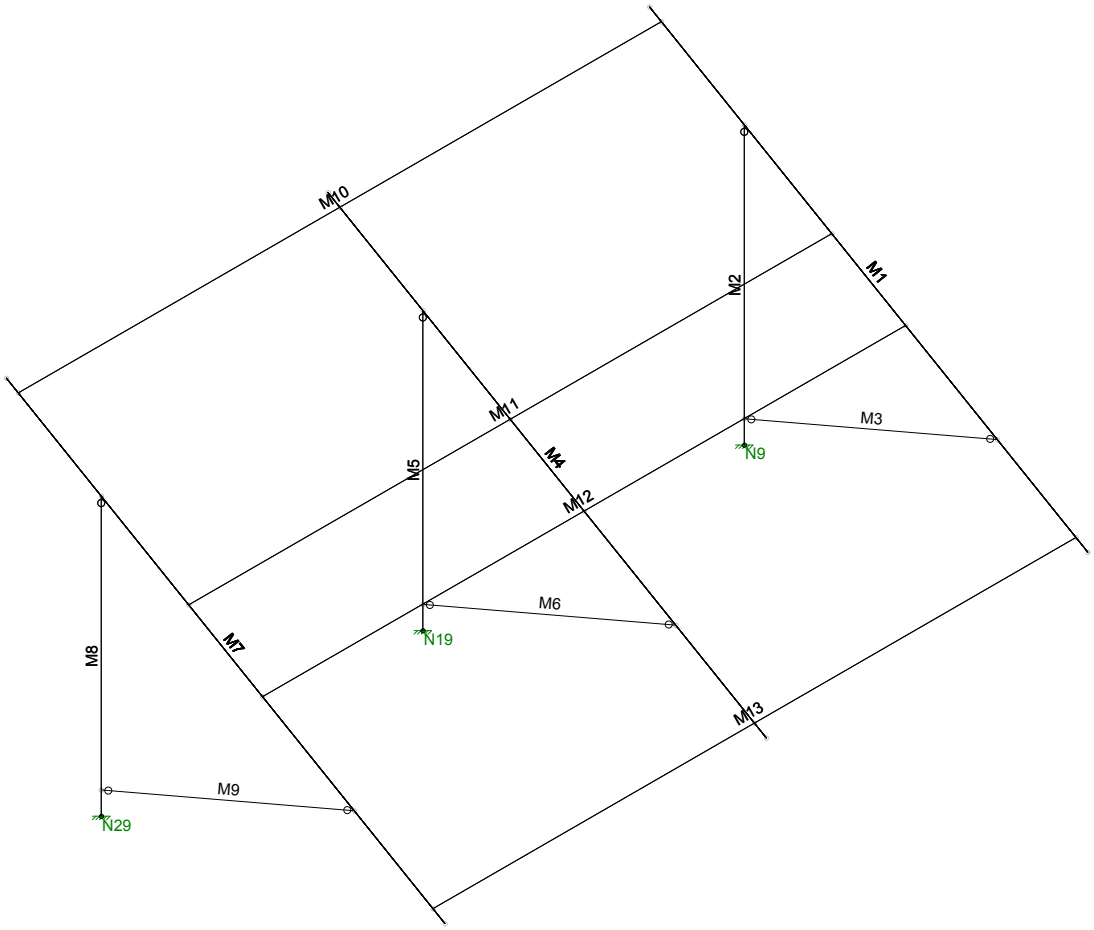


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

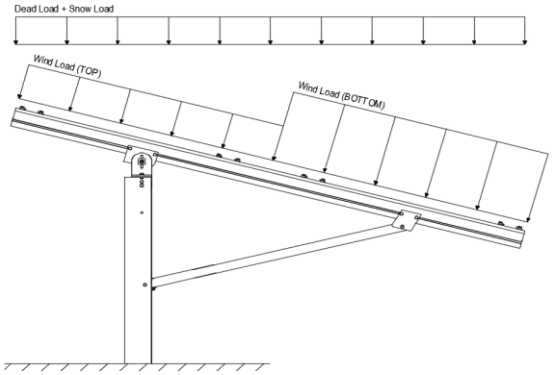
1.2 Construction

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 =	130 mph	Exposure Category = C	
Height <	15 ft	Importance Category = II	
Peak Velocity Pressure, q_z =	26.53 psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*	

Pressure Coefficients

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

2.4 Seismic Loads - N/A

S_S =	0.00	R =	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.*
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	

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

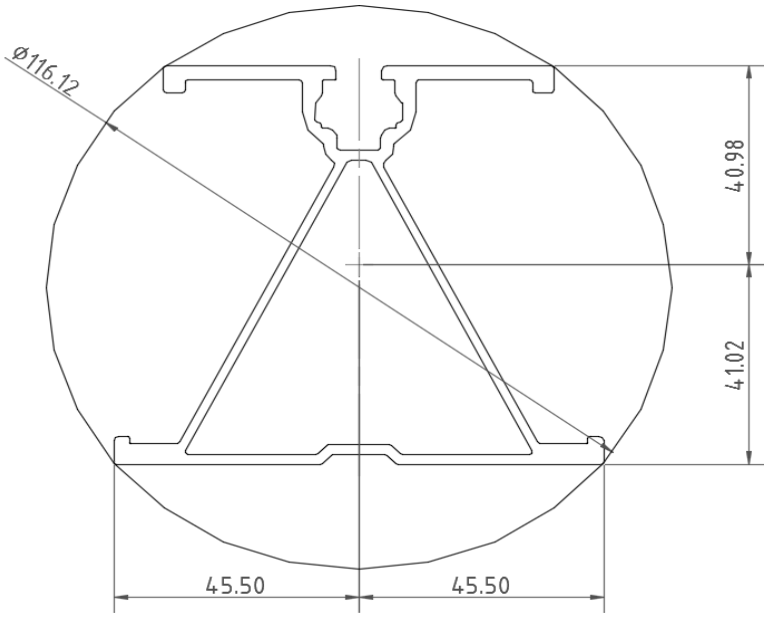
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	108	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 =	1.768	k-ft
M_z =	0.073	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	70%	

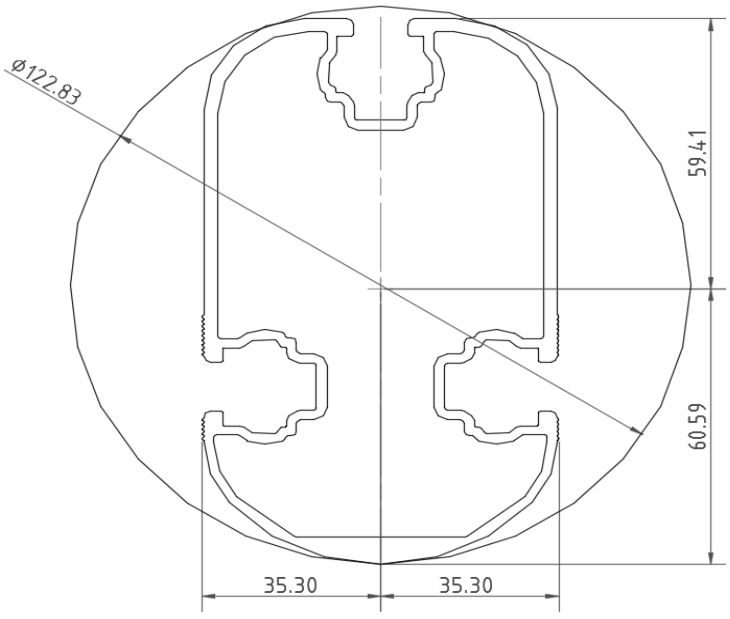


DETAIL VIEW

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 =	4.296	k-ft
M_z =	0.000	k-ft
P_n =	1.496	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	89%	

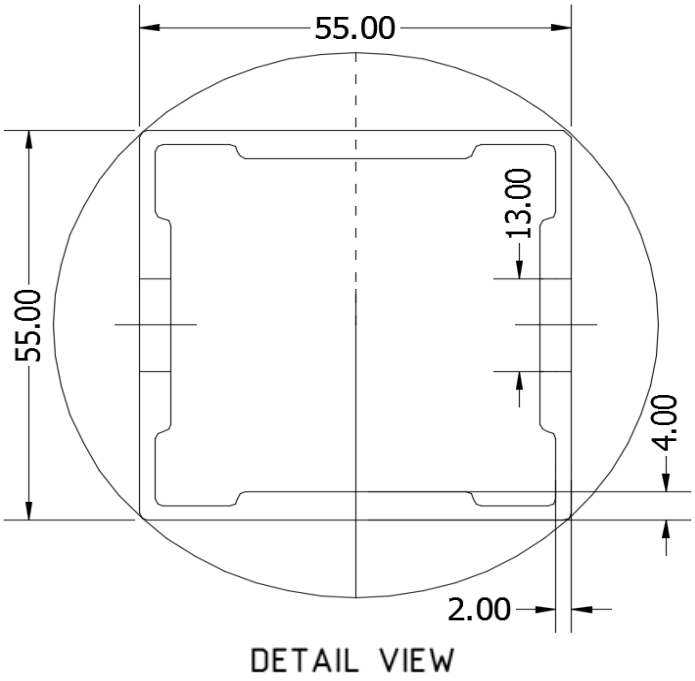


DETAIL VIEW

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).

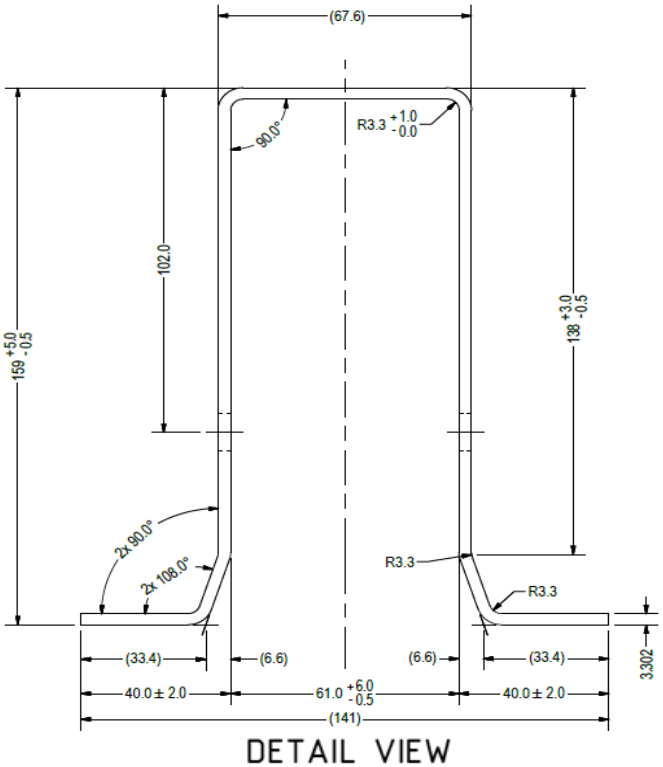
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.040	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	54%	



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 =	13.006	k-ft
M_z =	0.000	k-ft
P_r =	-5.243	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	83%	



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 =	6.78	k
Maximum Lateral Load =	4.08	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)

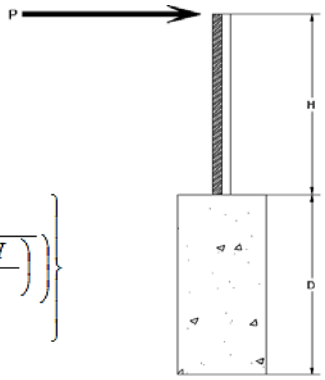
Lateral Force @ Top of Pole, P =	0.98	k
Height of Pole Above Grade, H =	6.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.98	k
Height of Pole Above Grade, H =	6.47	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 =	5.28		
Required Footing Depth, D =	9.28	ft	
2nd Trial @ D_2 =	6.27	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf	
Lateral Soil Bearing @ D, S_3 =	1.25	ksf	
Constant 2.34P/(S_1B), A =	2.74		
Required Footing Depth, D =	5.97	ft	
3rd Trial @ D_3 =	6.12	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf	
Lateral Soil Bearing @ D, S_3 =	1.22	ksf	
Constant 2.34P/(S_1B), A =	2.80		
Required Footing Depth, D =	6.06	ft	
4th Trial @ D_4 =	6.09	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf	
Lateral Soil Bearing @ D, S_3 =	1.22	ksf	
Constant 2.34P/(S_1B), A =	2.82		
Required Footing Depth, D =	6.08	ft	
5th Trial @ D_5 =	6.08	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf	
Lateral Soil Bearing @ D, S_3 =	1.22	ksf	
Constant 2.34P/(S_1B), A =	2.82		
Required Footing Depth, D =	6.25	ft	

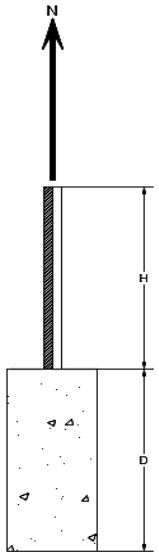
A 2ft diameter x 6.25ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.11	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	2.02	k
Required Concrete Volume, V =	13.94	ft^3
Required Footing Depth, D =	4.50	ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.72
2	0.4	0.2	118.10	6.62
3	0.6	0.2	118.10	6.51
4	0.8	0.2	118.10	6.41
5	1	0.2	118.10	6.30
6	1.2	0.2	118.10	6.20
7	1.4	0.2	118.10	6.10
8	1.6	0.2	118.10	5.99
9	1.8	0.2	118.10	5.89
10	2	0.2	118.10	5.79
11	2.2	0.2	118.10	5.68
12	2.4	0.2	118.10	5.58
13	2.6	0.2	118.10	5.47
14	2.8	0.2	118.10	5.37
15	3	0.2	118.10	5.27
16	3.2	0.2	118.10	5.16
17	3.4	0.2	118.10	5.06
18	3.6	0.2	118.10	4.96
19	3.8	0.2	118.10	4.85
20	4	0.2	118.10	4.75
21	4.2	0.2	118.10	4.64
22	4.4	0.2	118.10	4.54
23	4.6	0.2	118.10	4.44
24	0	0.0	0.00	4.44
25	0	0.0	0.00	4.44
26	0	0.0	0.00	4.44
27	0	0.0	0.00	4.44
28	0	0.0	0.00	4.44
29	0	0.0	0.00	4.44
30	0	0.0	0.00	4.44
31	0	0.0	0.00	4.44
32	0	0.0	0.00	4.44
33	0	0.0	0.00	4.44
34	0	0.0	0.00	4.44
Max	4.6	Sum	1.09	

