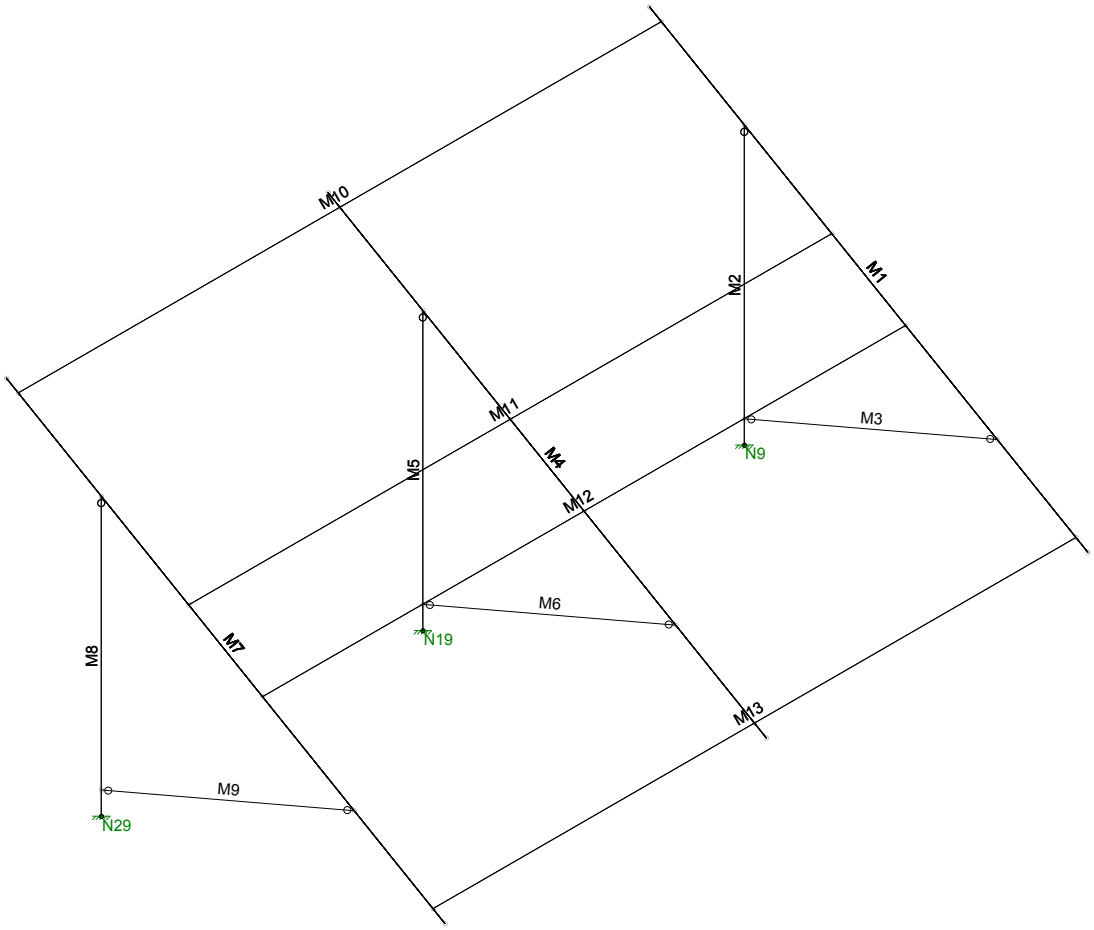


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

1.1 Project Description

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

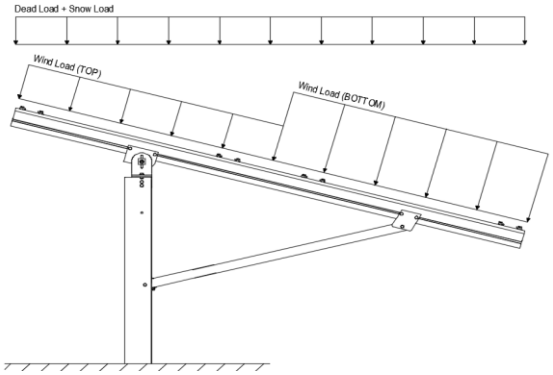
1.2 Construction

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

PV modules are required to meet the following specifications:

	Maximum		Minimum	
Height =	2000	mm	1900	mm
Width =	1050	mm	970	mm
Dead Load =	3.00	psf	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 7-05 - Chapter 6, Wind Loads
- ASCE 7-05 - Chapter 7, Snow Loads
- ASCE 7-05 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2003, 2006, 2009
- Aluminum Design Manual, Eighth Edition, 2005

2. LOAD ACTIONS

2.1 Permanent Loads

g_{MAX} =	3.00	psf	*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 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.73		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	100	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	15.70	psf	*Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

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 + 0.8W
1.2D + 1.6W + 0.5S
0.9D + 1.6W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

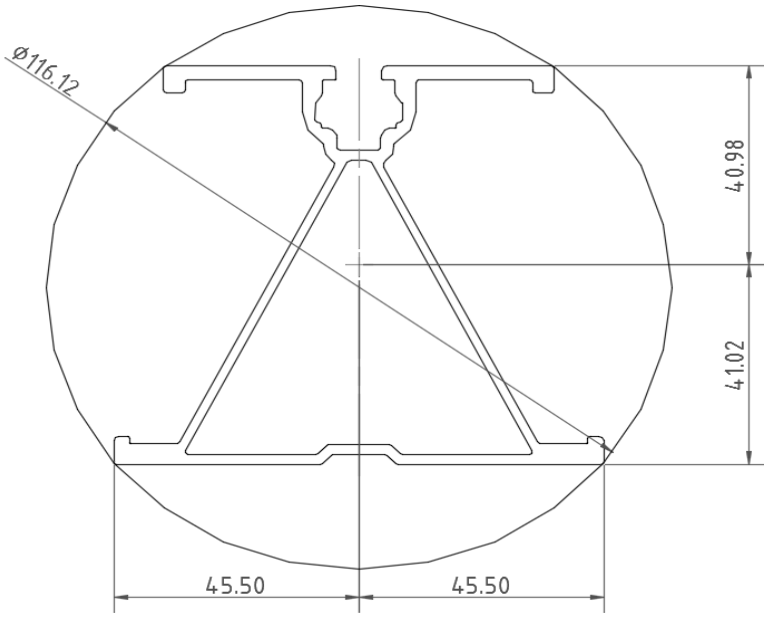
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	114	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 =	1.859	k-ft
M_z =	0.068	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	73%	

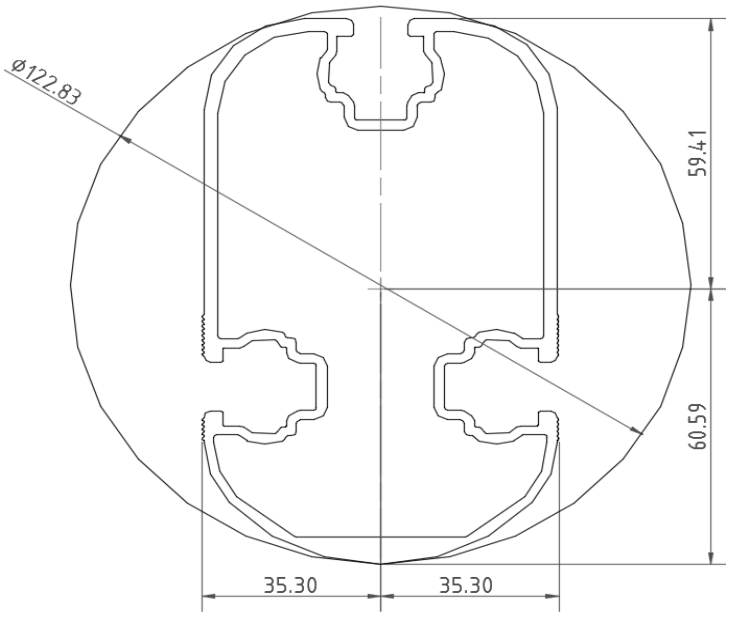


DETAIL VIEW

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 =	4.299	k-ft
M_z =	0.000	k-ft
P_n =	1.477	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	89%	

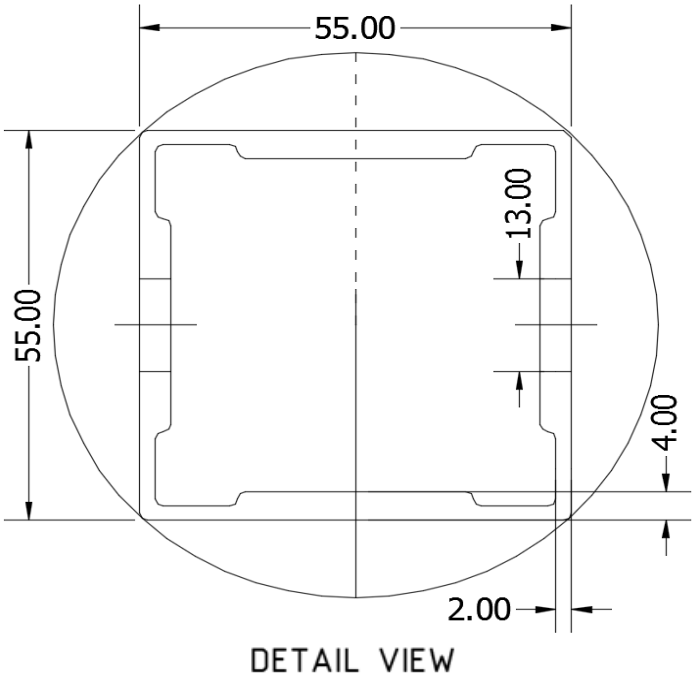


DETAIL VIEW

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).

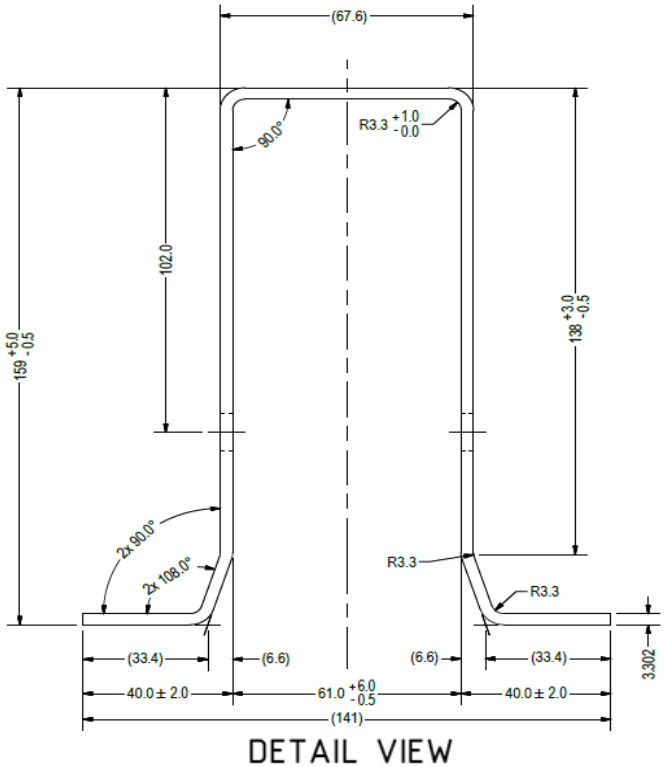
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.095	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 =	11.535	k-ft
M_z =	0.000	k-ft
P_r =	6.288	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	86%	



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 =	6.75	k
Maximum Lateral Load =	4.07	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

Lateral Force @ Top of Pole, P =	1.05	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

