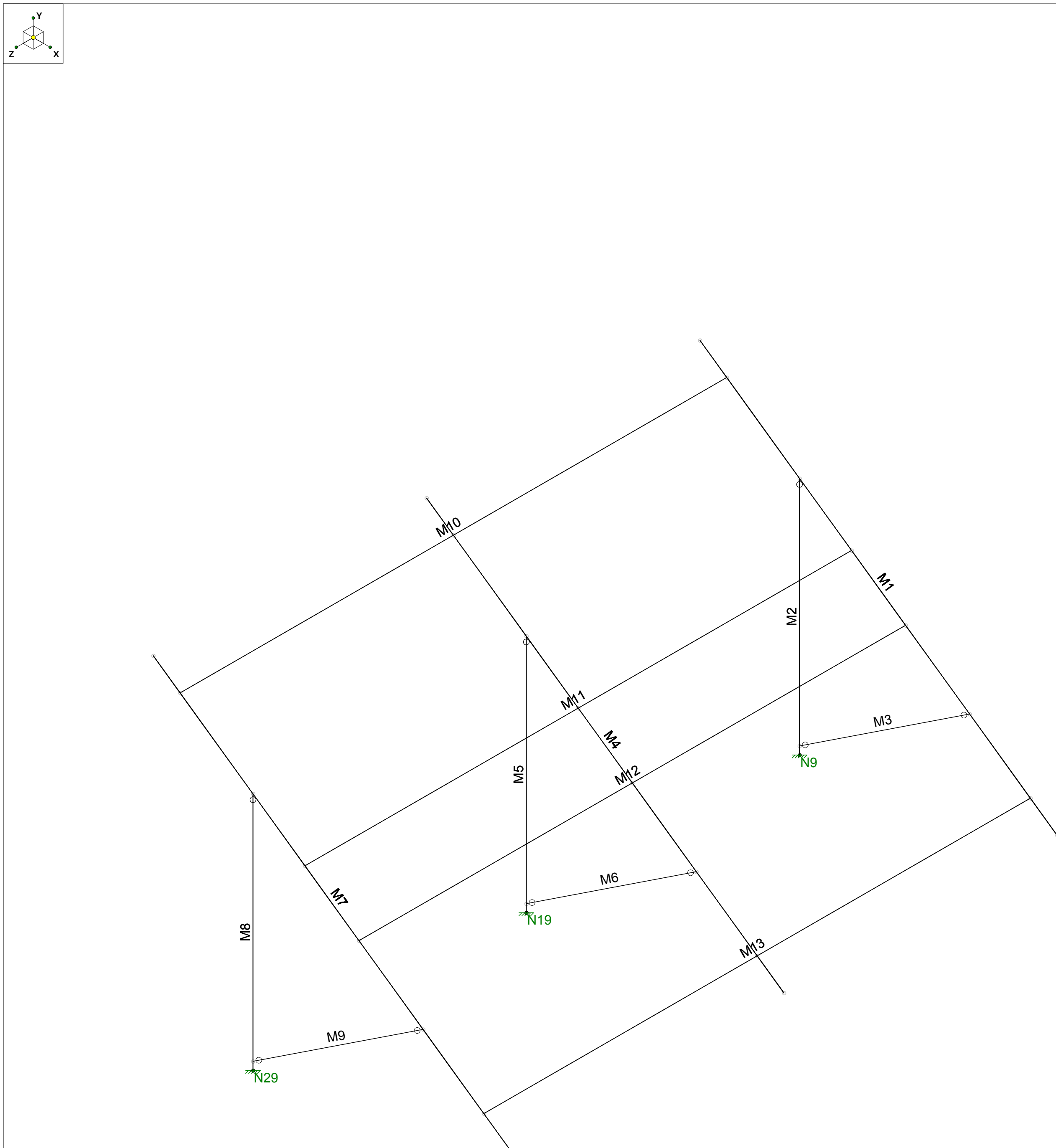


Schletter, Inc.		35° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

1.1 Project Description

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

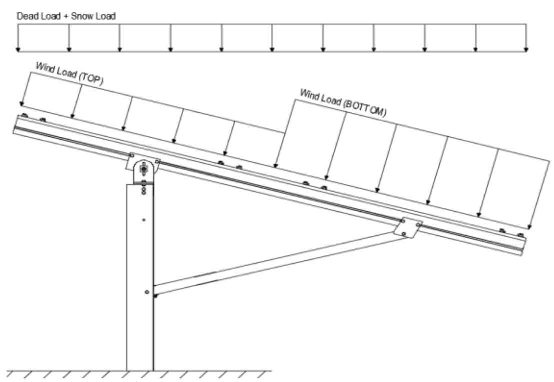
1.2 Construction

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

PV modules are required to meet the following specifications:

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

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



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

Self-weight of the PV modules.

2.2 Snow Loads

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

2.3 Wind Loads

Design Wind Speed, V = 90 mph
Height < 15 ft

Exposure Category = C
Importance Category = II

Peak Velocity Pressure, q_z = 12.72 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
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

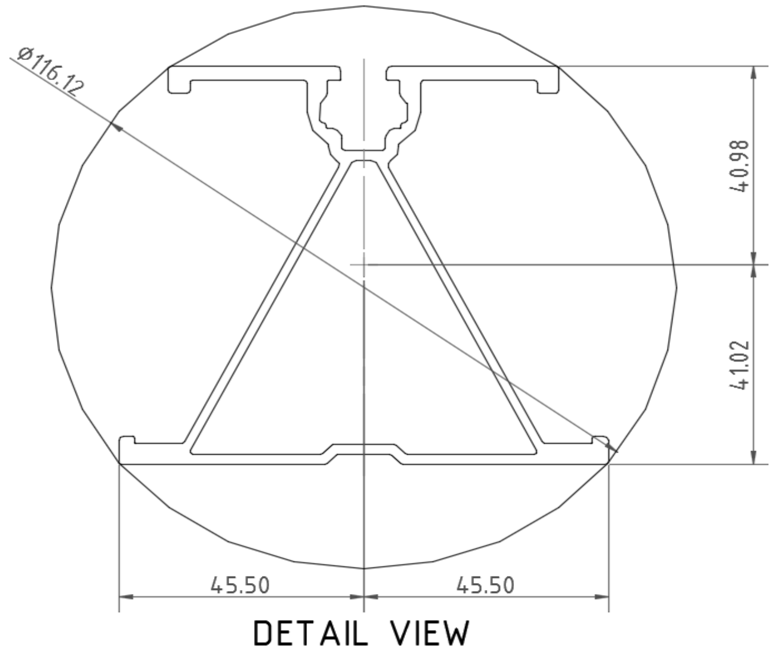
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

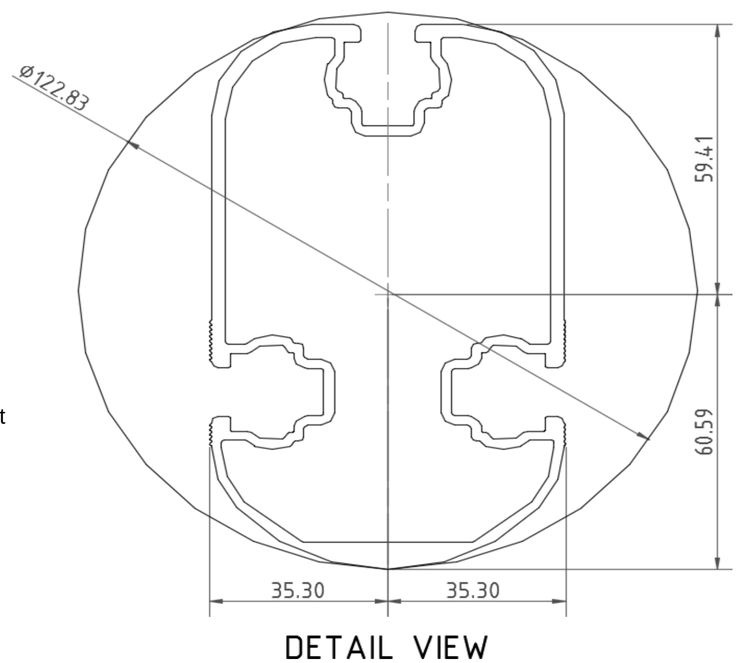
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	138	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.700	k-ft
M_z =	0.377	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	94%	



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).

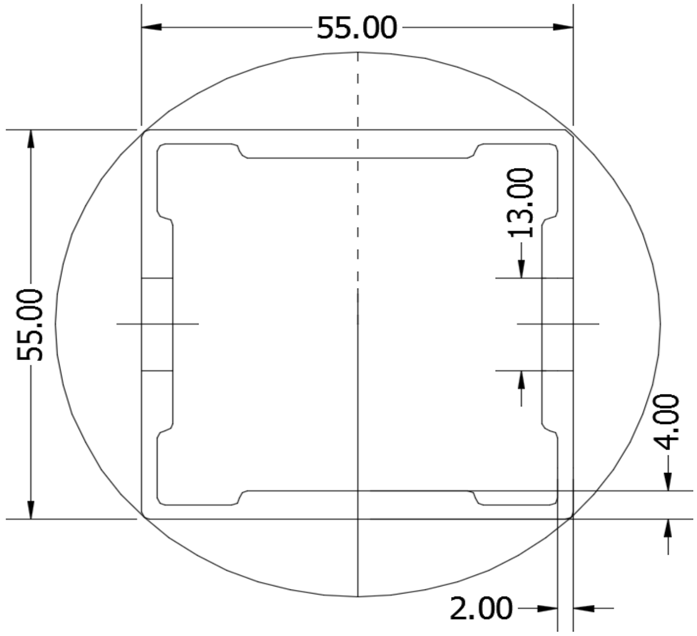
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.875	k-ft
M_z =	0.000	k-ft
P_n =	0.014	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	77%	



4.3 Strut Design

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

Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.434	k-ft
P_n =	3.860	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	60%	

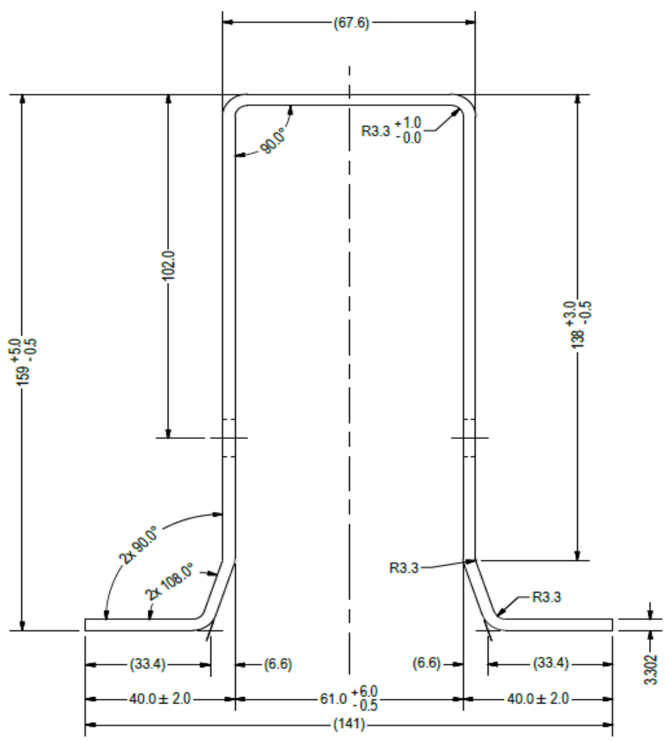


DETAIL VIEW

4.4 Post Design

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

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	85.68	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	17.018	k-ft
M_z =	0.000	k-ft
P_r =	-4.289	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	28.060	k
Utilization =	100%	



DETAIL VIEW

5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	5.54	k
Maximum Lateral Load =	3.98	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)

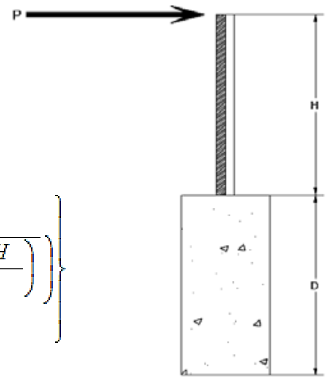
Lateral Force @ Top of Pole, P =	1.12	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	1.12	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 =	6.05	
Required Footing Depth, D =	10.52	ft
2nd Trial @ D_2 =	6.89	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.38	ksf
Constant 2.34P/(S_1B), A =	2.85	
Required Footing Depth, D =	6.35	ft
3rd Trial @ D_3 =	6.62	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.32	ksf
Constant 2.34P/(S_1B), A =	2.97	
Required Footing Depth, D =	6.52	ft
4th Trial @ D_4 =	6.57	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant 2.34P/(S_1B), A =	2.99	
Required Footing Depth, D =	6.55	ft
5th Trial @ D_5 =	6.56	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant 2.34P/(S_1B), A =	3.00	
Required Footing Depth, D =	6.75	ft

A 2ft diameter x 6.75ft deep footing unrestrained at ground level is required for the racking structure.

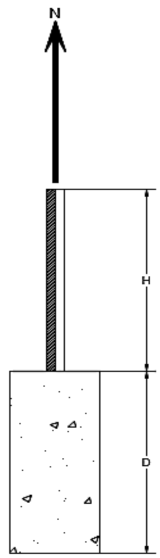
5.4 Uplifting Force Resistance

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 = 2.65 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 = 1.70 k
Required Concrete Volume, V = 11.75 ft^3
Required Footing Depth, D = 3.75 ft

A 2ft diameter x 3.75ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.71
2	0.4	0.2	118.10	5.61
3	0.6	0.2	118.10	5.50
4	0.8	0.2	118.10	5.40
5	1	0.2	118.10	5.30
6	1.2	0.2	118.10	5.19
7	1.4	0.2	118.10	5.09
8	1.6	0.2	118.10	4.98
9	1.8	0.2	118.10	4.88
10	2	0.2	118.10	4.78
11	2.2	0.2	118.10	4.67
12	2.4	0.2	118.10	4.57
13	2.6	0.2	118.10	4.47
14	2.8	0.2	118.10	4.36
15	3	0.2	118.10	4.26
16	3.2	0.2	118.10	4.15
17	3.4	0.2	118.10	4.05
18	3.6	0.2	118.10	3.95
19	3.8	0.2	118.10	3.84
20	4	0.2	118.10	3.74
21	0	0.0	0.00	3.74
22	0	0.0	0.00	3.74
23	0	0.0	0.00	3.74
24	0	0.0	0.00	3.74
25	0	0.0	0.00	3.74
26	0	0.0	0.00	3.74
27	0	0.0	0.00	3.74
28	0	0.0	0.00	3.74
29	0	0.0	0.00	3.74
30	0	0.0	0.00	3.74
31	0	0.0	0.00	3.74
32	0	0.0	0.00	3.74
33	0	0.0	0.00	3.74
34	0	0.0	0.00	3.74
Max	4	Sum	0.94	

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 = 6.75 ft
Footing Diameter, B = 2.00 ft
Compressive Force, P = 3.80 k

Footing Area = 3.14 ft^2
Circumference = 6.28 ft
Skin Friction Area = 23.56 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

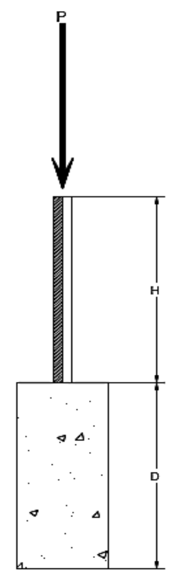
Footing Volume 21.21 ft^3
Weight 3.07 k

Skin Friction Resistance

Skin Friction = 0.15 ksf
Resistance = 3.53 k

1/3 Increase for Wind = 1.33
Total Resistance = 11.00 k
Applied Force = 6.87 k
Utilization = 62%

A 2ft diameter footing passes at a depth of 6.75ft.