5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.13	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	20.42	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

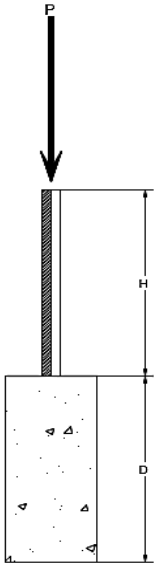
Weight of Concrete

Footing Volume	19.63	ft^3
Weight	2.85	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.06	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.37	k
Applied Force =	6.98	k
Utilization =	67%	

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



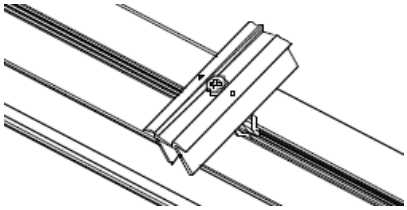
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

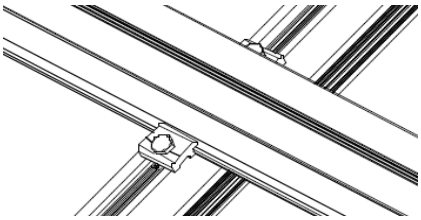
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.672 k
Allowable Uplift	=	1.214 k
Utilization	=	55%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.152 k
Allowable Uplift	=	2.180 k
Utilization	=	99%

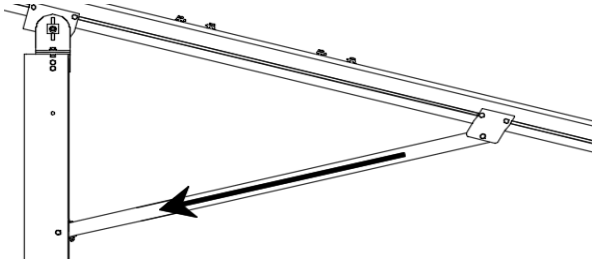


6.2 Strut Connections

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	=	5.040 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	57%

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

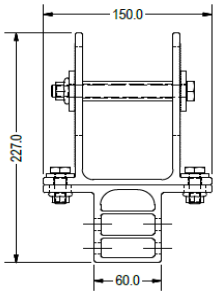


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

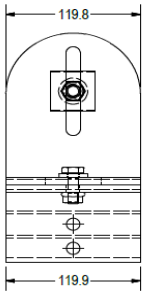
6.3 Girder to Post Connection

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.

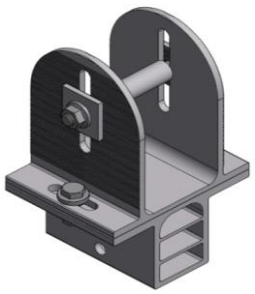
Maximum Tensile Load	=	4.434 k
Allowable Load	=	5.649 k
Utilization	=	78%



FRONT VIEW



SIDE VIEW



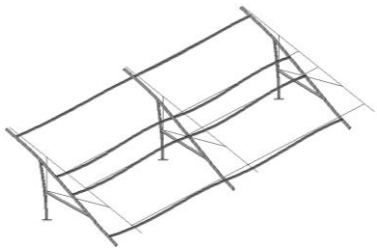
7. SEISMIC DESIGN

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 =	108 in	L_b =	108
J =	0.432	J =	0.432
	298.779		190.005
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	27.7 ksi	φF_L=	28.9
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 mm⁴	Iy =	446476 mm⁴
	2.155 in⁴		1.073 in⁴
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in³	Sy =	0.599 in³
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 = 1.98

80.5199

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

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 = 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 = 1.98

80.5199

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

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

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 =	-5.24	k	(LRFD Factored Load)
Mr (Strong) =	13.01	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 =	0.1557	<	0.2	
Utilization =	0.83	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.156	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 83%

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	-100.114	-100.114	0	0
2	M11	y	-100.114	-100.114	0	0
3	M12	y	-161.053	-161.053	0	0
4	M13	y	-161.053	-161.053	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	200.228	200.228	0	0
2	M11	y	200.228	200.228	0	0
3	M12	y	95.761	95.761	0	0
4	M13	y	95.761	95.761	0	0

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.5W	Yes	Y		1	1.2	3	1.6	4	.5														
2	LRFD 1.2D + 1.0W + 0.5S	Yes	Y		1	1.2	3	.5	4	1														
3	LRFD 0.9D + 1.0W	Yes	Y		2	.9					5	1												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												

