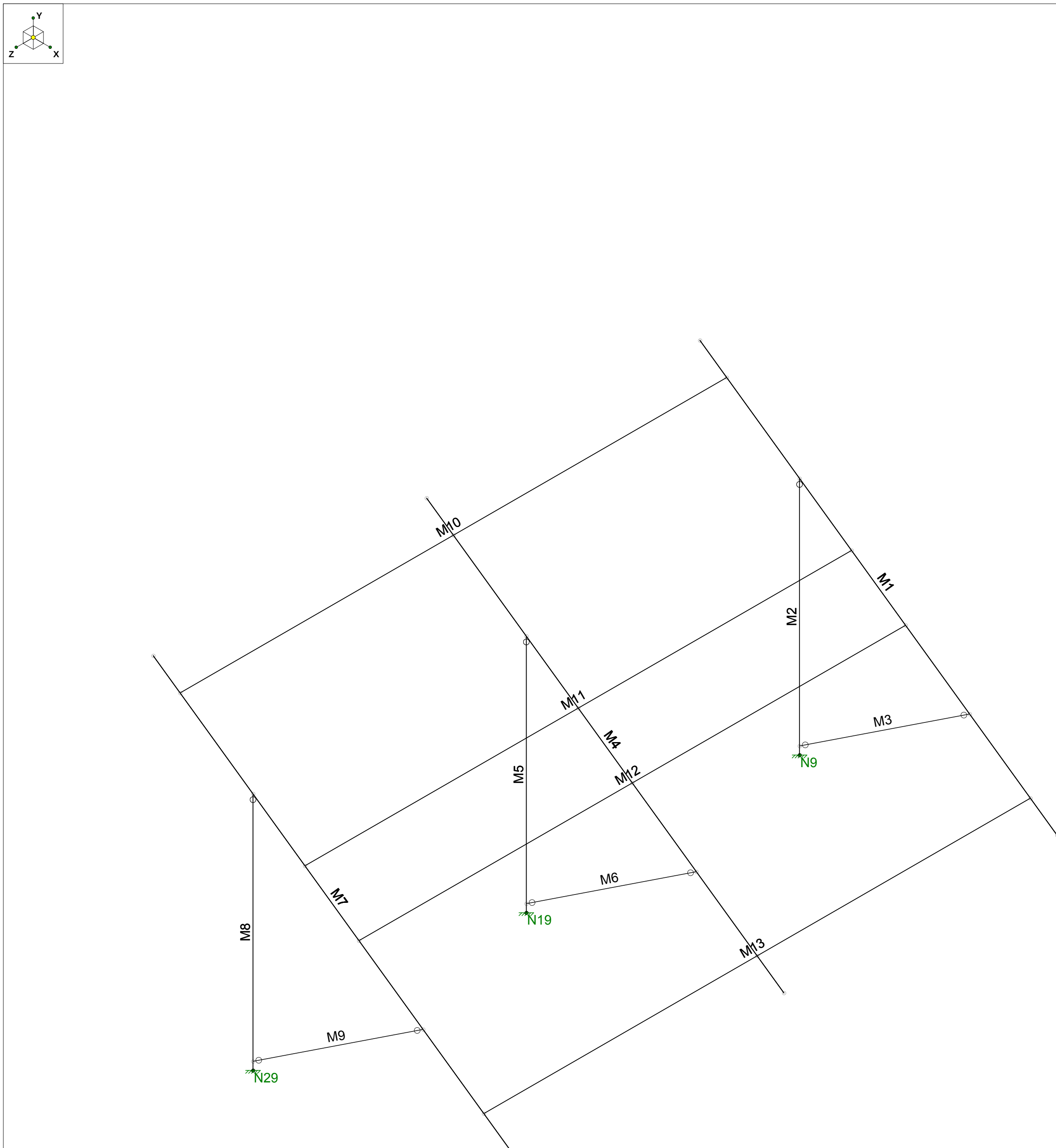


Schletter, Inc.		35° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

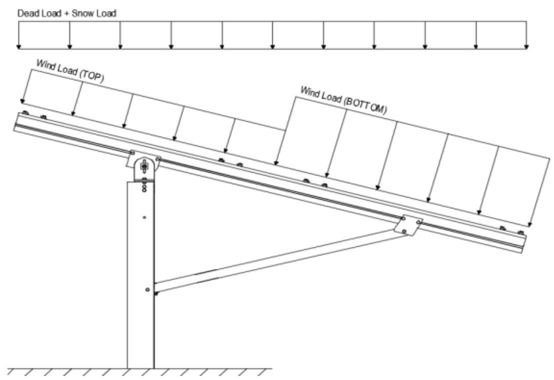
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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

PV modules are required to meet the following specifications:

	Maximum			Minimum	
Height =	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 7-10 - Chapter 26-31, Wind Loads
- ASCE 7-10 - Chapter 7, Snow Loads
- ASCE 7-10 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2012, 2015
- Aluminum Design Manual, Eighth Edition, 2005

2. LOAD ACTIONS

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

Self-weight of the PV modules.

2.2 Snow Loads
Ground Snow Load, P_g = 30.00 psf
Sloped Roof Snow Load, P_s = 14.43 psf *(ASCE 7-10, Eq. 7.4-1)*
I_s = 1.00
C_s = 0.64
C_e = 0.90
C_t = 1.20

2.3 Wind Loads
Design Wind Speed, V = 160 mph — Exposure Category = C
Height < 15 ft — Importance Category = II

Peak Velocity Pressure, q_z = 40.19 psf *Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

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 + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W [M]
1.238D + 0.875E [O]
1.1785D + 0.65625E + 0.75S [O]
0.362D + 0.875E [O]

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

Purlins	Location
M10	Top
M11	Mid-Top
M12	Mid-Bottom
M13	Bottom

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

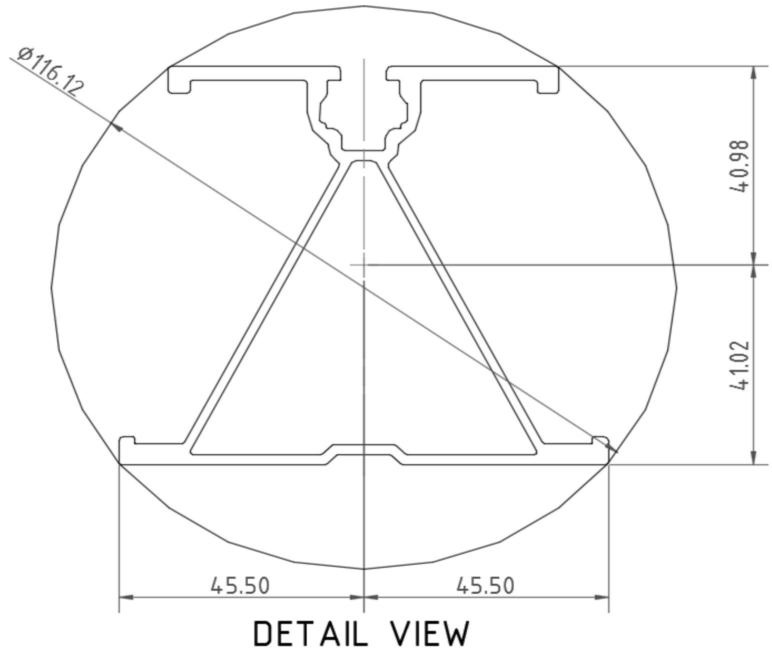
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

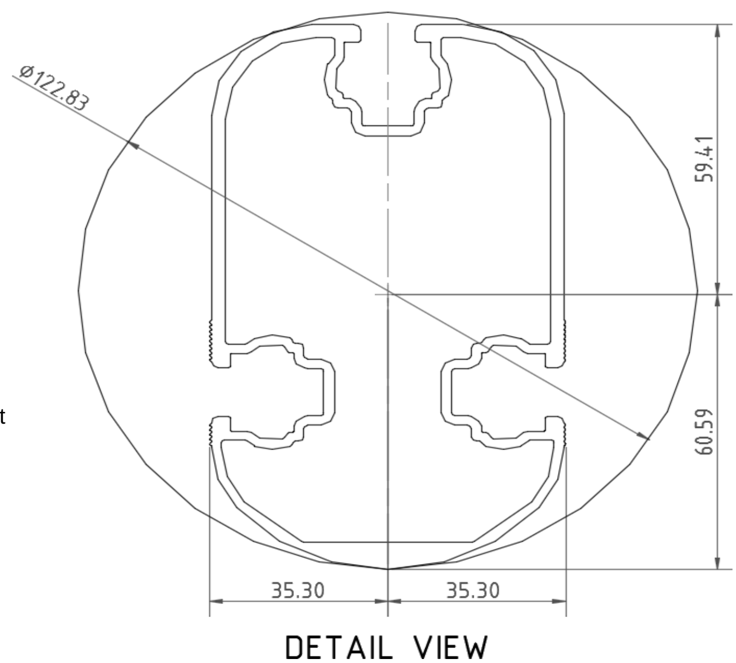
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	78	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.202	k-ft
M_z =	0.189	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	60%	



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).

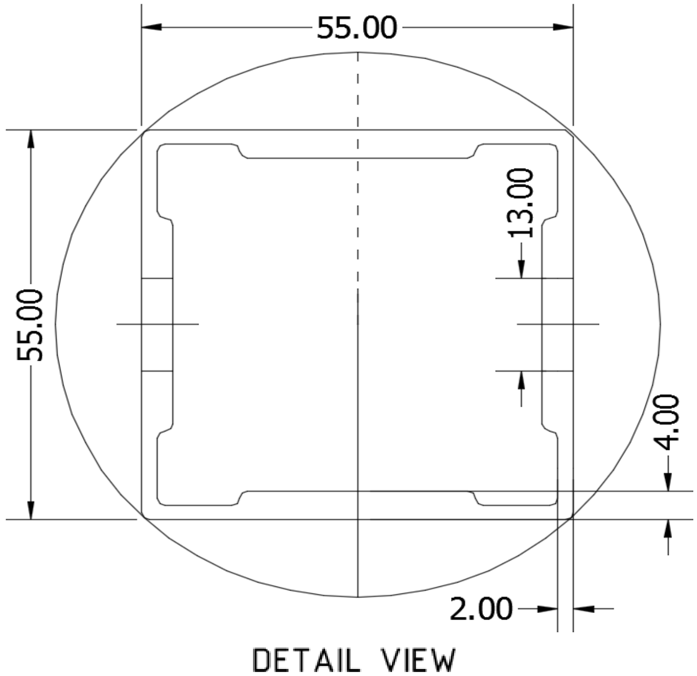
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.139	k-ft
M_z =	0.000	k-ft
P_n =	0.058	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	82%	



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).

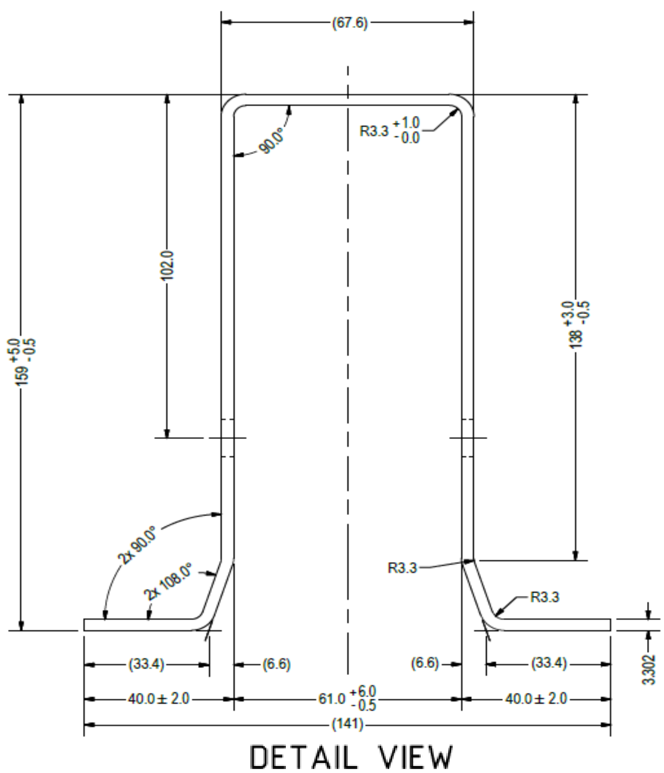
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	3.949	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	30%	



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 =	15.975	k-ft
M_z =	0.000	k-ft
P_r =	-5.046	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	28.060	k
Utilization =	97%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	6.52	k
Maximum Lateral Load =	4.20	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

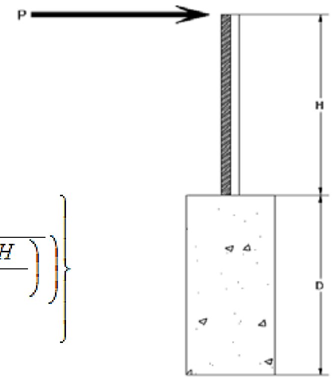
Lateral Force @ Top of Pole, P =	1.00	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	1.00	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 =	5.40	
Required Footing Depth, D =	9.73	ft
2nd Trial @ D_2 =	6.49	ft
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	1.30	ksf
Constant 2.34P/(S_1B), A =	2.71	
Required Footing Depth, D =	6.14	ft
3rd Trial @ D_3 =	6.31	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 =	2.78	
Required Footing Depth, D =	6.25	ft

4th Trial @ D_4 =	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 =	2.80	
Required Footing Depth, D =	6.27	ft
5th Trial @ D_5 =	6.27	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 =	2.80	
Required Footing Depth, D =	6.50	ft

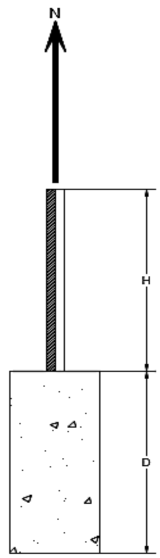
A 2ft diameter x 6.5ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.99	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 =	1.95	k
Required Concrete Volume, V =	13.48	ft^3
Required Footing Depth, D =	4.50	ft

