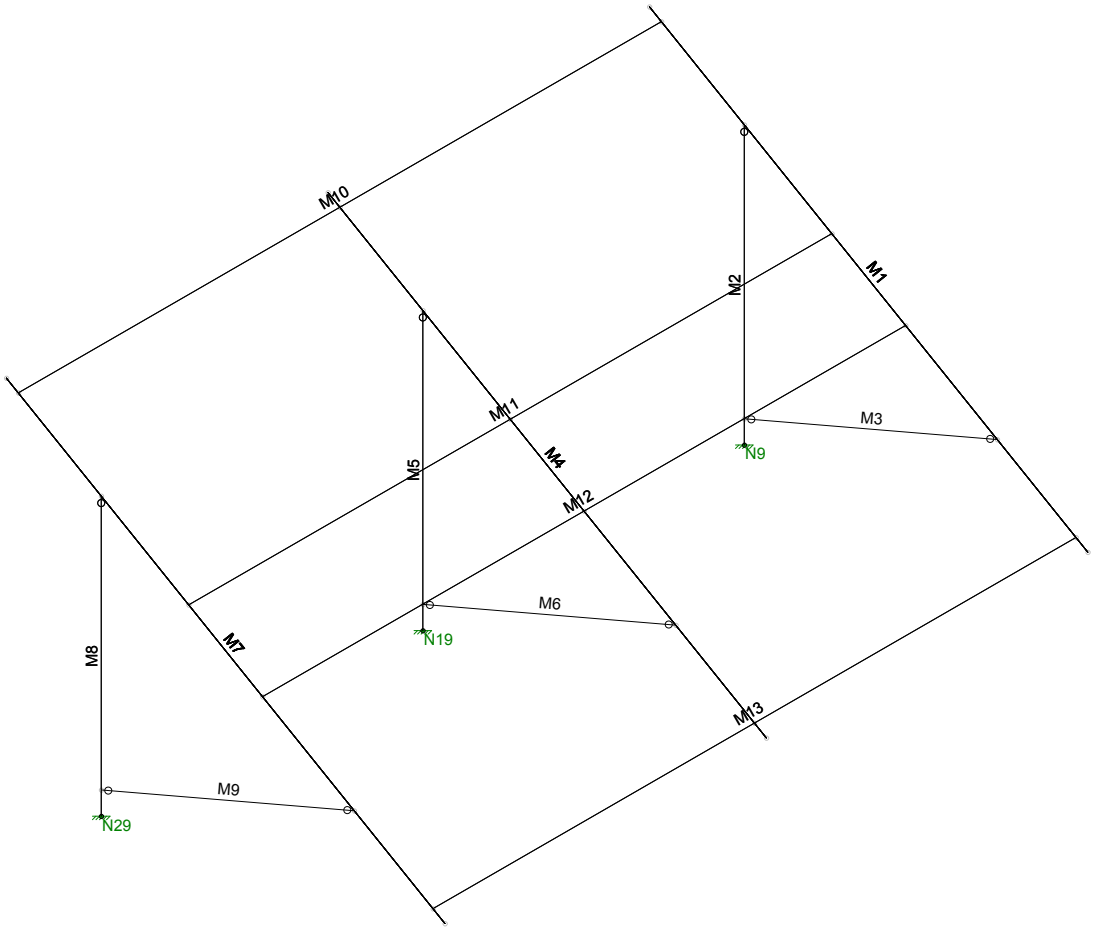


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

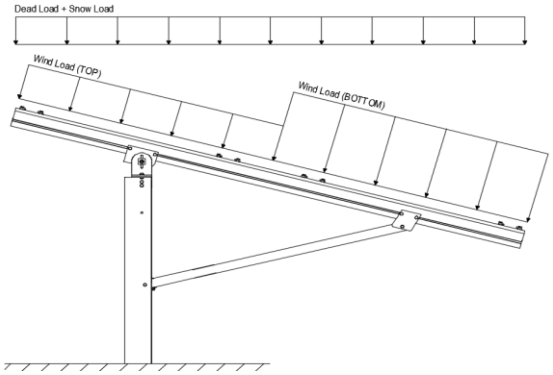
1.2 Construction

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

PV modules are required to meet the following specifications:

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

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



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

1.3 Technical Codes

- ASCE 7-10 - 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	*Self-weight of the PV modules.*
g_{MIN} =	1.75 psf	

2.2 Snow Loads

Ground Snow Load, P_g =	30.00 psf	
Sloped Roof Snow Load, P_s =	16.49 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	0.73	
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

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

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

2.4 Seismic Loads - N/A

S_S =	0.00	R =	1.25
S_{DS} =	0.00	C_S =	0
S_1 =	0.00	ρ =	1.3
S_{D1} =	0.00	Ω =	1.25
T_a =	0.00	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	*(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)*
0.56D + 1.3E	R	
1.54D + 1.25E + 0.2S	O	
0.56D + 1.25E	O	

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	*(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)*
1.238D + 0.875E	O	
1.1785D + 0.65625E + 0.75S	O	
0.362D + 0.875E	O	

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

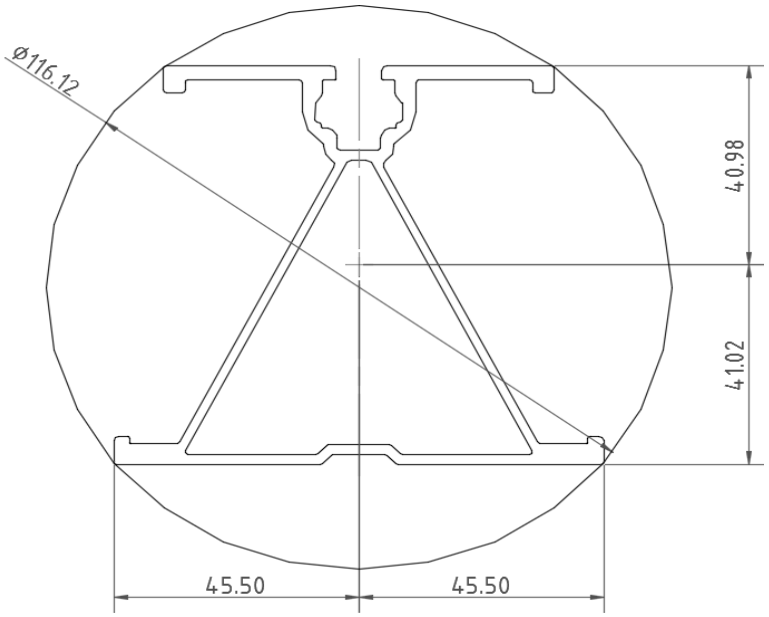
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	66	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 =	0.978	k-ft
M_z =	0.078	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	42%	

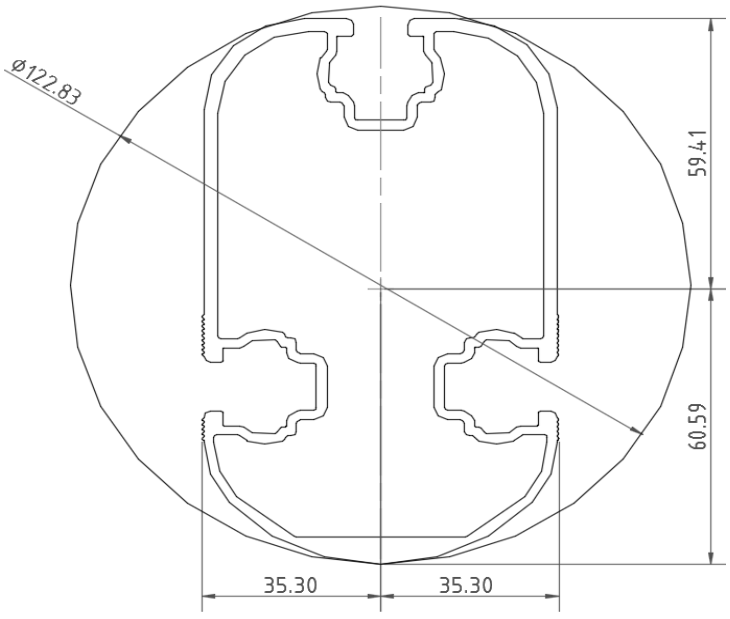


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.815	k-ft
M_z =	0.000	k-ft
P_n =	1.470	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	79%	

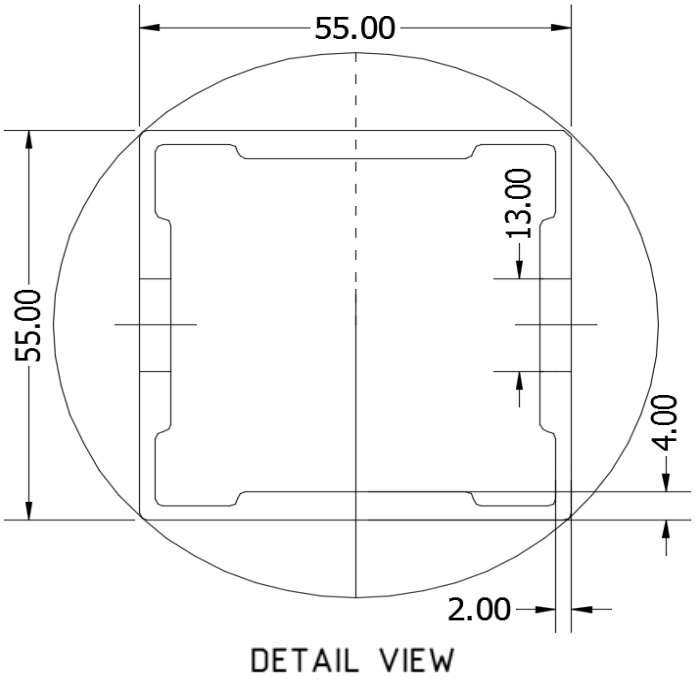


DETAIL VIEW

4.3 Strut Design

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

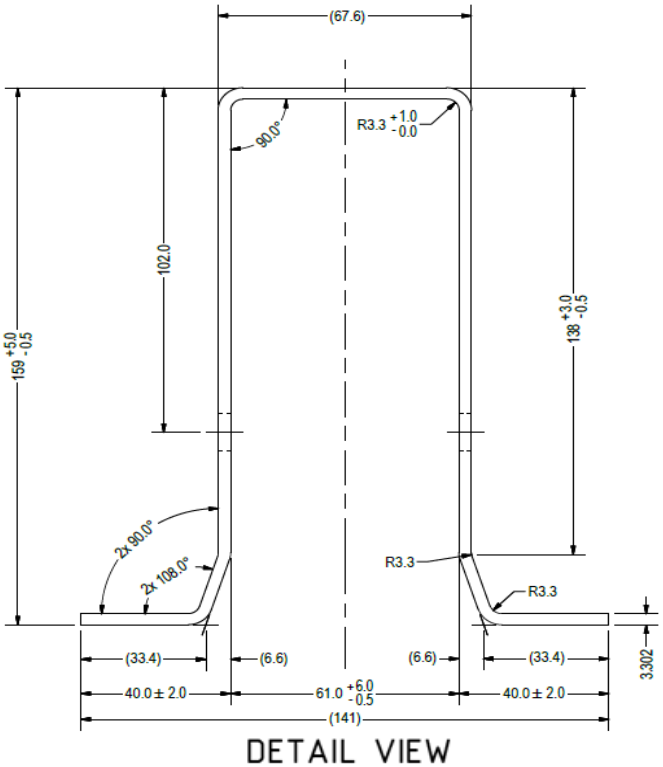
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.245	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	45%	



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 =	89.60	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 =	10.809	k-ft
M_z =	0.000	k-ft
P_r =	-4.835	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	71%	



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 =	6.27	k
Maximum Lateral Load =	3.75	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

Lateral Force @ Top of Pole, P =	0.57	k
Height of Pole Above Grade, H =	7.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

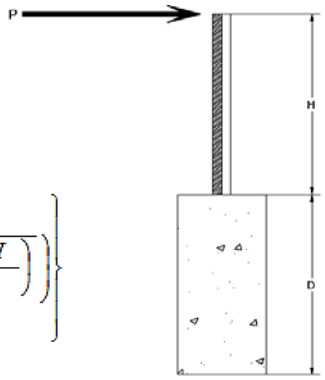
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	0.57	k
Height of Pole Above Grade, H =	7.47	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 =	3.06	
Required Footing Depth, D =	6.76	ft

2nd Trial @ D_2 =	5.00	ft
Lateral Soil Bearing @ D/3, S_1 =	0.33	ksf
Lateral Soil Bearing @ D, S_3 =	1.00	ksf
Constant 2.34P/(S_1B), A =	1.99	
Required Footing Depth, D =	5.14	ft

3rd Trial @ D_3 =	5.07	ft
Lateral Soil Bearing @ D/3, S_1 =	0.34	ksf
Lateral Soil Bearing @ D, S_3 =	1.01	ksf
Constant 2.34P/(S_1B), A =	1.96	
Required Footing Depth, D =	5.10	ft

4th Trial @ D_4 =	5.09	ft
Lateral Soil Bearing @ D/3, S_1 =	0.34	ksf
Lateral Soil Bearing @ D, S_3 =	1.02	ksf
Constant 2.34P/(S_1B), A =	1.96	
Required Footing Depth, D =	5.09	ft

5th Trial @ D_5 =	5.09	ft
Lateral Soil Bearing @ D/3, S_1 =	0.34	ksf
Lateral Soil Bearing @ D, S_3 =	1.02	ksf
Constant 2.34P/(S_1B), A =	1.96	
Required Footing Depth, D =	5.25	ft

A 2ft diameter x 5.25ft deep footing unrestrained at ground level is required for the racking structure.