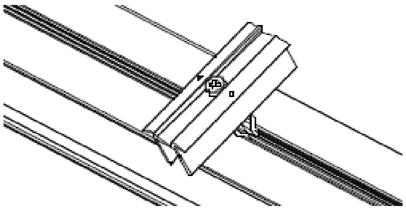
6. DESIGN OF JOINTS AND CONNECTIONS

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.

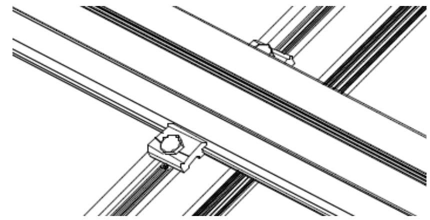
Fastening of Modules to Purlins

Maximum Uplifting Force =	0.454	k
Allowable Uplift =	1.214	k
Utilization =	37%	



Fastening of Purlins to Girders

Maximum Uplifting Force =	1.854	k
Allowable Uplift =	2.180	k
Utilization =	85%	

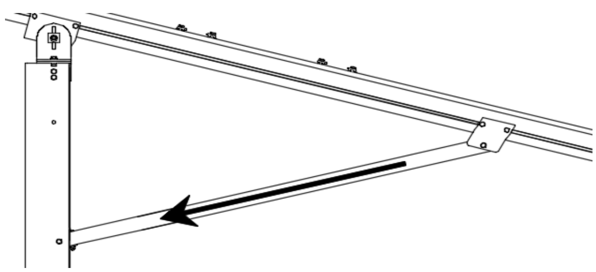


6.2 Strut Connections

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 =	3.860	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)

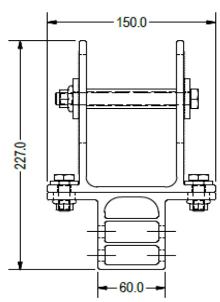


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

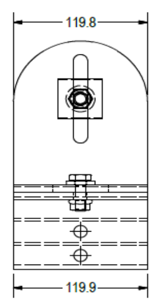
6.3 Girder to Post Connection

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.

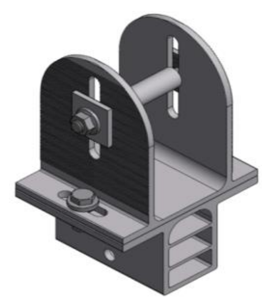
Maximum Tensile Load =	3.941	k
Allowable Load =	5.649	k
Utilization =	70%	



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

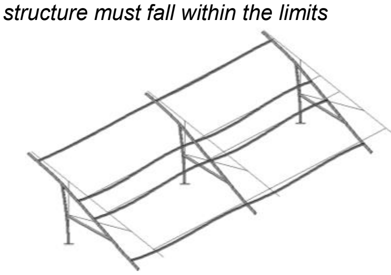
7.1 Seismic Drift

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} =	0.819	in

0.819 ≤ 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 = 138 in

J = 0.432

381.773

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

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= 27.0 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 = 138

J = 0.432

242.785

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

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= 28.3

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 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

$\lambda =$ 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 0.23671

φcc = 0.77756

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

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)

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

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

$\varphi F_L = \varphi yFcy$

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 =	-4.29	k	(LRFD Factored Load)
Mr (Strong) =	17.02	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 =	0.1165 <	0.2	
Utilization =	1.00 >	1.0	NG!

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.116 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 100%

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	-42.559	-42.559	0	0
2	M11	y	-42.559	-42.559	0	0
3	M12	y	-70.932	-70.932	0	0
4	M13	y	-70.932	-70.932	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	85.119	85.119	0	0
2	M11	y	85.119	85.119	0	0
3	M12	y	42.559	42.559	0	0
4	M13	y	42.559	42.559	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	913.837	2	2080.891	1	290.386	2	.423	2	.047	5	4.69	3
2		min	-1165.281	3	-1372.377	3	-376.445	5	-1.732	5	-.038	2	.131	10
3	N19	max	2963.374	2	5646.028	2	0	2	0	1	.05	4	10.136	3
4		min	-3059.394	3	-4246.573	3	-414.099	5	-1.826	4	0	3	-.067	10
5	N29	max	913.837	2	2080.891	1	312.511	3	.516	3	.053	4	4.69	3
6		min	-1165.281	3	-1372.377	3	-436.967	4	-1.849	4	-.019	3	-.123	5
7	Totals:	max	4791.048	2	9733.042	2	0	2						
8		min	-5389.956	3	-6991.327	3	-1190.907	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	1	.003	4	0	1	0	1	0	1
2			min	0	1	0	3	-.002	1	0	1	0	1	0	1
3		2	max	-.299	15	-.427	15	0	12	0	1	0	12	0	6
4			min	-1.274	4	-1.817	6	-1.498	5	0	1	0	5	0	15
5		3	max	-20.657	12	281.48	3	-24.941	12	.079	3	.306	1	.272	2
6			min	-211.878	1	-635.454	2	-161.107	1	-.275	2	.041	10	-.116	3
7		4	max	-21.153	12	280.417	3	-24.941	12	.079	3	.206	1	.667	2
8			min	-212.871	1	-636.872	2	-161.107	1	-.275	2	.025	10	-.291	3
9		5	max	-21.649	12	279.354	3	-24.941	12	.079	3	.106	1	1.062	2
10			min	-213.863	1	-638.289	2	-161.107	1	-.275	2	.009	10	-.464	3
11		6	max	145.934	3	565.976	2	6.336	3	.133	2	.109	2	1.016	2
12			min	-600.683	1	-180.318	3	-236.111	1	-.124	3	-.043	3	-.469	3
13		7	max	145.19	3	564.559	2	6.336	3	.133	2	.013	10	.666	2
14			min	-601.675	1	-181.381	3	-236.111	1	-.124	3	-.091	4	-.357	3
15		8	max	144.446	3	563.141	2	6.336	3	.133	2	-.023	12	.316	2
16			min	-602.668	1	-182.444	3	-236.111	1	-.124	3	-.189	1	-.244	3
17		9	max	112.322	3	89.114	3	-13.811	12	.02	5	.098	1	.11	1
18			min	-821.851	1	-71.831	2	-243.189	1	-.205	2	-.009	10	-.188	3
19		10	max	111.577	3	88.051	3	-13.811	12	.02	5	.061	3	.154	2
20			min	-822.843	1	-73.248	2	-243.189	1	-.205	2	-.06	2	-.243	3
21		11	max	110.833	3	86.988	3	-13.811	12	.02	5	.049	3	.2	2
22			min	-823.836	1	-74.666	2	-243.189	1	-.205	2	-.203	1	-.297	3
23		12	max	75.197	3	730.139	3	194.29	2	.437	3	.19	1	.413	2
24			min	-1040.319	1	-493.854	2	-395.475	3	-.388	2	-.081	5	-.601	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	74.453	3	729.076	3	194.29	2	.437	3	.237	1	.72	2
26			min	-1041.311	1	-495.272	2	-395.475	3	-.388	2	-.226	3	-1.053	3
27		14	max	214.771	1	445.281	2	78.29	5	.295	2	.186	3	1.015	2
28			min	11.489	15	-645.412	3	-127.925	3	-.499	3	-.21	4	-1.487	3
29		15	max	213.779	1	443.864	2	76.79	5	.295	2	.107	3	.739	2
30			min	11.19	15	-646.475	3	-127.925	3	-.499	3	-.202	1	-1.086	3
31		16	max	212.786	1	442.446	2	75.29	5	.295	2	.027	3	.464	2
32			min	10.89	15	-647.538	3	-127.925	3	-.499	3	-.266	1	-.684	3
33		17	max	211.794	1	441.029	2	73.791	5	.295	2	-.031	15	.19	2
34			min	10.591	15	-648.601	3	-127.925	3	-.499	3	-.331	1	-.282	3
35		18	max	1.274	4	1.819	6	1.501	4	0	1	0	12	0	6
36			min	.299	15	.428	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.004	2	.002	1	0	1	0	1	0	1
38			min	0	1	-.007	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.015	2	.003	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	-.427	15	0	1	0	1	0	1	0	6
42			min	-1.274	4	-1.815	6	-1.499	5	0	1	0	5	0	15
43		3	max	-8.793	12	895.886	3	0	1	.067	4	.217	4	.732	2
44			min	-434.368	1	-1876.307	2	-114.973	5	0	1	0	1	-.356	3
45		4	max	-9.289	12	894.823	3	0	1	.067	4	.145	4	1.897	2
46			min	-435.36	1	-1877.725	2	-116.472	5	0	1	0	1	-.912	3
47		5	max	-9.786	12	893.76	3	0	1	.067	4	.073	4	3.063	2
48			min	-436.353	1	-1879.142	2	-117.972	5	0	1	0	1	-1.467	3
49		6	max	620.484	3	1709.51	2	0	1	0	1	0	1	2.912	2
50			min	-1617.572	2	-688.073	3	-86.624	4	-.06	4	-.044	5	-1.441	3
51		7	max	619.739	3	1708.093	2	0	1	0	1	0	1	1.852	2
52			min	-1618.565	2	-689.136	3	-88.124	4	-.06	4	-.097	4	-1.014	3
53		8	max	618.995	3	1706.675	2	0	1	0	1	0	1	.792	2
54			min	-1619.558	2	-690.199	3	-89.623	4	-.06	4	-.152	4	-.586	3
55		9	max	610.316	3	226.613	3	0	1	.018	4	.071	5	.163	1
56			min	-1991.882	1	-179.673	2	-201.548	4	0	1	0	1	-.371	3
57		10	max	609.572	3	225.55	3	0	1	.018	4	0	1	.275	1
58			min	-1992.874	1	-181.091	2	-203.048	4	0	1	-.055	4	-.511	3
59		11	max	608.827	3	224.487	3	0	1	.018	4	0	1	.387	1
60			min	-1993.867	1	-182.508	2	-204.548	4	0	1	-.182	4	-.651	3
61		12	max	607.171	3	1963.052	3	0	1	.186	4	0	1	.997	2
62			min	-2416.048	1	-1457.347	2	-241.742	5	0	1	-.075	4	-1.49	3
63		13	max	606.427	3	1961.989	3	0	1	.186	4	0	1	1.902	2
64			min	-2417.04	1	-1458.764	2	-243.242	5	0	1	-.226	4	-2.708	3
65		14	max	437.514	1	1234.184	2	79.784	5	0	1	0	1	2.771	2
66			min	10.155	12	-1725.874	3	0	1	-.134	4	-.15	5	-3.875	3
67		15	max	436.522	1	1232.766	2	78.284	5	0	1	0	1	2.006	2
68			min	9.659	12	-1726.937	3	0	1	-.134	4	-.101	5	-2.804	3
69		16	max	435.529	1	1231.349	2	76.785	5	0	1	0	1	1.241	2
70			min	9.162	12	-1728	3	0	1	-.134	4	-.053	5	-1.732	3
71		17	max	434.537	1	1229.931	2	75.285	5	0	1	0	1	.477	2
72			min	8.666	12	-1729.063	3	0	1	-.134	4	-.006	5	-.659	3
73		18	max	1.274	6	1.821	6	1.5	4	0	1	0	1	0	6
74			min	.299	15	.428	15	0	1	0	1	0	4	0	15
75		19	max	0	1	.011	2	0	4	0	1	0	1	0	1
76			min	0	1	-.017	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.004	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.299	15	-.428	15	.002	1	0	1	0	1	0	4
80			min	-1.274	4	-1.817	4	-1.498	5	0	1	0	5	0	15
81		3	max	4.907	5	281.48	3	161.107	1	.275	2	.089	5	.272	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	-211.878	1	-635.454	2	-51.133	5	-.079	3	-.306	1	-.116	3
83		4	max	4.444	5	280.417	3	161.107	1	.275	2	.057	5	.667	2
84			min	-212.871	1	-636.872	2	-52.633	5	-.079	3	-.206	1	-.291	3
85		5	max	3.981	5	279.354	3	161.107	1	.275	2	.024	5	1.062	2
86			min	-213.863	1	-638.289	2	-54.133	5	-.079	3	-.106	1	-.464	3
87		6	max	145.934	3	565.976	2	236.111	1	.124	3	.043	3	1.016	2
88			min	-600.683	1	-180.318	3	-21.781	5	-.133	2	-.109	2	-.469	3
89		7	max	145.19	3	564.559	2	236.111	1	.124	3	.043	1	.666	2
90			min	-601.675	1	-181.381	3	-23.281	5	-.133	2	-.066	5	-.357	3
91		8	max	144.446	3	563.141	2	236.111	1	.124	3	.189	1	.316	2
92			min	-602.668	1	-182.444	3	-24.781	5	-.133	2	-.081	5	-.244	3
93		9	max	112.322	3	89.114	3	243.189	1	.205	2	.009	10	.11	1
94			min	-821.851	1	-71.831	2	-85.108	5	.018	15	-.098	1	-.188	3
95		10	max	111.577	3	88.051	3	243.189	1	.205	2	.06	2	.154	2
96			min	-822.843	1	-73.248	2	-86.608	5	.018	15	-.061	3	-.243	3
97		11	max	110.833	3	86.988	3	243.189	1	.205	2	.203	1	.2	2
98			min	-823.836	1	-74.666	2	-88.108	5	.018	15	-.101	5	-.297	3
99		12	max	75.197	3	730.139	3	395.475	3	.388	2	-.013	12	.413	2
100			min	-1040.319	1	-493.854	2	-207.919	5	-.437	3	-.19	1	-.601	3
101		13	max	74.453	3	729.076	3	395.475	3	.388	2	.226	3	.72	2
102			min	-1041.311	1	-495.272	2	-209.418	5	-.437	3	-.286	4	-1.053	3
103		14	max	214.771	1	445.281	2	133.257	4	.499	3	.145	2	1.015	2
104			min	14.787	15	-645.412	3	-12.642	10	-.295	2	-.186	3	-1.487	3
105		15	max	213.779	1	443.864	2	131.757	4	.499	3	.202	1	.739	2
106			min	14.487	15	-646.475	3	-12.642	10	-.295	2	-.113	5	-1.086	3
107		16	max	212.786	1	442.446	2	130.257	4	.499	3	.266	1	.464	2
108			min	14.188	15	-647.538	3	-12.642	10	-.295	2	-.052	5	-.684	3
109		17	max	211.794	1	441.029	2	128.758	4	.499	3	.331	1	.19	2
110			min	13.889	15	-648.601	3	-12.642	10	-.295	2	.005	15	-.282	3
111		18	max	1.274	6	1.82	4	1.5	5	0	1	0	1	0	4
112			min	.299	15	.428	15	-.002	1	0	1	0	5	0	15
113		19	max	0	1	.004	2	0	5	0	1	0	1	0	1
114			min	0	1	-.007	3	-.002	1	0	1	0	1	0	1
115	M10	1	max	127.94	3	437.744	2	-13.294	15	.01	2	.373	1	.295	2
116			min	-12.645	10	-650.958	3	-209.901	1	-.02	3	.031	15	-.499	3
117		2	max	127.94	3	321.083	2	-10.675	15	.01	2	.135	1	.225	3
118			min	-12.645	10	-482.546	3	-162.559	1	-.02	3	.016	15	-.193	1
119		3	max	127.94	3	204.421	2	-8.056	15	.01	2	.036	3	.734	3
120			min	-12.645	10	-314.133	3	-115.216	1	-.02	3	-.043	1	-.526	2
121		4	max	127.94	3	87.76	2	-5.438	15	.01	2	.01	3	1.028	3
122			min	-12.645	10	-145.721	3	-67.873	1	-.02	3	-.16	1	-.712	2
123		5	max	127.94	3	22.691	3	-2.273	10	.01	2	-.008	12	1.106	3
124			min	-12.645	10	-32.439	1	-20.531	1	-.02	3	-.216	1	-.75	2
125		6	max	127.94	3	191.103	3	26.812	1	.01	2	-.012	15	.97	3
126			min	-12.645	10	-145.563	2	-10.784	3	-.02	3	-.212	1	-.639	2
127		7	max	127.94	3	359.515	3	74.155	1	.01	2	-.01	15	.618	3
128			min	-12.645	10	-262.225	2	-6.857	3	-.02	3	-.148	1	-.378	2
129		8	max	127.94	3	527.927	3	121.498	1	.01	2	0	10	.056	1
130			min	-12.645	10	-378.886	2	-2.93	3	-.02	3	-.045	3	-.024	5
131		9	max	127.94	3	696.339	3	168.84	1	.01	2	.163	1	.594	1
132			min	-12.645	10	-495.548	2	.998	3	-.02	3	-.047	3	-.731	3
133		10	max	127.94	3	864.751	3	4.925	3	.02	3	.409	1	1.298	2
134			min	-12.645	10	29.94	15	-216.183	1	-.01	2	-.043	3	-1.729	3
135		11	max	127.94	3	495.548	2	-.998	3	.02	3	.163	1	.594	1
136			min	-12.645	10	-696.339	3	-168.84	1	-.01	2	-.047	3	-.731	3
137		12	max	127.94	3	378.886	2	2.93	3	.02	3	.004	5	.056	1
138			min	-12.645	10	-527.927	3	-121.498	1	-.01	2	-.045	3	.013	10