A 2ft diameter x 4.5ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.47
2	0.4	0.2	118.10	6.37
3	0.6	0.2	118.10	6.26
4	0.8	0.2	118.10	6.16
5	1	0.2	118.10	6.05
6	1.2	0.2	118.10	5.95
7	1.4	0.2	118.10	5.85
8	1.6	0.2	118.10	5.74
9	1.8	0.2	118.10	5.64
10	2	0.2	118.10	5.54
11	2.2	0.2	118.10	5.43
12	2.4	0.2	118.10	5.33
13	2.6	0.2	118.10	5.22
14	2.8	0.2	118.10	5.12
15	3	0.2	118.10	5.02
16	3.2	0.2	118.10	4.91
17	3.4	0.2	118.10	4.81
18	3.6	0.2	118.10	4.71
19	3.8	0.2	118.10	4.60
20	4	0.2	118.10	4.50
21	4.2	0.2	118.10	4.40
22	4.4	0.2	118.10	4.29
23	0	0.0	0.00	4.29
24	0	0.0	0.00	4.29
25	0	0.0	0.00	4.29
26	0	0.0	0.00	4.29
27	0	0.0	0.00	4.29
28	0	0.0	0.00	4.29
29	0	0.0	0.00	4.29
30	0	0.0	0.00	4.29
31	0	0.0	0.00	4.29
32	0	0.0	0.00	4.29
33	0	0.0	0.00	4.29
34	0	0.0	0.00	4.29
Max	4.4	Sum	1.04	

5.5 Compressive Force Resistance

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

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

Bearing Pressure

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

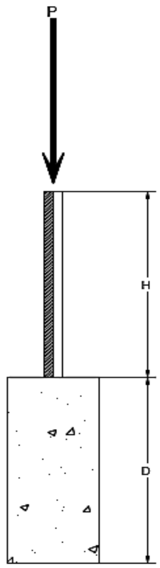
Weight of Concrete

Footing Volume	20.42	ft^3
Weight	2.96	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.30	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.68	k
Applied Force =	6.10	k
Utilization =	57%	

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



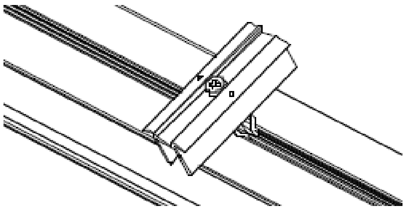
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

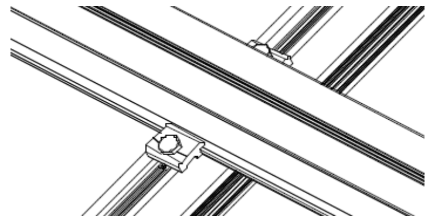
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.912	k
Allowable Uplift =	1.214	k
Utilization =	75%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.127	k
Allowable Uplift =	2.180	k
Utilization =	98%	

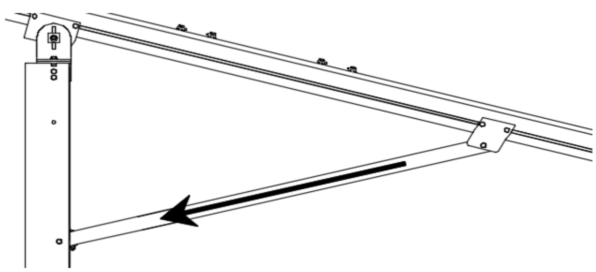


6.2 Strut Connections

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 =	3.949	k
M10 Bolt Shear Capacity =	8.894	k
Utilization =	44%	

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

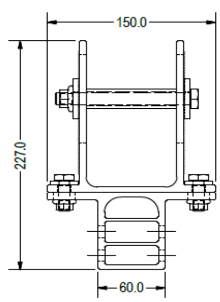


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

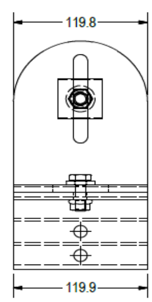
6.3 Girder to Post Connection

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.

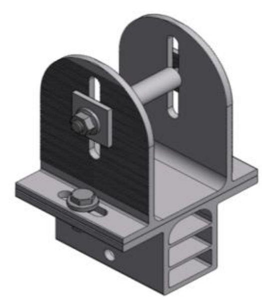
Maximum Tensile Load =	4.472	k
Allowable Load =	5.649	k
Utilization =	79%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

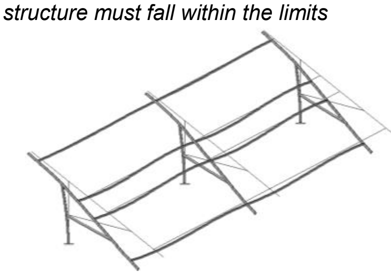
7.1 Seismic Drift

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} =	0.455	in

$0.455 \leq 1.556$, 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 = 78 in

J = 0.432

215.785

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

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= 28.6 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 = 78

J = 0.432

137.226

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

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= 29.6

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

$\lambda =$ 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

φF_L = $(\varphi ccFcy)/(\lambda^2)$

φF_L = 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = $\varphi c[Bp-1.6Dp*b/t]$

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = $\varphi c[Bp-1.6Dp*b/t]$

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = $\varphi yFcy$

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	85.68	in	
Pr =	-5.05	k	(LRFD Factored Load)
Mr (Strong) =	15.98	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 =	0.137 <	0.2		
Utilization =	0.97 <	1.0	OK	

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.137 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 97%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

