pressure, q_z = 26.53 psf — *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

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

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

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

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

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

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

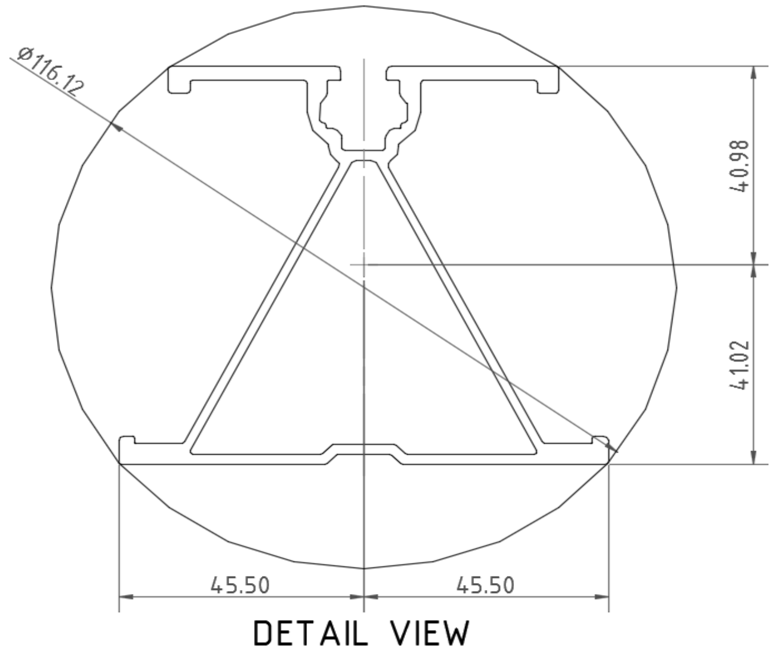
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

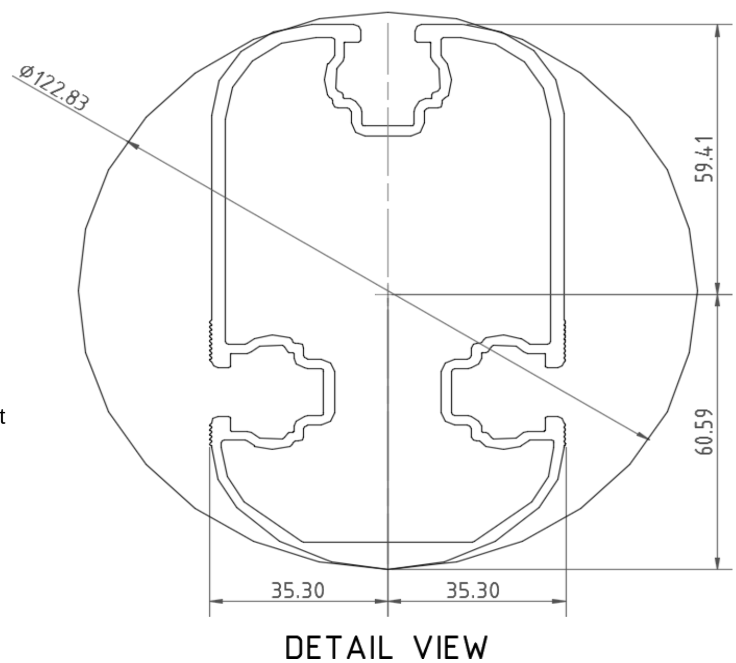
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	72	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.081	k-ft
M_z =	0.184	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	55%	



4.2 Girder Design

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

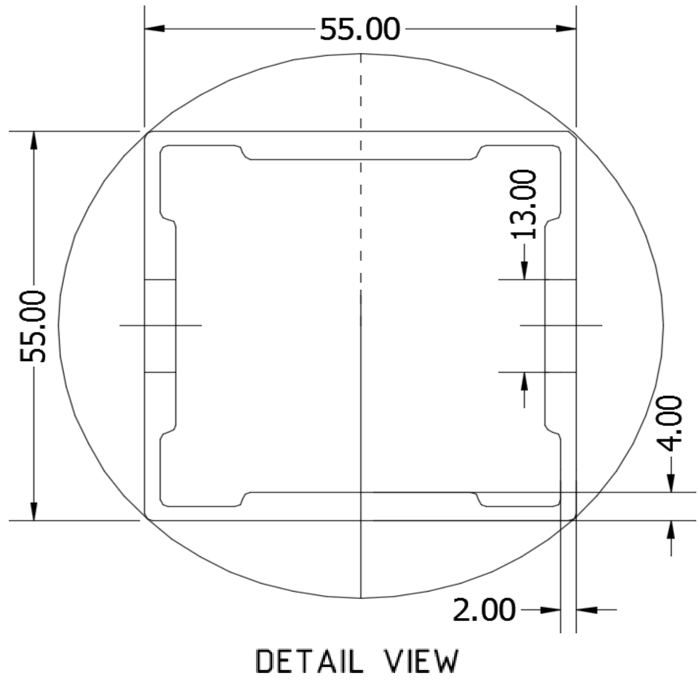
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.985	k-ft
M_z =	0.000	k-ft
P_n =	0.064	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	79%	



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).

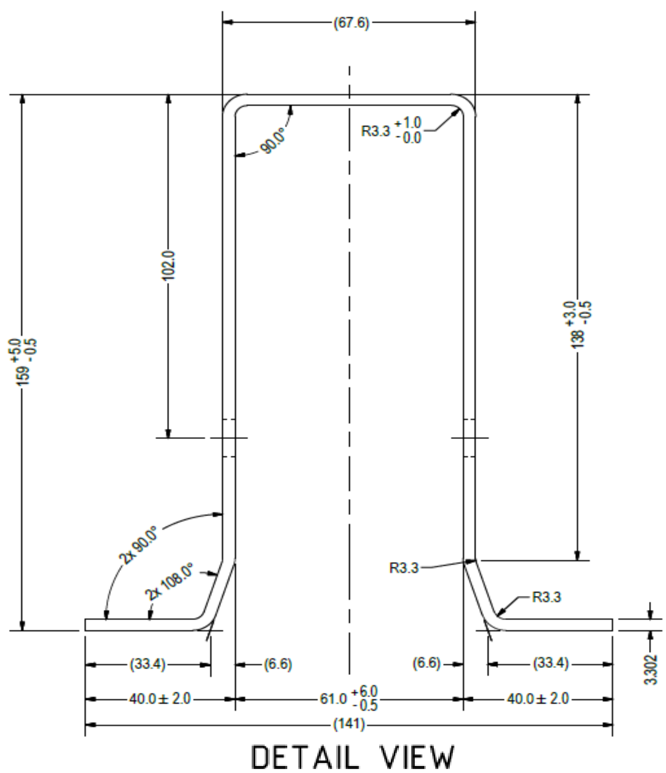
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	3.817	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	29%	



4.4 Post Design

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

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	85.68	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	15.288	k-ft
M_z =	0.000	k-ft
P_r =	-4.918	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	28.060	k
Utilization =	93%	



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 =	6.36	k
Maximum Lateral Load =	4.07	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)

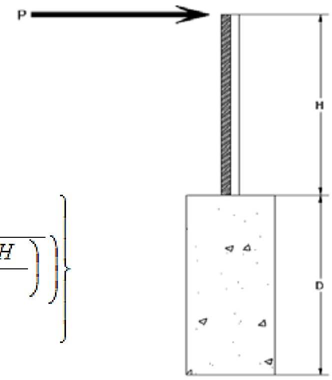
Lateral Force @ Top of Pole, P =	0.99	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	0.99	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf
Constant $2.34P/(S_1B)$, A =	5.34	
Required Footing Depth, D =	9.65	ft
2nd Trial @ D_2 =	6.45	ft
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	1.29	ksf
Constant $2.34P/(S_1B)$, A =	2.69	
Required Footing Depth, D =	6.12	ft
3rd Trial @ D_3 =	6.28	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.26	ksf
Constant $2.34P/(S_1B)$, A =	2.76	
Required Footing Depth, D =	6.22	ft
4th Trial @ D_4 =	6.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.25	ksf
Constant $2.34P/(S_1B)$, A =	2.78	
Required Footing Depth, D =	6.24	ft
5th Trial @ D_5 =	6.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.25	ksf
Constant $2.34P/(S_1B)$, A =	2.78	
Required Footing Depth, D =	6.25	ft

A 2ft diameter x 6.25ft deep footing unrestrained at ground level is required for the racking structure.

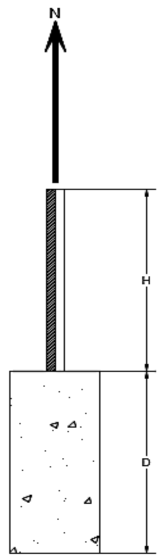
5.4 Uplifting Force Resistance

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 =	3.05	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	1.96	k
Required Concrete Volume, V =	13.54	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.59
2	0.4	0.2	118.10	6.49
3	0.6	0.2	118.10	6.38
4	0.8	0.2	118.10	6.28
5	1	0.2	118.10	6.18
6	1.2	0.2	118.10	6.07
7	1.4	0.2	118.10	5.97
8	1.6	0.2	118.10	5.86
9	1.8	0.2	118.10	5.76
10	2	0.2	118.10	5.66
11	2.2	0.2	118.10	5.55
12	2.4	0.2	118.10	5.45
13	2.6	0.2	118.10	5.35
14	2.8	0.2	118.10	5.24
15	3	0.2	118.10	5.14
16	3.2	0.2	118.10	5.03
17	3.4	0.2	118.10	4.93
18	3.6	0.2	118.10	4.83
19	3.8	0.2	118.10	4.72
20	4	0.2	118.10	4.62
21	4.2	0.2	118.10	4.52
22	4.4	0.2	118.10	4.41
23	4.6	0.2	118.10	4.31
24	0	0.0	0.00	4.31
25	0	0.0	0.00	4.31
26	0	0.0	0.00	4.31
27	0	0.0	0.00	4.31
28	0	0.0	0.00	4.31
29	0	0.0	0.00	4.31
30	0	0.0	0.00	4.31
31	0	0.0	0.00	4.31
32	0	0.0	0.00	4.31
33	0	0.0	0.00	4.31
34	0	0.0	0.00	4.31
Max	4.6	Sum	1.09	

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 =	6.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.13	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	20.42	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

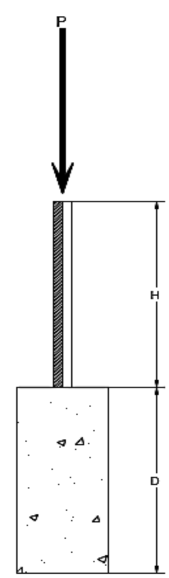
Weight of Concrete

Footing Volume	19.63	ft^3
Weight	2.85	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.06	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.37	k
Applied Force =	5.97	k
Utilization =	58%	

A 2ft diameter footing passes at a depth of 6.25ft.

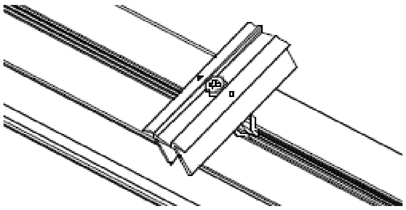


6. DESIGN OF JOINTS AND CONNECTIONS

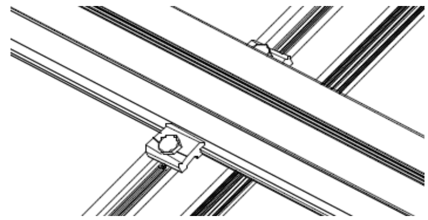
6.1 Anchorage of Modules to Purlins and Connection of Purlins to Girders

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 =	0.964	k
Allowable Uplift =	1.214	k
Utilization =	79%	



Fastening of Purlins to Girders		
Maximum Uplifting Force =	2.077	k
Allowable Uplift =	2.180	k
Utilization =	95%	

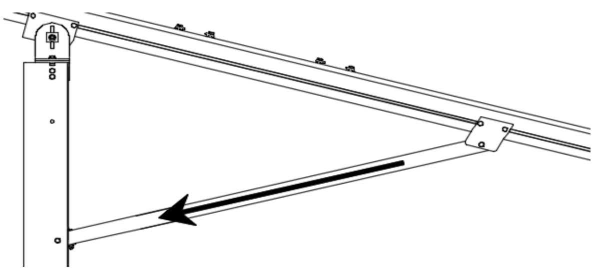


6.2 Strut Connections

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

Maximum Axial Load =	3.817	k
M10 Bolt Shear Capacity =	8.894	k
Utilization =	43%	

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

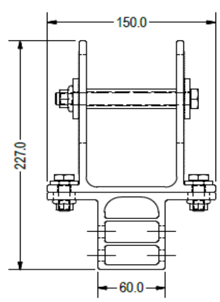


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

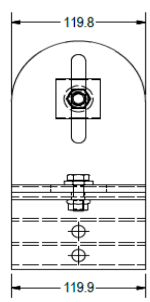
6.3 Girder to Post Connection

In order to connect the girder to the post, custom extruded sections are assembled to create a post head piece. The reliability of calculations is uncertain due to limited standards, therefore the strength of the head piece has been evaluated by load testing.

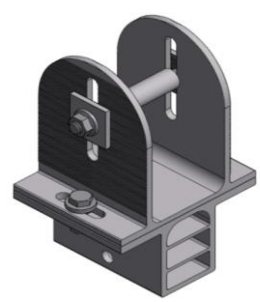
Maximum Tensile Load =	4.365	k
Allowable Load =	5.649	k
Utilization =	77%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

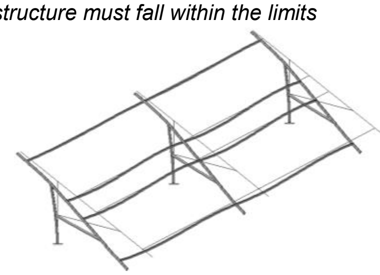
7.1 Seismic Drift

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

Mean Height, h_{sx} =	77.78	in
Allowable Story Drift for All Other Structures, Δ = {	$0.020h_{sx}$	
	1.556	in
Max Drift, Δ_{MAX} =	0.426	in

$0.426 \leq 1.556$, OK.