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	127.94	3	262.225	2	6.857	3	.02	3	-.006	15	.618	3
140			min	-12.645	10	-359.515	3	-74.155	1	-.01	2	-.148	1	-.378	2
141		14	max	127.94	3	145.563	2	10.784	3	.02	3	-.012	15	.97	3
142			min	-12.645	10	-191.103	3	-26.812	1	-.01	2	-.212	1	-.639	2
143		15	max	127.94	3	32.439	1	20.531	1	.02	3	-.008	12	1.106	3
144			min	-18.327	5	-22.691	3	-.644	5	-.01	2	-.216	1	-.75	2
145		16	max	127.94	3	145.721	3	67.873	1	.02	3	.01	3	1.028	3
146			min	-31.443	5	-87.76	2	2.137	15	-.01	2	-.16	1	-.712	2
147		17	max	127.94	3	314.133	3	115.216	1	.02	3	.036	3	.734	3
148			min	-44.56	5	-204.421	2	4.755	15	-.01	2	-.043	1	-.526	2
149		18	max	127.94	3	482.546	3	162.559	1	.02	3	.135	1	.225	3
150			min	-57.677	5	-321.083	2	7.374	15	-.01	2	0	15	-.193	1
151		19	max	127.94	3	650.958	3	209.901	1	.02	3	.373	1	.295	2
152			min	-70.793	5	-437.744	2	9.993	15	-.01	2	.01	15	-.499	3
153	M11	1	max	319.104	1	416.556	2	3.24	5	0	10	.418	1	.203	1
154			min	-375.151	3	-644.08	3	-215.778	1	-.005	3	-.091	5	-.569	3
155		2	max	319.104	1	299.894	2	7.291	5	0	10	.172	1	.146	3
156			min	-375.151	3	-475.668	3	-168.435	1	-.005	3	-.084	5	-.274	2
157		3	max	319.104	1	183.233	2	11.342	5	0	10	.055	3	.646	3
158			min	-375.151	3	-307.256	3	-121.093	1	-.005	3	-.074	4	-.583	2
159		4	max	319.104	1	66.571	2	15.393	5	0	10	.024	3	.931	3
160			min	-375.151	3	-138.844	3	-73.75	1	-.005	3	-.137	1	-.742	2
161		5	max	319.104	1	29.568	3	19.444	5	0	10	-.002	12	1.001	3
162			min	-375.151	3	-50.09	2	-26.407	1	-.005	3	-.201	1	-.753	2
163		6	max	319.104	1	197.98	3	28.536	4	0	10	-.003	15	.856	3
164			min	-375.151	3	-166.752	2	-14.454	3	-.005	3	-.205	1	-.614	2
165		7	max	319.104	1	366.392	3	68.278	1	0	10	.027	5	.495	3
166			min	-375.151	3	-283.413	2	-10.526	3	-.005	3	-.148	1	-.327	2
167		8	max	319.104	1	534.805	3	115.621	1	0	10	.065	5	.11	2
168			min	-375.151	3	-400.075	2	-6.599	3	-.005	3	-.05	3	-.08	3
169		9	max	319.104	1	703.217	3	162.964	1	0	10	.148	1	.696	2
170			min	-375.151	3	-516.736	2	-2.672	3	-.005	3	-.056	3	-.871	3
171		10	max	319.104	1	633.398	2	3.901	5	.005	3	.386	1	1.43	2
172			min	-375.151	3	-871.629	3	-210.307	1	-.002	1	-.057	3	-1.878	3
173		11	max	319.104	1	516.736	2	7.952	5	.005	3	.148	1	.696	2
174			min	-375.151	3	-703.217	3	-162.964	1	0	5	-.084	5	-.871	3
175		12	max	319.104	1	400.075	2	12.002	5	.005	3	-.001	10	.11	2
176			min	-375.151	3	-534.805	3	-115.621	1	0	5	-.079	4	-.08	3
177		13	max	319.104	1	283.413	2	16.053	5	.005	3	-.021	10	.495	3
178			min	-375.151	3	-366.392	3	-68.278	1	0	5	-.148	1	-.327	2
179		14	max	319.104	1	166.752	2	20.104	5	.005	3	-.015	12	.856	3
180			min	-375.151	3	-197.98	3	-20.936	1	0	5	-.205	1	-.614	2
181		15	max	319.104	1	50.09	2	31.169	4	.005	3	0	15	1.001	3
182			min	-375.151	3	-29.568	3	2.535	10	0	5	-.201	1	-.753	2
183		16	max	319.104	1	138.844	3	73.75	1	.005	3	.032	5	.931	3
184			min	-375.151	3	-66.571	2	9.769	10	0	5	-.137	1	-.742	2
185		17	max	319.104	1	307.256	3	121.093	1	.005	3	.071	5	.646	3
186			min	-375.151	3	-183.233	2	16.928	12	0	5	-.014	2	-.583	2
187		18	max	319.104	1	475.668	3	168.435	1	.005	3	.172	1	.146	3
188			min	-375.151	3	-299.894	2	19.546	12	0	5	.018	10	-.274	2
189		19	max	319.104	1	644.08	3	215.778	1	.005	3	.418	1	.203	1
190			min	-375.151	3	-416.556	2	22.164	12	0	5	.054	10	-.569	3
191	M12	1	max	58.786	5	632.682	2	7.792	5	0	10	.436	1	.338	2
192			min	-27.715	9	-272.69	3	-218.184	1	-.004	3	-.116	5	.006	12
193		2	max	52.226	2	458.014	2	11.843	5	0	10	.187	1	.305	3
194			min	-27.715	9	-191.289	3	-170.841	1	-.004	3	-.104	5	-.359	2
195		3	max	52.226	2	283.345	2	15.894	5	0	10	.041	3	.497	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-27.715	9	-109.888	3	-123.499	1	-.004	3	-.086	4	-.833	2
197		4	max	52.226	2	108.677	2	19.945	5	0	10	.013	3	.586	3
198			min	-27.715	9	-28.488	3	-76.156	1	-.004	3	-.128	1	-1.083	2
199		5	max	52.226	2	52.913	3	23.996	5	0	10	-.006	12	.57	3
200			min	-27.715	9	-65.992	2	-28.813	1	-.004	3	-.195	1	-1.111	2
201		6	max	52.226	2	134.313	3	32.805	4	0	10	0	15	.451	3
202			min	-27.715	9	-240.66	2	-11.686	3	-.004	3	-.202	1	-.915	2
203		7	max	52.226	2	215.714	3	65.872	1	0	10	.037	5	.227	3
204			min	-31.586	14	-415.329	2	-7.758	3	-.004	3	-.148	1	-.496	2
205		8	max	52.226	2	297.114	3	113.215	1	0	10	.08	5	.147	2
206			min	-43.423	4	-589.998	2	-3.831	3	-.004	3	-.047	3	-.101	3
207		9	max	52.226	2	378.515	3	160.558	1	0	10	.165	4	1.012	2
208			min	-56.54	4	-764.666	2	.097	3	-.004	3	-.049	3	-.532	3
209		10	max	52.226	2	939.335	2	130.434	14	.004	3	.377	1	2.101	2
210			min	-69.656	4	-459.916	3	-207.9	1	-.002	1	-.046	3	-1.068	3
211		11	max	52.226	2	764.666	2	12.733	5	.004	3	.141	1	1.012	2
212			min	-27.715	9	-378.515	3	-160.558	1	0	5	-.105	5	-.532	3
213		12	max	52.226	2	589.998	2	16.784	5	.004	3	-.003	10	.147	2
214			min	-27.715	9	-297.114	3	-113.215	1	0	5	-.095	4	-.101	3
215		13	max	52.226	2	415.329	2	20.835	5	.004	3	-.021	10	.227	3
216			min	-27.715	9	-215.714	3	-65.872	1	0	5	-.148	1	-.496	2
217		14	max	52.226	2	240.66	2	24.886	5	.004	3	-.017	12	.451	3
218			min	-27.715	9	-134.313	3	-18.53	1	0	5	-.202	1	-.915	2
219		15	max	52.226	2	65.992	2	36.337	4	.004	3	.001	15	.57	3
220			min	-28.812	14	-52.913	3	4.084	10	0	5	-.195	1	-1.111	2
221		16	max	52.226	2	28.488	3	76.156	1	.004	3	.041	5	.586	3
222			min	-37.683	4	-108.677	2	11.318	10	0	5	-.128	1	-1.083	2
223		17	max	52.226	2	109.888	3	123.499	1	.004	3	.086	4	.497	3
224			min	-50.8	4	-283.345	2	15.201	12	0	5	0	1	-.833	2
225		18	max	52.226	2	191.289	3	170.841	1	.004	3	.187	1	.305	3
226			min	-63.917	4	-458.014	2	17.819	12	0	5	.028	10	-.359	2
227		19	max	52.226	2	272.69	3	218.184	1	.004	3	.436	1	.338	2
228			min	-77.033	4	-632.682	2	20.438	12	0	5	.066	10	-.063	5
229	M13	1	max	48.112	5	633.178	2	5.836	5	.003	3	.371	1	.275	2
230			min	-160.935	1	-283.606	3	-209.745	1	-.014	2	-.11	5	-.079	3
231		2	max	34.995	5	458.51	2	9.887	5	.003	3	.133	1	.231	3
232			min	-160.935	1	-202.206	3	-162.402	1	-.014	2	-.1	5	-.422	2
233		3	max	21.878	5	283.841	2	13.938	5	.003	3	.034	3	.438	3
234			min	-160.935	1	-120.805	3	-115.06	1	-.014	2	-.096	4	-.897	2
235		4	max	8.762	5	109.173	2	17.989	5	.003	3	.009	3	.54	3
236			min	-160.935	1	-39.405	3	-67.717	1	-.014	2	-.161	1	-1.148	2
237		5	max	-2.536	15	41.996	3	22.04	5	.003	3	-.008	12	.538	3
238			min	-160.935	1	-65.496	2	-20.374	1	-.014	2	-.217	1	-1.176	2
239		6	max	-11.365	15	123.396	3	32.757	4	.003	3	-.005	15	.433	3
240			min	-160.935	1	-240.164	2	-10.455	3	-.014	2	-.213	1	-.98	2
241		7	max	-20.193	15	204.797	3	74.311	1	.003	3	.027	5	.223	3
242			min	-160.935	1	-414.833	2	-6.527	3	-.014	2	-.148	1	-.562	2
243		8	max	-24.941	12	286.197	3	121.654	1	.003	3	.069	5	.08	2
244			min	-160.935	1	-589.501	2	-2.6	3	-.014	2	-.045	3	-.091	3
245		9	max	-24.941	12	367.598	3	168.997	1	.003	3	.163	1	.945	2
246			min	-160.935	1	-764.17	2	1.316	12	-.014	2	-.046	3	-.508	3
247		10	max	-24.941	12	938.838	2	133.463	14	0	15	.409	1	2.033	2
248			min	-160.935	1	-448.999	3	-216.34	1	-.014	2	-.042	3	-1.03	3
249		11	max	29.097	5	764.17	2	9.439	5	.014	2	.163	1	.945	2
250			min	-160.935	1	-367.598	3	-168.997	1	-.003	3	-.087	5	-.508	3
251		12	max	15.981	5	589.501	2	13.49	5	.014	2	0	10	.08	2
252			min	-160.935	1	-286.197	3	-121.654	1	-.003	3	-.079	4	-.091	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	2.864	5	414.833	2	17.541	5	.014	2	-.021	10	.223	3
254			min	-160.935	1	-204.797	3	-74.311	1	-.003	3	-.148	1	-.562	2
255		14	max	-6.492	15	240.164	2	21.592	5	.014	2	-.018	15	.433	3
256			min	-160.935	1	-123.396	3	-26.969	1	-.003	3	-.213	1	-.98	2
257		15	max	-15.32	15	65.496	2	31	4	.014	2	.002	5	.538	3
258			min	-160.935	1	-41.996	3	2.16	10	-.003	3	-.217	1	-1.176	2
259		16	max	-24.149	15	39.405	3	67.717	1	.014	2	.038	5	.54	3
260			min	-160.935	1	-109.173	2	9.394	10	-.003	3	-.161	1	-1.148	2
261		17	max	-24.941	12	120.805	3	115.06	1	.014	2	.078	5	.438	3
262			min	-160.935	1	-283.841	2	14.394	12	-.003	3	-.044	1	-.897	2
263		18	max	-24.941	12	202.206	3	162.402	1	.014	2	.159	4	.231	3
264			min	-160.935	1	-458.51	2	17.012	12	-.003	3	.016	10	-.422	2
265		19	max	-24.941	12	283.606	3	209.745	1	.014	2	.371	1	.275	2
266			min	-160.935	1	-633.178	2	19.631	12	-.003	3	.051	10	-.079	3
267	M2	1	max	2080.891	1	1164.927	3	290.505	2	.047	5	1.732	5	4.69	3
268			min	-1372.377	3	-913.829	2	-376.478	5	-.038	2	-.423	2	.131	10
269		2	max	1502.014	1	750.152	3	199.187	2	.002	2	1.57	5	4.35	3
270			min	-1108.35	3	42.046	10	-340.017	5	-.001	3	-.322	2	.244	10
271		3	max	1498.908	1	750.152	3	199.187	2	.002	2	1.454	5	4.094	3
272			min	-1110.679	3	42.046	10	-337.325	5	-.001	3	-.254	2	.229	10
273		4	max	1495.802	1	750.152	3	199.187	2	.002	2	1.34	5	3.838	3
274			min	-1113.009	3	42.046	10	-334.633	5	-.001	3	-.186	2	.215	10
275		5	max	1492.695	1	750.152	3	199.187	2	.002	2	1.226	5	3.582	3
276			min	-1115.338	3	42.046	10	-331.941	5	-.001	3	-.125	1	.201	10
277		6	max	1489.589	1	750.152	3	199.187	2	.002	2	1.113	5	3.326	3