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

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-134.509	-134.509	0	0
2	M11	y	-134.509	-134.509	0	0
3	M12	y	-224.182	-224.182	0	0
4	M13	y	-224.182	-224.182	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	269.018	269.018	0	0
2	M11	y	269.018	269.018	0	0
3	M12	y	134.509	134.509	0	0
4	M13	y	134.509	134.509	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 + 0.5W	Yes	Y		1	1.2	3	1.6	4	.5														
2	LRFD 1.2D + 1.0W + 0.5S	Yes	Y		1	1.2	3	.5	4	1														
3	LRFD 0.9D + 1.0W	Yes	Y		2	.9					5	1												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 0.6W	Yes	Y		1	1			4	.6														
11	ASD 1.0D + 0.75L + 0.45W + 0....	Yes	Y		1	1	3	.75	4	.45														
12	ASD 0.6D + 0.6W	Yes	Y		2	.6					5	.6												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	1060.419	2	1963.962	2	121.974	2	.177	2	.027	5	5.916	3
2		min	-1404.637	3	-1557.701	3	-253.612	5	-1.108	5	-.016	2	-.136	10
3	N19	max	3228.316	2	5469.008	2	0	2	0	2	.028	4	9.373	3
4		min	-3208.519	3	-4986.919	3	-267.842	5	-1.148	4	0	3	-.473	10
5	N29	max	1060.419	2	1963.962	2	165.81	3	.28	3	.028	4	5.916	3
6		min	-1404.637	3	-1557.701	3	-267.096	4	-1.137	4	-.008	3	-.263	5
7	Totals:	max	5349.154	2	9396.933	2	0	2						
8		min	-6017.793	3	-8102.321	3	-780.299	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	-.299	15	-.428	15	0	10	0	1	0	10	0	6
4			min	-1.274	4	-1.817	6	-1.499	5	0	1	0	5	0	15
5		3	max	-17.856	10	327.48	3	-6.37	10	.041	3	.109	4	.294	2
6			min	-123.499	1	-673.693	2	-56.645	4	-.148	2	.009	10	-.14	3
7		4	max	-18.683	10	326.417	3	-6.37	10	.041	3	.074	3	.712	2
8			min	-124.492	1	-675.111	2	-58.144	4	-.148	2	.005	10	-.343	3
9		5	max	-19.51	10	325.354	3	-6.37	10	.041	3	.041	3	1.132	2
10			min	-125.484	1	-676.528	2	-59.644	4	-.148	2	0	10	-.545	3
11		6	max	144.203	3	565.39	2	-20.509	15	.025	2	.044	2	1.096	2
12			min	-547.201	2	-176.838	3	-80.859	1	-.042	3	-.025	5	-.563	3
13		7	max	143.459	3	563.973	2	-21.519	15	.025	2	.008	2	.745	2
14			min	-548.194	2	-177.902	3	-80.859	1	-.042	3	-.05	4	-.453	3
15		8	max	142.714	3	562.555	2	-22.022	12	.025	2	-.01	10	.396	2
16			min	-549.186	2	-178.965	3	-80.859	1	-.042	3	-.081	4	-.342	3
17		9	max	86.296	3	125.129	3	-13.08	10	.013	5	.069	3	.187	2
18			min	-604.278	2	-67.073	2	-93.545	1	-.085	3	-.006	10	-.294	3
19		10	max	85.552	3	124.066	3	-13.08	10	.013	5	.031	3	.229	2
20			min	-605.27	2	-68.49	2	-94.435	4	-.085	3	-.024	2	-.372	3
21		11	max	84.808	3	123.003	3	-13.08	10	.013	5	-.005	12	.272	2
22			min	-606.263	2	-69.908	2	-95.934	4	-.085	3	-.081	4	-.448	3
23		12	max	23.456	3	835.902	3	91.955	2	.189	3	.062	1	.473	2
24			min	-722.39	1	-466.123	2	-252.939	3	-.13	2	-.034	5	-.802	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	22.711	3	834.839	3	91.955	2	.189	3	.083	2	.763	2
26			min	-723.383	1	-467.54	2	-252.939	3	-.13	2	-.116	5	-1.321	3
27		14	max	126.005	1	454.846	2	48.069	5	.156	2	.104	3	1.041	2
28			min	3.49	15	-787.049	3	-105.458	3	-.329	3	-.093	4	-1.816	3
29		15	max	125.012	1	453.429	2	46.57	5	.156	2	.039	3	.759	2
30			min	3.191	15	-788.112	3	-105.458	3	-.329	3	-.072	4	-1.328	3
31		16	max	124.02	1	452.012	2	45.07	5	.156	2	-.017	12	.478	2
32			min	2.891	15	-789.175	3	-105.458	3	-.329	3	-.087	1	-.838	3
33		17	max	123.027	1	450.594	2	43.57	5	.156	2	-.002	15	.198	2
34			min	2.592	15	-790.238	3	-105.458	3	-.329	3	-.108	1	-.348	3
35		18	max	1.274	6	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	.014	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	57.514	3	1030.44	3	0	1	.04	4	.129	4	.718	2
44			min	-240.618	1	-1874.315	2	-66.668	5	0	1	0	1	-.4	3
45		4	max	56.77	3	1029.377	3	0	1	.04	4	.087	4	1.882	2
46			min	-241.61	1	-1875.732	2	-68.168	5	0	1	0	1	-1.04	3
47		5	max	56.025	3	1028.314	3	0	1	.04	4	.045	4	3.046	2
48			min	-242.603	1	-1877.149	2	-69.667	5	0	1	0	1	-1.678	3
49		6	max	813.923	3	1787.917	2	0	1	0	1	0	1	2.866	2
50			min	-1562.527	2	-866.031	3	-53.158	4	-.032	4	-.025	5	-1.621	3
51		7	max	813.178	3	1786.5	2	0	1	0	1	0	1	1.757	2
52			min	-1563.519	2	-867.094	3	-54.658	4	-.032	4	-.058	4	-1.084	3
53		8	max	812.434	3	1785.083	2	0	1	0	1	0	1	.649	2
54			min	-1564.512	2	-868.157	3	-56.158	4	-.032	4	-.093	4	-.545	3
55		9	max	883.08	3	209.048	3	0	1	.009	4	.057	5	.014	9
56			min	-1668.543	2	-183.273	2	-128.421	4	0	1	0	1	-.257	3
57		10	max	882.335	3	207.985	3	0	1	.009	4	0	1	.098	2
58			min	-1669.536	2	-184.691	2	-129.921	4	0	1	-.023	4	-.387	3
59		11	max	881.591	3	206.922	3	0	1	.009	4	0	1	.213	2
60			min	-1670.528	2	-186.108	2	-131.42	4	0	1	-.104	4	-.516	3
61		12	max	962.104	3	2213.027	3	0	1	.114	4	0	1	.83	2
62			min	-1781.869	2	-1455.531	2	-139.874	4	0	1	-.028	4	-1.449	3
63		13	max	961.36	3	2211.964	3	0	1	.114	4	0	1	1.734	2
64			min	-1782.862	2	-1456.949	2	-141.374	4	0	1	-.116	4	-2.822	3
65		14	max	244.539	1	1164.027	2	51.32	5	0	1	0	1	2.603	2
66			min	-57.528	3	-1850.059	3	0	1	-.076	4	-.069	5	-4.139	3
67		15	max	243.546	1	1162.609	2	49.82	5	0	1	0	1	1.881	2
68			min	-58.272	3	-1851.122	3	0	1	-.076	4	-.038	5	-2.991	3
69		16	max	242.554	1	1161.192	2	48.32	5	0	1	0	1	1.16	2
70			min	-59.016	3	-1852.186	3	0	1	-.076	4	-.008	5	-1.842	3
71		17	max	241.561	1	1159.774	2	46.821	5	0	1	.022	4	.44	2
72			min	-59.761	3	-1853.249	3	0	1	-.076	4	0	1	-.692	3
73		18	max	1.274	4	1.82	6	1.5	5	0	1	0	1	0	6
74			min	.299	15	.428	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.011	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	4	-1.818	4	-1.499	5	0	1	0	5	0	15
81		3	max	14.209	5	327.48	3	54.219	1	.148	2	.064	5	.294	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	-123.499	1	-673.693	2	-33.037	5	-.041	3	-.107	3	-.14	3
83		4	max	13.745	5	326.417	3	54.219	1	.148	2	.043	5	.712	2
84			min	-124.492	1	-675.111	2	-34.537	5	-.041	3	-.074	3	-.343	3
85		5	max	13.282	5	325.354	3	54.219	1	.148	2	.021	5	1.132	2
86			min	-125.484	1	-676.528	2	-36.037	5	-.041	3	-.041	3	-.545	3
87		6	max	144.203	3	565.39	2	80.859	1	.042	3	.015	3	1.096	2
88			min	-547.201	2	-176.838	3	-19.61	5	-.028	4	-.044	2	-.563	3
89		7	max	143.459	3	563.973	2	80.859	1	.042	3	.037	3	.745	2
90			min	-548.194	2	-177.902	3	-21.11	5	-.028	4	-.04	5	-.453	3
91		8	max	142.714	3	562.555	2	80.859	1	.042	3	.065	1	.396	2
92			min	-549.186	2	-178.965	3	-22.61	5	-.028	4	-.054	5	-.342	3
93		9	max	86.296	3	125.129	3	93.545	1	.085	3	.014	5	.187	2
94			min	-604.278	2	-67.073	2	-52.826	5	.008	9	-.069	3	-.294	3
95		10	max	85.552	3	124.066	3	93.545	1	.085	3	.024	2	.229	2
96			min	-605.27	2	-68.49	2	-54.326	5	.008	9	-.031	3	-.372	3
97		11	max	84.808	3	123.003	3	93.545	1	.085	3	.075	1	.272	2
98			min	-606.263	2	-69.908	2	-55.825	5	.008	9	-.053	5	-.448	3
99		12	max	24.338	5	835.902	3	252.939	3	.13	2	-.008	10	.473	2
100			min	-722.39	1	-466.123	2	-126.27	5	-.189	3	-.062	1	-.802	3
101		13	max	23.875	5	834.839	3	252.939	3	.13	2	.103	3	.763	2
102			min	-723.383	1	-467.54	2	-127.77	5	-.189	3	-.136	4	-1.321	3
103		14	max	126.005	1	454.846	2	105.458	3	.329	3	.061	2	1.041	2
104			min	13.15	15	-787.049	3	-10.609	10	-.156	2	-.104	3	-1.816	3
105		15	max	125.012	1	453.429	2	105.458	3	.329	3	.066	1	.759	2
106			min	12.851	15	-788.112	3	-10.609	10	-.156	2	-.051	5	-1.328	3
107		16	max	124.02	1	452.012	2	105.458	3	.329	3	.087	1	.478	2
108			min	12.551	15	-789.175	3	-10.609	10	-.156	2	-.017	5	-.838	3
109		17	max	123.027	1	450.594	2	105.458	3	.329	3	.108	1	.198	2
110			min	12.252	15	-790.238	3	-10.609	10	-.156	2	.01	15	-.348	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	105.472	3	447.419	2	-11.656	15	.015	2	.135	3	.156	2
116			min	-10.61	10	-792.2	3	-121.059	1	-.029	3	.01	10	-.329	3
117		2	max	105.472	3	333.513	2	-10.176	15	.015	2	.099	3	.174	3
118			min	-10.61	10	-601.08	3	-94.3	1	-.029	3	0	10	-.126	2
119		3	max	105.472	3	219.608	2	-7.68	10	.015	2	.065	3	.539	3
120			min	-10.61	10	-409.959	3	-67.541	1	-.029	3	-.014	1	-.326	2
121		4	max	105.472	3	105.703	2	-3.591	10	.015	2	.032	3	.766	3
122			min	-10.61	10	-218.839	3	-44.186	3	-.029	3	-.053	1	-.443	2
123		5	max	105.472	3	14.596	5	.497	10	.015	2	0	3	.856	3
124			min	-10.61	10	-27.718	3	-41.967	3	-.029	3	-.073	1	-.479	2
125		6	max	105.472	3	163.402	3	12.736	1	.015	2	-.004	15	.807	3
126			min	-10.61	10	-122.107	2	-39.747	3	-.029	3	-.073	1	-.432	2
127		7	max	105.472	3	354.523	3	39.495	1	.015	2	-.005	10	.619	3
128			min	-10.61	10	-236.013	2	-37.527	3	-.029	3	-.057	3	-.302	2
129		8	max	105.472	3	545.643	3	66.254	1	.015	2	.002	10	.294	3
130			min	-10.61	10	-349.918	2	-35.307	3	-.029	3	-.083	3	-.091	2
131		9	max	105.472	3	736.764	3	93.013	1	.015	2	.041	1	.203	2
132			min	-10.61	10	-463.823	2	-33.087	3	-.029	3	-.108	3	-.169	3
133		10	max	105.472	3	927.884	3	18.148	12	.029	3	.118	1	.579	2
134			min	-10.61	10	-555.384	12	-119.772	1	-.015	2	-.131	3	-.77	3
135		11	max	105.472	3	463.823	2	33.087	3	.029	3	.041	1	.203	2
136			min	-10.61	10	-736.764	3	-93.013	1	-.015	2	-.108	3	-.169	3
137		12	max	105.472	3	349.918	2	35.307	3	.029	3	.009	5	.294	3
138			min	-10.61	10	-545.643	3	-66.254	1	-.015	2	-.083	3	-.091	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	105.472	3	236.013	2	37.527	3	.029	3	0	15	.619	3
140			min	-10.61	10	-354.523	3	-39.495	1	-.015	2	-.057	3	-.302	2
141		14	max	105.472	3	122.107	2	39.747	3	.029	3	-.004	15	.807	3
142			min	-10.61	10	-163.402	3	-12.736	1	-.015	2	-.073	1	-.432	2
143		15	max	105.472	3	27.718	3	41.967	3	.029	3	0	3	.856	3
144			min	-10.916	5	3.56	10	-5.777	5	-.015	2	-.073	1	-.479	2
145		16	max	105.472	3	218.839	3	44.186	3	.029	3	.032	3	.766	3
146			min	-18.329	5	-105.703	2	-3.488	5	-.015	2	-.053	1	-.443	2
147		17	max	105.472	3	409.959	3	67.541	1	.029	3	.065	3	.539	3
148			min	-25.743	5	-219.608	2	-1.198	5	-.015	2	-.019	4	-.326	2
149		18	max	105.472	3	601.08	3	94.3	1	.029	3	.099	3	.174	3
150			min	-33.157	5	-333.513	2	.514	15	-.015	2	-.016	5	-.126	2
151		19	max	105.472	3	792.2	3	121.059	1	.029	3	.135	3	.156	2
152			min	-40.571	5	-447.419	2	1.994	15	-.015	2	-.015	5	-.329	3