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



APPENDIX A

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

Purlin = **S1.5**

Strong Axis:

3.4.14

L_b = 72 in

J = 0.432

199.186

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

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= 28.8 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

$\varphi F_L St$= 25.1 ksi

Ix = 897074 mm^4

2.155 in^4

y = 41.015 mm

Sx = 1.335 in^3

$M_{max}St$ = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 72

J = 0.432

126.67

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

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= 29.7

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

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

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:
3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

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

$\varphi F_L =$ 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 =	85.68	in	
Pr =	-4.92	k	(LRFD Factored Load)
Mr (Strong) =	15.29	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

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

Torsional/Flexural Torsional Buckling:

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

Bending (Strong Axis):

Yielding:			
Mn =	21.95 k-ft		
Flange Local Buckling:			
Mn =	19.207 k-ft		
Pr/Pc =	0.1335 <	0.2	
Utilization =	0.93 <	1.0	OK

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.134 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 93%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-32.97	-32.97	0	0
2	M11	Y	-32.97	-32.97	0	0
3	M12	Y	-32.97	-32.97	0	0
4	M13	Y	-32.97	-32.97	0	0

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-88.797	-88.797	0	0
2	M11	y	-88.797	-88.797	0	0
3	M12	y	-147.995	-147.995	0	0
4	M13	y	-147.995	-147.995	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	177.594	177.594	0	0
2	M11	y	177.594	177.594	0	0
3	M12	y	88.797	88.797	0	0
4	M13	y	88.797	88.797	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	1042.422	2	1908.86	2	106.505	2	.154	2	.025	5	5.898	3
2		min	-1389.858	3	-1521.175	3	-240.798	5	-1.044	5	-.014	2	-.172	10
3	N19	max	3130.58	2	5274.908	2	0	2	0	2	.026	4	8.868	3
4		min	-3087.636	3	-4866.552	3	-253.346	5	-1.08	4	0	3	-.512	10
5	N29	max	1042.422	2	1908.86	2	147.107	3	.249	3	.026	4	5.898	3
6		min	-1389.858	3	-1521.175	3	-251.907	4	-1.069	4	-.007	3	-.279	5
7	Totals:	max	5215.423	2	9092.629	2	0	2						
8		min	-5867.351	3	-7908.903	3	-739.238	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	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	-.299	15	-.428	15	0	10	0	1	0	10	0	6
4			min	-1.274	4	-1.818	6	-1.499	5	0	1	0	5	0	15
5		3	max	-16.243	10	322.639	3	-5.049	10	.038	3	.103	3	.289	2
6			min	-114.691	1	-661.165	2	-52.176	3	-.135	2	.006	10	-.139	3
7		4	max	-17.07	10	321.575	3	-5.049	10	.038	3	.071	3	.7	2
8			min	-115.683	1	-662.583	2	-52.956	4	-.135	2	.003	10	-.339	3
9		5	max	-17.897	10	320.512	3	-5.049	10	.038	3	.039	3	1.111	2
10			min	-116.676	1	-664	2	-54.456	4	-.135	2	0	10	-.538	3
11		6	max	137.188	3	548.007	2	-19.014	15	.016	2	.039	2	1.078	2
12			min	-531.277	2	-168.29	3	-69.68	1	-.034	3	-.023	5	-.557	3
13		7	max	136.444	3	546.59	2	-20.023	15	.016	2	.007	2	.739	2
14			min	-532.269	2	-169.353	3	-69.68	1	-.034	3	-.047	4	-.453	3
15		8	max	135.699	3	545.173	2	-21.033	15	.016	2	-.009	10	.4	2
16			min	-533.262	2	-170.416	3	-69.68	1	-.034	3	-.075	4	-.347	3
17		9	max	76.72	3	126.244	3	-10.865	10	.012	5	.066	3	.198	2
18			min	-584.15	2	-63.992	2	-84.775	4	-.075	3	-.006	10	-.303	3
19		10	max	75.975	3	125.181	3	-10.865	10	.012	5	.027	3	.238	2
20			min	-585.143	2	-65.41	2	-86.275	4	-.075	3	-.021	2	-.381	3
21		11	max	75.231	3	124.118	3	-10.865	10	.012	5	-.008	12	.279	2
22			min	-586.136	2	-66.827	2	-87.774	4	-.075	3	-.073	4	-.459	3
23		12	max	11.207	3	818.333	3	81.355	2	.161	3	.054	3	.473	2
24			min	-684.088	1	-449.616	2	-229.834	3	-.109	2	-.03	5	-.807	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	10.462	3	817.27	3	81.355	2	.161	3	.072	2	.752	2
26			min	-685.081	1	-451.034	2	-229.834	3	-.109	2	-.107	5	-1.314	3
27		14	max	117.084	1	445.765	2	44.995	5	.141	2	.093	3	1.02	2
28			min	2.54	15	-779.714	3	-98.615	3	-.3	3	-.084	4	-1.799	3
29		15	max	116.091	1	444.348	2	43.495	5	.141	2	.032	3	.744	2
30			min	2.241	15	-780.778	3	-98.615	3	-.3	3	-.063	4	-1.315	3
31		16	max	115.099	1	442.93	2	41.996	5	.141	2	-.017	15	.469	2
32			min	1.941	15	-781.841	3	-98.615	3	-.3	3	-.074	1	-.83	3
33		17	max	114.106	1	441.513	2	40.496	5	.141	2	0	15	.194	2
34			min	1.642	15	-782.904	3	-98.615	3	-.3	3	-.093	1	-.345	3
35		18	max	1.274	4	1.819	6	1.5	4	0	1	0	10	0	6
36			min	.299	15	.428	15	0	10	0	1	0	4	0	15
37		19	max	0	1	.005	2	0	1	0	1	0	1	0	1
38			min	0	1	-.009	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.013	2	.001	4	0	1	0	1	0	1
40			min	0	1	-.002	3	0	1	0	1	0	1	0	1
41		2	max	-.299	15	-.428	15	0	1	0	1	0	1	0	4
42			min	-1.274	4	-1.817	4	-1.499	5	0	1	0	5	0	15
43		3	max	63.926	3	1000.814	3	0	1	.038	4	.12	4	.689	2
44			min	-221.184	1	-1803.616	2	-61.78	5	0	1	0	1	-.387	3
45		4	max	63.182	3	999.751	3	0	1	.038	4	.081	4	1.809	2
46			min	-222.177	1	-1805.034	2	-63.279	5	0	1	0	1	-1.008	3
47		5	max	62.437	3	998.687	3	0	1	.038	4	.042	4	2.93	2
48			min	-223.169	1	-1806.451	2	-64.779	5	0	1	0	1	-1.628	3
49		6	max	803.063	3	1736.39	2	0	1	0	1	0	1	2.751	2
50			min	-1506.166	2	-855.118	3	-49.566	4	-.03	4	-.024	5	-1.568	3
51		7	max	802.319	3	1734.972	2	0	1	0	1	0	1	1.674	2
52			min	-1507.158	2	-856.181	3	-51.066	4	-.03	4	-.055	4	-1.037	3
53		8	max	801.574	3	1733.555	2	0	1	0	1	0	1	.597	2
54			min	-1508.151	2	-857.244	3	-52.565	4	-.03	4	-.087	4	-.505	3
55		9	max	880.416	3	195.738	3	0	1	.008	4	.055	5	.007	9
56			min	-1604.338	2	-179.04	2	-120.512	4	0	1	0	1	-.219	3
57		10	max	879.672	3	194.675	3	0	1	.008	4	0	1	.069	1
58			min	-1605.331	2	-180.458	2	-122.012	4	0	1	-.02	4	-.34	3
59		11	max	878.928	3	193.612	3	0	1	.008	4	0	1	.176	2
60			min	-1606.323	2	-181.875	2	-123.511	4	0	1	-.097	4	-.46	3
61		12	max	967.859	3	2154.426	3	0	1	.107	4	0	1	.774	2
62			min	-1710.04	2	-1410.569	2	-129.777	4	0	1	-.025	4	-1.366	3
63		13	max	967.115	3	2153.363	3	0	1	.107	4	0	1	1.65	2
64			min	-1711.032	2	-1411.986	2	-131.276	4	0	1	-.106	4	-2.703	3
65		14	max	225.331	1	1115.043	2	48.283	5	0	1	0	1	2.492	2
66			min	-64.483	3	-1781.632	3	0	1	-.07	4	-.062	5	-3.985	3
67		15	max	224.338	1	1113.625	2	46.784	5	0	1	0	1	1.801	2
68			min	-65.228	3	-1782.696	3	0	1	-.07	4	-.033	5	-2.879	3
69		16	max	223.346	1	1112.208	2	45.284	5	0	1	0	1	1.11	2
70			min	-65.972	3	-1783.759	3	0	1	-.07	4	-.004	5	-1.773	3
71		17	max	222.353	1	1110.79	2	43.784	5	0	1	.024	4	.42	2
72			min	-66.716	3	-1784.822	3	0	1	-.07	4	0	1	-.665	3
73		18	max	1.274	6	1.82	4	1.5	5	0	1	0	1	0	4
74			min	.299	15	.428	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.01	2	0	1	0	1	0	1	0	1
76			min	0	1	-.017	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	10	0	1	0	1	0	1
79		2	max	-.299	15	-.428	15	0	1	0	1	0	1	0	4
80			min	-1.274	6	-1.818	4	-1.499	5	0	1	0	5	0	15
81		3	max	15.234	5	322.639	3	52.176	3	.135	2	.06	5	.289	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	-114.691	1	-661.165	2	-30.994	5	-.038	3	-.103	3	-.139	3
83		4	max	14.771	5	321.575	3	52.176	3	.135	2	.041	5	.7	2
84			min	-115.683	1	-662.583	2	-32.493	5	-.038	3	-.071	3	-.339	3
85		5	max	14.308	5	320.512	3	52.176	3	.135	2	.02	5	1.111	2
86			min	-116.676	1	-664	2	-33.993	5	-.038	3	-.039	3	-.538	3
87		6	max	137.188	3	548.007	2	69.68	1	.034	3	.013	3	1.078	2
88			min	-531.277	2	-168.29	3	-18.893	5	-.026	4	-.039	2	-.557	3
89		7	max	136.444	3	546.59	2	69.68	1	.034	3	.035	3	.739	2
90			min	-532.269	2	-169.353	3	-20.392	5	-.026	4	-.038	5	-.453	3
91		8	max	135.699	3	545.173	2	69.68	1	.034	3	.058	3	.4	2
92			min	-533.262	2	-170.416	3	-21.892	5	-.026	4	-.051	5	-.347	3
93		9	max	76.72	3	126.244	3	82.177	1	.075	3	.014	5	.198	2
94			min	-584.15	2	-63.992	2	-49.315	5	.007	9	-.066	3	-.303	3
95		10	max	75.975	3	125.181	3	82.177	1	.075	3	.021	2	.238	2
96			min	-585.143	2	-65.41	2	-50.814	5	.007	9	-.027	3	-.381	3
97		11	max	75.231	3	124.118	3	82.177	1	.075	3	.065	1	.279	2
98			min	-586.136	2	-66.827	2	-52.314	5	.007	9	-.049	5	-.459	3
99		12	max	28.492	5	818.333	3	229.834	3	.109	2	-.007	10	.473	2
100			min	-684.088	1	-449.616	2	-117.997	5	-.161	3	-.054	3	-.807	3
101		13	max	28.029	5	817.27	3	229.834	3	.109	2	.088	3	.752	2
102			min	-685.081	1	-451.034	2	-119.497	5	-.161	3	-.124	4	-1.314	3
103		14	max	117.084	1	445.765	2	98.615	3	.3	3	.053	2	1.02	2
104			min	13.139	15	-779.714	3	-10.604	10	-.141	2	-.093	3	-1.799	3
105		15	max	116.091	1	444.348	2	98.615	3	.3	3	.056	1	.744	2
106			min	12.84	15	-780.778	3	-10.604	10	-.141	2	-.045	5	-1.315	3
107		16	max	115.099	1	442.93	2	98.615	3	.3	3	.074	1	.469	2
108			min	12.54	15	-781.841	3	-10.604	10	-.141	2	-.014	5	-.83	3
109		17	max	114.106	1	441.513	2	98.615	3	.3	3	.093	1	.194	2
110			min	12.241	15	-782.904	3	-10.604	10	-.141	2	.01	15	-.345	3
111		18	max	1.274	4	1.82	4	1.5	5	0	1	0	1	0	4
112			min	.299	15	.428	15	0	1	0	1	0	5	0	15
113		19	max	0	1	.005	2	0	5	0	1	0	1	0	1
