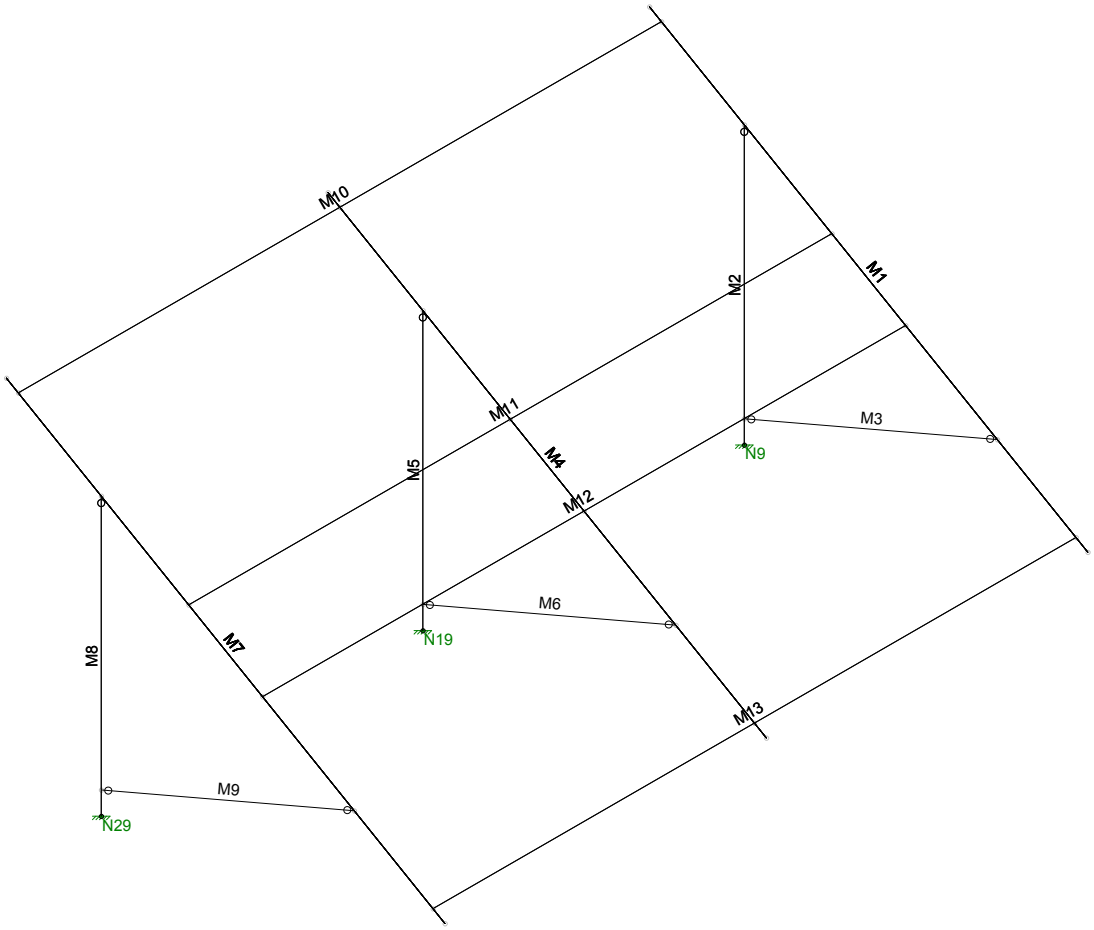


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

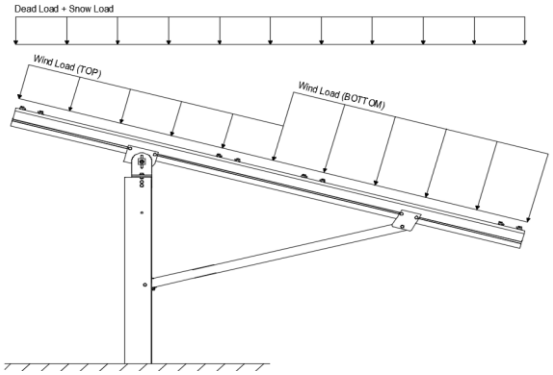
1.2 Construction

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 =	140 mph	Exposure Category = C	
Height <	15 ft	Importance Category = II	
Peak Velocity Pressure, q_z =	30.77 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

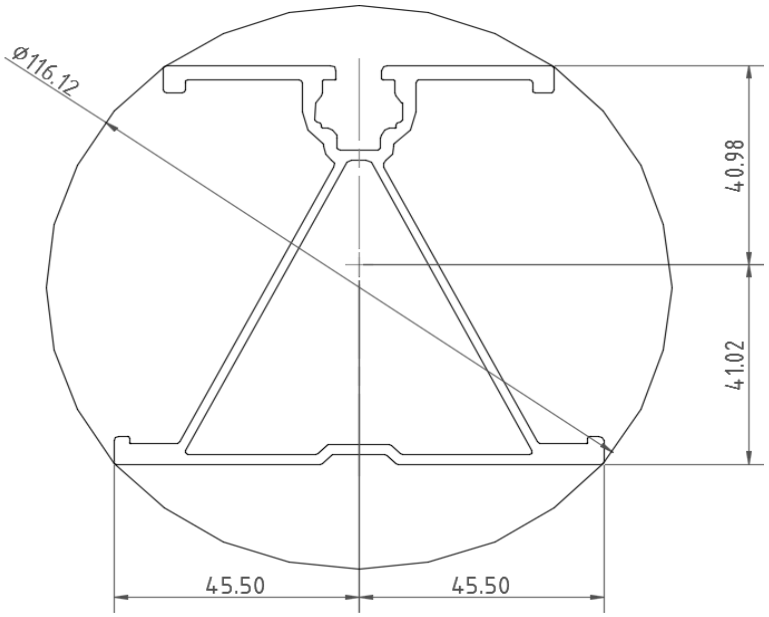
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	90	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 =	1.431	k-ft
M_z =	0.081	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	59%	

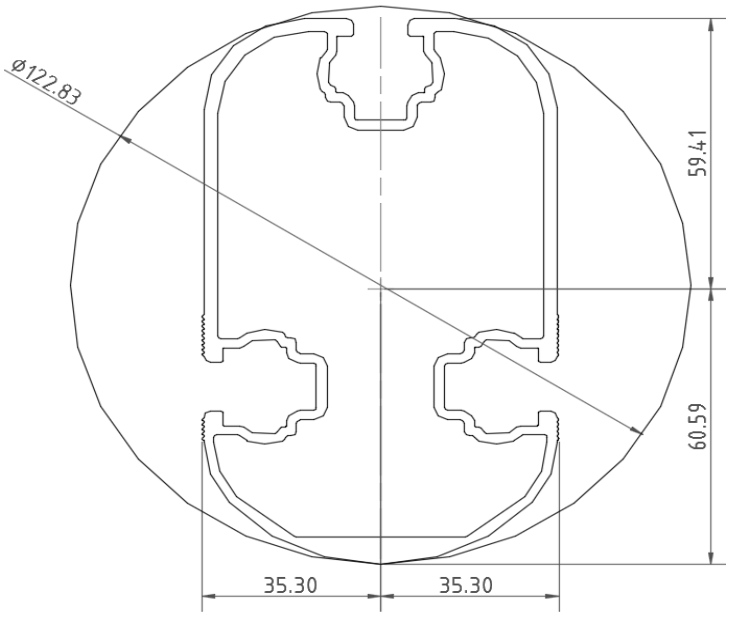


DETAIL VIEW

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 =	4.112	k-ft
M_z =	0.000	k-ft
P_n =	1.491	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	85%	

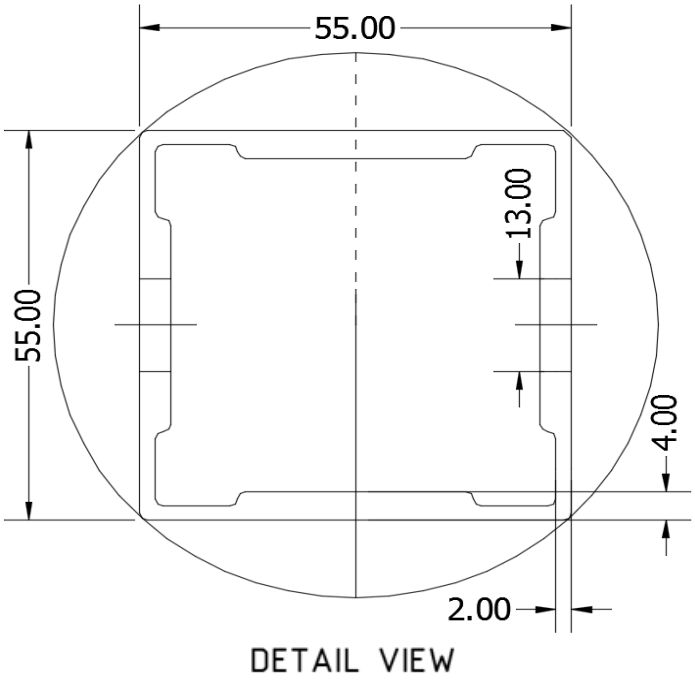


DETAIL VIEW

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).

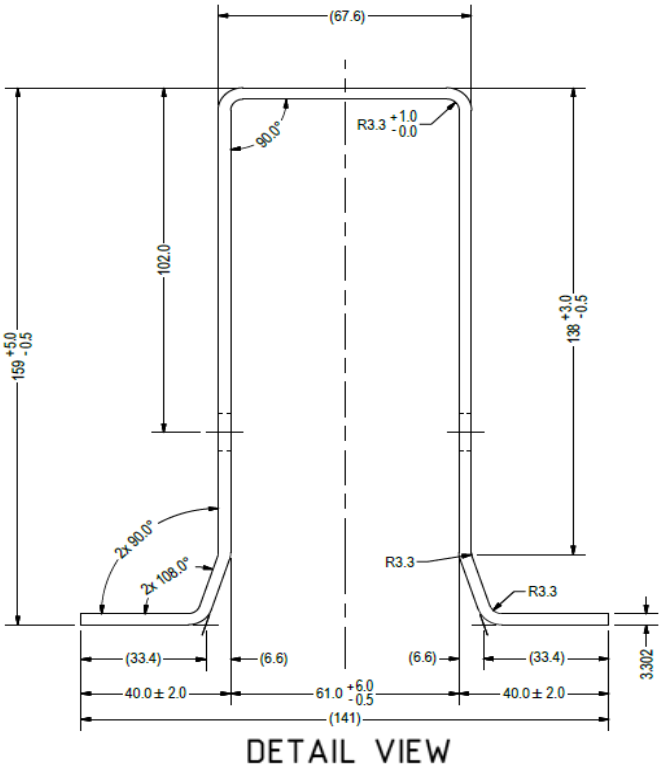
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.713	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	50%	



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 =	12.043	k-ft
M_z =	0.000	k-ft
P_r =	-5.095	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	78%	



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 =	6.59	k
Maximum Lateral Load =	3.96	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)

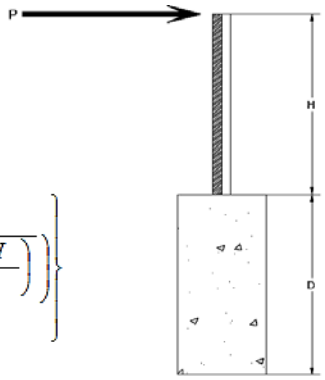
Lateral Force @ Top of Pole, P =	0.79	k
Height of Pole Above Grade, H =	6.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.79	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 =	4.27		
Required Footing Depth, D =	8.02	ft	
2nd Trial @ D_2 =	5.64	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.38	ksf	
Lateral Soil Bearing @ D, S_3 =	1.13	ksf	
Constant 2.34P/(S_1B), A =	2.46		
Required Footing Depth, D =	5.58	ft	
3rd Trial @ D_3 =	5.61	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf	
Lateral Soil Bearing @ D, S_3 =	1.12	ksf	
Constant 2.34P/(S_1B), A =	2.48		
Required Footing Depth, D =	5.60	ft	
4th Trial @ D_4 =	5.60	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf	
Lateral Soil Bearing @ D, S_3 =	1.12	ksf	
Constant 2.34P/(S_1B), A =	2.48		
Required Footing Depth, D =	5.60	ft	
5th Trial @ D_5 =	5.60	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf	
Lateral Soil Bearing @ D, S_3 =	1.12	ksf	
Constant 2.34P/(S_1B), A =	2.48		
Required Footing Depth, D =	5.75	ft	

A 2ft diameter x 5.75ft deep footing unrestrained at ground level is required for the racking structure.

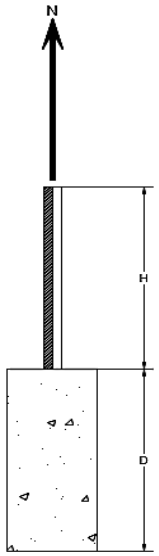
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.02	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 =	1.98	k
Required Concrete Volume, V =	13.69	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.53
2	0.4	0.2	118.10	6.43
3	0.6	0.2	118.10	6.33
4	0.8	0.2	118.10	6.22
5	1	0.2	118.10	6.12
6	1.2	0.2	118.10	6.02
7	1.4	0.2	118.10	5.91
8	1.6	0.2	118.10	5.81
9	1.8	0.2	118.10	5.71
10	2	0.2	118.10	5.60
11	2.2	0.2	118.10	5.50
12	2.4	0.2	118.10	5.39
13	2.6	0.2	118.10	5.29
14	2.8	0.2	118.10	5.19
15	3	0.2	118.10	5.08
16	3.2	0.2	118.10	4.98
17	3.4	0.2	118.10	4.88
18	3.6	0.2	118.10	4.77
19	3.8	0.2	118.10	4.67
20	4	0.2	118.10	4.56
21	4.2	0.2	118.10	4.46
22	4.4	0.2	118.10	4.36
23	0	0.0	0.00	4.36
24	0	0.0	0.00	4.36
25	0	0.0	0.00	4.36
26	0	0.0	0.00	4.36
27	0	0.0	0.00	4.36
28	0	0.0	0.00	4.36
29	0	0.0	0.00	4.36
30	0	0.0	0.00	4.36
31	0	0.0	0.00	4.36
32	0	0.0	0.00	4.36
33	0	0.0	0.00	4.36
34	0	0.0	0.00	4.36
Max	4.4	Sum	1.04	

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



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	5.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.71	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	17.28	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

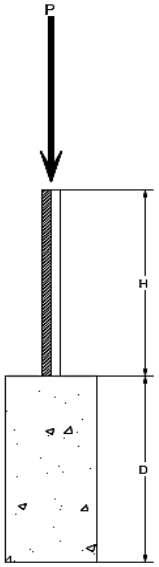
Weight of Concrete

Footing Volume	18.06	ft^3
Weight	2.62	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.59	k
1/3 Increase for Wind =	1.33	
Total Resistance =	9.74	k
Applied Force =	6.33	k
Utilization =	65%	

A 2ft diameter footing passes at a depth of 5.75ft.