153	M11	1	max	131.177	2	393.545	2	14.128	5	0	10	.175	3	.088	4
154			min	-191.729	3	-713.608	3	-127.185	1	-.005	3	-.07	5	-.273	3
155		2	max	131.177	2	279.64	2	16.418	5	0	10	.133	3	.173	3
156			min	-191.729	3	-522.488	3	-100.427	1	-.005	3	-.059	5	-.197	2
157		3	max	131.177	2	165.735	2	18.707	5	0	10	.092	3	.481	3
158			min	-191.729	3	-331.367	3	-73.668	1	-.005	3	-.047	5	-.358	2
159		4	max	131.177	2	51.83	2	20.997	5	0	10	.052	3	.652	3
160			min	-191.729	3	-140.247	3	-53.509	3	-.005	3	-.041	4	-.437	2
161		5	max	131.177	2	50.874	3	23.287	5	0	10	.014	3	.684	3
162			min	-191.729	3	-62.076	2	-51.289	3	-.005	3	-.064	1	-.433	2
163		6	max	131.177	2	241.994	3	26.488	4	0	10	.001	5	.578	3
164			min	-191.729	3	-175.981	2	-49.069	3	-.005	3	-.069	1	-.347	2
165		7	max	131.177	2	433.115	3	35.516	4	0	10	.021	5	.334	3
166			min	-191.729	3	-289.886	2	-46.849	3	-.005	3	-.056	3	-.179	2
167		8	max	131.177	2	624.235	3	60.127	1	0	10	.042	5	.072	2
168			min	-191.729	3	-403.791	2	-44.63	3	-.005	3	-.089	3	-.048	3
169		9	max	131.177	2	815.356	3	86.886	1	0	10	.071	4	.404	2
170			min	-191.729	3	-517.696	2	-42.41	3	-.005	3	-.121	3	-.567	3
171		10	max	131.177	2	631.602	2	40.19	3	.005	3	.112	4	.819	2
172			min	-191.729	3	-1006.476	3	-113.645	1	-.002	1	-.151	3	-1.225	3
173		11	max	131.177	2	517.696	2	42.41	3	.005	3	.032	1	.404	2
174			min	-191.729	3	-815.356	3	-86.886	1	0	5	-.121	3	-.567	3
175		12	max	131.177	2	403.791	2	44.63	3	.005	3	.002	10	.072	2
176			min	-191.729	3	-624.235	3	-60.127	1	0	5	-.089	3	-.048	3
177		13	max	131.177	2	289.886	2	46.849	3	.005	3	-.005	10	.334	3
178			min	-191.729	3	-433.115	3	-33.368	1	0	5	-.056	3	-.179	2
179		14	max	131.177	2	175.981	2	49.069	3	.005	3	-.009	15	.578	3
180			min	-191.729	3	-241.994	3	-8.23	2	0	5	-.069	1	-.347	2
181		15	max	131.177	2	62.076	2	51.289	3	.005	3	.014	3	.684	3
182			min	-191.729	3	-50.874	3	-.496	10	0	5	-.064	1	-.433	2
183		16	max	131.177	2	140.247	3	53.509	3	.005	3	.052	3	.652	3
184			min	-191.729	3	-51.83	2	3.592	10	0	5	-.04	1	-.437	2
185		17	max	131.177	2	331.367	3	73.668	1	.005	3	.092	3	.481	3
186			min	-191.729	3	-165.735	2	7.681	10	0	5	-.009	2	-.358	2
187		18	max	131.177	2	522.488	3	100.427	1	.005	3	.133	3	.173	3
188			min	-191.729	3	-279.64	2	11.77	10	0	5	0	10	-.197	2
189		19	max	131.177	2	713.608	3	127.185	1	.005	3	.175	3	.046	2
190			min	-191.729	3	-393.545	2	15.858	10	0	5	.01	10	-.273	3
191	M12	1	max	28.679	5	627.074	2	20.018	5	0	2	.16	1	.109	2
192			min	-25.758	3	-305.137	3	-129.77	1	-.005	3	-.089	5	.009	9
193		2	max	21.265	5	448.405	2	22.308	5	0	2	.117	3	.229	3
194			min	-25.758	3	-211.162	3	-103.011	1	-.005	3	-.074	5	-.279	2
195		3	max	20.304	2	269.736	2	24.597	5	0	2	.079	3	.347	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-25.758	3	-117.187	3	-76.252	1	-.005	3	-.057	5	-.539	2
197		4	max	20.304	2	91.067	2	26.887	5	0	2	.043	3	.398	3
198			min	-25.758	3	-23.212	3	-49.493	1	-.005	3	-.047	4	-.669	2
199		5	max	20.304	2	70.763	3	29.177	5	0	2	.008	3	.381	3
200			min	-25.758	3	-87.602	2	-46.736	3	-.005	3	-.061	1	-.67	2
201		6	max	20.304	2	164.738	3	32.179	4	0	2	.004	5	.296	3
202			min	-25.758	3	-266.271	2	-44.516	3	-.005	3	-.068	1	-.542	2
203		7	max	20.304	2	258.713	3	41.207	4	0	2	.028	5	.143	3
204			min	-25.758	3	-444.94	2	-42.296	3	-.005	3	-.056	3	-.286	2
205		8	max	20.304	2	352.688	3	57.543	1	0	2	.053	5	.1	2
206			min	-30.484	4	-623.609	2	-40.076	3	-.005	3	-.086	3	-.078	3
207		9	max	20.304	2	446.664	3	84.301	1	0	2	.086	4	.615	2
208			min	-37.898	4	-802.278	2	-37.856	3	-.005	3	-.114	3	-.367	3
209		10	max	20.304	2	980.947	2	77.488	14	.005	3	.132	4	1.259	2
210			min	-45.311	4	-540.639	3	-111.06	1	-.001	4	-.141	3	-.723	3
211		11	max	25.408	5	802.278	2	37.856	3	.005	3	.028	1	.615	2
212			min	-25.758	3	-446.664	3	-84.301	1	0	5	-.114	3	-.367	3
213		12	max	20.304	2	623.609	2	40.076	3	.005	3	0	10	.1	2
214			min	-25.758	3	-352.688	3	-57.543	1	0	5	-.086	3	-.078	3
215		13	max	20.304	2	444.94	2	42.296	3	.005	3	-.006	10	.143	3
216			min	-25.758	3	-258.713	3	-30.784	1	0	5	-.056	3	-.286	2
217		14	max	20.304	2	266.271	2	44.516	3	.005	3	-.009	10	.296	3
218			min	-25.758	3	-164.738	3	-4.577	2	0	5	-.068	1	-.542	2
219		15	max	20.304	2	87.602	2	46.736	3	.005	3	.008	3	.381	3
220			min	-25.758	3	-70.763	3	1.588	10	0	5	-.061	1	-.67	2
221		16	max	20.304	2	23.212	3	49.493	1	.005	3	.043	3	.398	3
222			min	-25.758	3	-91.067	2	5.676	10	0	5	-.035	1	-.669	2
223		17	max	20.304	2	117.187	3	76.252	1	.005	3	.079	3	.347	3
224			min	-26.399	4	-269.736	2	9.765	10	0	5	-.001	10	-.539	2
225		18	max	20.304	2	211.162	3	103.011	1	.005	3	.117	3	.229	3
226			min	-33.813	4	-448.405	2	13.854	10	0	5	.008	10	-.279	2
227		19	max	20.304	2	305.137	3	129.77	1	.005	3	.16	1	.109	2
228			min	-41.227	4	-627.074	2	17.942	10	0	5	.019	10	-.041	5
229	M13	1	max	30.006	5	671.202	2	15.136	5	.008	3	.129	3	.148	2
230			min	-54.187	1	-329.562	3	-121.486	1	-.021	2	-.078	5	-.041	3
231		2	max	22.593	5	492.533	2	17.426	5	.008	3	.094	3	.163	3
232			min	-54.187	1	-235.587	3	-94.727	1	-.021	2	-.066	5	-.272	2
233		3	max	15.179	5	313.864	2	19.716	5	.008	3	.061	3	.3	3
234			min	-54.187	1	-141.612	3	-67.968	1	-.021	2	-.055	4	-.563	2
235		4	max	7.765	5	135.195	2	22.005	5	.008	3	.029	3	.368	3
236			min	-54.187	1	-47.636	3	-42.699	3	-.021	2	-.053	1	-.726	2
237		5	max	.382	15	46.339	3	24.295	5	.008	3	0	3	.369	3
238			min	-54.187	1	-43.474	2	-40.479	3	-.021	2	-.073	1	-.759	2
239		6	max	-4.608	15	140.314	3	29.204	4	.008	3	-.001	15	.301	3
240			min	-54.187	1	-222.143	2	-38.259	3	-.021	2	-.074	1	-.663	2
241		7	max	-6.368	10	234.289	3	39.067	1	.008	3	.018	5	.166	3
242			min	-54.187	1	-400.812	2	-36.039	3	-.021	2	-.056	3	-.438	2
243		8	max	-6.368	10	328.264	3	65.826	1	.008	3	.039	5	-.007	15
244			min	-54.187	1	-579.481	2	-33.819	3	-.021	2	-.081	3	-.084	2
245		9	max	-6.368	10	422.239	3	92.585	1	.008	3	.071	4	.399	2
246			min	-54.187	1	-758.15	2	-31.599	3	-.021	2	-.105	3	-.308	3
247		10	max	-6.368	10	936.819	2	79.027	14	0	15	.116	1	1.011	2
248			min	-54.187	1	-308.863	12	-119.344	1	-.021	2	-.127	3	-.647	3
249		11	max	19.584	5	758.15	2	31.599	3	.021	2	.04	1	.399	2
250			min	-54.187	1	-422.239	3	-92.585	1	-.008	3	-.105	3	-.308	3
251		12	max	12.17	5	579.481	2	33.819	3	.021	2	.002	10	.004	5
252			min	-54.187	1	-328.264	3	-65.826	1	-.008	3	-.081	3	-.084	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	4.756	5	400.812	2	36.039	3	.021	2	-.006	10	.166	3
254			min	-54.187	1	-234.289	3	-39.067	1	-.008	3	-.056	3	-.438	2
255		14	max	-1.638	15	222.143	2	38.259	3	.021	2	-.007	15	.301	3
256			min	-54.187	1	-140.314	3	-12.308	1	-.008	3	-.074	1	-.663	2
257		15	max	-6.368	10	43.474	2	40.479	3	.021	2	.008	5	.369	3
258			min	-54.187	1	-46.339	3	-.153	10	-.008	3	-.073	1	-.759	2
259		16	max	-6.368	10	47.636	3	42.699	3	.021	2	.029	3	.368	3
260			min	-54.187	1	-135.195	2	3.936	10	-.008	3	-.053	1	-.726	2
261		17	max	-6.368	10	141.612	3	67.968	1	.021	2	.061	3	.3	3
262			min	-54.187	1	-313.864	2	8.024	10	-.008	3	-.014	1	-.563	2
263		18	max	-6.368	10	235.587	3	94.727	1	.021	2	.094	3	.163	3
264			min	-54.187	1	-492.533	2	12.113	10	-.008	3	0	10	-.272	2
265		19	max	-6.368	10	329.562	3	121.486	1	.021	2	.133	4	.148	2
266			min	-54.187	1	-671.202	2	16.202	10	-.008	3	.011	10	-.041	3
267	M2	1	max	1963.962	2	1404.134	3	122.022	2	.027	5	1.108	5	5.916	3
268			min	-1557.701	3	-1060.486	2	-253.627	5	-.016	2	-.177	2	-.136	10
269		2	max	1217.811	2	948.544	3	83.358	2	0	2	1.002	5	5.5	3
270			min	-1268.994	3	-.906	10	-227.975	5	0	3	-.135	2	-.005	10
271		3	max	1214.705	2	948.544	3	83.358	2	0	2	.924	5	5.177	3
272			min	-1271.324	3	-.906	10	-225.283	5	0	3	-.106	2	-.005	10
273		4	max	1211.599	2	948.544	3	83.358	2	0	2	.848	5	4.853	3
274			min	-1273.653	3	-.906	10	-222.591	5	0	3	-.078	2	-.005	10
275		5	max	1208.493	2	948.544	3	83.358	2	0	2	.773	5	4.53	3
276			min	-1275.983	3	-.906	10	-219.899	5	0	3	-.05	2	-.004	10
277		6	max	1205.387	2	948.544	3	83.358	2	0	2	.698	4	4.206	3
278			min	-1278.312	3	-.906	10	-217.207	5	0	3	-.022	1	-.004	10
279		7	max	1202.281	2	948.544	3	83.358	2	0	2	.626	4	3.883	3
280			min	-1280.642	3	-.906	10	-214.515	5	0	3	-.027	3	-.004	10
281		8	max	1199.175	2	948.544	3	83.358	2	0	2	.555	4	3.559	3
282			min	-1282.972	3	-.906	10	-211.823	5	0	3	-.078	3	-.003	10
283		9	max	1196.068	2	948.544	3	83.358	2	0	2	.485	4	3.236	3
284			min	-1285.301	3	-.906	10	-209.131	5	0	3	-.128	3	-.003	10
285		10	max	1192.962	2	948.544	3	83.358	2	0	2	.415	4	2.912	3
286			min	-1287.631	3	-.906	10	-206.439	5	0	3	-.178	3	-.003	10
287		11	max	1189.856	2	948.544	3	83.358	2	0	2	.347	4	2.588	3
288			min	-1289.96	3	-.906	10	-203.747	5	0	3	-.229	3	-.002	10
289		12	max	1186.75	2	948.544	3	83.358	2	0	2	.279	4	2.265	3
290			min	-1292.29	3	-.906	10	-201.055	5	0	3	-.279	3	-.002	10
291		13	max	1183.644	2	948.544	3	83.358	2	0	2	.213	4	1.941	3
292			min	-1294.619	3	-.906	10	-198.363	5	0	3	-.329	3	-.002	10
293		14	max	1180.538	2	948.544	3	83.358	2	0	2	.206	2	1.618	3
294			min	-1296.949	3	-.906	10	-195.671	5	0	3	-.38	3	-.002	10
295		15	max	1177.432	2	948.544	3	83.358	2	0	2	.235	2	1.294	3
296			min	-1299.279	3	-.906	10	-192.979	5	0	3	-.43	3	-.001	10
297		16	max	1174.326	2	948.544	3	83.358	2	0	2	.263	2	.971	3
298			min	-1301.608	3	-.906	10	-190.287	5	0	3	-.48	3	0	10
299		17	max	1171.22	2	948.544	3	83.358	2	0	2	.292	2	.647	3
300			min	-1303.938	3	-.906	10	-187.595	5	0	3	-.531	3	0	10
301		18	max	1168.114	2	948.544	3	83.358	2	0	2	.32	2	.324	3
302			min	-1306.267	3	-.906	10	-184.904	5	0	3	-.581	3	0	10
303		19	max	1165.008	2	948.544	3	83.358	2	0	2	.349	2	0	1
304			min	-1308.597	3	-.906	10	-182.212	5	0	3	-.631	3	0	1
305	M5	1	max	5469.008	2	3205.786	3	0	1	.028	4	1.148	4	9.373	3
306			min	-4986.919	3	-3229.048	2	-267.871	5	0	1	0	1	-.473	10
307		2	max	3286.963	2	1469.555	3	0	1	0	1	1.037	4	8.522	3
308			min	-3882.839	3	-14.532	10	-241.533	4	0	4	0	1	-.084	10