114			min	0	1	-.009	3	0	1	0	1	0	1	0	1
115	M10	1	max	98.628	3	438.364	2	-11.645	15	.015	2	.13	3	.141	2
116			min	-10.604	10	-784.766	3	-112.133	1	-.028	3	.007	10	-.3	3
117		2	max	98.628	3	328.176	2	-10.279	15	.015	2	.096	3	.161	3
118			min	-10.604	10	-598.259	3	-87.433	1	-.028	3	0	10	-.115	2
119		3	max	98.628	3	217.989	2	-6.573	10	.015	2	.063	3	.498	3
120			min	-10.604	10	-411.751	3	-62.732	1	-.028	3	-.012	1	-.297	2
121		4	max	98.628	3	107.802	2	-2.799	10	.015	2	.031	3	.71	3
122			min	-10.604	10	-225.244	3	-46.606	3	-.028	3	-.046	1	-.405	2
123		5	max	98.628	3	14.868	5	.975	10	.015	2	0	3	.798	3
124			min	-10.604	10	-38.737	3	-44.557	3	-.028	3	-.063	1	-.441	2
125		6	max	98.628	3	147.77	3	11.37	1	.015	2	-.004	15	.762	3
126			min	-10.604	10	-112.573	2	-42.508	3	-.028	3	-.063	1	-.402	2
127		7	max	98.628	3	334.277	3	36.07	1	.015	2	-.004	10	.601	3
128			min	-10.604	10	-222.761	2	-40.458	3	-.028	3	-.056	3	-.29	2
129		8	max	98.628	3	520.785	3	60.771	1	.015	2	.003	10	.316	3
130			min	-10.604	10	-332.948	2	-38.409	3	-.028	3	-.082	3	-.105	2
131		9	max	98.628	3	707.292	3	85.471	1	.015	2	.033	1	.153	2
132			min	-10.604	10	-443.135	2	-36.36	3	-.028	3	-.107	3	-.093	3
133		10	max	98.628	3	893.799	3	-11.252	15	.028	3	.099	1	.486	2
134			min	-10.604	10	20.877	15	-110.172	1	-.015	2	-.131	3	-.627	3
135		11	max	98.628	3	443.135	2	36.36	3	.028	3	.033	1	.153	2
136			min	-10.604	10	-707.292	3	-85.471	1	-.015	2	-.107	3	-.093	3
137		12	max	98.628	3	332.948	2	38.409	3	.028	3	.009	5	.316	3
138			min	-10.604	10	-520.785	3	-60.771	1	-.015	2	-.082	3	-.105	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
139		13	max	98.628	3	222.761	2	40.458	3	.028	3	0	5	.601	3
140			min	-10.604	10	-334.277	3	-36.07	1	-.015	2	-.056	3	-.29	2
141		14	max	98.628	3	112.573	2	42.508	3	.028	3	-.004	15	.762	3
142			min	-10.604	10	-147.77	3	-11.37	1	-.015	2	-.063	1	-.402	2
143		15	max	98.628	3	38.737	3	44.557	3	.028	3	0	3	.798	3
144			min	-10.604	10	.257	10	-6.514	5	-.015	2	-.063	1	-.441	2
145		16	max	98.628	3	225.244	3	46.606	3	.028	3	.031	3	.71	3
146			min	-16.966	5	-107.802	2	-4.4	5	-.015	2	-.046	1	-.405	2
147		17	max	98.628	3	411.751	3	62.732	1	.028	3	.063	3	.498	3
148			min	-23.81	5	-217.989	2	-2.286	5	-.015	2	-.019	4	-.297	2
149		18	max	98.628	3	598.259	3	87.433	1	.028	3	.096	3	.161	3
150			min	-30.653	5	-328.176	2	-.322	15	-.015	2	-.017	5	-.115	2
151		19	max	98.628	3	784.766	3	112.133	1	.028	3	.13	3	.141	2
152			min	-37.497	5	-438.364	2	1.044	15	-.015	2	-.017	5	-.3	3
153	M11	1	max	114.995	2	380.163	2	15.386	5	0	10	.172	3	.082	4
154			min	-166.887	3	-694.884	3	-118.286	1	-.004	3	-.067	5	-.236	3
155		2	max	114.995	2	269.975	2	17.5	5	0	10	.13	3	.165	3
156			min	-166.887	3	-508.377	3	-93.586	1	-.004	3	-.056	5	-.18	2
157		3	max	114.995	2	159.788	2	19.614	5	0	10	.09	3	.442	3
158			min	-166.887	3	-321.87	3	-68.885	1	-.004	3	-.044	5	-.323	2
159		4	max	114.995	2	49.601	2	21.727	5	0	10	.052	3	.594	3
160			min	-166.887	3	-135.363	3	-56.781	3	-.004	3	-.038	4	-.393	2
161		5	max	114.995	2	51.144	3	23.841	5	0	10	.015	3	.622	3
162			min	-166.887	3	-60.587	2	-54.732	3	-.004	3	-.055	1	-.389	2
163		6	max	114.995	2	237.652	3	26.444	4	0	10	.002	5	.526	3
164			min	-166.887	3	-170.774	2	-52.683	3	-.004	3	-.06	1	-.312	2
165		7	max	114.995	2	424.159	3	34.778	4	0	10	.02	5	.305	3
166			min	-166.887	3	-280.962	2	-50.634	3	-.004	3	-.056	3	-.162	2
167		8	max	114.995	2	610.666	3	54.618	1	0	10	.039	5	.062	2
168			min	-166.887	3	-391.149	2	-48.585	3	-.004	3	-.089	3	-.04	3
169		9	max	114.995	2	797.173	3	79.318	1	0	10	.064	4	.36	2
170			min	-166.887	3	-501.336	2	-46.536	3	-.004	3	-.12	3	-.509	3
171		10	max	114.995	2	611.524	2	44.487	3	.004	3	.101	4	.731	2
172			min	-166.887	3	-983.68	3	-104.019	1	-.001	4	-.151	3	-1.103	3
173		11	max	114.995	2	501.336	2	46.536	3	.004	3	.025	1	.36	2
174			min	-166.887	3	-797.173	3	-79.318	1	0	5	-.12	3	-.509	3
175		12	max	114.995	2	391.149	2	48.585	3	.004	3	.003	10	.062	2
176			min	-166.887	3	-610.666	3	-54.618	1	0	5	-.089	3	-.04	3
177		13	max	114.995	2	280.962	2	50.634	3	.004	3	-.004	10	.305	3
178			min	-166.887	3	-424.159	3	-29.917	1	0	5	-.056	3	-.162	2
179		14	max	114.995	2	170.774	2	52.683	3	.004	3	-.008	15	.526	3
180			min	-166.887	3	-237.652	3	-8.03	2	0	5	-.06	1	-.312	2
181		15	max	114.995	2	60.587	2	54.732	3	.004	3	.015	3	.622	3
182			min	-166.887	3	-51.144	3	-1.057	10	0	5	-.055	1	-.389	2
183		16	max	114.995	2	135.363	3	56.781	3	.004	3	.052	3	.594	3
184			min	-166.887	3	-49.601	2	2.717	10	0	5	-.034	1	-.393	2
185		17	max	114.995	2	321.87	3	68.885	1	.004	3	.09	3	.442	3
186			min	-166.887	3	-159.788	2	6.491	10	0	5	-.009	2	-.323	2
187		18	max	114.995	2	508.377	3	93.586	1	.004	3	.13	3	.165	3
188			min	-166.887	3	-269.975	2	10.265	10	0	5	-.001	10	-.18	2
189		19	max	114.995	2	694.884	3	118.286	1	.004	3	.172	3	.037	2
190			min	-166.887	3	-380.163	2	14.039	10	0	5	.007	10	-.236	3
191	M12	1	max	25.886	5	606.629	2	21.496	5	0	2	.153	3	.088	2
192			min	-26.678	3	-297.68	3	-120.91	1	-.005	3	-.085	5	.007	9
193		2	max	19.043	5	433.297	2	23.609	5	0	2	.115	3	.209	3
194			min	-26.678	3	-205.889	3	-96.21	1	-.005	3	-.07	5	-.258	2
195		3	max	17.611	2	259.965	2	25.723	5	0	2	.078	3	.316	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	-26.678	3	-114.099	3	-71.509	1	-.005	3	-.054	5	-.489	2
197		4	max	17.611	2	86.633	2	27.836	5	0	2	.043	3	.361	3
198			min	-26.678	3	-22.309	3	-52.032	3	-.005	3	-.043	4	-.605	2
199		5	max	17.611	2	69.482	3	29.95	5	0	2	.009	3	.345	3
200			min	-26.678	3	-86.699	2	-49.983	3	-.005	3	-.052	1	-.605	2
201		6	max	17.611	2	161.272	3	32.36	4	0	2	.004	5	.268	3
202			min	-26.678	3	-260.031	2	-47.934	3	-.005	3	-.058	1	-.489	2
203		7	max	17.611	2	253.063	3	40.693	4	0	2	.026	5	.13	3
204			min	-26.678	3	-433.363	2	-45.885	3	-.005	3	-.055	3	-.258	2
205		8	max	17.611	2	344.853	3	51.993	1	0	2	.05	5	.088	2
206			min	-28.803	4	-606.695	2	-43.836	3	-.005	3	-.085	3	-.069	3
207		9	max	17.611	2	436.643	3	76.694	1	0	2	.079	4	.551	2
208			min	-35.647	4	-780.027	2	-41.787	3	-.005	3	-.114	3	-.329	3
209		10	max	17.611	2	953.359	2	72.298	14	.005	3	.12	4	1.128	2
210			min	-42.49	4	-528.434	3	-101.395	1	-.001	4	-.141	3	-.651	3
211		11	max	23.982	5	780.027	2	41.787	3	.005	3	.021	1	.551	2
212			min	-26.678	3	-436.643	3	-76.694	1	0	2	-.114	3	-.329	3
213		12	max	17.611	2	606.695	2	43.836	3	.005	3	.001	10	.088	2
214			min	-26.678	3	-344.853	3	-51.993	1	0	2	-.085	3	-.069	3
215		13	max	17.611	2	433.363	2	45.885	3	.005	3	-.004	10	.13	3
216			min	-26.678	3	-253.063	3	-27.293	1	0	2	-.055	3	-.258	2
217		14	max	17.611	2	260.031	2	47.934	3	.005	3	-.007	10	.268	3
218			min	-26.678	3	-161.272	3	-4.266	2	0	2	-.058	1	-.489	2
219		15	max	17.611	2	86.699	2	49.983	3	.005	3	.009	3	.345	3
220			min	-26.678	3	-69.482	3	1.179	10	0	2	-.052	1	-.605	2
221		16	max	17.611	2	22.309	3	52.032	3	.005	3	.043	3	.361	3
222			min	-26.678	3	-86.633	2	4.954	10	0	2	-.029	1	-.605	2
223		17	max	17.611	2	114.099	3	71.509	1	.005	3	.078	3	.316	3
224			min	-26.678	3	-259.965	2	8.728	10	0	2	-.001	10	-.489	2
225		18	max	17.611	2	205.889	3	96.21	1	.005	3	.115	3	.209	3
226			min	-30.755	4	-433.297	2	12.502	10	0	2	.006	10	-.258	2
227		19	max	17.611	2	297.68	3	120.91	1	.005	3	.153	3	.088	2
228			min	-37.598	4	-606.629	2	16.276	10	0	2	.015	10	-.038	5
229	M13	1	max	27.963	5	658.647	2	16.162	5	.009	3	.125	3	.135	2
230			min	-52.169	3	-324.713	3	-112.684	1	-.021	2	-.074	5	-.038	3
231		2	max	21.12	5	485.315	2	18.275	5	.009	3	.091	3	.148	3
232			min	-52.169	3	-232.923	3	-87.984	1	-.021	2	-.062	5	-.246	2
233		3	max	14.276	5	311.983	2	20.389	5	.009	3	.059	3	.273	3
234			min	-52.169	3	-141.132	3	-63.283	1	-.021	2	-.051	4	-.512	2
235		4	max	7.433	5	138.651	2	22.502	5	.009	3	.029	3	.336	3
236			min	-52.169	3	-49.342	3	-44.894	3	-.021	2	-.046	4	-.662	2
237		5	max	.589	5	42.448	3	24.616	5	.009	3	0	12	.338	3
238			min	-52.169	3	-34.681	2	-42.844	3	-.021	2	-.063	1	-.697	2
239		6	max	-4.082	15	134.239	3	28.933	4	.009	3	-.001	15	.279	3
240			min	-52.169	3	-208.013	2	-40.795	3	-.021	2	-.064	1	-.616	2
241		7	max	-5.048	10	226.029	3	37.267	4	.009	3	.016	5	.159	3
242			min	-52.169	3	-381.345	2	-38.746	3	-.021	2	-.055	3	-.42	2
243		8	max	-5.048	10	317.82	3	60.22	1	.009	3	.036	5	-.007	15
244			min	-52.169	3	-554.677	2	-36.697	3	-.021	2	-.08	3	-.108	2
245		9	max	-5.048	10	409.61	3	84.92	1	.009	3	.064	4	.32	2
246			min	-52.169	3	-728.009	2	-34.648	3	-.021	2	-.104	3	-.264	3
247		10	max	-5.048	10	901.34	2	73.611	14	.009	3	.103	4	.863	2
248			min	-52.169	3	-501.4	3	-109.621	1	-.021	2	-.126	3	-.568	3
249		11	max	18.348	5	728.009	2	34.648	3	.021	2	.032	1	.32	2
250			min	-52.169	3	-409.61	3	-84.92	1	-.009	3	-.104	3	-.264	3
251		12	max	11.505	5	554.677	2	36.697	3	.021	2	.002	10	.003	5
252			min	-52.169	3	-317.82	3	-60.22	1	-.009	3	-.08	3	-.108	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	4.661	5	381.345	2	38.746	3	.021	2	-.005	10	.159	3
254			min	-52.169	3	-226.029	3	-35.519	1	-.009	3	-.055	3	-.42	2
255		14	max	-1.337	15	208.013	2	40.795	3	.021	2	-.006	15	.279	3
256			min	-52.169	3	-134.239	3	-10.818	1	-.009	3	-.064	1	-.616	2
257		15	max	-5.048	10	34.681	2	42.844	3	.021	2	.009	5	.338	3