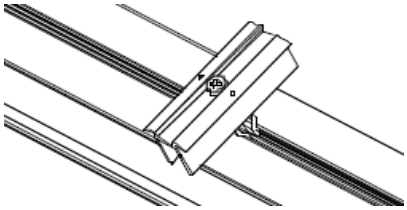
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

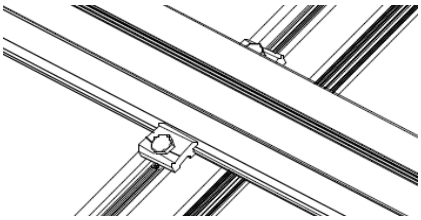
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.782 k
Allowable Uplift	=	1.214 k
Utilization	=	64%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.093 k
Allowable Uplift	=	2.180 k
Utilization	=	96%

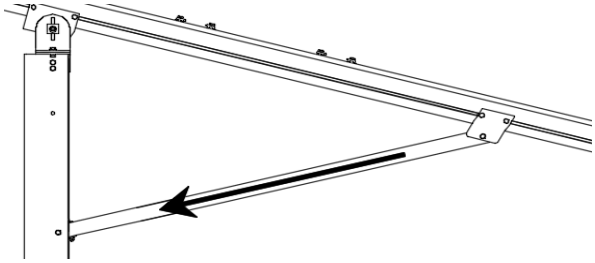


6.2 Strut Connections

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	=	4.713 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	53%

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

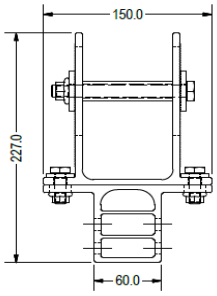


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

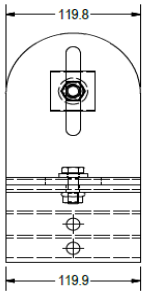
6.3 Girder to Post Connection

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.

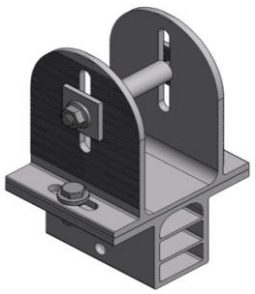
Maximum Tensile Load	=	4.301 k
Allowable Load	=	5.649 k
Utilization	=	76%



FRONT VIEW



SIDE VIEW



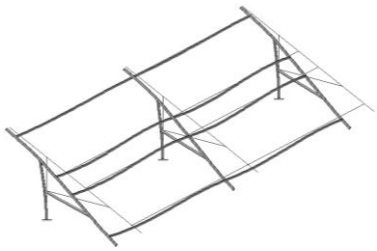
7. SEISMIC DESIGN

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 =	90 in	L_b =	90
J =	0.432	J =	0.432
	248.982		158.338
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	
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=	28.2 ksi	φF_L=	29.3
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

$\varphi F_L St$ = 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

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

$\varphi F_L Wk$ = 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:	Weak Axis:
3.4.14	**3.4.14**
L_b = 74.8031 in	L_b = 74.8031
J = 0.942	J = 0.942
116.737	116.737
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$
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= 29.9 ksi	φF_L= 29.9
3.4.16	**3.4.16**
b/t = 24.5	b/t = 24.5
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$
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= 28.2 ksi	φF_L= 28.2 ksi
3.4.16.1 Not Used	**3.4.16.1**
Rb/t = 0.0	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 = 24.5	h/t = 24.5
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$
S1 = 36.9	S1 = 36.9
m = 0.65	m = 0.65
C_0 = 27.5	C_0 = 27.5
Cc = 27.5	Cc = 27.5
$S2 = \frac{k_1 Bbr}{mDbr}$	$S2 = \frac{k_1 Bbr}{mDbr}$
S2 = 77.3	S2 = 77.3
φF_L= 1.3φyFcy	φF_L= 1.3φyFcy
φF_L= 43.2 ksi	φF_L= 43.2 ksi
φF_LSt= 28.2 ksi	φF_LWk= 28.2 ksi
Ix = 279836 mm^4	Iy = 279836 mm^4
0.672 in^4	0.672 in^4
y = 27.5 mm	x = 27.5 mm
Sx = 0.621 in^3	Sy = 0.621 in^3
M_{max}St = 1.460 k-ft	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 =	-5.09	k	(LRFD Factored Load)
Mr (Strong) =	12.04	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 =	0.1513	<	0.2	
Utilization =	0.78	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.151	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 78%