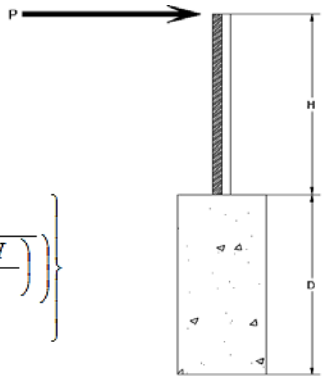
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.05	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 =	5.66	
Required Footing Depth, D =	9.75	ft

2nd Trial @ D_2 =	6.50	ft
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	1.30	ksf
Constant 2.34P/(S_1B), A =	2.83	
Required Footing Depth, D =	6.10	ft

3rd Trial @ D_3 =	6.30	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.26	ksf
Constant 2.34P/(S_1B), A =	2.92	
Required Footing Depth, D =	6.22	ft

4th Trial @ D_4 =	6.26	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 =	2.94	
Required Footing Depth, D =	6.25	ft

5th Trial @ D_5 =	6.26	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 =	2.94	
Required Footing Depth, D =	6.50	ft

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

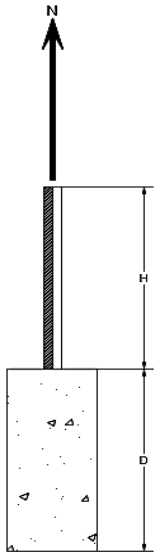
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.23	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 =	2.10	k
Required Concrete Volume, V =	14.47	ft^3
Required Footing Depth, D =	4.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.99
2	0.4	0.2	118.10	6.89
3	0.6	0.2	118.10	6.79
4	0.8	0.2	118.10	6.68
5	1	0.2	118.10	6.58
6	1.2	0.2	118.10	6.47
7	1.4	0.2	118.10	6.37
8	1.6	0.2	118.10	6.27
9	1.8	0.2	118.10	6.16
10	2	0.2	118.10	6.06
11	2.2	0.2	118.10	5.96
12	2.4	0.2	118.10	5.85
13	2.6	0.2	118.10	5.75
14	2.8	0.2	118.10	5.64
15	3	0.2	118.10	5.54
16	3.2	0.2	118.10	5.44
17	3.4	0.2	118.10	5.33
18	3.6	0.2	118.10	5.23
19	3.8	0.2	118.10	5.13
20	4	0.2	118.10	5.02
21	4.2	0.2	118.10	4.92
22	4.4	0.2	118.10	4.81
23	4.6	0.2	118.10	4.71
24	4.8	0.2	118.10	4.61
25	0	0.0	0.00	4.61
26	0	0.0	0.00	4.61
27	0	0.0	0.00	4.61
28	0	0.0	0.00	4.61
29	0	0.0	0.00	4.61
30	0	0.0	0.00	4.61
31	0	0.0	0.00	4.61
32	0	0.0	0.00	4.61
33	0	0.0	0.00	4.61
34	0	0.0	0.00	4.61
Max	4.8	Sum	1.13	

A 2ft diameter x 4.75ft 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 =	6.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.34	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	21.99	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

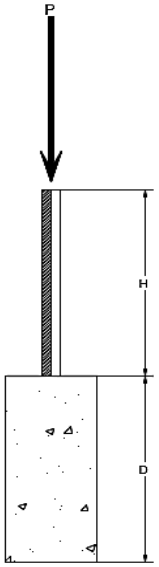
Weight of Concrete

Footing Volume	20.42	ft^3
Weight	2.96	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.30	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.68	k
Applied Force =	7.30	k
Utilization =	68%	

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



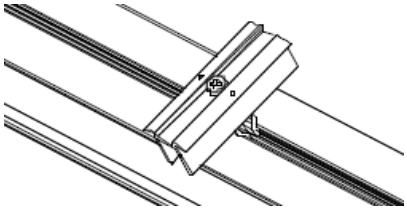
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

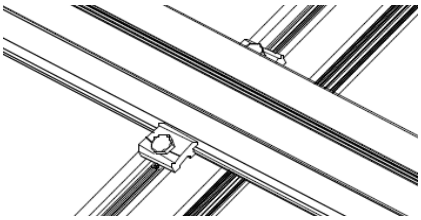
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.635 k
Allowable Uplift	=	1.214 k
Utilization	=	52%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.145 k
Allowable Uplift	=	2.180 k
Utilization	=	98%

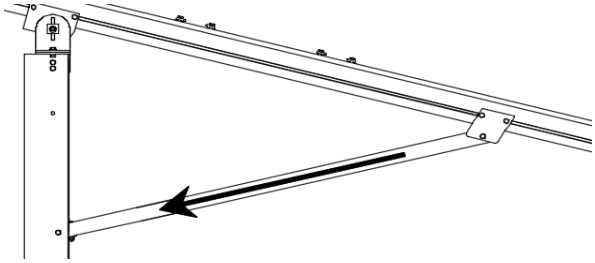


6.2 Strut Connections

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

Maximum Axial Load	=	5.095 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)

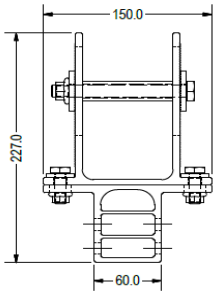


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

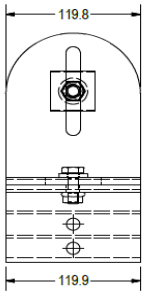
6.3 Girder to Post Connection

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.

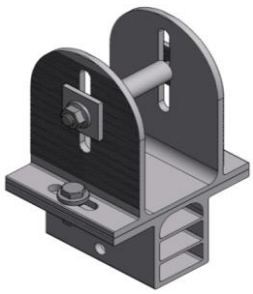
Maximum Tensile Load	=	4.424 k
Allowable Load	=	5.649 k
Utilization	=	78%



FRONT VIEW



SIDE VIEW



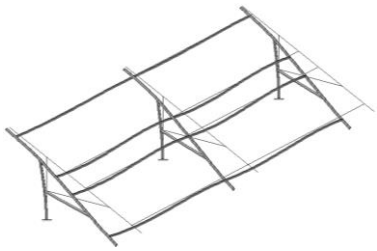
7. SEISMIC DESIGN

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 =	114 in	L_b =	114
J =	0.432	J =	0.432
	315.377		200.561
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	27.5 ksi	φF_L=	28.8
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 81.7717 in
J = 1.98
105.231

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 81.7717
J = 1.98
114.202

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= φb[Bt-Dt*√(Rb/t)]

φF_L= 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L St$= 30.1 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

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

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

$M_{max}Wk$ = 3.499 k-ft

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 74.8031 in

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$S2 = C_t$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 74.8031

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

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

φF_L = 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

φF_L = 33.25 ksi

φF_L = 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 =	6.29	k	(LRFD Factored Load)
Mr (Strong) =	11.54	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 =	0.27	≥	0.2	
Utilization =	0.86	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.270	≥	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 86%

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	-59.239	-59.239	0	0
2	M11	y	-59.239	-59.239	0	0
3	M12	y	-95.298	-95.298	0	0
4	M13	y	-95.298	-95.298	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	118.478	118.478	0	0
2	M11	y	118.478	118.478	0	0
3	M12	y	56.664	56.664	0	0
4	M13	y	56.664	56.664	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 + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8																
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6																
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6														
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3														
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3														
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25														
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25														

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...
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 1.0W	Yes	Y		1	1			4	1														
11	ASD 1.0D + 0.75L + 0.75W + 0....	Yes	Y		1	1	3	.75	4	.75														
12	ASD 0.6D + 1.0W	Yes	Y		2	.6					5	1												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	796.69	2	2398.595	1	170.219	2	.27	1	.006	3	6.668	1
2		min	-1123.488	3	-1667.831	3	-193.68	3	-.3	3	-.014	2	.285	15
3	N19	max	3104.545	2	6505.827	2	0	3	0	1	0	15	11.312	1
4		min	-3077.34	3	-5182.34	3	0	2	0	3	0	3	.447	15
5	N29	max	796.69	2	2398.595	1	193.68	3	.3	3	.014	2	6.668	1
6		min	-1123.488	3	-1667.831	3	-170.219	2	-.27	1	-.006	3	.285	15
7	Totals:	max	4697.925	2	11256.841	2	0	3						
8		min	-5324.317	3	-8518.001	3	0	2						