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	793.429	2	2350.858	2	154.547	2	.242	1	.005	3	6.477	1
2		min	-1127.805	3	-1673.026	3	-179.748	3	-.279	3	-.013	2	.275	15
3	N19	max	3114.147	2	6412.263	2	0	1	0	3	0	3	10.624	1
4		min	-3072.192	3	-5203.036	3	0	3	0	1	0	15	.42	15
5	N29	max	793.429	2	2350.858	2	179.748	3	.279	3	.013	2	6.477	1
6		min	-1127.805	3	-1673.026	3	-154.547	2	-.242	1	-.005	3	.275	15
7	Totals:	max	4701.006	2	11113.979	2	0	2						
8		min	-5327.802	3	-8549.088	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	.004	1	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	-10.001	15	313.427	3	-5.725	15	.046	3	.314	1	.268	2
4			min	-220.662	1	-725.682	2	-144.815	1	-.221	2	.013	15	-.112	3
5		3	max	-10.277	15	312.238	3	-5.725	15	.046	3	.219	1	.744	2
6			min	-221.577	1	-727.267	2	-144.815	1	-.221	2	.009	15	-.317	3
7		4	max	-10.553	15	311.05	3	-5.725	15	.046	3	.124	1	1.222	2
8			min	-222.492	1	-728.851	2	-144.815	1	-.221	2	.006	15	-.522	3
9		5	max	412.17	3	679.851	2	1.787	3	.03	2	.154	1	1.442	2
10			min	-1177.347	2	-280.15	3	-184.011	1	-.058	3	-.033	3	-.617	3
11		6	max	411.484	3	678.267	2	1.787	3	.03	2	.05	2	.996	2
12			min	-1178.261	2	-281.338	3	-184.011	1	-.058	3	-.032	3	-.433	3
13		7	max	410.798	3	676.682	2	1.787	3	.03	2	-.004	15	.551	2
14			min	-1179.176	2	-282.526	3	-184.011	1	-.058	3	-.087	1	-.248	3
15		8	max	410.112	3	675.098	2	1.787	3	.03	2	-.008	15	.108	2
16			min	-1180.091	2	-283.715	3	-184.011	1	-.058	3	-.208	1	-.062	3
17		9	max	384.197	3	9.197	3	15.04	3	-.002	15	.108	1	.028	3
18			min	-1344.106	1	-16.277	2	-230.216	1	-.158	2	.005	15	-.097	2
19		10	max	383.511	3	8.009	3	15.04	3	-.002	15	.054	3	.023	3
20			min	-1345.021	1	-17.862	2	-230.216	1	-.158	2	-.048	2	-.086	2
21		11	max	382.825	3	6.82	3	15.04	3	-.002	15	.064	3	.018	3
22			min	-1345.936	1	-19.446	2	-230.216	1	-.158	2	-.195	1	-.073	2
23		12	max	351.818	3	725.715	3	44.583	2	.256	3	.15	1	.094	2
24			min	-1576.165	1	-478.344	2	-208.793	3	-.226	2	.007	15	-.215	3
25		13	max	351.132	3	724.526	3	44.583	2	.256	3	.138	1	.408	2
26			min	-1577.08	1	-479.928	2	-208.793	3	-.226	2	-.036	3	-.691	3
27		14	max	350.446	3	723.338	3	44.583	2	.256	3	.126	2	.724	2
28			min	-1577.995	1	-481.513	2	-208.793	3	-.226	2	-.173	3	-1.166	3
29		15	max	349.76	3	722.15	3	44.583	2	.256	3	.155	2	1.04	2
30			min	-1578.909	1	-483.097	2	-208.793	3	-.226	2	-.31	3	-1.64	3
31		16	max	222.956	1	478.235	2	-5.219	15	.183	2	.027	3	.792	2
32			min	10.592	15	-745.78	3	-121.885	1	-.404	3	-.171	1	-1.253	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	222.041	1	476.651	2	-5.219	15	.183	2	-.004	12	.479	2
34			min	10.316	15	-746.968	3	-121.885	1	-.404	3	-.251	1	-.763	3
35		18	max	221.127	1	475.067	2	-5.219	15	.183	2	-.014	15	.167	2
36			min	10.04	15	-748.156	3	-121.885	1	-.404	3	-.331	1	-.272	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	.008	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	-6.67	12	995.547	3	0	1	0	1	0	1	.628	2
42			min	-358.839	1	-2022.932	2	0	1	0	1	0	1	-.319	3
43		3	max	-7.128	12	994.359	3	0	1	0	1	0	1	1.955	2
44			min	-359.754	1	-2024.517	2	0	1	0	1	0	1	-.972	3
45		4	max	-7.585	12	993.17	3	0	1	0	1	0	1	3.284	2
46			min	-360.669	1	-2026.101	2	0	1	0	1	0	1	-1.624	3
47		5	max	1504.24	3	2004.4	2	0	1	0	1	0	1	3.874	2
48			min	-3189.799	2	-1024.797	3	0	1	0	1	0	1	-1.905	3
49		6	max	1503.554	3	2002.815	2	0	1	0	1	0	1	2.559	2
50			min	-3190.713	2	-1025.985	3	0	1	0	1	0	1	-1.232	3
51		7	max	1502.867	3	2001.231	2	0	1	0	1	0	1	1.245	2
52			min	-3191.628	2	-1027.174	3	0	1	0	1	0	1	-.558	3
53		8	max	1502.181	3	1999.646	2	0	1	0	1	0	1	.116	3
54			min	-3192.543	2	-1028.362	3	0	1	0	1	0	1	-.085	1
55		9	max	1495.59	3	7.879	3	0	1	0	1	0	1	.434	3
56			min	-3296.883	2	-103.493	2	0	1	0	1	0	1	-.678	2
57		10	max	1494.904	3	6.691	3	0	1	0	1	0	1	.43	3
58			min	-3297.798	2	-105.078	2	0	1	0	1	0	1	-.609	2
59		11	max	1494.218	3	5.502	3	0	1	0	1	0	1	.426	3
60			min	-3298.713	2	-106.662	2	0	1	0	1	0	1	-.54	2
61		12	max	1497.809	3	2065.536	3	0	1	0	1	0	1	.034	9
62			min	-3518.457	1	-1575.065	2	0	1	0	1	0	1	-.234	3
63		13	max	1497.122	3	2064.347	3	0	1	0	1	0	1	1.014	1
64			min	-3519.372	1	-1576.65	2	0	1	0	1	0	1	-1.589	3
65		14	max	1496.436	3	2063.159	3	0	1	0	1	0	1	2.049	2
66			min	-3520.287	1	-1578.234	2	0	1	0	1	0	1	-2.943	3
67		15	max	1495.75	3	2061.971	3	0	1	0	1	0	1	3.086	2
68			min	-3521.202	1	-1579.819	2	0	1	0	1	0	1	-4.296	3
69		16	max	359.74	1	1437.894	2	0	1	0	1	0	1	2.35	2
70			min	9.92	12	-2005.171	3	0	1	0	1	0	1	-3.261	3
71		17	max	358.825	1	1436.31	2	0	1	0	1	0	1	1.407	2
72			min	9.463	12	-2006.36	3	0	1	0	1	0	1	-1.945	3
73		18	max	357.91	1	1434.725	2	0	1	0	1	0	1	.465	2
74			min	9.005	12	-2007.548	3	0	1	0	1	0	1	-.628	3
75		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
76			min	0	1	-.005	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.004	1	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	-10.001	15	313.427	3	144.815	1	.221	2	-.013	15	.268	2
80			min	-220.662	1	-725.682	2	5.725	15	-.046	3	-.314	1	-.112	3
81		3	max	-10.277	15	312.238	3	144.815	1	.221	2	-.009	15	.744	2
82			min	-221.577	1	-727.267	2	5.725	15	-.046	3	-.219	1	-.317	3
83		4	max	-10.553	15	311.05	3	144.815	1	.221	2	-.006	15	1.222	2
84			min	-222.492	1	-728.851	2	5.725	15	-.046	3	-.124	1	-.522	3
85		5	max	412.17	3	679.851	2	184.011	1	.058	3	.033	3	1.442	2
86			min	-1177.347	2	-280.15	3	-1.787	3	-.03	2	-.154	1	-.617	3
87		6	max	411.484	3	678.267	2	184.011	1	.058	3	.032	3	.996	2
88			min	-1178.261	2	-281.338	3	-1.787	3	-.03	2	-.05	2	-.433	3
89		7	max	410.798	3	676.682	2	184.011	1	.058	3	.087	1	.551	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	-1179.176	2	-282.526	3	-1.787	3	-.03	2	.004	15	-.248	3
91		8	max	410.112	3	675.098	2	184.011	1	.058	3	.208	1	.108	2
92			min	-1180.091	2	-283.715	3	-1.787	3	-.03	2	.008	15	-.062	3
93		9	max	384.197	3	9.197	3	230.216	1	.158	2	-.005	15	.028	3
94			min	-1344.106	1	-16.277	2	-15.04	3	.002	15	-.108	1	-.097	2
95		10	max	383.511	3	8.009	3	230.216	1	.158	2	.048	2	.023	3
96			min	-1345.021	1	-17.862	2	-15.04	3	.002	15	-.054	3	-.086	2
97		11	max	382.825	3	6.82	3	230.216	1	.158	2	.195	1	.018	3
98			min	-1345.936	1	-19.446	2	-15.04	3	.002	15	-.064	3	-.073	2
99		12	max	351.818	3	725.715	3	208.793	3	.226	2	-.007	15	.094	2
100			min	-1576.165	1	-478.344	2	-44.583	2	-.256	3	-.15	1	-.215	3
101		13	max	351.132	3	724.526	3	208.793	3	.226	2	.036	3	.408	2
102			min	-1577.08	1	-479.928	2	-44.583	2	-.256	3	-.138	1	-.691	3
103		14	max	350.446	3	723.338	3	208.793	3	.226	2	.173	3	.724	2
104			min	-1577.995	1	-481.513	2	-44.583	2	-.256	3	-.126	2	-1.166	3
105		15	max	349.76	3	722.15	3	208.793	3	.226	2	.31	3	1.04	2
106			min	-1578.909	1	-483.097	2	-44.583	2	-.256	3	-.155	2	-1.64	3
107		16	max	222.956	1	478.235	2	121.885	1	.404	3	.171	1	.792	2
108			min	10.592	15	-745.78	3	5.219	15	-.183	2	-.027	3	-1.253	3
109		17	max	222.041	1	476.651	2	121.885	1	.404	3	.251	1	.479	2
110			min	10.316	15	-746.968	3	5.219	15	-.183	2	.004	12	-.763	3
111		18	max	221.127	1	475.067	2	121.885	1	.404	3	.331	1	.167	2
112			min	10.04	15	-748.156	3	5.219	15	-.183	2	.014	15	-.272	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	121.937	1	473.435	2	-9.765	15	.008	2	.372	1	.183	2
116			min	5.219	15	-749.256	3	-220.609	1	-.022	3	.015	15	-.404	3
117		2	max	121.937	1	341.235	2	-7.711	15	.008	2	.174	1	.248	3
118			min	5.219	15	-554.452	3	-176.308	1	-.022	3	.007	15	-.224	2
119		3	max	121.937	1	209.035	2	-5.657	15	.008	2	.042	2	.705	3
120			min	5.219	15	-359.647	3	-132.007	1	-.022	3	-.002	9	-.499	2
121		4	max	121.937	1	76.835	2	-3.603	15	.008	2	.001	10	.967	3
122			min	5.219	15	-164.843	3	-87.706	1	-.022	3	-.09	1	-.642	2
123		5	max	121.937	1	29.961	3	-1.549	15	.008	2	-.007	15	1.035	3
124			min	5.219	15	-57.37	1	-43.405	1	-.022	3	-.156	1	-.653	2
125		6	max	121.937	1	224.766	3	6.967	9	.008	2	-.008	15	.907	3
126			min	5.219	15	-187.564	2	-14.25	2	-.022	3	-.177	1	-.531	2
127		7	max	121.937	1	419.57	3	45.198	1	.008	2	-.006	15	.585	3
128			min	5.219	15	-319.764	2	-3.824	10	-.022	3	-.154	1	-.278	2
129		8	max	121.937	1	614.375	3	89.499	1	.008	2	-.003	15	.123	1
130			min	5.219	15	-451.964	2	-.469	3	-.022	3	-.087	1	.004	15
131		9	max	121.937	1	809.179	3	133.8	1	.008	2	.04	9	.626	2
132			min	5.219	15	-584.164	2	2.165	12	-.022	3	-.043	2	-.644	3
133		10	max	121.937	1	-19.493	15	178.101	1	0	15	.181	1	1.277	2
134			min	5.219	15	-1003.983	3	-5.794	3	-.022	3	-.023	3	-1.55	3
135		11	max	121.937	1	584.164	2	-2.165	12	.022	3	.04	9	.626	2
136			min	5.219	15	-809.179	3	-133.8	1	-.008	2	-.043	2	-.644	3
137		12	max	121.937	1	451.964	2	.469	3	.022	3	-.003	15	.123	1
138			min	5.219	15	-614.375	3	-89.499	1	-.008	2	-.087	1	.004	15
139		13	max	121.937	1	319.764	2	3.824	10	.022	3	-.006	15	.585	3
140			min	5.219	15	-419.57	3	-45.198	1	-.008	2	-.154	1	-.278	2
141		14	max	121.937	1	187.564	2	14.25	2	.022	3	-.008	15	.907	3
142			min	5.219	15	-224.766	3	-6.967	9	-.008	2	-.177	1	-.531	2
143		15	max	121.937	1	57.37	1	43.405	1	.022	3	-.007	15	1.035	3
144			min	5.219	15	-29.961	3	1.549	15	-.008	2	-.156	1	-.653	2
145		16	max	121.937	1	164.843	3	87.706	1	.022	3	.001	10	.967	3
146			min	5.219	15	-76.835	2	3.603	15	-.008	2	-.09	1	-.642	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	121.937	1	359.647	3	132.007	1	.022	3	.042	2	.705	3
148			min	5.219	15	-209.035	2	5.657	15	-.008	2	-.002	9	-.499	2
149		18	max	121.937	1	554.452	3	176.308	1	.022	3	.174	1	.248	3
150			min	5.219	15	-341.235	2	7.711	15	-.008	2	.007	15	-.224	2
151		19	max	121.937	1	749.256	3	220.609	1	.022	3	.372	1	.183	2
152			min	5.219	15	-473.435	2	9.765	15	-.008	2	.015	15	-.404	3
153	M11	1	max	211.321	1	456.772	2	-10.199	15	0	12	.428	1	.091	1
154			min	-223.654	3	-720.594	3	-230.007	1	-.009	1	.018	15	-.373	3
155		2	max	211.321	1	324.572	2	-8.145	15	0	12	.22	1	.25	3