309		3	max	3283.857	2	1469.555	3	0	1	0	1	.955	4	8.02	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	-3885.168	3	-14.532	10	-238.841	4	0	4	0	1	-.079	10
311		4	max	3280.751	2	1469.555	3	0	1	0	1	.874	4	7.519	3
312			min	-3887.498	3	-14.532	10	-236.15	4	0	4	0	1	-.074	10
313		5	max	3277.645	2	1469.555	3	0	1	0	1	.794	4	7.018	3
314			min	-3889.827	3	-14.532	10	-233.458	4	0	4	0	1	-.069	10
315		6	max	3274.539	2	1469.555	3	0	1	0	1	.715	4	6.517	3
316			min	-3892.157	3	-14.532	10	-230.766	4	0	4	0	1	-.064	10
317		7	max	3271.433	2	1469.555	3	0	1	0	1	.637	4	6.015	3
318			min	-3894.486	3	-14.532	10	-228.074	4	0	4	0	1	-.059	10
319		8	max	3268.327	2	1469.555	3	0	1	0	1	.559	4	5.514	3
320			min	-3896.816	3	-14.532	10	-225.382	4	0	4	0	1	-.055	10
321		9	max	3265.221	2	1469.555	3	0	1	0	1	.483	4	5.013	3
322			min	-3899.146	3	-14.532	10	-222.69	4	0	4	0	1	-.05	10
323		10	max	3262.115	2	1469.555	3	0	1	0	1	.407	4	4.512	3
324			min	-3901.475	3	-14.532	10	-219.998	4	0	4	0	1	-.045	10
325		11	max	3259.009	2	1469.555	3	0	1	0	1	.333	4	4.01	3
326			min	-3903.805	3	-14.532	10	-217.306	4	0	4	0	1	-.04	10
327		12	max	3255.903	2	1469.555	3	0	1	0	1	.259	4	3.509	3
328			min	-3906.134	3	-14.532	10	-214.614	4	0	4	0	1	-.035	10
329		13	max	3252.796	2	1469.555	3	0	1	0	1	.186	4	3.008	3
330			min	-3908.464	3	-14.532	10	-211.922	4	0	4	0	1	-.03	10
331		14	max	3249.69	2	1469.555	3	0	1	0	1	.114	4	2.506	3
332			min	-3910.793	3	-14.532	10	-209.23	4	0	4	0	1	-.025	10
333		15	max	3246.584	2	1469.555	3	0	1	0	1	.044	4	2.005	3
334			min	-3913.123	3	-14.532	10	-206.538	4	0	4	0	1	-.02	10
335		16	max	3243.478	2	1469.555	3	0	1	0	1	0	1	1.504	3
336			min	-3915.453	3	-14.532	10	-203.846	4	0	4	-.026	5	-.015	10
337		17	max	3240.372	2	1469.555	3	0	1	0	1	0	1	1.003	3
338			min	-3917.782	3	-14.532	10	-201.154	4	0	4	-.096	4	-.01	10
339		18	max	3237.266	2	1469.555	3	0	1	0	1	0	1	.501	3
340			min	-3920.112	3	-14.532	10	-198.462	4	0	4	-.164	4	-.005	10
341		19	max	3234.16	2	1469.555	3	0	1	0	1	0	1	0	1
342			min	-3922.441	3	-14.532	10	-195.77	4	0	4	-.231	4	0	1
343	M8	1	max	1963.962	2	1404.134	3	165.751	3	.028	4	1.137	4	5.916	3
344			min	-1557.701	3	-1060.486	2	-267.149	4	-.008	3	-.28	3	-.263	5
345		2	max	1217.811	2	948.544	3	147.583	3	0	3	1.026	4	5.5	3
346			min	-1268.994	3	-41.437	5	-238.297	4	0	2	-.224	3	-.24	5
347		3	max	1214.705	2	948.544	3	147.583	3	0	3	.945	4	5.177	3
348			min	-1271.324	3	-41.437	5	-235.605	4	0	2	-.174	3	-.226	5
349		4	max	1211.599	2	948.544	3	147.583	3	0	3	.865	4	4.853	3
350			min	-1273.653	3	-41.437	5	-232.914	4	0	2	-.124	3	-.212	5
351		5	max	1208.493	2	948.544	3	147.583	3	0	3	.786	4	4.53	3
352			min	-1275.983	3	-41.437	5	-230.222	4	0	2	-.073	3	-.198	5
353		6	max	1205.387	2	948.544	3	147.583	3	0	3	.708	4	4.206	3
354			min	-1278.312	3	-41.437	5	-227.53	4	0	2	-.023	3	-.184	5
355		7	max	1202.281	2	948.544	3	147.583	3	0	3	.631	4	3.883	3
356			min	-1280.642	3	-41.437	5	-224.838	4	0	2	-.007	2	-.17	5
357		8	max	1199.175	2	948.544	3	147.583	3	0	3	.554	4	3.559	3
358			min	-1282.972	3	-41.437	5	-222.146	4	0	2	-.036	2	-.155	5
359		9	max	1196.068	2	948.544	3	147.583	3	0	3	.479	4	3.236	3
360			min	-1285.301	3	-41.437	5	-219.454	4	0	2	-.064	2	-.141	5
361		10	max	1192.962	2	948.544	3	147.583	3	0	3	.406	5	2.912	3
362			min	-1287.631	3	-41.437	5	-216.762	4	0	2	-.093	2	-.127	5
363		11	max	1189.856	2	948.544	3	147.583	3	0	3	.335	5	2.588	3
364			min	-1289.96	3	-41.437	5	-214.07	4	0	2	-.121	2	-.113	5
365		12	max	1186.75	2	948.544	3	147.583	3	0	3	.279	3	2.265	3
366			min	-1292.29	3	-41.437	5	-211.378	4	0	2	-.15	2	-.099	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	1183.644	2	948.544	3	147.583	3	0	3	.329	3	1.941	3
368			min	-1294.619	3	-41.437	5	-208.686	4	0	2	-.178	2	-.085	5
369		14	max	1180.538	2	948.544	3	147.583	3	0	3	.38	3	1.618	3
370			min	-1296.949	3	-41.437	5	-205.994	4	0	2	-.206	2	-.071	5
371		15	max	1177.432	2	948.544	3	147.583	3	0	3	.43	3	1.294	3
372			min	-1299.279	3	-41.437	5	-203.302	4	0	2	-.235	2	-.057	5
373		16	max	1174.326	2	948.544	3	147.583	3	0	3	.48	3	.971	3
374			min	-1301.608	3	-41.437	5	-200.61	4	0	2	-.263	2	-.042	5
375		17	max	1171.22	2	948.544	3	147.583	3	0	3	.531	3	.647	3
376			min	-1303.938	3	-41.437	5	-197.918	4	0	2	-.292	2	-.028	5
377		18	max	1168.114	2	948.544	3	147.583	3	0	3	.581	3	.324	3
378			min	-1306.267	3	-41.437	5	-195.226	4	0	2	-.32	2	-.014	5
379		19	max	1165.008	2	948.544	3	147.583	3	0	3	.631	3	0	1
380			min	-1308.597	3	-41.437	5	-192.534	4	0	2	-.349	2	0	1
381	M3	1	max	1340.785	2	4.147	4	38.506	2	.003	3	.036	5	0	1
382			min	-534.916	3	.975	15	-23.197	5	-.005	4	-.017	2	0	1
383		2	max	1340.547	2	3.686	4	38.506	2	.003	3	.029	5	0	15
384			min	-535.094	3	.866	15	-22.824	5	-.005	4	-.006	2	-.001	4
385		3	max	1340.309	2	3.225	4	38.506	2	.003	3	.023	4	0	15
386			min	-535.273	3	.758	15	-22.45	5	-.005	4	-.003	3	-.002	4
387		4	max	1340.071	2	2.765	4	38.506	2	.003	3	.017	4	0	15
388			min	-535.451	3	.65	15	-22.077	5	-.005	4	-.008	3	-.003	4
389		5	max	1339.833	2	2.304	4	38.506	2	.003	3	.027	2	0	15
390			min	-535.63	3	.542	15	-21.704	5	-.005	4	-.013	3	-.004	4
391		6	max	1339.595	2	1.843	4	38.506	2	.003	3	.039	2	-.001	15
392			min	-535.808	3	.433	15	-21.33	5	-.005	4	-.019	3	-.004	4
393		7	max	1339.357	2	1.382	4	38.506	2	.003	3	.05	2	-.001	15
394			min	-535.987	3	.325	15	-20.957	5	-.005	4	-.024	3	-.005	4
395		8	max	1339.119	2	.922	4	38.506	2	.003	3	.061	2	-.001	15
396			min	-536.166	3	.217	15	-20.584	5	-.005	4	-.029	3	-.005	4
397		9	max	1338.881	2	.461	4	38.506	2	.003	3	.072	2	-.001	15
398			min	-536.344	3	.108	15	-20.21	5	-.005	4	-.035	3	-.005	4
399		10	max	1338.643	2	0	1	38.506	2	.003	3	.083	2	-.001	15
400			min	-536.523	3	0	1	-19.837	5	-.005	4	-.04	3	-.005	4
401		11	max	1338.405	2	-.108	15	38.506	2	.003	3	.095	2	-.001	15
402			min	-536.701	3	-.461	6	-19.464	5	-.005	4	-.045	3	-.005	4
403		12	max	1338.167	2	-.217	15	38.506	2	.003	3	.106	2	-.001	15
404			min	-536.88	3	-.922	6	-19.09	5	-.005	4	-.051	3	-.005	4
405		13	max	1337.929	2	-.325	15	38.506	2	.003	3	.117	2	-.001	15
406			min	-537.058	3	-1.382	6	-18.717	5	-.005	4	-.056	3	-.005	4
407		14	max	1337.691	2	-.433	15	38.506	2	.003	3	.128	2	-.001	15
408			min	-537.237	3	-1.843	6	-18.344	5	-.005	4	-.061	3	-.004	4
409		15	max	1337.453	2	-.542	15	38.506	2	.003	3	.139	2	0	15
410			min	-537.415	3	-2.304	6	-18.327	3	-.005	4	-.067	3	-.004	4
411		16	max	1337.215	2	-.65	15	38.506	2	.003	3	.15	2	0	15
412			min	-537.594	3	-2.765	6	-18.327	3	-.005	4	-.072	3	-.003	4
413		17	max	1336.977	2	-.758	15	38.506	2	.003	3	.162	2	0	15
414			min	-537.772	3	-3.225	6	-18.327	3	-.005	4	-.077	3	-.002	4
415		18	max	1336.739	2	-.866	15	38.506	2	.003	3	.173	2	0	15
416			min	-537.951	3	-3.686	6	-18.327	3	-.005	4	-.083	3	-.001	4
417		19	max	1336.501	2	-.975	15	38.506	2	.003	3	.184	2	0	1
418			min	-538.129	3	-4.147	6	-18.327	3	-.005	4	-.088	3	0	1
419	M6	1	max	3942.232	2	4.147	6	0	1	0	1	.037	4	0	1
420			min	-2032.363	3	.975	15	-25.572	4	-.004	4	0	1	0	1
421		2	max	3941.994	2	3.686	6	0	1	0	1	.03	4	0	15
422			min	-2032.541	3	.866	15	-25.199	4	-.004	4	0	1	-.001	6
423		3	max	3941.756	2	3.225	6	0	1	0	1	.022	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	-2032.72	3	.758	15	-24.825	4	-.004	4	0	1	-.002	6
425		4	max	3941.518	2	2.765	6	0	1	0	1	.015	4	0	15
426			min	-2032.898	3	.65	15	-24.452	4	-.004	4	0	1	-.003	6
427		5	max	3941.28	2	2.304	6	0	1	0	1	.008	4	0	15
428			min	-2033.077	3	.542	15	-24.079	4	-.004	4	0	1	-.004	6
429		6	max	3941.042	2	1.843	6	0	1	0	1	.001	4	-.001	15
430			min	-2033.255	3	.433	15	-23.705	4	-.004	4	0	1	-.004	6
431		7	max	3940.804	2	1.382	6	0	1	0	1	0	1	-.001	15
432			min	-2033.434	3	.325	15	-23.332	4	-.004	4	-.006	4	-.005	6
433		8	max	3940.566	2	.922	6	0	1	0	1	0	1	-.001	15
434			min	-2033.612	3	.217	15	-22.959	4	-.004	4	-.012	4	-.005	6
435		9	max	3940.328	2	.461	6	0	1	0	1	0	1	-.001	15
436			min	-2033.791	3	.108	15	-22.585	4	-.004	4	-.019	4	-.005	6
437		10	max	3940.09	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2033.969	3	0	1	-22.212	4	-.004	4	-.026	4	-.005	6
439		11	max	3939.852	2	-.108	15	0	1	0	1	0	1	-.001	15
440			min	-2034.148	3	-.461	4	-21.839	4	-.004	4	-.032	4	-.005	6
441		12	max	3939.614	2	-.217	15	0	1	0	1	0	1	-.001	15
442			min	-2034.326	3	-.922	4	-21.465	4	-.004	4	-.038	4	-.005	6
443		13	max	3939.376	2	-.325	15	0	1	0	1	0	1	-.001	15
444			min	-2034.505	3	-1.382	4	-21.092	4	-.004	4	-.044	4	-.005	6
445		14	max	3939.138	2	-.433	15	0	1	0	1	0	1	-.001	15
446			min	-2034.683	3	-1.843	4	-20.719	4	-.004	4	-.05	4	-.004	6
447		15	max	3938.9	2	-.542	15	0	1	0	1	0	1	0	15
448			min	-2034.862	3	-2.304	4	-20.345	4	-.004	4	-.056	4	-.004	6
449		16	max	3938.662	2	-.65	15	0	1	0	1	0	1	0	15
450			min	-2035.04	3	-2.765	4	-19.972	4	-.004	4	-.062	4	-.003	6
451		17	max	3938.424	2	-.758	15	0	1	0	1	0	1	0	15
452			min	-2035.219	3	-3.225	4	-19.599	4	-.004	4	-.068	4	-.002	6
453		18	max	3938.186	2	-.866	15	0	1	0	1	0	1	0	15
454			min	-2035.397	3	-3.686	4	-19.225	4	-.004	4	-.074	4	-.001	6
455		19	max	3937.948	2	-.975	15	0	1	0	1	0	1	0	1
456			min	-2035.576	3	-4.147	4	-18.852	4	-.004	4	-.079	4	0	1
457	M9	1	max	1340.785	2	4.147	6	18.327	3	.004	2	.038	4	0	1
458			min	-534.916	3	.975	15	-38.506	2	-.005	5	-.008	3	0	1
459		2	max	1340.547	2	3.686	6	18.327	3	.004	2	.03	4	0	15
460			min	-535.094	3	.866	15	-38.506	2	-.005	5	-.003	3	-.001	6
461		3	max	1340.309	2	3.225	6	18.327	3	.004	2	.022	5	0	15
462			min	-535.273	3	.758	15	-38.506	2	-.005	5	-.005	2	-.002	6
463		4	max	1340.071	2	2.765	6	18.327	3	.004	2	.015	5	0	15
464			min	-535.451	3	.65	15	-38.506	2	-.005	5	-.016	2	-.003	6
465		5	max	1339.833	2	2.304	6	18.327	3	.004	2	.013	3	0	15
466			min	-535.63	3	.542	15	-38.506	2	-.005	5	-.027	2	-.004	6
467		6	max	1339.595	2	1.843	6	18.327	3	.004	2	.019	3	-.001	15
468			min	-535.808	3	.433	15	-38.506	2	-.005	5	-.039	2	-.004	6
469		7	max	1339.357	2	1.382	6	18.327	3	.004	2	.024	3	-.001	15
470			min	-535.987	3	.325	15	-38.506	2	-.005	5	-.05	2	-.005	6
471		8	max	1339.119	2	.922	6	18.327	3	.004	2	.029	3	-.001	15