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	-10.462	15	311.705	3	-6.269	15	.05	3	.34	1	.268	2
4			min	-229.879	1	-727.789	2	-156.656	1	-.235	2	.014	15	-.111	3
5		3	max	-10.738	15	310.517	3	-6.269	15	.05	3	.237	1	.746	2
6			min	-230.793	1	-729.374	2	-156.656	1	-.235	2	.01	15	-.315	3
7		4	max	-11.014	15	309.328	3	-6.269	15	.05	3	.134	1	1.225	2
8			min	-231.708	1	-730.958	2	-156.656	1	-.235	2	.006	15	-.519	3
9		5	max	411.208	3	684.991	2	4.015	3	.038	2	.169	1	1.445	2
10			min	-1185.469	2	-280.413	3	-199.925	1	-.065	3	-.037	3	-.613	3
11		6	max	410.522	3	683.407	2	4.015	3	.038	2	.056	2	.996	2
12			min	-1186.383	2	-281.601	3	-199.925	1	-.065	3	-.035	3	-.429	3
13		7	max	409.836	3	681.822	2	4.015	3	.038	2	-.004	15	.548	2
14			min	-1187.298	2	-282.789	3	-199.925	1	-.065	3	-.093	1	-.243	3
15		8	max	409.15	3	680.238	2	4.015	3	.038	2	-.009	15	.101	2
16			min	-1188.213	2	-283.978	3	-199.925	1	-.065	3	-.224	1	-.058	3
17		9	max	383.569	3	7.932	3	18.721	3	-.002	15	.113	1	.033	3
18			min	-1381.952	1	-17.771	2	-247.015	1	-.171	2	.005	15	-.105	2
19		10	max	382.882	3	6.744	3	18.721	3	-.002	15	.059	3	.028	3
20			min	-1382.867	1	-19.356	2	-247.015	1	-.171	2	-.053	2	-.092	2
21		11	max	382.196	3	5.555	3	18.721	3	-.002	15	.071	3	.024	3
22			min	-1383.781	1	-20.94	2	-247.015	1	-.171	2	-.211	1	-.079	2
23		12	max	351.641	3	724.631	3	54.081	2	.28	3	.16	1	.092	1
24			min	-1622.742	1	-486.975	2	-222.854	3	-.252	2	.007	15	-.208	3
25		13	max	350.955	3	723.443	3	54.081	2	.28	3	.151	1	.411	2
26			min	-1623.657	1	-488.56	2	-222.854	3	-.252	2	-.041	3	-.683	3
27		14	max	350.269	3	722.254	3	54.081	2	.28	3	.141	1	.733	2
28			min	-1624.572	1	-490.144	2	-222.854	3	-.252	2	-.187	3	-1.157	3
29		15	max	349.583	3	721.066	3	54.081	2	.28	3	.175	2	1.055	2
30			min	-1625.487	1	-491.728	2	-222.854	3	-.252	2	-.334	3	-1.631	3
31		16	max	232.184	1	485.215	2	-5.681	15	.203	2	.031	3	.803	2
32			min	11.057	15	-741.688	3	-130.925	1	-.429	3	-.187	1	-1.245	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
33		17	max	231.269	1	483.63	2	-5.681	15	.203	2	-.002	3	.485	2
34			min	10.781	15	-742.876	3	-130.925	1	-.429	3	-.273	1	-.758	3
35		18	max	230.354	1	482.046	2	-5.681	15	.203	2	-.015	15	.168	2
36			min	10.505	15	-744.064	3	-130.925	1	-.429	3	-.359	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	.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	-8.442	12	992.439	3	0	1	0	1	0	1	.637	2
42			min	-384.708	1	-2048.303	2	0	1	0	1	0	1	-.319	3
43		3	max	-8.899	12	991.25	3	0	1	0	1	0	1	1.981	2
44			min	-385.622	1	-2049.888	2	0	1	0	1	0	1	-.969	3
45		4	max	-9.357	12	990.062	3	0	1	0	1	0	1	3.327	2
46			min	-386.537	1	-2051.472	2	0	1	0	1	0	1	-1.619	3
47		5	max	1493.541	3	2023.166	2	0	1	0	1	0	1	3.925	2
48			min	-3238.432	2	-1017.86	3	0	1	0	1	0	1	-1.9	3
49		6	max	1492.855	3	2021.581	2	0	1	0	1	0	1	2.598	2
50			min	-3239.347	2	-1019.048	3	0	1	0	1	0	1	-1.232	3
51		7	max	1492.169	3	2019.997	2	0	1	0	1	0	1	1.272	2
52			min	-3240.262	2	-1020.236	3	0	1	0	1	0	1	-.563	3
53		8	max	1491.483	3	2018.412	2	0	1	0	1	0	1	.107	3
54			min	-3241.177	2	-1021.425	3	0	1	0	1	0	1	-.075	1
55		9	max	1481.091	3	10.239	3	0	1	0	1	0	1	.423	3
56			min	-3359.759	2	-101.733	2	0	1	0	1	0	1	-.671	2
57		10	max	1480.405	3	9.051	3	0	1	0	1	0	1	.416	3
58			min	-3360.674	2	-103.317	2	0	1	0	1	0	1	-.604	2
59		11	max	1479.719	3	7.862	3	0	1	0	1	0	1	.411	3
60			min	-3361.589	2	-104.902	2	0	1	0	1	0	1	-.535	2
61		12	max	1479.276	3	2059.707	3	0	1	0	1	0	1	.043	1
62			min	-3672.81	1	-1589.947	2	0	1	0	1	0	1	-.248	3
63		13	max	1478.59	3	2058.519	3	0	1	0	1	0	1	1.053	1
64			min	-3673.725	1	-1591.532	2	0	1	0	1	0	1	-1.599	3
65		14	max	1477.904	3	2057.331	3	0	1	0	1	0	1	2.078	2
66			min	-3674.64	1	-1593.116	2	0	1	0	1	0	1	-2.95	3
67		15	max	1477.218	3	2056.142	3	0	1	0	1	0	1	3.124	2
68			min	-3675.554	1	-1594.701	2	0	1	0	1	0	1	-4.299	3
69		16	max	385.585	1	1454.866	2	0	1	0	1	0	1	2.379	2
70			min	11.843	12	-2005.648	3	0	1	0	1	0	1	-3.263	3
71		17	max	384.671	1	1453.282	2	0	1	0	1	0	1	1.425	2
72			min	11.385	12	-2006.836	3	0	1	0	1	0	1	-1.947	3
73		18	max	383.756	1	1451.697	2	0	1	0	1	0	1	.471	2
74			min	10.928	12	-2008.024	3	0	1	0	1	0	1	-.63	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	-10.462	15	311.705	3	156.656	1	.235	2	-.014	15	.268	2
80			min	-229.879	1	-727.789	2	6.269	15	-.05	3	-.34	1	-.111	3
81		3	max	-10.738	15	310.517	3	156.656	1	.235	2	-.01	15	.746	2
82			min	-230.793	1	-729.374	2	6.269	15	-.05	3	-.237	1	-.315	3
83		4	max	-11.014	15	309.328	3	156.656	1	.235	2	-.006	15	1.225	2
84			min	-231.708	1	-730.958	2	6.269	15	-.05	3	-.134	1	-.519	3
85		5	max	411.208	3	684.991	2	199.925	1	.065	3	.037	3	1.445	2
86			min	-1185.469	2	-280.413	3	-4.015	3	-.038	2	-.169	1	-.613	3
87		6	max	410.522	3	683.407	2	199.925	1	.065	3	.035	3	.996	2
88			min	-1186.383	2	-281.601	3	-4.015	3	-.038	2	-.056	2	-.429	3
89		7	max	409.836	3	681.822	2	199.925	1	.065	3	.093	1	.548	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	-1187.298	2	-282.789	3	-4.015	3	-.038	2	.004	15	-.243	3
91		8	max	409.15	3	680.238	2	199.925	1	.065	3	.224	1	.101	2
92			min	-1188.213	2	-283.978	3	-4.015	3	-.038	2	.009	15	-.058	3
93		9	max	383.569	3	7.932	3	247.015	1	.171	2	-.005	15	.033	3
94			min	-1381.952	1	-17.771	2	-18.721	3	.002	15	-.113	1	-.105	2
95		10	max	382.882	3	6.744	3	247.015	1	.171	2	.053	2	.028	3
96			min	-1382.867	1	-19.356	2	-18.721	3	.002	15	-.059	3	-.092	2
97		11	max	382.196	3	5.555	3	247.015	1	.171	2	.211	1	.024	3
98			min	-1383.781	1	-20.94	2	-18.721	3	.002	15	-.071	3	-.079	2
99		12	max	351.641	3	724.631	3	222.854	3	.252	2	-.007	15	.092	1
100			min	-1622.742	1	-486.975	2	-54.081	2	-.28	3	-.16	1	-.208	3
101		13	max	350.955	3	723.443	3	222.854	3	.252	2	.041	3	.411	2
102			min	-1623.657	1	-488.56	2	-54.081	2	-.28	3	-.151	1	-.683	3
103		14	max	350.269	3	722.254	3	222.854	3	.252	2	.187	3	.733	2
104			min	-1624.572	1	-490.144	2	-54.081	2	-.28	3	-.141	1	-1.157	3
105		15	max	349.583	3	721.066	3	222.854	3	.252	2	.334	3	1.055	2
106			min	-1625.487	1	-491.728	2	-54.081	2	-.28	3	-.175	2	-1.631	3
107		16	max	232.184	1	485.215	2	130.925	1	.429	3	.187	1	.803	2
108			min	11.057	15	-741.688	3	5.681	15	-.203	2	-.031	3	-1.245	3
109		17	max	231.269	1	483.63	2	130.925	1	.429	3	.273	1	.485	2
110			min	10.781	15	-742.876	3	5.681	15	-.203	2	.002	3	-.758	3
111		18	max	230.354	1	482.046	2	130.925	1	.429	3	.359	1	.168	2
112			min	10.505	15	-744.064	3	5.681	15	-.203	2	.015	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	130.978	1	480.404	2	-10.23	15	.007	2	.403	1	.203	2
116			min	5.681	15	-745.172	3	-229.885	1	-.021	3	.017	15	-.429	3
117		2	max	130.978	1	346.487	2	-8.062	15	.007	2	.185	1	.255	3
118			min	5.681	15	-550.801	3	-183.122	1	-.021	3	.007	15	-.235	1
119		3	max	130.978	1	212.571	2	-5.894	15	.007	2	.04	2	.734	3
120			min	5.681	15	-356.43	3	-136.36	1	-.021	3	-.004	9	-.528	2
121		4	max	130.978	1	78.654	2	-3.726	15	.007	2	0	10	1.007	3
122			min	5.681	15	-162.059	3	-89.598	1	-.021	3	-.103	1	-.682	2
123		5	max	130.978	1	32.313	3	-1.558	15	.007	2	-.008	15	1.076	3
124			min	5.681	15	-58.182	1	-42.836	1	-.021	3	-.173	1	-.694	2
125		6	max	130.978	1	226.684	3	8.459	9	.007	2	-.009	15	.939	3
126			min	5.681	15	-189.201	1	-11.762	2	-.021	3	-.194	1	-.565	2
127		7	max	130.978	1	421.055	3	50.689	1	.007	2	-.007	15	.597	3
128			min	5.681	15	-323.095	2	-2.734	10	-.021	3	-.165	1	-.295	2
129		8	max	130.978	1	615.426	3	97.451	1	.007	2	-.003	15	.133	1
130			min	5.681	15	-457.012	2	.804	12	-.021	3	-.087	1	.004	15
131		9	max	130.978	1	809.798	3	144.213	1	.007	2	.05	9	.679	1
132			min	5.681	15	-590.928	2	3.008	12	-.021	3	-.035	2	-.702	3
133		10	max	130.978	1	724.845	2	-5.211	12	.007	2	.218	1	1.364	2