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	-116.109	-116.109	0	0
2	M11	y	-116.109	-116.109	0	0
3	M12	y	-186.784	-186.784	0	0
4	M13	y	-186.784	-186.784	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	232.218	232.218	0	0
2	M11	y	232.218	232.218	0	0
3	M12	y	111.061	111.061	0	0
4	M13	y	111.061	111.061	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	755.236	2	2226.306	2	110.785	2	.167	1	.004	3	5.861	1
2		min	-1106.281	3	-1628.946	3	-136.441	3	-.213	3	-.01	2	.245	15
3	N19	max	3032.923	2	5943.782	2	0	3	0	2	0	15	8.498	1
4		min	-2936.622	3	-5056.975	3	0	2	0	3	0	1	.338	15
5	N29	max	755.236	2	2226.306	2	136.441	3	.213	3	.01	2	5.861	1
6		min	-1106.281	3	-1628.946	3	-110.785	2	-.167	1	-.004	3	.245	15
7	Totals:	max	4543.395	2	10396.394	2	0	10						
8		min	-5149.185	3	-8314.867	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	-8.611	15	308.305	3	-4.228	15	.037	3	.242	1	.259	2
4			min	-192.745	1	-701.559	2	-111.173	1	-.178	2	.01	15	-.111	3
5		3	max	-8.887	15	307.116	3	-4.228	15	.037	3	.169	1	.72	2
6			min	-193.66	1	-703.144	2	-111.173	1	-.178	2	.007	15	-.313	3
7		4	max	-9.163	15	305.928	3	-4.228	15	.037	3	.096	1	1.182	2
8			min	-194.575	1	-704.728	2	-111.173	1	-.178	2	.004	15	-.514	3
9		5	max	399.4	3	645.963	2	-2.908	12	.008	2	.113	1	1.397	2
10			min	-1125.311	2	-268.72	3	-139.185	1	-.038	3	-.022	3	-.609	3
11		6	max	398.714	3	644.379	2	-2.908	12	.008	2	.035	2	.973	2
12			min	-1126.226	2	-269.908	3	-139.185	1	-.038	3	-.025	3	-.433	3
13		7	max	398.028	3	642.794	2	-2.908	12	.008	2	-.003	15	.551	2
14			min	-1127.14	2	-271.097	3	-139.185	1	-.038	3	-.07	1	-.255	3
15		8	max	397.342	3	641.21	2	-2.908	12	.008	2	-.006	15	.13	2
16			min	-1128.055	2	-272.285	3	-139.185	1	-.038	3	-.161	1	-.077	3
17		9	max	370.369	3	13.692	3	4.1	3	-.001	15	.091	1	.009	3
18			min	-1237.484	2	-11.081	2	-182.766	1	-.118	2	.004	15	-.067	2
19		10	max	369.683	3	12.504	3	4.1	3	-.001	15	.04	3	0	3
20			min	-1238.398	2	-12.666	2	-182.766	1	-.118	2	-.033	2	-.06	2
21		11	max	368.997	3	11.316	3	4.1	3	-.001	15	.043	3	-.003	15
22			min	-1239.313	2	-14.25	2	-182.766	1	-.118	2	-.149	1	-.051	2
23		12	max	336.635	3	704.124	3	20.498	2	.182	3	.12	1	.103	2
24			min	-1422.227	1	-440.82	2	-163.782	3	-.154	2	.005	15	-.236	3
25		13	max	335.949	3	702.936	3	20.498	2	.182	3	.103	1	.392	2
26			min	-1423.142	1	-442.405	2	-163.782	3	-.154	2	-.023	3	-.698	3
27		14	max	335.263	3	701.748	3	20.498	2	.182	3	.09	2	.683	2
28			min	-1424.057	1	-443.989	2	-163.782	3	-.154	2	-.13	3	-1.159	3
29		15	max	334.577	3	700.559	3	20.498	2	.182	3	.103	2	.975	2
30			min	-1424.972	1	-445.574	2	-163.782	3	-.154	2	-.238	3	-1.619	3
31		16	max	194.924	1	447.135	2	-3.914	15	.131	2	.017	3	.743	2
32			min	9.189	15	-734.953	3	-95.445	1	-.322	3	-.128	1	-1.236	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	194.009	1	445.551	2	-3.914	15	.131	2	-.007	12	.45	2
34			min	8.913	15	-736.141	3	-95.445	1	-.322	3	-.191	1	-.753	3
35		18	max	193.094	1	443.967	2	-3.914	15	.131	2	-.01	15	.158	2
36			min	8.637	15	-737.33	3	-95.445	1	-.322	3	-.253	1	-.27	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	.007	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	1.679	3	964.327	3	0	1	0	1	0	1	.58	2
42			min	-281.77	1	-1879.55	2	0	1	0	1	0	1	-.306	3
43		3	max	.993	3	963.139	3	0	1	0	1	0	1	1.814	2
44			min	-282.685	1	-1881.134	2	0	1	0	1	0	1	-.939	3
45		4	max	.307	3	961.951	3	0	1	0	1	0	1	3.049	2
46			min	-283.599	1	-1882.719	2	0	1	0	1	0	1	-1.57	3
47		5	max	1475.942	3	1885.955	2	0	1	0	1	0	1	3.592	2
48			min	-2945.685	2	-1006.88	3	0	1	0	1	0	1	-1.84	3
49		6	max	1475.256	3	1884.37	2	0	1	0	1	0	1	2.355	2
50			min	-2946.599	2	-1008.069	3	0	1	0	1	0	1	-1.179	3
51		7	max	1474.57	3	1882.786	2	0	1	0	1	0	1	1.119	2
52			min	-2947.514	2	-1009.257	3	0	1	0	1	0	1	-.517	3
53		8	max	1473.884	3	1881.202	2	0	1	0	1	0	1	.146	3
54			min	-2948.429	2	-1010.445	3	0	1	0	1	0	1	-.119	1
55		9	max	1478.802	3	-1.562	12	0	1	0	1	0	1	.461	3
56			min	-3010.188	2	-105.939	2	0	1	0	1	0	1	-.686	2
57		10	max	1478.116	3	-2.13	15	0	1	0	1	0	1	.463	3
58			min	-3011.102	2	-107.523	2	0	1	0	1	0	1	-.616	2
59		11	max	1477.43	3	-2.608	15	0	1	0	1	0	1	.465	3
60			min	-3012.017	2	-109.108	2	0	1	0	1	0	1	-.544	2
61		12	max	1493.126	3	2004.243	3	0	1	0	1	0	1	.019	9
62			min	-3083.507	2	-1485.201	2	0	1	0	1	0	1	-.17	3
63		13	max	1492.44	3	2003.055	3	0	1	0	1	0	1	.924	2
64			min	-3084.422	2	-1486.785	2	0	1	0	1	0	1	-1.485	3
65		14	max	1491.754	3	2001.867	3	0	1	0	1	0	1	1.9	2
66			min	-3085.337	2	-1488.37	2	0	1	0	1	0	1	-2.799	3
67		15	max	1491.068	3	2000.679	3	0	1	0	1	0	1	2.877	2
68			min	-3086.251	2	-1489.954	2	0	1	0	1	0	1	-4.112	3
69		16	max	282.902	1	1343.282	2	0	1	0	1	0	1	2.19	2
70			min	3.108	3	-1921.986	3	0	1	0	1	0	1	-3.121	3
71		17	max	281.987	1	1341.697	2	0	1	0	1	0	1	1.309	2
72			min	2.422	3	-1923.175	3	0	1	0	1	0	1	-1.86	3
73		18	max	281.072	1	1340.113	2	0	1	0	1	0	1	.429	2
74			min	1.736	3	-1924.363	3	0	1	0	1	0	1	-.598	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	.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	-8.611	15	308.305	3	111.173	1	.178	2	-.01	15	.259	2
80			min	-192.745	1	-701.559	2	4.228	15	-.037	3	-.242	1	-.111	3
81		3	max	-8.887	15	307.116	3	111.173	1	.178	2	-.007	15	.72	2
82			min	-193.66	1	-703.144	2	4.228	15	-.037	3	-.169	1	-.313	3
83		4	max	-9.163	15	305.928	3	111.173	1	.178	2	-.004	15	1.182	2
84			min	-194.575	1	-704.728	2	4.228	15	-.037	3	-.096	1	-.514	3
85		5	max	399.4	3	645.963	2	139.185	1	.038	3	.022	3	1.397	2
86			min	-1125.311	2	-268.72	3	2.908	12	-.008	2	-.113	1	-.609	3
87		6	max	398.714	3	644.379	2	139.185	1	.038	3	.025	3	.973	2
88			min	-1126.226	2	-269.908	3	2.908	12	-.008	2	-.035	2	-.433	3
89		7	max	398.028	3	642.794	2	139.185	1	.038	3	.07	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	-1127.14	2	-271.097	3	2.908	12	-.008	2	.003	15	-.255	3
91		8	max	397.342	3	641.21	2	139.185	1	.038	3	.161	1	.13	2
92			min	-1128.055	2	-272.285	3	2.908	12	-.008	2	.006	15	-.077	3
93		9	max	370.369	3	13.692	3	182.766	1	.118	2	-.004	15	.009	3
94			min	-1237.484	2	-11.081	2	-4.1	3	.001	15	-.091	1	-.067	2
95		10	max	369.683	3	12.504	3	182.766	1	.118	2	.033	2	0	3
96			min	-1238.398	2	-12.666	2	-4.1	3	.001	15	-.04	3	-.06	2
97		11	max	368.997	3	11.316	3	182.766	1	.118	2	.149	1	-.003	15
98			min	-1239.313	2	-14.25	2	-4.1	3	.001	15	-.043	3	-.051	2
99		12	max	336.635	3	704.124	3	163.782	3	.154	2	-.005	15	.103	2
100			min	-1422.227	1	-440.82	2	-20.498	2	-.182	3	-.12	1	-.236	3
101		13	max	335.949	3	702.936	3	163.782	3	.154	2	.023	3	.392	2
102			min	-1423.142	1	-442.405	2	-20.498	2	-.182	3	-.103	1	-.698	3
103		14	max	335.263	3	701.748	3	163.782	3	.154	2	.13	3	.683	2
104			min	-1424.057	1	-443.989	2	-20.498	2	-.182	3	-.09	2	-1.159	3
105		15	max	334.577	3	700.559	3	163.782	3	.154	2	.238	3	.975	2
106			min	-1424.972	1	-445.574	2	-20.498	2	-.182	3	-.103	2	-1.619	3
107		16	max	194.924	1	447.135	2	95.445	1	.322	3	.128	1	.743	2
108			min	9.189	15	-734.953	3	3.914	15	-.131	2	-.017	3	-1.236	3
109		17	max	194.009	1	445.551	2	95.445	1	.322	3	.191	1	.45	2
110			min	8.913	15	-736.141	3	3.914	15	-.131	2	.007	12	-.753	3
111		18	max	193.094	1	443.967	2	95.445	1	.322	3	.253	1	.158	2
112			min	8.637	15	-737.33	3	3.914	15	-.131	2	.01	15	-.27	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	95.486	1	442.371	2	-8.362	15	.01	2	.285	1	.131	2
116			min	3.914	15	-738.396	3	-192.436	1	-.023	3	.011	15	-.322	3
117		2	max	95.486	1	318.875	2	-6.65	15	.01	2	.14	1	.215	3
118			min	3.914	15	-549.401	3	-155.518	1	-.023	3	.005	15	-.186	2
119		3	max	95.486	1	195.38	2	-4.939	15	.01	2	.045	2	.594	3
120			min	3.914	15	-360.406	3	-118.601	1	-.023	3	0	15	-.401	2
121		4	max	95.486	1	71.884	2	-3.227	15	.01	2	.005	10	.815	3
122			min	3.914	15	-171.41	3	-81.683	1	-.023	3	-.057	1	-.512	2
123		5	max	95.486	1	17.585	3	-1.515	15	.01	2	-.005	15	.879	3
124			min	3.914	15	-51.612	2	-44.766	1	-.023	3	-.11	1	-.52	2
125		6	max	95.486	1	206.58	3	2.621	9	.01	2	-.006	15	.786	3
126			min	3.914	15	-175.108	2	-21.376	2	-.023	3	-.132	1	-.426	2
127		7	max	95.486	1	395.576	3	29.069	1	.01	2	-.005	15	.535	3
128			min	3.914	15	-298.603	2	-8.222	10	-.023	3	-.123	1	-.228	2
129		8	max	95.486	1	584.571	3	65.987	1	.01	2	-.003	15	.127	3
130			min	3.914	15	-422.099	2	-4.737	3	-.023	3	-.083	1	.003	15
131		9	max	95.486	1	773.566	3	102.905	1	.01	2	.016	9	.475	2
132			min	3.914	15	-545.595	2	-2.128	3	-.023	3	-.062	2	-.439	3
133		10	max	95.486	1	962.562	3	.879	12	.023	3	.089	9	.981	2
134			min	3.914	15	16.304	15	-139.822	1	0	15	-.036	10	-1.163	3
135		11	max	95.486	1	545.595	2	2.128	3	.023	3	.016	9	.475	2
136			min	3.914	15	-773.566	3	-102.905	1	-.01	2	-.062	2	-.439	3
137		12	max	95.486	1	422.099	2	4.737	3	.023	3	-.003	15	.127	3
138			min	3.914	15	-584.571	3	-65.987	1	-.01	2	-.083	1	.003	15
139		13	max	95.486	1	298.603	2	8.222	10	.023	3	-.005	15	.535	3
140			min	3.914	15	-395.576	3	-29.069	1	-.01	2	-.123	1	-.228	2
141		14	max	95.486	1	175.108	2	21.376	2	.023	3	-.006	15	.786	3
142			min	3.914	15	-206.58	3	-2.621	9	-.01	2	-.132	1	-.426	2
143		15	max	95.486	1	51.612	2	44.766	1	.023	3	-.005	15	.879	3
144			min	3.914	15	-17.585	3	1.515	15	-.01	2	-.11	1	-.52	2
145		16	max	95.486	1	171.41	3	81.683	1	.023	3	.005	10	.815	3
146			min	3.914	15	-71.884	2	3.227	15	-.01	2	-.057	1	-.512	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	95.486	1	360.406	3	118.601	1	.023	3	.045	2	.594	3
148			min	3.914	15	-195.38	2	4.939	15	-.01	2	0	15	-.401	2
149		18	max	95.486	1	549.401	3	155.518	1	.023	3	.14	1	.215	3
150			min	3.914	15	-318.875	2	6.65	15	-.01	2	.005	15	-.186	2
151		19	max	95.486	1	738.396	3	192.436	1	.023	3	.285	1	.131	2
152			min	3.914	15	-442.371	2	8.362	15	-.01	2	.011	15	-.322	3
153	M11	1	max	156.102	1	424.409	2	-8.835	15	0	3	.339	1	.048	1