472			min	-536.166	3	.217	15	-38.506	2	-.005	5	-.061	2	-.005	6
473		9	max	1338.881	2	.461	6	18.327	3	.004	2	.035	3	-.001	15
474			min	-536.344	3	.108	15	-38.506	2	-.005	5	-.072	2	-.005	6
475		10	max	1338.643	2	0	1	18.327	3	.004	2	.04	3	-.001	15
476			min	-536.523	3	0	1	-38.506	2	-.005	5	-.083	2	-.005	6
477		11	max	1338.405	2	-.108	15	18.327	3	.004	2	.045	3	-.001	15
478			min	-536.701	3	-.461	4	-38.506	2	-.005	5	-.095	2	-.005	6
479		12	max	1338.167	2	-.217	15	18.327	3	.004	2	.051	3	-.001	15
480			min	-536.88	3	-.922	4	-38.506	2	-.005	5	-.106	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	1337.929	2	-.325	15	18.327	3	.004	2	.056	3	-.001	15
482			min	-537.058	3	-1.382	4	-38.506	2	-.005	5	-.117	2	-.005	6
483		14	max	1337.691	2	-.433	15	18.327	3	.004	2	.061	3	-.001	15
484			min	-537.237	3	-1.843	4	-38.506	2	-.005	5	-.128	2	-.004	6
485		15	max	1337.453	2	-.542	15	18.327	3	.004	2	.067	3	0	15
486			min	-537.415	3	-2.304	4	-38.506	2	-.005	5	-.139	2	-.004	6
487		16	max	1337.215	2	-.65	15	18.327	3	.004	2	.072	3	0	15
488			min	-537.594	3	-2.765	4	-38.506	2	-.005	5	-.15	2	-.003	6
489		17	max	1336.977	2	-.758	15	18.327	3	.004	2	.077	3	0	15
490			min	-537.772	3	-3.225	4	-38.506	2	-.005	5	-.162	2	-.002	6
491		18	max	1336.739	2	-.866	15	18.327	3	.004	2	.083	3	0	15
492			min	-537.951	3	-3.686	4	-38.506	2	-.005	5	-.173	2	-.001	6
493		19	max	1336.501	2	-.975	15	18.327	3	.004	2	.088	3	0	1
494			min	-538.129	3	-4.147	4	-38.506	2	-.005	5	-.184	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	0	10	-.027	15	.01	1	4.91e-3	3	NC	3	NC	1
2			min	-.328	3	-.284	2	-.352	5	-1.252e-2	2	573.582	1	730.574	5
3		2	max	0	10	-.023	15	.003	1	4.91e-3	3	NC	2	NC	1
4			min	-.328	3	-.225	1	-.34	4	-1.252e-2	2	760.93	1	784.807	5
5		3	max	0	10	-.019	15	0	10	4.591e-3	3	NC	3	NC	1
6			min	-.328	3	-.168	1	-.328	4	-1.136e-2	2	911.334	14	851.674	5
7		4	max	0	10	-.015	15	-.001	10	4.103e-3	3	NC	3	NC	1
8			min	-.328	3	-.136	3	-.312	4	-9.579e-3	2	958.476	2	949.019	5
9		5	max	0	10	-.012	15	-.002	10	3.614e-3	3	NC	3	NC	1
10			min	-.328	3	-.129	3	-.294	4	-7.797e-3	2	694.626	2	1088.682	5
11		6	max	0	10	.005	10	0	12	3.716e-3	3	NC	5	NC	1
12			min	-.328	3	-.115	3	-.274	4	-7.245e-3	2	582.665	2	1286.329	5
13		7	max	0	10	.024	2	0	3	4.226e-3	3	NC	5	NC	1
14			min	-.328	3	-.093	3	-.256	4	-7.544e-3	2	532.812	2	1557.016	5
15		8	max	0	10	.035	2	0	3	4.736e-3	3	NC	5	NC	1
16			min	-.328	3	-.064	3	-.239	4	-7.842e-3	2	510.083	2	1926.928	5
17		9	max	0	10	.041	2	0	10	5.431e-3	3	NC	5	NC	1
18			min	-.328	3	-.031	3	-.224	4	-7.667e-3	2	498.841	2	2433.713	5
19		10	max	0	10	.05	1	0	2	6.451e-3	3	NC	5	NC	1
20			min	-.328	3	.004	12	-.21	4	-6.652e-3	2	492.422	2	3299.807	5
21		11	max	0	10	.062	1	0	3	7.47e-3	3	NC	5	NC	1
22			min	-.328	3	.009	15	-.196	4	-5.638e-3	2	491.831	2	4985.873	5
23		12	max	0	10	.097	3	.003	3	6.387e-3	3	NC	5	NC	1
24			min	-.328	3	.012	15	-.184	4	-4.271e-3	2	497.919	2	9084.834	5
25		13	max	0	10	.156	3	.007	3	4.115e-3	3	NC	5	NC	1
26			min	-.328	3	.012	10	-.173	4	-3.083e-3	4	455.498	3	NC	1
27		14	max	0	10	.234	3	.007	3	1.981e-3	3	NC	5	NC	1
28			min	-.328	3	-.002	10	-.166	4	-4.081e-3	4	360.499	3	NC	1
29		15	max	0	10	.336	3	.004	3	5.939e-3	3	NC	5	NC	1
30			min	-.328	3	-.023	2	-.164	5	-3.457e-3	4	282.824	3	NC	1
31		16	max	0	10	.456	3	.005	1	9.898e-3	3	NC	5	NC	1
32			min	-.328	3	-.068	2	-.164	5	-4.967e-3	2	225.494	3	NC	1
33		17	max	0	10	.588	3	.003	1	1.386e-2	3	NC	4	NC	1
34			min	-.328	3	-.12	2	-.165	4	-6.844e-3	2	184.497	3	NC	1
35		18	max	0	10	.725	3	0	10	1.644e-2	3	NC	4	NC	1
36			min	-.328	3	-.174	2	-.168	4	-8.067e-3	2	155.289	3	NC	1
37		19	max	0	10	.862	3	-.001	10	1.644e-2	3	NC	1	NC	1
38			min	-.328	3	-.228	2	-.172	4	-8.067e-3	2	134.082	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	.002	10	-.018	15	0	1	2.214e-4	4	NC	3	NC	1
40			min	-.505	3	-.647	2	-.349	4	0	1	408.93	1	731.971	4
41		2	max	.002	10	-.015	15	0	1	2.214e-4	4	8141.928	2	NC	1
42			min	-.505	3	-.493	2	-.339	4	0	1	643.571	1	773.7	4
43		3	max	.002	10	-.012	15	0	1	0	1	NC	11	NC	1
44			min	-.505	3	-.338	2	-.328	4	-9.255e-5	4	782.649	2	826.319	4
45		4	max	.002	10	-.008	15	0	1	0	1	NC	15	NC	1
46			min	-.505	3	-.203	1	-.313	4	-5.741e-4	4	423.314	2	912.609	4
47		5	max	.002	10	-.005	15	0	1	0	1	NC	5	NC	1
48			min	-.505	3	-.184	3	-.295	4	-1.056e-3	4	307.436	2	1043.906	4
49		6	max	.002	10	.007	10	0	1	0	1	NC	5	NC	1
50			min	-.505	3	-.175	3	-.275	4	-1.023e-3	4	261.763	2	1235.131	4
51		7	max	.003	10	.038	2	0	1	0	1	NC	5	NC	1
52			min	-.506	3	-.143	3	-.256	4	-6.346e-4	4	244.902	2	1498.588	4
53		8	max	.003	10	.049	2	0	1	0	1	NC	5	NC	1
54			min	-.506	3	-.096	3	-.239	4	-2.463e-4	4	240.104	2	1849.744	4
55		9	max	.003	10	.051	2	0	1	0	1	NC	4	NC	1
56			min	-.506	3	-.042	3	-.225	4	-3.689e-5	4	239.013	2	2297.943	4
57		10	max	.004	10	.066	1	0	1	0	1	NC	4	NC	1
58			min	-.507	3	.003	15	-.21	4	-1.437e-4	4	237.606	2	3071.167	4
59		11	max	.004	10	.084	1	0	1	0	1	NC	4	NC	1
60			min	-.507	3	.004	15	-.196	4	-2.505e-4	4	236.781	2	4499.171	4
61		12	max	.004	10	.148	3	0	1	0	1	NC	5	NC	1
62			min	-.507	3	.006	15	-.185	4	-1.165e-3	4	237.043	2	7243.142	4
63		13	max	.005	10	.237	3	0	1	0	1	NC	5	NC	1
64			min	-.508	3	.007	15	-.175	4	-2.537e-3	4	242.068	2	NC	1
65		14	max	.005	10	.365	3	0	1	0	1	NC	5	NC	1
66			min	-.508	3	-.007	10	-.169	4	-3.859e-3	4	258.799	2	NC	1
67		15	max	.005	10	.549	3	0	1	0	1	NC	5	NC	1
68			min	-.508	3	-.063	2	-.168	4	-2.95e-3	4	216.195	3	NC	1
69		16	max	.005	10	.774	3	0	1	0	1	NC	5	NC	1
70			min	-.508	3	-.16	2	-.167	4	-2.041e-3	4	158.576	3	NC	1
71		17	max	.005	10	1.025	3	0	1	0	1	NC	5	NC	1
72			min	-.508	3	-.273	2	-.168	4	-1.132e-3	4	122.296	3	NC	1
73		18	max	.005	10	1.284	3	0	1	0	1	NC	4	NC	1
74			min	-.508	3	-.391	2	-.167	4	-5.39e-4	4	98.86	3	NC	1
75		19	max	.005	10	1.544	3	0	1	0	1	NC	1	NC	1
76			min	-.508	3	-.51	2	-.166	4	-5.39e-4	4	82.996	3	NC	1
77	M7	1	max	.014	5	.004	5	-.001	10	1.252e-2	2	NC	3	NC	1
78			min	-.328	3	-.284	2	-.357	4	-4.91e-3	3	573.582	1	698.305	4
79		2	max	.014	5	.005	5	0	10	1.252e-2	2	NC	2	NC	1
80			min	-.328	3	-.225	1	-.342	4	-4.91e-3	3	760.93	1	760.11	4
81		3	max	.014	5	.005	5	.003	1	1.136e-2	2	NC	3	NC	1
82			min	-.328	3	-.168	1	-.326	4	-4.591e-3	3	989.377	9	835.586	4
83		4	max	.014	5	.005	5	.006	1	9.579e-3	2	NC	3	NC	1
84			min	-.328	3	-.136	3	-.309	5	-4.103e-3	3	958.476	2	935.638	4
85		5	max	.014	5	.005	5	.006	1	7.797e-3	2	NC	3	NC	1
86			min	-.328	3	-.129	3	-.29	5	-3.614e-3	3	694.626	2	1070.376	4
87		6	max	.014	5	.005	10	.005	1	7.245e-3	2	NC	4	NC	1
88			min	-.328	3	-.115	3	-.272	4	-3.716e-3	3	582.665	2	1252.626	4
89		7	max	.014	5	.024	2	.002	2	7.544e-3	2	NC	4	NC	1
90			min	-.328	3	-.093	3	-.255	4	-4.226e-3	3	532.812	2	1492.387	4
91		8	max	.014	5	.035	2	0	2	7.842e-3	2	NC	5	NC	1
92			min	-.328	3	-.064	3	-.239	4	-4.736e-3	3	510.083	2	1814.989	4
93		9	max	.014	5	.041	2	0	3	7.667e-3	2	NC	5	NC	1
94			min	-.328	3	-.031	3	-.224	4	-5.431e-3	3	498.841	2	2267.217	4
95		10	max	.014	5	.05	1	0	3	6.652e-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	-.328	3	-.001	5	-.21	4	-6.451e-3	3	492.422	2	2998.293	4
97		11	max	.014	5	.062	1	0	2	5.638e-3	2	NC	5	NC	1
98			min	-.328	3	-.003	5	-.196	4	-7.47e-3	3	491.831	2	4335.35	4
99		12	max	.014	5	.097	3	.002	2	4.271e-3	2	NC	5	NC	1
100			min	-.328	3	-.005	5	-.183	4	-6.387e-3	3	497.919	2	7339.706	4
101		13	max	.014	5	.156	3	.003	2	2.705e-3	2	NC	5	NC	1
102			min	-.328	3	-.007	5	-.173	4	-4.115e-3	3	455.498	3	NC	1
103		14	max	.014	5	.234	3	.001	2	1.215e-3	2	NC	7	NC	1
104			min	-.328	3	-.01	5	-.168	4	-3.883e-3	5	360.499	3	NC	1
105		15	max	.014	5	.336	3	0	10	3.091e-3	2	NC	9	NC	1
106			min	-.328	3	-.023	2	-.167	4	-5.939e-3	3	282.824	3	NC	1
107		16	max	.014	5	.456	3	0	10	4.967e-3	2	NC	9	NC	1
108			min	-.328	3	-.068	2	-.167	4	-9.898e-3	3	225.494	3	NC	1
109		17	max	.014	5	.588	3	0	10	6.844e-3	2	NC	4	NC	1
110			min	-.328	3	-.12	2	-.168	4	-1.386e-2	3	184.497	3	NC	1
111		18	max	.014	5	.725	3	.003	3	8.067e-3	2	NC	4	NC	1
112			min	-.328	3	-.174	2	-.167	4	-1.644e-2	3	155.289	3	NC	1
113		19	max	.014	5	.862	3	.009	1	8.067e-3	2	NC	1	NC	1
114			min	-.328	3	-.228	2	-.167	5	-1.644e-2	3	134.082	3	NC	1
115	M10	1	max	0	3	.678	3	.328	3	1.833e-2	3	NC	1	NC	1
116			min	-.167	4	-.155	2	-.014	5	-7.26e-3	2	NC	1	NC	1
117		2	max	0	3	.823	3	.34	3	2.016e-2	3	NC	4	NC	1
118			min	-.167	4	-.226	2	-.013	5	-8.219e-3	2	1072.686	3	NC	1
119		3	max	0	3	.962	3	.36	3	2.199e-2	3	NC	4	NC	2
120			min	-.167	4	-.292	2	-.01	5	-9.179e-3	2	549.064	3	4902.467	3
121		4	max	0	3	1.079	3	.386	3	2.382e-2	3	NC	4	NC	2
122			min	-.167	4	-.345	2	-.006	5	-1.014e-2	2	389.067	3	2726.1	3
123		5	max	0	3	1.164	3	.414	3	2.565e-2	3	NC	4	NC	5
124			min	-.167	4	-.379	2	0	15	-1.11e-2	2	320.626	3	1829.154	3
125		6	max	0	3	1.215	3	.442	3	2.748e-2	3	NC	4	NC	2
126			min	-.167	4	-.395	2	.002	10	-1.206e-2	2	290.393	3	1375.474	3
127		7	max	0	3	1.232	3	.468	3	2.931e-2	3	NC	4	NC	2
128			min	-.167	4	-.392	2	0	10	-1.302e-2	2	281.106	3	1121.006	3
129		8	max	0	3	1.225	3	.489	3	3.114e-2	3	NC	6	NC	2
130			min	-.167	4	-.378	2	-.002	10	-1.398e-2	2	284.914	3	973.78	3
131		9	max	0	3	1.206	3	.503	3	3.297e-2	3	NC	14	NC	2
132			min	-.167	4	-.359	2	-.004	10	-1.493e-2	2	295.228	3	894.766	3
133		10	max	0	1	1.194	3	.508	3	3.48e-2	3	NC	9	NC	2
134			min	-.167	4	-.35	2	-.005	10	-1.589e-2	2	301.895	3	868.854	3
135		11	max	0	10	1.206	3	.503	3	3.297e-2	3	NC	14	NC	2
136			min	-.167	4	-.359	2	-.004	10	-1.493e-2	2	295.228	3	894.766	3
137		12	max	0	10	1.225	3	.489	3	3.114e-2	3	NC	14	NC	2
138			min	-.167	4	-.378	2	-.002	10	-1.398e-2	2	284.914	3	973.78	3
139		13	max	0	10	1.232	3	.468	3	2.931e-2	3	NC	14	NC	2
140			min	-.167	4	-.392	2	0	10	-1.302e-2	2	281.106	3	1121.006	3
141		14	max	0	10	1.215	3	.442	3	2.748e-2	3	NC	14	NC	2
142			min	-.167	4	-.395	2	.002	10	-1.206e-2	2	290.393	3	1375.474	3
143		15	max	0	10	1.164	3	.414	3	2.565e-2	3	NC	14	NC	5
144			min	-.167	4	-.379	2	.003	10	-1.11e-2	2	320.626	3	1829.154	3
145		16	max	0	10	1.079	3	.386	3	2.382e-2	3	NC	14	NC	2
146			min	-.167	4	-.345	2	.003	10	-1.014e-2	2	389.067	3	2726.1	3