134			min	5.681	15	-1004.169	3	-190.976	1	-.021	3	-.018	3	-1.659	3
135		11	max	130.978	1	590.928	2	-3.008	12	.021	3	.05	9	.679	1
136			min	5.681	15	-809.798	3	-144.213	1	-.007	2	-.035	2	-.702	3
137		12	max	130.978	1	457.012	2	-.804	12	.021	3	-.003	15	.133	1
138			min	5.681	15	-615.426	3	-97.451	1	-.007	2	-.087	1	.004	15
139		13	max	130.978	1	323.095	2	2.734	10	.021	3	-.007	15	.597	3
140			min	5.681	15	-421.055	3	-50.689	1	-.007	2	-.165	1	-.295	2
141		14	max	130.978	1	189.201	1	11.762	2	.021	3	-.009	15	.939	3
142			min	5.681	15	-226.684	3	-8.459	9	-.007	2	-.194	1	-.565	2
143		15	max	130.978	1	58.182	1	42.836	1	.021	3	-.008	15	1.076	3
144			min	5.681	15	-32.313	3	1.558	15	-.007	2	-.173	1	-.694	2
145		16	max	130.978	1	162.059	3	89.598	1	.021	3	0	10	1.007	3
146			min	5.681	15	-78.654	2	3.726	15	-.007	2	-.103	1	-.682	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	130.978	1	356.43	3	136.36	1	.021	3	.04	2	.734	3
148			min	5.681	15	-212.571	2	5.894	15	-.007	2	-.004	9	-.528	2
149		18	max	130.978	1	550.801	3	183.122	1	.021	3	.185	1	.255	3
150			min	5.681	15	-346.487	2	8.062	15	-.007	2	.007	15	-.235	1
151		19	max	130.978	1	745.172	3	229.885	1	.021	3	.403	1	.203	2
152			min	5.681	15	-480.404	2	10.23	15	-.007	2	.017	15	-.429	3
153	M11	1	max	232.496	1	463.926	2	-10.652	15	0	12	.459	1	.109	1
154			min	-241.387	3	-720.765	3	-238.841	1	-.009	1	.019	15	-.406	3
155		2	max	232.496	1	330.009	2	-8.484	15	0	12	.232	1	.253	3
156			min	-241.387	3	-526.394	3	-192.079	1	-.009	1	.009	15	-.338	2
157		3	max	232.496	1	196.093	2	-6.316	15	0	12	.054	1	.706	3
158			min	-241.387	3	-332.022	3	-145.317	1	-.009	1	.001	15	-.615	2
159		4	max	232.496	1	64.918	1	-4.148	15	0	12	.02	3	.954	3
160			min	-241.387	3	-137.651	3	-98.555	1	-.009	1	-.075	1	-.752	2
161		5	max	232.496	1	56.72	3	-1.98	15	0	12	.001	3	.996	3
162			min	-241.387	3	-71.74	2	-51.792	1	-.009	1	-.155	1	-.746	2
163		6	max	232.496	1	251.091	3	2.447	9	0	12	-.008	15	.834	3
164			min	-241.387	3	-205.657	2	-15.089	2	-.009	1	-.185	1	-.6	2
165		7	max	232.496	1	445.463	3	41.732	1	0	12	-.007	15	.466	3
166			min	-241.387	3	-339.573	2	-9.755	3	-.009	1	-.165	1	-.312	2
167		8	max	232.496	1	639.834	3	88.494	1	0	12	-.003	15	.117	2
168			min	-241.387	3	-473.49	2	-6.45	3	-.009	1	-.096	1	-.107	3
169		9	max	232.496	1	834.205	3	135.257	1	0	12	.037	9	.687	2
170			min	-241.387	3	-607.406	2	-3.144	3	-.009	1	-.042	2	-.884	3
171		10	max	232.496	1	-20.54	15	182.019	1	.009	1	.189	1	1.399	2
172			min	-241.387	3	-1028.576	3	-.546	12	0	12	-.042	3	-1.868	3
173		11	max	232.496	1	607.406	2	3.144	3	.009	1	.037	9	.687	2
174			min	-241.387	3	-834.205	3	-135.257	1	0	12	-.042	2	-.884	3
175		12	max	232.496	1	473.49	2	6.45	3	.009	1	-.003	15	.117	2
176			min	-241.387	3	-639.834	3	-88.494	1	0	12	-.096	1	-.107	3
177		13	max	232.496	1	339.573	2	9.755	3	.009	1	-.007	15	.466	3
178			min	-241.387	3	-445.463	3	-41.732	1	0	12	-.165	1	-.312	2
179		14	max	232.496	1	205.657	2	15.089	2	.009	1	-.008	15	.834	3
180			min	-241.387	3	-251.091	3	-2.447	9	0	12	-.185	1	-.6	2
181		15	max	232.496	1	71.74	2	51.792	1	.009	1	.001	3	.996	3
182			min	-241.387	3	-56.72	3	1.98	15	0	12	-.155	1	-.746	2
183		16	max	232.496	1	137.651	3	98.555	1	.009	1	.02	3	.954	3
184			min	-241.387	3	-64.918	1	4.148	15	0	12	-.075	1	-.752	2
185		17	max	232.496	1	332.022	3	145.317	1	.009	1	.054	1	.706	3
186			min	-241.387	3	-196.093	2	6.316	15	0	12	.001	15	-.615	2
187		18	max	232.496	1	526.394	3	192.079	1	.009	1	.232	1	.253	3
188			min	-241.387	3	-330.009	2	8.484	15	0	12	.009	15	-.338	2
189		19	max	232.496	1	720.765	3	238.841	1	.009	1	.459	1	.109	1
190			min	-241.387	3	-463.926	2	10.652	15	0	12	.019	15	-.406	3
191	M12	1	max	14.746	3	695.625	2	-10.761	15	0	15	.484	1	.209	2
192			min	-46.015	1	-293.274	3	-242.845	1	-.006	1	.02	15	.003	15
193		2	max	14.746	3	500.809	2	-8.593	15	0	15	.252	1	.323	3
194			min	-46.015	1	-203.3	3	-196.083	1	-.006	1	.01	15	-.422	2
195		3	max	14.746	3	305.993	2	-6.425	15	0	15	.071	2	.49	3
196			min	-46.015	1	-113.325	3	-149.32	1	-.006	1	.002	15	-.848	2
197		4	max	14.746	3	111.177	2	-4.257	15	0	15	.01	10	.562	3
198			min	-46.015	1	-23.351	3	-102.558	1	-.006	1	-.063	1	-1.068	2
199		5	max	14.746	3	66.623	3	-2.089	15	0	15	-.006	12	.539	3
200			min	-46.015	1	-83.639	2	-55.796	1	-.006	1	-.146	1	-1.083	2
201		6	max	14.746	3	156.597	3	.9	9	0	15	-.008	15	.421	3
202			min	-46.015	1	-278.455	2	-19.381	2	-.006	1	-.181	1	-.892	2
203		7	max	14.746	3	246.572	3	37.729	1	0	15	-.007	15	.208	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	-46.015	1	-473.272	2	-5.91	10	-.006	1	-.165	1	-.495	2
205		8	max	14.746	3	336.546	3	84.491	1	0	15	-.003	15	.108	2
206			min	-46.015	1	-668.088	2	-1.775	3	-.006	1	-.101	1	-.099	3
207		9	max	14.746	3	426.52	3	131.253	1	0	15	.033	9	.916	2
208			min	-46.015	1	-862.904	2	1.258	12	-.006	1	-.051	2	-.502	3
209		10	max	14.746	3	1057.72	2	178.015	1	.003	3	.176	1	1.929	2
210			min	-46.015	1	-878.232	1	-58.834	2	-.006	1	-.028	10	-1	3
211		11	max	14.746	3	862.904	2	-1.258	12	.006	1	.033	9	.916	2
212			min	-46.015	1	-426.52	3	-131.253	1	0	15	-.051	2	-.502	3
213		12	max	14.746	3	668.088	2	1.775	3	.006	1	-.003	15	.108	2
214			min	-46.015	1	-336.546	3	-84.491	1	0	15	-.101	1	-.099	3
215		13	max	14.746	3	473.272	2	5.91	10	.006	1	-.007	15	.208	3
216			min	-46.015	1	-246.572	3	-37.729	1	0	15	-.165	1	-.495	2
217		14	max	14.746	3	278.455	2	19.381	2	.006	1	-.008	15	.421	3
218			min	-46.015	1	-156.597	3	-.9	9	0	15	-.181	1	-.892	2
219		15	max	14.746	3	83.639	2	55.796	1	.006	1	-.006	12	.539	3
220			min	-46.015	1	-66.623	3	2.089	15	0	15	-.146	1	-1.083	2
221		16	max	14.746	3	23.351	3	102.558	1	.006	1	.01	10	.562	3
222			min	-46.015	1	-111.177	2	4.257	15	0	15	-.063	1	-1.068	2
223		17	max	14.746	3	113.325	3	149.32	1	.006	1	.071	2	.49	3
224			min	-46.015	1	-305.993	2	6.425	15	0	15	.002	15	-.848	2
225		18	max	14.746	3	203.3	3	196.083	1	.006	1	.252	1	.323	3
226			min	-46.015	1	-500.809	2	8.593	15	0	15	.01	15	-.422	2
227		19	max	14.746	3	293.274	3	242.845	1	.006	1	.484	1	.209	2
228			min	-46.015	1	-695.625	2	10.761	15	0	15	.02	15	.003	15
229	M13	1	max	-6.268	15	727.157	2	-10.186	15	.007	3	.392	1	.235	2
230			min	-156.427	1	-312.916	3	-228.421	1	-.024	2	.016	15	-.05	3
231		2	max	-6.268	15	532.34	2	-8.018	15	.007	3	.176	1	.233	3
232			min	-156.427	1	-222.942	3	-181.659	1	-.024	2	.007	15	-.43	2
233		3	max	-6.268	15	337.524	2	-5.85	15	.007	3	.032	2	.421	3
234			min	-156.427	1	-132.968	3	-134.897	1	-.024	2	-.007	9	-.889	2
235		4	max	-6.268	15	142.708	2	-3.682	15	.007	3	.003	3	.514	3
236			min	-156.427	1	-42.994	3	-88.135	1	-.024	2	-.109	1	-1.143	2
237		5	max	-6.268	15	46.981	3	-1.514	15	.007	3	-.007	12	.512	3
238			min	-156.427	1	-52.108	2	-41.372	1	-.024	2	-.177	1	-1.19	2
239		6	max	-6.268	15	136.955	3	9.076	9	.007	3	-.009	15	.415	3
240			min	-156.427	1	-246.924	2	-10.31	2	-.024	2	-.196	1	-1.033	2
241		7	max	-6.268	15	226.929	3	52.152	1	.007	3	-.007	15	.223	3
242			min	-156.427	1	-441.74	2	-4.301	3	-.024	2	-.166	1	-.669	2
243		8	max	-6.268	15	316.903	3	98.914	1	.007	3	-.003	15	-.004	15
244			min	-156.427	1	-636.556	2	-.996	3	-.024	2	-.086	1	-.124	1
245		9	max	-6.268	15	406.878	3	145.677	1	.007	3	.05	9	.675	2
246			min	-156.427	1	-831.373	2	1.797	12	-.024	2	-.033	2	-.446	3
247		10	max	-6.268	15	1026.189	2	-4	12	.007	3	.221	1	1.655	2
248			min	-156.427	1	-496.852	3	-192.439	1	-.024	2	-.024	3	-.923	3
249		11	max	-6.268	15	831.373	2	-1.797	12	.024	2	.05	9	.675	2
250			min	-156.427	1	-406.878	3	-145.677	1	-.007	3	-.033	2	-.446	3
251		12	max	-6.268	15	636.556	2	.996	3	.024	2	-.003	15	-.004	15
252			min	-156.427	1	-316.903	3	-98.914	1	-.007	3	-.086	1	-.124	1
253		13	max	-6.268	15	441.74	2	4.301	3	.024	2	-.007	15	.223	3