278			min	-1117.668	3	42.046	10	-329.249	5	-.001	3	-.064	1	.186	10
279		7	max	1486.483	1	750.152	3	199.187	2	.002	2	1.008	4	3.071	3
280			min	-1119.998	3	42.046	10	-326.557	5	-.001	3	-.047	3	.172	10
281		8	max	1483.377	1	750.152	3	199.187	2	.002	2	.904	4	2.815	3
282			min	-1122.327	3	42.046	10	-323.866	5	-.001	3	-.138	3	.158	10
283		9	max	1480.271	1	750.152	3	199.187	2	.002	2	.802	4	2.559	3
284			min	-1124.657	3	42.046	10	-321.174	5	-.001	3	-.229	3	.143	10
285		10	max	1477.165	1	750.152	3	199.187	2	.002	2	.701	4	2.303	3
286			min	-1126.986	3	42.046	10	-318.482	5	-.001	3	-.321	3	.129	10
287		11	max	1474.059	1	750.152	3	199.187	2	.002	2	.601	4	2.047	3
288			min	-1129.316	3	42.046	10	-315.79	5	-.001	3	-.412	3	.115	10
289		12	max	1470.953	1	750.152	3	199.187	2	.002	2	.501	4	1.791	3
290			min	-1131.645	3	42.046	10	-313.098	5	-.001	3	-.503	3	.1	10
291		13	max	1467.847	1	750.152	3	199.187	2	.002	2	.425	2	1.535	3
292			min	-1133.975	3	42.046	10	-310.406	5	-.001	3	-.594	3	.086	10
293		14	max	1464.741	1	750.152	3	199.187	2	.002	2	.493	2	1.279	3
294			min	-1136.305	3	42.046	10	-307.714	5	-.001	3	-.686	3	.072	10
295		15	max	1461.635	1	750.152	3	199.187	2	.002	2	.561	2	1.024	3
296			min	-1138.634	3	42.046	10	-305.022	5	-.001	3	-.777	3	.057	10
297		16	max	1458.528	1	750.152	3	199.187	2	.002	2	.629	2	.768	3
298			min	-1140.964	3	42.046	10	-302.33	5	-.001	3	-.868	3	.043	10
299		17	max	1455.422	1	750.152	3	199.187	2	.002	2	.697	2	.512	3
300			min	-1143.293	3	42.046	10	-299.638	5	-.001	3	-.96	3	.029	10
301		18	max	1452.316	1	750.152	3	199.187	2	.002	2	.765	2	.256	3
302			min	-1145.623	3	42.046	10	-296.946	5	-.001	3	-1.051	3	.014	10
303		19	max	1449.21	1	750.152	3	199.187	2	.002	2	.833	2	0	1
304			min	-1147.952	3	42.046	10	-294.254	5	-.001	3	-1.142	3	0	1
305	M5	1	max	5646.028	2	3056.942	3	0	1	.05	4	1.826	4	10.136	3
306			min	-4246.573	3	-2963.749	2	-414.173	5	0	1	0	1	-.067	10
307		2	max	3804.974	1	1603.046	3	0	1	0	1	1.651	4	9.296	3
308			min	-3326.62	3	50.528	10	-374.989	4	0	4	0	1	.293	10
309		3	max	3801.868	1	1603.046	3	0	1	0	1	1.524	4	8.749	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	-3328.95	3	50.528	10	-372.297	4	0	4	0	1	.276	10
311		4	max	3798.762	1	1603.046	3	0	1	0	1	1.397	4	8.202	3
312			min	-3331.279	3	50.528	10	-369.605	4	0	4	0	1	.259	10
313		5	max	3795.656	1	1603.046	3	0	1	0	1	1.272	4	7.655	3
314			min	-3333.609	3	50.528	10	-366.913	4	0	4	0	1	.241	10
315		6	max	3792.55	1	1603.046	3	0	1	0	1	1.147	4	7.109	3
316			min	-3335.938	3	50.528	10	-364.222	4	0	4	0	1	.224	10
317		7	max	3789.444	1	1603.046	3	0	1	0	1	1.023	4	6.562	3
318			min	-3338.268	3	50.528	10	-361.53	4	0	4	0	1	.207	10
319		8	max	3786.338	1	1603.046	3	0	1	0	1	.9	4	6.015	3
320			min	-3340.598	3	50.528	10	-358.838	4	0	4	0	1	.19	10
321		9	max	3783.231	1	1603.046	3	0	1	0	1	.779	4	5.468	3
322			min	-3342.927	3	50.528	10	-356.146	4	0	4	0	1	.172	10
323		10	max	3780.125	1	1603.046	3	0	1	0	1	.658	4	4.921	3
324			min	-3345.257	3	50.528	10	-353.454	4	0	4	0	1	.155	10
325		11	max	3777.019	1	1603.046	3	0	1	0	1	.537	4	4.375	3
326			min	-3347.586	3	50.528	10	-350.762	4	0	4	0	1	.138	10
327		12	max	3773.913	1	1603.046	3	0	1	0	1	.418	4	3.828	3
328			min	-3349.916	3	50.528	10	-348.07	4	0	4	0	1	.121	10
329		13	max	3770.807	1	1603.046	3	0	1	0	1	.3	4	3.281	3
330			min	-3352.245	3	50.528	10	-345.378	4	0	4	0	1	.103	10
331		14	max	3767.701	1	1603.046	3	0	1	0	1	.183	4	2.734	3
332			min	-3354.575	3	50.528	10	-342.686	4	0	4	0	1	.086	10
333		15	max	3764.595	1	1603.046	3	0	1	0	1	.066	4	2.187	3
334			min	-3356.904	3	50.528	10	-339.994	4	0	4	0	1	.069	10
335		16	max	3761.489	1	1603.046	3	0	1	0	1	0	1	1.64	3
336			min	-3359.234	3	50.528	10	-337.302	4	0	4	-.049	5	.052	10
337		17	max	3758.383	1	1603.046	3	0	1	0	1	0	1	1.094	3
338			min	-3361.564	3	50.528	10	-334.61	4	0	4	-.164	4	.034	10
339		18	max	3755.277	1	1603.046	3	0	1	0	1	0	1	.547	3
340			min	-3363.893	3	50.528	10	-331.918	4	0	4	-.278	4	.017	10
341		19	max	3752.171	1	1603.046	3	0	1	0	1	0	1	0	1
342			min	-3366.223	3	50.528	10	-329.226	4	0	4	-.39	4	0	1
343	M8	1	max	2080.891	1	1164.927	3	312.415	3	.053	4	1.849	4	4.69	3
344			min	-1372.377	3	-913.829	2	-437.095	4	-.019	3	-.516	3	-.123	5
345		2	max	1502.014	1	750.152	3	267.687	3	.001	3	1.665	4	4.35	3
346			min	-1108.35	3	-18.204	5	-386.589	4	-.002	2	-.41	3	-.106	5
347		3	max	1498.908	1	750.152	3	267.687	3	.001	3	1.533	4	4.094	3
348			min	-1110.679	3	-18.204	5	-383.897	4	-.002	2	-.319	3	-.099	5
349		4	max	1495.802	1	750.152	3	267.687	3	.001	3	1.403	4	3.838	3
350			min	-1113.009	3	-18.204	5	-381.205	4	-.002	2	-.227	3	-.093	5
351		5	max	1492.695	1	750.152	3	267.687	3	.001	3	1.273	4	3.582	3
352			min	-1115.338	3	-18.204	5	-378.513	4	-.002	2	-.136	3	-.087	5
353		6	max	1489.589	1	750.152	3	267.687	3	.001	3	1.145	4	3.326	3
354			min	-1117.668	3	-18.204	5	-375.821	4	-.002	2	-.045	3	-.081	5
355		7	max	1486.483	1	750.152	3	267.687	3	.001	3	1.017	4	3.071	3
356			min	-1119.998	3	-18.204	5	-373.129	4	-.002	2	-.017	2	-.075	5
357		8	max	1483.377	1	750.152	3	267.687	3	.001	3	.89	4	2.815	3
358			min	-1122.327	3	-18.204	5	-370.438	4	-.002	2	-.085	2	-.068	5
359		9	max	1480.271	1	750.152	3	267.687	3	.001	3	.771	5	2.559	3
360			min	-1124.657	3	-18.204	5	-367.746	4	-.002	2	-.153	2	-.062	5
361		10	max	1477.165	1	750.152	3	267.687	3	.001	3	.656	5	2.303	3
362			min	-1126.986	3	-18.204	5	-365.054	4	-.002	2	-.221	2	-.056	5
363		11	max	1474.059	1	750.152	3	267.687	3	.001	3	.541	5	2.047	3
364			min	-1129.316	3	-18.204	5	-362.362	4	-.002	2	-.289	2	-.05	5
365		12	max	1470.953	1	750.152	3	267.687	3	.001	3	.503	3	1.791	3
366			min	-1131.645	3	-18.204	5	-359.67	4	-.002	2	-.357	2	-.043	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	1467.847	1	750.152	3	267.687	3	.001	3	.594	3	1.535	3
368			min	-1133.975	3	-18.204	5	-356.978	4	-.002	2	-.425	2	-.037	5
369		14	max	1464.741	1	750.152	3	267.687	3	.001	3	.686	3	1.279	3
370			min	-1136.305	3	-18.204	5	-354.286	4	-.002	2	-.493	2	-.031	5
371		15	max	1461.635	1	750.152	3	267.687	3	.001	3	.777	3	1.024	3
372			min	-1138.634	3	-18.204	5	-351.594	4	-.002	2	-.561	2	-.025	5
373		16	max	1458.528	1	750.152	3	267.687	3	.001	3	.868	3	.768	3
374			min	-1140.964	3	-18.204	5	-348.902	4	-.002	2	-.629	2	-.019	5
375		17	max	1455.422	1	750.152	3	267.687	3	.001	3	.96	3	.512	3
376			min	-1143.293	3	-18.204	5	-346.21	4	-.002	2	-.697	2	-.012	5
377		18	max	1452.316	1	750.152	3	267.687	3	.001	3	1.051	3	.256	3
378			min	-1145.623	3	-18.204	5	-343.518	4	-.002	2	-.765	2	-.006	5
379		19	max	1449.21	1	750.152	3	267.687	3	.001	3	1.142	3	0	1
380			min	-1147.952	3	-18.204	5	-340.826	4	-.002	2	-.833	2	0	1
381	M3	1	max	1300.745	2	4.147	6	90.901	2	.006	3	.061	5	0	1
382			min	-488.994	3	.975	15	-45.002	3	-.01	2	-.041	2	0	1
383		2	max	1300.507	2	3.686	6	90.901	2	.006	3	.051	5	0	15
384			min	-489.172	3	.866	15	-45.002	3	-.01	2	-.014	2	-.001	6
385		3	max	1300.269	2	3.225	6	90.901	2	.006	3	.043	4	0	15
386			min	-489.351	3	.758	15	-45.002	3	-.01	2	-.006	3	-.002	6
387		4	max	1300.031	2	2.765	6	90.901	2	.006	3	.039	2	0	15
388			min	-489.529	3	.65	15	-45.002	3	-.01	2	-.019	3	-.003	6
389		5	max	1299.793	2	2.304	6	90.901	2	.006	3	.065	2	0	15
390			min	-489.708	3	.542	15	-45.002	3	-.01	2	-.032	3	-.004	6
391		6	max	1299.555	2	1.843	6	90.901	2	.006	3	.091	2	-.001	15
392			min	-489.886	3	.433	15	-45.002	3	-.01	2	-.045	3	-.004	6
393		7	max	1299.317	2	1.382	6	90.901	2	.006	3	.118	2	-.001	15
394			min	-490.065	3	.325	15	-45.002	3	-.01	2	-.058	3	-.005	6
395		8	max	1299.079	2	.922	6	90.901	2	.006	3	.144	2	-.001	15
396			min	-490.243	3	.217	15	-45.002	3	-.01	2	-.072	3	-.005	6
397		9	max	1298.841	2	.461	6	90.901	2	.006	3	.17	2	-.001	15
398			min	-490.422	3	.108	15	-45.002	3	-.01	2	-.085	3	-.005	6
399		10	max	1298.603	2	0	1	90.901	2	.006	3	.197	2	-.001	15
400			min	-490.6	3	0	1	-45.002	3	-.01	2	-.098	3	-.005	6
401		11	max	1298.365	2	-.108	15	90.901	2	.006	3	.223	2	-.001	15
402			min	-490.779	3	-.461	4	-45.002	3	-.01	2	-.111	3	-.005	6
403		12	max	1298.127	2	-.217	15	90.901	2	.006	3	.25	2	-.001	15
404			min	-490.957	3	-.922	4	-45.002	3	-.01	2	-.124	3	-.005	6
405		13	max	1297.889	2	-.325	15	90.901	2	.006	3	.276	2	-.001	15
406			min	-491.136	3	-1.382	4	-45.002	3	-.01	2	-.137	3	-.005	6
407		14	max	1297.651	2	-.433	15	90.901	2	.006	3	.302	2	-.001	15
408			min	-491.314	3	-1.843	4	-45.002	3	-.01	2	-.15	3	-.004	6
409		15	max	1297.413	2	-.542	15	90.901	2	.006	3	.329	2	0	15
410			min	-491.493	3	-2.304	4	-45.002	3	-.01	2	-.163	3	-.004	6
411		16	max	1297.175	2	-.65	15	90.901	2	.006	3	.355	2	0	15
412			min	-491.671	3	-2.765	4	-45.002	3	-.01	2	-.176	3	-.003	6
413		17	max	1296.937	2	-.758	15	90.901	2	.006	3	.382	2	0	15
414			min	-491.85	3	-3.225	4	-45.002	3	-.01	2	-.189	3	-.002	6
415		18	max	1296.699	2	-.866	15	90.901	2	.006	3	.408	2	0	15
416			min	-492.028	3	-3.686	4	-45.002	3	-.01	2	-.202	3	-.001	6
417		19	max	1296.461	2	-.975	15	90.901	2	.006	3	.434	2	0	1
418			min	-492.207	3	-4.147	4	-45.002	3	-.01	2	-.215	3	0	1
419	M6	1	max	3860.333	2	4.147	4	0	1	0	1	.065	4	0	1