156			min	-223.654	3	-525.79	3	-185.706	1	-.009	1	.009	15	-.322	2
157		3	max	211.321	1	192.372	2	-6.092	15	0	12	.057	2	.679	3
158			min	-223.654	3	-330.985	3	-141.405	1	-.009	1	.002	15	-.581	2
159		4	max	211.321	1	61.329	1	-4.038	15	0	12	.021	3	.912	3
160			min	-223.654	3	-136.181	3	-97.104	1	-.009	1	-.062	1	-.707	2
161		5	max	211.321	1	58.623	3	-1.984	15	0	12	.002	3	.951	3
162			min	-223.654	3	-72.028	2	-52.803	1	-.009	1	-.137	1	-.701	2
163		6	max	211.321	1	253.428	3	.78	9	0	12	-.007	15	.795	3
164			min	-223.654	3	-204.227	2	-18.036	2	-.009	1	-.168	1	-.563	2
165		7	max	211.321	1	448.232	3	35.799	1	0	12	-.006	15	.444	3
166			min	-223.654	3	-336.427	2	-11.272	3	-.009	1	-.154	1	-.293	2
167		8	max	211.321	1	643.036	3	80.1	1	0	12	-.003	15	.11	2
168			min	-223.654	3	-468.627	2	-8.141	3	-.009	1	-.096	1	-.101	3
169		9	max	211.321	1	837.841	3	124.401	1	0	12	.027	9	.644	2
170			min	-223.654	3	-600.827	2	-5.01	3	-.009	1	-.051	2	-.842	3
171		10	max	211.321	1	1032.645	3	85.406	11	0	12	.152	1	1.311	2
172			min	-223.654	3	-733.027	2	-168.702	1	-.009	1	-.046	3	-1.777	3
173		11	max	211.321	1	600.827	2	5.01	3	.009	1	.027	9	.644	2
174			min	-223.654	3	-837.841	3	-124.401	1	0	12	-.051	2	-.842	3
175		12	max	211.321	1	468.627	2	8.141	3	.009	1	-.003	15	.11	2
176			min	-223.654	3	-643.036	3	-80.1	1	0	12	-.096	1	-.101	3
177		13	max	211.321	1	336.427	2	11.272	3	.009	1	-.006	15	.444	3
178			min	-223.654	3	-448.232	3	-35.799	1	0	12	-.154	1	-.293	2
179		14	max	211.321	1	204.227	2	18.036	2	.009	1	-.007	15	.795	3
180			min	-223.654	3	-253.428	3	-.78	9	0	12	-.168	1	-.563	2
181		15	max	211.321	1	72.028	2	52.803	1	.009	1	.002	3	.951	3
182			min	-223.654	3	-58.623	3	1.984	15	0	12	-.137	1	-.701	2
183		16	max	211.321	1	136.181	3	97.104	1	.009	1	.021	3	.912	3
184			min	-223.654	3	-61.329	1	4.038	15	0	12	-.062	1	-.707	2
185		17	max	211.321	1	330.985	3	141.405	1	.009	1	.057	2	.679	3
186			min	-223.654	3	-192.372	2	6.092	15	0	12	.002	15	-.581	2
187		18	max	211.321	1	525.79	3	185.706	1	.009	1	.22	1	.25	3
188			min	-223.654	3	-324.572	2	8.145	15	0	12	.009	15	-.322	2
189		19	max	211.321	1	720.594	3	230.007	1	.009	1	.428	1	.091	1
190			min	-223.654	3	-456.772	2	10.199	15	0	12	.018	15	-.373	3
191	M12	1	max	13.285	3	688.936	2	-10.305	15	0	15	.452	1	.188	2
192			min	-45.25	1	-294.289	3	-233.978	1	-.006	1	.018	15	.002	15
193		2	max	13.285	3	495.797	2	-8.251	15	0	15	.24	1	.309	3
194			min	-45.25	1	-203.952	3	-189.677	1	-.006	1	.009	15	-.405	2
195		3	max	13.285	3	302.658	2	-6.198	15	0	15	.074	2	.467	3
196			min	-45.25	1	-113.614	3	-145.376	1	-.006	1	.002	15	-.804	2
197		4	max	13.285	3	109.519	2	-4.144	15	0	15	.011	10	.536	3
198			min	-45.25	1	-23.277	3	-101.075	1	-.006	1	-.051	1	-1.01	2
199		5	max	13.285	3	67.06	3	-2.09	15	0	15	-.005	12	.514	3
200			min	-45.25	1	-83.62	2	-56.774	1	-.006	1	-.13	1	-1.023	2
201		6	max	13.285	3	157.398	3	-.036	15	0	15	-.007	15	.402	3
202			min	-45.25	1	-276.758	2	-22.379	2	-.006	1	-.164	1	-.843	2
203		7	max	13.285	3	247.735	3	31.828	1	0	15	-.006	15	.199	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	-45.25	1	-469.897	2	-7.209	10	-.006	1	-.155	1	-.469	2
205		8	max	13.285	3	338.072	3	76.129	1	0	15	-.003	15	.097	2
206			min	-45.25	1	-663.036	2	-3.325	3	-.006	1	-.101	1	-.094	3
207		9	max	13.285	3	428.41	3	120.43	1	0	15	.024	9	.857	2
208			min	-45.25	1	-856.175	2	-.194	3	-.006	1	-.06	2	-.477	3
209		10	max	13.285	3	518.747	3	164.731	1	.006	1	.14	1	1.81	2
210			min	-45.25	1	-1049.314	2	-115.707	9	-.003	3	-.032	10	-.951	3
211		11	max	13.285	3	856.175	2	.194	3	.006	1	.024	9	.857	2
212			min	-45.25	1	-428.41	3	-120.43	1	0	15	-.06	2	-.477	3
213		12	max	13.285	3	663.036	2	3.325	3	.006	1	-.003	15	.097	2
214			min	-45.25	1	-338.072	3	-76.129	1	0	15	-.101	1	-.094	3
215		13	max	13.285	3	469.897	2	7.209	10	.006	1	-.006	15	.199	3
216			min	-45.25	1	-247.735	3	-31.828	1	0	15	-.155	1	-.469	2
217		14	max	13.285	3	276.758	2	22.379	2	.006	1	-.007	15	.402	3
218			min	-45.25	1	-157.398	3	.036	15	0	15	-.164	1	-.843	2
219		15	max	13.285	3	83.62	2	56.774	1	.006	1	-.005	12	.514	3
220			min	-45.25	1	-67.06	3	2.09	15	0	15	-.13	1	-1.023	2
221		16	max	13.285	3	23.277	3	101.075	1	.006	1	.011	10	.536	3
222			min	-45.25	1	-109.519	2	4.144	15	0	15	-.051	1	-1.01	2
223		17	max	13.285	3	113.614	3	145.376	1	.006	1	.074	2	.467	3
224			min	-45.25	1	-302.658	2	6.198	15	0	15	.002	15	-.804	2
225		18	max	13.285	3	203.952	3	189.677	1	.006	1	.24	1	.309	3
226			min	-45.25	1	-495.797	2	8.251	15	0	15	.009	15	-.405	2
227		19	max	13.285	3	294.289	3	233.978	1	.006	1	.452	1	.188	2
228			min	-45.25	1	-688.936	2	10.305	15	0	15	.018	15	.002	15
229	M13	1	max	-5.725	15	725.043	2	-9.725	15	.007	3	.363	1	.221	2
230			min	-144.614	1	-314.638	3	-219.266	1	-.025	2	.015	15	-.046	3
231		2	max	-5.725	15	531.904	2	-7.671	15	.007	3	.166	1	.223	3
232			min	-144.614	1	-224.301	3	-174.965	1	-.025	2	.006	15	-.407	2
233		3	max	-5.725	15	338.765	2	-5.617	15	.007	3	.035	2	.402	3
234			min	-144.614	1	-133.963	3	-130.664	1	-.025	2	-.005	9	-.842	2
235		4	max	-5.725	15	145.626	2	-3.563	15	.007	3	.005	3	.491	3
236			min	-144.614	1	-43.626	3	-86.363	1	-.025	2	-.096	1	-1.085	2
237		5	max	-5.725	15	46.711	3	-1.51	15	.007	3	-.006	12	.489	3
238			min	-144.614	1	-47.513	2	-42.062	1	-.025	2	-.16	1	-1.134	2
239		6	max	-5.725	15	137.049	3	7.527	9	.007	3	-.008	15	.398	3
240			min	-144.614	1	-240.651	2	-12.903	2	-.025	2	-.18	1	-.99	2
241		7	max	-5.725	15	227.386	3	46.54	1	.007	3	-.006	15	.215	3
242			min	-144.614	1	-433.79	2	-5.502	3	-.025	2	-.155	1	-.652	2
243		8	max	-5.725	15	317.724	3	90.841	1	.007	3	-.003	15	-.005	15
244			min	-144.614	1	-626.929	2	-2.37	3	-.025	2	-.087	1	-.14	1
245		9	max	-5.725	15	408.061	3	135.142	1	.007	3	.041	9	.601	2
246			min	-144.614	1	-820.068	2	.761	3	-.025	2	-.042	2	-.42	3
247		10	max	-5.725	15	1013.207	2	123.953	9	.025	2	.184	1	1.518	2
248			min	-144.614	1	-588.326	11	-179.443	1	0	15	-.028	3	-.873	3
249		11	max	-5.725	15	820.068	2	-.761	3	.025	2	.041	9	.601	2
250			min	-144.614	1	-408.061	3	-135.142	1	-.007	3	-.042	2	-.42	3
251		12	max	-5.725	15	626.929	2	2.37	3	.025	2	-.003	15	-.005	15
252			min	-144.614	1	-317.724	3	-90.841	1	-.007	3	-.087	1	-.14	1
253		13	max	-5.725	15	433.79	2	5.502	3	.025	2	-.006	15	.215	3
254			min	-144.614	1	-227.386	3	-46.54	1	-.007	3	-.155	1	-.652	2
255		14	max	-5.725	15	240.651	2	12.903	2	.025	2	-.008	15	.398	3
256			min	-144.614	1	-137.049	3	-7.527	9	-.007	3	-.18	1	-.99	2
257		15	max	-5.725	15	47.513	2	42.062	1	.025	2	-.006	12	.489	3
258			min	-144.614	1	-46.711	3	1.51	15	-.007	3	-.16	1	-1.134	2
259		16	max	-5.725	15	43.626	3	86.363	1	.025	2	.005	3	.491	3
260			min	-144.614	1	-145.626	2	3.563	15	-.007	3	-.096	1	-1.085	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	-5.725	15	133.963	3	130.664	1	.025	2	.035	2	.402	3
262			min	-144.614	1	-338.765	2	5.617	15	-.007	3	-.005	9	-.842	2
263		18	max	-5.725	15	224.301	3	174.965	1	.025	2	.166	1	.223	3
264			min	-144.614	1	-531.904	2	7.671	15	-.007	3	.006	15	-.407	2
265		19	max	-5.725	15	314.638	3	219.266	1	.025	2	.363	1	.221	2
266			min	-144.614	1	-725.043	2	9.725	15	-.007	3	.015	15	-.046	3
267	M2	1	max	2350.858	2	1127.114	3	154.704	2	.005	3	.279	3	6.477	1
268			min	-1673.026	3	-792.174	2	-179.609	3	-.013	2	-.242	1	.275	15
269		2	max	2347.587	2	1127.114	3	154.704	2	.005	3	.215	3	6.563	1
270			min	-1675.48	3	-792.174	2	-179.609	3	-.013	2	-.19	1	.272	15
271		3	max	1754.205	1	1112.149	1	108.172	2	.001	2	.166	3	6.393	1
272			min	-1394.413	3	45.582	15	-161.309	3	0	3	-.167	1	.262	15
273		4	max	1750.934	1	1112.149	1	108.172	2	.001	2	.108	3	5.993	1
274			min	-1396.866	3	45.582	15	-161.309	3	0	3	-.13	1	.246	15
275		5	max	1747.662	1	1112.149	1	108.172	2	.001	2	.05	3	5.594	1
276			min	-1399.32	3	45.582	15	-161.309	3	0	3	-.093	1	.229	15
277		6	max	1744.391	1	1112.149	1	108.172	2	.001	2	-.002	15	5.194	1
278			min	-1401.774	3	45.582	15	-161.309	3	0	3	-.055	1	.213	15
279		7	max	1741.119	1	1112.149	1	108.172	2	.001	2	.007	10	4.795	1
280			min	-1404.227	3	45.582	15	-161.309	3	0	3	-.066	3	.197	15
281		8	max	1737.848	1	1112.149	1	108.172	2	.001	2	.045	2	4.395	1
282			min	-1406.681	3	45.582	15	-161.309	3	0	3	-.124	3	.18	15
283		9	max	1734.576	1	1112.149	1	108.172	2	.001	2	.084	2	3.996	1
284			min	-1409.134	3	45.582	15	-161.309	3	0	3	-.182	3	.164	15
285		10	max	1731.305	1	1112.149	1	108.172	2	.001	2	.123	2	3.596	1
286			min	-1411.588	3	45.582	15	-161.309	3	0	3	-.24	3	.147	15
287		11	max	1728.033	1	1112.149	1	108.172	2	.001	2	.161	2	3.196	1
288			min	-1414.041	3	45.582	15	-161.309	3	0	3	-.298	3	.131	15
289		12	max	1724.762	1	1112.149	1	108.172	2	.001	2	.2	2	2.797	1
290			min	-1416.495	3	45.582	15	-161.309	3	0	3	-.356	3	.115	15
291		13	max	1721.491	1	1112.149	1	108.172	2	.001	2	.239	2	2.397	1
292			min	-1418.949	3	45.582	15	-161.309	3	0	3	-.414	3	.098	15
293		14	max	1718.219	1	1112.149	1	108.172	2	.001	2	.278	2	1.998	1
294			min	-1421.402	3	45.582	15	-161.309	3	0	3	-.472	3	.082	15
295		15	max	1714.948	1	1112.149	1	108.172	2	.001	2	.317	2	1.598	1
296			min	-1423.856	3	45.582	15	-161.309	3	0	3	-.53	3	.066	15
297		16	max	1711.676	1	1112.149	1	108.172	2	.001	2	.356	2	1.199	1
298			min	-1426.309	3	45.582	15	-161.309	3	0	3	-.588	3	.049	15
299		17	max	1708.405	1	1112.149	1	108.172	2	.001	2	.395	2	.799	1
300			min	-1428.763	3	45.582	15	-161.309	3	0	3	-.646	3	.033	15
301		18	max	1705.133	1	1112.149	1	108.172	2	.001	2	.434	2	.4	1
302			min	-1431.217	3	45.582	15	-161.309	3	0	3	-.704	3	.016	15
303		19	max	1701.862	1	1112.149	1	108.172	2	.001	2	.472	2	0	1
304			min	-1433.67	3	45.582	15	-161.309	3	0	3	-.762	3	0	1
305	M5	1	max	6412.263	2	3068.158	3	0	1	0	1	0	1	10.624	1
306			min	-5203.036	3	-3108.554	2	0	1	0	1	0	1	.42	15
307		2	max	6408.991	2	3068.158	3	0	1	0	1	0	1	11.292	1
308			min	-5205.489	3	-3108.554	2	0	1	0	1	0	1	.426	15