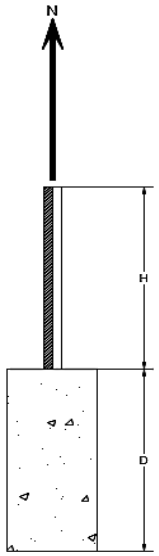
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.88	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 =	1.89	k
Required Concrete Volume, V =	13.03	ft^3
Required Footing Depth, D =	4.25	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.22
2	0.4	0.2	118.10	6.12
3	0.6	0.2	118.10	6.01
4	0.8	0.2	118.10	5.91
5	1	0.2	118.10	5.81
6	1.2	0.2	118.10	5.70
7	1.4	0.2	118.10	5.60
8	1.6	0.2	118.10	5.50
9	1.8	0.2	118.10	5.39
10	2	0.2	118.10	5.29
11	2.2	0.2	118.10	5.18
12	2.4	0.2	118.10	5.08
13	2.6	0.2	118.10	4.98
14	2.8	0.2	118.10	4.87
15	3	0.2	118.10	4.77
16	3.2	0.2	118.10	4.67
17	3.4	0.2	118.10	4.56
18	3.6	0.2	118.10	4.46
19	3.8	0.2	118.10	4.36
20	4	0.2	118.10	4.25
21	4.2	0.2	118.10	4.15
22	0	0.0	0.00	4.15
23	0	0.0	0.00	4.15
24	0	0.0	0.00	4.15
25	0	0.0	0.00	4.15
26	0	0.0	0.00	4.15
27	0	0.0	0.00	4.15
28	0	0.0	0.00	4.15
29	0	0.0	0.00	4.15
30	0	0.0	0.00	4.15
31	0	0.0	0.00	4.15
32	0	0.0	0.00	4.15
33	0	0.0	0.00	4.15
34	0	0.0	0.00	4.15
Max	4.2	Sum	0.99	

A 2ft diameter x 4.25ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	5.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.13	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	14.14	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

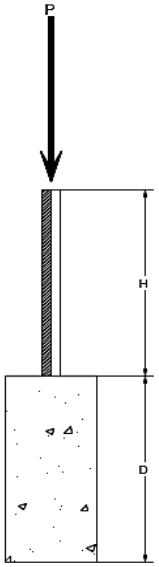
Weight of Concrete

Footing Volume	16.49	ft^3
Weight	2.39	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.12	k
1/3 Increase for Wind =	1.33	
Total Resistance =	9.11	k
Applied Force =	5.52	k
Utilization =	61%	

A 2ft diameter footing passes at a depth of 5.25ft.



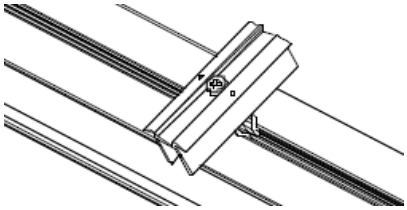
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

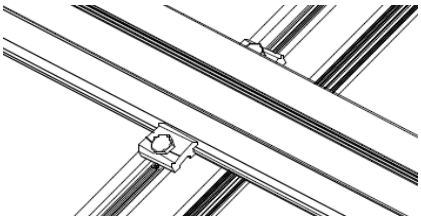
Fastening of Modules to Purlins

Maximum Uplifting Force	=	1.027 k
Allowable Uplift	=	1.214 k
Utilization	=	85%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.024 k
Allowable Uplift	=	2.180 k
Utilization	=	93%

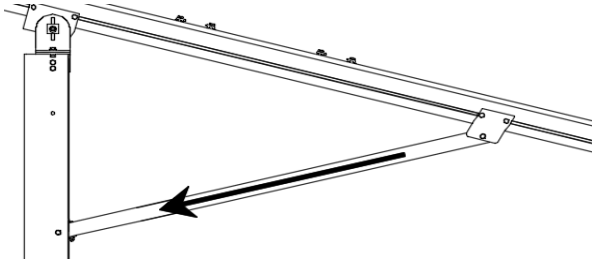


6.2 Strut Connections

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

Maximum Axial Load	=	4.245 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	48%

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

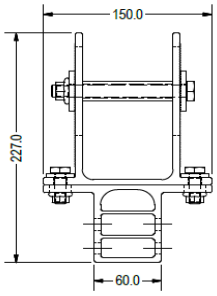


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

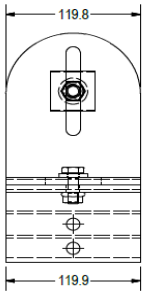
6.3 Girder to Post Connection

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

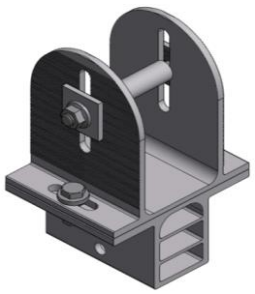
Maximum Tensile Load	=	4.142 k
Allowable Load	=	5.649 k
Utilization	=	73%



FRONT VIEW



SIDE VIEW



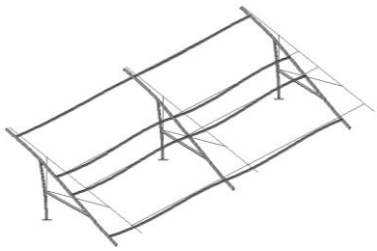
7. SEISMIC DESIGN

7.1 Seismic Drift - N/A

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}	=	79.13 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.583 in
Max Drift, Δ_{MAX}	=	0 in
N/A		

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:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	66 in	L_b =	66
J =	0.432	J =	0.432
	182.587		116.114
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	29.0 ksi	φF_L=	29.9
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 81.7717 in
J = 1.98
105.231

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

S1 = 0.51461

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

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 30.1 ksi

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 81.7717
J = 1.98
114.202

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L = φb[Bt-Dt*√(Rb/t)]

φF_L = 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L St$ = 30.1 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

$M_{max}St$ = 4.935 k-ft

$\varphi F_L Wk$ = 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)

φF_L = φyFcy

φF_L = 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L = φc[Bt-Dt*√(Rb/t)]

φF_L = 30.80 ksi

φF_L = 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

A.3 Design of Aluminum Struts - Aluminum Design Manual, 2005 Edition

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 74.8031 in

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 74.8031

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

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

φF_L = 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = φyFcy

φF_L = 33.25 ksi

φF_L = 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	89.60	in	
Pr =	-4.83	k	(LRFD Factored Load)
Mr (Strong) =	10.81	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	128.92		
4.71√(E/Fy) =	103.55	=> kL/r	> 4.71√(E/Fy)
Fcr =	15.10	ksi	
Fe =	17.22	ksi	
Pn =	33.677	k	

Torsional/Flexural Torsional Buckling:

Fcr =	11.6026	ksi
Fey =	43.9243	ksi
Fez =	14.9387	ksi
Pn =	25.8738	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1436	<	0.2	
Utilization =	0.71	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.144	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 71%

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								

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-9.843	-9.843	0	0
2	M11	Y	-9.843	-9.843	0	0
3	M12	Y	-9.843	-9.843	0	0
4	M13	Y	-9.843	-9.843	0	0

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-5.454	-5.454	0	0
2	M11	Y	-5.454	-5.454	0	0
3	M12	Y	-5.454	-5.454	0	0
4	M13	Y	-5.454	-5.454	0	0

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-46.866	-46.866	0	0
2	M11	Y	-46.866	-46.866	0	0
3	M12	Y	-46.866	-46.866	0	0
4	M13	Y	-46.866	-46.866	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	-151.652	-151.652	0	0
2	M11	y	-151.652	-151.652	0	0
3	M12	y	-243.962	-243.962	0	0
4	M13	y	-243.962	-243.962	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	303.305	303.305	0	0
2	M11	y	303.305	303.305	0	0
3	M12	y	145.059	145.059	0	0
4	M13	y	145.059	145.059	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...	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														

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
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	731.743	2	2100.418	2	70.343	2	.106	2	.003	3	4.969	1
2		min	-1099.901	3	-1611.838	3	-92.235	3	-.145	3	-.006	2	.2	15
3	N19	max	2888.269	2	5270.833	2	0	3	0	15	0	15	5.852	1
4		min	-2732.202	3	-4815.226	3	0	2	0	3	0	1	.237	15
5	N29	max	731.743	2	2100.418	2	92.235	3	.145	3	.006	2	4.969	1
6		min	-1099.901	3	-1611.838	3	-70.343	2	-.106	2	-.003	3	.2	15
7	Totals:	max	4351.754	2	9471.669	2	0	2						
8		min	-4932.004	3	-8038.901	3	0	3						