258			min	-52.169	3	-42.448	3	-.508	10	-.009	3	-.063	1	-.697	2
259		16	max	-5.048	10	49.342	3	44.894	3	.021	2	.029	3	.336	3
260			min	-52.169	3	-138.651	2	3.266	10	-.009	3	-.045	1	-.662	2
261		17	max	-5.048	10	141.132	3	63.283	1	.021	2	.059	3	.273	3
262			min	-52.169	3	-311.983	2	7.04	10	-.009	3	-.011	1	-.512	2
263		18	max	-5.048	10	232.923	3	87.984	1	.021	2	.091	3	.148	3
264			min	-52.169	3	-485.315	2	10.815	10	-.009	3	0	10	-.246	2
265		19	max	-5.048	10	324.713	3	112.684	1	.021	2	.125	3	.135	2
266			min	-52.169	3	-658.647	2	14.589	10	-.009	3	.008	10	-.038	3
267	M2	1	max	1908.86	2	1389.368	3	106.546	2	.025	5	1.044	5	5.898	3
268			min	-1521.175	3	-1042.489	2	-240.811	5	-.014	2	-.154	2	-.172	10
269		2	max	1180.402	2	945.987	3	72.749	2	0	2	.943	5	5.486	3
270			min	-1240.346	3	-6.455	10	-216.203	5	0	3	-.118	2	-.037	10
271		3	max	1177.296	2	945.987	3	72.749	2	0	2	.87	5	5.163	3
272			min	-1242.675	3	-6.455	10	-213.511	5	0	3	-.093	2	-.035	10
273		4	max	1174.19	2	945.987	3	72.749	2	0	2	.798	5	4.84	3
274			min	-1245.005	3	-6.455	10	-210.819	5	0	3	-.068	2	-.033	10
275		5	max	1171.084	2	945.987	3	72.749	2	0	2	.726	5	4.518	3
276			min	-1247.335	3	-6.455	10	-208.127	5	0	3	-.043	2	-.031	10
277		6	max	1167.978	2	945.987	3	72.749	2	0	2	.656	4	4.195	3
278			min	-1249.664	3	-6.455	10	-205.435	5	0	3	-.019	1	-.029	10
279		7	max	1164.872	2	945.987	3	72.749	2	0	2	.588	4	3.872	3
280			min	-1251.994	3	-6.455	10	-202.743	5	0	3	-.025	3	-.026	10
281		8	max	1161.766	2	945.987	3	72.749	2	0	2	.52	4	3.55	3
282			min	-1254.323	3	-6.455	10	-200.051	5	0	3	-.069	3	-.024	10
283		9	max	1158.659	2	945.987	3	72.749	2	0	2	.454	4	3.227	3
284			min	-1256.653	3	-6.455	10	-197.359	5	0	3	-.114	3	-.022	10
285		10	max	1155.553	2	945.987	3	72.749	2	0	2	.388	4	2.904	3
286			min	-1258.982	3	-6.455	10	-194.667	5	0	3	-.159	3	-.02	10
287		11	max	1152.447	2	945.987	3	72.749	2	0	2	.323	4	2.581	3
288			min	-1261.312	3	-6.455	10	-191.975	5	0	3	-.204	3	-.018	10
289		12	max	1149.341	2	945.987	3	72.749	2	0	2	.259	4	2.259	3
290			min	-1263.642	3	-6.455	10	-189.283	5	0	3	-.249	3	-.015	10
291		13	max	1146.235	2	945.987	3	72.749	2	0	2	.197	4	1.936	3
292			min	-1265.971	3	-6.455	10	-186.591	5	0	3	-.293	3	-.013	10
293		14	max	1143.129	2	945.987	3	72.749	2	0	2	.18	2	1.613	3
294			min	-1268.301	3	-6.455	10	-183.899	5	0	3	-.338	3	-.011	10
295		15	max	1140.023	2	945.987	3	72.749	2	0	2	.205	2	1.291	3
296			min	-1270.63	3	-6.455	10	-181.207	5	0	3	-.383	3	-.009	10
297		16	max	1136.917	2	945.987	3	72.749	2	0	2	.23	2	.968	3
298			min	-1272.96	3	-6.455	10	-178.516	5	0	3	-.428	3	-.007	10
299		17	max	1133.811	2	945.987	3	72.749	2	0	2	.255	2	.645	3
300			min	-1275.289	3	-6.455	10	-175.824	5	0	3	-.473	3	-.004	10
301		18	max	1130.705	2	945.987	3	72.749	2	0	2	.279	2	.323	3
302			min	-1277.619	3	-6.455	10	-173.132	5	0	3	-.517	3	-.002	10
303		19	max	1127.599	2	945.987	3	72.749	2	0	2	.304	2	0	1
304			min	-1279.949	3	-6.455	10	-170.44	5	0	3	-.562	3	0	1
305	M5	1	max	5274.908	2	3085.103	3	0	1	.026	4	1.08	4	8.868	3
306			min	-4866.552	3	-3131.279	2	-253.372	5	0	1	0	1	-.512	10
307		2	max	3164.923	2	1388.62	3	0	1	0	1	.975	4	8.052	3
308			min	-3785.593	3	-20.545	10	-228.194	4	0	4	0	1	-.119	10
309		3	max	3161.817	2	1388.62	3	0	1	0	1	.898	4	7.579	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
310			min	-3787.923	3	-20.545	10	-225.502	4	0	4	0	1	-.112	10
311		4	max	3158.711	2	1388.62	3	0	1	0	1	.821	4	7.105	3
312			min	-3790.253	3	-20.545	10	-222.81	4	0	4	0	1	-.105	10
313		5	max	3155.605	2	1388.62	3	0	1	0	1	.746	4	6.631	3
314			min	-3792.582	3	-20.545	10	-220.118	4	0	4	0	1	-.098	10
315		6	max	3152.499	2	1388.62	3	0	1	0	1	.671	4	6.158	3
316			min	-3794.912	3	-20.545	10	-217.426	4	0	4	0	1	-.091	10
317		7	max	3149.393	2	1388.62	3	0	1	0	1	.597	4	5.684	3
318			min	-3797.241	3	-20.545	10	-214.734	4	0	4	0	1	-.084	10
319		8	max	3146.287	2	1388.62	3	0	1	0	1	.525	4	5.21	3
320			min	-3799.571	3	-20.545	10	-212.043	4	0	4	0	1	-.077	10
321		9	max	3143.181	2	1388.62	3	0	1	0	1	.453	4	4.737	3
322			min	-3801.9	3	-20.545	10	-209.351	4	0	4	0	1	-.07	10
323		10	max	3140.074	2	1388.62	3	0	1	0	1	.382	4	4.263	3
324			min	-3804.23	3	-20.545	10	-206.659	4	0	4	0	1	-.063	10
325		11	max	3136.968	2	1388.62	3	0	1	0	1	.312	4	3.789	3
326			min	-3806.559	3	-20.545	10	-203.967	4	0	4	0	1	-.056	10
327		12	max	3133.862	2	1388.62	3	0	1	0	1	.243	4	3.316	3
328			min	-3808.889	3	-20.545	10	-201.275	4	0	4	0	1	-.049	10
329		13	max	3130.756	2	1388.62	3	0	1	0	1	.175	4	2.842	3
330			min	-3811.219	3	-20.545	10	-198.583	4	0	4	0	1	-.042	10
331		14	max	3127.65	2	1388.62	3	0	1	0	1	.107	4	2.368	3
332			min	-3813.548	3	-20.545	10	-195.891	4	0	4	0	1	-.035	10
333		15	max	3124.544	2	1388.62	3	0	1	0	1	.041	4	1.895	3
334			min	-3815.878	3	-20.545	10	-193.199	4	0	4	0	1	-.028	10
335		16	max	3121.438	2	1388.62	3	0	1	0	1	0	1	1.421	3
336			min	-3818.207	3	-20.545	10	-190.507	4	0	4	-.025	5	-.021	10
337		17	max	3118.332	2	1388.62	3	0	1	0	1	0	1	.947	3
338			min	-3820.537	3	-20.545	10	-187.815	4	0	4	-.089	4	-.014	10
339		18	max	3115.226	2	1388.62	3	0	1	0	1	0	1	.474	3
340			min	-3822.866	3	-20.545	10	-185.123	4	0	4	-.153	4	-.007	10
341		19	max	3112.12	2	1388.62	3	0	1	0	1	0	1	0	1
342			min	-3825.196	3	-20.545	10	-182.431	4	0	4	-.215	4	0	1
343	M8	1	max	1908.86	2	1389.368	3	147.055	3	.026	4	1.069	4	5.898	3
344			min	-1521.175	3	-1042.489	2	-251.954	4	-.007	3	-.249	3	-.279	5
345		2	max	1180.402	2	945.987	3	131.311	3	0	3	.963	4	5.486	3
346			min	-1240.346	3	-44.011	5	-224.719	4	0	2	-.199	3	-.255	5
347		3	max	1177.296	2	945.987	3	131.311	3	0	3	.887	4	5.163	3
348			min	-1242.675	3	-44.011	5	-222.027	4	0	2	-.155	3	-.24	5
349		4	max	1174.19	2	945.987	3	131.311	3	0	3	.812	4	4.84	3
350			min	-1245.005	3	-44.011	5	-219.335	4	0	2	-.11	3	-.225	5
351		5	max	1171.084	2	945.987	3	131.311	3	0	3	.738	4	4.518	3
352			min	-1247.335	3	-44.011	5	-216.643	4	0	2	-.065	3	-.21	5
353		6	max	1167.978	2	945.987	3	131.311	3	0	3	.664	4	4.195	3
354			min	-1249.664	3	-44.011	5	-213.951	4	0	2	-.02	3	-.195	5
355		7	max	1164.872	2	945.987	3	131.311	3	0	3	.592	4	3.872	3
356			min	-1251.994	3	-44.011	5	-211.259	4	0	2	-.006	2	-.18	5
357		8	max	1161.766	2	945.987	3	131.311	3	0	3	.52	4	3.55	3
358			min	-1254.323	3	-44.011	5	-208.567	4	0	2	-.031	2	-.165	5
359		9	max	1158.659	2	945.987	3	131.311	3	0	3	.449	4	3.227	3
360			min	-1256.653	3	-44.011	5	-205.875	4	0	2	-.056	2	-.15	5
361		10	max	1155.553	2	945.987	3	131.311	3	0	3	.381	5	2.904	3
362			min	-1258.982	3	-44.011	5	-203.183	4	0	2	-.081	2	-.135	5
363		11	max	1152.447	2	945.987	3	131.311	3	0	3	.314	5	2.581	3
364			min	-1261.312	3	-44.011	5	-200.491	4	0	2	-.106	2	-.12	5
365		12	max	1149.341	2	945.987	3	131.311	3	0	3	.249	3	2.259	3
366			min	-1263.642	3	-44.011	5	-197.799	4	0	2	-.131	2	-.105	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	1146.235	2	945.987	3	131.311	3	0	3	.293	3	1.936	3
368			min	-1265.971	3	-44.011	5	-195.107	4	0	2	-.155	2	-.09	5
369		14	max	1143.129	2	945.987	3	131.311	3	0	3	.338	3	1.613	3
370			min	-1268.301	3	-44.011	5	-192.415	4	0	2	-.18	2	-.075	5
371		15	max	1140.023	2	945.987	3	131.311	3	0	3	.383	3	1.291	3
372			min	-1270.63	3	-44.011	5	-189.723	4	0	2	-.205	2	-.06	5
373		16	max	1136.917	2	945.987	3	131.311	3	0	3	.428	3	.968	3
374			min	-1272.96	3	-44.011	5	-187.031	4	0	2	-.23	2	-.045	5
375		17	max	1133.811	2	945.987	3	131.311	3	0	3	.473	3	.645	3
376			min	-1275.289	3	-44.011	5	-184.339	4	0	2	-.255	2	-.03	5
377		18	max	1130.705	2	945.987	3	131.311	3	0	3	.517	3	.323	3
378			min	-1277.619	3	-44.011	5	-181.648	4	0	2	-.279	2	-.015	5
379		19	max	1127.599	2	945.987	3	131.311	3	0	3	.562	3	0	1
380			min	-1279.949	3	-44.011	5	-178.956	4	0	2	-.304	2	0	1
381	M3	1	max	1308.633	2	4.147	4	33.664	2	.003	3	.034	5	0	1
382			min	-520.526	3	.975	15	-22.122	5	-.005	4	-.015	2	0	1
383		2	max	1308.395	2	3.686	4	33.664	2	.003	3	.027	5	0	15
384			min	-520.705	3	.866	15	-21.749	5	-.005	4	-.005	2	-.001	4
385		3	max	1308.157	2	3.225	4	33.664	2	.003	3	.021	4	0	15
386			min	-520.883	3	.758	15	-21.375	5	-.005	4	-.002	3	-.002	4
387		4	max	1307.919	2	2.765	4	33.664	2	.003	3	.016	4	0	15
388			min	-521.062	3	.65	15	-21.002	5	-.005	4	-.007	3	-.003	4
389		5	max	1307.681	2	2.304	4	33.664	2	.003	3	.024	2	0	15
390			min	-521.24	3	.542	15	-20.629	5	-.005	4	-.012	3	-.004	4
391		6	max	1307.443	2	1.843	4	33.664	2	.003	3	.034	2	-.001	15
392			min	-521.419	3	.433	15	-20.255	5	-.005	4	-.016	3	-.004	4
393		7	max	1307.205	2	1.382	4	33.664	2	.003	3	.044	2	-.001	15
394			min	-521.597	3	.325	15	-19.882	5	-.005	4	-.021	3	-.005	4
395		8	max	1306.967	2	.922	4	33.664	2	.003	3	.053	2	-.001	15
396			min	-521.776	3	.217	15	-19.509	5	-.005	4	-.025	3	-.005	4
397		9	max	1306.729	2	.461	4	33.664	2	.003	3	.063	2	-.001	15
398			min	-521.954	3	.108	15	-19.135	5	-.005	4	-.03	3	-.005	4
399		10	max	1306.491	2	0	1	33.664	2	.003	3	.073	2	-.001	15
400			min	-522.133	3	0	1	-18.762	5	-.005	4	-.035	3	-.005	4
401		11	max	1306.253	2	-.108	15	33.664	2	.003	3	.083	2	-.001	15
402			min	-522.311	3	-.461	6	-18.389	5	-.005	4	-.039	3	-.005	4
403		12	max	1306.015	2	-.217	15	33.664	2	.003	3	.092	2	-.001	15
404			min	-522.49	3	-.922	6	-18.015	5	-.005	4	-.044	3	-.005	4