154			min	-167.742	3	-694.503	3	-203.316	1	-.008	1	.014	15	-.271	3
155		2	max	156.102	1	300.913	2	-7.123	15	0	3	.185	1	.229	3
156			min	-167.742	3	-505.508	3	-166.398	1	-.008	1	.007	15	-.266	2
157		3	max	156.102	1	177.417	2	-5.412	15	0	3	.062	2	.572	3
158			min	-167.742	3	-316.513	3	-129.48	1	-.008	1	.002	15	-.466	2
159		4	max	156.102	1	53.922	2	-3.7	15	0	3	.024	3	.757	3
160			min	-167.742	3	-127.517	3	-92.563	1	-.008	1	-.031	1	-.562	2
161		5	max	156.102	1	61.478	3	-1.989	15	0	3	.005	3	.784	3
162			min	-167.742	3	-69.574	2	-55.645	1	-.008	1	-.092	1	-.555	2
163		6	max	156.102	1	250.473	3	-.277	15	0	3	-.005	15	.654	3
164			min	-167.742	3	-193.07	2	-26.811	2	-.008	1	-.123	1	-.446	2
165		7	max	156.102	1	439.469	3	20.142	9	0	3	-.005	15	.367	3
166			min	-167.742	3	-316.566	2	-15.844	3	-.008	1	-.123	1	-.234	2
167		8	max	156.102	1	628.464	3	55.107	1	0	3	-.003	15	.082	2
168			min	-167.742	3	-440.061	2	-13.234	3	-.008	1	-.093	1	-.078	3
169		9	max	156.102	1	817.459	3	92.025	1	0	3	.004	9	.5	2
170			min	-167.742	3	-563.557	2	-10.625	3	-.008	1	-.072	2	-.681	3
171		10	max	156.102	1	-16.366	15	128.943	1	.008	1	.072	9	1.021	2
172			min	-167.742	3	-1006.454	3	4.029	10	0	15	-.056	3	-1.441	3
173		11	max	156.102	1	563.557	2	10.625	3	.008	1	.004	9	.5	2
174			min	-167.742	3	-817.459	3	-92.025	1	0	3	-.072	2	-.681	3
175		12	max	156.102	1	440.061	2	13.234	3	.008	1	-.003	15	.082	2
176			min	-167.742	3	-628.464	3	-55.107	1	0	3	-.093	1	-.078	3
177		13	max	156.102	1	316.566	2	15.844	3	.008	1	-.005	15	.367	3
178			min	-167.742	3	-439.469	3	-20.142	9	0	3	-.123	1	-.234	2
179		14	max	156.102	1	193.07	2	26.811	2	.008	1	-.005	15	.654	3
180			min	-167.742	3	-250.473	3	.277	15	0	3	-.123	1	-.446	2
181		15	max	156.102	1	69.574	2	55.645	1	.008	1	.005	3	.784	3
182			min	-167.742	3	-61.478	3	1.989	15	0	3	-.092	1	-.555	2
183		16	max	156.102	1	127.517	3	92.563	1	.008	1	.024	3	.757	3
184			min	-167.742	3	-53.922	2	3.7	15	0	3	-.031	1	-.562	2
185		17	max	156.102	1	316.513	3	129.48	1	.008	1	.062	2	.572	3
186			min	-167.742	3	-177.417	2	5.412	15	0	3	.002	15	-.466	2
187		18	max	156.102	1	505.508	3	166.398	1	.008	1	.185	1	.229	3
188			min	-167.742	3	-300.913	2	7.123	15	0	3	.007	15	-.266	2
189		19	max	156.102	1	694.503	3	203.316	1	.008	1	.339	1	.048	1
190			min	-167.742	3	-424.409	2	8.835	15	0	3	.014	15	-.271	3
191	M12	1	max	7.825	3	649.73	2	-8.932	15	0	15	.358	1	.126	2
192			min	-42.943	1	-287.385	3	-207.212	1	-.004	1	.014	15	.002	15
193		2	max	7.825	3	467.339	2	-7.22	15	0	15	.201	1	.254	3
194			min	-42.943	1	-199.354	3	-170.294	1	-.004	1	.007	15	-.339	2
195		3	max	7.825	3	284.947	2	-5.509	15	0	15	.077	2	.383	3
196			min	-42.943	1	-111.323	3	-133.376	1	-.004	1	.002	15	-.652	2
197		4	max	7.825	3	102.556	2	-3.797	15	0	15	.019	2	.439	3
198			min	-42.943	1	-23.292	3	-96.459	1	-.004	1	-.026	9	-.814	2
199		5	max	7.825	3	64.739	3	-2.086	15	0	15	-.002	12	.422	3
200			min	-42.943	1	-79.836	2	-59.541	1	-.004	1	-.086	1	-.823	2
201		6	max	7.825	3	152.77	3	-.374	15	0	15	-.005	15	.331	3
202			min	-42.943	1	-262.227	2	-31.302	2	-.004	1	-.12	1	-.681	2
203		7	max	7.825	3	240.801	3	18.768	9	0	15	-.005	15	.168	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	-42.943	1	-444.619	2	-15.865	2	-.004	1	-.124	1	-.386	2
205		8	max	7.825	3	328.833	3	51.211	1	0	15	-.003	15	.06	2
206			min	-42.943	1	-627.01	2	-8.029	3	-.004	1	-.097	1	-.07	3
207		9	max	7.825	3	416.864	3	88.129	1	0	15	.002	9	.659	2
208			min	-42.943	1	-809.402	2	-5.42	3	-.004	1	-.08	2	-.381	3
209		10	max	7.825	3	-16.129	15	125.047	1	.004	1	.068	9	1.409	2
210			min	-42.943	1	-991.794	2	1.177	12	0	15	-.061	2	-.765	3
211		11	max	7.825	3	809.402	2	5.42	3	.004	1	.002	9	.659	2
212			min	-42.943	1	-416.864	3	-88.129	1	0	15	-.08	2	-.381	3
213		12	max	7.825	3	627.01	2	8.029	3	.004	1	-.003	15	.06	2
214			min	-42.943	1	-328.833	3	-51.211	1	0	15	-.097	1	-.07	3
215		13	max	7.825	3	444.619	2	15.865	2	.004	1	-.005	15	.168	3
216			min	-42.943	1	-240.801	3	-18.768	9	0	15	-.124	1	-.386	2
217		14	max	7.825	3	262.227	2	31.302	2	.004	1	-.005	15	.331	3
218			min	-42.943	1	-152.77	3	.374	15	0	15	-.12	1	-.681	2
219		15	max	7.825	3	79.836	2	59.541	1	.004	1	-.002	12	.422	3
220			min	-42.943	1	-64.739	3	2.086	15	0	15	-.086	1	-.823	2
221		16	max	7.825	3	23.292	3	96.459	1	.004	1	.019	2	.439	3
222			min	-42.943	1	-102.556	2	3.797	15	0	15	-.026	9	-.814	2
223		17	max	7.825	3	111.323	3	133.376	1	.004	1	.077	2	.383	3
224			min	-42.943	1	-284.947	2	5.509	15	0	15	.002	15	-.652	2
225		18	max	7.825	3	199.354	3	170.294	1	.004	1	.201	1	.254	3
226			min	-42.943	1	-467.339	2	7.22	15	0	15	.007	15	-.339	2
227		19	max	7.825	3	287.385	3	207.212	1	.004	1	.358	1	.126	2
228			min	-42.943	1	-649.73	2	8.932	15	0	15	.014	15	.002	15
229	M13	1	max	-4.228	15	700.898	2	-8.335	15	.008	3	.279	1	.178	2
230			min	-111.043	1	-309.514	3	-191.524	1	-.025	2	.011	15	-.037	3
231		2	max	-4.228	15	518.507	2	-6.623	15	.008	3	.135	1	.184	3
232			min	-111.043	1	-221.483	3	-154.607	1	-.025	2	.005	15	-.33	2
233		3	max	-4.228	15	336.115	2	-4.912	15	.008	3	.04	2	.332	3
234			min	-111.043	1	-133.452	3	-117.689	1	-.025	2	0	15	-.686	2
235		4	max	-4.228	15	153.723	2	-3.2	15	.008	3	.007	3	.406	3
236			min	-111.043	1	-45.421	3	-80.772	1	-.025	2	-.061	1	-.89	2
237		5	max	-4.228	15	42.61	3	-1.488	15	.008	3	-.004	12	.408	3
238			min	-111.043	1	-28.668	2	-43.854	1	-.025	2	-.113	1	-.942	2
239		6	max	-4.228	15	130.641	3	3.001	9	.008	3	-.006	15	.335	3
240			min	-111.043	1	-211.06	2	-20.46	2	-.025	2	-.134	1	-.842	2
241		7	max	-4.228	15	218.672	3	29.981	1	.008	3	-.005	15	.19	3
242			min	-111.043	1	-393.451	2	-8.994	3	-.025	2	-.124	1	-.59	2
243		8	max	-4.228	15	306.703	3	66.899	1	.008	3	-.003	15	-.005	15
244			min	-111.043	1	-575.843	2	-6.384	3	-.025	2	-.084	1	-.186	2
245		9	max	-4.228	15	394.735	3	103.816	1	.008	3	.016	9	.369	2
246			min	-111.043	1	-758.234	2	-3.775	3	-.025	2	-.062	2	-.321	3
247		10	max	-4.228	15	-14.802	15	140.734	1	.025	2	.089	9	1.077	2
248			min	-111.043	1	-940.626	2	.107	12	0	15	-.038	3	-.687	3
249		11	max	-4.228	15	758.234	2	3.775	3	.025	2	.016	9	.369	2
250			min	-111.043	1	-394.735	3	-103.816	1	-.008	3	-.062	2	-.321	3
251		12	max	-4.228	15	575.843	2	6.384	3	.025	2	-.003	15	-.005	15
252			min	-111.043	1	-306.703	3	-66.899	1	-.008	3	-.084	1	-.186	2
253		13	max	-4.228	15	393.451	2	8.994	3	.025	2	-.005	15	.19	3
254			min	-111.043	1	-218.672	3	-29.981	1	-.008	3	-.124	1	-.59	2
255		14	max	-4.228	15	211.06	2	20.46	2	.025	2	-.006	15	.335	3
256			min	-111.043	1	-130.641	3	-3.001	9	-.008	3	-.134	1	-.842	2
257		15	max	-4.228	15	28.668	2	43.854	1	.025	2	-.004	12	.408	3
258			min	-111.043	1	-42.61	3	1.488	15	-.008	3	-.113	1	-.942	2
259		16	max	-4.228	15	45.421	3	80.772	1	.025	2	.007	3	.406	3
260			min	-111.043	1	-153.723	2	3.2	15	-.008	3	-.061	1	-.89	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	-4.228	15	133.452	3	117.689	1	.025	2	.04	2	.332	3
262			min	-111.043	1	-336.115	2	4.912	15	-.008	3	0	15	-.686	2
263		18	max	-4.228	15	221.483	3	154.607	1	.025	2	.135	1	.184	3
264			min	-111.043	1	-518.507	2	6.623	15	-.008	3	.005	15	-.33	2
265		19	max	-4.228	15	309.514	3	191.524	1	.025	2	.279	1	.178	2
266			min	-111.043	1	-700.898	2	8.335	15	-.008	3	.011	15	-.037	3
267	M2	1	max	2226.306	2	1105.615	3	110.893	2	.004	3	.213	3	5.861	1
268			min	-1628.946	3	-754.087	2	-136.338	3	-.01	2	-.167	1	.245	15
269		2	max	2223.035	2	1105.615	3	110.893	2	.004	3	.164	3	5.945	1
270			min	-1631.399	3	-754.087	2	-136.338	3	-.01	2	-.132	1	.242	15
271		3	max	1566.78	1	1007.73	1	76.324	2	.001	2	.126	3	5.793	1
272			min	-1358.396	3	40.466	15	-123.181	3	0	3	-.117	1	.233	15
273		4	max	1563.508	1	1007.73	1	76.324	2	.001	2	.082	3	5.431	1
274			min	-1360.849	3	40.466	15	-123.181	3	0	3	-.092	1	.218	15
275		5	max	1560.237	1	1007.73	1	76.324	2	.001	2	.038	3	5.069	1
276			min	-1363.303	3	40.466	15	-123.181	3	0	3	-.067	1	.204	15
277		6	max	1556.965	1	1007.73	1	76.324	2	.001	2	-.002	15	4.707	1
278			min	-1365.756	3	40.466	15	-123.181	3	0	3	-.043	1	.189	15
279		7	max	1553.694	1	1007.73	1	76.324	2	.001	2	.003	10	4.345	1
280			min	-1368.21	3	40.466	15	-123.181	3	0	3	-.051	3	.174	15
281		8	max	1550.423	1	1007.73	1	76.324	2	.001	2	.027	2	3.983	1
282			min	-1370.664	3	40.466	15	-123.181	3	0	3	-.095	3	.16	15
283		9	max	1547.151	1	1007.73	1	76.324	2	.001	2	.054	2	3.62	1
284			min	-1373.117	3	40.466	15	-123.181	3	0	3	-.139	3	.145	15
285		10	max	1543.88	1	1007.73	1	76.324	2	.001	2	.082	2	3.258	1
286			min	-1375.571	3	40.466	15	-123.181	3	0	3	-.183	3	.131	15
287		11	max	1540.608	1	1007.73	1	76.324	2	.001	2	.109	2	2.896	1
288			min	-1378.024	3	40.466	15	-123.181	3	0	3	-.228	3	.116	15
289		12	max	1537.337	1	1007.73	1	76.324	2	.001	2	.137	2	2.534	1
290			min	-1380.478	3	40.466	15	-123.181	3	0	3	-.272	3	.102	15
291		13	max	1534.065	1	1007.73	1	76.324	2	.001	2	.164	2	2.172	1
292			min	-1382.931	3	40.466	15	-123.181	3	0	3	-.316	3	.087	15
293		14	max	1530.794	1	1007.73	1	76.324	2	.001	2	.192	2	1.81	1
294			min	-1385.385	3	40.466	15	-123.181	3	0	3	-.361	3	.073	15
295		15	max	1527.522	1	1007.73	1	76.324	2	.001	2	.219	2	1.448	1
296			min	-1387.839	3	40.466	15	-123.181	3	0	3	-.405	3	.058	15
297		16	max	1524.251	1	1007.73	1	76.324	2	.001	2	.246	2	1.086	1
298			min	-1390.292	3	40.466	15	-123.181	3	0	3	-.449	3	.044	15
299		17	max	1520.979	1	1007.73	1	76.324	2	.001	2	.274	2	.724	1
300			min	-1392.746	3	40.466	15	-123.181	3	0	3	-.493	3	.029	15
301		18	max	1517.708	1	1007.73	1	76.324	2	.001	2	.301	2	.362	1
302			min	-1395.199	3	40.466	15	-123.181	3	0	3	-.538	3	.015	15
303		19	max	1514.437	1	1007.73	1	76.324	2	.001	2	.329	2	0	1
304			min	-1397.653	3	40.466	15	-123.181	3	0	3	-.582	3	0	1
305	M5	1	max	5943.782	2	2933.03	3	0	1	0	1	0	1	8.498	1