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	.003	2	0	5	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-6.676	15	310.602	3	-2.494	15	.029	3	.153	1	.252	2
4			min	-153.655	1	-683.8	2	-70.435	1	-.126	2	.006	15	-.113	3
5		3	max	-6.952	15	309.414	3	-2.494	15	.029	3	.107	1	.701	2
6			min	-154.57	1	-685.384	2	-70.435	1	-.126	2	.004	15	-.317	3
7		4	max	-7.228	15	308.225	3	-2.494	15	.029	3	.06	1	1.152	2
8			min	-155.484	1	-686.969	2	-70.435	1	-.126	2	.002	15	-.519	3
9		5	max	394.635	3	610.653	2	-2.841	15	0	15	.071	2	1.364	2
10			min	-1073.263	2	-259.545	3	-87.172	1	-.021	3	-.014	3	-.617	3
11		6	max	393.949	3	609.069	2	-2.841	15	0	15	.02	2	.964	2
12			min	-1074.178	2	-260.733	3	-87.172	1	-.021	3	-.017	3	-.447	3
13		7	max	393.263	3	607.484	2	-2.841	15	0	15	-.002	15	.565	2
14			min	-1075.093	2	-261.921	3	-87.172	1	-.021	3	-.047	1	-.275	3
15		8	max	392.576	3	605.9	2	-2.841	15	0	15	-.004	15	.167	2
16			min	-1076.008	2	-263.109	3	-87.172	1	-.021	3	-.104	1	-.103	3
17		9	max	364.703	3	23.1	3	-3.489	12	0	15	.066	1	-.002	15
18			min	-1176.429	2	-4.754	2	-124.971	1	-.074	2	.003	15	-.024	2
19		10	max	364.017	3	21.911	3	-3.489	12	0	15	.026	3	-.002	15
20			min	-1177.344	2	-6.338	2	-124.971	1	-.074	2	-.02	2	-.038	3
21		11	max	363.331	3	20.723	3	-3.489	12	0	15	.023	3	-.002	15
22			min	-1178.259	2	-7.923	2	-124.971	1	-.074	2	-.098	1	-.052	3
23		12	max	328.914	3	688.171	3	8.333	10	.111	3	.079	1	.123	2
24			min	-1273.135	2	-401.564	2	-114.354	3	-.09	2	.003	15	-.281	3
25		13	max	328.228	3	686.983	3	8.333	10	.111	3	.065	1	.387	2
26			min	-1274.05	2	-403.149	2	-114.354	3	-.09	2	-.011	3	-.732	3
27		14	max	327.542	3	685.794	3	8.333	10	.111	3	.058	2	.652	2
28			min	-1274.964	2	-404.733	2	-114.354	3	-.09	2	-.086	3	-1.182	3
29		15	max	326.856	3	684.606	3	8.333	10	.111	3	.062	2	.918	2
30			min	-1275.879	2	-406.318	2	-114.354	3	-.09	2	-.161	3	-1.632	3
31		16	max	155.362	1	419.287	2	-2.331	15	.088	2	.01	3	.699	2
32			min	7.236	15	-739.657	3	-60.704	1	-.231	3	-.079	1	-1.245	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
33		17	max	154.447	1	417.703	2	-2.331	15	.088	2	-.004	15	.425	2
34			min	6.96	15	-740.845	3	-60.704	1	-.231	3	-.119	1	-.759	3
35		18	max	153.533	1	416.119	2	-2.331	15	.088	2	-.006	15	.151	2
36			min	6.684	15	-742.033	3	-60.704	1	-.231	3	-.158	1	-.273	3
37		19	max	0	1	0	2	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.006	2	0	1	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	13.541	3	911.207	3	0	1	0	1	0	1	.512	2
42			min	-182.746	1	-1670.493	2	0	1	0	1	0	1	-.286	3
43		3	max	12.855	3	910.018	3	0	1	0	1	0	1	1.609	2
44			min	-183.661	1	-1672.078	2	0	1	0	1	0	1	-.884	3
45		4	max	12.169	3	908.83	3	0	1	0	1	0	1	2.707	2
46			min	-184.576	1	-1673.662	2	0	1	0	1	0	1	-1.48	3
47		5	max	1423.876	3	1719.014	2	0	1	0	1	0	1	3.182	2
48			min	-2603.455	2	-977.626	3	0	1	0	1	0	1	-1.73	3
49		6	max	1423.19	3	1717.429	2	0	1	0	1	0	1	2.054	2
50			min	-2604.369	2	-978.815	3	0	1	0	1	0	1	-1.088	3
51		7	max	1422.504	3	1715.845	2	0	1	0	1	0	1	.928	2
52			min	-2605.284	2	-980.003	3	0	1	0	1	0	1	-.445	3
53		8	max	1421.818	3	1714.26	2	0	1	0	1	0	1	.198	3
54			min	-2606.199	2	-981.191	3	0	1	0	1	0	1	-.197	2
55		9	max	1441.061	3	-1.132	15	0	1	0	1	0	1	.51	3
56			min	-2611.872	2	-108.625	2	0	1	0	1	0	1	-.707	2
57		10	max	1440.375	3	-1.61	15	0	1	0	1	0	1	.524	3
58			min	-2612.787	2	-110.209	2	0	1	0	1	0	1	-.635	2
59		11	max	1439.689	3	-2.088	15	0	1	0	1	0	1	.539	3
60			min	-2613.702	2	-111.793	2	0	1	0	1	0	1	-.562	2
61		12	max	1472.02	3	1911.337	3	0	1	0	1	0	1	-.001	15
62			min	-2630.467	2	-1351.455	2	0	1	0	1	0	1	-.111	2
63		13	max	1471.334	3	1910.149	3	0	1	0	1	0	1	.777	2
64			min	-2631.382	2	-1353.04	2	0	1	0	1	0	1	-1.31	3
65		14	max	1470.648	3	1908.96	3	0	1	0	1	0	1	1.665	2
66			min	-2632.296	2	-1354.624	2	0	1	0	1	0	1	-2.563	3
67		15	max	1469.962	3	1907.772	3	0	1	0	1	0	1	2.554	2
68			min	-2633.211	2	-1356.208	2	0	1	0	1	0	1	-3.815	3
69		16	max	184.82	1	1196.988	2	0	1	0	1	0	1	1.944	2
70			min	-10.228	3	-1787.081	3	0	1	0	1	0	1	-2.897	3
71		17	max	183.906	1	1195.404	2	0	1	0	1	0	1	1.159	2
72			min	-10.914	3	-1788.27	3	0	1	0	1	0	1	-1.724	3
73		18	max	182.991	1	1193.819	2	0	1	0	1	0	1	.376	2
74			min	-11.6	3	-1789.458	3	0	1	0	1	0	1	-.55	3
75		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
76			min	0	1	-.004	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.003	2	0	1	0	1	0	1	0	1
78			min	0	1	0	3	0	5	0	1	0	1	0	1
79		2	max	-6.676	15	310.602	3	70.435	1	.126	2	-.006	15	.252	2
80			min	-153.655	1	-683.8	2	2.494	15	-.029	3	-.153	1	-.113	3
81		3	max	-6.952	15	309.414	3	70.435	1	.126	2	-.004	15	.701	2
82			min	-154.57	1	-685.384	2	2.494	15	-.029	3	-.107	1	-.317	3
83		4	max	-7.228	15	308.225	3	70.435	1	.126	2	-.002	15	1.152	2
84			min	-155.484	1	-686.969	2	2.494	15	-.029	3	-.06	1	-.519	3
85		5	max	394.635	3	610.653	2	87.172	1	.021	3	.014	3	1.364	2
86			min	-1073.263	2	-259.545	3	2.841	15	0	15	-.071	2	-.617	3
87		6	max	393.949	3	609.069	2	87.172	1	.021	3	.017	3	.964	2
88			min	-1074.178	2	-260.733	3	2.841	15	0	15	-.02	2	-.447	3
89		7	max	393.263	3	607.484	2	87.172	1	.021	3	.047	1	.565	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
90			min	-1075.093	2	-261.921	3	2.841	15	0	15	.002	15	-.275	3
91		8	max	392.576	3	605.9	2	87.172	1	.021	3	.104	1	.167	2
92			min	-1076.008	2	-263.109	3	2.841	15	0	15	.004	15	-.103	3
93		9	max	364.703	3	23.1	3	124.971	1	.074	2	-.003	15	-.002	15
94			min	-1176.429	2	-4.754	2	3.489	12	0	15	-.066	1	-.024	2
95		10	max	364.017	3	21.911	3	124.971	1	.074	2	.02	2	-.002	15
96			min	-1177.344	2	-6.338	2	3.489	12	0	15	-.026	3	-.038	3
97		11	max	363.331	3	20.723	3	124.971	1	.074	2	.098	1	-.002	15
98			min	-1178.259	2	-7.923	2	3.489	12	0	15	-.023	3	-.052	3
99		12	max	328.914	3	688.171	3	114.354	3	.09	2	-.003	15	.123	2
100			min	-1273.135	2	-401.564	2	-8.333	10	-.111	3	-.079	1	-.281	3
101		13	max	328.228	3	686.983	3	114.354	3	.09	2	.011	3	.387	2
102			min	-1274.05	2	-403.149	2	-8.333	10	-.111	3	-.065	1	-.732	3
103		14	max	327.542	3	685.794	3	114.354	3	.09	2	.086	3	.652	2
104			min	-1274.964	2	-404.733	2	-8.333	10	-.111	3	-.058	2	-1.182	3
105		15	max	326.856	3	684.606	3	114.354	3	.09	2	.161	3	.918	2
106			min	-1275.879	2	-406.318	2	-8.333	10	-.111	3	-.062	2	-1.632	3
107		16	max	155.362	1	419.287	2	60.704	1	.231	3	.079	1	.699	2
108			min	7.236	15	-739.657	3	2.331	15	-.088	2	-.01	3	-1.245	3
109		17	max	154.447	1	417.703	2	60.704	1	.231	3	.119	1	.425	2
110			min	6.96	15	-740.845	3	2.331	15	-.088	2	.004	15	-.759	3
111		18	max	153.533	1	416.119	2	60.704	1	.231	3	.158	1	.151	2
112			min	6.684	15	-742.033	3	2.331	15	-.088	2	.006	15	-.273	3
113		19	max	0	1	0	2	0	5	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	60.726	1	414.544	2	-6.408	15	.012	2	.179	1	.088	2
116			min	2.331	15	-743.04	3	-152.721	1	-.024	3	.007	15	-.231	3
117		2	max	60.726	1	302.26	2	-5.153	15	.012	2	.094	1	.168	3
118			min	2.331	15	-561.001	3	-125.648	1	-.024	3	.003	15	-.131	2
119		3	max	60.726	1	189.976	2	-3.898	15	.012	2	.04	2	.455	3
120			min	2.331	15	-378.962	3	-98.575	1	-.024	3	0	15	-.281	2
121		4	max	60.726	1	77.691	2	-2.643	15	.012	2	.007	10	.631	3
122			min	2.331	15	-196.924	3	-71.502	1	-.024	3	-.027	1	-.363	2
123		5	max	60.726	1	-.904	15	-1.387	15	.012	2	-.003	15	.696	3
124			min	2.331	15	-34.593	2	-44.429	1	-.024	3	-.062	1	-.376	2
125		6	max	60.726	1	167.153	3	-.132	15	.012	2	-.003	15	.649	3
126			min	2.331	15	-146.877	2	-29.542	2	-.024	3	-.081	1	-.321	2
127		7	max	60.726	1	349.192	3	15.808	9	.012	2	-.003	15	.491	3
128			min	2.331	15	-259.161	2	-18.222	2	-.024	3	-.083	1	-.197	2
129		8	max	60.726	1	531.231	3	36.789	1	.012	2	-.002	15	.222	3
130			min	2.331	15	-371.446	2	-10.085	10	-.024	3	-.069	1	-.005	10
131		9	max	60.726	1	713.269	3	63.862	1	.012	2	0	15	.257	2
132			min	2.331	15	-483.73	2	-8.08	3	-.024	3	-.069	2	-.158	3
133		10	max	60.726	1	895.308	3	3.151	10	.024	3	.034	9	.587	2
134			min	2.331	15	11.773	15	-90.935	1	0	15	-.063	2	-.649	3
135		11	max	60.726	1	483.73	2	8.08	3	.024	3	0	15	.257	2
136			min	2.331	15	-713.269	3	-63.862	1	-.012	2	-.069	2	-.158	3
137		12	max	60.726	1	371.446	2	10.085	10	.024	3	-.002	15	.222	3
138			min	2.331	15	-531.231	3	-36.789	1	-.012	2	-.069	1	-.005	10
139		13	max	60.726	1	259.161	2	18.222	2	.024	3	-.003	15	.491	3
140			min	2.331	15	-349.192	3	-15.808	9	-.012	2	-.083	1	-.197	2
141		14	max	60.726	1	146.877	2	29.542	2	.024	3	-.003	15	.649	3
142			min	2.331	15	-167.153	3	.132	15	-.012	2	-.081	1	-.321	2
143		15	max	60.726	1	34.593	2	44.429	1	.024	3	-.003	15	.696	3
144			min	2.331	15	.904	15	1.387	15	-.012	2	-.062	1	-.376	2
145		16	max	60.726	1	196.924	3	71.502	1	.024	3	.007	10	.631	3
146			min	2.331	15	-77.691	2	2.643	15	-.012	2	-.027	1	-.363	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
147		17	max	60.726	1	378.962	3	98.575	1	.024	3	.04	2	.455	3
148			min	2.331	15	-189.976	2	3.898	15	-.012	2	0	15	-.281	2
149		18	max	60.726	1	561.001	3	125.648	1	.024	3	.094	1	.168	3
150			min	2.331	15	-302.26	2	5.153	15	-.012	2	.003	15	-.131	2
151		19	max	60.726	1	743.04	3	152.721	1	.024	3	.179	1	.088	2
152			min	2.331	15	-414.544	2	6.408	15	-.012	2	.007	15	-.231	3
153	M11	1	max	103.805	1	391.352	2	-6.922	15	.003	3	.225	1	.018	1
154			min	-109.559	3	-669.18	3	-165.558	1	-.008	2	.008	15	-.163	3
155		2	max	103.805	1	279.067	2	-5.667	15	.003	3	.132	1	.19	3
156			min	-109.559	3	-487.142	3	-138.485	1	-.008	2	.005	15	-.189	2
157		3	max	103.805	1	166.783	2	-4.412	15	.003	3	.058	2	.432	3
158			min	-109.559	3	-305.103	3	-111.412	1	-.008	2	.002	15	-.325	2
159		4	max	103.805	1	54.499	2	-3.157	15	.003	3	.023	3	.563	3
160			min	-109.559	3	-123.065	3	-84.339	1	-.008	2	-.011	9	-.393	2