309		3	max	4533.732	1	1954.436	1	0	1	0	1	0	1	11.235	1
310			min	-4230.906	3	72.258	15	0	1	0	1	0	1	.415	15
311		4	max	4530.46	1	1954.436	1	0	1	0	1	0	1	10.533	1
312			min	-4233.36	3	72.258	15	0	1	0	1	0	1	.389	15
313		5	max	4527.189	1	1954.436	1	0	1	0	1	0	1	9.83	1
314			min	-4235.813	3	72.258	15	0	1	0	1	0	1	.363	15
315		6	max	4523.917	1	1954.436	1	0	1	0	1	0	1	9.128	1
316			min	-4238.267	3	72.258	15	0	1	0	1	0	1	.337	15
317		7	max	4520.646	1	1954.436	1	0	1	0	1	0	1	8.426	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	-4240.721	3	72.258	15	0	1	0	1	0	1	.312	15
319		8	max	4517.374	1	1954.436	1	0	1	0	1	0	1	7.724	1
320			min	-4243.174	3	72.258	15	0	1	0	1	0	1	.286	15
321		9	max	4514.103	1	1954.436	1	0	1	0	1	0	1	7.022	1
322			min	-4245.628	3	72.258	15	0	1	0	1	0	1	.26	15
323		10	max	4510.832	1	1954.436	1	0	1	0	1	0	1	6.32	1
324			min	-4248.081	3	72.258	15	0	1	0	1	0	1	.234	15
325		11	max	4507.56	1	1954.436	1	0	1	0	1	0	1	5.617	1
326			min	-4250.535	3	72.258	15	0	1	0	1	0	1	.208	15
327		12	max	4504.289	1	1954.436	1	0	1	0	1	0	1	4.915	1
328			min	-4252.989	3	72.258	15	0	1	0	1	0	1	.182	15
329		13	max	4501.017	1	1954.436	1	0	1	0	1	0	1	4.213	1
330			min	-4255.442	3	72.258	15	0	1	0	1	0	1	.156	15
331		14	max	4497.746	1	1954.436	1	0	1	0	1	0	1	3.511	1
332			min	-4257.896	3	72.258	15	0	1	0	1	0	1	.13	15
333		15	max	4494.474	1	1954.436	1	0	1	0	1	0	1	2.809	1
334			min	-4260.349	3	72.258	15	0	1	0	1	0	1	.104	15
335		16	max	4491.203	1	1954.436	1	0	1	0	1	0	1	2.107	1
336			min	-4262.803	3	72.258	15	0	1	0	1	0	1	.078	15
337		17	max	4487.931	1	1954.436	1	0	1	0	1	0	1	1.404	1
338			min	-4265.256	3	72.258	15	0	1	0	1	0	1	.052	15
339		18	max	4484.66	1	1954.436	1	0	1	0	1	0	1	.702	1
340			min	-4267.71	3	72.258	15	0	1	0	1	0	1	.026	15
341		19	max	4481.388	1	1954.436	1	0	1	0	1	0	1	0	1
342			min	-4270.164	3	72.258	15	0	1	0	1	0	1	0	1
343	M8	1	max	2350.858	2	1127.114	3	179.609	3	.013	2	.242	1	6.477	1
344			min	-1673.026	3	-792.174	2	-154.704	2	-.005	3	-.279	3	.275	15
345		2	max	2347.587	2	1127.114	3	179.609	3	.013	2	.19	1	6.563	1
346			min	-1675.48	3	-792.174	2	-154.704	2	-.005	3	-.215	3	.272	15
347		3	max	1754.205	1	1112.149	1	161.309	3	0	3	.167	1	6.393	1
348			min	-1394.413	3	45.582	15	-108.172	2	-.001	2	-.166	3	.262	15
349		4	max	1750.934	1	1112.149	1	161.309	3	0	3	.13	1	5.993	1
350			min	-1396.866	3	45.582	15	-108.172	2	-.001	2	-.108	3	.246	15
351		5	max	1747.662	1	1112.149	1	161.309	3	0	3	.093	1	5.594	1
352			min	-1399.32	3	45.582	15	-108.172	2	-.001	2	-.05	3	.229	15
353		6	max	1744.391	1	1112.149	1	161.309	3	0	3	.055	1	5.194	1
354			min	-1401.774	3	45.582	15	-108.172	2	-.001	2	.002	15	.213	15
355		7	max	1741.119	1	1112.149	1	161.309	3	0	3	.066	3	4.795	1
356			min	-1404.227	3	45.582	15	-108.172	2	-.001	2	-.007	10	.197	15
357		8	max	1737.848	1	1112.149	1	161.309	3	0	3	.124	3	4.395	1
358			min	-1406.681	3	45.582	15	-108.172	2	-.001	2	-.045	2	.18	15
359		9	max	1734.576	1	1112.149	1	161.309	3	0	3	.182	3	3.996	1
360			min	-1409.134	3	45.582	15	-108.172	2	-.001	2	-.084	2	.164	15
361		10	max	1731.305	1	1112.149	1	161.309	3	0	3	.24	3	3.596	1
362			min	-1411.588	3	45.582	15	-108.172	2	-.001	2	-.123	2	.147	15
363		11	max	1728.033	1	1112.149	1	161.309	3	0	3	.298	3	3.196	1
364			min	-1414.041	3	45.582	15	-108.172	2	-.001	2	-.161	2	.131	15
365		12	max	1724.762	1	1112.149	1	161.309	3	0	3	.356	3	2.797	1
366			min	-1416.495	3	45.582	15	-108.172	2	-.001	2	-.2	2	.115	15
367		13	max	1721.491	1	1112.149	1	161.309	3	0	3	.414	3	2.397	1
368			min	-1418.949	3	45.582	15	-108.172	2	-.001	2	-.239	2	.098	15
369		14	max	1718.219	1	1112.149	1	161.309	3	0	3	.472	3	1.998	1
370			min	-1421.402	3	45.582	15	-108.172	2	-.001	2	-.278	2	.082	15
371		15	max	1714.948	1	1112.149	1	161.309	3	0	3	.53	3	1.598	1
372			min	-1423.856	3	45.582	15	-108.172	2	-.001	2	-.317	2	.066	15
373		16	max	1711.676	1	1112.149	1	161.309	3	0	3	.588	3	1.199	1
374			min	-1426.309	3	45.582	15	-108.172	2	-.001	2	-.356	2	.049	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	1708.405	1	1112.149	1	161.309	3	0	3	.646	3	.799	1
376			min	-1428.763	3	45.582	15	-108.172	2	-.001	2	-.395	2	.033	15
377		18	max	1705.133	1	1112.149	1	161.309	3	0	3	.704	3	.4	1
378			min	-1431.217	3	45.582	15	-108.172	2	-.001	2	-.434	2	.016	15
379		19	max	1701.862	1	1112.149	1	161.309	3	0	3	.762	3	0	1
380			min	-1433.67	3	45.582	15	-108.172	2	-.001	2	-.472	2	0	1
381	M3	1	max	1767.304	2	5.617	4	45.956	2	.013	3	.001	3	0	1
382			min	-732.094	3	1.32	15	-18.828	3	-.029	2	-.003	2	0	1
383		2	max	1767.095	2	4.993	4	45.956	2	.013	3	.013	2	0	15
384			min	-732.251	3	1.174	15	-18.828	3	-.029	2	-.006	3	-.002	4
385		3	max	1766.886	2	4.369	4	45.956	2	.013	3	.03	2	0	15
386			min	-732.407	3	1.027	15	-18.828	3	-.029	2	-.012	3	-.004	4
387		4	max	1766.678	2	3.745	4	45.956	2	.013	3	.046	2	-.001	15
388			min	-732.563	3	.88	15	-18.828	3	-.029	2	-.019	3	-.005	4
389		5	max	1766.469	2	3.121	4	45.956	2	.013	3	.062	2	-.001	15
390			min	-732.72	3	.734	15	-18.828	3	-.029	2	-.026	3	-.006	4
391		6	max	1766.26	2	2.497	4	45.956	2	.013	3	.079	2	-.002	15
392			min	-732.876	3	.587	15	-18.828	3	-.029	2	-.033	3	-.007	4
393		7	max	1766.052	2	1.872	4	45.956	2	.013	3	.095	2	-.002	15
394			min	-733.033	3	.44	15	-18.828	3	-.029	2	-.039	3	-.008	4
395		8	max	1765.843	2	1.248	4	45.956	2	.013	3	.112	2	-.002	15
396			min	-733.189	3	.293	15	-18.828	3	-.029	2	-.046	3	-.009	4
397		9	max	1765.635	2	.624	4	45.956	2	.013	3	.128	2	-.002	15
398			min	-733.346	3	.147	15	-18.828	3	-.029	2	-.053	3	-.009	4
399		10	max	1765.426	2	0	1	45.956	2	.013	3	.144	2	-.002	15
400			min	-733.502	3	0	1	-18.828	3	-.029	2	-.059	3	-.009	4
401		11	max	1765.217	2	-.147	15	45.956	2	.013	3	.161	2	-.002	15
402			min	-733.659	3	-.624	4	-18.828	3	-.029	2	-.066	3	-.009	4
403		12	max	1765.009	2	-.293	15	45.956	2	.013	3	.177	2	-.002	15
404			min	-733.815	3	-1.248	4	-18.828	3	-.029	2	-.073	3	-.009	4
405		13	max	1764.8	2	-.44	15	45.956	2	.013	3	.193	2	-.002	15
406			min	-733.972	3	-1.872	4	-18.828	3	-.029	2	-.08	3	-.008	4
407		14	max	1764.592	2	-.587	15	45.956	2	.013	3	.21	2	-.002	15
408			min	-734.128	3	-2.497	4	-18.828	3	-.029	2	-.086	3	-.007	4
409		15	max	1764.383	2	-.734	15	45.956	2	.013	3	.226	2	-.001	15
410			min	-734.284	3	-3.121	4	-18.828	3	-.029	2	-.093	3	-.006	4
411		16	max	1764.174	2	-.88	15	45.956	2	.013	3	.243	2	-.001	15
412			min	-734.441	3	-3.745	4	-18.828	3	-.029	2	-.1	3	-.005	4
413		17	max	1763.966	2	-1.027	15	45.956	2	.013	3	.259	2	0	15
414			min	-734.597	3	-4.369	4	-18.828	3	-.029	2	-.106	3	-.004	4
415		18	max	1763.757	2	-1.174	15	45.956	2	.013	3	.275	2	0	15
416			min	-734.754	3	-4.993	4	-18.828	3	-.029	2	-.113	3	-.002	4
417		19	max	1763.549	2	-1.32	15	45.956	2	.013	3	.292	2	0	1
418			min	-734.91	3	-5.617	4	-18.828	3	-.029	2	-.12	3	0	1
419	M6	1	max	5039.659	2	5.617	4	0	1	0	1	0	1	0	1
420			min	-2514.782	3	1.32	15	0	1	0	1	0	1	0	1
421		2	max	5039.45	2	4.993	4	0	1	0	1	0	1	0	15
422			min	-2514.939	3	1.174	15	0	1	0	1	0	1	-.002	4
423		3	max	5039.241	2	4.369	4	0	1	0	1	0	1	0	15
424			min	-2515.095	3	1.027	15	0	1	0	1	0	1	-.004	4
425		4	max	5039.033	2	3.745	4	0	1	0	1	0	1	-.001	15
426			min	-2515.252	3	.88	15	0	1	0	1	0	1	-.005	4
427		5	max	5038.824	2	3.121	4	0	1	0	1	0	1	-.001	15
428			min	-2515.408	3	.734	15	0	1	0	1	0	1	-.006	4
429		6	max	5038.615	2	2.497	4	0	1	0	1	0	1	-.002	15
430			min	-2515.565	3	.587	15	0	1	0	1	0	1	-.007	4
431		7	max	5038.407	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	-2515.721	3	.44	15	0	1	0	1	0	1	-.008	4
433		8	max	5038.198	2	1.248	4	0	1	0	1	0	1	-.002	15
434			min	-2515.877	3	.293	15	0	1	0	1	0	1	-.009	4
435		9	max	5037.99	2	.624	4	0	1	0	1	0	1	-.002	15
436			min	-2516.034	3	.147	15	0	1	0	1	0	1	-.009	4
437		10	max	5037.781	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2516.19	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	5037.572	2	-.147	15	0	1	0	1	0	1	-.002	15
440			min	-2516.347	3	-.624	4	0	1	0	1	0	1	-.009	4
441		12	max	5037.364	2	-.293	15	0	1	0	1	0	1	-.002	15
442			min	-2516.503	3	-1.248	4	0	1	0	1	0	1	-.009	4
443		13	max	5037.155	2	-.44	15	0	1	0	1	0	1	-.002	15
444			min	-2516.66	3	-1.872	4	0	1	0	1	0	1	-.008	4
445		14	max	5036.947	2	-.587	15	0	1	0	1	0	1	-.002	15
446			min	-2516.816	3	-2.497	4	0	1	0	1	0	1	-.007	4
447		15	max	5036.738	2	-.734	15	0	1	0	1	0	1	-.001	15
448			min	-2516.973	3	-3.121	4	0	1	0	1	0	1	-.006	4
449		16	max	5036.529	2	-.88	15	0	1	0	1	0	1	-.001	15
450			min	-2517.129	3	-3.745	4	0	1	0	1	0	1	-.005	4
451		17	max	5036.321	2	-1.027	15	0	1	0	1	0	1	0	15
452			min	-2517.286	3	-4.369	4	0	1	0	1	0	1	-.004	4
453		18	max	5036.112	2	-1.174	15	0	1	0	1	0	1	0	15
454			min	-2517.442	3	-4.993	4	0	1	0	1	0	1	-.002	4
455		19	max	5035.904	2	-1.32	15	0	1	0	1	0	1	0	1
456			min	-2517.598	3	-5.617	4	0	1	0	1	0	1	0	1
457	M9	1	max	1767.304	2	5.617	4	18.828	3	.029	2	.003	2	0	1
458			min	-732.094	3	1.32	15	-45.956	2	-.013	3	-.001	3	0	1
459		2	max	1767.095	2	4.993	4	18.828	3	.029	2	.006	3	0	15
460			min	-732.251	3	1.174	15	-45.956	2	-.013	3	-.013	2	-.002	4
461		3	max	1766.886	2	4.369	4	18.828	3	.029	2	.012	3	0	15
462			min	-732.407	3	1.027	15	-45.956	2	-.013	3	-.03	2	-.004	4
463		4	max	1766.678	2	3.745	4	18.828	3	.029	2	.019	3	-.001	15
464			min	-732.563	3	.88	15	-45.956	2	-.013	3	-.046	2	-.005	4
465		5	max	1766.469	2	3.121	4	18.828	3	.029	2	.026	3	-.001	15
466			min	-732.72	3	.734	15	-45.956	2	-.013	3	-.062	2	-.006	4
467		6	max	1766.26	2	2.497	4	18.828	3	.029	2	.033	3	-.002	15
468			min	-732.876	3	.587	15	-45.956	2	-.013	3	-.079	2	-.007	4
469		7	max	1766.052	2	1.872	4	18.828	3	.029	2	.039	3	-.002	15
470			min	-733.033	3	.44	15	-45.956	2	-.013	3	-.095	2	-.008	4
471		8	max	1765.843	2	1.248	4	18.828	3	.029	2	.046	3	-.002	15
472			min	-733.189	3	.293	15	-45.956	2	-.013	3	-.112	2	-.009	4
473		9	max	1765.635	2	.624	4	18.828	3	.029	2	.053	3	-.002	15