147		17	max	0	10	.962	3	.36	3	2.199e-2	3	NC	14	NC	2
148			min	-.167	4	-.292	2	.002	10	-9.179e-3	2	549.064	3	4902.467	3
149		18	max	0	10	.823	3	.34	3	2.016e-2	3	NC	9	NC	1
150			min	-.167	4	-.226	2	.001	10	-8.219e-3	2	1072.686	3	NC	1
151		19	max	0	10	.678	3	.328	3	1.833e-2	3	NC	1	NC	1
152			min	-.167	4	-.155	2	0	10	-7.26e-3	2	2194.83	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	.065	1	.328	3	6.406e-3	3	NC	1	NC	1
154			min	-.191	4	-.004	5	-.014	5	-4.213e-4	10	NC	1	NC	1
155		2	max	0	2	.135	3	.334	3	6.724e-3	3	NC	4	NC	1
156			min	-.191	4	-.005	10	-.003	5	-4.121e-4	10	2228.254	3	NC	1
157		3	max	0	2	.199	3	.351	3	7.041e-3	3	NC	4	NC	2
158			min	-.191	4	-.037	2	.002	15	-4.028e-4	10	1169.958	3	6983.011	3
159		4	max	0	2	.243	3	.375	3	7.359e-3	3	NC	4	NC	2
160			min	-.192	4	-.059	2	.004	15	-3.936e-4	10	880.253	3	3342.058	3
161		5	max	0	2	.26	3	.404	3	7.677e-3	3	NC	4	NC	2
162			min	-.192	4	-.064	2	.003	15	-3.843e-4	10	801.596	3	2069.638	3
163		6	max	0	2	.249	3	.434	3	7.994e-3	3	NC	4	NC	2
164			min	-.192	4	-.051	2	.002	15	-3.75e-4	10	847.033	3	1481.685	3
165		7	max	0	2	.216	3	.462	3	8.312e-3	3	NC	4	NC	2
166			min	-.192	4	-.023	2	.001	10	-3.658e-4	10	1038.058	3	1169.47	3
167		8	max	0	2	.168	3	.485	3	8.629e-3	3	NC	1	NC	2
168			min	-.192	4	0	10	-.001	10	-3.565e-4	10	1514.155	3	994.774	3
169		9	max	0	2	.124	3	.501	3	8.947e-3	3	NC	1	NC	2
170			min	-.192	4	.004	15	-.003	10	-3.473e-4	10	2679.58	3	902.698	3
171		10	max	0	1	.103	3	.507	3	9.264e-3	3	NC	2	NC	2
172			min	-.192	4	.005	15	-.004	10	-3.38e-4	10	4174.566	3	872.644	3
173		11	max	0	3	.124	3	.501	3	8.947e-3	3	NC	1	NC	2
174			min	-.192	4	.006	15	-.003	10	-3.473e-4	10	2679.58	3	902.698	3
175		12	max	0	3	.168	3	.485	3	8.629e-3	3	NC	1	NC	2
176			min	-.192	4	0	10	-.001	10	-3.565e-4	10	1514.155	3	994.774	3
177		13	max	0	3	.216	3	.462	3	8.312e-3	3	NC	4	NC	2
178			min	-.192	4	-.023	2	.001	10	-3.658e-4	10	1038.058	3	1169.47	3
179		14	max	0	3	.249	3	.434	3	7.994e-3	3	NC	4	NC	2
180			min	-.192	4	-.051	2	.003	10	-3.75e-4	10	847.033	3	1481.685	3
181		15	max	0	3	.26	3	.404	3	7.677e-3	3	NC	4	NC	2
182			min	-.192	4	-.064	2	.004	10	-3.843e-4	10	801.596	3	2069.638	3
183		16	max	0	3	.243	3	.375	3	7.359e-3	3	NC	5	NC	2
184			min	-.192	4	-.059	2	.004	10	-3.936e-4	10	880.253	3	3342.058	3
185		17	max	0	3	.199	3	.351	3	7.041e-3	3	NC	4	NC	2
186			min	-.192	4	-.037	2	.003	10	-4.028e-4	10	1169.958	3	6983.011	3
187		18	max	.001	3	.135	3	.334	3	6.724e-3	3	NC	4	NC	1
188			min	-.192	4	-.005	10	.001	10	-4.121e-4	10	2228.254	3	NC	1
189		19	max	.001	3	.065	1	.328	3	6.406e-3	3	NC	1	NC	1
190			min	-.192	4	.01	15	0	10	-4.213e-4	10	NC	1	NC	1
191	M12	1	max	0	2	.039	2	.328	3	4.527e-3	3	NC	1	NC	1
192			min	-.23	4	-.043	3	-.014	5	-2.253e-4	5	NC	1	NC	1
193		2	max	0	2	.003	5	.337	3	4.836e-3	3	NC	4	NC	1
194			min	-.23	4	-.03	2	-.002	5	-1.674e-4	5	2272.283	2	NC	1
195		3	max	0	2	.03	3	.355	3	5.145e-3	3	NC	4	NC	2
196			min	-.23	4	-.087	2	.001	10	-1.096e-4	5	1236.215	2	5888.23	3
197		4	max	0	2	.048	3	.379	3	5.454e-3	3	NC	4	NC	2
198			min	-.23	4	-.123	2	.002	10	-5.169e-5	5	963.673	2	3049.362	3
199		5	max	0	2	.05	3	.408	3	5.763e-3	3	NC	4	NC	2
200			min	-.229	4	-.131	2	.003	10	-2.619e-6	15	915.884	2	1965.211	3
201		6	max	0	2	.036	3	.436	3	6.072e-3	3	NC	4	NC	2
202			min	-.229	4	-.112	2	.002	15	3.61e-5	15	1029.839	2	1440.614	3
203		7	max	0	2	.01	3	.463	3	6.381e-3	3	NC	4	NC	2
204			min	-.229	4	-.072	2	0	15	4.004e-5	10	1410.131	2	1154.385	3
205		8	max	0	2	.003	4	.485	3	6.69e-3	3	NC	4	NC	2
206			min	-.229	4	-.021	3	0	10	6.556e-6	10	2671.144	2	991.593	3
207		9	max	0	2	.028	2	.501	3	6.999e-3	3	NC	1	NC	2
208			min	-.229	4	-.049	3	-.002	10	-2.693e-5	10	NC	1	905.027	3
209		10	max	0	1	.05	2	.506	3	7.308e-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	-.229	4	-.062	3	-.003	10	-6.041e-5	10	8500.815	3	876.7	3
211		11	max	0	3	.028	2	.501	3	6.999e-3	3	NC	1	NC	2
212			min	-.229	4	-.049	3	-.002	10	-2.693e-5	10	NC	1	905.027	3
213		12	max	0	3	.002	9	.485	3	6.69e-3	3	NC	4	NC	2
214			min	-.229	4	-.021	3	0	10	6.556e-6	10	2671.144	2	991.593	3
215		13	max	0	3	.01	3	.463	3	6.381e-3	3	NC	4	NC	2
216			min	-.229	4	-.072	2	0	10	4.004e-5	10	1410.131	2	1154.385	3
217		14	max	0	3	.036	3	.436	3	6.072e-3	3	NC	4	NC	2
218			min	-.229	4	-.112	2	.002	10	7.353e-5	10	1029.839	2	1440.614	3
219		15	max	0	3	.05	3	.408	3	5.763e-3	3	NC	5	NC	2
220			min	-.229	4	-.131	2	.003	10	1.07e-4	10	915.884	2	1965.211	3
221		16	max	0	3	.048	3	.379	3	5.454e-3	3	NC	5	NC	2
222			min	-.229	4	-.123	2	.002	10	1.405e-4	10	963.673	2	3049.362	3
223		17	max	0	3	.03	3	.355	3	5.145e-3	3	NC	4	NC	2
224			min	-.229	4	-.087	2	.001	10	1.74e-4	10	1236.215	2	5888.23	3
225		18	max	0	3	0	9	.337	3	4.836e-3	3	NC	4	NC	1
226			min	-.229	4	-.03	2	0	10	2.075e-4	10	2272.283	2	NC	1
227		19	max	0	3	.039	2	.328	3	4.527e-3	3	NC	1	NC	1
228			min	-.229	4	-.043	3	0	10	2.409e-4	10	NC	1	NC	1
229	M13	1	max	0	10	.005	5	.328	3	8.958e-3	2	NC	1	NC	1
230			min	-.336	4	-.205	1	-.014	5	1.741e-5	3	NC	1	NC	1
231		2	max	0	10	.003	5	.34	3	1.026e-2	2	NC	4	NC	1
232			min	-.336	4	-.303	2	-.001	5	-4.94e-4	3	1441.315	2	NC	1
233		3	max	0	10	0	15	.36	3	1.157e-2	2	NC	4	NC	2
234			min	-.336	4	-.4	2	.004	15	-1.005e-3	3	758.581	2	4833.614	3
235		4	max	0	10	-.002	15	.385	3	1.287e-2	2	NC	5	NC	2
236			min	-.336	4	-.475	2	.005	10	-1.517e-3	3	556.776	2	2716.943	3
237		5	max	0	10	-.004	15	.413	3	1.418e-2	2	NC	5	NC	5
238			min	-.336	4	-.52	2	.005	10	-2.028e-3	3	479.801	2	1835.03	3
239		6	max	0	10	-.007	15	.441	3	1.548e-2	2	NC	5	NC	5
240			min	-.336	4	-.534	2	.004	10	-2.54e-3	3	460.005	2	1385.925	3
241		7	max	0	10	-.009	15	.466	3	1.679e-2	2	NC	5	NC	2
242			min	-.336	4	-.521	2	.003	10	-3.051e-3	3	478.336	2	1132.926	3
243		8	max	0	10	-.011	15	.486	3	1.809e-2	2	NC	5	NC	2
244			min	-.336	4	-.49	2	0	10	-3.562e-3	3	527.995	2	986.156	3
245		9	max	0	10	-.012	15	.5	3	1.94e-2	2	NC	5	NC	2
246			min	-.336	4	-.456	2	-.001	10	-4.074e-3	3	595.964	2	907.281	3
247		10	max	0	1	-.014	15	.505	3	2.07e-2	2	NC	5	NC	2
248			min	-.336	4	-.44	2	-.002	10	-4.585e-3	3	636.648	2	881.412	3
249		11	max	0	1	-.015	15	.5	3	1.94e-2	2	NC	5	NC	2
250			min	-.336	4	-.456	2	-.001	10	-4.074e-3	3	595.964	2	907.281	3
251		12	max	0	1	-.018	15	.486	3	1.809e-2	2	NC	5	NC	2
252			min	-.336	4	-.49	2	0	10	-3.562e-3	3	527.995	2	986.156	3
253		13	max	0	1	-.02	15	.466	3	1.679e-2	2	NC	5	NC	2
254			min	-.336	4	-.521	2	.003	10	-3.051e-3	3	478.336	2	1132.926	3
255		14	max	0	1	-.022	15	.441	3	1.548e-2	2	NC	5	NC	5
256			min	-.336	4	-.534	2	.004	10	-2.54e-3	3	460.005	2	1385.925	3
257		15	max	0	1	-.021	12	.413	3	1.418e-2	2	NC	5	NC	4
258			min	-.336	4	-.52	2	.005	10	-2.028e-3	3	479.801	2	1835.03	3
259		16	max	0	1	-.024	15	.385	3	1.287e-2	2	NC	5	NC	2
260			min	-.336	4	-.475	2	.005	10	-1.517e-3	3	556.776	2	2716.943	3
261		17	max	0	1	-.024	15	.36	3	1.157e-2	2	NC	5	NC	2
262			min	-.336	4	-.4	2	.004	10	-1.005e-3	3	758.581	2	4833.614	3
263		18	max	0	1	-.023	15	.34	3	1.026e-2	2	NC	4	NC	1
264			min	-.336	4	-.303	2	.002	10	-4.94e-4	3	1441.315	2	NC	1
265		19	max	0	1	-.022	15	.328	3	8.958e-3	2	NC	1	NC	1
266			min	-.336	4	-.205	1	0	10	1.741e-5	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	10	0	5	3.103e-3	2	NC	1	NC	1
270			min	0	2	-.002	3	0	2	-5.297e-3	5	NC	1	NC	1
271		3	max	0	3	0	10	.003	5	2.855e-3	2	NC	1	NC	1
272			min	0	2	-.008	3	0	2	-5.142e-3	5	9812.78	3	NC	1
273		4	max	0	3	0	10	.007	5	2.607e-3	2	NC	1	NC	1
274			min	0	2	-.016	3	-.001	2	-4.987e-3	5	4530.85	3	9915.893	5
275		5	max	0	3	0	10	.013	5	2.359e-3	2	NC	2	NC	1
276			min	0	2	-.028	3	-.002	2	-4.831e-3	5	2623.23	3	5757.455	5
277		6	max	0	3	0	10	.019	5	2.111e-3	2	NC	2	NC	1
278			min	0	2	-.043	3	-.002	2	-4.676e-3	5	1722.253	3	3796.856	5
279		7	max	0	3	0	10	.027	5	1.863e-3	2	NC	2	NC	1
280			min	0	2	-.06	3	-.003	2	-4.521e-3	5	1225.174	3	2715.252	5
281		8	max	0	3	0	10	.036	5	1.615e-3	2	NC	2	NC	1
282			min	0	2	-.08	3	-.004	2	-4.366e-3	5	921.392	3	2053.862	5
283		9	max	0	3	0	10	.045	5	1.367e-3	2	NC	2	NC	1
284			min	0	2	-.102	3	-.005	2	-4.211e-3	5	722.004	3	1619.363	5
285		10	max	0	3	0	10	.056	5	1.119e-3	2	NC	2	NC	1
286			min	0	2	-.126	3	-.005	2	-4.056e-3	5	583.926	3	1318.173	5
287		11	max	0	3	0	10	.067	5	8.707e-4	2	NC	10	NC	1
288			min	0	2	-.152	3	-.006	2	-3.911e-3	4	484.243	3	1100.542	5
289		12	max	0	3	0	10	.079	5	6.227e-4	2	NC	10	NC	1
290			min	0	2	-.18	3	-.006	2	-3.773e-3	4	409.86	3	938.037	5
291		13	max	0	3	0	10	.091	5	4.333e-4	3	NC	10	NC	1
292			min	0	2	-.209	3	-.006	2	-3.636e-3	4	352.845	3	813.43	5
293		14	max	.001	3	0	10	.103	5	6.112e-4	3	NC	10	NC	1
294			min	-.001	2	-.239	3	-.006	2	-3.499e-3	4	308.154	3	715.77	5
295		15	max	.001	3	0	10	.116	5	7.892e-4	3	NC	10	NC	1
296			min	-.001	2	-.27	3	-.005	2	-3.361e-3	4	272.476	3	637.851	5
297		16	max	.001	3	0	10	.128	4	9.671e-4	3	NC	10	NC	1
298			min	-.001	2	-.303	3	-.004	1	-3.224e-3	4	243.541	3	574.73	4
299		17	max	.001	3	0	10	.141	4	1.145e-3	3	NC	10	NC	1
300			min	-.001	2	-.335	3	-.003	1	-3.086e-3	4	219.758	3	522.574	4
301		18	max	.001	3	0	10	.154	4	1.323e-3	3	NC	10	NC	1
302			min	-.001	2	-.368	3	-.002	1	-2.949e-3	4	199.983	3	479.319	4
303		19	max	.001	3	0	10	.166	4	1.501e-3	3	NC	10	NC	1
304			min	-.001	2	-.402	3	-.007	3	-2.812e-3	4	183.38	3	443.132	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	-5.537e-3	4	NC	1	NC	1
309		3	max	0	3	0	10	.004	4	0	1	NC	1	NC	1
310			min	0	2	-.012	3	0	1	-5.359e-3	4	6242.333	3	NC	1
311		4	max	0	3	0	10	.008	4	0	1	NC	1	NC	1
312			min	0	2	-.025	3	0	1	-5.181e-3	4	2900.396	3	9577.144	4
313		5	max	.001	3	0	10	.013	4	0	1	NC	2	NC	1
314			min	0	2	-.044	3	0	1	-5.003e-3	4	1683.593	3	5564.327	4
315		6	max	.001	3	.001	10	.02	4	0	1	NC	2	NC	1
316			min	-.001	2	-.067	3	0	1	-4.826e-3	4	1106.855	3	3671.964	4
317		7	max	.002	3	.002	10	.028	4	0	1	NC	2	NC	1
318			min	-.001	2	-.093	3	0	1	-4.648e-3	4	788.047	3	2627.809	4
319		8	max	.002	3	.002	10	.037	4	0	1	NC	2	NC	1
320			min	-.002	2	-.124	3	0	1	-4.47e-3	4	592.978	3	1989.227	4
321		9	max	.002	3	.002	10	.047	4	0	1	NC	2	NC	1