161		5	max	103.805	1	58.974	3	-1.902	15	.003	3	.007	3	.582	3
162			min	-109.559	3	-57.785	2	-57.267	1	-.008	2	-.047	1	-.392	2
163		6	max	103.805	1	241.013	3	-.647	15	.003	3	-.003	15	.491	3
164			min	-109.559	3	-170.07	2	-37.526	2	-.008	2	-.074	1	-.322	2
165		7	max	103.805	1	423.051	3	8.495	9	.003	3	-.003	15	.288	3
166			min	-109.559	3	-282.354	2	-26.205	2	-.008	2	-.084	1	-.184	2
167		8	max	103.805	1	605.09	3	26.283	9	.003	3	-.002	15	.026	1
168			min	-109.559	3	-394.638	2	-20.255	3	-.008	2	-.078	1	-.026	3
169		9	max	103.805	1	787.128	3	51.025	1	.003	3	0	15	.299	2
170			min	-109.559	3	-506.922	2	-18.341	3	-.008	2	-.079	2	-.452	3
171		10	max	103.805	1	969.167	3	78.098	1	.008	2	.02	9	.643	2
172			min	-109.559	3	-619.207	2	-16.428	3	0	15	-.078	2	-.988	3
173		11	max	103.805	1	506.922	2	18.341	3	.008	2	0	15	.299	2
174			min	-109.559	3	-787.128	3	-51.025	1	-.003	3	-.079	2	-.452	3
175		12	max	103.805	1	394.638	2	20.255	3	.008	2	-.002	15	.026	1
176			min	-109.559	3	-605.09	3	-26.283	9	-.003	3	-.078	1	-.026	3
177		13	max	103.805	1	282.354	2	26.205	2	.008	2	-.003	15	.288	3
178			min	-109.559	3	-423.051	3	-8.495	9	-.003	3	-.084	1	-.184	2
179		14	max	103.805	1	170.07	2	37.526	2	.008	2	-.003	15	.491	3
180			min	-109.559	3	-241.013	3	.647	15	-.003	3	-.074	1	-.322	2
181		15	max	103.805	1	57.785	2	57.267	1	.008	2	.007	3	.582	3
182			min	-109.559	3	-58.974	3	1.902	15	-.003	3	-.047	1	-.392	2
183		16	max	103.805	1	123.065	3	84.339	1	.008	2	.023	3	.563	3
184			min	-109.559	3	-54.499	2	3.157	15	-.003	3	-.011	9	-.393	2
185		17	max	103.805	1	305.103	3	111.412	1	.008	2	.058	2	.432	3
186			min	-109.559	3	-166.783	2	4.412	15	-.003	3	.002	15	-.325	2
187		18	max	103.805	1	487.142	3	138.485	1	.008	2	.132	1	.19	3
188			min	-109.559	3	-279.067	2	5.667	15	-.003	3	.005	15	-.189	2
189		19	max	103.805	1	669.18	3	165.558	1	.008	2	.225	1	.018	1
190			min	-109.559	3	-391.352	2	6.922	15	-.003	3	.008	15	-.163	3
191	M12	1	max	.745	3	607.86	2	-7.014	15	0	10	.24	1	.068	2
192			min	-37.465	1	-287.683	3	-169.795	1	-.004	3	.009	15	0	15
193		2	max	.745	3	439.164	2	-5.759	15	0	10	.145	1	.182	3
194			min	-37.465	1	-202.351	3	-142.723	1	-.004	3	.005	15	-.252	2
195		3	max	.745	3	270.468	2	-4.504	15	0	10	.071	2	.279	3
196			min	-37.465	1	-117.018	3	-115.65	1	-.004	3	.002	15	-.469	2
197		4	max	.745	3	101.772	2	-3.249	15	0	10	.027	2	.325	3
198			min	-37.465	1	-31.685	3	-88.577	1	-.004	3	-.009	9	-.582	2
199		5	max	.745	3	53.648	3	-1.994	15	0	10	0	10	.318	3
200			min	-37.465	1	-66.924	2	-61.504	1	-.004	3	-.042	1	-.593	2
201		6	max	.745	3	138.98	3	-.739	15	0	10	-.003	15	.259	3
202			min	-37.465	1	-235.62	2	-42.875	2	-.004	3	-.072	1	-.501	2
203		7	max	.745	3	224.313	3	7.195	9	0	10	-.003	15	.148	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
204			min	-37.465	1	-404.316	2	-31.555	2	-.004	3	-.085	1	-.305	2
205		8	max	.745	3	309.646	3	24.982	9	0	10	-.002	15	0	15
206			min	-37.465	1	-573.011	2	-20.234	2	-.004	3	-.081	1	-.015	1
207		9	max	.745	3	394.978	3	46.788	1	0	10	0	15	.395	2
208			min	-37.465	1	-741.707	2	-12.932	10	-.004	3	-.086	2	-.23	3
209		10	max	.745	3	-11.619	15	73.86	1	.004	3	.018	9	.9	2
210			min	-37.465	1	-910.403	2	-9.465	10	0	10	-.088	2	-.498	3
211		11	max	.745	3	741.707	2	12.932	10	.004	3	0	15	.395	2
212			min	-37.465	1	-394.978	3	-46.788	1	0	10	-.086	2	-.23	3
213		12	max	.745	3	573.011	2	20.234	2	.004	3	-.002	15	0	15
214			min	-37.465	1	-309.646	3	-24.982	9	0	10	-.081	1	-.015	1
215		13	max	.745	3	404.316	2	31.555	2	.004	3	-.003	15	.148	3
216			min	-37.465	1	-224.313	3	-7.195	9	0	10	-.085	1	-.305	2
217		14	max	.745	3	235.62	2	42.875	2	.004	3	-.003	15	.259	3
218			min	-37.465	1	-138.98	3	.739	15	0	10	-.072	1	-.501	2
219		15	max	.745	3	66.924	2	61.504	1	.004	3	0	10	.318	3
220			min	-37.465	1	-53.648	3	1.994	15	0	10	-.042	1	-.593	2
221		16	max	.745	3	31.685	3	88.577	1	.004	3	.027	2	.325	3
222			min	-37.465	1	-101.772	2	3.249	15	0	10	-.009	9	-.582	2
223		17	max	.745	3	117.018	3	115.65	1	.004	3	.071	2	.279	3
224			min	-37.465	1	-270.468	2	4.504	15	0	10	.002	15	-.469	2
225		18	max	.745	3	202.351	3	142.723	1	.004	3	.145	1	.182	3
226			min	-37.465	1	-439.164	2	5.759	15	0	10	.005	15	-.252	2
227		19	max	.745	3	287.683	3	169.795	1	.004	3	.24	1	.068	2
228			min	-37.465	1	-607.86	2	7.014	15	0	10	.009	15	0	15
229	M13	1	max	-2.494	15	683.135	2	-6.4	15	.009	3	.176	1	.126	2
230			min	-70.373	1	-311.813	3	-152.616	1	-.023	2	.007	15	-.029	3
231		2	max	-2.494	15	514.439	2	-5.145	15	.009	3	.091	1	.136	3
232			min	-70.373	1	-226.48	3	-125.543	1	-.023	2	.003	15	-.24	2
233		3	max	-2.494	15	345.743	2	-3.89	15	.009	3	.037	2	.248	3
234			min	-70.373	1	-141.148	3	-98.47	1	-.023	2	0	15	-.503	2
235		4	max	-2.494	15	177.047	2	-2.635	15	.009	3	.007	3	.308	3
236			min	-70.373	1	-55.815	3	-71.397	1	-.023	2	-.029	1	-.663	2
237		5	max	-2.494	15	29.518	3	-1.38	15	.009	3	-.002	12	.316	3
238			min	-70.373	1	.582	15	-44.324	1	-.023	2	-.064	1	-.72	2
239		6	max	-2.494	15	114.851	3	-.125	15	.009	3	-.003	15	.272	3
240			min	-70.373	1	-160.345	2	-29.585	2	-.023	2	-.083	1	-.673	2
241		7	max	-2.494	15	200.183	3	15.914	9	.009	3	-.003	15	.176	3
242			min	-70.373	1	-329.041	2	-18.264	2	-.023	2	-.085	1	-.524	2
243		8	max	-2.494	15	285.516	3	36.894	1	.009	3	-.002	15	.027	3
244			min	-70.373	1	-497.736	2	-10.931	3	-.023	2	-.071	1	-.271	2
245		9	max	-2.494	15	370.849	3	63.967	1	.009	3	0	15	.085	2
246			min	-70.373	1	-666.432	2	-9.017	3	-.023	2	-.071	2	-.173	3
247		10	max	-2.494	15	-10.287	15	91.04	1	.023	2	.033	9	.544	2
248			min	-70.373	1	-835.128	2	-3.192	10	0	15	-.065	2	-.426	3
249		11	max	-2.494	15	666.432	2	9.017	3	.023	2	0	15	.085	2
250			min	-70.373	1	-370.849	3	-63.967	1	-.009	3	-.071	2	-.173	3
251		12	max	-2.494	15	497.736	2	10.931	3	.023	2	-.002	15	.027	3
252			min	-70.373	1	-285.516	3	-36.894	1	-.009	3	-.071	1	-.271	2
253		13	max	-2.494	15	329.041	2	18.264	2	.023	2	-.003	15	.176	3
254			min	-70.373	1	-200.183	3	-15.914	9	-.009	3	-.085	1	-.524	2
255		14	max	-2.494	15	160.345	2	29.585	2	.023	2	-.003	15	.272	3
256			min	-70.373	1	-114.851	3	.125	15	-.009	3	-.083	1	-.673	2
257		15	max	-2.494	15	-.582	15	44.324	1	.023	2	-.002	12	.316	3
258			min	-70.373	1	-29.518	3	1.38	15	-.009	3	-.064	1	-.72	2
259		16	max	-2.494	15	55.815	3	71.397	1	.023	2	.007	3	.308	3
260			min	-70.373	1	-177.047	2	2.635	15	-.009	3	-.029	1	-.663	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
261		17	max	-2.494	15	141.148	3	98.47	1	.023	2	.037	2	.248	3
262			min	-70.373	1	-345.743	2	3.89	15	-.009	3	0	15	-.503	2
263		18	max	-2.494	15	226.48	3	125.543	1	.023	2	.091	1	.136	3
264			min	-70.373	1	-514.439	2	5.145	15	-.009	3	.003	15	-.24	2
265		19	max	-2.494	15	311.813	3	152.616	1	.023	2	.176	1	.126	2
266			min	-70.373	1	-683.135	2	6.4	15	-.009	3	.007	15	-.029	3
267	M2	1	max	2100.418	2	1099.241	3	70.409	2	.003	3	.145	3	4.969	1
268			min	-1611.838	3	-730.713	2	-92.166	3	-.006	2	-.106	2	.2	15
269		2	max	2097.147	2	1099.241	3	70.409	2	.003	3	.112	3	5.058	1
270			min	-1614.291	3	-730.713	2	-92.166	3	-.006	2	-.081	2	.197	15
271		3	max	1456.144	2	858.756	1	48.153	2	0	2	.086	3	4.936	1
272			min	-1344.617	3	33.06	15	-83.497	3	0	3	-.072	2	.19	15
273		4	max	1452.872	2	858.756	1	48.153	2	0	2	.056	3	4.628	1
274			min	-1347.07	3	33.06	15	-83.497	3	0	3	-.055	1	.178	15
275		5	max	1449.601	2	858.756	1	48.153	2	0	2	.026	3	4.319	1
276			min	-1349.524	3	33.06	15	-83.497	3	0	3	-.041	1	.166	15
277		6	max	1446.329	2	858.756	1	48.153	2	0	2	0	15	4.011	1
278			min	-1351.977	3	33.06	15	-83.497	3	0	3	-.026	1	.154	15
279		7	max	1443.058	2	858.756	1	48.153	2	0	2	0	10	3.702	1
280			min	-1354.431	3	33.06	15	-83.497	3	0	3	-.034	3	.143	15
281		8	max	1439.786	2	858.756	1	48.153	2	0	2	.015	2	3.394	1
282			min	-1356.885	3	33.06	15	-83.497	3	0	3	-.064	3	.131	15
283		9	max	1436.515	2	858.756	1	48.153	2	0	2	.032	2	3.085	1
284			min	-1359.338	3	33.06	15	-83.497	3	0	3	-.094	3	.119	15
285		10	max	1433.244	2	858.756	1	48.153	2	0	2	.049	2	2.777	1
286			min	-1361.792	3	33.06	15	-83.497	3	0	3	-.124	3	.107	15
287		11	max	1429.972	2	858.756	1	48.153	2	0	2	.067	2	2.468	1
288			min	-1364.245	3	33.06	15	-83.497	3	0	3	-.154	3	.095	15
289		12	max	1426.701	2	858.756	1	48.153	2	0	2	.084	2	2.16	1
290			min	-1366.699	3	33.06	15	-83.497	3	0	3	-.184	3	.083	15
291		13	max	1423.429	2	858.756	1	48.153	2	0	2	.101	2	1.851	1
292			min	-1369.153	3	33.06	15	-83.497	3	0	3	-.214	3	.071	15
293		14	max	1420.158	2	858.756	1	48.153	2	0	2	.118	2	1.543	1
294			min	-1371.606	3	33.06	15	-83.497	3	0	3	-.244	3	.059	15
295		15	max	1416.886	2	858.756	1	48.153	2	0	2	.136	2	1.234	1
296			min	-1374.06	3	33.06	15	-83.497	3	0	3	-.274	3	.048	15
297		16	max	1413.615	2	858.756	1	48.153	2	0	2	.153	2	.926	1
298			min	-1376.513	3	33.06	15	-83.497	3	0	3	-.304	3	.036	15
299		17	max	1410.343	2	858.756	1	48.153	2	0	2	.17	2	.617	1
300			min	-1378.967	3	33.06	15	-83.497	3	0	3	-.334	3	.024	15
301		18	max	1407.072	2	858.756	1	48.153	2	0	2	.188	2	.309	1
302			min	-1381.42	3	33.06	15	-83.497	3	0	3	-.364	3	.012	15
303		19	max	1403.8	2	858.756	1	48.153	2	0	2	.205	2	0	1
304			min	-1383.874	3	33.06	15	-83.497	3	0	3	-.394	3	0	1
305	M5	1	max	5270.833	2	2729.219	3	0	1	0	1	0	1	5.852	1
306			min	-4815.226	3	-2885.587	2	0	1	0	1	0	1	.237	15
307		2	max	5267.561	2	2729.219	3	0	1	0	1	0	1	6.455	1
308			min	-4817.68	3	-2885.587	2	0	1	0	1	0	1	.241	15
309		3	max	3616.051	2	1134.881	1	0	1	0	1	0	1	6.524	1
310			min	-3905.132	3	41.058	15	0	1	0	1	0	1	.236	15
311		4	max	3612.78	2	1134.881	1	0	1	0	1	0	1	6.116	1
312			min	-3907.586	3	41.058	15	0	1	0	1	0	1	.221	15
313		5	max	3609.509	2	1134.881	1	0	1	0	1	0	1	5.708	1
314			min	-3910.039	3	41.058	15	0	1	0	1	0	1	.207	15