474			min	-733.346	3	.147	15	-45.956	2	-.013	3	-.128	2	-.009	4
475		10	max	1765.426	2	0	1	18.828	3	.029	2	.059	3	-.002	15
476			min	-733.502	3	0	1	-45.956	2	-.013	3	-.144	2	-.009	4
477		11	max	1765.217	2	-.147	15	18.828	3	.029	2	.066	3	-.002	15
478			min	-733.659	3	-.624	4	-45.956	2	-.013	3	-.161	2	-.009	4
479		12	max	1765.009	2	-.293	15	18.828	3	.029	2	.073	3	-.002	15
480			min	-733.815	3	-1.248	4	-45.956	2	-.013	3	-.177	2	-.009	4
481		13	max	1764.8	2	-.44	15	18.828	3	.029	2	.08	3	-.002	15
482			min	-733.972	3	-1.872	4	-45.956	2	-.013	3	-.193	2	-.008	4
483		14	max	1764.592	2	-.587	15	18.828	3	.029	2	.086	3	-.002	15
484			min	-734.128	3	-2.497	4	-45.956	2	-.013	3	-.21	2	-.007	4
485		15	max	1764.383	2	-.734	15	18.828	3	.029	2	.093	3	-.001	15
486			min	-734.284	3	-3.121	4	-45.956	2	-.013	3	-.226	2	-.006	4
487		16	max	1764.174	2	-.88	15	18.828	3	.029	2	.1	3	-.001	15
488			min	-734.441	3	-3.745	4	-45.956	2	-.013	3	-.243	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	1763.966	2	-1.027	15	18.828	3	.029	2	.106	3	0	15
490			min	-734.597	3	-4.369	4	-45.956	2	-.013	3	-.259	2	-.004	4
491		18	max	1763.757	2	-1.174	15	18.828	3	.029	2	.113	3	0	15
492			min	-734.754	3	-4.993	4	-45.956	2	-.013	3	-.275	2	-.002	4
493		19	max	1763.549	2	-1.32	15	18.828	3	.029	2	.12	3	0	1
494			min	-734.91	3	-5.617	4	-45.956	2	-.013	3	-.292	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	-.02	15	-.029	15	.013	1	8.92e-3	3	NC	3	NC	1
2			min	-.477	1	-.8	1	0	15	-2.583e-2	2	125.42	1	NC	1
3		2	max	-.02	15	-.025	15	0	15	8.619e-3	3	NC	12	NC	2
4			min	-.477	1	-.674	1	-.009	1	-2.439e-2	2	141.221	1	6766.105	1
5		3	max	-.02	15	-.021	15	0	15	8.028e-3	3	9428.071	12	NC	3
6			min	-.477	1	-.551	1	-.021	1	-2.158e-2	2	160.991	1	4568.101	1
7		4	max	-.02	15	-.017	15	0	15	7.437e-3	3	7400.933	12	NC	3
8			min	-.477	1	-.437	1	-.023	1	-1.876e-2	2	184.879	1	4387.971	1
9		5	max	-.02	15	-.014	15	0	3	7.216e-3	3	7713.267	12	NC	3
10			min	-.477	1	-.339	1	-.021	1	-1.684e-2	2	211.931	1	4996.81	1
11		6	max	-.02	15	-.011	15	.002	3	7.949e-3	3	NC	12	NC	3
12			min	-.476	1	-.26	1	-.013	1	-1.721e-2	2	240.446	1	7214.662	1
13		7	max	-.02	15	-.008	15	.002	3	8.682e-3	3	NC	3	NC	1
14			min	-.476	1	-.193	1	-.005	2	-1.759e-2	2	271.068	1	NC	1
15		8	max	-.02	15	-.006	15	0	3	9.414e-3	3	NC	3	NC	1
16			min	-.475	1	-.134	1	0	2	-1.797e-2	2	305.886	1	NC	1
17		9	max	-.02	15	-.004	15	0	2	1.054e-2	3	7265.971	15	NC	1
18			min	-.475	1	-.075	1	-.001	3	-1.712e-2	2	349.869	1	NC	1
19		10	max	-.02	15	-.001	15	.001	2	1.203e-2	3	8313.816	15	NC	1
20			min	-.474	1	-.043	3	-.002	3	-1.51e-2	2	410.233	1	NC	1
21		11	max	-.019	15	.045	1	.001	1	1.351e-2	3	9749.055	15	NC	1
22			min	-.474	1	-.022	3	0	15	-1.309e-2	2	497.667	1	NC	1
23		12	max	-.019	15	.107	1	.005	3	1.27e-2	3	NC	15	NC	1
24			min	-.473	1	-.002	3	-.005	1	-1.066e-2	2	635.673	1	NC	1
25		13	max	-.019	15	.167	1	.013	3	9.444e-3	3	NC	15	NC	1
26			min	-.472	1	.006	15	-.008	2	-7.776e-3	2	872.772	1	9514.623	3
27		14	max	-.019	15	.222	1	.02	3	6.187e-3	3	NC	5	NC	1
28			min	-.472	1	.009	15	-.008	2	-4.894e-3	2	921.55	3	6452.543	3
29		15	max	-.019	15	.266	1	.02	3	2.93e-3	3	NC	2	NC	1
30			min	-.471	1	.011	15	-.003	2	-2.013e-3	2	688.852	3	6420.844	3
31		16	max	-.019	15	.295	1	.013	3	7.191e-3	3	NC	5	NC	2
32			min	-.471	1	.013	15	0	15	-3.8e-3	2	501.329	3	6900.208	1
33		17	max	-.019	15	.312	1	.016	1	1.233e-2	3	NC	4	NC	2
34			min	-.471	1	.014	15	0	15	-6.135e-3	2	373.755	3	5843.792	1
35		18	max	-.019	15	.389	3	.008	1	1.748e-2	3	NC	1	NC	2
36			min	-.471	1	.015	15	0	15	-8.47e-3	2	290.726	3	7928.178	1
37		19	max	-.019	15	.501	3	0	15	2.01e-2	3	NC	1	NC	1
38			min	-.471	1	.016	15	-.011	1	-9.661e-3	2	236.325	3	NC	1
39	M4	1	max	-.031	15	-.032	12	0	1	0	1	NC	3	NC	1
40			min	-.836	1	-1.54	1	0	1	0	1	72.313	1	NC	1
41		2	max	-.031	15	-.042	15	0	1	0	1	4125.398	12	NC	1
42			min	-.836	1	-1.279	1	0	1	0	1	83.433	1	NC	1
43		3	max	-.031	15	-.035	15	0	1	0	1	2613.058	15	NC	1
44			min	-.836	1	-1.025	1	0	1	0	1	98.096	1	NC	1
45		4	max	-.031	15	-.028	15	0	1	0	1	2981.086	15	NC	1
46			min	-.836	1	-.795	1	0	1	0	1	116.64	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	-.031	15	-.022	15	0	1	0	1	3390.609	15	NC	1
48			min	-.835	1	-.607	1	0	1	0	1	138.005	1	NC	1
49		6	max	-.031	15	-.018	15	0	1	0	1	3813.121	15	NC	1
50			min	-.834	1	-.467	1	0	1	0	1	159.725	1	NC	1
51		7	max	-.031	15	-.014	15	0	1	0	1	4262.994	15	NC	1
52			min	-.833	1	-.359	1	0	1	0	1	181.885	1	NC	1
53		8	max	-.031	15	-.01	15	0	1	0	1	4780.668	15	NC	1
54			min	-.832	1	-.266	1	0	1	0	1	206.534	1	NC	1
55		9	max	-.031	15	-.006	15	0	1	0	1	NC	12	NC	1
56			min	-.831	1	-.171	1	0	1	0	1	239.679	1	NC	1
57		10	max	-.031	15	-.003	15	0	1	0	1	NC	3	NC	1
58			min	-.83	1	-.067	1	0	1	0	1	291.077	1	NC	1
59		11	max	-.031	15	.046	1	0	1	0	1	7918.413	15	NC	1
60			min	-.828	1	-.008	3	0	1	0	1	378.486	1	NC	1
61		12	max	-.031	15	.166	1	0	1	0	1	NC	15	NC	1
62			min	-.827	1	.006	15	0	1	0	1	556.983	1	NC	1
63		13	max	-.031	15	.286	1	0	1	0	1	NC	2	NC	1
64			min	-.825	1	.01	15	0	1	0	1	1053.349	1	NC	1
65		14	max	-.031	15	.39	1	0	1	0	1	NC	5	NC	1
66			min	-.824	1	.014	15	0	1	0	1	1137.809	3	NC	1
67		15	max	-.031	15	.463	1	0	1	0	1	NC	4	NC	1
68			min	-.823	1	.017	15	0	1	0	1	649.453	3	NC	1
69		16	max	-.031	15	.491	1	0	1	0	1	NC	4	NC	1
70			min	-.823	1	.019	15	0	1	0	1	375.615	3	NC	1
71		17	max	-.031	15	.547	3	0	1	0	1	NC	4	NC	1
72			min	-.823	1	.02	15	0	1	0	1	241.317	3	NC	1
73		18	max	-.031	15	.787	3	0	1	0	1	NC	4	NC	1
74			min	-.823	1	.02	15	0	1	0	1	171.295	3	NC	1
75		19	max	-.031	15	1.037	3	0	1	0	1	NC	1	NC	1
76			min	-.823	1	.02	15	0	1	0	1	131.643	3	NC	1
77	M7	1	max	-.02	15	-.029	15	0	15	2.583e-2	2	NC	3	NC	1
78			min	-.477	1	-.8	1	-.013	1	-8.92e-3	3	125.42	1	NC	1
79		2	max	-.02	15	-.025	15	.009	1	2.439e-2	2	NC	12	NC	2
80			min	-.477	1	-.674	1	0	15	-8.619e-3	3	141.221	1	6766.105	1
81		3	max	-.02	15	-.021	15	.021	1	2.158e-2	2	9428.071	12	NC	3
82			min	-.477	1	-.551	1	0	15	-8.028e-3	3	160.991	1	4568.101	1
83		4	max	-.02	15	-.017	15	.023	1	1.876e-2	2	7400.933	12	NC	3
84			min	-.477	1	-.437	1	0	15	-7.437e-3	3	184.879	1	4387.971	1
85		5	max	-.02	15	-.014	15	.021	1	1.684e-2	2	7713.267	12	NC	3
86			min	-.477	1	-.339	1	0	3	-7.216e-3	3	211.931	1	4996.81	1
87		6	max	-.02	15	-.011	15	.013	1	1.721e-2	2	NC	12	NC	3
88			min	-.476	1	-.26	1	-.002	3	-7.949e-3	3	240.446	1	7214.662	1
89		7	max	-.02	15	-.008	15	.005	2	1.759e-2	2	NC	3	NC	1
90			min	-.476	1	-.193	1	-.002	3	-8.682e-3	3	271.068	1	NC	1
91		8	max	-.02	15	-.006	15	0	2	1.797e-2	2	NC	3	NC	1
92			min	-.475	1	-.134	1	0	3	-9.414e-3	3	305.886	1	NC	1
93		9	max	-.02	15	-.004	15	.001	3	1.712e-2	2	7265.971	15	NC	1
94			min	-.475	1	-.075	1	0	2	-1.054e-2	3	349.869	1	NC	1
95		10	max	-.02	15	-.001	15	.002	3	1.51e-2	2	8313.816	15	NC	1
96			min	-.474	1	-.043	3	-.001	2	-1.203e-2	3	410.233	1	NC	1
97		11	max	-.019	15	.045	1	0	15	1.309e-2	2	9749.055	15	NC	1
98			min	-.474	1	-.022	3	-.001	1	-1.351e-2	3	497.667	1	NC	1
99		12	max	-.019	15	.107	1	.005	1	1.066e-2	2	NC	15	NC	1
100			min	-.473	1	-.002	3	-.005	3	-1.27e-2	3	635.673	1	NC	1
101		13	max	-.019	15	.167	1	.008	2	7.776e-3	2	NC	15	NC	1
102			min	-.472	1	.006	15	-.013	3	-9.444e-3	3	872.772	1	9514.623	3
103		14	max	-.019	15	.222	1	.008	2	4.894e-3	2	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
104			min	-.472	1	.009	15	-.02	3	-6.187e-3	3	921.55	3	6452.543	3
105		15	max	-.019	15	.266	1	.003	2	2.013e-3	2	NC	2	NC	1
106			min	-.471	1	.011	15	-.02	3	-2.93e-3	3	688.852	3	6420.844	3
107		16	max	-.019	15	.295	1	0	15	3.8e-3	2	NC	5	NC	2
108			min	-.471	1	.013	15	-.013	3	-7.191e-3	3	501.329	3	6900.208	1
109		17	max	-.019	15	.312	1	0	15	6.135e-3	2	NC	4	NC	2
110			min	-.471	1	.014	15	-.016	1	-1.233e-2	3	373.755	3	5843.792	1
111		18	max	-.019	15	.389	3	0	15	8.47e-3	2	NC	1	NC	2
112			min	-.471	1	.015	15	-.008	1	-1.748e-2	3	290.726	3	7928.178	1
113		19	max	-.019	15	.501	3	.011	1	9.661e-3	2	NC	1	NC	1
114			min	-.471	1	.016	15	0	15	-2.01e-2	3	236.325	3	NC	1
115	M10	1	max	.001	1	.446	3	.471	1	1.423e-2	3	NC	1	NC	1
116			min	0	15	.015	15	.019	15	-1.219e-3	2	NC	1	NC	1
117		2	max	0	1	.694	3	.528	1	1.615e-2	3	NC	4	NC	3
118			min	0	15	.013	15	.022	15	-1.901e-3	2	872.214	3	3827.445	1
119		3	max	0	1	.923	3	.613	1	1.808e-2	3	NC	5	NC	5
120			min	0	15	-.032	10	.025	15	-2.583e-3	2	452.909	3	1530.2	1
121		4	max	0	1	1.098	3	.701	1	2.e-2	3	NC	5	NC	5
122			min	0	15	-.078	2	.029	15	-3.265e-3	2	331.52	3	940.807	1
123		5	max	0	1	1.197	3	.776	1	2.193e-2	3	NC	5	NC	5
124			min	0	15	-.09	2	.031	15	-3.947e-3	2	287.725	3	710.025	1
125		6	max	0	1	1.215	3	.826	1	2.386e-2	3	NC	5	NC	5
126			min	0	15	-.054	10	.033	15	-4.629e-3	2	280.854	3	609.174	1
127		7	max	0	1	1.163	3	.849	1	2.578e-2	3	NC	4	NC	5
128			min	0	15	-.013	10	.033	15	-5.311e-3	2	301.36	3	572.499	1
129		8	max	0	1	1.066	3	.847	1	2.771e-2	3	NC	1	NC	5
130			min	0	15	.016	15	.032	15	-5.993e-3	2	348.789	3	574.417	1
131		9	max	0	1	.964	3	.833	1	2.963e-2	3	NC	4	NC	5
132			min	0	15	.018	15	.031	15	-6.675e-3	2	417.222	3	597.449	1
133		10	max	0	1	.915	3	.823	1	3.156e-2	3	NC	5	NC	5
134			min	0	1	.02	15	.031	15	-7.357e-3	2	461.038	3	614.321	1
135		11	max	0	15	.964	3	.833	1	2.963e-2	3	NC	4	NC	5
136			min	0	1	.018	15	.031	15	-6.675e-3	2	417.222	3	597.449	1
137		12	max	0	15	1.066	3	.847	1	2.771e-2	3	NC	1	NC	5
138			min	0	1	.016	15	.032	15	-5.993e-3	2	348.789	3	574.417	1
139		13	max	0	15	1.163	3	.849	1	2.578e-2	3	NC	4	NC	5
140			min	0	1	-.013	10	.033	15	-5.311e-3	2	301.36	3	572.499	1
141		14	max	0	15	1.215	3	.826	1	2.386e-2	3	NC	5	NC	5
142			min	0	1	-.054	10	.033	15	-4.629e-3	2	280.854	3	609.174	1
143		15	max	0	15	1.197	3	.776	1	2.193e-2	3	NC	5	NC	5
144			min	0	1	-.09	2	.031	15	-3.947e-3	2	287.725	3	710.025	1
145		16	max	0	15	1.098	3	.701	1	2.e-2	3	NC	5	NC	5
146			min	0	1	-.078	2	.029	15	-3.265e-3	2	331.52	3	940.807	1
147		17	max	0	15	.923	3	.613	1	1.808e-2	3	NC	5	NC	5