254			min	-156.427	1	-226.929	3	-52.152	1	-.007	3	-.166	1	-.669	2
255		14	max	-6.268	15	246.924	2	10.31	2	.024	2	-.009	15	.415	3
256			min	-156.427	1	-136.955	3	-9.076	9	-.007	3	-.196	1	-1.033	2
257		15	max	-6.268	15	52.108	2	41.372	1	.024	2	-.007	12	.512	3
258			min	-156.427	1	-46.981	3	1.514	15	-.007	3	-.177	1	-1.19	2
259		16	max	-6.268	15	42.994	3	88.135	1	.024	2	.003	3	.514	3
260			min	-156.427	1	-142.708	2	3.682	15	-.007	3	-.109	1	-1.143	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	-6.268	15	132.968	3	134.897	1	.024	2	.032	2	.421	3
262			min	-156.427	1	-337.524	2	5.85	15	-.007	3	-.007	9	-.889	2
263		18	max	-6.268	15	222.942	3	181.659	1	.024	2	.176	1	.233	3
264			min	-156.427	1	-532.34	2	8.018	15	-.007	3	.007	15	-.43	2
265		19	max	-6.268	15	312.916	3	228.421	1	.024	2	.392	1	.235	2
266			min	-156.427	1	-727.157	2	10.186	15	-.007	3	.016	15	-.05	3
267	M2	1	max	2398.595	1	1122.804	3	170.393	2	.006	3	.3	3	6.668	1
268			min	-1667.831	3	-795.413	2	-193.531	3	-.014	2	-.27	1	.285	15
269		2	max	2395.323	1	1122.804	3	170.393	2	.006	3	.231	3	6.754	1
270			min	-1670.284	3	-795.413	2	-193.531	3	-.014	2	-.212	1	.282	15
271		3	max	1811.823	1	1144.146	1	119.799	2	.002	2	.178	3	6.577	1
272			min	-1389.927	3	47.258	15	-173.445	3	0	3	-.186	1	.272	15
273		4	max	1808.552	1	1144.146	1	119.799	2	.002	2	.116	3	6.166	1
274			min	-1392.38	3	47.258	15	-173.445	3	0	3	-.144	1	.255	15
275		5	max	1805.28	1	1144.146	1	119.799	2	.002	2	.054	3	5.755	1
276			min	-1394.834	3	47.258	15	-173.445	3	0	3	-.102	1	.238	15
277		6	max	1802.009	1	1144.146	1	119.799	2	.002	2	-.002	15	5.344	1
278			min	-1397.287	3	47.258	15	-173.445	3	0	3	-.06	1	.221	15
279		7	max	1798.737	1	1144.146	1	119.799	2	.002	2	.009	10	4.933	1
280			min	-1399.741	3	47.258	15	-173.445	3	0	3	-.071	3	.204	15
281		8	max	1795.466	1	1144.146	1	119.799	2	.002	2	.052	2	4.522	1
282			min	-1402.194	3	47.258	15	-173.445	3	0	3	-.133	3	.187	15
283		9	max	1792.194	1	1144.146	1	119.799	2	.002	2	.095	2	4.111	1
284			min	-1404.648	3	47.258	15	-173.445	3	0	3	-.196	3	.17	15
285		10	max	1788.923	1	1144.146	1	119.799	2	.002	2	.138	2	3.7	1
286			min	-1407.102	3	47.258	15	-173.445	3	0	3	-.258	3	.153	15
287		11	max	1785.651	1	1144.146	1	119.799	2	.002	2	.181	2	3.288	1
288			min	-1409.555	3	47.258	15	-173.445	3	0	3	-.32	3	.136	15
289		12	max	1782.38	1	1144.146	1	119.799	2	.002	2	.224	2	2.877	1
290			min	-1412.009	3	47.258	15	-173.445	3	0	3	-.383	3	.119	15
291		13	max	1779.108	1	1144.146	1	119.799	2	.002	2	.267	2	2.466	1
292			min	-1414.462	3	47.258	15	-173.445	3	0	3	-.445	3	.102	15
293		14	max	1775.837	1	1144.146	1	119.799	2	.002	2	.31	2	2.055	1
294			min	-1416.916	3	47.258	15	-173.445	3	0	3	-.507	3	.085	15
295		15	max	1772.566	1	1144.146	1	119.799	2	.002	2	.353	2	1.644	1
296			min	-1419.37	3	47.258	15	-173.445	3	0	3	-.57	3	.068	15
297		16	max	1769.294	1	1144.146	1	119.799	2	.002	2	.396	2	1.233	1
298			min	-1421.823	3	47.258	15	-173.445	3	0	3	-.632	3	.051	15
299		17	max	1766.023	1	1144.146	1	119.799	2	.002	2	.439	2	.822	1
300			min	-1424.277	3	47.258	15	-173.445	3	0	3	-.694	3	.034	15
301		18	max	1762.751	1	1144.146	1	119.799	2	.002	2	.482	2	.411	1
302			min	-1426.73	3	47.258	15	-173.445	3	0	3	-.757	3	.017	15
303		19	max	1759.48	1	1144.146	1	119.799	2	.002	2	.525	2	0	1
304			min	-1429.184	3	47.258	15	-173.445	3	0	3	-.819	3	0	1
305	M5	1	max	6505.827	2	3073.263	3	0	1	0	1	0	1	11.312	1
306			min	-5182.34	3	-3098.568	2	0	1	0	1	0	1	.447	15
307		2	max	6502.555	2	3073.263	3	0	1	0	1	0	1	11.98	1
308			min	-5184.793	3	-3098.568	2	0	1	0	1	0	1	.454	15
309		3	max	4703.715	1	2070.296	1	0	1	0	1	0	1	11.901	1
310			min	-4215.285	3	76.943	15	0	1	0	1	0	1	.442	15
311		4	max	4700.444	1	2070.296	1	0	1	0	1	0	1	11.157	1
312			min	-4217.739	3	76.943	15	0	1	0	1	0	1	.415	15
313		5	max	4697.172	1	2070.296	1	0	1	0	1	0	1	10.413	1
314			min	-4220.192	3	76.943	15	0	1	0	1	0	1	.387	15
315		6	max	4693.901	1	2070.296	1	0	1	0	1	0	1	9.669	1
316			min	-4222.646	3	76.943	15	0	1	0	1	0	1	.359	15
317		7	max	4690.629	1	2070.296	1	0	1	0	1	0	1	8.926	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	-4225.1	3	76.943	15	0	1	0	1	0	1	.332	15
319		8	max	4687.358	1	2070.296	1	0	1	0	1	0	1	8.182	1
320			min	-4227.553	3	76.943	15	0	1	0	1	0	1	.304	15
321		9	max	4684.087	1	2070.296	1	0	1	0	1	0	1	7.438	1
322			min	-4230.007	3	76.943	15	0	1	0	1	0	1	.276	15
323		10	max	4680.815	1	2070.296	1	0	1	0	1	0	1	6.694	1
324			min	-4232.46	3	76.943	15	0	1	0	1	0	1	.249	15
325		11	max	4677.544	1	2070.296	1	0	1	0	1	0	1	5.95	1
326			min	-4234.914	3	76.943	15	0	1	0	1	0	1	.221	15
327		12	max	4674.272	1	2070.296	1	0	1	0	1	0	1	5.207	1
328			min	-4237.367	3	76.943	15	0	1	0	1	0	1	.194	15
329		13	max	4671.001	1	2070.296	1	0	1	0	1	0	1	4.463	1
330			min	-4239.821	3	76.943	15	0	1	0	1	0	1	.166	15
331		14	max	4667.729	1	2070.296	1	0	1	0	1	0	1	3.719	1
332			min	-4242.275	3	76.943	15	0	1	0	1	0	1	.138	15
333		15	max	4664.458	1	2070.296	1	0	1	0	1	0	1	2.975	1
334			min	-4244.728	3	76.943	15	0	1	0	1	0	1	.111	15
335		16	max	4661.186	1	2070.296	1	0	1	0	1	0	1	2.231	1
336			min	-4247.182	3	76.943	15	0	1	0	1	0	1	.083	15
337		17	max	4657.915	1	2070.296	1	0	1	0	1	0	1	1.488	1
338			min	-4249.635	3	76.943	15	0	1	0	1	0	1	.055	15
339		18	max	4654.643	1	2070.296	1	0	1	0	1	0	1	.744	1
340			min	-4252.089	3	76.943	15	0	1	0	1	0	1	.028	15
341		19	max	4651.372	1	2070.296	1	0	1	0	1	0	1	0	1
342			min	-4254.543	3	76.943	15	0	1	0	1	0	1	0	1
343	M8	1	max	2398.595	1	1122.804	3	193.531	3	.014	2	.27	1	6.668	1
344			min	-1667.831	3	-795.413	2	-170.393	2	-.006	3	-.3	3	.285	15
345		2	max	2395.323	1	1122.804	3	193.531	3	.014	2	.212	1	6.754	1
346			min	-1670.284	3	-795.413	2	-170.393	2	-.006	3	-.231	3	.282	15
347		3	max	1811.823	1	1144.146	1	173.445	3	0	3	.186	1	6.577	1
348			min	-1389.927	3	47.258	15	-119.799	2	-.002	2	-.178	3	.272	15
349		4	max	1808.552	1	1144.146	1	173.445	3	0	3	.144	1	6.166	1
350			min	-1392.38	3	47.258	15	-119.799	2	-.002	2	-.116	3	.255	15
351		5	max	1805.28	1	1144.146	1	173.445	3	0	3	.102	1	5.755	1
352			min	-1394.834	3	47.258	15	-119.799	2	-.002	2	-.054	3	.238	15
353		6	max	1802.009	1	1144.146	1	173.445	3	0	3	.06	1	5.344	1
354			min	-1397.287	3	47.258	15	-119.799	2	-.002	2	.002	15	.221	15
355		7	max	1798.737	1	1144.146	1	173.445	3	0	3	.071	3	4.933	1
356			min	-1399.741	3	47.258	15	-119.799	2	-.002	2	-.009	10	.204	15
357		8	max	1795.466	1	1144.146	1	173.445	3	0	3	.133	3	4.522	1
358			min	-1402.194	3	47.258	15	-119.799	2	-.002	2	-.052	2	.187	15
359		9	max	1792.194	1	1144.146	1	173.445	3	0	3	.196	3	4.111	1
360			min	-1404.648	3	47.258	15	-119.799	2	-.002	2	-.095	2	.17	15
361		10	max	1788.923	1	1144.146	1	173.445	3	0	3	.258	3	3.7	1
362			min	-1407.102	3	47.258	15	-119.799	2	-.002	2	-.138	2	.153	15
363		11	max	1785.651	1	1144.146	1	173.445	3	0	3	.32	3	3.288	1
364			min	-1409.555	3	47.258	15	-119.799	2	-.002	2	-.181	2	.136	15
365		12	max	1782.38	1	1144.146	1	173.445	3	0	3	.383	3	2.877	1
366			min	-1412.009	3	47.258	15	-119.799	2	-.002	2	-.224	2	.119	15
367		13	max	1779.108	1	1144.146	1	173.445	3	0	3	.445	3	2.466	1
368			min	-1414.462	3	47.258	15	-119.799	2	-.002	2	-.267	2	.102	15
369		14	max	1775.837	1	1144.146	1	173.445	3	0	3	.507	3	2.055	1
370			min	-1416.916	3	47.258	15	-119.799	2	-.002	2	-.31	2	.085	15
371		15	max	1772.566	1	1144.146	1	173.445	3	0	3	.57	3	1.644	1
372			min	-1419.37	3	47.258	15	-119.799	2	-.002	2	-.353	2	.068	15
373		16	max	1769.294	1	1144.146	1	173.445	3	0	3	.632	3	1.233	1
374			min	-1421.823	3	47.258	15	-119.799	2	-.002	2	-.396	2	.051	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	1766.023	1	1144.146	1	173.445	3	0	3	.694	3	.822	1
376			min	-1424.277	3	47.258	15	-119.799	2	-.002	2	-.439	2	.034	15