306			min	-5056.975	3	-3028.686	2	0	1	0	1	0	1	.338	15
307		2	max	5940.511	2	2933.03	3	0	1	0	1	0	1	9.144	1
308			min	-5059.429	3	-3028.686	2	0	1	0	1	0	1	.344	15
309		3	max	4116.756	2	1591.051	1	0	1	0	1	0	1	9.146	1
310			min	-4107.862	3	58.383	15	0	1	0	1	0	1	.336	15
311		4	max	4113.485	2	1591.051	1	0	1	0	1	0	1	8.574	1
312			min	-4110.315	3	58.383	15	0	1	0	1	0	1	.315	15
313		5	max	4110.213	2	1591.051	1	0	1	0	1	0	1	8.003	1
314			min	-4112.769	3	58.383	15	0	1	0	1	0	1	.294	15
315		6	max	4106.942	2	1591.051	1	0	1	0	1	0	1	7.431	1
316			min	-4115.222	3	58.383	15	0	1	0	1	0	1	.273	15
317		7	max	4103.67	2	1591.051	1	0	1	0	1	0	1	6.859	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	-4117.676	3	58.383	15	0	1	0	1	0	1	.252	15
319		8	max	4100.399	2	1591.051	1	0	1	0	1	0	1	6.288	1
320			min	-4120.13	3	58.383	15	0	1	0	1	0	1	.231	15
321		9	max	4097.127	2	1591.051	1	0	1	0	1	0	1	5.716	1
322			min	-4122.583	3	58.383	15	0	1	0	1	0	1	.21	15
323		10	max	4093.856	2	1591.051	1	0	1	0	1	0	1	5.145	1
324			min	-4125.037	3	58.383	15	0	1	0	1	0	1	.189	15
325		11	max	4090.585	2	1591.051	1	0	1	0	1	0	1	4.573	1
326			min	-4127.49	3	58.383	15	0	1	0	1	0	1	.168	15
327		12	max	4087.313	2	1591.051	1	0	1	0	1	0	1	4.001	1
328			min	-4129.944	3	58.383	15	0	1	0	1	0	1	.147	15
329		13	max	4084.042	2	1591.051	1	0	1	0	1	0	1	3.43	1
330			min	-4132.398	3	58.383	15	0	1	0	1	0	1	.126	15
331		14	max	4080.77	2	1591.051	1	0	1	0	1	0	1	2.858	1
332			min	-4134.851	3	58.383	15	0	1	0	1	0	1	.105	15
333		15	max	4077.499	2	1591.051	1	0	1	0	1	0	1	2.286	1
334			min	-4137.305	3	58.383	15	0	1	0	1	0	1	.084	15
335		16	max	4074.227	2	1591.051	1	0	1	0	1	0	1	1.715	1
336			min	-4139.758	3	58.383	15	0	1	0	1	0	1	.063	15
337		17	max	4070.956	2	1591.051	1	0	1	0	1	0	1	1.143	1
338			min	-4142.212	3	58.383	15	0	1	0	1	0	1	.042	15
339		18	max	4067.684	2	1591.051	1	0	1	0	1	0	1	.572	1
340			min	-4144.666	3	58.383	15	0	1	0	1	0	1	.021	15
341		19	max	4064.413	2	1591.051	1	0	1	0	1	0	1	0	1
342			min	-4147.119	3	58.383	15	0	1	0	1	0	1	0	1
343	M8	1	max	2226.306	2	1105.615	3	136.338	3	.01	2	.167	1	5.861	1
344			min	-1628.946	3	-754.087	2	-110.893	2	-.004	3	-.213	3	.245	15
345		2	max	2223.035	2	1105.615	3	136.338	3	.01	2	.132	1	5.945	1
346			min	-1631.399	3	-754.087	2	-110.893	2	-.004	3	-.164	3	.242	15
347		3	max	1566.78	1	1007.73	1	123.181	3	0	3	.117	1	5.793	1
348			min	-1358.396	3	40.466	15	-76.324	2	-.001	2	-.126	3	.233	15
349		4	max	1563.508	1	1007.73	1	123.181	3	0	3	.092	1	5.431	1
350			min	-1360.849	3	40.466	15	-76.324	2	-.001	2	-.082	3	.218	15
351		5	max	1560.237	1	1007.73	1	123.181	3	0	3	.067	1	5.069	1
352			min	-1363.303	3	40.466	15	-76.324	2	-.001	2	-.038	3	.204	15
353		6	max	1556.965	1	1007.73	1	123.181	3	0	3	.043	1	4.707	1
354			min	-1365.756	3	40.466	15	-76.324	2	-.001	2	.002	15	.189	15
355		7	max	1553.694	1	1007.73	1	123.181	3	0	3	.051	3	4.345	1
356			min	-1368.21	3	40.466	15	-76.324	2	-.001	2	-.003	10	.174	15
357		8	max	1550.423	1	1007.73	1	123.181	3	0	3	.095	3	3.983	1
358			min	-1370.664	3	40.466	15	-76.324	2	-.001	2	-.027	2	.16	15
359		9	max	1547.151	1	1007.73	1	123.181	3	0	3	.139	3	3.62	1
360			min	-1373.117	3	40.466	15	-76.324	2	-.001	2	-.054	2	.145	15
361		10	max	1543.88	1	1007.73	1	123.181	3	0	3	.183	3	3.258	1
362			min	-1375.571	3	40.466	15	-76.324	2	-.001	2	-.082	2	.131	15
363		11	max	1540.608	1	1007.73	1	123.181	3	0	3	.228	3	2.896	1
364			min	-1378.024	3	40.466	15	-76.324	2	-.001	2	-.109	2	.116	15
365		12	max	1537.337	1	1007.73	1	123.181	3	0	3	.272	3	2.534	1
366			min	-1380.478	3	40.466	15	-76.324	2	-.001	2	-.137	2	.102	15
367		13	max	1534.065	1	1007.73	1	123.181	3	0	3	.316	3	2.172	1
368			min	-1382.931	3	40.466	15	-76.324	2	-.001	2	-.164	2	.087	15
369		14	max	1530.794	1	1007.73	1	123.181	3	0	3	.361	3	1.81	1
370			min	-1385.385	3	40.466	15	-76.324	2	-.001	2	-.192	2	.073	15
371		15	max	1527.522	1	1007.73	1	123.181	3	0	3	.405	3	1.448	1
372			min	-1387.839	3	40.466	15	-76.324	2	-.001	2	-.219	2	.058	15
373		16	max	1524.251	1	1007.73	1	123.181	3	0	3	.449	3	1.086	1
374			min	-1390.292	3	40.466	15	-76.324	2	-.001	2	-.246	2	.044	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	1520.979	1	1007.73	1	123.181	3	0	3	.493	3	.724	1
376			min	-1392.746	3	40.466	15	-76.324	2	-.001	2	-.274	2	.029	15
377		18	max	1517.708	1	1007.73	1	123.181	3	0	3	.538	3	.362	1
378			min	-1395.199	3	40.466	15	-76.324	2	-.001	2	-.301	2	.015	15
379		19	max	1514.437	1	1007.73	1	123.181	3	0	3	.582	3	0	1
380			min	-1397.653	3	40.466	15	-76.324	2	-.001	2	-.329	2	0	1
381	M3	1	max	1694.737	2	5.617	4	34.176	2	.01	3	0	3	0	1
382			min	-711.466	3	1.32	15	-13.546	3	-.021	2	-.002	2	0	1
383		2	max	1694.528	2	4.993	4	34.176	2	.01	3	.01	2	0	15
384			min	-711.623	3	1.174	15	-13.546	3	-.021	2	-.004	3	-.002	4
385		3	max	1694.319	2	4.369	4	34.176	2	.01	3	.022	2	0	15
386			min	-711.779	3	1.027	15	-13.546	3	-.021	2	-.009	3	-.004	4
387		4	max	1694.111	2	3.745	4	34.176	2	.01	3	.034	2	-.001	15
388			min	-711.936	3	.88	15	-13.546	3	-.021	2	-.014	3	-.005	4
389		5	max	1693.902	2	3.121	4	34.176	2	.01	3	.046	2	-.001	15
390			min	-712.092	3	.734	15	-13.546	3	-.021	2	-.019	3	-.006	4
391		6	max	1693.694	2	2.497	4	34.176	2	.01	3	.059	2	-.002	15
392			min	-712.249	3	.587	15	-13.546	3	-.021	2	-.023	3	-.007	4
393		7	max	1693.485	2	1.872	4	34.176	2	.01	3	.071	2	-.002	15
394			min	-712.405	3	.44	15	-13.546	3	-.021	2	-.028	3	-.008	4
395		8	max	1693.276	2	1.248	4	34.176	2	.01	3	.083	2	-.002	15
396			min	-712.562	3	.293	15	-13.546	3	-.021	2	-.033	3	-.009	4
397		9	max	1693.068	2	.624	4	34.176	2	.01	3	.095	2	-.002	15
398			min	-712.718	3	.147	15	-13.546	3	-.021	2	-.038	3	-.009	4
399		10	max	1692.859	2	0	1	34.176	2	.01	3	.107	2	-.002	15
400			min	-712.875	3	0	1	-13.546	3	-.021	2	-.043	3	-.009	4
401		11	max	1692.651	2	-.147	15	34.176	2	.01	3	.119	2	-.002	15
402			min	-713.031	3	-.624	4	-13.546	3	-.021	2	-.048	3	-.009	4
403		12	max	1692.442	2	-.293	15	34.176	2	.01	3	.132	2	-.002	15
404			min	-713.187	3	-1.248	4	-13.546	3	-.021	2	-.052	3	-.009	4
405		13	max	1692.233	2	-.44	15	34.176	2	.01	3	.144	2	-.002	15
406			min	-713.344	3	-1.872	4	-13.546	3	-.021	2	-.057	3	-.008	4
407		14	max	1692.025	2	-.587	15	34.176	2	.01	3	.156	2	-.002	15
408			min	-713.5	3	-2.497	4	-13.546	3	-.021	2	-.062	3	-.007	4
409		15	max	1691.816	2	-.734	15	34.176	2	.01	3	.168	2	-.001	15
410			min	-713.657	3	-3.121	4	-13.546	3	-.021	2	-.067	3	-.006	4
411		16	max	1691.608	2	-.88	15	34.176	2	.01	3	.18	2	-.001	15
412			min	-713.813	3	-3.745	4	-13.546	3	-.021	2	-.072	3	-.005	4
413		17	max	1691.399	2	-1.027	15	34.176	2	.01	3	.193	2	0	15
414			min	-713.97	3	-4.369	4	-13.546	3	-.021	2	-.077	3	-.004	4
415		18	max	1691.19	2	-1.174	15	34.176	2	.01	3	.205	2	0	15
416			min	-714.126	3	-4.993	4	-13.546	3	-.021	2	-.081	3	-.002	4
417		19	max	1690.982	2	-1.32	15	34.176	2	.01	3	.217	2	0	1
418			min	-714.283	3	-5.617	4	-13.546	3	-.021	2	-.086	3	0	1
419	M6	1	max	4713.378	2	5.617	4	0	1	0	1	0	1	0	1
420			min	-2452.738	3	1.32	15	0	1	0	1	0	1	0	1
421		2	max	4713.169	2	4.993	4	0	1	0	1	0	1	0	15
422			min	-2452.894	3	1.174	15	0	1	0	1	0	1	-.002	4
423		3	max	4712.96	2	4.369	4	0	1	0	1	0	1	0	15
424			min	-2453.051	3	1.027	15	0	1	0	1	0	1	-.004	4
425		4	max	4712.752	2	3.745	4	0	1	0	1	0	1	-.001	15
426			min	-2453.207	3	.88	15	0	1	0	1	0	1	-.005	4
427		5	max	4712.543	2	3.121	4	0	1	0	1	0	1	-.001	15
428			min	-2453.364	3	.734	15	0	1	0	1	0	1	-.006	4
429		6	max	4712.335	2	2.497	4	0	1	0	1	0	1	-.002	15
430			min	-2453.52	3	.587	15	0	1	0	1	0	1	-.007	4
431		7	max	4712.126	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	-2453.677	3	.44	15	0	1	0	1	0	1	-.008	4
433		8	max	4711.917	2	1.248	4	0	1	0	1	0	1	-.002	15
434			min	-2453.833	3	.293	15	0	1	0	1	0	1	-.009	4
435		9	max	4711.709	2	.624	4	0	1	0	1	0	1	-.002	15
436			min	-2453.989	3	.147	15	0	1	0	1	0	1	-.009	4
437		10	max	4711.5	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2454.146	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	4711.292	2	-.147	15	0	1	0	1	0	1	-.002	15
440			min	-2454.302	3	-.624	4	0	1	0	1	0	1	-.009	4
441		12	max	4711.083	2	-.293	15	0	1	0	1	0	1	-.002	15
442			min	-2454.459	3	-1.248	4	0	1	0	1	0	1	-.009	4
443		13	max	4710.874	2	-.44	15	0	1	0	1	0	1	-.002	15
444			min	-2454.615	3	-1.872	4	0	1	0	1	0	1	-.008	4
445		14	max	4710.666	2	-.587	15	0	1	0	1	0	1	-.002	15
446			min	-2454.772	3	-2.497	4	0	1	0	1	0	1	-.007	4
447		15	max	4710.457	2	-.734	15	0	1	0	1	0	1	-.001	15
448			min	-2454.928	3	-3.121	4	0	1	0	1	0	1	-.006	4
449		16	max	4710.248	2	-.88	15	0	1	0	1	0	1	-.001	15
450			min	-2455.085	3	-3.745	4	0	1	0	1	0	1	-.005	4
451		17	max	4710.04	2	-1.027	15	0	1	0	1	0	1	0	15
452			min	-2455.241	3	-4.369	4	0	1	0	1	0	1	-.004	4
453		18	max	4709.831	2	-1.174	15	0	1	0	1	0	1	0	15
454			min	-2455.398	3	-4.993	4	0	1	0	1	0	1	-.002	4
455		19	max	4709.623	2	-1.32	15	0	1	0	1	0	1	0	1
456			min	-2455.554	3	-5.617	4	0	1	0	1	0	1	0	1
457	M9	1	max	1694.737	2	5.617	4	13.546	3	.021	2	.002	2	0	1
458			min	-711.466	3	1.32	15	-34.176	2	-.01	3	0	3	0	1
459		2	max	1694.528	2	4.993	4	13.546	3	.021	2	.004	3	0	15
460			min	-711.623	3	1.174	15	-34.176	2	-.01	3	-.01	2	-.002	4
461		3	max	1694.319	2	4.369	4	13.546	3	.021	2	.009	3	0	15
462			min	-711.779	3	1.027	15	-34.176	2	-.01	3	-.022	2	-.004	4
463		4	max	1694.111	2	3.745	4	13.546	3	.021	2	.014	3	-.001	15
464			min	-711.936	3	.88	15	-34.176	2	-.01	3	-.034	2	-.005	4
465		5	max	1693.902	2	3.121	4	13.546	3	.021	2	.019	3	-.001	15
466			min	-712.092	3	.734	15	-34.176	2	-.01	3	-.046	2	-.006	4
467		6	max	1693.694	2	2.497	4	13.546	3	.021	2	.023	3	-.002	15
468			min	-712.249	3	.587	15	-34.176	2	-.01	3	-.059	2	-.007	4
469		7	max	1693.485	2	1.872	4	13.546	3	.021	2	.028	3	-.002	15
470			min	-712.405	3	.44	15	-34.176	2	-.01	3	-.071	2	-.008	4