420			min	-1696.904	3	.975	15	-42.081	4	-.005	4	0	1	0	1
421		2	max	3860.095	2	3.686	4	0	1	0	1	.052	4	0	15
422			min	-1697.082	3	.866	15	-41.708	4	-.005	4	0	1	-.001	4
423		3	max	3859.857	2	3.225	4	0	1	0	1	.04	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	-1697.261	3	.758	15	-41.335	4	-.005	4	0	1	-.002	4
425		4	max	3859.619	2	2.765	4	0	1	0	1	.028	4	0	15
426			min	-1697.439	3	.65	15	-40.961	4	-.005	4	0	1	-.003	4
427		5	max	3859.381	2	2.304	4	0	1	0	1	.017	4	0	15
428			min	-1697.618	3	.542	15	-40.588	4	-.005	4	0	1	-.004	4
429		6	max	3859.143	2	1.843	4	0	1	0	1	.005	4	-.001	15
430			min	-1697.796	3	.433	15	-40.215	4	-.005	4	0	1	-.004	4
431		7	max	3858.905	2	1.382	4	0	1	0	1	0	1	-.001	15
432			min	-1697.975	3	.325	15	-39.841	4	-.005	4	-.007	4	-.005	4
433		8	max	3858.667	2	.922	4	0	1	0	1	0	1	-.001	15
434			min	-1698.153	3	.217	15	-39.468	4	-.005	4	-.018	4	-.005	4
435		9	max	3858.429	2	.461	4	0	1	0	1	0	1	-.001	15
436			min	-1698.332	3	.108	15	-39.095	4	-.005	4	-.03	4	-.005	4
437		10	max	3858.191	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1698.51	3	0	1	-38.721	4	-.005	4	-.041	4	-.005	4
439		11	max	3857.953	2	-.108	15	0	1	0	1	0	1	-.001	15
440			min	-1698.689	3	-.461	6	-38.348	4	-.005	4	-.052	4	-.005	4
441		12	max	3857.715	2	-.217	15	0	1	0	1	0	1	-.001	15
442			min	-1698.867	3	-.922	6	-37.975	4	-.005	4	-.063	4	-.005	4
443		13	max	3857.477	2	-.325	15	0	1	0	1	0	1	-.001	15
444			min	-1699.046	3	-1.382	6	-37.601	4	-.005	4	-.074	4	-.005	4
445		14	max	3857.239	2	-.433	15	0	1	0	1	0	1	-.001	15
446			min	-1699.224	3	-1.843	6	-37.228	4	-.005	4	-.085	4	-.004	4
447		15	max	3857.001	2	-.542	15	0	1	0	1	0	1	0	15
448			min	-1699.403	3	-2.304	6	-36.855	4	-.005	4	-.096	4	-.004	4
449		16	max	3856.763	2	-.65	15	0	1	0	1	0	1	0	15
450			min	-1699.581	3	-2.765	6	-36.481	4	-.005	4	-.106	4	-.003	4
451		17	max	3856.525	2	-.758	15	0	1	0	1	0	1	0	15
452			min	-1699.76	3	-3.225	6	-36.108	4	-.005	4	-.117	4	-.002	4
453		18	max	3856.287	2	-.866	15	0	1	0	1	0	1	0	15
454			min	-1699.938	3	-3.686	6	-35.735	4	-.005	4	-.127	4	-.001	4
455		19	max	3856.049	2	-.975	15	0	1	0	1	0	1	0	1
456			min	-1700.117	3	-4.147	6	-35.361	4	-.005	4	-.138	4	0	1
457	M9	1	max	1300.745	2	4.147	4	45.002	3	.01	2	.069	4	0	1
458			min	-488.994	3	.975	15	-90.901	2	-.006	3	-.02	3	0	1
459		2	max	1300.507	2	3.686	4	45.002	3	.01	2	.054	4	0	15
460			min	-489.172	3	.866	15	-90.901	2	-.006	3	-.007	3	-.001	4
461		3	max	1300.269	2	3.225	4	45.002	3	.01	2	.04	5	0	15
462			min	-489.351	3	.758	15	-90.901	2	-.006	3	-.012	2	-.002	4
463		4	max	1300.031	2	2.765	4	45.002	3	.01	2	.029	5	0	15
464			min	-489.529	3	.65	15	-90.901	2	-.006	3	-.039	2	-.003	4
465		5	max	1299.793	2	2.304	4	45.002	3	.01	2	.032	3	0	15
466			min	-489.708	3	.542	15	-90.901	2	-.006	3	-.065	2	-.004	4
467		6	max	1299.555	2	1.843	4	45.002	3	.01	2	.045	3	-.001	15
468			min	-489.886	3	.433	15	-90.901	2	-.006	3	-.091	2	-.004	4
469		7	max	1299.317	2	1.382	4	45.002	3	.01	2	.058	3	-.001	15
470			min	-490.065	3	.325	15	-90.901	2	-.006	3	-.118	2	-.005	4
471		8	max	1299.079	2	.922	4	45.002	3	.01	2	.072	3	-.001	15
472			min	-490.243	3	.217	15	-90.901	2	-.006	3	-.144	2	-.005	4
473		9	max	1298.841	2	.461	4	45.002	3	.01	2	.085	3	-.001	15
474			min	-490.422	3	.108	15	-90.901	2	-.006	3	-.17	2	-.005	4
475		10	max	1298.603	2	0	1	45.002	3	.01	2	.098	3	-.001	15
476			min	-490.6	3	0	1	-90.901	2	-.006	3	-.197	2	-.005	4
477		11	max	1298.365	2	-.108	15	45.002	3	.01	2	.111	3	-.001	15
478			min	-490.779	3	-.461	6	-90.901	2	-.006	3	-.223	2	-.005	4
479		12	max	1298.127	2	-.217	15	45.002	3	.01	2	.124	3	-.001	15
480			min	-490.957	3	-.922	6	-90.901	2	-.006	3	-.25	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	1297.889	2	-.325	15	45.002	3	.01	2	.137	3	-.001	15
482			min	-491.136	3	-1.382	6	-90.901	2	-.006	3	-.276	2	-.005	4
483		14	max	1297.651	2	-.433	15	45.002	3	.01	2	.15	3	-.001	15
484			min	-491.314	3	-1.843	6	-90.901	2	-.006	3	-.302	2	-.004	4
485		15	max	1297.413	2	-.542	15	45.002	3	.01	2	.163	3	0	15
486			min	-491.493	3	-2.304	6	-90.901	2	-.006	3	-.329	2	-.004	4
487		16	max	1297.175	2	-.65	15	45.002	3	.01	2	.176	3	0	15
488			min	-491.671	3	-2.765	6	-90.901	2	-.006	3	-.355	2	-.003	4
489		17	max	1296.937	2	-.758	15	45.002	3	.01	2	.189	3	0	15
490			min	-491.85	3	-3.225	6	-90.901	2	-.006	3	-.382	2	-.002	4
491		18	max	1296.699	2	-.866	15	45.002	3	.01	2	.202	3	0	15
492			min	-492.028	3	-3.686	6	-90.901	2	-.006	3	-.408	2	-.001	4
493		19	max	1296.461	2	-.975	15	45.002	3	.01	2	.215	3	0	1
494			min	-492.207	3	-4.147	6	-90.901	2	-.006	3	-.434	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	-.016	10	-.031	15	.03	1	1.121e-2	3	NC	3	NC	3
2			min	-.259	3	-.372	1	-.665	5	-2.682e-2	2	337.259	1	336.87	5
3		2	max	-.016	10	-.027	15	.009	1	1.121e-2	3	NC	3	NC	3
4			min	-.259	3	-.301	1	-.638	4	-2.682e-2	2	410.603	1	363.115	5
5		3	max	-.016	10	-.022	15	-.001	12	1.059e-2	3	NC	2	NC	2
6			min	-.259	3	-.23	1	-.612	4	-2.466e-2	2	524.902	1	395.29	5
7		4	max	-.016	10	-.018	15	-.002	12	9.64e-3	3	NC	3	NC	1
8			min	-.259	3	-.162	1	-.579	4	-2.135e-2	2	716.13	1	440.473	5
9		5	max	-.016	10	-.013	15	0	12	8.687e-3	3	NC	3	NC	1
10			min	-.259	3	-.102	3	-.541	4	-1.804e-2	2	856.814	14	503.545	5
11		6	max	-.016	10	-.001	10	0	3	9.177e-3	3	NC	5	NC	2
12			min	-.259	3	-.09	3	-.5	4	-1.763e-2	2	950.598	2	590.989	5
13		7	max	-.016	10	.011	2	.002	3	1.067e-2	3	NC	5	NC	2
14			min	-.259	3	-.071	3	-.46	4	-1.923e-2	2	816.183	2	710.075	5
15		8	max	-.015	10	.025	2	.001	3	1.215e-2	3	NC	1	NC	2
16			min	-.259	3	-.047	3	-.423	4	-2.083e-2	2	752.026	2	873.441	5
17		9	max	-.015	10	.04	1	0	12	1.368e-2	3	NC	5	NC	2
18			min	-.259	3	-.02	3	-.392	4	-2.096e-2	2	712.713	2	1101.282	5
19		10	max	-.015	10	.064	1	0	3	1.527e-2	3	NC	5	NC	2
20			min	-.259	3	.006	15	-.36	4	-1.85e-2	2	681.904	2	1482.564	5
21		11	max	-.015	10	.086	1	.003	3	1.686e-2	3	NC	5	NC	2
22			min	-.259	3	.01	15	-.331	4	-1.604e-2	2	660.531	2	2198.337	5
23		12	max	-.015	10	.106	1	.008	3	1.407e-2	3	NC	5	NC	2
24			min	-.26	3	.013	15	-.306	4	-1.216e-2	2	648.685	2	3819.767	5
25		13	max	-.015	10	.125	3	.013	3	8.807e-3	3	NC	5	NC	2
26			min	-.26	3	.017	15	-.283	4	-7.485e-3	2	569.687	3	6251.565	1
27		14	max	-.015	10	.185	3	.011	3	3.794e-3	3	NC	5	NC	2
28			min	-.26	3	.009	10	-.266	4	-7.297e-3	4	454.347	3	4451.316	1
29		15	max	-.015	10	.265	3	.012	1	9.805e-3	3	NC	5	NC	3
30			min	-.26	3	-.008	10	-.258	5	-6.632e-3	4	357.592	3	3300.794	1
31		16	max	-.015	10	.36	3	.016	1	1.582e-2	3	NC	5	NC	3
32			min	-.26	3	-.03	10	-.257	5	-1.009e-2	2	285.377	3	3056.222	1
33		17	max	-.015	10	.464	3	.009	1	2.183e-2	3	NC	5	NC	3
34			min	-.26	3	-.064	2	-.26	4	-1.364e-2	2	233.515	3	3568.935	1
35		18	max	-.015	10	.572	3	0	10	2.575e-2	3	NC	4	NC	2
36			min	-.26	3	-.109	2	-.268	4	-1.595e-2	2	196.532	3	6641.987	1
37		19	max	-.015	10	.68	3	-.004	10	2.575e-2	3	NC	1	NC	1
38			min	-.26	3	-.154	2	-.277	4	-1.595e-2	2	169.688	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
39	M4	1	max	-.02	15	-.034	15	0	1	4.2e-5	5	NC	3	NC	1
40			min	-.552	3	-.828	1	-.663	4	0	1	203.944	1	336.8	4
41		2	max	-.02	15	-.028	15	0	1	4.2e-5	5	NC	10	NC	1
42			min	-.552	3	-.66	1	-.639	4	0	1	274.029	1	358.72	4
43		3	max	-.02	15	-.021	15	0	1	0	1	5078.773	12	NC	1
44			min	-.552	3	-.492	1	-.612	4	-4.804e-4	4	418.109	1	385.852	4
45		4	max	-.02	15	-.016	15	0	1	0	1	NC	11	NC	1
46			min	-.552	3	-.331	1	-.579	4	-1.281e-3	4	563.453	2	427.036	4
47		5	max	-.02	15	-.01	15	0	1	0	1	8578.862	15	NC	1
48			min	-.552	3	-.208	3	-.54	4	-2.083e-3	4	358.911	2	487.126	4
49		6	max	-.02	15	.002	10	0	1	0	1	NC	15	NC	1
50			min	-.553	3	-.193	3	-.499	4	-1.983e-3	4	287.914	2	572.436	4
51		7	max	-.02	15	.035	2	0	1	0	1	NC	5	NC	1
52			min	-.553	3	-.157	3	-.459	4	-1.261e-3	4	259.655	2	689.032	4
53		8	max	-.019	15	.06	2	0	1	0	1	NC	5	NC	1
54			min	-.553	3	-.107	3	-.423	4	-5.391e-4	4	247.64	2	846.203	4
55		9	max	-.019	15	.083	1	0	1	0	1	NC	4	NC	1
56			min	-.553	3	-.049	3	-.392	4	-1.542e-4	4	241.112	2	1055.382	4
57		10	max	-.019	10	.124	1	0	1	0	1	NC	4	NC	1
58			min	-.554	3	.006	15	-.36	4	-3.652e-4	4	235.587	2	1405.82	4
59		11	max	-.019	10	.162	1	0	1	0	1	NC	5	NC	1
60			min	-.554	3	.008	15	-.331	4	-5.762e-4	4	231.777	2	2040.986	4
61		12	max	-.018	10	.195	1	0	1	0	1	NC	5	NC	1
62			min	-.554	3	.011	15	-.306	4	-2.087e-3	4	230.003	2	3291.825	4
63		13	max	-.018	10	.261	3	0	1	0	1	NC	5	NC	1
64			min	-.554	3	.012	15	-.284	4	-4.332e-3	4	233.596	2	7041.578	4
65		14	max	-.018	10	.397	3	0	1	0	1	NC	5	NC	1
66			min	-.554	3	.009	10	-.27	4	-6.492e-3	4	248.931	2	NC	1
67		15	max	-.018	10	.585	3	0	1	0	1	NC	5	NC	1
68			min	-.554	3	-.036	10	-.265	4	-4.881e-3	4	184.9	3	NC	1
69		16	max	-.018	10	.812	3	0	1	0	1	NC	5	NC	1
70			min	-.554	3	-.116	2	-.264	4	-3.27e-3	4	140.788	3	NC	1
71		17	max	-.018	10	1.063	3	0	1	0	1	NC	5	NC	1
72			min	-.554	3	-.233	2	-.264	4	-1.658e-3	4	111.407	3	NC	1
73		18	max	-.018	10	1.323	3	0	1	0	1	NC	4	NC	1
74			min	-.554	3	-.357	2	-.265	4	-6.08e-4	4	91.627	3	NC	1
75		19	max	-.018	10	1.582	3	0	1	0	1	NC	1	NC	1