322			min	-.002	2	-.159	3	0	1	-4.292e-3	4	464.84	3	1569.668	4
323		10	max	.002	3	.003	10	.058	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	-.196	3	0	1	-4.115e-3	4	376.051	3	1278.818	4
325		11	max	.003	3	.003	10	.069	4	0	1	NC	10	NC	1
326			min	-.002	2	-.236	3	0	1	-3.937e-3	4	311.924	3	1068.664	4
327		12	max	.003	3	.004	10	.081	4	0	1	NC	10	NC	1
328			min	-.002	2	-.279	3	0	1	-3.759e-3	4	264.056	3	911.757	4
329		13	max	.003	3	.004	10	.093	4	0	1	NC	10	NC	1
330			min	-.003	2	-.324	3	0	1	-3.581e-3	4	227.355	3	791.469	4
331		14	max	.003	3	.005	10	.106	4	0	1	NC	10	NC	1
332			min	-.003	2	-.371	3	0	1	-3.404e-3	4	198.581	3	697.227	4
333		15	max	.003	3	.005	10	.118	4	0	1	NC	10	NC	1
334			min	-.003	2	-.42	3	0	1	-3.226e-3	4	175.606	3	622.075	4
335		16	max	.004	3	.006	10	.131	4	0	1	NC	10	NC	1
336			min	-.003	2	-.469	3	0	1	-3.048e-3	4	156.97	3	561.248	4
337		17	max	.004	3	.006	10	.144	4	0	1	NC	10	NC	1
338			min	-.003	2	-.52	3	0	1	-2.87e-3	4	141.65	3	511.407	4
339		18	max	.004	3	.007	10	.157	4	0	1	NC	10	NC	1
340			min	-.004	2	-.572	3	0	1	-2.692e-3	4	128.912	3	470.155	4
341		19	max	.004	3	.008	10	.169	4	0	1	9677.298	10	NC	1
342			min	-.004	2	-.623	3	0	1	-2.515e-3	4	118.215	3	435.737	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	1.524e-3	3	NC	1	NC	1
346			min	0	2	-.002	3	0	3	-5.608e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	1.346e-3	3	NC	1	NC	1
348			min	0	2	-.008	3	0	3	-5.422e-3	4	9812.78	3	NC	1
349		4	max	0	3	0	5	.008	4	1.168e-3	3	NC	1	NC	1
350			min	0	2	-.016	3	-.002	3	-5.235e-3	4	4530.85	3	9678.641	4
351		5	max	0	3	.001	5	.013	4	9.902e-4	3	NC	2	NC	1
352			min	0	2	-.028	3	-.003	3	-5.048e-3	4	2623.23	3	5623.609	4
353		6	max	0	3	.002	5	.02	4	8.122e-4	3	NC	2	NC	1
354			min	0	2	-.043	3	-.004	3	-4.861e-3	4	1722.253	3	3711.092	4
355		7	max	0	3	.003	5	.028	4	6.343e-4	3	NC	2	NC	1
356			min	0	2	-.06	3	-.005	3	-4.675e-3	4	1225.174	3	2655.734	4
357		8	max	0	3	.004	5	.037	4	4.564e-4	3	NC	2	NC	1
358			min	0	2	-.08	3	-.006	3	-4.488e-3	4	921.392	3	2010.266	4
359		9	max	0	3	.004	5	.046	4	2.784e-4	3	NC	2	NC	1
360			min	0	2	-.102	3	-.007	3	-4.301e-3	4	722.004	3	1586.166	4
361		10	max	0	3	.006	5	.057	4	1.005e-4	3	NC	2	NC	1
362			min	0	2	-.126	3	-.008	3	-4.114e-3	4	583.926	3	1292.158	4
363		11	max	0	3	.007	5	.068	4	-1.628e-5	9	NC	5	NC	1
364			min	0	2	-.152	3	-.009	3	-3.928e-3	4	484.243	3	1079.712	4
365		12	max	0	3	.008	5	.08	4	3.227e-5	9	NC	7	NC	1
366			min	0	2	-.18	3	-.009	3	-3.741e-3	4	409.86	3	921.089	4
367		13	max	0	3	.009	5	.092	4	8.081e-5	9	NC	10	NC	1
368			min	0	2	-.209	3	-.009	3	-3.57e-3	5	352.845	3	799.477	4
369		14	max	.001	3	.01	5	.105	4	1.294e-4	9	NC	10	NC	1
370			min	-.001	2	-.239	3	-.008	3	-3.402e-3	5	308.154	3	704.192	4
371		15	max	.001	3	.012	5	.117	4	2.702e-4	1	NC	10	NC	1
372			min	-.001	2	-.27	3	-.007	3	-3.234e-3	5	272.476	3	628.2	4
373		16	max	.001	3	.013	5	.13	4	4.514e-4	1	NC	10	NC	1
374			min	-.001	2	-.303	3	-.005	3	-3.066e-3	5	243.541	3	566.687	4
375		17	max	.001	3	.015	5	.143	4	6.326e-4	1	NC	10	NC	1
376			min	-.001	2	-.335	3	-.002	3	-2.899e-3	5	219.758	3	516.276	4
377		18	max	.001	3	.016	5	.155	4	8.653e-4	2	NC	10	NC	1
378			min	-.001	2	-.368	3	0	10	-2.731e-3	5	199.983	3	474.543	4
379		19	max	.001	3	.018	5	.168	4	1.113e-3	2	NC	10	NC	1
380			min	-.001	2	-.402	3	-.001	2	-2.563e-3	5	183.38	3	439.714	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	1.739e-3	2	NC	1	NC	1
382			min	0	2	0	3	0	2	-2.752e-3	5	NC	1	NC	1
383		2	max	0	3	0	10	.017	5	1.789e-3	2	NC	1	NC	3
384			min	0	2	-.02	3	-.01	2	-2.697e-3	5	NC	1	6414.688	2
385		3	max	.001	3	-.001	10	.034	5	1.839e-3	2	NC	1	NC	4
386			min	-.001	2	-.04	3	-.019	2	-2.642e-3	5	NC	1	3186.194	2
387		4	max	.001	3	-.002	10	.051	5	1.889e-3	2	NC	1	NC	4
388			min	-.001	2	-.06	3	-.029	2	-2.588e-3	5	NC	1	2127.394	2
389		5	max	.001	3	-.002	10	.069	5	1.939e-3	2	NC	1	NC	4
390			min	-.002	2	-.08	3	-.038	2	-2.533e-3	5	NC	1	1611.139	2
391		6	max	.002	3	-.003	10	.087	5	1.989e-3	2	NC	1	NC	4
392			min	-.002	2	-.1	3	-.047	2	-2.478e-3	5	NC	1	1312.528	2
393		7	max	.002	3	-.003	10	.105	5	2.039e-3	2	NC	1	NC	13
394			min	-.003	2	-.119	3	-.055	2	-2.423e-3	5	NC	1	1123.772	2
395		8	max	.002	3	-.003	10	.124	5	2.089e-3	2	NC	1	9213.551	13
396			min	-.003	2	-.139	3	-.061	2	-2.368e-3	5	NC	1	999.233	2
397		9	max	.002	3	-.004	10	.142	5	2.14e-3	2	NC	1	7746.878	13
398			min	-.004	2	-.158	3	-.067	2	-2.314e-3	5	NC	1	916.773	2
399		10	max	.002	3	-.004	10	.159	5	2.19e-3	2	NC	1	6800.267	13
400			min	-.004	2	-.178	3	-.071	2	-2.259e-3	5	NC	1	863.254	14
401		11	max	.002	3	-.004	10	.176	5	2.24e-3	2	NC	1	6202.534	13
402			min	-.005	2	-.197	3	-.073	2	-2.204e-3	5	NC	1	772.236	14
403		12	max	.003	3	-.004	10	.193	5	2.29e-3	2	NC	1	5868.351	13
404			min	-.005	2	-.217	3	-.073	2	-2.149e-3	5	NC	1	698.782	14
405		13	max	.003	3	-.004	10	.209	5	2.34e-3	2	NC	1	5766.055	13
406			min	-.005	2	-.236	3	-.071	2	-2.094e-3	5	NC	1	638.452	14
407		14	max	.003	3	-.004	10	.224	5	2.39e-3	2	NC	1	5911.872	13
408			min	-.006	2	-.255	3	-.066	2	-2.04e-3	5	NC	1	588.182	14
409		15	max	.003	3	-.004	10	.238	5	2.44e-3	2	NC	1	6391.619	13
410			min	-.006	2	-.274	3	-.058	2	-1.985e-3	5	NC	1	545.788	14
411		16	max	.003	3	-.004	10	.251	5	2.491e-3	2	NC	1	7517.423	9
412			min	-.007	2	-.294	3	-.048	2	-1.93e-3	5	NC	1	509.673	14
413		17	max	.004	3	-.003	10	.263	5	2.541e-3	2	NC	1	NC	9
414			min	-.007	2	-.313	3	-.034	2	-1.875e-3	5	NC	1	478.645	14
415		18	max	.004	3	-.003	10	.275	4	2.591e-3	2	NC	1	NC	4
416			min	-.008	2	-.332	3	-.017	2	-1.82e-3	5	NC	1	451.795	14
417		19	max	.004	3	-.003	10	.286	4	2.641e-3	2	NC	1	NC	1
418			min	-.008	2	-.351	3	.002	12	-1.766e-3	5	NC	1	428.421	14
419	M6	1	max	.001	3	0	10	0	4	0	1	NC	1	NC	1
420			min	0	2	0	3	0	1	-2.882e-3	4	NC	1	NC	1
421		2	max	.002	3	0	10	.018	4	0	1	NC	1	NC	1
422			min	-.002	2	-.031	3	0	1	-2.835e-3	4	NC	1	NC	1
423		3	max	.003	3	-.001	10	.035	4	0	1	NC	1	NC	1
424			min	-.003	2	-.061	3	0	1	-2.789e-3	4	NC	1	NC	1
425		4	max	.003	3	-.002	10	.054	4	0	1	NC	1	NC	1
426			min	-.004	2	-.091	3	0	1	-2.742e-3	4	NC	1	NC	1
427		5	max	.004	3	-.002	10	.072	4	0	1	NC	1	NC	1
428			min	-.006	2	-.121	3	0	1	-2.695e-3	4	NC	1	7536.512	4
429		6	max	.005	3	-.003	10	.091	4	0	1	NC	1	NC	1
430			min	-.007	2	-.151	3	0	1	-2.648e-3	4	NC	1	5591.873	4
431		7	max	.005	3	-.003	10	.11	4	0	1	NC	1	NC	1
432			min	-.008	2	-.182	3	0	1	-2.602e-3	4	NC	1	4437.37	4
433		8	max	.006	3	-.004	10	.129	4	0	1	NC	1	NC	1
434			min	-.01	2	-.212	3	0	1	-2.555e-3	4	NC	1	3704.619	4
435		9	max	.007	3	-.004	10	.147	4	0	1	NC	1	NC	1
436			min	-.011	2	-.241	3	0	1	-2.508e-3	4	NC	1	3223.162	4
437		10	max	.007	3	-.004	10	.165	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	-.271	3	0	1	-2.461e-3	4	NC	1	2906.479	4
439		11	max	.008	3	-.004	10	.182	4	0	1	NC	1	NC	1
440			min	-.014	2	-.301	3	0	1	-2.415e-3	4	NC	1	2709.14	4
441		12	max	.009	3	-.004	10	.199	4	0	1	NC	1	NC	1
442			min	-.015	2	-.331	3	0	1	-2.368e-3	4	NC	1	2609.255	4
443		13	max	.009	3	-.004	10	.215	4	0	1	NC	1	NC	1
444			min	-.016	2	-.36	3	0	1	-2.321e-3	4	NC	1	2602.147	4
445		14	max	.01	3	-.004	10	.23	4	0	1	NC	1	NC	1
446			min	-.018	2	-.39	3	0	1	-2.274e-3	4	NC	1	2701.631	4
447		15	max	.011	3	-.004	10	.244	4	0	1	NC	1	NC	1
448			min	-.019	2	-.42	3	0	1	-2.228e-3	4	NC	1	2952.293	4
449		16	max	.011	3	-.004	10	.257	4	0	1	NC	1	NC	1
450			min	-.02	2	-.449	3	0	1	-2.181e-3	4	NC	1	3472.506	4
451		17	max	.012	3	-.004	10	.268	4	0	1	NC	1	NC	1
452			min	-.022	2	-.479	3	0	1	-2.134e-3	4	NC	1	4631.485	4
453		18	max	.013	3	-.004	10	.278	4	0	1	NC	1	NC	1
454			min	-.023	2	-.508	3	0	1	-2.087e-3	4	NC	1	8294.324	4
455		19	max	.013	3	-.003	10	.286	4	0	1	NC	1	NC	1
456			min	-.024	2	-.537	3	0	1	-2.04e-3	4	NC	1	NC	1
457	M9	1	max	0	3	0	5	0	4	8.313e-4	3	NC	1	NC	1
458			min	0	2	0	3	0	3	-2.926e-3	4	NC	1	NC	1
459		2	max	0	3	0	5	.018	4	8.706e-4	3	NC	1	NC	3
460			min	0	2	-.02	3	-.005	3	-2.872e-3	4	NC	1	6414.688	2
461		3	max	.001	3	.001	5	.036	4	9.1e-4	3	NC	1	NC	4
462			min	-.001	2	-.04	3	-.01	3	-2.818e-3	4	NC	1	3186.194	2
463		4	max	.001	3	.002	5	.054	4	9.493e-4	3	NC	1	NC	5
464			min	-.001	2	-.06	3	-.015	3	-2.763e-3	4	NC	1	2127.394	2
465		5	max	.001	3	.002	5	.073	4	9.887e-4	3	NC	1	NC	15
466			min	-.002	2	-.08	3	-.019	3	-2.709e-3	4	NC	1	1611.139	2
467		6	max	.002	3	.003	5	.092	4	1.028e-3	3	NC	1	9073.22	15
468			min	-.002	2	-.1	3	-.024	3	-2.655e-3	4	NC	1	1312.528	2
469		7	max	.002	3	.004	5	.111	4	1.067e-3	3	NC	1	7152.795	15
470			min	-.003	2	-.119	3	-.028	3	-2.601e-3	4	NC	1	1123.772	2
471		8	max	.002	3	.005	5	.13	4	1.107e-3	3	NC	1	6130.011	9
472			min	-.003	2	-.139	3	-.031	3	-2.547e-3	4	NC	1	999.233	2
473		9	max	.002	3	.005	5	.148	4	1.146e-3	3	NC	1	5622.316	9
474			min	-.004	2	-.158	3	-.034	3	-2.492e-3	4	NC	1	916.773	2
475		10	max	.002	3	.006	5	.166	4	1.185e-3	3	NC	1	5303.194	9
476			min	-.004	2	-.178	3	-.036	3	-2.438e-3	4	NC	1	864.992	2
477		11	max	.002	3	.007	5	.184	4	1.225e-3	3	NC	1	5138.412	9
478			min	-.005	2	-.197	3	-.037	3	-2.384e-3	4	8846.486	5	838.341	2
479		12	max	.003	3	.008	5	.2	4	1.264e-3	3	NC	1	5118.346	9
480			min	-.005	2	-.217	3	-.038	3	-2.33e-3	4	7837.804	5	835.274	2
481		13	max	.003	3	.009	5	.216	4	1.303e-3	3	NC	1	5256.894	9
482			min	-.005	2	-.236	3	-.037	3	-2.34e-3	2	7004.077	5	858.079	2
483		14	max	.003	3	.01	5	.231	4	1.343e-3	3	NC	1	5601.085	9
484			min	-.006	2	-.255	3	-.035	3	-2.39e-3	2	6306.789	5	914.454	2
485		15	max	.003	3	.011	5	.244	4	1.382e-3	3	NC	1	6262.57	9
486			min	-.006	2	-.274	3	-.031	3	-2.44e-3	2	5718.064	5	1022.65	2
487		16	max	.003	3	.012	5	.256	4	1.422e-3	3	NC	1	7517.423	9
488			min	-.007	2	-.294	3	-.027	3	-2.491e-3	2	5217.183	5	1227.785	2
489		17	max	.004	3	.013	5	.267	4	1.461e-3	3	NC	1	NC	9
490			min	-.007	2	-.313	3	-.02	3	-2.541e-3	2	4788.411	5	1667.8	2
491		18	max	.004	3	.014	5	.276	4	1.5e-3	3	NC	1	NC	9
492			min	-.008	2	-.332	3	-.012	3	-2.591e-3	2	4419.58	5	3036.043	2
493		19	max	.004	3	.015	5	.283	4	1.54e-3	3	NC	1	NC	1
494			min	-.008	2	-.351	3	-.006	1	-2.641e-3	2	4101.147	5	NC	1