405		13	max	1305.777	2	-.325	15	33.664	2	.003	3	.102	2	-.001	15
406			min	-522.668	3	-1.382	6	-17.642	5	-.005	4	-.048	3	-.005	4
407		14	max	1305.539	2	-.433	15	33.664	2	.003	3	.112	2	-.001	15
408			min	-522.847	3	-1.843	6	-17.269	5	-.005	4	-.053	3	-.004	4
409		15	max	1305.301	2	-.542	15	33.664	2	.003	3	.122	2	0	15
410			min	-523.025	3	-2.304	6	-16.895	5	-.005	4	-.058	3	-.004	4
411		16	max	1305.063	2	-.65	15	33.664	2	.003	3	.132	2	0	15
412			min	-523.204	3	-2.765	6	-16.522	5	-.005	4	-.062	3	-.003	4
413		17	max	1304.825	2	-.758	15	33.664	2	.003	3	.141	2	0	15
414			min	-523.382	3	-3.225	6	-16.149	5	-.005	4	-.067	3	-.002	4
415		18	max	1304.587	2	-.866	15	33.664	2	.003	3	.151	2	0	15
416			min	-523.561	3	-3.686	6	-15.882	3	-.005	4	-.072	3	-.001	4
417		19	max	1304.349	2	-.975	15	33.664	2	.003	3	.161	2	0	1
418			min	-523.739	3	-4.147	6	-15.882	3	-.005	4	-.076	3	0	1
419	M6	1	max	3811.239	2	4.147	6	0	1	0	1	.035	4	0	1
420			min	-1988.519	3	.975	15	-24.163	4	-.004	4	0	1	0	1
421		2	max	3811.001	2	3.686	6	0	1	0	1	.028	4	0	15
422			min	-1988.698	3	.866	15	-23.789	4	-.004	4	0	1	-.001	6
423		3	max	3810.763	2	3.225	6	0	1	0	1	.021	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	-1988.876	3	.758	15	-23.416	4	-.004	4	0	1	-.002	6
425		4	max	3810.525	2	2.765	6	0	1	0	1	.014	4	0	15
426			min	-1989.055	3	.65	15	-23.043	4	-.004	4	0	1	-.003	6
427		5	max	3810.287	2	2.304	6	0	1	0	1	.007	4	0	15
428			min	-1989.233	3	.542	15	-22.669	4	-.004	4	0	1	-.004	6
429		6	max	3810.049	2	1.843	6	0	1	0	1	0	4	-.001	15
430			min	-1989.412	3	.433	15	-22.296	4	-.004	4	0	1	-.004	6
431		7	max	3809.811	2	1.382	6	0	1	0	1	0	1	-.001	15
432			min	-1989.59	3	.325	15	-21.923	4	-.004	4	-.006	4	-.005	6
433		8	max	3809.573	2	.922	6	0	1	0	1	0	1	-.001	15
434			min	-1989.769	3	.217	15	-21.549	4	-.004	4	-.012	4	-.005	6
435		9	max	3809.335	2	.461	6	0	1	0	1	0	1	-.001	15
436			min	-1989.947	3	.108	15	-21.176	4	-.004	4	-.018	4	-.005	6
437		10	max	3809.097	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1990.126	3	0	1	-20.803	4	-.004	4	-.024	4	-.005	6
439		11	max	3808.859	2	-.108	15	0	1	0	1	0	1	-.001	15
440			min	-1990.305	3	-.461	4	-20.429	4	-.004	4	-.03	4	-.005	6
441		12	max	3808.621	2	-.217	15	0	1	0	1	0	1	-.001	15
442			min	-1990.483	3	-.922	4	-20.056	4	-.004	4	-.036	4	-.005	6
443		13	max	3808.383	2	-.325	15	0	1	0	1	0	1	-.001	15
444			min	-1990.662	3	-1.382	4	-19.683	4	-.004	4	-.042	4	-.005	6
445		14	max	3808.145	2	-.433	15	0	1	0	1	0	1	-.001	15
446			min	-1990.84	3	-1.843	4	-19.309	4	-.004	4	-.048	4	-.004	6
447		15	max	3807.907	2	-.542	15	0	1	0	1	0	1	0	15
448			min	-1991.019	3	-2.304	4	-18.936	4	-.004	4	-.053	4	-.004	6
449		16	max	3807.669	2	-.65	15	0	1	0	1	0	1	0	15
450			min	-1991.197	3	-2.765	4	-18.563	4	-.004	4	-.059	4	-.003	6
451		17	max	3807.431	2	-.758	15	0	1	0	1	0	1	0	15
452			min	-1991.376	3	-3.225	4	-18.189	4	-.004	4	-.064	4	-.002	6
453		18	max	3807.193	2	-.866	15	0	1	0	1	0	1	0	15
454			min	-1991.554	3	-3.686	4	-17.816	4	-.004	4	-.069	4	-.001	6
455		19	max	3806.955	2	-.975	15	0	1	0	1	0	1	0	1
456			min	-1991.733	3	-4.147	4	-17.443	4	-.004	4	-.074	4	0	1
457	M9	1	max	1308.633	2	4.147	4	15.882	3	.004	2	.035	4	0	1
458			min	-520.526	3	.975	15	-33.664	2	-.004	5	-.007	3	0	1
459		2	max	1308.395	2	3.686	4	15.882	3	.004	2	.028	4	0	15
460			min	-520.705	3	.866	15	-33.664	2	-.004	5	-.002	3	-.001	4
461		3	max	1308.157	2	3.225	4	15.882	3	.004	2	.021	5	0	15
462			min	-520.883	3	.758	15	-33.664	2	-.004	5	-.004	2	-.002	4
463		4	max	1307.919	2	2.765	4	15.882	3	.004	2	.014	5	0	15
464			min	-521.062	3	.65	15	-33.664	2	-.004	5	-.014	2	-.003	4
465		5	max	1307.681	2	2.304	4	15.882	3	.004	2	.012	3	0	15
466			min	-521.24	3	.542	15	-33.664	2	-.004	5	-.024	2	-.004	4
467		6	max	1307.443	2	1.843	4	15.882	3	.004	2	.016	3	-.001	15
468			min	-521.419	3	.433	15	-33.664	2	-.004	5	-.034	2	-.004	4
469		7	max	1307.205	2	1.382	4	15.882	3	.004	2	.021	3	-.001	15
470			min	-521.597	3	.325	15	-33.664	2	-.004	5	-.044	2	-.005	4
471		8	max	1306.967	2	.922	4	15.882	3	.004	2	.025	3	-.001	15
472			min	-521.776	3	.217	15	-33.664	2	-.004	5	-.053	2	-.005	4
473		9	max	1306.729	2	.461	4	15.882	3	.004	2	.03	3	-.001	15
474			min	-521.954	3	.108	15	-33.664	2	-.004	5	-.063	2	-.005	4
475		10	max	1306.491	2	0	1	15.882	3	.004	2	.035	3	-.001	15
476			min	-522.133	3	0	1	-33.664	2	-.004	5	-.073	2	-.005	4
477		11	max	1306.253	2	-.108	15	15.882	3	.004	2	.039	3	-.001	15
478			min	-522.311	3	-.461	6	-33.664	2	-.004	5	-.083	2	-.005	4
479		12	max	1306.015	2	-.217	15	15.882	3	.004	2	.044	3	-.001	15
480			min	-522.49	3	-.922	6	-33.664	2	-.004	5	-.092	2	-.005	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1305.777	2	-.325	15	15.882	3	.004	2	.048	3	-.001	15
482			min	-522.668	3	-1.382	6	-33.664	2	-.004	5	-.102	2	-.005	4
483		14	max	1305.539	2	-.433	15	15.882	3	.004	2	.053	3	-.001	15
484			min	-522.847	3	-1.843	6	-33.664	2	-.004	5	-.112	2	-.004	4
485		15	max	1305.301	2	-.542	15	15.882	3	.004	2	.058	3	0	15
486			min	-523.025	3	-2.304	6	-33.664	2	-.004	5	-.122	2	-.004	4
487		16	max	1305.063	2	-.65	15	15.882	3	.004	2	.062	3	0	15
488			min	-523.204	3	-2.765	6	-33.664	2	-.004	5	-.132	2	-.003	4
489		17	max	1304.825	2	-.758	15	15.882	3	.004	2	.067	3	0	15
490			min	-523.382	3	-3.225	6	-33.664	2	-.004	5	-.141	2	-.002	4
491		18	max	1304.587	2	-.866	15	15.882	3	.004	2	.072	3	0	15
492			min	-523.561	3	-3.686	6	-33.664	2	-.004	5	-.151	2	-.001	4
493		19	max	1304.349	2	-.975	15	15.882	3	.004	2	.076	3	0	1
494			min	-523.739	3	-4.147	6	-33.664	2	-.004	5	-.161	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	.001	10	-.026	15	.008	3	4.365e-3	3	NC	3	NC	1
2			min	-.327	3	-.279	2	-.327	5	-1.115e-2	2	617.421	1	787.733	5
3		2	max	.001	10	-.022	15	.002	3	4.365e-3	3	NC	3	NC	1
4			min	-.327	3	-.216	1	-.316	4	-1.115e-2	2	829.936	1	845.442	5
5		3	max	.001	10	-.019	15	0	10	4.067e-3	3	NC	3	NC	1
6			min	-.327	3	-.161	1	-.305	4	-1.009e-2	2	1055.428	9	916.502	5
7		4	max	.001	10	-.015	15	0	10	3.609e-3	3	NC	3	NC	1
8			min	-.327	3	-.136	3	-.29	4	-8.468e-3	2	930.505	2	1019.958	5
9		5	max	.001	10	-.012	15	-.001	10	3.152e-3	3	NC	1	NC	1
10			min	-.327	3	-.129	3	-.274	4	-6.844e-3	2	682.67	2	1168.206	5
11		6	max	.001	10	.006	10	0	12	3.206e-3	3	NC	5	NC	1
12			min	-.327	3	-.115	3	-.256	4	-6.295e-3	2	575.537	2	1377.389	5
13		7	max	.001	10	.025	2	0	3	3.615e-3	3	NC	5	NC	1
14			min	-.327	3	-.093	3	-.239	4	-6.49e-3	2	527.427	2	1662.15	5
15		8	max	.001	10	.036	2	0	3	4.024e-3	3	NC	5	NC	1
16			min	-.327	3	-.065	3	-.223	4	-6.685e-3	2	505.507	2	2047.757	5
17		9	max	.002	10	.041	2	0	2	4.611e-3	3	NC	5	NC	1
18			min	-.327	3	-.032	3	-.21	4	-6.496e-3	2	494.928	2	2568.946	5
19		10	max	.002	10	.049	1	0	2	5.514e-3	3	NC	5	NC	1
20			min	-.327	3	.004	12	-.196	4	-5.628e-3	2	489.325	2	3445.342	5
21		11	max	.002	10	.059	1	0	3	6.418e-3	3	NC	5	NC	1
22			min	-.327	3	.009	15	-.184	4	-4.761e-3	2	489.661	2	5103.54	5
23		12	max	.002	10	.096	3	.002	3	5.505e-3	3	NC	5	NC	1
24			min	-.327	3	.012	15	-.173	4	-3.61e-3	2	496.813	2	8895.125	5
25		13	max	.002	10	.155	3	.006	3	3.566e-3	3	NC	5	NC	1
26			min	-.327	3	.011	10	-.163	4	-2.847e-3	4	457.797	3	NC	1
27		14	max	.002	10	.233	3	.006	3	1.749e-3	3	NC	5	NC	1
28			min	-.327	3	-.003	10	-.156	4	-3.816e-3	4	361.839	3	NC	1
29		15	max	.002	10	.335	3	.004	3	5.356e-3	3	NC	5	NC	1
30			min	-.327	3	-.025	2	-.154	5	-3.224e-3	4	283.725	3	NC	1
31		16	max	.002	10	.455	3	.005	1	8.963e-3	3	NC	5	NC	1
32			min	-.327	3	-.07	2	-.154	5	-4.447e-3	2	226.182	3	NC	1
33		17	max	.002	10	.587	3	.003	1	1.257e-2	3	NC	4	NC	1
34			min	-.327	3	-.122	2	-.155	4	-6.141e-3	2	185.064	3	NC	1
35		18	max	.002	10	.723	3	0	10	1.492e-2	3	NC	4	NC	1
36			min	-.327	3	-.176	2	-.157	4	-7.246e-3	2	155.774	3	NC	1
37		19	max	.002	10	.859	3	0	10	1.492e-2	3	NC	1	NC	1
38			min	-.327	3	-.229	2	-.16	4	-7.246e-3	2	134.506	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	.004	10	-.017	15	0	1	2.463e-4	4	NC	3	NC	1
40			min	-.477	3	-.614	2	-.325	4	0	1	449.811	1	789.16	4
41		2	max	.004	10	-.014	15	0	1	2.463e-4	4	8314.95	15	NC	1
42			min	-.477	3	-.468	2	-.316	4	0	1	719.51	1	833.409	4
43		3	max	.004	10	-.011	15	0	1	0	1	NC	11	NC	1
44			min	-.477	3	-.32	2	-.305	4	-5.155e-5	4	806.903	2	889.198	4
45		4	max	.004	10	-.008	15	0	1	0	1	NC	15	NC	1
46			min	-.477	3	-.187	1	-.291	4	-5.085e-4	4	440.488	2	980.901	4
47		5	max	.004	10	-.005	15	0	1	0	1	NC	5	NC	1
48			min	-.477	3	-.173	3	-.274	4	-9.654e-4	4	321.089	2	1120.358	4
49		6	max	.004	10	.007	10	0	1	0	1	NC	5	NC	1
50			min	-.477	3	-.165	3	-.256	4	-9.408e-4	4	274.12	2	1322.897	4
51		7	max	.005	10	.035	2	0	1	0	1	NC	5	NC	1
52			min	-.478	3	-.134	3	-.238	4	-5.832e-4	4	257.112	2	1600.278	4
53		8	max	.005	10	.044	2	0	1	0	1	NC	4	NC	1
54			min	-.478	3	-.089	3	-.223	4	-2.256e-4	4	252.659	2	1966.418	4
55		9	max	.005	10	.046	2	0	1	0	1	NC	4	NC	1
56			min	-.478	3	-.038	3	-.21	4	-3.386e-5	4	251.951	2	2426.914	4
57		10	max	.006	10	.059	1	0	1	0	1	NC	4	NC	1
58			min	-.479	3	.003	15	-.196	4	-1.353e-4	4	250.684	2	3211.251	4
59		11	max	.006	10	.076	3	0	1	0	1	NC	4	NC	1
60			min	-.479	3	.004	15	-.184	4	-2.368e-4	4	249.839	2	4623.891	4
61		12	max	.006	10	.141	3	0	1	0	1	NC	5	NC	1