315		6	max	3606.237	2	1134.881	1	0	1	0	1	0	1	5.3	1
316			min	-3912.493	3	41.058	15	0	1	0	1	0	1	.192	15
317		7	max	3602.966	2	1134.881	1	0	1	0	1	0	1	4.893	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
318			min	-3914.947	3	41.058	15	0	1	0	1	0	1	.177	15
319		8	max	3599.694	2	1134.881	1	0	1	0	1	0	1	4.485	1
320			min	-3917.4	3	41.058	15	0	1	0	1	0	1	.162	15
321		9	max	3596.423	2	1134.881	1	0	1	0	1	0	1	4.077	1
322			min	-3919.854	3	41.058	15	0	1	0	1	0	1	.148	15
323		10	max	3593.151	2	1134.881	1	0	1	0	1	0	1	3.67	1
324			min	-3922.307	3	41.058	15	0	1	0	1	0	1	.133	15
325		11	max	3589.88	2	1134.881	1	0	1	0	1	0	1	3.262	1
326			min	-3924.761	3	41.058	15	0	1	0	1	0	1	.118	15
327		12	max	3586.608	2	1134.881	1	0	1	0	1	0	1	2.854	1
328			min	-3927.215	3	41.058	15	0	1	0	1	0	1	.103	15
329		13	max	3583.337	2	1134.881	1	0	1	0	1	0	1	2.446	1
330			min	-3929.668	3	41.058	15	0	1	0	1	0	1	.089	15
331		14	max	3580.066	2	1134.881	1	0	1	0	1	0	1	2.039	1
332			min	-3932.122	3	41.058	15	0	1	0	1	0	1	.074	15
333		15	max	3576.794	2	1134.881	1	0	1	0	1	0	1	1.631	1
334			min	-3934.575	3	41.058	15	0	1	0	1	0	1	.059	15
335		16	max	3573.523	2	1134.881	1	0	1	0	1	0	1	1.223	1
336			min	-3937.029	3	41.058	15	0	1	0	1	0	1	.044	15
337		17	max	3570.251	2	1134.881	1	0	1	0	1	0	1	.815	1
338			min	-3939.482	3	41.058	15	0	1	0	1	0	1	.03	15
339		18	max	3566.98	2	1134.881	1	0	1	0	1	0	1	.408	1
340			min	-3941.936	3	41.058	15	0	1	0	1	0	1	.015	15
341		19	max	3563.708	2	1134.881	1	0	1	0	1	0	1	0	1
342			min	-3944.39	3	41.058	15	0	1	0	1	0	1	0	1
343	M8	1	max	2100.418	2	1099.241	3	92.166	3	.006	2	.106	2	4.969	1
344			min	-1611.838	3	-730.713	2	-70.409	2	-.003	3	-.145	3	.2	15
345		2	max	2097.147	2	1099.241	3	92.166	3	.006	2	.081	2	5.058	1
346			min	-1614.291	3	-730.713	2	-70.409	2	-.003	3	-.112	3	.197	15
347		3	max	1456.144	2	858.756	1	83.497	3	0	3	.072	2	4.936	1
348			min	-1344.617	3	33.06	15	-48.153	2	0	2	-.086	3	.19	15
349		4	max	1452.872	2	858.756	1	83.497	3	0	3	.055	1	4.628	1
350			min	-1347.07	3	33.06	15	-48.153	2	0	2	-.056	3	.178	15
351		5	max	1449.601	2	858.756	1	83.497	3	0	3	.041	1	4.319	1
352			min	-1349.524	3	33.06	15	-48.153	2	0	2	-.026	3	.166	15
353		6	max	1446.329	2	858.756	1	83.497	3	0	3	.026	1	4.011	1
354			min	-1351.977	3	33.06	15	-48.153	2	0	2	0	15	.154	15
355		7	max	1443.058	2	858.756	1	83.497	3	0	3	.034	3	3.702	1
356			min	-1354.431	3	33.06	15	-48.153	2	0	2	0	10	.143	15
357		8	max	1439.786	2	858.756	1	83.497	3	0	3	.064	3	3.394	1
358			min	-1356.885	3	33.06	15	-48.153	2	0	2	-.015	2	.131	15
359		9	max	1436.515	2	858.756	1	83.497	3	0	3	.094	3	3.085	1
360			min	-1359.338	3	33.06	15	-48.153	2	0	2	-.032	2	.119	15
361		10	max	1433.244	2	858.756	1	83.497	3	0	3	.124	3	2.777	1
362			min	-1361.792	3	33.06	15	-48.153	2	0	2	-.049	2	.107	15
363		11	max	1429.972	2	858.756	1	83.497	3	0	3	.154	3	2.468	1
364			min	-1364.245	3	33.06	15	-48.153	2	0	2	-.067	2	.095	15
365		12	max	1426.701	2	858.756	1	83.497	3	0	3	.184	3	2.16	1
366			min	-1366.699	3	33.06	15	-48.153	2	0	2	-.084	2	.083	15
367		13	max	1423.429	2	858.756	1	83.497	3	0	3	.214	3	1.851	1
368			min	-1369.153	3	33.06	15	-48.153	2	0	2	-.101	2	.071	15
369		14	max	1420.158	2	858.756	1	83.497	3	0	3	.244	3	1.543	1
370			min	-1371.606	3	33.06	15	-48.153	2	0	2	-.118	2	.059	15
371		15	max	1416.886	2	858.756	1	83.497	3	0	3	.274	3	1.234	1
372			min	-1374.06	3	33.06	15	-48.153	2	0	2	-.136	2	.048	15
373		16	max	1413.615	2	858.756	1	83.497	3	0	3	.304	3	.926	1
374			min	-1376.513	3	33.06	15	-48.153	2	0	2	-.153	2	.036	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
375		17	max	1410.343	2	858.756	1	83.497	3	0	3	.334	3	.617	1
376			min	-1378.967	3	33.06	15	-48.153	2	0	2	-.17	2	.024	15
377		18	max	1407.072	2	858.756	1	83.497	3	0	3	.364	3	.309	1
378			min	-1381.42	3	33.06	15	-48.153	2	0	2	-.188	2	.012	15
379		19	max	1403.8	2	858.756	1	83.497	3	0	3	.394	3	0	1
380			min	-1383.874	3	33.06	15	-48.153	2	0	2	-.205	2	0	1
381	M3	1	max	1628.218	2	5.617	4	22.017	2	.007	3	0	3	0	1
382			min	-702.978	3	1.32	15	-8.926	3	-.014	2	-.002	2	0	1
383		2	max	1628.009	2	4.993	4	22.017	2	.007	3	.006	2	0	15
384			min	-703.134	3	1.174	15	-8.926	3	-.014	2	-.003	3	-.002	4
385		3	max	1627.801	2	4.369	4	22.017	2	.007	3	.014	2	0	15
386			min	-703.291	3	1.027	15	-8.926	3	-.014	2	-.006	3	-.004	4
387		4	max	1627.592	2	3.745	4	22.017	2	.007	3	.022	2	-.001	15
388			min	-703.447	3	.88	15	-8.926	3	-.014	2	-.009	3	-.005	4
389		5	max	1627.383	2	3.121	4	22.017	2	.007	3	.03	2	-.001	15
390			min	-703.604	3	.734	15	-8.926	3	-.014	2	-.012	3	-.006	4
391		6	max	1627.175	2	2.497	4	22.017	2	.007	3	.038	2	-.002	15
392			min	-703.76	3	.587	15	-8.926	3	-.014	2	-.015	3	-.007	4
393		7	max	1626.966	2	1.872	4	22.017	2	.007	3	.045	2	-.002	15
394			min	-703.917	3	.44	15	-8.926	3	-.014	2	-.019	3	-.008	4
395		8	max	1626.758	2	1.248	4	22.017	2	.007	3	.053	2	-.002	15
396			min	-704.073	3	.293	15	-8.926	3	-.014	2	-.022	3	-.009	4
397		9	max	1626.549	2	.624	4	22.017	2	.007	3	.061	2	-.002	15
398			min	-704.23	3	.147	15	-8.926	3	-.014	2	-.025	3	-.009	4
399		10	max	1626.34	2	0	1	22.017	2	.007	3	.069	2	-.002	15
400			min	-704.386	3	0	1	-8.926	3	-.014	2	-.028	3	-.009	4
401		11	max	1626.132	2	-.147	15	22.017	2	.007	3	.077	2	-.002	15
402			min	-704.543	3	-.624	4	-8.926	3	-.014	2	-.031	3	-.009	4
403		12	max	1625.923	2	-.293	15	22.017	2	.007	3	.085	2	-.002	15
404			min	-704.699	3	-1.248	4	-8.926	3	-.014	2	-.035	3	-.009	4
405		13	max	1625.715	2	-.44	15	22.017	2	.007	3	.093	2	-.002	15
406			min	-704.856	3	-1.872	4	-8.926	3	-.014	2	-.038	3	-.008	4
407		14	max	1625.506	2	-.587	15	22.017	2	.007	3	.1	2	-.002	15
408			min	-705.012	3	-2.497	4	-8.926	3	-.014	2	-.041	3	-.007	4
409		15	max	1625.297	2	-.734	15	22.017	2	.007	3	.108	2	-.001	15
410			min	-705.168	3	-3.121	4	-8.926	3	-.014	2	-.044	3	-.006	4
411		16	max	1625.089	2	-.88	15	22.017	2	.007	3	.116	2	-.001	15
412			min	-705.325	3	-3.745	4	-8.926	3	-.014	2	-.047	3	-.005	4
413		17	max	1624.88	2	-1.027	15	22.017	2	.007	3	.124	2	0	15
414			min	-705.481	3	-4.369	4	-8.926	3	-.014	2	-.051	3	-.004	4
415		18	max	1624.672	2	-1.174	15	22.017	2	.007	3	.132	2	0	15
416			min	-705.638	3	-4.993	4	-8.926	3	-.014	2	-.054	3	-.002	4
417		19	max	1624.463	2	-1.32	15	22.017	2	.007	3	.14	2	0	1
418			min	-705.794	3	-5.617	4	-8.926	3	-.014	2	-.057	3	0	1
419	M6	1	max	4245.019	2	5.617	4	0	1	0	1	0	1	0	1
420			min	-2348.812	3	1.32	15	0	1	0	1	0	1	0	1
421		2	max	4244.81	2	4.993	4	0	1	0	1	0	1	0	15
422			min	-2348.969	3	1.174	15	0	1	0	1	0	1	-.002	4
423		3	max	4244.602	2	4.369	4	0	1	0	1	0	1	0	15
424			min	-2349.125	3	1.027	15	0	1	0	1	0	1	-.004	4
425		4	max	4244.393	2	3.745	4	0	1	0	1	0	1	-.001	15
426			min	-2349.281	3	.88	15	0	1	0	1	0	1	-.005	4
427		5	max	4244.185	2	3.121	4	0	1	0	1	0	1	-.001	15
428			min	-2349.438	3	.734	15	0	1	0	1	0	1	-.006	4
429		6	max	4243.976	2	2.497	4	0	1	0	1	0	1	-.002	15
430			min	-2349.594	3	.587	15	0	1	0	1	0	1	-.007	4
431		7	max	4243.767	2	1.872	4	0	1	0	1	0	1	-.002	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
432			min	-2349.751	3	.44	15	0	1	0	1	0	1	-.008	4
433		8	max	4243.559	2	1.248	4	0	1	0	1	0	1	-.002	15
434			min	-2349.907	3	.293	15	0	1	0	1	0	1	-.009	4
435		9	max	4243.35	2	.624	4	0	1	0	1	0	1	-.002	15
436			min	-2350.064	3	.147	15	0	1	0	1	0	1	-.009	4
437		10	max	4243.142	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2350.22	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	4242.933	2	-.147	15	0	1	0	1	0	1	-.002	15
440			min	-2350.377	3	-.624	4	0	1	0	1	0	1	-.009	4
441		12	max	4242.724	2	-.293	15	0	1	0	1	0	1	-.002	15
442			min	-2350.533	3	-1.248	4	0	1	0	1	0	1	-.009	4
443		13	max	4242.516	2	-.44	15	0	1	0	1	0	1	-.002	15
444			min	-2350.69	3	-1.872	4	0	1	0	1	0	1	-.008	4
445		14	max	4242.307	2	-.587	15	0	1	0	1	0	1	-.002	15
446			min	-2350.846	3	-2.497	4	0	1	0	1	0	1	-.007	4
447		15	max	4242.099	2	-.734	15	0	1	0	1	0	1	-.001	15
448			min	-2351.002	3	-3.121	4	0	1	0	1	0	1	-.006	4
449		16	max	4241.89	2	-.88	15	0	1	0	1	0	1	-.001	15
450			min	-2351.159	3	-3.745	4	0	1	0	1	0	1	-.005	4
451		17	max	4241.681	2	-1.027	15	0	1	0	1	0	1	0	15
452			min	-2351.315	3	-4.369	4	0	1	0	1	0	1	-.004	4
453		18	max	4241.473	2	-1.174	15	0	1	0	1	0	1	0	15
454			min	-2351.472	3	-4.993	4	0	1	0	1	0	1	-.002	4
455		19	max	4241.264	2	-1.32	15	0	1	0	1	0	1	0	1
456			min	-2351.628	3	-5.617	4	0	1	0	1	0	1	0	1
457	M9	1	max	1628.218	2	5.617	4	8.926	3	.014	2	.002	2	0	1
458			min	-702.978	3	1.32	15	-22.017	2	-.007	3	0	3	0	1
459		2	max	1628.009	2	4.993	4	8.926	3	.014	2	.003	3	0	15
460			min	-703.134	3	1.174	15	-22.017	2	-.007	3	-.006	2	-.002	4
461		3	max	1627.801	2	4.369	4	8.926	3	.014	2	.006	3	0	15
462			min	-703.291	3	1.027	15	-22.017	2	-.007	3	-.014	2	-.004	4
463		4	max	1627.592	2	3.745	4	8.926	3	.014	2	.009	3	-.001	15
464			min	-703.447	3	.88	15	-22.017	2	-.007	3	-.022	2	-.005	4
465		5	max	1627.383	2	3.121	4	8.926	3	.014	2	.012	3	-.001	15
466			min	-703.604	3	.734	15	-22.017	2	-.007	3	-.03	2	-.006	4
467		6	max	1627.175	2	2.497	4	8.926	3	.014	2	.015	3	-.002	15
468			min	-703.76	3	.587	15	-22.017	2	-.007	3	-.038	2	-.007	4
469		7	max	1626.966	2	1.872	4	8.926	3	.014	2	.019	3	-.002	15
470			min	-703.917	3	.44	15	-22.017	2	-.007	3	-.045	2	-.008	4
471		8	max	1626.758	2	1.248	4	8.926	3	.014	2	.022	3	-.002	15
472			min	-704.073	3	.293	15	-22.017	2	-.007	3	-.053	2	-.009	4
473		9	max	1626.549	2	.624	4	8.926	3	.014	2	.025	3	-.002	15
474			min	-704.23	3	.147	15	-22.017	2	-.007	3	-.061	2	-.009	4
475		10	max	1626.34	2	0	1	8.926	3	.014	2	.028	3	-.002	15
476			min	-704.386	3	0	1	-22.017	2	-.007	3	-.069	2	-.009	4
477		11	max	1626.132	2	-.147	15	8.926	3	.014	2	.031	3	-.002	15