471		8	max	1693.276	2	1.248	4	13.546	3	.021	2	.033	3	-.002	15
472			min	-712.562	3	.293	15	-34.176	2	-.01	3	-.083	2	-.009	4
473		9	max	1693.068	2	.624	4	13.546	3	.021	2	.038	3	-.002	15
474			min	-712.718	3	.147	15	-34.176	2	-.01	3	-.095	2	-.009	4
475		10	max	1692.859	2	0	1	13.546	3	.021	2	.043	3	-.002	15
476			min	-712.875	3	0	1	-34.176	2	-.01	3	-.107	2	-.009	4
477		11	max	1692.651	2	-.147	15	13.546	3	.021	2	.048	3	-.002	15
478			min	-713.031	3	-.624	4	-34.176	2	-.01	3	-.119	2	-.009	4
479		12	max	1692.442	2	-.293	15	13.546	3	.021	2	.052	3	-.002	15
480			min	-713.187	3	-1.248	4	-34.176	2	-.01	3	-.132	2	-.009	4
481		13	max	1692.233	2	-.44	15	13.546	3	.021	2	.057	3	-.002	15
482			min	-713.344	3	-1.872	4	-34.176	2	-.01	3	-.144	2	-.008	4
483		14	max	1692.025	2	-.587	15	13.546	3	.021	2	.062	3	-.002	15
484			min	-713.5	3	-2.497	4	-34.176	2	-.01	3	-.156	2	-.007	4
485		15	max	1691.816	2	-.734	15	13.546	3	.021	2	.067	3	-.001	15
486			min	-713.657	3	-3.121	4	-34.176	2	-.01	3	-.168	2	-.006	4
487		16	max	1691.608	2	-.88	15	13.546	3	.021	2	.072	3	-.001	15
488			min	-713.813	3	-3.745	4	-34.176	2	-.01	3	-.18	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	1691.399	2	-1.027	15	13.546	3	.021	2	.077	3	0	15
490			min	-713.97	3	-4.369	4	-34.176	2	-.01	3	-.193	2	-.004	4
491		18	max	1691.19	2	-1.174	15	13.546	3	.021	2	.081	3	0	15
492			min	-714.126	3	-4.993	4	-34.176	2	-.01	3	-.205	2	-.002	4
493		19	max	1690.982	2	-1.32	15	13.546	3	.021	2	.086	3	0	1
494			min	-714.283	3	-5.617	4	-34.176	2	-.01	3	-.217	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	-.017	15	-.026	15	.01	1	6.596e-3	3	NC	3	NC	1
2			min	-.432	1	-.733	1	0	15	-1.975e-2	2	137.45	1	NC	1
3		2	max	-.017	15	-.022	15	0	15	6.354e-3	3	NC	12	NC	2
4			min	-.432	1	-.616	1	-.007	1	-1.859e-2	2	155.011	1	8880.508	1
5		3	max	-.017	15	-.019	15	0	15	5.879e-3	3	8898.988	12	NC	3
6			min	-.432	1	-.502	1	-.016	1	-1.632e-2	2	177.06	1	6018.506	1
7		4	max	-.017	15	-.015	15	0	15	5.404e-3	3	6904.055	12	NC	3
8			min	-.432	1	-.397	1	-.018	1	-1.405e-2	2	203.813	1	5821.018	1
9		5	max	-.017	15	-.012	15	0	3	5.196e-3	3	6980.366	12	NC	3
10			min	-.432	1	-.307	1	-.015	1	-1.244e-2	2	234.25	1	6707.958	1
11		6	max	-.017	15	-.01	15	.001	3	5.674e-3	3	9827.991	12	NC	2
12			min	-.431	1	-.234	1	-.01	1	-1.255e-2	2	266.47	1	9844.963	1
13		7	max	-.017	15	-.007	15	.002	3	6.153e-3	3	NC	3	NC	1
14			min	-.431	1	-.173	1	-.004	2	-1.265e-2	2	301.155	1	NC	1
15		8	max	-.017	15	-.005	15	0	3	6.632e-3	3	NC	3	NC	1
16			min	-.431	1	-.118	1	0	10	-1.275e-2	2	340.591	1	NC	1
17		9	max	-.017	15	-.003	15	0	10	7.445e-3	3	8110.239	15	NC	1
18			min	-.43	1	-.067	3	0	3	-1.203e-2	2	390.302	1	NC	1
19		10	max	-.017	15	0	10	.001	2	8.574e-3	3	9266.41	15	NC	1
20			min	-.43	1	-.046	3	-.001	3	-1.053e-2	2	458.371	1	NC	1
21		11	max	-.017	15	.044	1	0	1	9.702e-3	3	NC	15	NC	1
22			min	-.429	1	-.026	3	0	3	-9.02e-3	2	556.751	1	NC	1
23		12	max	-.017	15	.099	1	.003	3	9.159e-3	3	NC	15	NC	1
24			min	-.429	1	-.005	3	-.003	1	-7.294e-3	2	711.656	1	NC	1
25		13	max	-.017	15	.153	1	.01	3	6.84e-3	3	NC	5	NC	1
26			min	-.428	1	.006	15	-.006	2	-5.331e-3	2	977.115	1	NC	1
27		14	max	-.017	15	.202	1	.015	3	4.521e-3	3	NC	5	NC	1
28			min	-.427	1	.008	15	-.005	2	-3.369e-3	2	950.76	3	8533.233	3
29		15	max	-.017	15	.241	1	.015	3	2.202e-3	3	NC	2	NC	1
30			min	-.427	1	.01	15	-.001	10	-1.406e-3	2	702.43	3	8343.597	3
31		16	max	-.017	15	.267	1	.011	1	5.626e-3	3	NC	5	NC	2
32			min	-.427	1	.011	15	0	15	-2.692e-3	2	507.708	3	8599.103	1
33		17	max	-.017	15	.282	1	.012	1	9.724e-3	3	NC	4	NC	2
34			min	-.427	1	.012	15	0	15	-4.358e-3	2	377.122	3	7450.325	1
35		18	max	-.017	15	.389	3	.006	1	1.382e-2	3	NC	1	NC	1
36			min	-.427	1	.013	15	0	15	-6.025e-3	2	292.747	3	NC	1
37		19	max	-.017	15	.501	3	0	15	1.591e-2	3	NC	1	NC	1
38			min	-.427	1	.014	15	-.009	1	-6.875e-3	2	237.664	3	NC	1
39	M4	1	max	-.025	15	-.019	12	0	1	0	1	NC	3	NC	1
40			min	-.68	1	-1.301	2	0	1	0	1	88.625	1	NC	1
41		2	max	-.025	15	-.034	15	0	1	0	1	4216.536	12	NC	1
42			min	-.68	1	-1.062	1	0	1	0	1	102.87	1	NC	1
43		3	max	-.025	15	-.028	15	0	1	0	1	3251.502	15	NC	1
44			min	-.68	1	-.847	1	0	1	0	1	121.892	1	NC	1
45		4	max	-.025	15	-.023	15	0	1	0	1	3707.592	15	NC	1
46			min	-.68	1	-.653	1	0	1	0	1	146.238	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	-.025	15	-.018	15	0	1	0	1	4212.718	15	NC	1
48			min	-.68	1	-.496	1	0	1	0	1	174.453	1	NC	1
49		6	max	-.025	15	-.014	15	0	1	0	1	4729.884	15	NC	1
50			min	-.679	1	-.382	1	0	1	0	1	202.897	1	NC	1
51		7	max	-.025	15	-.011	15	0	1	0	1	5277.399	15	NC	1
52			min	-.678	1	-.296	1	0	1	0	1	231.465	1	NC	1
53		8	max	-.025	15	-.008	15	0	1	0	1	5906.801	15	NC	1
54			min	-.677	1	-.223	1	0	1	0	1	262.946	1	NC	1
55		9	max	-.025	15	-.005	15	0	1	0	1	9509.442	12	NC	1
56			min	-.676	1	-.147	1	0	1	0	1	305.885	1	NC	1
57		10	max	-.025	15	-.002	15	0	1	0	1	NC	3	NC	1
58			min	-.675	1	-.062	1	0	1	0	1	374.422	1	NC	1
59		11	max	-.025	15	.03	1	0	1	0	1	9775.226	15	NC	1
60			min	-.673	1	0	3	0	1	0	1	495.614	1	NC	1
61		12	max	-.025	15	.13	1	0	1	0	1	NC	15	NC	1
62			min	-.672	1	.005	15	0	1	0	1	761.374	1	NC	1
63		13	max	-.025	15	.23	1	0	1	0	1	NC	5	NC	1
64			min	-.671	1	.008	15	0	1	0	1	1648.813	1	NC	1
65		14	max	-.025	15	.317	1	0	1	0	1	NC	1	NC	1
66			min	-.67	1	.011	15	0	1	0	1	1461.173	3	NC	1
67		15	max	-.025	15	.376	1	0	1	0	1	NC	4	NC	1
68			min	-.669	1	.014	15	0	1	0	1	780.835	3	NC	1
69		16	max	-.025	15	.395	1	0	1	0	1	NC	4	NC	1
70			min	-.669	1	.015	15	0	1	0	1	431.258	3	NC	1
71		17	max	-.025	15	.503	3	0	1	0	1	NC	4	NC	1
72			min	-.669	1	.016	15	0	1	0	1	270.223	3	NC	1
73		18	max	-.025	15	.728	3	0	1	0	1	NC	4	NC	1
74			min	-.669	1	.016	15	0	1	0	1	189.196	3	NC	1
75		19	max	-.025	15	.961	3	0	1	0	1	NC	1	NC	1
76			min	-.669	1	.016	15	0	1	0	1	144.263	3	NC	1
77	M7	1	max	-.017	15	-.026	15	0	15	1.975e-2	2	NC	3	NC	1
78			min	-.432	1	-.733	1	-.01	1	-6.596e-3	3	137.45	1	NC	1
79		2	max	-.017	15	-.022	15	.007	1	1.859e-2	2	NC	12	NC	2
80			min	-.432	1	-.616	1	0	15	-6.354e-3	3	155.011	1	8880.508	1
81		3	max	-.017	15	-.019	15	.016	1	1.632e-2	2	8898.988	12	NC	3
82			min	-.432	1	-.502	1	0	15	-5.879e-3	3	177.06	1	6018.506	1
83		4	max	-.017	15	-.015	15	.018	1	1.405e-2	2	6904.055	12	NC	3
84			min	-.432	1	-.397	1	0	15	-5.404e-3	3	203.813	1	5821.018	1
85		5	max	-.017	15	-.012	15	.015	1	1.244e-2	2	6980.366	12	NC	3
86			min	-.432	1	-.307	1	0	3	-5.196e-3	3	234.25	1	6707.958	1
87		6	max	-.017	15	-.01	15	.01	1	1.255e-2	2	9827.991	12	NC	2
88			min	-.431	1	-.234	1	-.001	3	-5.674e-3	3	266.47	1	9844.963	1
89		7	max	-.017	15	-.007	15	.004	2	1.265e-2	2	NC	3	NC	1
90			min	-.431	1	-.173	1	-.002	3	-6.153e-3	3	301.155	1	NC	1
91		8	max	-.017	15	-.005	15	0	10	1.275e-2	2	NC	3	NC	1
92			min	-.431	1	-.118	1	0	3	-6.632e-3	3	340.591	1	NC	1
93		9	max	-.017	15	-.003	15	0	3	1.203e-2	2	8110.239	15	NC	1
94			min	-.43	1	-.067	3	0	10	-7.445e-3	3	390.302	1	NC	1
95		10	max	-.017	15	0	10	.001	3	1.053e-2	2	9266.41	15	NC	1
96			min	-.43	1	-.046	3	-.001	2	-8.574e-3	3	458.371	1	NC	1
97		11	max	-.017	15	.044	1	0	3	9.02e-3	2	NC	15	NC	1
98			min	-.429	1	-.026	3	0	1	-9.702e-3	3	556.751	1	NC	1
99		12	max	-.017	15	.099	1	.003	1	7.294e-3	2	NC	15	NC	1
100			min	-.429	1	-.005	3	-.003	3	-9.159e-3	3	711.656	1	NC	1
101		13	max	-.017	15	.153	1	.006	2	5.331e-3	2	NC	5	NC	1
102			min	-.428	1	.006	15	-.01	3	-6.84e-3	3	977.115	1	NC	1
103		14	max	-.017	15	.202	1	.005	2	3.369e-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	-.427	1	.008	15	-.015	3	-4.521e-3	3	950.76	3	8533.233	3
105		15	max	-.017	15	.241	1	.001	10	1.406e-3	2	NC	2	NC	1
106			min	-.427	1	.01	15	-.015	3	-2.202e-3	3	702.43	3	8343.597	3
107		16	max	-.017	15	.267	1	0	15	2.692e-3	2	NC	5	NC	2
108			min	-.427	1	.011	15	-.011	1	-5.626e-3	3	507.708	3	8599.103	1
109		17	max	-.017	15	.282	1	0	15	4.358e-3	2	NC	4	NC	2
110			min	-.427	1	.012	15	-.012	1	-9.724e-3	3	377.122	3	7450.325	1
111		18	max	-.017	15	.389	3	0	15	6.025e-3	2	NC	1	NC	1
112			min	-.427	1	.013	15	-.006	1	-1.382e-2	3	292.747	3	NC	1
113		19	max	-.017	15	.501	3	.009	1	6.875e-3	2	NC	1	NC	1
114			min	-.427	1	.014	15	0	15	-1.591e-2	3	237.664	3	NC	1
115	M10	1	max	0	1	.446	3	.427	1	1.423e-2	3	NC	1	NC	1
116			min	0	15	.014	15	.017	15	-1.135e-3	2	NC	1	NC	1
117		2	max	0	1	.609	3	.461	1	1.593e-2	3	NC	4	NC	3
118			min	0	15	.012	15	.019	15	-1.832e-3	2	1107.917	3	5309.878	1
119		3	max	0	1	.76	3	.511	1	1.763e-2	3	NC	4	NC	5
120			min	0	15	.011	15	.02	15	-2.53e-3	2	573.559	3	2152.386	1
121		4	max	0	1	.879	3	.564	1	1.933e-2	3	NC	5	NC	5
122			min	0	15	-.006	10	.022	15	-3.227e-3	2	415.514	3	1318.294	1
123		5	max	0	1	.955	3	.61	1	2.103e-2	3	NC	5	NC	5
124			min	0	15	-.012	10	.024	15	-3.925e-3	2	354.08	3	981.491	1
125		6	max	0	1	.982	3	.645	1	2.273e-2	3	NC	4	NC	5
126			min	0	15	-.003	10	.025	15	-4.622e-3	2	335.956	3	824.337	1
127		7	max	0	1	.967	3	.666	1	2.444e-2	3	NC	4	NC	5
128			min	0	15	.012	15	.025	15	-5.32e-3	2	345.743	3	753.135	1
129		8	max	0	1	.923	3	.673	1	2.614e-2	3	NC	4	NC	5
130			min	0	15	.014	15	.025	15	-6.017e-3	2	377.607	3	730.801	1
131		9	max	0	1	.873	3	.672	1	2.784e-2	3	NC	2	NC	5
132			min	0	15	.015	15	.025	15	-6.715e-3	2	422.044	3	735.731	1
133		10	max	0	1	.847	3	.669	1	2.954e-2	3	NC	2	NC	5
134			min	0	1	.016	15	.025	15	-7.412e-3	2	448.618	3	744.287	1
135		11	max	0	15	.873	3	.672	1	2.784e-2	3	NC	2	NC	5
136			min	0	1	.015	15	.025	15	-6.715e-3	2	422.044	3	735.731	1
137		12	max	0	15	.923	3	.673	1	2.614e-2	3	NC	4	NC	5
138			min	0	1	.014	15	.025	15	-6.017e-3	2	377.607	3	730.801	1
139		13	max	0	15	.967	3	.666	1	2.444e-2	3	NC	4	NC	5
140			min	0	1	.012	15	.025	15	-5.32e-3	2	345.743	3	753.135	1
141		14	max	0	15	.982	3	.645	1	2.273e-2	3	NC	4	NC	5
142			min	0	1	-.003	10	.025	15	-4.622e-3	2	335.956	3	824.337	1
143		15	max	0	15	.955	3	.61	1	2.103e-2	3	NC	5	NC	5
144			min	0	1	-.012	10	.024	15	-3.925e-3	2	354.08	3	981.491	1