62			min	-.479	3	.005	15	-.173	4	-1.097e-3	4	249.971	2	7206.207	4
63		13	max	.007	10	.224	3	0	1	0	1	NC	5	NC	1
64			min	-.48	3	.006	15	-.164	4	-2.386e-3	4	255.028	2	NC	1
65		14	max	.007	10	.345	3	0	1	0	1	NC	5	NC	1
66			min	-.48	3	-.008	10	-.159	4	-3.628e-3	4	272.404	2	NC	1
67		15	max	.007	10	.519	3	0	1	0	1	NC	5	NC	1
68			min	-.48	3	-.061	2	-.157	4	-2.789e-3	4	230.371	3	NC	1
69		16	max	.007	10	.734	3	0	1	0	1	NC	5	NC	1
70			min	-.48	3	-.154	2	-.157	4	-1.95e-3	4	168.345	3	NC	1
71		17	max	.007	10	.973	3	0	1	0	1	NC	4	NC	1
72			min	-.48	3	-.261	2	-.157	4	-1.112e-3	4	129.493	3	NC	1
73		18	max	.007	10	1.22	3	0	1	0	1	NC	4	NC	1
74			min	-.48	3	-.374	2	-.156	4	-5.648e-4	4	104.495	3	NC	1
75		19	max	.007	10	1.467	3	0	1	0	1	NC	1	NC	1
76			min	-.48	3	-.486	2	-.155	4	-5.648e-4	4	87.624	3	NC	1
77	M7	1	max	.015	5	.005	5	-.001	10	1.115e-2	2	NC	3	NC	1
78			min	-.327	3	-.279	2	-.332	4	-4.365e-3	3	617.421	1	755.323	4
79		2	max	.015	5	.006	5	0	10	1.115e-2	2	NC	3	NC	1
80			min	-.327	3	-.216	1	-.317	4	-4.365e-3	3	829.936	1	820.713	4
81		3	max	.015	5	.006	5	.003	1	1.009e-2	2	NC	3	NC	1
82			min	-.327	3	-.161	1	-.303	4	-4.067e-3	3	1055.428	9	900.451	4
83		4	max	.015	5	.006	5	.005	1	8.468e-3	2	NC	3	NC	1
84			min	-.327	3	-.136	3	-.287	5	-3.609e-3	3	930.505	2	1006.614	4
85		5	max	.015	5	.006	5	.005	1	6.844e-3	2	NC	1	NC	1
86			min	-.327	3	-.129	3	-.271	5	-3.152e-3	3	682.67	2	1149.929	4
87		6	max	.015	5	.006	10	.004	1	6.295e-3	2	NC	4	NC	1
88			min	-.327	3	-.115	3	-.254	4	-3.206e-3	3	575.537	2	1343.811	4
89		7	max	.015	5	.025	2	.002	2	6.49e-3	2	NC	4	NC	1
90			min	-.327	3	-.093	3	-.238	4	-3.615e-3	3	527.427	2	1598.181	4
91		8	max	.015	5	.036	2	0	2	6.685e-3	2	NC	5	NC	1
92			min	-.327	3	-.065	3	-.223	4	-4.024e-3	3	505.507	2	1938.067	4
93		9	max	.015	5	.041	2	0	3	6.496e-3	2	NC	5	NC	1
94			min	-.327	3	-.032	3	-.21	4	-4.611e-3	3	494.928	2	2408.277	4
95		10	max	.015	5	.049	1	0	3	5.628e-3	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	-.327	3	-.001	5	-.197	4	-5.514e-3	3	489.325	2	3159.507	4
97		11	max	.015	5	.059	1	0	2	4.761e-3	2	NC	5	NC	1
98			min	-.327	3	-.003	5	-.184	4	-6.418e-3	3	489.661	2	4505.849	4
99		12	max	.015	5	.096	3	.002	2	3.61e-3	2	NC	5	NC	1
100			min	-.327	3	-.005	5	-.172	4	-5.505e-3	3	496.813	2	7405.712	4
101		13	max	.015	5	.155	3	.003	2	2.301e-3	2	NC	5	NC	1
102			min	-.327	3	-.008	5	-.163	4	-3.566e-3	3	457.797	3	NC	1
103		14	max	.015	5	.233	3	.001	2	1.057e-3	2	NC	9	NC	1
104			min	-.327	3	-.011	5	-.157	4	-3.65e-3	5	361.839	3	NC	1
105		15	max	.015	5	.335	3	0	10	2.752e-3	2	NC	9	NC	1
106			min	-.327	3	-.025	2	-.156	4	-5.356e-3	3	283.725	3	NC	1
107		16	max	.015	5	.455	3	0	10	4.447e-3	2	NC	9	NC	1
108			min	-.327	3	-.07	2	-.157	4	-8.963e-3	3	226.182	3	NC	1
109		17	max	.015	5	.587	3	0	10	6.141e-3	2	NC	4	NC	1
110			min	-.327	3	-.122	2	-.157	4	-1.257e-2	3	185.064	3	NC	1
111		18	max	.015	5	.723	3	.002	3	7.246e-3	2	NC	4	NC	1
112			min	-.327	3	-.176	2	-.156	4	-1.492e-2	3	155.774	3	NC	1
113		19	max	.015	5	.859	3	.008	3	7.246e-3	2	NC	1	NC	1
114			min	-.327	3	-.229	2	-.155	5	-1.492e-2	3	134.506	3	NC	1
115	M10	1	max	0	3	.676	3	.327	3	1.827e-2	3	NC	1	NC	1
116			min	-.156	4	-.157	2	-.015	5	-7.231e-3	2	NC	1	NC	1
117		2	max	0	3	.797	3	.338	3	1.993e-2	3	NC	4	NC	1
118			min	-.156	4	-.216	2	-.014	5	-8.107e-3	2	1183.445	3	NC	1
119		3	max	0	3	.914	3	.355	3	2.158e-2	3	NC	4	NC	2
120			min	-.156	4	-.27	2	-.011	5	-8.983e-3	2	604.962	3	5277.005	3
121		4	max	0	3	1.013	3	.376	3	2.324e-2	3	NC	4	NC	2
122			min	-.156	4	-.315	2	-.007	5	-9.859e-3	2	427.066	3	2950.706	3
123		5	max	0	3	1.087	3	.4	3	2.489e-2	3	NC	4	NC	2
124			min	-.156	4	-.346	2	-.002	5	-1.073e-2	2	349.812	3	1985.404	3
125		6	max	0	3	1.134	3	.424	3	2.655e-2	3	NC	4	NC	2
126			min	-.156	4	-.361	2	-.001	10	-1.161e-2	2	314.19	3	1495.062	3
127		7	max	0	3	1.154	3	.446	3	2.82e-2	3	NC	4	NC	2
128			min	-.156	4	-.362	2	-.003	10	-1.249e-2	2	300.95	3	1219.218	3
129		8	max	0	3	1.154	3	.463	3	2.986e-2	3	NC	13	NC	2
130			min	-.156	4	-.354	2	-.005	10	-1.336e-2	2	301.379	3	1059.262	3
131		9	max	0	3	1.142	3	.475	3	3.151e-2	3	NC	14	NC	2
132			min	-.156	4	-.341	2	-.006	10	-1.424e-2	2	308.793	3	973.237	3
133		10	max	0	1	1.134	3	.48	3	3.317e-2	3	NC	14	NC	2
134			min	-.156	4	-.335	2	-.007	10	-1.511e-2	2	314.062	3	944.941	3
135		11	max	0	10	1.142	3	.475	3	3.151e-2	3	NC	14	NC	2
136			min	-.156	4	-.341	2	-.006	10	-1.424e-2	2	308.793	3	973.237	3
137		12	max	0	10	1.154	3	.463	3	2.986e-2	3	NC	14	NC	2
138			min	-.156	4	-.354	2	-.005	10	-1.336e-2	2	301.379	3	1059.262	3
139		13	max	0	10	1.154	3	.446	3	2.82e-2	3	NC	14	NC	2
140			min	-.156	4	-.362	2	-.003	10	-1.249e-2	2	300.95	3	1219.218	3
141		14	max	0	10	1.134	3	.424	3	2.655e-2	3	NC	14	NC	2
142			min	-.156	4	-.361	2	-.001	10	-1.161e-2	2	314.19	3	1495.062	3
143		15	max	0	10	1.087	3	.4	3	2.489e-2	3	NC	14	NC	2
144			min	-.156	4	-.346	2	0	10	-1.073e-2	2	349.812	3	1985.404	3
145		16	max	0	10	1.013	3	.376	3	2.324e-2	3	NC	14	NC	2
146			min	-.156	4	-.315	2	0	10	-9.859e-3	2	427.066	3	2950.706	3
147		17	max	0	10	.914	3	.355	3	2.158e-2	3	9907.329	14	NC	2
148			min	-.156	4	-.27	2	0	10	-8.983e-3	2	604.962	3	5277.005	3
149		18	max	0	10	.797	3	.338	3	1.993e-2	3	NC	9	NC	1
150			min	-.156	4	-.216	2	-.001	10	-8.107e-3	2	1183.445	3	NC	1
151		19	max	0	10	.676	3	.327	3	1.827e-2	3	NC	1	NC	1
152			min	-.156	4	-.157	2	-.002	10	-7.231e-3	2	2011.46	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	0	2	.064	3	.327	3	6.42e-3	3	NC	1	NC	1
154			min	-.18	4	-.004	5	-.015	5	-4.868e-4	10	NC	1	NC	1
155		2	max	0	2	.12	3	.332	3	6.671e-3	3	NC	4	NC	1
156			min	-.18	4	0	15	-.006	5	-4.681e-4	10	2602.491	3	NC	1
157		3	max	0	2	.169	3	.346	3	6.921e-3	3	NC	4	NC	2
158			min	-.18	4	-.02	2	0	15	-4.494e-4	10	1368.686	3	7539.58	3
159		4	max	0	2	.204	3	.367	3	7.172e-3	3	NC	4	NC	2
160			min	-.18	4	-.037	2	0	10	-4.307e-4	10	1029.485	3	3629.217	3
161		5	max	0	2	.218	3	.391	3	7.422e-3	3	NC	4	NC	2
162			min	-.18	4	-.041	2	0	10	-4.12e-4	10	935.355	3	2252.254	3
163		6	max	0	2	.211	3	.417	3	7.672e-3	3	NC	4	NC	2
164			min	-.18	4	-.031	2	0	10	-3.933e-4	10	983.271	3	1613.646	3
165		7	max	0	2	.185	3	.44	3	7.923e-3	3	NC	4	NC	2
166			min	-.18	4	-.012	10	-.002	10	-3.746e-4	10	1192.409	3	1273.779	3
167		8	max	0	2	.149	3	.46	3	8.173e-3	3	NC	1	NC	2
168			min	-.18	4	.003	15	-.004	10	-3.559e-4	10	1700.628	3	1083.301	3
169		9	max	0	2	.115	3	.474	3	8.424e-3	3	NC	1	NC	2
170			min	-.18	4	.003	15	-.005	10	-3.372e-4	10	2860.111	3	982.747	3
171		10	max	0	1	.099	3	.479	3	8.674e-3	3	NC	2	NC	2
172			min	-.18	4	.004	15	-.006	10	-3.185e-4	10	4194.08	3	949.835	3
173		11	max	0	3	.115	3	.474	3	8.424e-3	3	NC	1	NC	2
174			min	-.18	4	.005	15	-.005	10	-3.372e-4	10	2860.111	3	982.747	3
175		12	max	0	3	.149	3	.46	3	8.173e-3	3	NC	1	NC	2
176			min	-.18	4	.003	10	-.004	10	-3.559e-4	10	1700.628	3	1083.301	3
177		13	max	0	3	.185	3	.44	3	7.923e-3	3	NC	4	NC	2
178			min	-.18	4	-.012	10	-.002	10	-3.746e-4	10	1192.409	3	1273.779	3
179		14	max	0	3	.211	3	.417	3	7.672e-3	3	NC	4	NC	2
180			min	-.18	4	-.031	2	0	10	-3.933e-4	10	983.271	3	1613.646	3
181		15	max	0	3	.218	3	.391	3	7.422e-3	3	NC	4	NC	2
182			min	-.18	4	-.041	2	0	10	-4.12e-4	10	935.355	3	2252.254	3
183		16	max	0	3	.204	3	.367	3	7.172e-3	3	NC	4	NC	2
184			min	-.18	4	-.037	2	0	10	-4.307e-4	10	1029.485	3	3629.217	3
185		17	max	0	3	.169	3	.346	3	6.921e-3	3	NC	4	NC	2
186			min	-.18	4	-.02	2	0	10	-4.494e-4	10	1368.686	3	7539.58	3
187		18	max	0	3	.12	3	.332	3	6.671e-3	3	NC	4	NC	1
188			min	-.18	4	0	10	0	10	-4.681e-4	10	2602.491	3	NC	1
189		19	max	0	3	.064	3	.327	3	6.42e-3	3	NC	1	NC	1
190			min	-.18	4	.01	15	-.002	10	-4.868e-4	10	NC	1	NC	1
191	M12	1	max	0	2	.04	2	.327	3	4.493e-3	3	NC	1	NC	1
192			min	-.215	4	-.044	3	-.015	5	-2.415e-4	5	NC	1	NC	1
193		2	max	0	2	.003	4	.334	3	4.767e-3	3	NC	4	NC	1
194			min	-.215	4	-.014	2	-.004	5	-1.847e-4	5	2689.952	2	NC	1
195		3	max	0	2	.013	3	.35	3	5.04e-3	3	NC	4	NC	2
196			min	-.215	4	-.059	2	0	10	-1.278e-4	5	1465.015	2	6415.124	3
197		4	max	0	2	.027	3	.371	3	5.314e-3	3	NC	4	NC	2
198			min	-.215	4	-.087	2	0	10	-7.097e-5	5	1141.681	2	3327.99	3
199		5	max	0	2	.029	3	.394	3	5.588e-3	3	NC	4	NC	2
200			min	-.215	4	-.093	2	0	10	-1.581e-5	15	1082.955	2	2145.519	3
201		6	max	0	2	.018	3	.419	3	5.861e-3	3	NC	4	NC	2
202			min	-.214	4	-.079	2	-.001	10	2.228e-5	15	1211.992	2	1572.413	3
203		7	max	0	2	.002	5	.442	3	6.135e-3	3	NC	4	NC	2
204			min	-.214	4	-.048	2	-.002	10	-1.339e-5	10	1641.299	2	1259.365	3
205		8	max	0	2	.004	14	.461	3	6.409e-3	3	NC	4	NC	2
206			min	-.214	4	-.025	3	-.003	10	-5.346e-5	10	3006.927	2	1081.133	3
207		9	max	0	2	.028	2	.473	3	6.683e-3	3	NC	1	NC	2
208			min	-.214	4	-.047	3	-.005	10	-9.353e-5	10	NC	1	986.231	3
209		10	max	0	1	.045	2	.478	3	6.956e-3	3	NC	1	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.214	4	-.057	3	-.005	10	-1.336e-4	10	NC	1	955.091	3
211		11	max	0	3	.028	2	.473	3	6.683e-3	3	NC	1	NC	2
212			min	-.214	4	-.047	3	-.005	10	-9.353e-5	10	NC	1	986.231	3
213		12	max	0	3	.003	9	.461	3	6.409e-3	3	NC	4	NC	2
214			min	-.214	4	-.025	3	-.003	10	-5.346e-5	10	3006.927	2	1081.133	3
215		13	max	0	3	0	12	.442	3	6.135e-3	3	NC	4	NC	2
216			min	-.214	4	-.048	2	-.002	10	-1.339e-5	10	1641.299	2	1259.365	3
217		14	max	0	3	.018	3	.419	3	5.861e-3	3	NC	4	NC	2