377		18	max	1762.751	1	1144.146	1	173.445	3	0	3	.757	3	.411	1
378			min	-1426.73	3	47.258	15	-119.799	2	-.002	2	-.482	2	.017	15
379		19	max	1759.48	1	1144.146	1	173.445	3	0	3	.819	3	0	1
380			min	-1429.184	3	47.258	15	-119.799	2	-.002	2	-.525	2	0	1
381	M3	1	max	1776.408	2	5.617	4	49.953	2	.015	3	.001	3	0	1
382			min	-730.25	3	1.32	15	-20.654	3	-.031	2	-.003	2	0	1
383		2	max	1776.199	2	4.993	4	49.953	2	.015	3	.014	2	0	15
384			min	-730.406	3	1.174	15	-20.654	3	-.031	2	-.006	3	-.002	4
385		3	max	1775.99	2	4.369	4	49.953	2	.015	3	.032	2	0	15
386			min	-730.563	3	1.027	15	-20.654	3	-.031	2	-.014	3	-.004	4
387		4	max	1775.782	2	3.745	4	49.953	2	.015	3	.05	2	-.001	15
388			min	-730.719	3	.88	15	-20.654	3	-.031	2	-.021	3	-.005	4
389		5	max	1775.573	2	3.121	4	49.953	2	.015	3	.068	2	-.001	15
390			min	-730.876	3	.734	15	-20.654	3	-.031	2	-.028	3	-.006	4
391		6	max	1775.365	2	2.497	4	49.953	2	.015	3	.086	2	-.002	15
392			min	-731.032	3	.587	15	-20.654	3	-.031	2	-.036	3	-.007	4
393		7	max	1775.156	2	1.872	4	49.953	2	.015	3	.103	2	-.002	15
394			min	-731.188	3	.44	15	-20.654	3	-.031	2	-.043	3	-.008	4
395		8	max	1774.947	2	1.248	4	49.953	2	.015	3	.121	2	-.002	15
396			min	-731.345	3	.293	15	-20.654	3	-.031	2	-.05	3	-.009	4
397		9	max	1774.739	2	.624	4	49.953	2	.015	3	.139	2	-.002	15
398			min	-731.501	3	.147	15	-20.654	3	-.031	2	-.058	3	-.009	4
399		10	max	1774.53	2	0	1	49.953	2	.015	3	.157	2	-.002	15
400			min	-731.658	3	0	1	-20.654	3	-.031	2	-.065	3	-.009	4
401		11	max	1774.322	2	-.147	15	49.953	2	.015	3	.175	2	-.002	15
402			min	-731.814	3	-.624	4	-20.654	3	-.031	2	-.073	3	-.009	4
403		12	max	1774.113	2	-.293	15	49.953	2	.015	3	.193	2	-.002	15
404			min	-731.971	3	-1.248	4	-20.654	3	-.031	2	-.08	3	-.009	4
405		13	max	1773.904	2	-.44	15	49.953	2	.015	3	.21	2	-.002	15
406			min	-732.127	3	-1.872	4	-20.654	3	-.031	2	-.087	3	-.008	4
407		14	max	1773.696	2	-.587	15	49.953	2	.015	3	.228	2	-.002	15
408			min	-732.284	3	-2.497	4	-20.654	3	-.031	2	-.095	3	-.007	4
409		15	max	1773.487	2	-.734	15	49.953	2	.015	3	.246	2	-.001	15
410			min	-732.44	3	-3.121	4	-20.654	3	-.031	2	-.102	3	-.006	4
411		16	max	1773.279	2	-.88	15	49.953	2	.015	3	.264	2	-.001	15
412			min	-732.597	3	-3.745	4	-20.654	3	-.031	2	-.109	3	-.005	4
413		17	max	1773.07	2	-1.027	15	49.953	2	.015	3	.282	2	0	15
414			min	-732.753	3	-4.369	4	-20.654	3	-.031	2	-.117	3	-.004	4
415		18	max	1772.861	2	-1.174	15	49.953	2	.015	3	.299	2	0	15
416			min	-732.909	3	-4.993	4	-20.654	3	-.031	2	-.124	3	-.002	4
417		19	max	1772.653	2	-1.32	15	49.953	2	.015	3	.317	2	0	1
418			min	-733.066	3	-5.617	4	-20.654	3	-.031	2	-.131	3	0	1
419	M6	1	max	5094.68	2	5.617	4	0	1	0	1	0	1	0	1
420			min	-2502.393	3	1.32	15	0	1	0	1	0	1	0	1
421		2	max	5094.471	2	4.993	4	0	1	0	1	0	1	0	15
422			min	-2502.549	3	1.174	15	0	1	0	1	0	1	-.002	4
423		3	max	5094.262	2	4.369	4	0	1	0	1	0	1	0	15
424			min	-2502.706	3	1.027	15	0	1	0	1	0	1	-.004	4
425		4	max	5094.054	2	3.745	4	0	1	0	1	0	1	-.001	15
426			min	-2502.862	3	.88	15	0	1	0	1	0	1	-.005	4
427		5	max	5093.845	2	3.121	4	0	1	0	1	0	1	-.001	15
428			min	-2503.018	3	.734	15	0	1	0	1	0	1	-.006	4
429		6	max	5093.637	2	2.497	4	0	1	0	1	0	1	-.002	15
430			min	-2503.175	3	.587	15	0	1	0	1	0	1	-.007	4
431		7	max	5093.428	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	-2503.331	3	.44	15	0	1	0	1	0	1	-.008	4
433		8	max	5093.219	2	1.248	4	0	1	0	1	0	1	-.002	15
434			min	-2503.488	3	.293	15	0	1	0	1	0	1	-.009	4
435		9	max	5093.011	2	.624	4	0	1	0	1	0	1	-.002	15
436			min	-2503.644	3	.147	15	0	1	0	1	0	1	-.009	4
437		10	max	5092.802	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2503.801	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	5092.594	2	-.147	15	0	1	0	1	0	1	-.002	15
440			min	-2503.957	3	-.624	4	0	1	0	1	0	1	-.009	4
441		12	max	5092.385	2	-.293	15	0	1	0	1	0	1	-.002	15
442			min	-2504.114	3	-1.248	4	0	1	0	1	0	1	-.009	4
443		13	max	5092.176	2	-.44	15	0	1	0	1	0	1	-.002	15
444			min	-2504.27	3	-1.872	4	0	1	0	1	0	1	-.008	4
445		14	max	5091.968	2	-.587	15	0	1	0	1	0	1	-.002	15
446			min	-2504.427	3	-2.497	4	0	1	0	1	0	1	-.007	4
447		15	max	5091.759	2	-.734	15	0	1	0	1	0	1	-.001	15
448			min	-2504.583	3	-3.121	4	0	1	0	1	0	1	-.006	4
449		16	max	5091.551	2	-.88	15	0	1	0	1	0	1	-.001	15
450			min	-2504.739	3	-3.745	4	0	1	0	1	0	1	-.005	4
451		17	max	5091.342	2	-1.027	15	0	1	0	1	0	1	0	15
452			min	-2504.896	3	-4.369	4	0	1	0	1	0	1	-.004	4
453		18	max	5091.133	2	-1.174	15	0	1	0	1	0	1	0	15
454			min	-2505.052	3	-4.993	4	0	1	0	1	0	1	-.002	4
455		19	max	5090.925	2	-1.32	15	0	1	0	1	0	1	0	1
456			min	-2505.209	3	-5.617	4	0	1	0	1	0	1	0	1
457	M9	1	max	1776.408	2	5.617	4	20.654	3	.031	2	.003	2	0	1
458			min	-730.25	3	1.32	15	-49.953	2	-.015	3	-.001	3	0	1
459		2	max	1776.199	2	4.993	4	20.654	3	.031	2	.006	3	0	15
460			min	-730.406	3	1.174	15	-49.953	2	-.015	3	-.014	2	-.002	4
461		3	max	1775.99	2	4.369	4	20.654	3	.031	2	.014	3	0	15
462			min	-730.563	3	1.027	15	-49.953	2	-.015	3	-.032	2	-.004	4
463		4	max	1775.782	2	3.745	4	20.654	3	.031	2	.021	3	-.001	15
464			min	-730.719	3	.88	15	-49.953	2	-.015	3	-.05	2	-.005	4
465		5	max	1775.573	2	3.121	4	20.654	3	.031	2	.028	3	-.001	15
466			min	-730.876	3	.734	15	-49.953	2	-.015	3	-.068	2	-.006	4
467		6	max	1775.365	2	2.497	4	20.654	3	.031	2	.036	3	-.002	15
468			min	-731.032	3	.587	15	-49.953	2	-.015	3	-.086	2	-.007	4
469		7	max	1775.156	2	1.872	4	20.654	3	.031	2	.043	3	-.002	15
470			min	-731.188	3	.44	15	-49.953	2	-.015	3	-.103	2	-.008	4
471		8	max	1774.947	2	1.248	4	20.654	3	.031	2	.05	3	-.002	15
472			min	-731.345	3	.293	15	-49.953	2	-.015	3	-.121	2	-.009	4
473		9	max	1774.739	2	.624	4	20.654	3	.031	2	.058	3	-.002	15
474			min	-731.501	3	.147	15	-49.953	2	-.015	3	-.139	2	-.009	4
475		10	max	1774.53	2	0	1	20.654	3	.031	2	.065	3	-.002	15
476			min	-731.658	3	0	1	-49.953	2	-.015	3	-.157	2	-.009	4
477		11	max	1774.322	2	-.147	15	20.654	3	.031	2	.073	3	-.002	15
478			min	-731.814	3	-.624	4	-49.953	2	-.015	3	-.175	2	-.009	4
479		12	max	1774.113	2	-.293	15	20.654	3	.031	2	.08	3	-.002	15
480			min	-731.971	3	-1.248	4	-49.953	2	-.015	3	-.193	2	-.009	4
481		13	max	1773.904	2	-.44	15	20.654	3	.031	2	.087	3	-.002	15
482			min	-732.127	3	-1.872	4	-49.953	2	-.015	3	-.21	2	-.008	4
483		14	max	1773.696	2	-.587	15	20.654	3	.031	2	.095	3	-.002	15
484			min	-732.284	3	-2.497	4	-49.953	2	-.015	3	-.228	2	-.007	4
485		15	max	1773.487	2	-.734	15	20.654	3	.031	2	.102	3	-.001	15
486			min	-732.44	3	-3.121	4	-49.953	2	-.015	3	-.246	2	-.006	4
487		16	max	1773.279	2	-.88	15	20.654	3	.031	2	.109	3	-.001	15
488			min	-732.597	3	-3.745	4	-49.953	2	-.015	3	-.264	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	1773.07	2	-1.027	15	20.654	3	.031	2	.117	3	0	15
490			min	-732.753	3	-4.369	4	-49.953	2	-.015	3	-.282	2	-.004	4
491		18	max	1772.861	2	-1.174	15	20.654	3	.031	2	.124	3	0	15
492			min	-732.909	3	-4.993	4	-49.953	2	-.015	3	-.299	2	-.002	4
493		19	max	1772.653	2	-1.32	15	20.654	3	.031	2	.131	3	0	1
494			min	-733.066	3	-5.617	4	-49.953	2	-.015	3	-.317	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	-.03	15	.014	1	9.719e-3	3	NC	3	NC	1
2			min	-.491	1	-.82	1	0	15	-2.784e-2	2	122.219	1	NC	1
3		2	max	-.02	15	-.026	15	0	15	9.398e-3	3	NC	3	NC	2
4			min	-.491	1	-.691	1	-.01	1	-2.632e-2	2	137.542	1	6241.793	1
5		3	max	-.02	15	-.022	15	0	15	8.767e-3	3	9118.558	12	NC	3
6			min	-.491	1	-.565	1	-.022	1	-2.333e-2	2	156.693	1	4209.489	1
7		4	max	-.02	15	-.018	15	-.001	15	8.137e-3	3	7162.62	12	NC	3
8			min	-.491	1	-.449	1	-.025	1	-2.035e-2	2	179.804	1	4035.496	1
9		5	max	-.02	15	-.014	15	0	3	7.913e-3	3	7479.121	12	NC	3
10			min	-.49	1	-.349	1	-.023	1	-1.833e-2	2	205.946	1	4579.769	1
11		6	max	-.02	15	-.011	15	.002	3	8.735e-3	3	NC	12	NC	3