76			min	-.554	3	-.481	2	-.265	4	-6.08e-4	4	77.837	3	NC	1
77	M7	1	max	.006	5	-.004	15	-.004	12	2.682e-2	2	NC	3	NC	3
78			min	-.259	3	-.372	1	-.681	4	-1.121e-2	3	337.259	1	316.444	4
79		2	max	.006	5	-.002	15	-.001	12	2.682e-2	2	NC	3	NC	3
80			min	-.259	3	-.301	1	-.644	4	-1.121e-2	3	410.603	1	347.157	4
81		3	max	.006	5	0	15	.009	1	2.466e-2	2	NC	2	NC	2
82			min	-.259	3	-.23	1	-.606	4	-1.059e-2	3	524.902	1	384.586	4
83		4	max	.006	5	0	15	.017	1	2.135e-2	2	NC	3	NC	1
84			min	-.259	3	-.162	1	-.569	5	-9.64e-3	3	716.13	1	431.575	4
85		5	max	.006	5	.002	5	.018	1	1.804e-2	2	NC	3	NC	1
86			min	-.259	3	-.102	3	-.53	5	-8.687e-3	3	880.438	9	491.913	4
87		6	max	.006	5	.002	5	.014	1	1.763e-2	2	NC	5	NC	2
88			min	-.259	3	-.09	3	-.493	4	-9.177e-3	3	950.598	2	570.476	4
89		7	max	.006	5	.011	2	.006	1	1.923e-2	2	NC	4	NC	2
90			min	-.259	3	-.071	3	-.457	4	-1.067e-2	3	816.183	2	671.354	4
91		8	max	.006	5	.025	2	.002	2	2.083e-2	2	NC	1	NC	2
92			min	-.259	3	-.047	3	-.424	4	-1.215e-2	3	752.026	2	806.61	4
93		9	max	.006	5	.04	1	0	2	2.096e-2	2	NC	4	NC	2
94			min	-.259	3	-.02	3	-.392	4	-1.368e-2	3	712.713	2	1000.827	4
95		10	max	.006	5	.064	1	0	9	1.85e-2	2	NC	4	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.259	3	0	15	-.36	4	-1.527e-2	3	681.904	2	1306.354	4
97		11	max	.006	5	.086	1	.002	2	1.604e-2	2	NC	4	NC	2
98			min	-.259	3	0	15	-.33	4	-1.686e-2	3	660.531	2	1843.285	4
99		12	max	.006	5	.106	1	.007	1	1.216e-2	2	NC	5	NC	2
100			min	-.26	3	0	5	-.303	4	-1.407e-2	3	648.685	2	2975.817	4
101		13	max	.006	5	.125	3	.009	2	7.485e-3	2	NC	5	NC	2
102			min	-.26	3	-.002	5	-.281	4	-8.807e-3	3	569.687	3	5822.533	4
103		14	max	.006	5	.185	3	.003	2	2.991e-3	2	NC	5	NC	2
104			min	-.26	3	-.005	5	-.269	4	-6.484e-3	5	454.347	3	4451.316	1
105		15	max	.006	5	.265	3	-.001	10	6.541e-3	2	NC	5	NC	3
106			min	-.26	3	-.008	5	-.266	4	-9.805e-3	3	357.592	3	3300.794	1
107		16	max	.006	5	.36	3	-.001	12	1.009e-2	2	NC	5	NC	3
108			min	-.26	3	-.03	10	-.266	4	-1.582e-2	3	285.377	3	3056.222	1
109		17	max	.006	5	.464	3	0	12	1.364e-2	2	NC	4	NC	3
110			min	-.26	3	-.064	2	-.266	4	-2.183e-2	3	233.515	3	3568.935	1
111		18	max	.006	5	.572	3	.008	1	1.595e-2	2	NC	4	NC	2
112			min	-.26	3	-.109	2	-.262	4	-2.575e-2	3	196.532	3	6641.987	1
113		19	max	.006	5	.68	3	.028	1	1.595e-2	2	NC	1	NC	1
114			min	-.26	3	-.154	2	-.262	5	-2.575e-2	3	169.688	3	NC	1
115	M10	1	max	.001	3	.534	3	.26	3	1.449e-2	3	NC	1	NC	1
116			min	-.264	4	-.093	2	-.006	5	-5.991e-3	2	NC	1	NC	1
117		2	max	.001	3	.944	3	.28	3	1.675e-2	3	NC	4	NC	3
118			min	-.264	4	-.346	2	-.002	5	-7.169e-3	2	673.184	3	3491.256	1
119		3	max	.001	3	1.328	3	.377	1	1.9e-2	3	NC	5	NC	5
120			min	-.264	4	-.575	2	.005	15	-8.347e-3	2	347.968	3	1419.341	1
121		4	max	0	3	1.618	3	.483	1	2.126e-2	3	NC	5	NC	5
122			min	-.264	4	-.737	2	.013	15	-9.525e-3	2	254.706	3	919.987	1
123		5	max	0	3	1.778	3	.548	1	2.352e-2	3	NC	5	NC	5
124			min	-.264	4	-.809	2	.019	15	-1.07e-2	2	222.006	3	755.655	1
125		6	max	0	3	1.796	3	.558	1	2.577e-2	3	NC	5	NC	15
126			min	-.264	4	-.786	2	.024	15	-1.188e-2	2	218.733	3	735.064	1
127		7	max	0	3	1.691	3	.514	1	2.803e-2	3	NC	5	NC	15
128			min	-.264	4	-.681	2	.025	15	-1.306e-2	2	238.526	3	831.968	1
129		8	max	0	3	1.509	3	.531	3	3.029e-2	3	NC	4	NC	5
130			min	-.264	4	-.529	2	.024	15	-1.424e-2	2	283.172	3	1018.086	3
131		9	max	0	3	1.322	3	.549	3	3.255e-2	3	NC	4	NC	5
132			min	-.264	4	-.383	2	.021	15	-1.541e-2	2	350.268	3	955.035	3
133		10	max	0	1	1.233	3	.554	3	3.48e-2	3	NC	9	NC	5
134			min	-.264	4	-.314	2	.018	10	-1.659e-2	2	395.225	3	936.096	3
135		11	max	0	10	1.322	3	.549	3	3.255e-2	3	NC	4	NC	5
136			min	-.264	4	-.383	2	.022	15	-1.541e-2	2	350.268	3	955.035	3
137		12	max	0	10	1.509	3	.531	3	3.029e-2	3	NC	4	NC	5
138			min	-.264	4	-.529	2	.029	15	-1.424e-2	2	283.172	3	1018.086	3
139		13	max	0	10	1.691	3	.514	1	2.803e-2	3	NC	5	NC	15
140			min	-.264	4	-.681	2	.036	15	-1.306e-2	2	238.526	3	831.968	1
141		14	max	0	10	1.796	3	.558	1	2.577e-2	3	NC	5	NC	15
142			min	-.264	4	-.786	2	.042	15	-1.188e-2	2	218.733	3	735.064	1
143		15	max	0	10	1.778	3	.548	1	2.352e-2	3	NC	5	NC	15
144			min	-.264	4	-.809	2	.045	15	-1.07e-2	2	222.006	3	755.655	1
145		16	max	0	10	1.618	3	.483	1	2.126e-2	3	NC	5	NC	15
146			min	-.265	4	-.737	2	.045	15	-9.525e-3	2	254.706	3	919.987	1
147		17	max	0	10	1.328	3	.377	1	1.9e-2	3	NC	5	NC	5
148			min	-.265	4	-.575	2	.041	15	-8.347e-3	2	347.968	3	1419.341	1
149		18	max	0	10	.944	3	.28	3	1.675e-2	3	NC	4	NC	3
150			min	-.265	4	-.346	2	.027	10	-7.169e-3	2	673.184	3	3491.256	1
151		19	max	0	10	.534	3	.26	3	1.449e-2	3	NC	1	NC	1
152			min	-.265	4	-.093	2	.015	10	-5.991e-3	2	4117.792	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	.003	1	.093	1	.26	3	4.92e-3	3	NC	1	NC	1
154			min	-.32	4	0	15	-.006	5	-1.277e-4	5	NC	1	NC	1
155		2	max	.003	1	.343	3	.266	3	5.53e-3	3	NC	4	NC	3
156			min	-.32	4	-.182	2	.024	15	-6.143e-5	5	961.122	3	4725.34	1
157		3	max	.003	1	.614	3	.346	1	6.141e-3	3	NC	5	NC	10
158			min	-.32	4	-.381	2	.038	15	-6.975e-5	10	494.886	3	1694.12	1
159		4	max	.002	1	.803	3	.449	1	6.752e-3	3	NC	5	7071.199	15
160			min	-.32	4	-.507	2	.04	15	-9.216e-5	10	369.572	3	1040.065	1
161		5	max	.002	1	.874	3	.517	1	7.362e-3	3	NC	5	9406.654	15
162			min	-.321	4	-.537	2	.032	15	-1.146e-4	10	337.592	3	827.944	1
163		6	max	.002	1	.817	3	.533	1	7.973e-3	3	NC	5	NC	5
164			min	-.321	4	-.472	2	.019	15	-1.37e-4	10	362.73	3	788.073	1
165		7	max	.001	1	.652	3	.498	1	8.583e-3	3	NC	5	NC	5
166			min	-.321	4	-.329	2	.005	15	-1.594e-4	10	463.346	3	876.038	1
167		8	max	0	1	.425	3	.524	3	9.194e-3	3	NC	4	NC	5
168			min	-.321	4	-.145	2	-.005	5	-1.818e-4	10	748.809	3	1041.887	3
169		9	max	0	1	.21	3	.546	3	9.805e-3	3	NC	1	NC	4
170			min	-.321	4	.001	10	-.002	15	-2.042e-4	10	1789.314	3	962.143	3
171		10	max	0	1	.174	1	.554	3	1.042e-2	3	NC	4	NC	5
172			min	-.321	4	.009	15	.019	10	-2.266e-4	10	3416.456	1	937.696	3
173		11	max	0	3	.21	3	.546	3	9.805e-3	3	NC	1	NC	10
174			min	-.321	4	.001	10	.025	10	-2.042e-4	10	1789.314	3	962.143	3
175		12	max	0	3	.425	3	.524	3	9.194e-3	3	NC	4	NC	10
176			min	-.321	4	-.145	2	.04	10	-1.818e-4	10	748.809	3	1041.887	3
177		13	max	.001	3	.652	3	.498	1	8.583e-3	3	NC	5	7425.896	15
178			min	-.321	4	-.329	2	.054	10	-1.594e-4	10	463.346	3	876.038	1
179		14	max	.002	3	.817	3	.533	1	7.973e-3	3	9995.923	15	NC	15
180			min	-.321	4	-.472	2	.044	15	-1.37e-4	10	362.73	3	788.073	1
181		15	max	.002	3	.874	3	.517	1	7.362e-3	3	7565.917	15	NC	5
182			min	-.321	4	-.537	2	.029	15	-1.146e-4	10	337.592	3	827.944	1
183		16	max	.003	3	.803	3	.449	1	6.752e-3	3	6942.854	15	NC	5
184			min	-.321	4	-.507	2	.013	15	-9.216e-5	10	369.572	3	1040.065	1
185		17	max	.003	3	.614	3	.346	1	6.141e-3	3	7769.818	15	NC	4
186			min	-.322	4	-.381	2	.003	15	-6.975e-5	10	494.886	3	1694.12	1
187		18	max	.004	3	.343	3	.266	3	5.53e-3	3	NC	15	NC	3
188			min	-.322	4	-.182	2	.006	15	-4.734e-5	10	961.122	3	4725.34	1
189		19	max	.004	3	.093	1	.26	3	4.92e-3	3	NC	1	NC	1
190			min	-.322	4	.011	15	.015	10	-2.492e-5	10	NC	1	NC	1
191	M12	1	max	0	2	.031	2	.259	3	3.694e-3	3	NC	1	NC	1
192			min	-.403	4	-.03	3	-.006	5	-7.998e-5	5	NC	1	NC	1
193		2	max	0	2	.163	3	.276	3	4.153e-3	3	NC	5	NC	2
194			min	-.403	4	-.309	2	.021	10	-1.586e-5	15	811.301	2	4605.861	4
195		3	max	0	2	.318	3	.334	1	4.613e-3	3	NC	5	NC	10
196			min	-.403	4	-.605	2	.034	10	3.092e-5	15	433.794	2	1836.191	1
197		4	max	0	2	.409	3	.436	1	5.072e-3	3	NC	5	8615.065	10
198			min	-.403	4	-.796	2	.044	15	7.769e-5	15	333.822	2	1096.891	1
199		5	max	0	2	.426	3	.505	1	5.532e-3	3	NC	5	9214.776	15
200			min	-.403	4	-.848	2	.033	15	1.245e-4	15	313.861	2	860.246	1
201		6	max	0	2	.37	3	.525	1	5.991e-3	3	NC	5	NC	5
202			min	-.403	4	-.759	2	.016	15	1.712e-4	15	349.164	2	810.556	1
203		7	max	0	2	.256	3	.497	3	6.451e-3	3	NC	5	NC	5
204			min	-.403	4	-.554	2	0	15	2.18e-4	15	471.44	2	893.449	1
205		8	max	0	2	.115	3	.528	3	6.911e-3	3	NC	5	NC	7
206			min	-.403	4	-.288	2	-.015	5	2.648e-4	15	866.26	2	1027.077	3
207		9	max	0	2	.001	5	.547	3	7.37e-3	3	NC	3	NC	4
208			min	-.403	4	-.042	2	-.009	5	3.116e-4	15	3770.939	2	959.717	3
209		10	max	0	1	.07	2	.553	3	7.83e-3	3	NC	4	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.403	4	-.07	3	.019	15	3.583e-4	15	6876.14	3	939.345	3
211		11	max	0	9	0	15	.547	3	7.37e-3	3	NC	3	NC	10
212			min	-.403	4	-.042	2	.026	10	3.739e-4	15	3770.939	2	959.717	3
213		12	max	0	9	.115	3	.528	3	6.911e-3	3	NC	5	NC	10
214			min	-.403	4	-.288	2	.038	10	3.895e-4	15	866.26	2	1027.077	3
215		13	max	0	9	.256	3	.497	3	6.451e-3	3	NC	15	7920.677	10
216			min	-.403	4	-.554	2	.05	10	4.051e-4	15	471.44	2	893.449	1
217		14	max	0	9	.37	3	.525	1	5.991e-3	3	9339.566	15	NC	15
218			min	-.403	4	-.759	2	.047	15	4.207e-4	15	349.164	2	810.556	1
219		15	max	0	9	.426	3	.505	1	5.532e-3	3	7845.868	15	NC	5
220			min	-.403	4	-.848	2	.028	15	4.363e-4	15	313.861	2	860.246	1
221		16	max	0	9	.409	3	.436	1	5.072e-3	3	7719.812	15	NC	5
222			min	-.403	4	-.796	2	.009	15	4.5e-4	10	333.822	2	1096.891	1
223		17	max	0	9	.318	3	.334	1	4.613e-3	3	9124.326	15	NC	4