145		16	max	0	15	.879	3	.564	1	1.933e-2	3	NC	5	NC	5
146			min	0	1	-.006	10	.022	15	-3.227e-3	2	415.514	3	1318.294	1
147		17	max	0	15	.76	3	.511	1	1.763e-2	3	NC	4	NC	5
148			min	0	1	.011	15	.02	15	-2.53e-3	2	573.559	3	2152.386	1
149		18	max	0	15	.609	3	.461	1	1.593e-2	3	NC	4	NC	3
150			min	0	1	.012	15	.019	15	-1.832e-3	2	1107.917	3	5309.878	1
151		19	max	0	15	.446	3	.427	1	1.423e-2	3	NC	1	NC	1
152			min	0	1	.014	15	.017	15	-1.135e-3	2	NC	1	NC	1
153	M11	1	max	.001	1	.072	1	.429	1	7.024e-3	1	NC	1	NC	1
154			min	-.001	3	-.015	3	.017	15	2.872e-4	15	NC	1	NC	1
155		2	max	0	1	.09	3	.452	1	7.646e-3	1	NC	4	NC	2
156			min	-.001	3	-.016	2	.018	15	3.054e-4	15	1714.041	3	7618.547	1
157		3	max	0	1	.183	3	.497	1	8.269e-3	1	NC	5	NC	3
158			min	0	3	-.082	2	.02	15	3.237e-4	15	908.517	3	2644.958	1
159		4	max	0	1	.246	3	.548	1	8.891e-3	1	NC	5	NC	5
160			min	0	3	-.123	2	.022	15	3.419e-4	15	691.098	3	1504.621	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	.267	3	.597	1	9.513e-3	1	NC	5	NC	5
162			min	0	3	-.133	2	.023	15	3.602e-4	15	638.728	3	1070.699	1
163		6	max	0	1	.246	3	.635	1	1.014e-2	1	NC	5	NC	5
164			min	0	3	-.113	2	.025	15	3.784e-4	15	690.52	3	870.974	1
165		7	max	0	1	.189	3	.661	1	1.076e-2	1	NC	4	NC	5
166			min	0	3	-.069	2	.025	15	3.967e-4	15	881.458	3	776.357	1
167		8	max	0	1	.113	3	.672	1	1.138e-2	1	NC	4	NC	5
168			min	0	3	-.013	2	.025	15	4.149e-4	15	1403.459	3	738.763	1
169		9	max	0	1	.059	1	.674	1	1.2e-2	1	NC	1	NC	5
170			min	0	3	.002	15	.025	15	4.331e-4	15	3139.369	3	733.369	1
171		10	max	0	1	.081	1	.673	1	1.263e-2	1	NC	1	NC	5
172			min	0	1	.003	15	.025	15	4.514e-4	15	7301.262	3	737.657	1
173		11	max	0	3	.059	1	.674	1	1.2e-2	1	NC	1	NC	5
174			min	0	1	.002	15	.025	15	4.331e-4	15	3139.369	3	733.369	1
175		12	max	0	3	.113	3	.672	1	1.138e-2	1	NC	4	NC	5
176			min	0	1	-.013	2	.025	15	4.149e-4	15	1403.459	3	738.763	1
177		13	max	0	3	.189	3	.661	1	1.076e-2	1	NC	4	NC	5
178			min	0	1	-.069	2	.025	15	3.967e-4	15	881.458	3	776.357	1
179		14	max	0	3	.246	3	.635	1	1.014e-2	1	NC	5	NC	5
180			min	0	1	-.113	2	.025	15	3.784e-4	15	690.52	3	870.974	1
181		15	max	0	3	.267	3	.597	1	9.513e-3	1	NC	5	NC	5
182			min	0	1	-.133	2	.023	15	3.602e-4	15	638.728	3	1070.699	1
183		16	max	0	3	.246	3	.548	1	8.891e-3	1	NC	5	NC	5
184			min	0	1	-.123	2	.022	15	3.419e-4	15	691.098	3	1504.621	1
185		17	max	0	3	.183	3	.497	1	8.269e-3	1	NC	5	NC	3
186			min	0	1	-.082	2	.02	15	3.237e-4	15	908.517	3	2644.958	1
187		18	max	.001	3	.09	3	.452	1	7.646e-3	1	NC	4	NC	2
188			min	0	1	-.016	2	.018	15	3.054e-4	15	1714.041	3	7618.547	1
189		19	max	.001	3	.072	1	.429	1	7.024e-3	1	NC	1	NC	1
190			min	-.001	1	-.015	3	.017	15	2.872e-4	15	NC	1	NC	1
191	M12	1	max	0	3	-.004	15	.43	1	6.752e-3	1	NC	1	NC	1
192			min	0	1	-.093	1	.017	15	2.72e-4	15	NC	1	NC	1
193		2	max	0	3	-.007	15	.45	1	7.073e-3	1	NC	4	NC	2
194			min	0	1	-.195	1	.018	15	2.834e-4	15	1422.378	2	8921.208	1
195		3	max	0	3	.039	3	.493	1	7.395e-3	1	NC	5	NC	3
196			min	0	1	-.302	2	.02	15	2.948e-4	15	765.595	2	2861.349	1
197		4	max	0	3	.069	3	.544	1	7.717e-3	1	NC	5	NC	5
198			min	0	1	-.375	2	.022	15	3.062e-4	15	583.63	2	1576.433	1
199		5	max	0	3	.076	3	.594	1	8.038e-3	1	NC	5	NC	5
200			min	0	1	-.404	2	.023	15	3.176e-4	15	533.237	2	1101.618	1
201		6	max	0	3	.06	3	.634	1	8.36e-3	1	NC	5	NC	5
202			min	0	1	-.389	2	.025	15	3.29e-4	15	558.958	2	885.162	1
203		7	max	0	3	.026	3	.661	1	8.682e-3	1	NC	5	NC	5
204			min	0	1	-.337	2	.025	15	3.404e-4	15	667.481	2	781.722	1
205		8	max	0	3	-.009	15	.674	1	9.003e-3	1	NC	5	NC	5
206			min	0	1	-.265	1	.025	15	3.518e-4	15	915.01	2	738.503	1
207		9	max	0	3	-.007	15	.677	1	9.325e-3	1	NC	5	NC	5
208			min	0	1	-.212	1	.025	15	3.633e-4	15	1408.678	2	729.333	1
209		10	max	0	1	-.007	15	.676	1	9.647e-3	1	NC	3	NC	5
210			min	0	1	-.188	1	.025	15	3.747e-4	15	1878.255	2	732.053	1
211		11	max	0	1	-.007	15	.677	1	9.325e-3	1	NC	5	NC	5
212			min	0	3	-.212	1	.025	15	3.633e-4	15	1408.678	2	729.333	1
213		12	max	0	1	-.009	15	.674	1	9.003e-3	1	NC	5	NC	5
214			min	0	3	-.265	1	.025	15	3.518e-4	15	915.01	2	738.503	1
215		13	max	0	1	.026	3	.661	1	8.682e-3	1	NC	5	NC	5
216			min	0	3	-.337	2	.025	15	3.404e-4	15	667.481	2	781.722	1
217		14	max	0	1	.06	3	.634	1	8.36e-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	-.389	2	.025	15	3.29e-4	15	558.958	2	885.162	1
219		15	max	0	1	.076	3	.594	1	8.038e-3	1	NC	5	NC	5
220			min	0	3	-.404	2	.023	15	3.176e-4	15	533.237	2	1101.618	1
221		16	max	0	1	.069	3	.544	1	7.717e-3	1	NC	5	NC	5
222			min	0	3	-.375	2	.022	15	3.062e-4	15	583.63	2	1576.433	1
223		17	max	0	1	.039	3	.493	1	7.395e-3	1	NC	5	NC	3
224			min	0	3	-.302	2	.02	15	2.948e-4	15	765.595	2	2861.349	1
225		18	max	0	1	-.007	15	.45	1	7.073e-3	1	NC	4	NC	2
226			min	0	3	-.195	1	.018	15	2.834e-4	15	1422.378	2	8921.208	1
227		19	max	0	1	-.004	15	.43	1	6.752e-3	1	NC	1	NC	1
228			min	0	3	-.093	1	.017	15	2.72e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.024	15	.432	1	1.551e-2	2	NC	1	NC	1
230			min	0	1	-.676	1	.017	15	-1.886e-3	3	NC	1	NC	1
231		2	max	0	15	-.027	12	.468	1	1.731e-2	2	NC	5	NC	3
232			min	0	1	-.84	1	.019	15	-2.482e-3	3	913.243	2	4980.021	1
233		3	max	0	15	.017	3	.52	1	1.911e-2	2	NC	5	NC	5
234			min	0	1	-1.003	2	.021	15	-3.078e-3	3	477.8	2	2056.218	1
235		4	max	0	15	.054	3	.574	1	2.091e-2	2	NC	5	NC	5
236			min	0	1	-1.146	2	.023	15	-3.674e-3	3	346.649	2	1270.99	1
237		5	max	0	15	.068	3	.621	1	2.271e-2	2	NC	15	NC	5
238			min	0	1	-1.24	2	.024	15	-4.271e-3	3	293.426	2	951.195	1
239		6	max	0	15	.061	3	.657	1	2.452e-2	2	NC	15	NC	5
240			min	0	1	-1.283	2	.025	15	-4.867e-3	3	274.218	2	801.315	1
241		7	max	0	15	.036	3	.678	1	2.632e-2	2	NC	15	NC	5
242			min	0	1	-1.28	2	.026	15	-5.463e-3	3	275.367	2	733.305	1
243		8	max	0	15	0	3	.685	1	2.812e-2	2	NC	15	NC	5
244			min	0	1	-1.246	2	.026	15	-6.059e-3	3	290.744	2	712.03	1
245		9	max	0	15	-.026	12	.683	1	2.992e-2	2	NC	15	NC	5
246			min	0	1	-1.201	2	.025	15	-6.656e-3	3	313.067	2	716.835	1
247		10	max	0	1	-.035	12	.68	1	3.172e-2	2	NC	15	NC	5
248			min	0	1	-1.178	2	.025	15	-7.252e-3	3	326.164	2	725.056	1
249		11	max	0	1	-.026	12	.683	1	2.992e-2	2	NC	15	NC	5
250			min	0	15	-1.201	2	.025	15	-6.656e-3	3	313.067	2	716.835	1
251		12	max	0	1	0	3	.685	1	2.812e-2	2	NC	15	NC	5
252			min	0	15	-1.246	2	.026	15	-6.059e-3	3	290.744	2	712.03	1
253		13	max	0	1	.036	3	.678	1	2.632e-2	2	NC	15	NC	5
254			min	0	15	-1.28	2	.026	15	-5.463e-3	3	275.367	2	733.305	1
255		14	max	0	1	.061	3	.657	1	2.452e-2	2	NC	15	NC	5
256			min	0	15	-1.283	2	.025	15	-4.867e-3	3	274.218	2	801.315	1
257		15	max	0	1	.068	3	.621	1	2.271e-2	2	NC	15	NC	5
258			min	0	15	-1.24	2	.024	15	-4.271e-3	3	293.426	2	951.195	1
259		16	max	0	1	.054	3	.574	1	2.091e-2	2	NC	5	NC	5
260			min	0	15	-1.146	2	.023	15	-3.674e-3	3	346.649	2	1270.99	1
261		17	max	0	1	.017	3	.52	1	1.911e-2	2	NC	5	NC	5
262			min	0	15	-1.003	2	.021	15	-3.078e-3	3	477.8	2	2056.218	1
263		18	max	0	1	-.027	12	.468	1	1.731e-2	2	NC	5	NC	3
264			min	0	15	-.84	1	.019	15	-2.482e-3	3	913.243	2	4980.021	1
265		19	max	0	1	-.024	15	.432	1	1.551e-2	2	NC	1	NC	1
266			min	0	15	-.676	1	.017	15	-1.886e-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	3.41e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	1	-1.393e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	4.813e-3	2	NC	2	NC	1
272			min	0	2	-.008	1	0	1	-1.934e-3	3	9291.674	1	NC	1
273		4	max	0	3	0	15	.001	3	4.429e-3	2	NC	4	NC	1
274			min	0	2	-.019	1	-.001	1	-1.716e-3	3	4118.618	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	4.045e-3	2	NC	5	NC	1
276			min	0	2	-.033	1	-.002	1	-1.499e-3	3	2341.681	1	NC	1
277		6	max	0	3	-.002	15	.003	3	3.66e-3	2	NC	5	NC	1
278			min	0	2	-.051	1	-.003	1	-1.282e-3	3	1521.53	1	NC	1
279		7	max	0	3	-.003	15	.004	3	3.276e-3	2	NC	5	NC	1
280			min	0	2	-.072	1	-.004	1	-1.064e-3	3	1075.146	1	NC	1
281		8	max	0	3	-.004	15	.005	3	2.892e-3	2	NC	5	NC	1
282			min	0	2	-.096	1	-.005	1	-8.467e-4	3	805.012	1	NC	1
283		9	max	0	3	-.005	15	.006	3	2.508e-3	2	NC	5	NC	1
284			min	0	2	-.123	1	-.006	1	-6.293e-4	3	628.701	1	NC	1
285		10	max	0	3	-.006	15	.006	3	2.123e-3	2	NC	15	NC	1
286			min	0	2	-.153	1	-.007	1	-4.119e-4	3	507.221	1	NC	1
287		11	max	0	3	-.007	15	.006	3	1.739e-3	2	NC	15	NC	1
288			min	-.001	2	-.185	1	-.007	1	-1.945e-4	3	419.774	1	NC	1
289		12	max	.001	3	-.009	15	.006	3	1.355e-3	2	8778.926	15	NC	1
290			min	-.001	2	-.219	1	-.008	1	1.308e-5	15	354.735	1	NC	1
291		13	max	.001	3	-.01	15	.005	3	9.707e-4	2	7550.818	15	NC	1
292			min	-.001	2	-.254	1	-.009	1	4.932e-6	15	304.986	1	NC	1
293		14	max	.001	3	-.012	15	.004	3	5.865e-4	2	6589.754	15	NC	1
294			min	-.001	2	-.292	1	-.009	1	-4.508e-5	9	266.078	1	NC	1
295		15	max	.001	3	-.013	15	.002	3	6.752e-4	3	5823.279	15	NC	1
296			min	-.001	2	-.33	1	-.009	1	-1.607e-4	9	235.064	1	NC	1
297		16	max	.001	3	-.015	15	0	15	8.926e-4	3	5202.22	15	NC	1
298			min	-.002	2	-.37	1	-.008	1	-4.233e-4	1	209.945	1	NC	1
299		17	max	.001	3	-.017	15	0	15	1.11e-3	3	4692.176	15	NC	1
300			min	-.002	2	-.41	1	-.008	1	-7.549e-4	1	189.323	1	NC	1
301		18	max	.002	3	-.018	15	0	15	1.327e-3	3	4268.388	15	NC	1
302			min	-.002	2	-.451	1	-.009	3	-1.086e-3	1	172.195	1	8500.058	3
303		19	max	.002	3	-.02	15	0	10	1.545e-3	3	3912.804	15	NC	1
304			min	-.002	2	-.492	1	-.015	3	-1.418e-3	1	157.828	1	5350.288	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	3	NC	1
310			min	0	2	-.012	1	0	1	0	1	6344.098	1	NC	1
311		4	max	0	3	-.001	15	0	1	0	1	NC	4	NC	1
312			min	0	2	-.028	1	0	1	0	1	2732.115	1	NC	1
313		5	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
314			min	-.001	2	-.051	1	0	1	0	1	1534.034	1	NC	1
315		6	max	.001	3	-.003	15	0	1	0	1	NC	5	NC	1
316			min	-.002	2	-.078	1	0	1	0	1	989.828	1	NC	1
317		7	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