12			min	-.49	1	-.268	1	-.015	1	-1.882e-2	2	233.477	1	6581.976	1
13		7	max	-.02	15	-.009	15	.002	3	9.556e-3	3	NC	3	NC	1
14			min	-.489	1	-.2	1	-.005	2	-1.931e-2	2	263.036	1	NC	1
15		8	max	-.02	15	-.006	15	0	3	1.038e-2	3	NC	12	NC	1
16			min	-.489	1	-.139	1	0	2	-1.979e-2	2	296.66	1	NC	1
17		9	max	-.02	15	-.004	15	0	2	1.16e-2	3	7031.793	15	NC	1
18			min	-.488	1	-.079	1	-.001	3	-1.891e-2	2	339.167	1	NC	1
19		10	max	-.02	15	-.001	15	.002	2	1.319e-2	3	8050.245	15	NC	1
20			min	-.488	1	-.041	3	-.002	3	-1.673e-2	2	397.547	1	NC	1
21		11	max	-.02	15	.045	1	.001	1	1.478e-2	3	9447.979	15	NC	1
22			min	-.487	1	-.021	3	0	15	-1.456e-2	2	482.165	1	NC	1
23		12	max	-.02	15	.109	1	.005	3	1.387e-2	3	NC	15	NC	1
24			min	-.487	1	0	3	-.006	1	-1.188e-2	2	615.829	1	NC	1
25		13	max	-.02	15	.172	1	.014	3	1.03e-2	3	NC	15	NC	1
26			min	-.486	1	.007	15	-.009	2	-8.663e-3	2	845.664	1	8755.346	3
27		14	max	-.02	15	.228	1	.021	3	6.734e-3	3	NC	5	NC	1
28			min	-.485	1	.009	15	-.009	2	-5.449e-3	2	917.981	3	5977.754	3
29		15	max	-.02	15	.273	1	.021	3	3.165e-3	3	NC	2	NC	1
30			min	-.485	1	.011	15	-.004	2	-2.236e-3	2	688.981	3	5977.358	3
31		16	max	-.02	15	.303	1	.014	3	7.68e-3	3	NC	5	NC	2
32			min	-.485	1	.013	15	0	10	-4.213e-3	2	502.797	3	6492.006	1
33		17	max	-.02	15	.321	1	.017	1	1.314e-2	3	NC	4	NC	2
34			min	-.485	1	.014	15	0	15	-6.8e-3	2	375.466	3	5449.634	1
35		18	max	-.02	15	.386	3	.008	1	1.861e-2	3	NC	1	NC	2
36			min	-.485	1	.015	15	0	15	-9.386e-3	2	292.349	3	7369.995	1
37		19	max	-.02	15	.497	3	0	15	2.139e-2	3	NC	1	NC	1
38			min	-.485	1	.016	15	-.012	1	-1.071e-2	2	237.797	3	NC	1
39	M4	1	max	-.033	15	-.036	12	0	1	0	1	NC	3	NC	1
40			min	-.886	1	-1.619	1	0	1	0	1	68.328	1	NC	1
41		2	max	-.033	15	-.045	15	0	1	0	1	3961.436	12	NC	1
42			min	-.886	1	-1.346	1	0	1	0	1	78.685	1	NC	1
43		3	max	-.033	15	-.037	15	0	1	0	1	2449.449	15	NC	1
44			min	-.886	1	-1.08	1	0	1	0	1	92.288	1	NC	1
45		4	max	-.033	15	-.03	15	0	1	0	1	2794.46	15	NC	1
46			min	-.886	1	-.84	1	0	1	0	1	109.426	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	-.033	15	-.024	15	0	1	0	1	3178.758	15	NC	1
48			min	-.885	1	-.642	1	0	1	0	1	129.128	1	NC	1
49		6	max	-.033	15	-.019	15	0	1	0	1	3575.96	15	NC	1
50			min	-.884	1	-.494	1	0	1	0	1	149.196	1	NC	1
51		7	max	-.033	15	-.015	15	0	1	0	1	3999.439	15	NC	1
52			min	-.883	1	-.379	1	0	1	0	1	169.75	1	NC	1
53		8	max	-.033	15	-.011	15	0	1	0	1	4486.78	15	NC	1
54			min	-.882	1	-.28	1	0	1	0	1	192.666	1	NC	1
55		9	max	-.033	15	-.007	15	0	1	0	1	NC	12	NC	1
56			min	-.88	1	-.179	1	0	1	0	1	223.352	1	NC	1
57		10	max	-.033	15	-.003	15	0	1	0	1	NC	3	NC	1
58			min	-.879	1	-.068	1	0	1	0	1	270.536	1	NC	1
59		11	max	-.033	15	.05	1	0	1	0	1	7427.35	15	NC	1
60			min	-.878	1	-.01	3	0	1	0	1	349.853	1	NC	1
61		12	max	-.033	15	.177	1	0	1	0	1	9799.367	15	NC	1
62			min	-.876	1	.006	15	0	1	0	1	508.527	1	NC	1
63		13	max	-.033	15	.303	1	0	1	0	1	NC	15	NC	1
64			min	-.875	1	.011	15	0	1	0	1	929.176	1	NC	1
65		14	max	-.033	15	.413	1	0	1	0	1	NC	5	NC	1
66			min	-.873	1	.015	15	0	1	0	1	1061.083	3	NC	1
67		15	max	-.033	15	.491	1	0	1	0	1	NC	4	NC	1
68			min	-.872	1	.018	15	0	1	0	1	619.229	3	NC	1
69		16	max	-.033	15	.522	1	0	1	0	1	NC	4	NC	1
70			min	-.872	1	.02	15	0	1	0	1	363.717	3	NC	1
71		17	max	-.033	15	.554	3	0	1	0	1	NC	4	NC	1
72			min	-.872	1	.021	15	0	1	0	1	235.672	3	NC	1
73		18	max	-.033	15	.796	3	0	1	0	1	NC	4	NC	1
74			min	-.872	1	.021	15	0	1	0	1	168.081	3	NC	1
75		19	max	-.033	15	1.047	3	0	1	0	1	NC	1	NC	1
76			min	-.872	1	.021	15	0	1	0	1	129.526	3	NC	1
77	M7	1	max	-.02	15	-.03	15	0	15	2.784e-2	2	NC	3	NC	1
78			min	-.491	1	-.82	1	-.014	1	-9.719e-3	3	122.219	1	NC	1
79		2	max	-.02	15	-.026	15	.01	1	2.632e-2	2	NC	3	NC	2
80			min	-.491	1	-.691	1	0	15	-9.398e-3	3	137.542	1	6241.793	1
81		3	max	-.02	15	-.022	15	.022	1	2.333e-2	2	9118.558	12	NC	3
82			min	-.491	1	-.565	1	0	15	-8.767e-3	3	156.693	1	4209.489	1
83		4	max	-.02	15	-.018	15	.025	1	2.035e-2	2	7162.62	12	NC	3
84			min	-.491	1	-.449	1	.001	15	-8.137e-3	3	179.804	1	4035.496	1
85		5	max	-.02	15	-.014	15	.023	1	1.833e-2	2	7479.121	12	NC	3
86			min	-.49	1	-.349	1	0	3	-7.913e-3	3	205.946	1	4579.769	1
87		6	max	-.02	15	-.011	15	.015	1	1.882e-2	2	NC	12	NC	3
88			min	-.49	1	-.268	1	-.002	3	-8.735e-3	3	233.477	1	6581.976	1
89		7	max	-.02	15	-.009	15	.005	2	1.931e-2	2	NC	3	NC	1
90			min	-.489	1	-.2	1	-.002	3	-9.556e-3	3	263.036	1	NC	1
91		8	max	-.02	15	-.006	15	0	2	1.979e-2	2	NC	12	NC	1
92			min	-.489	1	-.139	1	0	3	-1.038e-2	3	296.66	1	NC	1
93		9	max	-.02	15	-.004	15	.001	3	1.891e-2	2	7031.793	15	NC	1
94			min	-.488	1	-.079	1	0	2	-1.16e-2	3	339.167	1	NC	1
95		10	max	-.02	15	-.001	15	.002	3	1.673e-2	2	8050.245	15	NC	1
96			min	-.488	1	-.041	3	-.002	2	-1.319e-2	3	397.547	1	NC	1
97		11	max	-.02	15	.045	1	0	15	1.456e-2	2	9447.979	15	NC	1
98			min	-.487	1	-.021	3	-.001	1	-1.478e-2	3	482.165	1	NC	1
99		12	max	-.02	15	.109	1	.006	1	1.188e-2	2	NC	15	NC	1
100			min	-.487	1	0	3	-.005	3	-1.387e-2	3	615.829	1	NC	1
101		13	max	-.02	15	.172	1	.009	2	8.663e-3	2	NC	15	NC	1
102			min	-.486	1	.007	15	-.014	3	-1.03e-2	3	845.664	1	8755.346	3
103		14	max	-.02	15	.228	1	.009	2	5.449e-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	-.485	1	.009	15	-.021	3	-6.734e-3	3	917.981	3	5977.754	3
105		15	max	-.02	15	.273	1	.004	2	2.236e-3	2	NC	2	NC	1
106			min	-.485	1	.011	15	-.021	3	-3.165e-3	3	688.981	3	5977.358	3
107		16	max	-.02	15	.303	1	0	10	4.213e-3	2	NC	5	NC	2
108			min	-.485	1	.013	15	-.014	3	-7.68e-3	3	502.797	3	6492.006	1
109		17	max	-.02	15	.321	1	0	15	6.8e-3	2	NC	4	NC	2
110			min	-.485	1	.014	15	-.017	1	-1.314e-2	3	375.466	3	5449.634	1
111		18	max	-.02	15	.386	3	0	15	9.386e-3	2	NC	1	NC	2
112			min	-.485	1	.015	15	-.008	1	-1.861e-2	3	292.349	3	7369.995	1
113		19	max	-.02	15	.497	3	.012	1	1.071e-2	2	NC	1	NC	1
114			min	-.485	1	.016	15	0	15	-2.139e-2	3	237.797	3	NC	1
115	M10	1	max	.001	1	.443	3	.485	1	1.41e-2	3	NC	1	NC	1
116			min	0	15	.016	15	.02	15	-1.236e-3	2	NC	1	NC	1
117		2	max	.001	1	.721	3	.551	1	1.606e-2	3	NC	5	NC	3
118			min	0	15	.011	10	.023	15	-1.902e-3	2	817.855	3	3470.817	1
119		3	max	0	1	.979	3	.65	1	1.803e-2	3	NC	5	NC	5
120			min	0	15	-.055	10	.027	15	-2.568e-3	2	424.942	3	1382.494	1
121		4	max	0	1	1.173	3	.753	1	1.999e-2	3	NC	5	NC	5
122			min	0	15	-.126	2	.031	15	-3.233e-3	2	311.918	3	851.603	1
123		5	max	0	1	1.28	3	.838	1	2.196e-2	3	NC	5	NC	5
124			min	0	15	-.138	2	.034	15	-3.899e-3	2	272.129	3	646.008	1
125		6	max	0	1	1.294	3	.893	1	2.392e-2	3	NC	5	NC	15
126			min	0	15	-.091	2	.036	15	-4.565e-3	2	267.883	3	558.658	1
127		7	max	0	1	1.225	3	.915	1	2.589e-2	3	NC	4	NC	15
128			min	0	15	-.03	10	.036	15	-5.23e-3	2	291.231	3	530.682	1
129		8	max	0	1	1.106	3	.908	1	2.785e-2	3	NC	4	NC	15
130			min	0	15	.016	15	.035	15	-5.896e-3	2	343.701	3	539.517	1
131		9	max	0	1	.983	3	.886	1	2.982e-2	3	NC	5	NC	5
132			min	0	15	.019	15	.033	15	-6.562e-3	2	421.494	3	568.711	1
133		10	max	0	1	.925	3	.872	1	3.178e-2	3	NC	5	NC	5
134			min	0	1	.021	15	.033	15	-7.228e-3	2	472.943	3	588.824	1
135		11	max	0	15	.983	3	.886	1	2.982e-2	3	NC	5	NC	5
136			min	0	1	.019	15	.033	15	-6.562e-3	2	421.494	3	568.711	1
137		12	max	0	15	1.106	3	.908	1	2.785e-2	3	NC	4	NC	15
138			min	0	1	.016	15	.035	15	-5.896e-3	2	343.701	3	539.517	1
139		13	max	0	15	1.225	3	.915	1	2.589e-2	3	NC	4	NC	15
140			min	0	1	-.03	10	.036	15	-5.23e-3	2	291.231	3	530.682	1
141		14	max	0	15	1.294	3	.893	1	2.392e-2	3	NC	5	NC	15
142			min	0	1	-.091	2	.036	15	-4.565e-3	2	267.883	3	558.658	1
143		15	max	0	15	1.28	3	.838	1	2.196e-2	3	NC	5	NC	5
144			min	0	1	-.138	2	.034	15	-3.899e-3	2	272.129	3	646.008	1
145		16	max	0	15	1.173	3	.753	1	1.999e-2	3	NC	5	NC	5
146			min	0	1	-.126	2	.031	15	-3.233e-3	2	311.918	3	851.603	1