224			min	-.403	4	-.605	2	-.002	15	4.38e-4	10	433.794	2	1836.191	1
225		18	max	0	9	.163	3	.276	3	4.153e-3	3	NC	7	NC	2
226			min	-.403	4	-.309	2	.001	15	4.259e-4	10	811.301	2	5506.894	1
227		19	max	0	9	.031	2	.259	3	3.694e-3	3	NC	1	NC	1
228			min	-.403	4	-.03	3	.015	10	4.138e-4	10	NC	1	NC	1
229	M13	1	max	0	12	-.002	15	.259	3	9.533e-3	1	NC	1	NC	1
230			min	-.631	4	-.276	1	-.006	5	3.657e-5	3	NC	1	NC	1
231		2	max	0	12	.06	3	.28	3	1.098e-2	1	NC	5	NC	3
232			min	-.631	4	-.62	2	.028	10	-2.999e-4	3	669.388	2	3433.124	1
233		3	max	0	12	.2	3	.382	1	1.243e-2	1	NC	5	9341.274	10
234			min	-.631	4	-.98	2	.045	10	-6.364e-4	3	357.367	2	1402.573	1
235		4	max	0	12	.286	3	.488	1	1.388e-2	1	NC	5	6274.035	10
236			min	-.631	4	-1.226	2	.05	15	-9.729e-4	3	270.975	2	910.846	1
237		5	max	0	12	.302	3	.554	1	1.533e-2	1	NC	5	7084.36	15
238			min	-.63	4	-1.326	2	.042	15	-1.309e-3	3	246.766	2	748.588	1
239		6	max	0	12	.25	3	.564	1	1.678e-2	1	NC	5	NC	15
240			min	-.63	4	-1.276	2	.026	15	-1.646e-3	3	258.311	2	727.911	1
241		7	max	0	12	.142	3	.521	1	1.823e-2	1	NC	5	NC	5
242			min	-.63	4	-1.102	2	.01	15	-1.982e-3	3	308.768	2	822.578	1
243		8	max	0	12	.007	3	.529	3	1.979e-2	2	NC	5	NC	5
244			min	-.63	4	-.868	1	-.002	15	-2.319e-3	3	425.352	2	1021.982	3
245		9	max	0	12	-.026	15	.547	3	2.137e-2	2	NC	3	NC	5
246			min	-.63	4	-.686	1	-.001	15	-2.655e-3	3	662.488	2	959.885	3
247		10	max	0	1	-.025	15	.552	3	2.294e-2	2	NC	5	NC	5
248			min	-.63	4	-.602	1	.02	15	-2.992e-3	3	847.978	1	941.292	3
249		11	max	0	1	-.029	15	.547	3	2.137e-2	2	NC	3	NC	10
250			min	-.63	4	-.686	1	.028	10	-2.655e-3	3	662.488	2	959.885	3
251		12	max	0	1	.007	3	.529	3	1.979e-2	2	NC	15	NC	10
252			min	-.63	4	-.868	1	.042	10	-2.319e-3	3	425.352	2	1021.982	3
253		13	max	0	1	.142	3	.521	1	1.823e-2	1	9200.963	15	8053.254	15
254			min	-.63	4	-1.102	2	.052	15	-1.982e-3	3	308.768	2	822.578	1
255		14	max	0	1	.25	3	.564	1	1.678e-2	1	7498.234	15	NC	15
256			min	-.63	4	-1.276	2	.04	15	-1.646e-3	3	258.311	2	727.911	1
257		15	max	0	1	.302	3	.554	1	1.533e-2	1	6874.752	15	NC	5
258			min	-.63	4	-1.326	2	.023	15	-1.309e-3	3	246.766	2	748.588	1
259		16	max	.001	1	.286	3	.488	1	1.388e-2	1	7148.591	15	NC	5
260			min	-.63	4	-1.226	2	.007	15	-9.729e-4	3	270.975	2	910.846	1
261		17	max	.001	1	.2	3	.382	1	1.243e-2	1	8786.575	15	NC	4
262			min	-.63	4	-.98	2	-.002	15	-6.364e-4	3	357.367	2	1402.573	1
263		18	max	.002	1	.06	3	.28	3	1.098e-2	1	NC	7	NC	3
264			min	-.63	4	-.62	2	.003	15	-2.999e-4	3	669.388	2	3433.124	1
265		19	max	.002	1	-.025	15	.259	3	9.533e-3	1	NC	1	NC	1
266			min	-.63	4	-.276	1	.016	10	3.657e-5	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	10	.001	5	7.284e-3	2	NC	1	NC	1
270			min	0	1	-.002	3	0	2	-9.251e-3	5	NC	1	NC	1
271		3	max	0	3	0	10	.005	5	6.688e-3	2	NC	1	NC	1
272			min	0	1	-.006	3	-.001	2	-8.999e-3	5	NC	1	NC	1
273		4	max	0	3	0	10	.012	5	6.091e-3	2	NC	2	NC	1
274			min	0	1	-.013	3	-.003	2	-8.747e-3	5	5724.194	3	6328.094	5
275		5	max	0	3	-.001	10	.02	5	5.495e-3	2	NC	2	NC	1
276			min	0	1	-.022	3	-.004	2	-8.494e-3	5	3315.034	3	3669.835	5
277		6	max	0	3	-.002	10	.03	5	4.899e-3	2	NC	5	NC	1
278			min	0	1	-.034	3	-.006	2	-8.242e-3	5	2176.759	3	2417.245	5
279		7	max	0	3	-.002	10	.043	5	4.303e-3	2	NC	10	NC	1
280			min	0	1	-.048	3	-.008	2	-7.989e-3	5	1548.634	3	1726.583	5
281		8	max	0	3	-.003	10	.056	5	3.706e-3	2	NC	10	NC	9
282			min	0	1	-.063	3	-.01	2	-7.737e-3	5	1164.716	3	1304.447	5
283		9	max	0	3	-.004	10	.072	5	3.11e-3	2	NC	10	NC	9
284			min	0	1	-.081	3	-.011	2	-7.485e-3	5	912.711	3	1027.249	5
285		10	max	0	3	-.005	10	.088	5	2.514e-3	2	NC	10	NC	9
286			min	0	1	-.1	3	-.013	2	-7.232e-3	5	738.183	3	835.178	5
287		11	max	0	3	-.006	10	.106	5	1.918e-3	2	NC	10	NC	9
288			min	0	1	-.12	3	-.014	1	-6.98e-3	5	612.181	3	696.445	5
289		12	max	0	3	-.008	10	.124	5	1.322e-3	2	9644.02	10	NC	9
290			min	-.001	1	-.142	3	-.015	1	-6.794e-3	4	518.155	3	592.887	5
291		13	max	0	3	-.009	10	.143	5	7.526e-4	3	8275.84	10	NC	9
292			min	-.001	1	-.165	3	-.015	1	-6.614e-3	4	446.082	3	513.503	5
293		14	max	0	3	-.01	10	.163	5	1.152e-3	3	7208.78	10	NC	9
294			min	-.001	1	-.189	3	-.015	1	-6.433e-3	4	389.586	3	451.3	5
295		15	max	.001	3	-.012	10	.183	5	1.551e-3	3	6360.434	10	NC	9
296			min	-.001	1	-.214	3	-.014	1	-6.252e-3	4	344.483	3	401.678	5
297		16	max	.001	3	-.013	10	.204	5	1.951e-3	3	5674.826	10	NC	9
298			min	-.001	1	-.239	3	-.012	1	-6.072e-3	4	307.904	3	361.49	5
299		17	max	.001	3	-.014	10	.224	4	2.35e-3	3	5112.96	10	NC	9
300			min	-.002	1	-.265	3	-.01	1	-5.891e-3	4	277.837	3	328.349	4
301		18	max	.001	3	-.016	10	.245	4	2.75e-3	3	4646.998	10	NC	1
302			min	-.002	1	-.291	3	-.006	1	-5.71e-3	4	252.838	3	300.286	4
303		19	max	.001	3	-.017	10	.266	4	3.149e-3	3	4256.629	10	NC	1
304			min	-.002	1	-.318	3	-.011	3	-5.53e-3	4	231.848	3	276.769	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	10	.001	4	0	1	NC	1	NC	1
308			min	0	1	-.004	3	0	1	-9.968e-3	4	NC	1	NC	1
309		3	max	0	3	0	10	.006	4	0	1	NC	1	NC	1
310			min	0	1	-.013	3	0	1	-9.652e-3	4	5755.045	3	NC	1
311		4	max	0	3	0	10	.012	4	0	1	NC	2	NC	1
312			min	0	1	-.028	3	0	1	-9.336e-3	4	2667.476	3	6012.387	4
313		5	max	0	3	-.001	10	.021	4	0	1	NC	2	NC	1
314			min	-.001	1	-.048	3	0	1	-9.02e-3	4	1546.83	3	3491.32	4
315		6	max	.001	3	-.002	10	.032	4	0	1	NC	5	NC	1
316			min	-.001	1	-.072	3	0	1	-8.705e-3	4	1016.4	3	2302.752	4
317		7	max	.001	3	-.003	10	.045	4	0	1	NC	5	NC	1
318			min	-.001	1	-.102	3	0	1	-8.389e-3	4	723.411	3	1647.106	4
319		8	max	.002	3	-.004	10	.059	4	0	1	NC	5	NC	1
320			min	-.002	1	-.135	3	0	1	-8.073e-3	4	544.224	3	1246.237	4
321		9	max	.002	3	-.005	10	.075	4	0	1	NC	10	NC	1
322			min	-.002	1	-.173	3	0	1	-7.757e-3	4	426.556	3	982.935	4
323		10	max	.002	3	-.006	10	.092	4	0	1	NC	10	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	1	-.214	3	0	1	-7.441e-3	4	345.041	3	800.462	4
325		11	max	.002	3	-.007	10	.11	4	0	1	NC	10	NC	1
326			min	-.002	1	-.257	3	0	1	-7.126e-3	4	286.177	3	668.658	4
327		12	max	.002	3	-.009	10	.129	4	0	1	8548.57	10	NC	1
328			min	-.003	1	-.304	3	0	1	-6.81e-3	4	242.244	3	570.284	4
329		13	max	.003	3	-.01	10	.149	4	0	1	7298.798	10	NC	1
330			min	-.003	1	-.353	3	0	1	-6.494e-3	4	208.564	3	494.897	4
331		14	max	.003	3	-.012	10	.169	4	0	1	6331.81	10	NC	1
332			min	-.003	1	-.404	3	0	1	-6.178e-3	4	182.16	3	435.861	4
333		15	max	.003	3	-.013	10	.19	4	0	1	5568.021	10	NC	1
334			min	-.003	1	-.457	3	0	1	-5.863e-3	4	161.078	3	388.806	4
335		16	max	.003	3	-.015	10	.21	4	0	1	4954.092	10	NC	1
336			min	-.004	1	-.512	3	0	1	-5.547e-3	4	143.98	3	350.744	4
337		17	max	.003	3	-.017	10	.231	4	0	1	4453.273	10	NC	1
338			min	-.004	1	-.567	3	0	1	-5.231e-3	4	129.925	3	319.579	4
339		18	max	.004	3	-.018	10	.251	4	0	1	4039.571	10	NC	1
340			min	-.004	1	-.623	3	0	1	-4.915e-3	4	118.238	3	293.809	4
341		19	max	.004	3	-.02	10	.271	4	0	1	3694.17	10	NC	1
342			min	-.004	1	-.68	3	0	1	-4.6e-3	4	108.425	3	272.331	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	.002	4	3.641e-3	3	NC	1	NC	1
346			min	0	1	-.002	3	0	3	-1.052e-2	4	NC	1	NC	1
347		3	max	0	3	0	5	.006	4	3.241e-3	3	NC	1	NC	1
348			min	0	1	-.006	3	-.002	3	-1.014e-2	4	NC	1	NC	1
349		4	max	0	3	0	5	.012	4	2.842e-3	3	NC	2	NC	1
350			min	0	1	-.013	3	-.003	3	-9.76e-3	4	5724.194	3	5956.729	4
351		5	max	0	3	0	5	.021	4	2.443e-3	3	NC	2	NC	1
352			min	0	1	-.022	3	-.005	3	-9.383e-3	4	3315.034	3	3462.033	4
353		6	max	0	3	0	5	.032	4	2.043e-3	3	NC	4	NC	1
354			min	0	1	-.034	3	-.007	3	-9.005e-3	4	2176.759	3	2285.258	4
355		7	max	0	3	.001	5	.045	4	1.644e-3	3	NC	5	NC	1
356			min	0	1	-.048	3	-.01	3	-8.627e-3	4	1548.634	3	1635.865	4
357		8	max	0	3	.002	5	.059	4	1.244e-3	3	NC	5	NC	9
358			min	0	1	-.063	3	-.012	3	-8.25e-3	4	1164.716	3	1238.705	4
359		9	max	0	3	.002	5	.075	4	8.45e-4	3	NC	5	NC	9
360			min	0	1	-.081	3	-.014	3	-7.872e-3	4	912.711	3	977.785	4
361		10	max	0	3	.002	5	.092	4	4.456e-4	3	NC	5	NC	9
362			min	0	1	-.1	3	-.015	3	-7.494e-3	4	738.183	3	796.937	4
363		11	max	0	3	.003	5	.111	4	4.62e-5	3	NC	5	NC	9
364			min	0	1	-.12	3	-.016	3	-7.117e-3	4	612.181	3	666.3	4
365		12	max	0	3	.003	5	.13	4	5.453e-5	9	NC	5	NC	9
366			min	-.001	1	-.142	3	-.017	3	-6.739e-3	4	518.155	3	568.8	4
367		13	max	0	3	.004	5	.149	4	2.481e-4	9	NC	5	NC	9
368			min	-.001	1	-.165	3	-.016	3	-6.412e-3	5	446.082	3	494.094	4
369		14	max	0	3	.005	5	.169	4	4.548e-4	1	NC	5	NC	9
370			min	-.001	1	-.189	3	-.015	3	-6.109e-3	5	389.586	3	435.607	4
371		15	max	.001	3	.005	5	.189	4	9.809e-4	1	NC	5	NC	9
372			min	-.001	1	-.214	3	-.013	3	-5.807e-3	5	344.483	3	389.012	4
373		16	max	.001	3	.006	5	.21	4	1.507e-3	1	NC	5	NC	9
374			min	-.001	1	-.239	3	-.009	3	-5.505e-3	5	307.904	3	351.346	4
375		17	max	.001	3	.006	5	.23	4	2.033e-3	1	NC	5	NC	9
376			min	-.002	1	-.265	3	-.004	3	-5.202e-3	5	277.837	3	320.535	4
377		18	max	.001	3	.007	5	.25	4	2.559e-3	1	NC	5	NC	1
378			min	-.002	1	-.291	3	0	10	-4.9e-3	5	252.838	3	295.09	4
379		19	max	.001	3	.008	5	.269	4	3.085e-3	1	NC	7	NC	1
380			min	-.002	1	-.318	3	-.004	2	-4.598e-3	5	231.848	3	273.921	4