148			min	0	1	-.032	10	.025	15	-2.583e-3	2	452.909	3	1530.2	1
149		18	max	0	15	.694	3	.528	1	1.615e-2	3	NC	4	NC	3
150			min	0	1	.013	15	.022	15	-1.901e-3	2	872.214	3	3827.445	1
151		19	max	0	15	.446	3	.471	1	1.423e-2	3	NC	1	NC	1
152			min	-.001	1	.015	15	.019	15	-1.219e-3	2	NC	1	NC	1
153	M11	1	max	.002	1	.077	1	.473	1	7.837e-3	1	NC	1	NC	1
154			min	-.002	3	-.012	3	.019	15	3.25e-4	15	NC	1	NC	1
155		2	max	.002	1	.165	3	.514	1	8.653e-3	1	NC	5	NC	3
156			min	-.002	3	-.078	2	.021	15	3.502e-4	15	1221.145	3	5271.004	1
157		3	max	.001	1	.324	3	.591	1	9.469e-3	1	NC	5	NC	3
158			min	-.001	3	-.195	2	.024	15	3.753e-4	15	644.411	3	1835.482	1
159		4	max	.001	1	.429	3	.677	1	1.029e-2	1	NC	5	NC	5
160			min	-.001	3	-.266	2	.027	15	4.004e-4	15	489.878	3	1058.692	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	.001	1	.464	3	.754	1	1.11e-2	1	NC	5	NC	5
162			min	-.001	3	-.282	2	.03	15	4.256e-4	15	454.207	3	768.687	1
163		6	max	0	1	.424	3	.81	1	1.192e-2	1	NC	5	NC	5
164			min	0	3	-.244	2	.032	15	4.507e-4	15	495.414	3	641.617	1
165		7	max	0	1	.323	3	.839	1	1.273e-2	1	NC	5	NC	5
166			min	0	3	-.161	2	.033	15	4.758e-4	15	645.468	3	590.019	1
167		8	max	0	1	.188	3	.845	1	1.355e-2	1	NC	4	NC	5
168			min	0	3	-.057	2	.032	15	5.01e-4	15	1083.687	3	581.432	1
169		9	max	0	1	.065	1	.835	1	1.437e-2	1	NC	1	NC	5
170			min	0	3	.003	15	.031	15	5.261e-4	15	2945.422	3	596.506	1
171		10	max	0	1	.106	1	.828	1	1.518e-2	1	NC	2	NC	5
172			min	0	1	.003	12	.031	15	5.512e-4	15	7222.454	1	609.772	1
173		11	max	0	3	.065	1	.835	1	1.437e-2	1	NC	1	NC	5
174			min	0	1	.003	15	.031	15	5.261e-4	15	2945.422	3	596.506	1
175		12	max	0	3	.188	3	.845	1	1.355e-2	1	NC	4	NC	5
176			min	0	1	-.057	2	.032	15	5.01e-4	15	1083.687	3	581.432	1
177		13	max	0	3	.323	3	.839	1	1.273e-2	1	NC	5	NC	5
178			min	0	1	-.161	2	.033	15	4.758e-4	15	645.468	3	590.019	1
179		14	max	0	3	.424	3	.81	1	1.192e-2	1	NC	5	NC	5
180			min	0	1	-.244	2	.032	15	4.507e-4	15	495.414	3	641.617	1
181		15	max	.001	3	.464	3	.754	1	1.11e-2	1	NC	5	NC	5
182			min	-.001	1	-.282	2	.03	15	4.256e-4	15	454.207	3	768.687	1
183		16	max	.001	3	.429	3	.677	1	1.029e-2	1	NC	5	NC	5
184			min	-.001	1	-.266	2	.027	15	4.004e-4	15	489.878	3	1058.692	1
185		17	max	.001	3	.324	3	.591	1	9.469e-3	1	NC	5	NC	3
186			min	-.001	1	-.195	2	.024	15	3.753e-4	15	644.411	3	1835.482	1
187		18	max	.002	3	.165	3	.514	1	8.653e-3	1	NC	5	NC	3
188			min	-.002	1	-.078	2	.021	15	3.502e-4	15	1221.145	3	5271.004	1
189		19	max	.002	3	.077	1	.473	1	7.837e-3	1	NC	1	NC	1
190			min	-.002	1	-.012	3	.019	15	3.25e-4	15	NC	1	NC	1
191	M12	1	max	0	3	-.005	15	.475	1	7.419e-3	1	NC	1	NC	1
192			min	0	1	-.106	1	.02	15	3.059e-4	15	NC	1	NC	1
193		2	max	0	3	.036	3	.51	1	7.939e-3	1	NC	5	NC	2
194			min	0	1	-.29	2	.021	15	3.239e-4	15	998.346	2	6227.285	1
195		3	max	0	3	.124	3	.583	1	8.458e-3	1	NC	5	NC	5
196			min	0	1	-.475	2	.024	15	3.418e-4	15	537.459	2	1996.167	1
197		4	max	0	3	.174	3	.669	1	8.978e-3	1	NC	5	NC	5
198			min	0	1	-.598	2	.027	15	3.598e-4	15	411.492	2	1114.253	1
199		5	max	0	3	.183	3	.747	1	9.497e-3	1	NC	5	NC	5
200			min	0	1	-.642	2	.03	15	3.777e-4	15	379.555	2	794.201	1
201		6	max	0	3	.151	3	.805	1	1.002e-2	1	NC	5	NC	5
202			min	0	1	-.607	2	.032	15	3.957e-4	15	404.974	2	654.582	1
203		7	max	0	3	.089	3	.837	1	1.054e-2	1	NC	5	NC	5
204			min	0	1	-.505	2	.033	15	4.137e-4	15	499.93	2	596.09	1
205		8	max	0	3	.011	3	.846	1	1.106e-2	1	NC	5	NC	5
206			min	0	1	-.373	1	.032	15	4.316e-4	15	732.725	2	582.754	1
207		9	max	0	3	-.009	15	.838	1	1.158e-2	1	NC	3	NC	5
208			min	0	1	-.269	1	.031	15	4.496e-4	15	1297.232	2	594.278	1
209		10	max	0	1	-.008	15	.831	1	1.209e-2	1	NC	3	NC	5
210			min	0	1	-.222	1	.031	15	4.675e-4	15	1865.09	1	605.943	1
211		11	max	0	1	-.009	15	.838	1	1.158e-2	1	NC	3	NC	5
212			min	0	3	-.269	1	.031	15	4.496e-4	15	1297.232	2	594.278	1
213		12	max	0	1	.011	3	.846	1	1.106e-2	1	NC	5	NC	5
214			min	0	3	-.373	1	.032	15	4.316e-4	15	732.725	2	582.754	1
215		13	max	0	1	.089	3	.837	1	1.054e-2	1	NC	5	NC	5
216			min	0	3	-.505	2	.033	15	4.137e-4	15	499.93	2	596.09	1
217		14	max	0	1	.151	3	.805	1	1.002e-2	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	-.607	2	.032	15	3.957e-4	15	404.974	2	654.582	1
219		15	max	0	1	.183	3	.747	1	9.497e-3	1	NC	5	NC	5
220			min	0	3	-.642	2	.03	15	3.777e-4	15	379.555	2	794.201	1
221		16	max	0	1	.174	3	.669	1	8.978e-3	1	NC	5	NC	5
222			min	0	3	-.598	2	.027	15	3.598e-4	15	411.492	2	1114.253	1
223		17	max	0	1	.124	3	.583	1	8.458e-3	1	NC	5	NC	5
224			min	0	3	-.475	2	.024	15	3.418e-4	15	537.459	2	1996.167	1
225		18	max	0	1	.036	3	.51	1	7.939e-3	1	NC	5	NC	2
226			min	0	3	-.29	2	.021	15	3.239e-4	15	998.346	2	6227.285	1
227		19	max	0	1	-.005	15	.475	1	7.419e-3	1	NC	1	NC	1
228			min	0	3	-.106	1	.02	15	3.059e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.027	15	.477	1	1.604e-2	1	NC	1	NC	1
230			min	-.001	1	-.739	1	.02	15	-1.801e-3	3	NC	1	NC	1
231		2	max	0	15	0	3	.537	1	1.806e-2	2	NC	5	NC	3
232			min	-.001	1	-1.006	1	.022	15	-2.429e-3	3	698.087	2	3580.166	1
233		3	max	0	15	.087	3	.625	1	2.023e-2	2	NC	5	NC	5
234			min	0	1	-1.249	1	.026	15	-3.057e-3	3	367.47	2	1462.491	1
235		4	max	0	15	.143	3	.715	1	2.241e-2	2	NC	15	NC	5
236			min	0	1	-1.445	2	.029	15	-3.685e-3	3	269.794	2	908.647	1
237		5	max	0	15	.161	3	.79	1	2.458e-2	2	NC	15	NC	5
238			min	0	1	-1.573	2	.032	15	-4.313e-3	3	232.603	2	689.878	1
239		6	max	0	15	.141	3	.841	1	2.675e-2	2	9754.926	15	NC	5
240			min	0	1	-1.613	2	.033	15	-4.941e-3	3	223.154	2	594.055	1
241		7	max	0	15	.09	3	.863	1	2.892e-2	2	9769.879	15	NC	5
242			min	0	1	-1.585	1	.033	15	-5.569e-3	3	232.256	2	559.51	1
243		8	max	0	15	.022	3	.861	1	3.109e-2	2	NC	15	NC	5
244			min	0	1	-1.522	1	.033	15	-6.198e-3	3	256.66	2	562.006	1
245		9	max	0	15	-.032	12	.846	1	3.327e-2	2	NC	15	NC	5
246			min	0	1	-1.449	1	.032	15	-6.826e-3	3	290.034	2	584.716	1
247		10	max	0	1	-.046	15	.836	1	3.544e-2	2	NC	12	NC	5
248			min	0	1	-1.412	1	.031	15	-7.454e-3	3	309.943	2	601.191	1
249		11	max	0	1	-.032	12	.846	1	3.327e-2	2	NC	15	NC	5
250			min	0	15	-1.449	1	.032	15	-6.826e-3	3	290.034	2	584.716	1
251		12	max	0	1	.022	3	.861	1	3.109e-2	2	NC	15	NC	5
252			min	0	15	-1.522	1	.033	15	-6.198e-3	3	256.66	2	562.006	1
253		13	max	0	1	.09	3	.863	1	2.892e-2	2	9769.879	15	NC	5
254			min	0	15	-1.585	1	.033	15	-5.569e-3	3	232.256	2	559.51	1
255		14	max	0	1	.141	3	.841	1	2.675e-2	2	9754.926	15	NC	5
256			min	0	15	-1.613	2	.033	15	-4.941e-3	3	223.154	2	594.055	1
257		15	max	0	1	.161	3	.79	1	2.458e-2	2	NC	15	NC	5
258			min	0	15	-1.573	2	.032	15	-4.313e-3	3	232.603	2	689.878	1
259		16	max	0	1	.143	3	.715	1	2.241e-2	2	NC	15	NC	5
260			min	0	15	-1.445	2	.029	15	-3.685e-3	3	269.794	2	908.647	1
261		17	max	0	1	.087	3	.625	1	2.023e-2	2	NC	5	NC	5
262			min	0	15	-1.249	1	.026	15	-3.057e-3	3	367.47	2	1462.491	1
263		18	max	.001	1	0	3	.537	1	1.806e-2	2	NC	5	NC	3
264			min	0	15	-1.006	1	.022	15	-2.429e-3	3	698.087	2	3580.166	1
265		19	max	.001	1	-.027	15	.477	1	1.604e-2	1	NC	1	NC	1
266			min	0	15	-.739	1	.02	15	-1.801e-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	4.598e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	1	-1.929e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	6.49e-3	2	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-2.681e-3	3	8409.378	1	NC	1
273		4	max	0	3	0	15	.002	3	5.971e-3	2	NC	4	NC	1
274			min	0	1	-.021	1	-.002	1	-2.384e-3	3	3729.178	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	-.002	15	.003	3	5.451e-3	2	NC	5	NC	1
276			min	0	1	-.037	1	-.003	1	-2.087e-3	3	2120.677	1	NC	1
277		6	max	0	3	-.002	15	.004	3	4.931e-3	2	NC	5	NC	1
278			min	0	1	-.056	1	-.004	1	-1.79e-3	3	1378.082	1	NC	1
279		7	max	0	3	-.003	15	.005	3	4.411e-3	2	NC	5	NC	1
280			min	0	1	-.08	1	-.005	1	-1.493e-3	3	973.851	1	NC	1
281		8	max	0	3	-.004	15	.006	3	3.892e-3	2	NC	5	NC	1
282			min	0	1	-.106	1	-.007	1	-1.196e-3	3	729.203	1	NC	1
283		9	max	0	3	-.006	15	.007	3	3.372e-3	2	NC	15	NC	1
284			min	0	1	-.136	1	-.008	1	-8.985e-4	3	569.516	1	9886.872	2
285		10	max	0	3	-.007	15	.008	3	2.852e-3	2	NC	15	NC	1
286			min	-.001	1	-.169	1	-.009	1	-6.015e-4	3	459.484	1	8738.06	2
287		11	max	0	3	-.008	15	.008	3	2.333e-3	2	9219.161	15	NC	1
288			min	-.001	1	-.204	1	-.01	1	-3.044e-4	3	380.275	1	8006.536	2
289		12	max	.001	3	-.01	15	.008	3	1.813e-3	2	7794.573	15	NC	3
290			min	-.001	1	-.241	1	-.011	1	-7.328e-6	3	321.361	1	7595.045	2
291		13	max	.001	3	-.012	15	.007	3	1.293e-3	2	6704.112	15	NC	3
292			min	-.001	1	-.281	1	-.012	1	7.682e-6	15	276.297	1	7473.518	2
293		14	max	.001	3	-.013	15	.005	3	7.733e-4	2	5850.776	15	NC	3
294			min	-.002	1	-.322	1	-.012	1	-6.23e-5	9	241.052	1	7665.044	2
295		15	max	.001	3	-.015	15	.002	3	8.839e-4	3	5170.224	15	NC	1
296			min	-.002	1	-.364	1	-.012	1	-2.348e-4	9	212.956	1	8283.472	2
297		16	max	.001	3	-.017	15	0	15	1.181e-3	3	4618.791	15	NC	1
298			min	-.002	1	-.408	1	-.011	1	-6.223e-4	1	190.201	1	9644.192	2
299		17	max	.002	3	-.019	15	0	15	1.478e-3	3	4165.931	15	NC	1
300			min	-.002	1	-.452	1	-.01	1	-1.09e-3	1	171.52	1	NC	1
301		18	max	.002	3	-.02	15	0	10	1.775e-3	3	3789.66	15	NC	1
302			min	-.002	1	-.497	1	-.012	3	-1.558e-3	1	156.003	1	6525.035	3
303		19	max	.002	3	-.022	15	.002	10	2.072e-3	3	3473.946	15	NC	1
304			min	-.002	1	-.543	1	-.019	3	-2.026e-3	1	142.988	1	4100.895	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	-.003	1	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	4	NC	1
310			min	0	2	-.015	1	0	1	0	1	5085.38	1	NC	1
311		4	max	0	3	-.001	15	0	1	0	1	NC	5	NC	1
312			min	-.001	2	-.035	1	0	1	0	1	2203.317	1	NC	1
313		5	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
314			min	-.001	2	-.063	1	0	1	0	1	1240.321	1	NC	1
315		6	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
316			min	-.002	2	-.097	1	0	1	0	1	801.453	1	NC	1
317		7	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
318			min	-.002	2	-.138	1	0	1	0	1	564.332	1	NC	1