318			min	-.002	2	-.111	1	0	1	0	1	696.346	1	NC	1
319		8	max	.002	3	-.006	15	0	1	0	1	NC	15	NC	1
320			min	-.002	2	-.149	1	0	1	0	1	519.802	1	NC	1
321		9	max	.002	3	-.007	15	0	1	0	1	NC	15	NC	1
322			min	-.002	2	-.192	1	0	1	0	1	405.057	1	NC	1
323		10	max	.003	3	-.009	15	0	1	0	1	8762.835	15	NC	1
324			min	-.003	2	-.238	1	0	1	0	1	326.242	1	NC	1
325		11	max	.003	3	-.011	15	0	1	0	1	7251.54	15	NC	1
326			min	-.003	2	-.288	1	0	1	0	1	269.642	1	NC	1
327		12	max	.003	3	-.013	15	0	1	0	1	6127.632	15	NC	1
328			min	-.003	2	-.341	1	0	1	0	1	227.625	1	NC	1
329		13	max	.003	3	-.015	15	0	1	0	1	5268.018	15	NC	1
330			min	-.003	2	-.397	1	0	1	0	1	195.536	1	NC	1
331		14	max	.004	3	-.017	15	0	1	0	1	4595.779	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	2	-.455	1	0	1	0	1	170.471	1	NC	1
333		15	max	.004	3	-.019	15	0	1	0	1	4059.955	15	NC	1
334			min	-.004	2	-.516	1	0	1	0	1	150.512	1	NC	1
335		16	max	.004	3	-.021	15	0	1	0	1	3626	15	NC	1
336			min	-.004	2	-.578	1	0	1	0	1	134.362	1	NC	1
337		17	max	.004	3	-.024	15	0	1	0	1	3269.765	15	NC	1
338			min	-.005	2	-.641	1	0	1	0	1	121.114	1	NC	1
339		18	max	.005	3	-.026	15	0	1	0	1	2973.884	15	NC	1
340			min	-.005	2	-.705	1	0	1	0	1	110.118	1	NC	1
341		19	max	.005	3	-.028	15	0	1	0	1	2725.703	15	NC	1
342			min	-.005	2	-.769	1	0	1	0	1	100.9	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	1.393e-3	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-3.41e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	1.934e-3	3	NC	2	NC	1
348			min	0	2	-.008	1	0	3	-4.813e-3	2	9291.674	1	NC	1
349		4	max	0	3	0	15	.001	1	1.716e-3	3	NC	4	NC	1
350			min	0	2	-.019	1	-.001	3	-4.429e-3	2	4118.618	1	NC	1
351		5	max	0	3	-.001	15	.002	1	1.499e-3	3	NC	5	NC	1
352			min	0	2	-.033	1	-.002	3	-4.045e-3	2	2341.681	1	NC	1
353		6	max	0	3	-.002	15	.003	1	1.282e-3	3	NC	5	NC	1
354			min	0	2	-.051	1	-.003	3	-3.66e-3	2	1521.53	1	NC	1
355		7	max	0	3	-.003	15	.004	1	1.064e-3	3	NC	5	NC	1
356			min	0	2	-.072	1	-.004	3	-3.276e-3	2	1075.146	1	NC	1
357		8	max	0	3	-.004	15	.005	1	8.467e-4	3	NC	5	NC	1
358			min	0	2	-.096	1	-.005	3	-2.892e-3	2	805.012	1	NC	1
359		9	max	0	3	-.005	15	.006	1	6.293e-4	3	NC	5	NC	1
360			min	0	2	-.123	1	-.006	3	-2.508e-3	2	628.701	1	NC	1
361		10	max	0	3	-.006	15	.007	1	4.119e-4	3	NC	15	NC	1
362			min	0	2	-.153	1	-.006	3	-2.123e-3	2	507.221	1	NC	1
363		11	max	0	3	-.007	15	.007	1	1.945e-4	3	NC	15	NC	1
364			min	-.001	2	-.185	1	-.006	3	-1.739e-3	2	419.774	1	NC	1
365		12	max	.001	3	-.009	15	.008	1	-1.308e-5	15	8778.926	15	NC	1
366			min	-.001	2	-.219	1	-.006	3	-1.355e-3	2	354.735	1	NC	1
367		13	max	.001	3	-.01	15	.009	1	-4.932e-6	15	7550.818	15	NC	1
368			min	-.001	2	-.254	1	-.005	3	-9.707e-4	2	304.986	1	NC	1
369		14	max	.001	3	-.012	15	.009	1	4.508e-5	9	6589.754	15	NC	1
370			min	-.001	2	-.292	1	-.004	3	-5.865e-4	2	266.078	1	NC	1
371		15	max	.001	3	-.013	15	.009	1	1.607e-4	9	5823.279	15	NC	1
372			min	-.001	2	-.33	1	-.002	3	-6.752e-4	3	235.064	1	NC	1
373		16	max	.001	3	-.015	15	.008	1	4.233e-4	1	5202.22	15	NC	1
374			min	-.002	2	-.37	1	0	15	-8.926e-4	3	209.945	1	NC	1
375		17	max	.001	3	-.017	15	.008	1	7.549e-4	1	4692.176	15	NC	1
376			min	-.002	2	-.41	1	0	15	-1.11e-3	3	189.323	1	NC	1
377		18	max	.002	3	-.018	15	.009	3	1.086e-3	1	4268.388	15	NC	1
378			min	-.002	2	-.451	1	0	15	-1.327e-3	3	172.195	1	8500.058	3
379		19	max	.002	3	-.02	15	.015	3	1.418e-3	1	3912.804	15	NC	1
380			min	-.002	2	-.492	1	0	10	-1.545e-3	3	157.828	1	5350.288	3
381	M3	1	max	.004	1	0	15	0	3	1.902e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	1	-7.085e-4	3	NC	1	NC	1
383		2	max	.003	1	-.002	15	.009	3	2.207e-3	2	NC	1	NC	4
384			min	0	15	-.033	1	-.02	2	-8.488e-4	3	NC	1	3742.487	2
385		3	max	.003	3	-.003	15	.017	3	2.512e-3	2	NC	1	NC	4
386			min	0	15	-.065	1	-.04	2	-9.891e-4	3	NC	1	1885.692	2
387		4	max	.003	3	-.005	15	.025	3	2.817e-3	2	NC	1	NC	4
388			min	0	15	-.096	1	-.059	2	-1.129e-3	3	NC	1	1275.193	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	.032	3	3.122e-3	2	NC	1	NC	5
390			min	0	10	-.127	1	-.076	2	-1.27e-3	3	NC	1	976.816	2
391		6	max	.004	3	-.008	15	.039	3	3.427e-3	2	NC	1	NC	5
392			min	0	10	-.158	1	-.093	2	-1.41e-3	3	NC	1	803.989	2
393		7	max	.004	3	-.009	15	.045	3	3.732e-3	2	NC	1	NC	5
394			min	-.001	2	-.189	1	-.107	2	-1.55e-3	3	8990.605	4	694.8	2
395		8	max	.005	3	-.011	15	.05	3	4.037e-3	2	NC	1	NC	5
396			min	-.002	2	-.22	1	-.119	2	-1.691e-3	3	8301.976	4	623.053	2
397		9	max	.005	3	-.012	15	.054	3	4.342e-3	2	NC	1	NC	5
398			min	-.003	2	-.25	1	-.128	2	-1.831e-3	3	7931.316	4	576.075	2
399		10	max	.005	3	-.013	15	.057	3	4.647e-3	2	NC	1	NC	5
400			min	-.003	2	-.28	1	-.135	2	-1.971e-3	3	7814.056	4	547.409	2
401		11	max	.005	3	-.014	15	.058	3	4.952e-3	2	NC	1	NC	5
402			min	-.004	2	-.31	1	-.138	2	-2.111e-3	3	7931.316	4	534.02	2
403		12	max	.006	3	-.016	15	.058	3	5.257e-3	2	NC	1	NC	5
404			min	-.005	2	-.34	1	-.137	2	-2.252e-3	3	8301.976	4	535.288	2
405		13	max	.006	3	-.017	15	.056	3	5.563e-3	2	NC	1	NC	5
406			min	-.005	2	-.37	1	-.131	2	-2.392e-3	3	8990.605	4	552.987	2
407		14	max	.006	3	-.018	15	.052	3	5.868e-3	2	NC	1	NC	5
408			min	-.006	2	-.399	1	-.121	2	-2.532e-3	3	NC	1	592.387	2
409		15	max	.007	3	-.018	15	.047	3	6.173e-3	2	NC	1	NC	5
410			min	-.007	2	-.428	1	-.106	2	-2.673e-3	3	NC	1	665.692	2
411		16	max	.007	3	-.019	15	.039	3	6.478e-3	2	NC	1	NC	5
412			min	-.008	2	-.457	1	-.086	2	-2.813e-3	3	NC	1	802.845	2
413		17	max	.007	3	-.02	15	.029	3	6.783e-3	2	NC	1	NC	5
414			min	-.008	2	-.486	1	-.059	2	-2.953e-3	3	NC	1	1095.195	2
415		18	max	.007	3	-.021	15	.016	3	7.088e-3	2	NC	1	NC	4
416			min	-.009	2	-.515	1	-.027	2	-3.094e-3	3	NC	1	2001.608	2
417		19	max	.008	3	-.022	15	.016	1	7.393e-3	2	NC	1	NC	1
418			min	-.01	2	-.544	1	0	12	-3.234e-3	3	NC	1	NC	1
419	M6	1	max	.006	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.003	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	-.052	1	0	1	0	1	NC	1	NC	1
423		3	max	.006	3	-.004	15	0	1	0	1	NC	1	NC	1
424			min	0	10	-.101	1	0	1	0	1	NC	1	NC	1
425		4	max	.007	3	-.007	15	0	1	0	1	NC	1	NC	1
426			min	-.002	2	-.151	1	0	1	0	1	NC	1	NC	1
427		5	max	.008	3	-.009	15	0	1	0	1	NC	1	NC	1
428			min	-.004	2	-.2	1	0	1	0	1	NC	1	NC	1
429		6	max	.009	3	-.011	15	0	1	0	1	NC	1	NC	1
430			min	-.006	2	-.248	1	0	1	0	1	NC	1	NC	1
431		7	max	.01	3	-.013	15	0	1	0	1	NC	1	NC	1
432			min	-.008	2	-.297	1	0	1	0	1	8990.605	4	NC	1
433		8	max	.011	3	-.015	15	0	1	0	1	NC	1	NC	1
434			min	-.01	2	-.345	1	0	1	0	1	8301.976	4	NC	1
435		9	max	.012	3	-.016	15	0	1	0	1	NC	1	NC	1
436			min	-.012	2	-.394	1	0	1	0	1	7931.316	4	NC	1
437		10	max	.013	3	-.018	15	0	1	0	1	NC	1	NC	1
438			min	-.014	2	-.442	1	0	1	0	1	7814.056	4	NC	1
439		11	max	.014	3	-.02	15	0	1	0	1	NC	1	NC	1
440			min	-.015	2	-.489	1	0	1	0	1	7931.316	4	NC	1
441		12	max	.015	3	-.022	15	0	1	0	1	NC	1	NC	1
442			min	-.017	2	-.537	1	0	1	0	1	8301.976	4	NC	1
443		13	max	.016	3	-.023	15	0	1	0	1	NC	1	NC	1
444			min	-.019	2	-.584	1	0	1	0	1	8990.605	4	NC	1
445		14	max	.017	3	-.025	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	-.021	2	-.631	1	0	1	0	1	NC	1	NC	1
447		15	max	.018	3	-.026	15	0	1	0	1	NC	1	NC	1
448			min	-.023	2	-.678	1	0	1	0	1	NC	1	NC	1
449		16	max	.019	3	-.028	15	0	1	0	1	NC	1	NC	1
450			min	-.025	2	-.725	1	0	1	0	1	NC	1	NC	1
451		17	max	.021	3	-.029	15	0	1	0	1	NC	1	NC	1
452			min	-.027	2	-.772	1	0	1	0	1	NC	1	NC	1
453		18	max	.022	3	-.03	15	0	1	0	1	NC	1	NC	1
454			min	-.029	2	-.818	1	0	1	0	1	NC	1	NC	1
455		19	max	.023	3	-.032	15	0	1	0	1	NC	1	NC	1
456			min	-.031	2	-.865	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.004	1	0	15	0	1	7.085e-4	3	NC	1	NC	1
458			min	0	15	-.002	1	0	3	-1.902e-3	2	NC	1	NC	1
459		2	max	.003	1	-.002	15	.02	2	8.488e-4	3	NC	1	NC	4
460			min	0	15	-.033	1	-.009	3	-2.207e-3	2	NC	1	3742.487	2
461		3	max	.003	3	-.003	15	.04	2	9.891e-4	3	NC	1	NC	4
462			min	0	15	-.065	1	-.017	3	-2.512e-3	2	NC	1	1885.692	2
463		4	max	.003	3	-.005	15	.059	2	1.129e-3	3	NC	1	NC	4
464			min	0	15	-.096	1	-.025	3	-2.817e-3	2	NC	1	1275.193	2
465		5	max	.004	3	-.006	15	.076	2	1.27e-3	3	NC	1	NC	5
466			min	0	10	-.127	1	-.032	3	-3.122e-3	2	NC	1	976.816	2
467		6	max	.004	3	-.008	15	.093	2	1.41e-3	3	NC	1	NC	5
468			min	0	10	-.158	1	-.039	3	-3.427e-3	2	NC	1	803.989	2
469		7	max	.004	3	-.009	15	.107	2	1.55e-3	3	NC	1	NC	5
470			min	-.001	2	-.189	1	-.045	3	-3.732e-3	2	8990.605	4	694.8	2
471		8	max	.005	3	-.011	15	.119	2	1.691e-3	3	NC	1	NC	5
472			min	-.002	2	-.22	1	-.05	3	-4.037e-3	2	8301.976	4	623.053	2
473		9	max	.005	3	-.012	15	.128	2	1.831e-3	3	NC	1	NC	5
474			min	-.003	2	-.25	1	-.054	3	-4.342e-3	2	7931.316	4	576.075	2
475		10	max	.005	3	-.013	15	.135	2	1.971e-3	3	NC	1	NC	5
476			min	-.003	2	-.28	1	-.057	3	-4.647e-3	2	7814.056	4	547.409	2
477		11	max	.005	3	-.014	15	.138	2	2.111e-3	3	NC	1	NC	5
478			min	-.004	2	-.31	1	-.058	3	-4.952e-3	2	7931.316	4	534.02	2
479		12	max	.006	3	-.016	15	.137	2	2.252e-3	3	NC	1	NC	5
480			min	-.005	2	-.34	1	-.058	3	-5.257e-3	2	8301.976	4	535.288	2
481		13	max	.006	3	-.017	15	.131	2	2.392e-3	3	NC	1	NC	5
482			min	-.005	2	-.37	1	-.056	3	-5.563e-3	2	8990.605	4	552.987	2
483		14	max	.006	3	-.018	15	.121	2	2.532e-3	3	NC	1	NC	5
484			min	-.006	2	-.399	1	-.052	3	-5.868e-3	2	NC	1	592.387	2
485		15	max	.007	3	-.018	15	.106	2	2.673e-3	3	NC	1	NC	5
486			min	-.007	2	-.428	1	-.047	3	-6.173e-3	2	NC	1	665.692	2
487		16	max	.007	3	-.019	15	.086	2	2.813e-3	3	NC	1	NC	5
488			min	-.008	2	-.457	1	-.039	3	-6.478e-3	2	NC	1	802.845	2
489		17	max	.007	3	-.02	15	.059	2	2.953e-3	3	NC	1	NC	5
490			min	-.008	2	-.486	1	-.029	3	-6.783e-3	2	NC	1	1095.195	2
491		18	max	.007	3	-.021	15	.027	2	3.094e-3	3	NC	1	NC	4
492			min	-.009	2	-.515	1	-.016	3	-7.088e-3	2	NC	1	2001.608	2
493		19	max	.008	3	-.022	15	0	12	3.234e-3	3	NC	1	NC	1
494			min	-.01	2	-.544	1	-.016	1	-7.393e-3	2	NC	1	NC	1