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
381	M3	1	max	0	3	0	10	0	5	4.083e-3	2	NC	1	NC	1
382			min	0	10	0	3	0	2	-4.841e-3	5	NC	1	NC	1
383		2	max	0	3	-.002	10	.029	5	4.198e-3	2	NC	1	NC	4
384			min	0	2	-.016	3	-.023	2	-4.77e-3	5	NC	1	2717.263	2
385		3	max	0	3	-.003	10	.059	5	4.313e-3	2	NC	1	NC	4
386			min	0	2	-.032	3	-.045	2	-4.7e-3	5	NC	1	1349.674	2
387		4	max	.001	3	-.004	10	.089	5	4.429e-3	2	NC	1	NC	4
388			min	-.001	2	-.048	3	-.068	2	-4.629e-3	5	NC	1	901.166	2
389		5	max	.001	3	-.006	10	.121	5	4.544e-3	2	NC	1	NC	4
390			min	-.002	2	-.063	3	-.09	2	-4.559e-3	5	NC	1	682.48	2
391		6	max	.001	3	-.007	10	.152	5	4.659e-3	2	NC	1	NC	4
392			min	-.002	2	-.079	3	-.11	2	-4.489e-3	5	NC	1	555.989	2
393		7	max	.002	3	-.008	10	.184	5	4.774e-3	2	NC	1	NC	4
394			min	-.003	2	-.095	3	-.128	2	-4.418e-3	5	NC	1	476.032	2
395		8	max	.002	3	-.01	10	.216	5	4.889e-3	2	NC	1	NC	4
396			min	-.003	2	-.11	3	-.144	2	-4.348e-3	5	NC	1	423.277	2
397		9	max	.002	3	-.011	10	.248	5	5.005e-3	2	NC	1	NC	4
398			min	-.004	2	-.126	3	-.157	2	-4.278e-3	5	NC	1	388.347	2
399		10	max	.002	3	-.012	10	.28	5	5.12e-3	2	NC	1	NC	4
400			min	-.004	2	-.141	3	-.166	2	-4.207e-3	5	NC	1	366.412	2
401		11	max	.002	3	-.013	10	.311	5	5.235e-3	2	NC	1	NC	4
402			min	-.004	2	-.156	3	-.171	2	-4.137e-3	5	NC	1	355.123	2
403		12	max	.002	3	-.014	10	.341	5	5.35e-3	2	NC	1	NC	6
404			min	-.005	2	-.172	3	-.171	2	-4.066e-3	5	NC	1	353.824	2
405		13	max	.003	3	-.015	10	.37	5	5.465e-3	2	NC	1	NC	6
406			min	-.005	2	-.187	3	-.165	2	-3.996e-3	5	NC	1	363.485	2
407		14	max	.003	3	-.016	10	.399	5	5.581e-3	2	NC	1	9006.71	6
408			min	-.006	2	-.202	3	-.154	2	-3.926e-3	5	NC	1	361.595	14
409		15	max	.003	3	-.016	10	.426	5	5.696e-3	2	NC	1	8785.371	6
410			min	-.006	2	-.217	3	-.136	2	-3.855e-3	5	NC	1	327.726	14
411		16	max	.003	3	-.017	10	.451	5	5.811e-3	2	NC	1	9439.802	6
412			min	-.007	2	-.232	3	-.111	2	-3.785e-3	5	NC	1	298.538	14
413		17	max	.003	3	-.018	10	.475	5	5.926e-3	2	NC	1	NC	4
414			min	-.007	2	-.247	3	-.079	2	-3.715e-3	5	NC	1	273.148	14
415		18	max	.003	3	-.018	10	.499	4	6.041e-3	2	NC	1	NC	4
416			min	-.007	2	-.262	3	-.038	2	-3.644e-3	5	NC	1	250.882	14
417		19	max	.004	3	-.019	10	.524	4	6.157e-3	2	NC	1	NC	1
418			min	-.008	2	-.277	3	0	12	-3.574e-3	5	NC	1	231.218	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	-5.233e-3	4	NC	1	NC	1
421		2	max	.002	3	-.001	15	.031	4	0	1	NC	1	NC	1
422			min	-.002	2	-.034	3	0	1	-5.179e-3	4	NC	1	NC	1
423		3	max	.002	3	-.003	15	.063	4	0	1	NC	1	NC	1
424			min	-.003	2	-.067	3	0	1	-5.126e-3	4	NC	1	NC	1
425		4	max	.003	3	-.004	15	.096	4	0	1	NC	1	NC	1
426			min	-.004	2	-.1	3	0	1	-5.072e-3	4	NC	1	7465.664	4
427		5	max	.004	3	-.005	15	.13	4	0	1	NC	1	NC	1
428			min	-.005	2	-.133	3	0	1	-5.019e-3	4	NC	1	4912.6	4
429		6	max	.004	3	-.007	15	.163	4	0	1	NC	1	NC	1
430			min	-.007	2	-.166	3	0	1	-4.965e-3	4	NC	1	3585.946	4
431		7	max	.005	3	-.008	15	.197	4	0	1	NC	1	NC	1
432			min	-.008	2	-.199	3	0	1	-4.911e-3	4	NC	1	2810.124	4
433		8	max	.005	3	-.009	15	.231	4	0	1	NC	1	NC	1
434			min	-.009	2	-.232	3	0	1	-4.858e-3	4	NC	1	2322.614	4
435		9	max	.006	3	-.01	15	.264	4	0	1	NC	1	NC	1
436			min	-.011	2	-.264	3	0	1	-4.804e-3	4	NC	1	2003.989	4
437		10	max	.006	3	-.012	15	.297	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	-.297	3	0	1	-4.751e-3	4	NC	1	1794.306	4
439		11	max	.007	3	-.013	15	.329	4	0	1	NC	1	NC	1
440			min	-.013	2	-.33	3	0	1	-4.697e-3	4	NC	1	1662.167	4
441		12	max	.008	3	-.014	15	.359	4	0	1	NC	1	NC	1
442			min	-.014	2	-.362	3	0	1	-4.643e-3	4	NC	1	1592.124	4
443		13	max	.008	3	-.015	15	.389	4	0	1	NC	1	NC	1
444			min	-.016	2	-.395	3	0	1	-4.59e-3	4	NC	1	1579.956	4
445		14	max	.009	3	-.016	15	.417	4	0	1	NC	1	NC	1
446			min	-.017	2	-.427	3	0	1	-4.536e-3	4	NC	1	1632.973	4
447		15	max	.009	3	-.017	15	.442	4	0	1	NC	1	NC	1
448			min	-.018	2	-.46	3	0	1	-4.482e-3	4	NC	1	1777.062	4
449		16	max	.01	3	-.018	15	.466	4	0	1	NC	1	NC	1
450			min	-.02	2	-.492	3	0	1	-4.429e-3	4	NC	1	2082.086	4
451		17	max	.01	3	-.019	15	.488	4	0	1	NC	1	NC	1
452			min	-.021	2	-.524	3	0	1	-4.375e-3	4	NC	1	2766.874	4
453		18	max	.011	3	-.02	15	.507	4	0	1	NC	1	NC	1
454			min	-.022	2	-.557	3	0	1	-4.322e-3	4	NC	1	4937.96	4
455		19	max	.012	3	-.021	15	.523	4	0	1	NC	1	NC	1
456			min	-.024	2	-.589	3	0	1	-4.268e-3	4	NC	1	NC	1
457	M9	1	max	0	3	0	5	0	4	2.008e-3	3	NC	1	NC	1
458			min	0	10	0	3	0	3	-5.546e-3	4	NC	1	NC	1
459		2	max	0	3	0	5	.033	4	2.083e-3	3	NC	1	NC	4
460			min	0	2	-.016	3	-.012	3	-5.484e-3	4	NC	1	2717.263	2
461		3	max	0	3	0	5	.067	4	2.158e-3	3	NC	1	NC	5
462			min	0	2	-.032	3	-.023	3	-5.423e-3	4	NC	1	1349.674	2
463		4	max	.001	3	0	5	.101	4	2.233e-3	3	NC	1	NC	15
464			min	-.001	2	-.048	3	-.035	3	-5.361e-3	4	NC	1	901.166	2
465		5	max	.001	3	0	5	.136	4	2.308e-3	3	NC	1	7977.257	15
466			min	-.002	2	-.063	3	-.046	3	-5.3e-3	4	NC	1	682.48	2
467		6	max	.001	3	0	5	.172	4	2.383e-3	3	NC	1	5771.558	15
468			min	-.002	2	-.079	3	-.056	3	-5.238e-3	4	NC	1	555.989	2
469		7	max	.002	3	0	5	.207	4	2.458e-3	3	NC	1	4493.92	15
470			min	-.003	2	-.095	3	-.066	3	-5.177e-3	4	NC	1	476.032	2
471		8	max	.002	3	.001	5	.242	4	2.533e-3	3	NC	1	3696.299	15
472			min	-.003	2	-.11	3	-.074	3	-5.115e-3	4	NC	1	423.277	2
473		9	max	.002	3	.001	5	.276	4	2.608e-3	3	NC	1	3177.137	15
474			min	-.004	2	-.126	3	-.08	3	-5.054e-3	4	NC	1	388.347	2
475		10	max	.002	3	.002	5	.309	4	2.683e-3	3	NC	1	2836.053	15
476			min	-.004	2	-.141	3	-.085	3	-5.12e-3	2	NC	1	366.412	2
477		11	max	.002	3	.002	5	.341	4	2.758e-3	3	NC	1	2620.655	15
478			min	-.004	2	-.156	3	-.088	3	-5.235e-3	2	NC	1	355.123	2
479		12	max	.002	3	.003	5	.371	4	2.833e-3	3	NC	1	2505.018	15
480			min	-.005	2	-.172	3	-.088	3	-5.35e-3	2	NC	1	353.824	2
481		13	max	.003	3	.003	5	.4	4	2.908e-3	3	NC	1	2481.525	15
482			min	-.005	2	-.187	3	-.086	3	-5.465e-3	2	NC	1	363.485	2
483		14	max	.003	3	.004	5	.426	4	2.983e-3	3	NC	1	2560.964	15
484			min	-.006	2	-.202	3	-.081	3	-5.581e-3	2	NC	1	387.365	2
485		15	max	.003	3	.004	5	.45	4	3.058e-3	3	NC	1	2783.347	15
486			min	-.006	2	-.217	3	-.072	3	-5.696e-3	2	NC	1	433.198	2
487		16	max	.003	3	.005	5	.471	4	3.132e-3	3	NC	1	3257.444	15
488			min	-.007	2	-.232	3	-.06	3	-5.811e-3	2	NC	1	520.093	2
489		17	max	.003	3	.005	5	.489	4	3.207e-3	3	NC	1	4324.556	15
490			min	-.007	2	-.247	3	-.044	3	-5.926e-3	2	NC	1	706.486	2
491		18	max	.003	3	.006	5	.503	4	3.282e-3	3	NC	1	7711.237	15
492			min	-.007	2	-.262	3	-.025	3	-6.041e-3	2	NC	1	1286.078	2
493		19	max	.004	3	.007	5	.515	5	3.357e-3	3	NC	1	NC	1
494			min	-.008	2	-.277	3	-.017	1	-6.157e-3	2	9636.887	5	NC	1