319		8	max	.002	3	-.007	15	0	1	0	1	NC	15	NC	1
320			min	-.002	2	-.184	1	0	1	0	1	421.517	1	NC	1
321		9	max	.002	3	-.009	15	0	1	0	1	8770.598	15	NC	1
322			min	-.003	2	-.236	1	0	1	0	1	328.616	1	NC	1
323		10	max	.003	3	-.011	15	0	1	0	1	7075.704	15	NC	1
324			min	-.003	1	-.293	1	0	1	0	1	264.765	1	NC	1
325		11	max	.003	3	-.013	15	0	1	0	1	5855.694	15	NC	1
326			min	-.003	1	-.355	1	0	1	0	1	218.889	1	NC	1
327		12	max	.003	3	-.016	15	0	1	0	1	4948.338	15	NC	1
328			min	-.003	1	-.42	1	0	1	0	1	184.82	1	NC	1
329		13	max	.003	3	-.018	15	0	1	0	1	4254.309	15	NC	1
330			min	-.004	1	-.489	1	0	1	0	1	158.792	1	NC	1
331		14	max	.004	3	-.021	15	0	1	0	1	3711.533	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	-.004	1	-.56	1	0	1	0	1	138.457	1	NC	1
333		15	max	.004	3	-.024	15	0	1	0	1	3278.882	15	NC	1
334			min	-.004	1	-.635	1	0	1	0	1	122.261	1	NC	1
335		16	max	.004	3	-.026	15	0	1	0	1	2928.472	15	NC	1
336			min	-.005	1	-.711	1	0	1	0	1	109.153	1	NC	1
337		17	max	.005	3	-.029	15	0	1	0	1	2640.81	15	NC	1
338			min	-.005	1	-.789	1	0	1	0	1	98.399	1	NC	1
339		18	max	.005	3	-.032	15	0	1	0	1	2401.878	15	NC	1
340			min	-.005	1	-.867	1	0	1	0	1	89.471	1	NC	1
341		19	max	.005	3	-.035	15	0	1	0	1	2201.46	15	NC	1
342			min	-.006	1	-.947	1	0	1	0	1	81.987	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	1	1.929e-3	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-4.598e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	2.681e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-6.49e-3	2	8409.378	1	NC	1
349		4	max	0	3	0	15	.002	1	2.384e-3	3	NC	4	NC	1
350			min	0	1	-.021	1	-.002	3	-5.971e-3	2	3729.178	1	NC	1
351		5	max	0	3	-.002	15	.003	1	2.087e-3	3	NC	5	NC	1
352			min	0	1	-.037	1	-.003	3	-5.451e-3	2	2120.677	1	NC	1
353		6	max	0	3	-.002	15	.004	1	1.79e-3	3	NC	5	NC	1
354			min	0	1	-.056	1	-.004	3	-4.931e-3	2	1378.082	1	NC	1
355		7	max	0	3	-.003	15	.005	1	1.493e-3	3	NC	5	NC	1
356			min	0	1	-.08	1	-.005	3	-4.411e-3	2	973.851	1	NC	1
357		8	max	0	3	-.004	15	.007	1	1.196e-3	3	NC	5	NC	1
358			min	0	1	-.106	1	-.006	3	-3.892e-3	2	729.203	1	NC	1
359		9	max	0	3	-.006	15	.008	1	8.985e-4	3	NC	15	NC	1
360			min	0	1	-.136	1	-.007	3	-3.372e-3	2	569.516	1	9886.872	2
361		10	max	0	3	-.007	15	.009	1	6.015e-4	3	NC	15	NC	1
362			min	-.001	1	-.169	1	-.008	3	-2.852e-3	2	459.484	1	8738.06	2
363		11	max	0	3	-.008	15	.01	1	3.044e-4	3	9219.161	15	NC	1
364			min	-.001	1	-.204	1	-.008	3	-2.333e-3	2	380.275	1	8006.536	2
365		12	max	.001	3	-.01	15	.011	1	7.328e-6	3	7794.573	15	NC	3
366			min	-.001	1	-.241	1	-.008	3	-1.813e-3	2	321.361	1	7595.045	2
367		13	max	.001	3	-.012	15	.012	1	-7.682e-6	15	6704.112	15	NC	3
368			min	-.001	1	-.281	1	-.007	3	-1.293e-3	2	276.297	1	7473.518	2
369		14	max	.001	3	-.013	15	.012	1	6.23e-5	9	5850.776	15	NC	3
370			min	-.002	1	-.322	1	-.005	3	-7.733e-4	2	241.052	1	7665.044	2
371		15	max	.001	3	-.015	15	.012	1	2.348e-4	9	5170.224	15	NC	1
372			min	-.002	1	-.364	1	-.002	3	-8.839e-4	3	212.956	1	8283.472	2
373		16	max	.001	3	-.017	15	.011	1	6.223e-4	1	4618.791	15	NC	1
374			min	-.002	1	-.408	1	0	15	-1.181e-3	3	190.201	1	9644.192	2
375		17	max	.002	3	-.019	15	.01	1	1.09e-3	1	4165.931	15	NC	1
376			min	-.002	1	-.452	1	0	15	-1.478e-3	3	171.52	1	NC	1
377		18	max	.002	3	-.02	15	.012	3	1.558e-3	1	3789.66	15	NC	1
378			min	-.002	1	-.497	1	0	10	-1.775e-3	3	156.003	1	6525.035	3
379		19	max	.002	3	-.022	15	.019	3	2.026e-3	1	3473.946	15	NC	1
380			min	-.002	1	-.543	1	-.002	10	-2.072e-3	3	142.988	1	4100.895	3
381	M3	1	max	.004	1	0	15	0	3	2.563e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	1	-9.889e-4	3	NC	1	NC	1
383		2	max	.004	1	-.002	15	.012	3	2.977e-3	2	NC	1	NC	4
384			min	0	15	-.037	1	-.027	2	-1.181e-3	3	NC	1	2781.305	2
385		3	max	.003	1	-.004	15	.023	3	3.391e-3	2	NC	1	NC	4
386			min	0	15	-.071	1	-.054	2	-1.373e-3	3	NC	1	1401.438	2
387		4	max	.003	3	-.005	15	.034	3	3.805e-3	2	NC	1	NC	5
388			min	0	15	-.106	1	-.079	2	-1.565e-3	3	NC	1	947.747	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	-.007	15	.044	3	4.22e-3	2	NC	1	NC	5
390			min	0	10	-.14	1	-.103	2	-1.757e-3	3	NC	1	726.009	2
391		6	max	.004	3	-.009	15	.054	3	4.634e-3	2	NC	1	NC	5
392			min	0	10	-.174	1	-.125	2	-1.949e-3	3	NC	1	597.571	2
393		7	max	.004	3	-.01	15	.062	3	5.048e-3	2	NC	1	NC	5
394			min	-.001	2	-.208	1	-.144	2	-2.142e-3	3	8990.605	4	516.428	2
395		8	max	.005	3	-.012	15	.069	3	5.462e-3	2	NC	1	NC	5
396			min	-.002	2	-.242	1	-.161	2	-2.334e-3	3	8301.976	4	463.11	2
397		9	max	.005	3	-.013	15	.074	3	5.876e-3	2	NC	1	NC	5
398			min	-.003	2	-.275	1	-.173	2	-2.526e-3	3	7931.316	4	428.2	2
399		10	max	.005	3	-.015	15	.078	3	6.29e-3	2	NC	1	NC	5
400			min	-.004	2	-.309	1	-.182	2	-2.718e-3	3	7814.056	4	406.9	2
401		11	max	.005	3	-.016	15	.08	3	6.704e-3	2	NC	1	NC	5
402			min	-.004	2	-.342	1	-.186	2	-2.91e-3	3	7931.316	4	396.955	2
403		12	max	.006	3	-.017	15	.08	3	7.119e-3	2	NC	1	NC	5
404			min	-.005	2	-.375	1	-.184	2	-3.102e-3	3	8301.976	4	397.903	2
405		13	max	.006	3	-.018	15	.077	3	7.533e-3	2	NC	1	NC	5
406			min	-.006	2	-.407	1	-.177	2	-3.294e-3	3	8990.605	4	411.065	2
407		14	max	.006	3	-.02	15	.072	3	7.947e-3	2	NC	1	NC	5
408			min	-.006	2	-.44	1	-.164	2	-3.486e-3	3	NC	1	440.36	2
409		15	max	.007	3	-.021	15	.064	3	8.361e-3	2	NC	1	NC	5
410			min	-.007	2	-.472	1	-.144	2	-3.678e-3	3	NC	1	494.858	2
411		16	max	.007	3	-.022	15	.053	3	8.775e-3	2	NC	1	NC	5
412			min	-.008	2	-.504	1	-.116	2	-3.871e-3	3	NC	1	596.822	2
413		17	max	.007	3	-.023	15	.039	3	9.189e-3	2	NC	1	NC	5
414			min	-.009	2	-.536	1	-.081	2	-4.063e-3	3	NC	1	814.159	2
415		18	max	.008	3	-.024	15	.021	3	9.604e-3	2	NC	1	NC	4
416			min	-.009	2	-.568	1	-.037	2	-4.255e-3	3	NC	1	1487.995	2
417		19	max	.008	3	-.025	15	.022	1	1.002e-2	2	NC	1	NC	1
418			min	-.01	2	-.6	1	0	3	-4.447e-3	3	NC	1	NC	1
419	M6	1	max	.007	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.004	1	0	1	0	1	NC	1	NC	1
421		2	max	.006	3	-.003	15	0	1	0	1	NC	1	NC	1
422			min	0	15	-.064	1	0	1	0	1	NC	1	NC	1
423		3	max	.007	3	-.005	15	0	1	0	1	NC	1	NC	1
424			min	0	10	-.124	1	0	1	0	1	NC	1	NC	1
425		4	max	.008	3	-.008	15	0	1	0	1	NC	1	NC	1
426			min	-.001	2	-.184	1	0	1	0	1	NC	1	NC	1
427		5	max	.009	3	-.01	15	0	1	0	1	NC	1	NC	1
428			min	-.003	2	-.244	1	0	1	0	1	NC	1	NC	1
429		6	max	.01	3	-.013	15	0	1	0	1	NC	1	NC	1
430			min	-.006	2	-.303	1	0	1	0	1	NC	1	NC	1
431		7	max	.011	3	-.015	15	0	1	0	1	NC	1	NC	1
432			min	-.008	2	-.363	1	0	1	0	1	8990.605	4	NC	1
433		8	max	.012	3	-.017	15	0	1	0	1	NC	1	NC	1
434			min	-.01	2	-.422	1	0	1	0	1	8301.976	4	NC	1
435		9	max	.013	3	-.02	15	0	1	0	1	NC	1	NC	1
436			min	-.012	2	-.481	1	0	1	0	1	7931.316	4	NC	1
437		10	max	.014	3	-.022	15	0	1	0	1	NC	1	NC	1
438			min	-.014	2	-.54	1	0	1	0	1	7814.056	4	NC	1
439		11	max	.015	3	-.024	15	0	1	0	1	NC	1	NC	1
440			min	-.016	2	-.599	1	0	1	0	1	7931.316	4	NC	1
441		12	max	.016	3	-.026	15	0	1	0	1	NC	1	NC	1
442			min	-.018	2	-.657	1	0	1	0	1	8301.976	4	NC	1
443		13	max	.017	3	-.028	15	0	1	0	1	NC	1	NC	1
444			min	-.02	2	-.715	1	0	1	0	1	8990.605	4	NC	1
445		14	max	.018	3	-.03	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	-.022	2	-.773	1	0	1	0	1	NC	1	NC	1
447		15	max	.019	3	-.032	15	0	1	0	1	NC	1	NC	1
448			min	-.024	2	-.831	1	0	1	0	1	NC	1	NC	1
449		16	max	.02	3	-.034	15	0	1	0	1	NC	1	NC	1
450			min	-.026	2	-.889	1	0	1	0	1	NC	1	NC	1
451		17	max	.021	3	-.036	15	0	1	0	1	NC	1	NC	1
452			min	-.028	2	-.946	1	0	1	0	1	NC	1	NC	1
453		18	max	.022	3	-.037	15	0	1	0	1	NC	1	NC	1
454			min	-.03	2	-1.004	1	0	1	0	1	NC	1	NC	1
455		19	max	.023	3	-.039	15	0	1	0	1	NC	1	NC	1
456			min	-.033	2	-1.061	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.004	1	0	15	0	1	9.889e-4	3	NC	1	NC	1
458			min	0	15	-.002	1	0	3	-2.563e-3	2	NC	1	NC	1
459		2	max	.004	1	-.002	15	.027	2	1.181e-3	3	NC	1	NC	4
460			min	0	15	-.037	1	-.012	3	-2.977e-3	2	NC	1	2781.305	2
461		3	max	.003	1	-.004	15	.054	2	1.373e-3	3	NC	1	NC	4
462			min	0	15	-.071	1	-.023	3	-3.391e-3	2	NC	1	1401.438	2
463		4	max	.003	3	-.005	15	.079	2	1.565e-3	3	NC	1	NC	5
464			min	0	15	-.106	1	-.034	3	-3.805e-3	2	NC	1	947.747	2
465		5	max	.004	3	-.007	15	.103	2	1.757e-3	3	NC	1	NC	5
466			min	0	10	-.14	1	-.044	3	-4.22e-3	2	NC	1	726.009	2
467		6	max	.004	3	-.009	15	.125	2	1.949e-3	3	NC	1	NC	5
468			min	0	10	-.174	1	-.054	3	-4.634e-3	2	NC	1	597.571	2
469		7	max	.004	3	-.01	15	.144	2	2.142e-3	3	NC	1	NC	5
470			min	-.001	2	-.208	1	-.062	3	-5.048e-3	2	8990.605	4	516.428	2
471		8	max	.005	3	-.012	15	.161	2	2.334e-3	3	NC	1	NC	5
472			min	-.002	2	-.242	1	-.069	3	-5.462e-3	2	8301.976	4	463.11	2
473		9	max	.005	3	-.013	15	.173	2	2.526e-3	3	NC	1	NC	5
474			min	-.003	2	-.275	1	-.074	3	-5.876e-3	2	7931.316	4	428.2	2
475		10	max	.005	3	-.015	15	.182	2	2.718e-3	3	NC	1	NC	5
476			min	-.004	2	-.309	1	-.078	3	-6.29e-3	2	7814.056	4	406.9	2
477		11	max	.005	3	-.016	15	.186	2	2.91e-3	3	NC	1	NC	5
478			min	-.004	2	-.342	1	-.08	3	-6.704e-3	2	7931.316	4	396.955	2
479		12	max	.006	3	-.017	15	.184	2	3.102e-3	3	NC	1	NC	5
480			min	-.005	2	-.375	1	-.08	3	-7.119e-3	2	8301.976	4	397.903	2
481		13	max	.006	3	-.018	15	.177	2	3.294e-3	3	NC	1	NC	5
482			min	-.006	2	-.407	1	-.077	3	-7.533e-3	2	8990.605	4	411.065	2
483		14	max	.006	3	-.02	15	.164	2	3.486e-3	3	NC	1	NC	5
484			min	-.006	2	-.44	1	-.072	3	-7.947e-3	2	NC	1	440.36	2
485		15	max	.007	3	-.021	15	.144	2	3.678e-3	3	NC	1	NC	5
486			min	-.007	2	-.472	1	-.064	3	-8.361e-3	2	NC	1	494.858	2
487		16	max	.007	3	-.022	15	.116	2	3.871e-3	3	NC	1	NC	5
488			min	-.008	2	-.504	1	-.053	3	-8.775e-3	2	NC	1	596.822	2
489		17	max	.007	3	-.023	15	.081	2	4.063e-3	3	NC	1	NC	5
490			min	-.009	2	-.536	1	-.039	3	-9.189e-3	2	NC	1	814.159	2
491		18	max	.008	3	-.024	15	.037	2	4.255e-3	3	NC	1	NC	4
492			min	-.009	2	-.568	1	-.021	3	-9.604e-3	2	NC	1	1487.995	2
493		19	max	.008	3	-.025	15	0	3	4.447e-3	3	NC	1	NC	1
494			min	-.01	2	-.6	1	-.022	1	-1.002e-2	2	NC	1	NC	1