478			min	-704.543	3	-.624	4	-22.017	2	-.007	3	-.077	2	-.009	4
479		12	max	1625.923	2	-.293	15	8.926	3	.014	2	.035	3	-.002	15
480			min	-704.699	3	-1.248	4	-22.017	2	-.007	3	-.085	2	-.009	4
481		13	max	1625.715	2	-.44	15	8.926	3	.014	2	.038	3	-.002	15
482			min	-704.856	3	-1.872	4	-22.017	2	-.007	3	-.093	2	-.008	4
483		14	max	1625.506	2	-.587	15	8.926	3	.014	2	.041	3	-.002	15
484			min	-705.012	3	-2.497	4	-22.017	2	-.007	3	-.1	2	-.007	4
485		15	max	1625.297	2	-.734	15	8.926	3	.014	2	.044	3	-.001	15
486			min	-705.168	3	-3.121	4	-22.017	2	-.007	3	-.108	2	-.006	4
487		16	max	1625.089	2	-.88	15	8.926	3	.014	2	.047	3	-.001	15
488			min	-705.325	3	-3.745	4	-22.017	2	-.007	3	-.116	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
489		17	max	1624.88	2	-1.027	15	8.926	3	.014	2	.051	3	0	15
490			min	-705.481	3	-4.369	4	-22.017	2	-.007	3	-.124	2	-.004	4
491		18	max	1624.672	2	-1.174	15	8.926	3	.014	2	.054	3	0	15
492			min	-705.638	3	-4.993	4	-22.017	2	-.007	3	-.132	2	-.002	4
493		19	max	1624.463	2	-1.32	15	8.926	3	.014	2	.057	3	0	1
494			min	-705.794	3	-5.617	4	-22.017	2	-.007	3	-.14	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	-.014	15	-.021	15	.006	1	4.533e-3	3	NC	3	NC	1
2			min	-.368	1	-.666	2	0	15	-1.314e-2	2	159.718	1	NC	1
3		2	max	-.014	15	-.018	15	0	15	4.346e-3	3	NC	12	NC	1
4			min	-.368	1	-.546	2	-.005	1	-1.232e-2	2	180.954	1	NC	1
5		3	max	-.014	15	-.015	15	0	15	3.979e-3	3	7635.546	12	NC	2
6			min	-.368	1	-.435	1	-.01	1	-1.072e-2	2	207.891	1	9727.955	1
7		4	max	-.014	15	-.012	15	0	15	3.612e-3	3	5836.551	15	NC	2
8			min	-.368	1	-.341	1	-.011	1	-9.124e-3	2	240.955	1	9489.522	1
9		5	max	-.014	15	-.01	15	0	12	3.421e-3	3	6478.312	15	NC	1
10			min	-.368	1	-.261	1	-.009	1	-7.953e-3	2	279.032	1	NC	1
11		6	max	-.014	15	-.008	15	0	3	3.683e-3	3	7162.779	15	NC	1
12			min	-.367	1	-.196	1	-.006	1	-7.881e-3	2	319.757	1	NC	1
13		7	max	-.014	15	-.006	15	.001	3	3.946e-3	3	NC	12	NC	1
14			min	-.367	1	-.143	1	-.002	2	-7.81e-3	2	363.9	1	NC	1
15		8	max	-.014	15	-.004	15	0	3	4.208e-3	3	NC	3	NC	1
16			min	-.367	1	-.095	1	0	10	-7.738e-3	2	414.255	1	NC	1
17		9	max	-.014	15	-.003	15	0	10	4.681e-3	3	NC	12	NC	1
18			min	-.366	1	-.073	3	0	3	-7.221e-3	2	477.872	1	NC	1
19		10	max	-.014	15	.005	2	0	2	5.351e-3	3	NC	15	NC	1
20			min	-.366	1	-.053	3	0	3	-6.283e-3	2	565.387	1	NC	1
21		11	max	-.014	15	.046	2	0	1	6.021e-3	3	NC	15	NC	1
22			min	-.365	1	-.032	3	0	3	-5.345e-3	2	692.828	1	NC	1
23		12	max	-.014	15	.089	1	.002	3	5.683e-3	3	NC	5	NC	1
24			min	-.365	1	-.011	3	-.002	1	-4.307e-3	2	895.989	1	NC	1
25		13	max	-.014	15	.134	1	.006	3	4.274e-3	3	NC	5	NC	1
26			min	-.365	1	.005	15	-.003	2	-3.163e-3	2	1251.505	1	NC	1
27		14	max	-.014	15	.174	1	.01	3	2.865e-3	3	NC	2	NC	1
28			min	-.364	1	.006	15	-.003	2	-2.02e-3	2	1014.833	3	NC	1
29		15	max	-.014	15	.205	1	.01	3	1.456e-3	3	NC	2	NC	1
30			min	-.364	1	.008	15	0	10	-8.757e-4	2	727.587	3	NC	1
31		16	max	-.014	15	.226	1	.007	3	3.936e-3	3	NC	5	NC	1
32			min	-.364	1	.009	15	0	15	-1.758e-3	2	515.73	3	NC	1
33		17	max	-.014	15	.286	3	.008	1	6.872e-3	3	NC	1	NC	1
34			min	-.364	1	.01	15	0	15	-2.878e-3	2	378.707	3	NC	1
35		18	max	-.014	15	.397	3	.004	1	9.809e-3	3	NC	1	NC	1
36			min	-.364	1	.011	15	0	15	-3.998e-3	2	291.972	3	NC	1
37		19	max	-.014	15	.512	3	0	15	1.131e-2	3	NC	1	NC	1
38			min	-.364	1	.012	15	-.005	1	-4.57e-3	2	236.009	3	NC	1
39	M4	1	max	-.018	15	-.001	3	0	1	0	1	NC	3	NC	1
40			min	-.485	1	-1.059	2	0	1	0	1	122.043	2	NC	1
41		2	max	-.018	15	-.024	15	0	1	0	1	4512.026	12	NC	1
42			min	-.485	1	-.849	2	0	1	0	1	144.353	1	NC	1
43		3	max	-.018	15	-.02	15	0	1	0	1	4629.92	15	NC	1
44			min	-.485	1	-.648	2	0	1	0	1	173.236	1	NC	1
45		4	max	-.018	15	-.016	15	0	1	0	1	5260.81	15	NC	1
46			min	-.484	1	-.473	1	0	1	0	1	210.89	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
47		5	max	-.018	15	-.013	15	0	1	0	1	5950.509	15	NC	1
48			min	-.484	1	-.357	1	0	1	0	1	254.78	1	NC	1
49		6	max	-.018	15	-.01	15	0	1	0	1	6644.333	15	NC	1
50			min	-.483	1	-.277	1	0	1	0	1	297.953	1	NC	1
51		7	max	-.018	15	-.008	15	0	1	0	1	7369.23	15	NC	1
52			min	-.483	1	-.218	1	0	1	0	1	339.533	1	NC	1
53		8	max	-.018	15	-.006	15	0	1	0	1	8198.734	15	NC	1
54			min	-.482	1	-.17	1	0	1	0	1	384.036	1	NC	1
55		9	max	-.018	15	-.004	15	0	1	0	1	NC	12	NC	1
56			min	-.481	1	-.119	2	0	1	0	1	446.139	1	NC	1
57		10	max	-.018	15	-.002	15	0	1	0	1	NC	3	NC	1
58			min	-.48	1	-.066	2	0	1	0	1	550.087	1	NC	1
59		11	max	-.017	15	.015	3	0	1	0	1	NC	15	NC	1
60			min	-.479	1	-.003	10	0	1	0	1	745.123	1	NC	1
61		12	max	-.017	15	.083	1	0	1	0	1	NC	5	NC	1
62			min	-.478	1	.003	15	0	1	0	1	1223.483	1	NC	1
63		13	max	-.017	15	.159	1	0	1	0	1	NC	5	NC	1
64			min	-.477	1	.006	15	0	1	0	1	2680.39	9	NC	1
65		14	max	-.017	15	.224	1	0	1	0	1	NC	5	NC	1
66			min	-.476	1	.008	15	0	1	0	1	1360.26	2	NC	1
67		15	max	-.017	15	.267	1	0	1	0	1	NC	4	NC	1
68			min	-.475	1	.01	15	0	1	0	1	1005.687	2	NC	1
69		16	max	-.017	15	.278	1	0	1	0	1	NC	4	NC	1
70			min	-.475	1	.011	15	0	1	0	1	533.616	3	NC	1
71		17	max	-.017	15	.438	3	0	1	0	1	NC	4	NC	1
72			min	-.475	1	.011	15	0	1	0	1	322.812	3	NC	1
73		18	max	-.017	15	.638	3	0	1	0	1	NC	4	NC	1
74			min	-.476	1	.011	15	0	1	0	1	221.742	3	NC	1
75		19	max	-.017	15	.846	3	0	1	0	1	NC	1	NC	1
76			min	-.476	1	.011	15	0	1	0	1	167.273	3	NC	1
77	M7	1	max	-.014	15	-.021	15	0	15	1.314e-2	2	NC	3	NC	1
78			min	-.368	1	-.666	2	-.006	1	-4.533e-3	3	159.718	1	NC	1
79		2	max	-.014	15	-.018	15	.005	1	1.232e-2	2	NC	12	NC	1
80			min	-.368	1	-.546	2	0	15	-4.346e-3	3	180.954	1	NC	1
81		3	max	-.014	15	-.015	15	.01	1	1.072e-2	2	7635.546	12	NC	2
82			min	-.368	1	-.435	1	0	15	-3.979e-3	3	207.891	1	9727.955	1
83		4	max	-.014	15	-.012	15	.011	1	9.124e-3	2	5836.551	15	NC	2
84			min	-.368	1	-.341	1	0	15	-3.612e-3	3	240.955	1	9489.522	1
85		5	max	-.014	15	-.01	15	.009	1	7.953e-3	2	6478.312	15	NC	1
86			min	-.368	1	-.261	1	0	12	-3.421e-3	3	279.032	1	NC	1
87		6	max	-.014	15	-.008	15	.006	1	7.881e-3	2	7162.779	15	NC	1
88			min	-.367	1	-.196	1	0	3	-3.683e-3	3	319.757	1	NC	1
89		7	max	-.014	15	-.006	15	.002	2	7.81e-3	2	NC	12	NC	1
90			min	-.367	1	-.143	1	-.001	3	-3.946e-3	3	363.9	1	NC	1
91		8	max	-.014	15	-.004	15	0	10	7.738e-3	2	NC	3	NC	1
92			min	-.367	1	-.095	1	0	3	-4.208e-3	3	414.255	1	NC	1
93		9	max	-.014	15	-.003	15	0	3	7.221e-3	2	NC	12	NC	1
94			min	-.366	1	-.073	3	0	10	-4.681e-3	3	477.872	1	NC	1
95		10	max	-.014	15	.005	2	0	3	6.283e-3	2	NC	15	NC	1
96			min	-.366	1	-.053	3	0	2	-5.351e-3	3	565.387	1	NC	1
97		11	max	-.014	15	.046	2	0	3	5.345e-3	2	NC	15	NC	1
98			min	-.365	1	-.032	3	0	1	-6.021e-3	3	692.828	1	NC	1
99		12	max	-.014	15	.089	1	.002	1	4.307e-3	2	NC	5	NC	1
100			min	-.365	1	-.011	3	-.002	3	-5.683e-3	3	895.989	1	NC	1
101		13	max	-.014	15	.134	1	.003	2	3.163e-3	2	NC	5	NC	1
102			min	-.365	1	.005	15	-.006	3	-4.274e-3	3	1251.505	1	NC	1
103		14	max	-.014	15	.174	1	.003	2	2.02e-3	2	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
104			min	-.364	1	.006	15	-.01	3	-2.865e-3	3	1014.833	3	NC	1
105		15	max	-.014	15	.205	1	0	10	8.757e-4	2	NC	2	NC	1
106			min	-.364	1	.008	15	-.01	3	-1.456e-3	3	727.587	3	NC	1
107		16	max	-.014	15	.226	1	0	15	1.758e-3	2	NC	5	NC	1
108			min	-.364	1	.009	15	-.007	3	-3.936e-3	3	515.73	3	NC	1
109		17	max	-.014	15	.286	3	0	15	2.878e-3	2	NC	1	NC	1
110			min	-.364	1	.01	15	-.008	1	-6.872e-3	3	378.707	3	NC	1
111		18	max	-.014	15	.397	3	0	15	3.998e-3	2	NC	1	NC	1
112			min	-.364	1	.011	15	-.004	1	-9.809e-3	3	291.972	3	NC	1
113		19	max	-.014	15	.512	3	.005	1	4.57e-3	2	NC	1	NC	1
114			min	-.364	1	.012	15	0	15	-1.131e-2	3	236.009	3	NC	1
115	M10	1	max	0	1	.456	3	.364	1	1.459e-2	3	NC	1	NC	1
116			min	0	15	.011	15	.014	15	-1.26e-3	2	NC	1	NC	1
117		2	max	0	1	.54	3	.378	1	1.59e-2	3	NC	4	NC	2
118			min	0	15	.011	15	.015	15	-1.902e-3	2	1569.442	3	9379.188	1
119		3	max	0	1	.619	3	.397	1	1.721e-2	3	NC	4	NC	3
120			min	0	15	.01	15	.015	15	-2.545e-3	2	807.264	3	3904.406	1
121		4	max	0	1	.686	3	.419	1	1.851e-2	3	NC	4	NC	4
122			min	0	15	.01	15	.016	15	-3.187e-3	2	574.624	3	2394.645	1
123		5	max	0	1	.733	3	.439	1	1.982e-2	3	NC	4	NC	5
124			min	0	15	.01	15	.017	15	-3.83e-3	2	475.69	3	1761.779	1
125		6	max	0	1	.761	3	.455	1	2.112e-2	3	NC	4	NC	5
126			min	0	15	.01	15	.017	15	-4.473e-3	2	432.891	3	1448.92	1
127		7	max	0	1	.769	3	.466	1	2.243e-2	3	NC	4	NC	5
128			min	0	15	.01	15	.017	15	-5.115e-3	2	421.19	3	1287.389	1
129		8	max	0	1	.764	3	.473	1	2.374e-2	3	NC	4	NC	5
130			min	0	15	.011	15	.017	15	-5.758e-3	2	429.153	3	1210.148	1
131		9	max	0	1	.751	3	.475	1	2.504e-2	3	NC	4	NC	5
132			min	0	15	.011	15	.017	15	-6.4e-3	2	446.773	3	1182.989	1
133		10	max	0	1	.744	3	.476	1	2.635e-2	3	NC	4	NC	5
134			min	0	1	.011	15	.017	15	-7.043e-3	2	457.894	3	1179.865	1
135		11	max	0	15	.751	3	.475	1	2.504e-2	3	NC	4	NC	5
136			min	0	1	.011	15	.017	15	-6.4e-3	2	446.773	3	1182.989	1
137		12	max	0	15	.764	3	.473	1	2.374e-2	3	NC	4	NC	5
138			min	0	1	.011	15	.017	15	-5.758e-3	2	429.153	3	1210.148	1
139		13	max	0	15	.769	3	.466	1	2.243e-2	3	NC	4	NC	5
140			min	0	1	.01	15	.017	15	-5.115e-3	2	421.19	3	1287.389	1
141		14	max	0	15	.761	3	.455	1	2.112e-2	3	NC	4	NC	5
142			min	0	1	.01	15	.017	15	-4.473e-3	2	432.891	3	1448.92	1
143		15	max	0	15	.733	3	.439	1	1.982e-2	3	NC	4	NC	5
144			min	0	1	.01	15	.017	15	-3.83e-3	2	475.69	3	1761.779	1
145		16	max	0	15	.686	3	.419	1	1.851e-2	3	NC	4	NC	4
146			min	0	1	.01	15	.016	15	-3.187e-3	2	574.624	3	2394.645	1
147		17	max	0	15	.619	3	.397	1	1.721e-2	3	NC	4	NC	3
148			min	0	1	.01	15	.015	15	-2.545e-3	2	807.264	3	3904.406	1
149		18	max	0	15	.54	3	.378	1	1.59e-2	3	NC	4	NC	2
150			min	0	1	.011	15	.015	15	-1.902e-3	2	1569.442	3	9379.188	1
151		19	max	0	15	.456	3	.364	1	1.459e-2	3	NC	1	NC	1
152			min	0	1	.011	15	.014	15	-1.26e-3	2	NC	1	NC	1