218			min	-.214	4	-.079	2	-.001	10	2.669e-5	10	1211.992	2	1572.413	3
219		15	max	0	3	.029	3	.394	3	5.588e-3	3	NC	4	NC	2
220			min	-.214	4	-.093	2	0	10	6.676e-5	10	1082.955	2	2145.519	3
221		16	max	0	3	.027	3	.371	3	5.314e-3	3	NC	4	NC	2
222			min	-.214	4	-.087	2	0	10	1.068e-4	10	1141.681	2	3327.99	3
223		17	max	0	3	.013	3	.35	3	5.04e-3	3	NC	4	NC	2
224			min	-.214	4	-.059	2	0	10	1.469e-4	10	1465.015	2	6415.124	3
225		18	max	0	3	.001	9	.334	3	4.767e-3	3	NC	4	NC	1
226			min	-.214	4	-.014	2	-.001	10	1.87e-4	10	2689.952	2	NC	1
227		19	max	0	3	.04	2	.327	3	4.493e-3	3	NC	1	NC	1
228			min	-.214	4	-.044	3	-.002	10	2.27e-4	10	NC	1	NC	1
229	M13	1	max	0	10	.006	5	.327	3	8.815e-3	2	NC	1	NC	1
230			min	-.312	4	-.197	1	-.015	5	7.175e-6	3	NC	1	NC	1
231		2	max	0	10	.004	5	.338	3	1.002e-2	2	NC	4	NC	1
232			min	-.312	4	-.279	2	-.004	5	-4.93e-4	3	1618.516	2	NC	1
233		3	max	0	10	.001	15	.355	3	1.123e-2	2	NC	4	NC	2
234			min	-.312	4	-.36	2	.001	10	-9.931e-4	3	849.107	2	5218.067	3
235		4	max	0	10	0	15	.376	3	1.244e-2	2	NC	5	NC	2
236			min	-.312	4	-.423	2	.002	10	-1.493e-3	3	619.394	2	2948.836	3
237		5	max	0	10	-.003	15	.399	3	1.365e-2	2	NC	5	NC	2
238			min	-.312	4	-.463	2	.002	10	-1.993e-3	3	528.714	2	1997.135	3
239		6	max	0	10	-.005	15	.423	3	1.486e-2	2	NC	5	NC	2
240			min	-.312	4	-.478	2	.001	10	-2.493e-3	3	500.02	2	1510.46	3
241		7	max	0	10	-.008	15	.444	3	1.607e-2	2	NC	5	NC	2
242			min	-.312	4	-.472	2	0	10	-2.994e-3	3	510.228	2	1235.491	3
243		8	max	0	10	-.009	15	.461	3	1.727e-2	2	NC	5	NC	2
244			min	-.312	4	-.452	2	-.002	10	-3.494e-3	3	549.612	2	1075.611	3
245		9	max	0	10	-.011	15	.473	3	1.848e-2	2	NC	5	NC	2
246			min	-.312	4	-.429	2	-.003	10	-3.994e-3	3	604.228	2	989.511	3
247		10	max	0	1	-.012	15	.477	3	1.969e-2	2	NC	5	NC	2
248			min	-.312	4	-.417	2	-.004	10	-4.494e-3	3	636.436	2	961.186	3
249		11	max	0	3	-.014	15	.473	3	1.848e-2	2	NC	5	NC	2
250			min	-.312	4	-.429	2	-.003	10	-3.994e-3	3	604.228	2	989.511	3
251		12	max	0	3	-.016	15	.461	3	1.727e-2	2	NC	5	NC	2
252			min	-.312	4	-.452	2	-.002	10	-3.494e-3	3	549.612	2	1075.611	3
253		13	max	0	3	-.018	15	.444	3	1.607e-2	2	NC	5	NC	2
254			min	-.312	4	-.472	2	0	10	-2.994e-3	3	510.228	2	1235.491	3
255		14	max	0	3	-.02	15	.423	3	1.486e-2	2	NC	5	NC	2
256			min	-.312	4	-.478	2	.001	10	-2.493e-3	3	500.02	2	1510.46	3
257		15	max	0	3	-.022	15	.399	3	1.365e-2	2	NC	5	NC	2
258			min	-.312	4	-.463	2	.002	10	-1.993e-3	3	528.714	2	1997.135	3
259		16	max	0	3	-.023	15	.376	3	1.244e-2	2	NC	5	NC	2
260			min	-.312	4	-.423	2	.002	10	-1.493e-3	3	619.394	2	2948.836	3
261		17	max	0	3	-.023	15	.355	3	1.123e-2	2	NC	5	NC	2
262			min	-.312	4	-.36	2	.001	10	-9.931e-4	3	849.107	2	5218.067	3
263		18	max	0	3	-.022	15	.338	3	1.002e-2	2	NC	4	NC	1
264			min	-.312	4	-.279	2	0	10	-4.93e-4	3	1618.516	2	NC	1
265		19	max	0	3	-.021	15	.327	3	8.815e-3	2	NC	1	NC	1
266			min	-.312	4	-.197	1	-.001	10	7.175e-6	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	10	0	5	2.714e-3	2	NC	1	NC	1
270			min	0	2	-.002	3	0	2	-4.964e-3	5	NC	1	NC	1
271		3	max	0	3	0	10	.003	5	2.498e-3	2	NC	1	NC	1
272			min	0	2	-.007	3	0	2	-4.818e-3	5	9841.691	3	NC	1
273		4	max	0	3	0	10	.007	5	2.282e-3	2	NC	1	NC	1
274			min	0	2	-.016	3	0	2	-4.673e-3	5	4543.722	3	NC	1
275		5	max	0	3	0	10	.012	5	2.065e-3	2	NC	2	NC	1
276			min	0	2	-.028	3	-.001	2	-4.528e-3	5	2630.569	3	6113.671	5
277		6	max	0	3	0	10	.018	5	1.849e-3	2	NC	2	NC	1
278			min	0	2	-.043	3	-.002	2	-4.383e-3	5	1727.032	3	4032.465	5
279		7	max	0	3	0	10	.026	5	1.633e-3	2	NC	2	NC	1
280			min	0	2	-.06	3	-.003	2	-4.238e-3	5	1228.557	3	2884.232	5
281		8	max	0	3	0	10	.034	5	1.416e-3	2	NC	2	NC	1
282			min	0	2	-.08	3	-.003	2	-4.093e-3	5	923.927	3	2182.047	5
283		9	max	0	3	0	10	.043	5	1.2e-3	2	NC	2	NC	1
284			min	0	2	-.102	3	-.004	2	-3.947e-3	5	723.986	3	1720.715	5
285		10	max	0	3	.001	10	.053	5	9.835e-4	2	NC	2	NC	1
286			min	0	2	-.126	3	-.005	2	-3.802e-3	5	585.526	3	1400.902	5
287		11	max	0	3	.001	10	.063	5	7.672e-4	2	NC	2	NC	1
288			min	0	2	-.152	3	-.005	2	-3.667e-3	4	485.568	3	1169.801	5
289		12	max	0	3	.002	10	.074	5	5.508e-4	2	NC	10	NC	1
290			min	0	2	-.179	3	-.005	2	-3.537e-3	4	410.981	3	997.228	5
291		13	max	0	3	.002	10	.085	5	3.759e-4	3	NC	10	NC	1
292			min	0	2	-.208	3	-.005	2	-3.406e-3	4	353.809	3	864.893	5
293		14	max	.001	3	.002	10	.097	5	5.307e-4	3	NC	10	NC	1
294			min	0	2	-.238	3	-.005	2	-3.276e-3	4	308.995	3	761.172	5
295		15	max	.001	3	.002	10	.109	5	6.856e-4	3	NC	10	NC	1
296			min	-.001	2	-.27	3	-.004	2	-3.146e-3	4	273.219	3	678.412	5
297		16	max	.001	3	.002	10	.121	4	8.405e-4	3	NC	10	NC	1
298			min	-.001	2	-.302	3	-.004	2	-3.015e-3	4	244.205	3	611.275	4
299		17	max	.001	3	.003	10	.133	4	9.953e-4	3	NC	10	NC	1
300			min	-.001	2	-.334	3	-.003	1	-2.885e-3	4	220.357	3	555.938	4
301		18	max	.001	3	.003	10	.144	4	1.15e-3	3	NC	10	NC	1
302			min	-.001	2	-.367	3	-.002	1	-2.755e-3	4	200.528	3	510.046	4
303		19	max	.001	3	.003	10	.156	4	1.305e-3	3	NC	10	NC	1
304			min	-.001	2	-.401	3	-.006	3	-2.624e-3	4	183.88	3	471.657	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	2	0	4	0	1	NC	1	NC	1
308			min	0	2	-.003	3	0	1	-5.172e-3	4	NC	1	NC	1
309		3	max	0	3	0	10	.003	4	0	1	NC	1	NC	1
310			min	0	2	-.011	3	0	1	-5.007e-3	4	6600.693	3	NC	1
311		4	max	0	3	0	10	.007	4	0	1	NC	1	NC	1
312			min	0	2	-.024	3	0	1	-4.842e-3	4	3067.993	3	NC	1
313		5	max	.001	3	.001	10	.012	4	0	1	NC	2	NC	1
314			min	0	2	-.041	3	0	1	-4.677e-3	4	1781.14	3	5917.738	4
315		6	max	.001	3	.001	10	.019	4	0	1	NC	2	NC	1
316			min	-.001	2	-.063	3	0	1	-4.512e-3	4	1171.078	3	3905.614	4
317		7	max	.001	3	.002	10	.026	4	0	1	NC	2	NC	1
318			min	-.001	2	-.088	3	0	1	-4.347e-3	4	833.811	3	2795.313	4
319		8	max	.002	3	.002	10	.035	4	0	1	NC	2	NC	1
320			min	-.001	2	-.117	3	0	1	-4.182e-3	4	627.433	3	2116.238	4
321		9	max	.002	3	.003	10	.044	4	0	1	NC	2	NC	1
322			min	-.002	2	-.15	3	0	1	-4.017e-3	4	491.861	3	1670.05	4
323		10	max	.002	3	.004	10	.054	4	0	1	NC	2	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	-.185	3	0	1	-3.852e-3	4	397.917	3	1360.723	4
325		11	max	.002	3	.004	10	.065	4	0	1	NC	2	NC	1
326			min	-.002	2	-.223	3	0	1	-3.687e-3	4	330.065	3	1137.204	4
327		12	max	.003	3	.005	10	.076	4	0	1	NC	2	NC	1
328			min	-.002	2	-.264	3	0	1	-3.522e-3	4	279.417	3	970.31	4
329		13	max	.003	3	.006	10	.087	4	0	1	NC	10	NC	1
330			min	-.002	2	-.306	3	0	1	-3.357e-3	4	240.583	3	842.355	4
331		14	max	.003	3	.006	10	.099	4	0	1	NC	10	NC	1
332			min	-.003	2	-.351	3	0	1	-3.192e-3	4	210.136	3	742.101	4
333		15	max	.003	3	.007	10	.111	4	0	1	NC	10	NC	1
334			min	-.003	2	-.397	3	0	1	-3.027e-3	4	185.825	3	662.147	4
335		16	max	.004	3	.008	10	.123	4	0	1	9442.879	10	NC	1
336			min	-.003	2	-.444	3	0	1	-2.862e-3	4	166.105	3	597.428	4
337		17	max	.004	3	.009	10	.135	4	0	1	8583.604	10	NC	1
338			min	-.003	2	-.492	3	0	1	-2.697e-3	4	149.895	3	544.392	4
339		18	max	.004	3	.009	10	.147	4	0	1	7860.214	10	NC	1
340			min	-.003	2	-.54	3	0	1	-2.532e-3	4	136.415	3	500.49	4
341		19	max	.004	3	.01	10	.159	4	0	1	7246.099	10	NC	1
342			min	-.004	2	-.589	3	0	1	-2.367e-3	4	125.096	3	463.854	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	10	0	4	1.328e-3	3	NC	1	NC	1
346			min	0	2	-.002	3	0	3	-5.224e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	1.173e-3	3	NC	1	NC	1
348			min	0	2	-.007	3	0	3	-5.053e-3	4	9841.691	3	NC	1
349		4	max	0	3	0	5	.007	4	1.018e-3	3	NC	1	NC	1
350			min	0	2	-.016	3	-.002	3	-4.881e-3	4	4543.722	3	NC	1
351		5	max	0	3	.001	5	.012	4	8.631e-4	3	NC	2	NC	1
352			min	0	2	-.028	3	-.002	3	-4.709e-3	4	2630.569	3	5986.829	4
353		6	max	0	3	.002	5	.019	4	7.082e-4	3	NC	2	NC	1
354			min	0	2	-.043	3	-.004	3	-4.537e-3	4	1727.032	3	3951.096	4
355		7	max	0	3	.003	5	.026	4	5.534e-4	3	NC	2	NC	1
356			min	0	2	-.06	3	-.005	3	-4.366e-3	4	1228.557	3	2827.695	4
357		8	max	0	3	.004	5	.034	4	3.985e-4	3	NC	2	NC	1
358			min	0	2	-.08	3	-.006	3	-4.194e-3	4	923.927	3	2140.579	4
359		9	max	0	3	.005	5	.044	4	2.436e-4	3	NC	2	NC	1
360			min	0	2	-.102	3	-.007	3	-4.022e-3	4	723.986	3	1689.092	4
361		10	max	0	3	.006	5	.054	4	8.875e-5	3	NC	2	NC	1
362			min	0	2	-.126	3	-.007	3	-3.851e-3	4	585.526	3	1376.081	4
363		11	max	0	3	.007	5	.064	4	-1.155e-5	9	NC	2	NC	1
364			min	0	2	-.152	3	-.008	3	-3.679e-3	4	485.568	3	1149.892	4
365		12	max	0	3	.008	5	.075	4	2.912e-5	9	NC	10	NC	1
366			min	0	2	-.179	3	-.008	3	-3.507e-3	4	410.981	3	980.995	4
367		13	max	0	3	.01	5	.087	4	6.978e-5	9	NC	10	NC	1
368			min	0	2	-.208	3	-.008	3	-3.349e-3	5	353.809	3	851.498	4
369		14	max	.001	3	.011	5	.098	4	1.104e-4	9	NC	10	NC	1
370			min	0	2	-.238	3	-.007	3	-3.193e-3	5	308.995	3	750.026	4
371		15	max	.001	3	.013	5	.11	4	2.272e-4	1	NC	10	NC	1
372			min	-.001	2	-.27	3	-.006	3	-3.037e-3	5	273.219	3	669.092	4
373		16	max	.001	3	.014	5	.122	4	3.833e-4	1	NC	10	NC	1
374			min	-.001	2	-.302	3	-.004	3	-2.882e-3	5	244.205	3	603.57	4
375		17	max	.001	3	.016	5	.134	4	5.393e-4	1	NC	10	NC	1
376			min	-.001	2	-.334	3	-.001	3	-2.726e-3	5	220.357	3	549.865	4
377		18	max	.001	3	.017	5	.146	4	7.472e-4	2	NC	10	NC	1
378			min	-.001	2	-.367	3	0	10	-2.57e-3	5	200.528	3	505.398	4
379		19	max	.001	3	.019	5	.157	4	9.636e-4	2	NC	10	NC	1
380			min	-.001	2	-.401	3	-.001	2	-2.415e-3	5	183.88	3	468.277	4