153	M11	1	max	0	1	.067	2	.365	1	5.879e-3	1	NC	1	NC	1
154			min	0	3	-.021	3	.014	15	2.335e-4	15	NC	1	NC	1
155		2	max	0	1	.039	1	.375	1	6.271e-3	1	NC	4	NC	1
156			min	0	3	.001	15	.014	15	2.436e-4	15	2808.751	3	NC	1
157		3	max	0	1	.067	3	.392	1	6.662e-3	1	NC	4	NC	3
158			min	0	3	0	10	.015	15	2.538e-4	15	1489.21	3	4931.619	1
159		4	max	0	1	.096	3	.413	1	7.054e-3	1	NC	4	NC	3
160			min	0	3	-.017	2	.016	15	2.639e-4	15	1121.011	3	2776.305	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
161		5	max	0	1	.109	3	.433	1	7.445e-3	1	NC	4	NC	5
162			min	0	3	-.025	2	.016	15	2.741e-4	15	1011.817	3	1936.116	1
163		6	max	0	1	.105	3	.451	1	7.837e-3	1	NC	4	NC	5
164			min	0	3	-.022	2	.017	15	2.842e-4	15	1046.124	3	1533.33	1
165		7	max	0	1	.086	3	.465	1	8.229e-3	1	NC	4	NC	5
166			min	0	3	-.009	2	.017	15	2.943e-4	15	1226.398	3	1324.21	1
167		8	max	0	1	.059	3	.474	1	8.62e-3	1	NC	4	NC	5
168			min	0	3	.001	15	.017	15	3.045e-4	15	1633.091	3	1218.202	1
169		9	max	0	1	.039	1	.478	1	9.012e-3	1	NC	4	NC	5
170			min	0	3	.002	15	.018	15	3.146e-4	15	2396.586	3	1173.447	1
171		10	max	0	1	.046	1	.479	1	9.403e-3	1	NC	4	NC	5
172			min	0	1	.002	15	.017	15	3.248e-4	15	3070.527	3	1163.566	1
173		11	max	0	3	.039	1	.478	1	9.012e-3	1	NC	4	NC	5
174			min	0	1	.002	15	.018	15	3.146e-4	15	2396.586	3	1173.447	1
175		12	max	0	3	.059	3	.474	1	8.62e-3	1	NC	4	NC	5
176			min	0	1	.001	15	.017	15	3.045e-4	15	1633.091	3	1218.202	1
177		13	max	0	3	.086	3	.465	1	8.229e-3	1	NC	4	NC	5
178			min	0	1	-.009	2	.017	15	2.943e-4	15	1226.398	3	1324.21	1
179		14	max	0	3	.105	3	.451	1	7.837e-3	1	NC	4	NC	5
180			min	0	1	-.022	2	.017	15	2.842e-4	15	1046.124	3	1533.33	1
181		15	max	0	3	.109	3	.433	1	7.445e-3	1	NC	4	NC	5
182			min	0	1	-.025	2	.016	15	2.741e-4	15	1011.817	3	1936.116	1
183		16	max	0	3	.096	3	.413	1	7.054e-3	1	NC	4	NC	3
184			min	0	1	-.017	2	.016	15	2.639e-4	15	1121.011	3	2776.305	1
185		17	max	0	3	.067	3	.392	1	6.662e-3	1	NC	4	NC	3
186			min	0	1	0	10	.015	15	2.538e-4	15	1489.21	3	4931.619	1
187		18	max	0	3	.039	1	.375	1	6.271e-3	1	NC	4	NC	1
188			min	0	1	.001	15	.014	15	2.436e-4	15	2808.751	3	NC	1
189		19	max	0	3	.067	2	.365	1	5.879e-3	1	NC	1	NC	1
190			min	0	1	-.021	3	.014	15	2.335e-4	15	NC	1	NC	1
191	M12	1	max	0	3	-.003	15	.367	1	5.803e-3	1	NC	1	NC	1
192			min	0	1	-.084	3	.014	15	2.229e-4	15	NC	1	NC	1
193		2	max	0	3	-.004	15	.375	1	5.886e-3	1	NC	4	NC	1
194			min	0	1	-.115	1	.014	15	2.268e-4	15	2375.774	2	NC	1
195		3	max	0	3	-.005	15	.391	1	5.97e-3	1	NC	4	NC	3
196			min	0	1	-.161	2	.015	15	2.308e-4	15	1270.302	2	5327.394	1
197		4	max	0	3	-.006	15	.412	1	6.054e-3	1	NC	5	NC	4
198			min	0	1	-.196	2	.016	15	2.348e-4	15	952.186	2	2900.059	1
199		5	max	0	3	-.003	12	.433	1	6.137e-3	1	NC	5	NC	5
200			min	0	1	-.213	2	.016	15	2.388e-4	15	844.322	2	1983.807	1
201		6	max	0	3	-.004	12	.452	1	6.221e-3	1	NC	5	NC	5
202			min	0	1	-.214	2	.017	15	2.428e-4	15	842.23	2	1550.86	1
203		7	max	0	3	-.006	15	.466	1	6.304e-3	1	NC	5	NC	5
204			min	0	1	-.2	2	.017	15	2.468e-4	15	926.101	2	1326.675	1
205		8	max	0	3	-.006	15	.475	1	6.388e-3	1	NC	5	NC	5
206			min	0	1	-.177	2	.018	15	2.508e-4	15	1104.121	2	1211.824	1
207		9	max	0	3	-.005	15	.48	1	6.471e-3	1	NC	4	NC	5
208			min	0	1	-.154	1	.018	15	2.548e-4	15	1365.98	2	1161.681	1
209		10	max	0	1	-.005	15	.481	1	6.555e-3	1	NC	4	NC	5
210			min	0	1	-.146	1	.018	15	2.588e-4	15	1540.548	2	1149.706	1
211		11	max	0	1	-.005	15	.48	1	6.471e-3	1	NC	4	NC	5
212			min	0	3	-.154	1	.018	15	2.548e-4	15	1365.98	2	1161.681	1
213		12	max	0	1	-.006	15	.475	1	6.388e-3	1	NC	5	NC	5
214			min	0	3	-.177	2	.018	15	2.508e-4	15	1104.121	2	1211.824	1
215		13	max	0	1	-.006	15	.466	1	6.304e-3	1	NC	5	NC	5
216			min	0	3	-.2	2	.017	15	2.468e-4	15	926.101	2	1326.675	1
217		14	max	0	1	-.004	12	.452	1	6.221e-3	1	NC	5	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
218			min	0	3	-.214	2	.017	15	2.428e-4	15	842.23	2	1550.86	1
219		15	max	0	1	-.003	12	.433	1	6.137e-3	1	NC	5	NC	5
220			min	0	3	-.213	2	.016	15	2.388e-4	15	844.322	2	1983.807	1
221		16	max	0	1	-.006	15	.412	1	6.054e-3	1	NC	5	NC	4
222			min	0	3	-.196	2	.016	15	2.348e-4	15	952.186	2	2900.059	1
223		17	max	0	1	-.005	15	.391	1	5.97e-3	1	NC	4	NC	3
224			min	0	3	-.161	2	.015	15	2.308e-4	15	1270.302	2	5327.394	1
225		18	max	0	1	-.004	15	.375	1	5.886e-3	1	NC	4	NC	1
226			min	0	3	-.115	1	.014	15	2.268e-4	15	2375.774	2	NC	1
227		19	max	0	1	-.003	15	.367	1	5.803e-3	1	NC	1	NC	1
228			min	0	3	-.084	3	.014	15	2.229e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.019	15	.368	1	1.524e-2	2	NC	1	NC	1
230			min	0	1	-.608	2	.014	15	-2.152e-3	3	NC	1	NC	1
231		2	max	0	15	-.021	15	.383	1	1.649e-2	2	NC	4	NC	2
232			min	0	1	-.704	2	.015	15	-2.661e-3	3	1372.745	2	8740.418	1
233		3	max	0	15	-.022	15	.404	1	1.774e-2	2	NC	5	NC	3
234			min	0	1	-.793	2	.015	15	-3.17e-3	3	711.785	2	3694.405	1
235		4	max	0	15	-.012	12	.426	1	1.899e-2	2	NC	5	NC	5
236			min	0	1	-.868	2	.016	15	-3.678e-3	3	507.526	2	2283.483	1
237		5	max	0	15	0	3	.446	1	2.024e-2	2	NC	5	NC	5
238			min	0	1	-.923	2	.017	15	-4.187e-3	3	418.607	2	1687.08	1
239		6	max	0	15	.002	3	.463	1	2.149e-2	2	NC	5	NC	5
240			min	0	1	-.957	2	.017	15	-4.696e-3	3	377.671	2	1390.499	1
241		7	max	0	15	-.002	3	.475	1	2.274e-2	2	NC	5	NC	5
242			min	0	1	-.972	2	.018	15	-5.205e-3	3	362.641	2	1236.525	1
243		8	max	0	15	-.011	12	.482	1	2.399e-2	2	NC	5	NC	5
244			min	0	1	-.971	2	.018	15	-5.714e-3	3	363.414	2	1162.288	1
245		9	max	0	15	-.018	12	.484	1	2.524e-2	2	NC	5	NC	5
246			min	0	1	-.962	2	.018	15	-6.222e-3	3	372.172	2	1135.633	1
247		10	max	0	1	-.021	12	.485	1	2.649e-2	2	NC	5	NC	5
248			min	0	1	-.957	2	.018	15	-6.731e-3	3	378.337	2	1132.24	1
249		11	max	0	1	-.018	12	.484	1	2.524e-2	2	NC	5	NC	5
250			min	0	15	-.962	2	.018	15	-6.222e-3	3	372.172	2	1135.633	1
251		12	max	0	1	-.011	12	.482	1	2.399e-2	2	NC	5	NC	5
252			min	0	15	-.971	2	.018	15	-5.714e-3	3	363.414	2	1162.288	1
253		13	max	0	1	-.002	3	.475	1	2.274e-2	2	NC	5	NC	5
254			min	0	15	-.972	2	.018	15	-5.205e-3	3	362.641	2	1236.525	1
255		14	max	0	1	.002	3	.463	1	2.149e-2	2	NC	5	NC	5
256			min	0	15	-.957	2	.017	15	-4.696e-3	3	377.671	2	1390.499	1
257		15	max	0	1	0	3	.446	1	2.024e-2	2	NC	5	NC	5
258			min	0	15	-.923	2	.017	15	-4.187e-3	3	418.607	2	1687.08	1
259		16	max	0	1	-.012	12	.426	1	1.899e-2	2	NC	5	NC	5
260			min	0	15	-.868	2	.016	15	-3.678e-3	3	507.526	2	2283.483	1
261		17	max	0	1	-.022	15	.404	1	1.774e-2	2	NC	5	NC	3
262			min	0	15	-.793	2	.015	15	-3.17e-3	3	711.785	2	3694.405	1
263		18	max	0	1	-.021	15	.383	1	1.649e-2	2	NC	4	NC	2
264			min	0	15	-.704	2	.015	15	-2.661e-3	3	1372.745	2	8740.418	1
265		19	max	0	1	-.019	15	.368	1	1.524e-2	2	NC	1	NC	1
266			min	0	15	-.608	2	.014	15	-2.152e-3	3	NC	1	NC	1
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	3	2.19e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	2	-9.207e-4	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	3.091e-3	2	NC	1	NC	1
272			min	0	2	-.007	1	0	2	-1.279e-3	3	NC	1	NC	1
273		4	max	0	3	0	15	0	3	2.843e-3	2	NC	4	NC	1
274			min	0	2	-.016	1	0	2	-1.136e-3	3	4846.608	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
275		5	max	0	3	-.001	15	.002	3	2.596e-3	2	NC	4	NC	1
276			min	0	2	-.028	1	-.001	2	-9.923e-4	3	2753.538	1	NC	1
277		6	max	0	3	-.002	15	.002	3	2.348e-3	2	NC	5	NC	1
278			min	0	2	-.043	1	-.002	2	-8.491e-4	3	1788.391	1	NC	1
279		7	max	0	3	-.002	15	.003	3	2.101e-3	2	NC	5	NC	1
280			min	0	2	-.061	1	-.002	2	-7.058e-4	3	1263.379	1	NC	1
281		8	max	0	3	-.003	15	.003	3	1.853e-3	2	NC	5	NC	1
282			min	0	2	-.082	1	-.003	2	-5.626e-4	3	945.777	1	NC	1
283		9	max	0	3	-.004	15	.004	3	1.606e-3	2	NC	5	NC	1
284			min	0	2	-.105	1	-.003	2	-4.193e-4	3	738.537	1	NC	1
285		10	max	0	3	-.005	15	.004	3	1.358e-3	2	NC	15	NC	1
286			min	0	2	-.13	1	-.004	1	-2.761e-4	3	595.773	1	NC	1
287		11	max	0	3	-.006	15	.004	3	1.111e-3	2	NC	15	NC	1
288			min	-.001	2	-.157	1	-.004	1	-1.328e-4	3	493.02	1	NC	1
289		12	max	.001	3	-.007	15	.004	3	8.635e-4	2	NC	15	NC	1
290			min	-.001	2	-.186	1	-.005	1	6.101e-6	15	416.606	1	NC	1
291		13	max	.001	3	-.008	15	.003	3	6.16e-4	2	9241.879	15	NC	1
292			min	-.001	2	-.217	1	-.005	1	1.798e-6	15	358.161	1	NC	1
293		14	max	.001	3	-.01	15	.002	3	3.685e-4	2	8065.599	15	NC	1
294			min	-.001	2	-.248	1	-.005	1	-3.551e-5	9	312.456	1	NC	1
295		15	max	.001	3	-.011	15	.001	3	4.401e-4	3	7127.479	15	NC	1
296			min	-.001	2	-.281	1	-.005	1	-9.655e-5	9	276.026	1	NC	1
297		16	max	.001	3	-.012	15	0	15	5.834e-4	3	6367.337	15	NC	1
298			min	-.001	2	-.315	1	-.005	1	-2.533e-4	1	246.522	1	NC	1
299		17	max	.001	3	-.014	15	0	15	7.266e-4	3	5743.069	15	NC	1
300			min	-.002	2	-.349	1	-.005	1	-4.506e-4	1	222.303	1	NC	1
301		18	max	.002	3	-.015	15	0	15	8.699e-4	3	5224.374	15	NC	1
302			min	-.002	2	-.384	1	-.006	3	-6.479e-4	1	202.186	1	NC	1
303		19	max	.002	3	-.016	15	0	10	1.013e-3	3	4789.154	15	NC	1
304			min	-.002	2	-.419	1	-.01	3	-8.689e-4	2	185.313	1	7982.799	3
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	1	0	1	NC	1	NC	1
308			min	0	2	-.002	3	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	2	NC	1
310			min	0	2	-.008	1	0	1	0	1	9172.364	1	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	0	2	-.02	1	0	1	0	1	3902.144	1	NC	1
313		5	max	.001	3	-.001	15	0	1	0	1	NC	5	NC	1
314			min	-.001	2	-.036	1	0	1	0	1	2179.724	1	NC	1
315		6	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
316			min	-.001	2	-.055	1	0	1	0	1	1402.484	1	NC	1
317		7	max	.002	3	-.003	15	0	1	0	1	NC	5	NC	1
318			min	-.002	2	-.079	1	0	1	0	1	984.894	1	NC	1
319		8	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
320			min	-.002	2	-.106	1	0	1	0	1	734.299	1	NC	1
321		9	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
322			min	-.002	2	-.136	1	0	1	0	1	571.698	1	NC	1
323		10	max	.002	3	-.006	15	0	1	0	1	NC	15	NC	1
324			min	-.002	2	-.169	1	0	1	0	1	460.151	1	NC	1
325		11	max	.003	3	-.008	15	0	1	0	1	NC	15	NC	1
326			min	-.003	2	-.204	1	0	1	0	1	380.121	1	NC	1
327		12	max	.003	3	-.009	15	0	1	0	1	8719.627	15	NC	1
328			min	-.003	2	-.242	1	0	1	0	1	320.756	1	NC	1
329		13	max	.003	3	-.01	15	0	1	0	1	7496.035	15	NC	1
330			min	-.003	2	-.282	1	0	1	0	1	275.444	1	NC	1
331		14	max	.003	3	-.012	15	0	1	0	1	6539.223	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
332			min	-.003	2	-.323	1	0	1	0	1	240.069	1	NC	1
333		15	max	.004	3	-.013	15	0	1	0	1	5776.621	15	NC	1
334			min	-.004	2	-.366	1	0	1	0	1	211.913	1	NC	1
335		16	max	.004	3	-.015	15	0	1	0	1	5159.033	15	NC	1
336			min	-.004	2	-.41	1	0	1	0	1	189.138	1	NC	1
337		17	max	.004	3	-.017	15	0	1	0	1	4652.076	15	NC	1
338			min	-.004	2	-.455	1	0	1	0	1	170.461	1	NC	1
339		18	max	.005	3	-.018	15	0	1	0	1	4231.026	15	NC	1
340			min	-.004	2	-.501	1	0	1	0	1	154.963	1	NC	1
341		19	max	.005	3	-.02	15	0	1	0	1	3877.867	15	NC	1
342			min	-.004	2	-.547	1	0	1	0	1	141.975	1	NC	1
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	15	0	2	9.207e-4	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-2.19e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	2	1.279e-3	3	NC	1	NC	1
348			min	0	2	-.007	1	0	3	-3.091e-3	2	NC	1	NC	1
349		4	max	0	3	0	15	0	2	1.136e-3	3	NC	4	NC	1
350			min	0	2	-.016	1	0	3	-2.843e-3	2	4846.608	1	NC	1
351		5	max	0	3	-.001	15	.001	2	9.923e-4	3	NC	4	NC	1
352			min	0	2	-.028	1	-.002	3	-2.596e-3	2	2753.538	1	NC	1
353		6	max	0	3	-.002	15	.002	2	8.491e-4	3	NC	5	NC	1
354			min	0	2	-.043	1	-.002	3	-2.348e-3	2	1788.391	1	NC	1
355		7	max	0	3	-.002	15	.002	2	7.058e-4	3	NC	5	NC	1
356			min	0	2	-.061	1	-.003	3	-2.101e-3	2	1263.379	1	NC	1
357		8	max	0	3	-.003	15	.003	2	5.626e-4	3	NC	5	NC	1
358			min	0	2	-.082	1	-.003	3	-1.853e-3	2	945.777	1	NC	1
359		9	max	0	3	-.004	15	.003	2	4.193e-4	3	NC	5	NC	1
360			min	0	2	-.105	1	-.004	3	-1.606e-3	2	738.537	1	NC	1
361		10	max	0	3	-.005	15	.004	1	2.761e-4	3	NC	15	NC	1
362			min	0	2	-.13	1	-.004	3	-1.358e-3	2	595.773	1	NC	1
363		11	max	0	3	-.006	15	.004	1	1.328e-4	3	NC	15	NC	1
364			min	-.001	2	-.157	1	-.004	3	-1.111e-3	2	493.02	1	NC	1
365		12	max	.001	3	-.007	15	.005	1	-6.101e-6	15	NC	15	NC	1
366			min	-.001	2	-.186	1	-.004	3	-8.635e-4	2	416.606	1	NC	1
367		13	max	.001	3	-.008	15	.005	1	-1.798e-6	15	9241.879	15	NC	1
368			min	-.001	2	-.217	1	-.003	3	-6.16e-4	2	358.161	1	NC	1
369		14	max	.001	3	-.01	15	.005	1	3.551e-5	9	8065.599	15	NC	1
370			min	-.001	2	-.248	1	-.002	3	-3.685e-4	2	312.456	1	NC	1
371		15	max	.001	3	-.011	15	.005	1	9.655e-5	9	7127.479	15	NC	1
372			min	-.001	2	-.281	1	-.001	3	-4.401e-4	3	276.026	1	NC	1
373		16	max	.001	3	-.012	15	.005	1	2.533e-4	1	6367.337	15	NC	1
374			min	-.001	2	-.315	1	0	15	-5.834e-4	3	246.522	1	NC	1
375		17	max	.001	3	-.014	15	.005	1	4.506e-4	1	5743.069	15	NC	1
376			min	-.002	2	-.349	1	0	15	-7.266e-4	3	222.303	1	NC	1
377		18	max	.002	3	-.015	15	.006	3	6.479e-4	1	5224.374	15	NC	1
378			min	-.002	2	-.384	1	0	15	-8.699e-4	3	202.186	1	NC	1
379		19	max	.002	3	-.016	15	.01	3	8.689e-4	2	4789.154	15	NC	1
380			min	-.002	2	-.419	1	0	10	-1.013e-3	3	185.313	1	7982.799	3
381	M3	1	max	.003	1	0	15	0	3	1.221e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	2	-4.666e-4	3	NC	1	NC	1
383		2	max	.003	1	-.001	15	.006	3	1.415e-3	2	NC	1	NC	3
384			min	0	15	-.029	1	-.013	2	-5.603e-4	3	NC	1	5814.701	2
385		3	max	.003	3	-.003	15	.011	3	1.609e-3	2	NC	1	NC	4
386			min	0	15	-.056	1	-.026	2	-6.54e-4	3	NC	1	2929.655	2
387		4	max	.003	3	-.004	15	.016	3	1.804e-3	2	NC	1	NC	4
388			min	0	15	-.082	1	-.038	2	-7.477e-4	3	NC	1	1981.081	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
389		5	max	.004	3	-.006	15	.021	3	1.998e-3	2	NC	1	NC	4
390			min	0	10	-.109	1	-.049	2	-8.414e-4	3	NC	1	1517.477	2
391		6	max	.004	3	-.007	15	.026	3	2.192e-3	2	NC	1	NC	4
392			min	0	2	-.136	1	-.06	2	-9.351e-4	3	NC	1	1248.945	2
393		7	max	.004	3	-.008	15	.03	3	2.387e-3	2	NC	1	NC	4
394			min	-.001	2	-.162	1	-.069	2	-1.029e-3	3	8990.605	4	1079.291	2
395		8	max	.004	3	-.009	15	.033	3	2.581e-3	2	NC	1	NC	5
396			min	-.002	2	-.188	1	-.076	2	-1.123e-3	3	8301.976	4	967.81	2
397		9	max	.005	3	-.01	15	.036	3	2.775e-3	2	NC	1	NC	5
398			min	-.003	2	-.214	1	-.082	2	-1.216e-3	3	7931.316	4	894.813	2
399		10	max	.005	3	-.011	15	.037	3	2.97e-3	2	NC	1	NC	5
400			min	-.003	2	-.24	1	-.087	2	-1.31e-3	3	7814.056	4	850.263	2
401		11	max	.005	3	-.012	15	.038	3	3.164e-3	2	NC	1	NC	5
402			min	-.004	2	-.266	1	-.088	2	-1.404e-3	3	7931.316	4	829.447	2
403		12	max	.006	3	-.013	15	.038	3	3.358e-3	2	NC	1	NC	5
404			min	-.005	2	-.291	1	-.088	2	-1.497e-3	3	8301.976	4	831.397	2
405		13	max	.006	3	-.014	15	.037	3	3.553e-3	2	NC	1	NC	5
406			min	-.005	2	-.316	1	-.084	2	-1.591e-3	3	8990.605	4	858.868	2
407		14	max	.006	3	-.015	15	.035	3	3.747e-3	2	NC	1	NC	5
408			min	-.006	2	-.341	1	-.078	2	-1.685e-3	3	NC	1	920.045	2
409		15	max	.007	3	-.015	15	.031	3	3.941e-3	2	NC	1	NC	4
410			min	-.007	2	-.366	1	-.068	2	-1.779e-3	3	NC	1	1033.877	2
411		16	max	.007	3	-.016	15	.026	3	4.136e-3	2	NC	1	NC	4
412			min	-.007	2	-.39	1	-.055	2	-1.872e-3	3	NC	1	1246.866	2
413		17	max	.007	3	-.017	15	.019	3	4.33e-3	2	NC	1	NC	4
414			min	-.008	2	-.415	1	-.038	2	-1.966e-3	3	NC	1	1700.875	2
415		18	max	.007	3	-.017	15	.011	3	4.524e-3	2	NC	1	NC	4
416			min	-.009	2	-.439	1	-.017	2	-2.06e-3	3	NC	1	3108.518	2
417		19	max	.008	3	-.018	15	.01	1	4.718e-3	2	NC	1	NC	1
418			min	-.009	2	-.463	1	0	15	-2.153e-3	3	NC	1	NC	1
419	M6	1	max	.004	3	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.002	1	0	1	0	1	NC	1	NC	1
421		2	max	.005	3	-.002	15	0	1	0	1	NC	1	NC	1
422			min	0	15	-.038	1	0	1	0	1	NC	1	NC	1
423		3	max	.006	3	-.003	15	0	1	0	1	NC	1	NC	1
424			min	0	2	-.073	1	0	1	0	1	NC	1	NC	1
425		4	max	.007	3	-.005	15	0	1	0	1	NC	1	NC	1
426			min	-.002	2	-.109	1	0	1	0	1	NC	1	NC	1
427		5	max	.008	3	-.007	15	0	1	0	1	NC	1	NC	1
428			min	-.004	2	-.144	1	0	1	0	1	NC	1	NC	1
429		6	max	.009	3	-.008	15	0	1	0	1	NC	1	NC	1
430			min	-.006	2	-.179	1	0	1	0	1	NC	1	NC	1
431		7	max	.01	3	-.009	15	0	1	0	1	NC	1	NC	1
432			min	-.008	2	-.214	1	0	1	0	1	8990.605	4	NC	1
433		8	max	.011	3	-.011	15	0	1	0	1	NC	1	NC	1
434			min	-.009	2	-.249	1	0	1	0	1	8301.976	4	NC	1
435		9	max	.012	3	-.012	15	0	1	0	1	NC	1	NC	1
436			min	-.011	2	-.284	1	0	1	0	1	7931.316	4	NC	1
437		10	max	.013	3	-.013	15	0	1	0	1	NC	1	NC	1
438			min	-.013	2	-.318	1	0	1	0	1	7814.056	4	NC	1
439		11	max	.013	3	-.015	15	0	1	0	1	NC	1	NC	1
440			min	-.015	2	-.352	1	0	1	0	1	7931.316	4	NC	1
441		12	max	.014	3	-.016	15	0	1	0	1	NC	1	NC	1
442			min	-.016	2	-.386	1	0	1	0	1	8301.976	4	NC	1
443		13	max	.015	3	-.017	15	0	1	0	1	NC	1	NC	1
444			min	-.018	2	-.42	1	0	1	0	1	8990.605	4	NC	1
445		14	max	.016	3	-.018	15	0	1	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
446			min	-.02	2	-.453	1	0	1	0	1	NC	1	NC	1
447		15	max	.017	3	-.019	15	0	1	0	1	NC	1	NC	1
448			min	-.022	2	-.487	1	0	1	0	1	NC	1	NC	1
449		16	max	.018	3	-.02	15	0	1	0	1	NC	1	NC	1
450			min	-.023	2	-.52	1	0	1	0	1	NC	1	NC	1
451		17	max	.019	3	-.021	15	0	1	0	1	NC	1	NC	1
452			min	-.025	2	-.553	1	0	1	0	1	NC	1	NC	1
453		18	max	.02	3	-.021	15	0	1	0	1	NC	1	NC	1
454			min	-.027	2	-.586	1	0	1	0	1	NC	1	NC	1
455		19	max	.021	3	-.022	15	0	1	0	1	NC	1	NC	1
456			min	-.029	2	-.619	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.003	1	0	15	0	2	4.666e-4	3	NC	1	NC	1
458			min	0	15	-.002	1	0	3	-1.221e-3	2	NC	1	NC	1
459		2	max	.003	1	-.001	15	.013	2	5.603e-4	3	NC	1	NC	3
460			min	0	15	-.029	1	-.006	3	-1.415e-3	2	NC	1	5814.701	2
461		3	max	.003	3	-.003	15	.026	2	6.54e-4	3	NC	1	NC	4
462			min	0	15	-.056	1	-.011	3	-1.609e-3	2	NC	1	2929.655	2
463		4	max	.003	3	-.004	15	.038	2	7.477e-4	3	NC	1	NC	4
464			min	0	15	-.082	1	-.016	3	-1.804e-3	2	NC	1	1981.081	2
465		5	max	.004	3	-.006	15	.049	2	8.414e-4	3	NC	1	NC	4
466			min	0	10	-.109	1	-.021	3	-1.998e-3	2	NC	1	1517.477	2
467		6	max	.004	3	-.007	15	.06	2	9.351e-4	3	NC	1	NC	4
468			min	0	2	-.136	1	-.026	3	-2.192e-3	2	NC	1	1248.945	2
469		7	max	.004	3	-.008	15	.069	2	1.029e-3	3	NC	1	NC	4
470			min	-.001	2	-.162	1	-.03	3	-2.387e-3	2	8990.605	4	1079.291	2
471		8	max	.004	3	-.009	15	.076	2	1.123e-3	3	NC	1	NC	5
472			min	-.002	2	-.188	1	-.033	3	-2.581e-3	2	8301.976	4	967.81	2
473		9	max	.005	3	-.01	15	.082	2	1.216e-3	3	NC	1	NC	5
474			min	-.003	2	-.214	1	-.036	3	-2.775e-3	2	7931.316	4	894.813	2
475		10	max	.005	3	-.011	15	.087	2	1.31e-3	3	NC	1	NC	5
476			min	-.003	2	-.24	1	-.037	3	-2.97e-3	2	7814.056	4	850.263	2
477		11	max	.005	3	-.012	15	.088	2	1.404e-3	3	NC	1	NC	5
478			min	-.004	2	-.266	1	-.038	3	-3.164e-3	2	7931.316	4	829.447	2
479		12	max	.006	3	-.013	15	.088	2	1.497e-3	3	NC	1	NC	5
480			min	-.005	2	-.291	1	-.038	3	-3.358e-3	2	8301.976	4	831.397	2
481		13	max	.006	3	-.014	15	.084	2	1.591e-3	3	NC	1	NC	5
482			min	-.005	2	-.316	1	-.037	3	-3.553e-3	2	8990.605	4	858.868	2
483		14	max	.006	3	-.015	15	.078	2	1.685e-3	3	NC	1	NC	5
484			min	-.006	2	-.341	1	-.035	3	-3.747e-3	2	NC	1	920.045	2
485		15	max	.007	3	-.015	15	.068	2	1.779e-3	3	NC	1	NC	4
486			min	-.007	2	-.366	1	-.031	3	-3.941e-3	2	NC	1	1033.877	2
487		16	max	.007	3	-.016	15	.055	2	1.872e-3	3	NC	1	NC	4
488			min	-.007	2	-.39	1	-.026	3	-4.136e-3	2	NC	1	1246.866	2
489		17	max	.007	3	-.017	15	.038	2	1.966e-3	3	NC	1	NC	4
490			min	-.008	2	-.415	1	-.019	3	-4.33e-3	2	NC	1	1700.875	2
491		18	max	.007	3	-.017	15	.017	2	2.06e-3	3	NC	1	NC	4
492			min	-.009	2	-.439	1	-.011	3	-4.524e-3	2	NC	1	3108.518	2
493		19	max	.008	3	-.018	15	0	15	2.153e-3	3	NC	1	NC	1
494			min	-.009	2	-.463	1	-.01	1	-4.718e-3	2	NC	1	NC	1