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
381	M3	1	max	0	3	0	10	0	5	1.521e-3	2	NC	1	NC	1
382			min	0	2	0	3	0	2	-2.578e-3	5	NC	1	NC	1
383		2	max	0	3	0	10	.016	5	1.565e-3	2	NC	1	NC	1
384			min	0	2	-.02	3	-.008	2	-2.526e-3	5	NC	1	7337.393	2
385		3	max	.001	3	0	10	.032	5	1.609e-3	2	NC	1	NC	4
386			min	0	2	-.04	3	-.017	2	-2.473e-3	5	NC	1	3644.501	2
387		4	max	.001	3	-.001	10	.048	5	1.653e-3	2	NC	1	NC	4
388			min	-.001	2	-.06	3	-.025	2	-2.421e-3	5	NC	1	2433.399	2
389		5	max	.001	3	-.002	10	.065	5	1.697e-3	2	NC	1	NC	4
390			min	-.002	2	-.08	3	-.033	2	-2.369e-3	5	NC	1	1842.884	2
391		6	max	.002	3	-.002	10	.082	5	1.74e-3	2	NC	1	NC	4
392			min	-.002	2	-.099	3	-.041	2	-2.316e-3	5	NC	1	1501.32	2
393		7	max	.002	3	-.002	10	.099	5	1.784e-3	2	NC	1	NC	13
394			min	-.003	2	-.119	3	-.048	2	-2.264e-3	5	NC	1	1285.413	2
395		8	max	.002	3	-.003	10	.116	5	1.828e-3	2	NC	1	NC	14
396			min	-.003	2	-.139	3	-.054	2	-2.212e-3	5	NC	1	1142.96	2
397		9	max	.002	3	-.003	10	.132	5	1.872e-3	2	NC	1	NC	14
398			min	-.004	2	-.158	3	-.058	2	-2.159e-3	5	NC	1	1048.638	2
399		10	max	.002	3	-.003	10	.149	5	1.916e-3	2	NC	1	NC	14
400			min	-.004	2	-.177	3	-.062	2	-2.107e-3	5	NC	1	989.409	2
401		11	max	.002	3	-.003	10	.165	5	1.96e-3	2	NC	1	NC	14
402			min	-.004	2	-.197	3	-.064	2	-2.055e-3	5	NC	1	958.924	2
403		12	max	.003	3	-.003	10	.18	5	2.004e-3	2	NC	1	NC	14
404			min	-.005	2	-.216	3	-.064	2	-2.002e-3	5	NC	1	955.415	2
405		13	max	.003	3	-.003	10	.195	5	2.048e-3	2	NC	1	NC	14
406			min	-.005	2	-.235	3	-.062	2	-1.95e-3	5	NC	1	981.501	2
407		14	max	.003	3	-.002	10	.209	5	2.092e-3	2	NC	1	NC	14
408			min	-.006	2	-.255	3	-.058	2	-1.898e-3	5	NC	1	1045.984	2
409		15	max	.003	3	-.002	10	.222	5	2.136e-3	2	NC	1	NC	14
410			min	-.006	2	-.274	3	-.051	2	-1.846e-3	5	NC	1	1169.742	2
411		16	max	.003	3	-.002	10	.235	5	2.18e-3	2	NC	1	NC	14
412			min	-.007	2	-.293	3	-.042	2	-1.793e-3	5	NC	1	1404.381	2
413		17	max	.003	3	-.001	10	.246	5	2.224e-3	2	NC	1	NC	9
414			min	-.007	2	-.312	3	-.03	2	-1.741e-3	5	NC	1	1907.686	2
415		18	max	.004	3	-.001	10	.257	4	2.268e-3	2	NC	1	NC	4
416			min	-.008	2	-.331	3	-.015	2	-1.689e-3	5	NC	1	3472.727	2
417		19	max	.004	3	0	10	.266	4	2.312e-3	2	NC	1	NC	1
418			min	-.008	2	-.35	3	.002	10	-1.636e-3	5	NC	1	NC	1
419	M6	1	max	.001	3	0	10	0	4	0	1	NC	1	NC	1
420			min	0	2	0	3	0	1	-2.691e-3	4	NC	1	NC	1
421		2	max	.002	3	0	10	.016	4	0	1	NC	1	NC	1
422			min	-.002	2	-.029	3	0	1	-2.646e-3	4	NC	1	NC	1
423		3	max	.002	3	0	10	.033	4	0	1	NC	1	NC	1
424			min	-.003	2	-.058	3	0	1	-2.601e-3	4	NC	1	NC	1
425		4	max	.003	3	-.001	10	.05	4	0	1	NC	1	NC	1
426			min	-.004	2	-.086	3	0	1	-2.556e-3	4	NC	1	NC	1
427		5	max	.004	3	-.002	10	.067	4	0	1	NC	1	NC	1
428			min	-.005	2	-.115	3	0	1	-2.511e-3	4	NC	1	7900.756	4
429		6	max	.004	3	-.002	10	.085	4	0	1	NC	1	NC	1
430			min	-.007	2	-.143	3	0	1	-2.466e-3	4	NC	1	5874.983	4
431		7	max	.005	3	-.003	10	.103	4	0	1	NC	1	NC	1
432			min	-.008	2	-.172	3	0	1	-2.421e-3	4	NC	1	4670.013	4
433		8	max	.006	3	-.003	10	.12	4	0	1	NC	1	NC	1
434			min	-.009	2	-.2	3	0	1	-2.376e-3	4	NC	1	3904.274	4
435		9	max	.006	3	-.003	10	.137	4	0	1	NC	1	NC	1
436			min	-.011	2	-.228	3	0	1	-2.331e-3	4	NC	1	3400.836	4
437		10	max	.007	3	-.003	10	.154	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	-.256	3	0	1	-2.286e-3	4	NC	1	3069.779	4
439		11	max	.008	3	-.003	10	.17	4	0	1	NC	1	NC	1
440			min	-.013	2	-.284	3	0	1	-2.241e-3	4	NC	1	2863.88	4
441		12	max	.008	3	-.003	10	.186	4	0	1	NC	1	NC	1
442			min	-.014	2	-.312	3	0	1	-2.196e-3	4	NC	1	2760.469	4
443		13	max	.009	3	-.003	10	.201	4	0	1	NC	1	NC	1
444			min	-.016	2	-.34	3	0	1	-2.151e-3	4	NC	1	2754.922	4
445		14	max	.01	3	-.003	10	.215	4	0	1	NC	1	NC	1
446			min	-.017	2	-.368	3	0	1	-2.106e-3	4	NC	1	2862.131	4
447		15	max	.01	3	-.003	10	.228	4	0	1	NC	1	NC	1
448			min	-.018	2	-.396	3	0	1	-2.061e-3	4	NC	1	3129.599	4
449		16	max	.011	3	-.002	10	.239	4	0	1	NC	1	NC	1
450			min	-.02	2	-.424	3	0	1	-2.016e-3	4	NC	1	3683.168	4
451		17	max	.012	3	-.002	10	.25	4	0	1	NC	1	NC	1
452			min	-.021	2	-.452	3	0	1	-1.971e-3	4	NC	1	4915.124	4
453		18	max	.012	3	-.002	10	.259	4	0	1	NC	1	NC	1
454			min	-.022	2	-.48	3	0	1	-1.926e-3	4	NC	1	8806.828	4
455		19	max	.013	3	-.001	10	.267	4	0	1	NC	1	NC	1
456			min	-.023	2	-.507	3	0	1	-1.881e-3	4	NC	1	NC	1
457	M9	1	max	0	3	0	5	0	4	7.233e-4	3	NC	1	NC	1
458			min	0	2	0	3	0	3	-2.723e-3	4	NC	1	NC	1
459		2	max	0	3	0	5	.017	4	7.587e-4	3	NC	1	NC	1
460			min	0	2	-.02	3	-.004	3	-2.671e-3	4	NC	1	7337.393	2
461		3	max	.001	3	.001	5	.033	4	7.941e-4	3	NC	1	NC	4
462			min	0	2	-.04	3	-.009	3	-2.619e-3	4	NC	1	3644.501	2
463		4	max	.001	3	.002	5	.051	4	8.295e-4	3	NC	1	NC	5
464			min	-.001	2	-.06	3	-.013	3	-2.567e-3	4	NC	1	2433.399	2
465		5	max	.001	3	.003	5	.068	4	8.648e-4	3	NC	1	NC	9
466			min	-.002	2	-.08	3	-.017	3	-2.515e-3	4	NC	1	1842.884	2
467		6	max	.002	3	.003	5	.086	4	9.002e-4	3	NC	1	9639.669	9
468			min	-.002	2	-.099	3	-.021	3	-2.463e-3	4	NC	1	1501.32	2
469		7	max	.002	3	.004	5	.104	4	9.356e-4	3	NC	1	8249.828	9
470			min	-.003	2	-.119	3	-.024	3	-2.411e-3	4	NC	1	1285.413	2
471		8	max	.002	3	.005	5	.121	4	9.71e-4	3	NC	1	7332.72	9
472			min	-.003	2	-.139	3	-.027	3	-2.359e-3	4	NC	1	1142.96	2
473		9	max	.002	3	.006	5	.138	4	1.006e-3	3	NC	1	6725.232	9
474			min	-.004	2	-.158	3	-.03	3	-2.307e-3	4	NC	1	1048.638	2
475		10	max	.002	3	.007	5	.155	4	1.042e-3	3	NC	1	6343.35	9
476			min	-.004	2	-.177	3	-.031	3	-2.255e-3	4	9354.854	5	989.409	2
477		11	max	.002	3	.008	5	.171	4	1.077e-3	3	NC	1	6146.109	9
478			min	-.004	2	-.197	3	-.033	3	-2.203e-3	4	8221.032	5	958.924	2
479		12	max	.003	3	.009	5	.187	4	1.112e-3	3	NC	1	6121.98	9
480			min	-.005	2	-.216	3	-.033	3	-2.151e-3	4	7296.78	5	955.415	2
481		13	max	.003	3	.01	5	.201	4	1.148e-3	3	NC	1	6287.575	9
482			min	-.005	2	-.235	3	-.032	3	-2.099e-3	4	6531.935	5	981.501	2
483		14	max	.003	3	.011	5	.215	4	1.183e-3	3	NC	1	6699.129	9
484			min	-.006	2	-.255	3	-.03	3	-2.092e-3	2	5891.388	5	1045.984	2
485		15	max	.003	3	.012	5	.227	4	1.219e-3	3	NC	1	7490.169	9
486			min	-.006	2	-.274	3	-.027	3	-2.136e-3	2	5349.757	5	1169.742	2
487		16	max	.003	3	.013	5	.239	4	1.254e-3	3	NC	1	8990.864	9
488			min	-.007	2	-.293	3	-.023	3	-2.18e-3	2	4888.199	5	1404.381	2
489		17	max	.003	3	.014	5	.249	4	1.289e-3	3	NC	1	NC	9
490			min	-.007	2	-.312	3	-.018	3	-2.224e-3	2	4492.412	5	1907.686	2
491		18	max	.004	3	.015	5	.257	4	1.325e-3	3	NC	1	NC	9
492			min	-.008	2	-.331	3	-.011	3	-2.268e-3	2	4151.344	5	3472.727	2
493		19	max	.004	3	.016	5	.264	4	1.36e-3	3	NC	1	NC	1
494			min	-.008	2	-.35	3	-.005	1	-2.312e-3	2	3856.325	5	NC	1