147		17	max	0	15	.979	3	.65	1	1.803e-2	3	NC	5	NC	5
148			min	0	1	-.055	10	.027	15	-2.568e-3	2	424.942	3	1382.494	1
149		18	max	0	15	.721	3	.551	1	1.606e-2	3	NC	5	NC	3
150			min	-.001	1	.011	10	.023	15	-1.902e-3	2	817.855	3	3470.817	1
151		19	max	0	15	.443	3	.485	1	1.41e-2	3	NC	1	NC	1
152			min	-.001	1	.016	15	.02	15	-1.236e-3	2	NC	1	NC	1
153	M11	1	max	.002	1	.078	1	.487	1	8.087e-3	1	NC	1	NC	1
154			min	-.002	3	-.01	3	.02	15	3.375e-4	15	NC	1	NC	1
155		2	max	.002	1	.194	3	.535	1	8.965e-3	1	NC	5	NC	3
156			min	-.002	3	-.104	2	.022	15	3.65e-4	15	1113.941	3	4717.423	1
157		3	max	.002	1	.378	3	.626	1	9.844e-3	1	NC	5	NC	3
158			min	-.002	3	-.242	2	.026	15	3.925e-4	15	586.836	3	1645.774	1
159		4	max	.001	1	.501	3	.726	1	1.072e-2	1	NC	5	NC	5
160			min	-.001	3	-.326	2	.03	15	4.199e-4	15	445.766	3	954.055	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	.541	3	.814	1	1.16e-2	1	NC	5	NC	5
162			min	-.001	3	-.345	2	.033	15	4.474e-4	15	413.323	3	697.685	1
163		6	max	0	1	.495	3	.875	1	1.248e-2	1	NC	5	NC	5
164			min	0	3	-.299	2	.035	15	4.749e-4	15	451.317	3	587.804	1
165		7	max	0	1	.376	3	.904	1	1.336e-2	1	NC	5	NC	15
166			min	0	3	-.202	2	.035	15	5.024e-4	15	589.863	3	546.867	1
167		8	max	0	1	.218	3	.904	1	1.424e-2	1	NC	4	NC	5
168			min	0	3	-.077	2	.035	15	5.299e-4	15	999.314	3	546.311	1
169		9	max	0	1	.07	3	.888	1	1.512e-2	1	NC	1	NC	5
170			min	0	3	.003	15	.033	15	5.574e-4	15	2824.901	3	568.058	1
171		10	max	0	1	.114	1	.877	1	1.599e-2	1	NC	3	NC	5
172			min	0	1	.002	12	.033	15	5.849e-4	15	6243.118	1	584.662	1
173		11	max	0	3	.07	3	.888	1	1.512e-2	1	NC	1	NC	5
174			min	0	1	.003	15	.033	15	5.574e-4	15	2824.901	3	568.058	1
175		12	max	0	3	.218	3	.904	1	1.424e-2	1	NC	4	NC	5
176			min	0	1	-.077	2	.035	15	5.299e-4	15	999.314	3	546.311	1
177		13	max	0	3	.376	3	.904	1	1.336e-2	1	NC	5	NC	15
178			min	0	1	-.202	2	.035	15	5.024e-4	15	589.863	3	546.867	1
179		14	max	0	3	.495	3	.875	1	1.248e-2	1	NC	5	NC	5
180			min	0	1	-.299	2	.035	15	4.749e-4	15	451.317	3	587.804	1
181		15	max	.001	3	.541	3	.814	1	1.16e-2	1	NC	5	NC	5
182			min	-.001	1	-.345	2	.033	15	4.474e-4	15	413.323	3	697.685	1
183		16	max	.001	3	.501	3	.726	1	1.072e-2	1	NC	5	NC	5
184			min	-.001	1	-.326	2	.03	15	4.199e-4	15	445.766	3	954.055	1
185		17	max	.002	3	.378	3	.626	1	9.844e-3	1	NC	5	NC	3
186			min	-.002	1	-.242	2	.026	15	3.925e-4	15	586.836	3	1645.774	1
187		18	max	.002	3	.194	3	.535	1	8.965e-3	1	NC	5	NC	3
188			min	-.002	1	-.104	2	.022	15	3.65e-4	15	1113.941	3	4717.423	1
189		19	max	.002	3	.078	1	.487	1	8.087e-3	1	NC	1	NC	1
190			min	-.002	1	-.01	3	.02	15	3.375e-4	15	NC	1	NC	1
191	M12	1	max	0	3	-.005	15	.489	1	7.627e-3	1	NC	1	NC	1
192			min	0	1	-.11	1	.02	15	3.17e-4	15	NC	1	NC	1
193		2	max	0	3	.056	3	.53	1	8.21e-3	1	NC	5	NC	2
194			min	0	1	-.327	2	.022	15	3.372e-4	15	903.28	2	5587.32	1
195		3	max	0	3	.158	3	.616	1	8.794e-3	1	NC	5	NC	5
196			min	0	1	-.544	2	.025	15	3.574e-4	15	486.127	2	1792.661	1
197		4	max	0	3	.216	3	.715	1	9.378e-3	1	NC	5	NC	5
198			min	0	1	-.687	2	.029	15	3.776e-4	15	372.457	2	1005.516	1
199		5	max	0	3	.226	3	.805	1	9.961e-3	1	NC	5	NC	5
200			min	0	1	-.737	2	.033	15	3.978e-4	15	344.225	2	721.789	1
201		6	max	0	3	.189	3	.868	1	1.055e-2	1	NC	5	NC	5
202			min	0	1	-.693	2	.035	15	4.18e-4	15	368.722	2	600.419	1
203		7	max	0	3	.116	3	.901	1	1.113e-2	1	NC	5	NC	15
204			min	0	1	-.572	2	.035	15	4.382e-4	15	458.728	2	553.09	1
205		8	max	0	3	.024	3	.905	1	1.171e-2	1	NC	5	NC	5
206			min	0	1	-.416	1	.035	15	4.584e-4	15	683.734	2	548.002	1
207		9	max	0	3	-.01	15	.891	1	1.23e-2	1	NC	3	NC	5
208			min	0	1	-.29	1	.034	15	4.786e-4	15	1260.215	2	566.212	1
209		10	max	0	1	-.009	15	.881	1	1.288e-2	1	NC	3	NC	5
210			min	0	1	-.233	1	.033	15	4.988e-4	15	1857.186	1	581.163	1
211		11	max	0	1	-.01	15	.891	1	1.23e-2	1	NC	3	NC	5
212			min	0	3	-.29	1	.034	15	4.786e-4	15	1260.215	2	566.212	1
213		12	max	0	1	.024	3	.905	1	1.171e-2	1	NC	5	NC	5
214			min	0	3	-.416	1	.035	15	4.584e-4	15	683.734	2	548.002	1
215		13	max	0	1	.116	3	.901	1	1.113e-2	1	NC	5	NC	15
216			min	0	3	-.572	2	.035	15	4.382e-4	15	458.728	2	553.09	1
217		14	max	0	1	.189	3	.868	1	1.055e-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	-.693	2	.035	15	4.18e-4	15	368.722	2	600.419	1
219		15	max	0	1	.226	3	.805	1	9.961e-3	1	NC	5	NC	5
220			min	0	3	-.737	2	.033	15	3.978e-4	15	344.225	2	721.789	1
221		16	max	0	1	.216	3	.715	1	9.378e-3	1	NC	5	NC	5
222			min	0	3	-.687	2	.029	15	3.776e-4	15	372.457	2	1005.516	1
223		17	max	0	1	.158	3	.616	1	8.794e-3	1	NC	5	NC	5
224			min	0	3	-.544	2	.025	15	3.574e-4	15	486.127	2	1792.661	1
225		18	max	0	1	.056	3	.53	1	8.21e-3	1	NC	5	NC	2
226			min	0	3	-.327	2	.022	15	3.372e-4	15	903.28	2	5587.32	1
227		19	max	0	1	-.005	15	.489	1	7.627e-3	1	NC	1	NC	1
228			min	0	3	-.11	1	.02	15	3.17e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.028	15	.491	1	1.639e-2	1	NC	1	NC	1
230			min	-.001	1	-.757	1	.02	15	-1.751e-3	3	NC	1	NC	1
231		2	max	0	15	.015	3	.561	1	1.841e-2	1	NC	5	NC	3
232			min	-.001	1	-1.066	1	.023	15	-2.378e-3	3	647.54	2	3242.747	1
233		3	max	0	15	.115	3	.663	1	2.044e-2	2	NC	15	NC	5
234			min	-.001	1	-1.346	1	.027	15	-3.005e-3	3	341.474	2	1321.065	1
235		4	max	0	15	.179	3	.768	1	2.27e-2	2	NC	15	NC	5
236			min	0	1	-1.561	1	.031	15	-3.632e-3	3	251.605	2	822.658	1
237		5	max	0	15	.199	3	.854	1	2.497e-2	2	9476.222	15	NC	5
238			min	0	1	-1.694	1	.035	15	-4.258e-3	3	218.149	2	627.951	1
239		6	max	0	15	.173	3	.909	1	2.723e-2	2	8905.686	15	NC	15
240			min	0	1	-1.738	1	.036	15	-4.885e-3	3	211.034	2	545.128	1
241		7	max	0	15	.112	3	.93	1	2.95e-2	2	9015.981	15	NC	15
242			min	0	1	-1.706	1	.036	15	-5.512e-3	3	222.256	2	519.042	1
243		8	max	0	15	.032	3	.922	1	3.176e-2	2	9619.699	15	NC	15
244			min	0	1	-1.624	1	.035	15	-6.139e-3	3	249.55	2	528.338	1
245		9	max	0	15	-.032	12	.9	1	3.403e-2	2	NC	15	NC	5
246			min	0	1	-1.531	1	.034	15	-6.765e-3	3	287.113	2	557.145	1
247		10	max	0	1	-.049	15	.886	1	3.629e-2	2	NC	12	NC	5
248			min	0	1	-1.485	1	.033	15	-7.392e-3	3	309.888	2	576.828	1
249		11	max	0	1	-.032	12	.9	1	3.403e-2	2	NC	15	NC	5
250			min	0	15	-1.531	1	.034	15	-6.765e-3	3	287.113	2	557.145	1
251		12	max	0	1	.032	3	.922	1	3.176e-2	2	9619.699	15	NC	15
252			min	0	15	-1.624	1	.035	15	-6.139e-3	3	249.55	2	528.338	1
253		13	max	0	1	.112	3	.93	1	2.95e-2	2	9015.981	15	NC	15
254			min	0	15	-1.706	1	.036	15	-5.512e-3	3	222.256	2	519.042	1
255		14	max	0	1	.173	3	.909	1	2.723e-2	2	8905.686	15	NC	15
256			min	0	15	-1.738	1	.036	15	-4.885e-3	3	211.034	2	545.128	1
257		15	max	0	1	.199	3	.854	1	2.497e-2	2	9476.222	15	NC	5
258			min	0	15	-1.694	1	.035	15	-4.258e-3	3	218.149	2	627.951	1
259		16	max	0	1	.179	3	.768	1	2.27e-2	2	NC	15	NC	5
260			min	0	15	-1.561	1	.031	15	-3.632e-3	3	251.605	2	822.658	1
261		17	max	.001	1	.115	3	.663	1	2.044e-2	2	NC	15	NC	5
262			min	0	15	-1.346	1	.027	15	-3.005e-3	3	341.474	2	1321.065	1
263		18	max	.001	1	.015	3	.561	1	1.841e-2	1	NC	5	NC	3
264			min	0	15	-1.066	1	.023	15	-2.378e-3	3	647.54	2	3242.747	1
265		19	max	.001	1	-.028	15	.491	1	1.639e-2	1	NC	1	NC	1
266			min	0	15	-.757	1	.02	15	-1.751e-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	5.002e-3	2	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-2.114e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	7.06e-3	2	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-2.939e-3	3	8169.391	1	NC	1
273		4	max	0	3	0	15	.002	3	6.493e-3	2	NC	4	NC	1
274			min	0	1	-.021	1	-.002	1	-2.615e-3	3	3623.556	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	5.927e-3	2	NC	5	NC	1
276			min	0	1	-.038	1	-.003	1	-2.291e-3	3	2060.814	1	NC	1
277		6	max	0	3	-.002	15	.005	3	5.36e-3	2	NC	5	NC	1
278			min	0	1	-.058	1	-.004	1	-1.968e-3	3	1339.255	1	NC	1
279		7	max	0	3	-.003	15	.006	3	4.794e-3	2	NC	5	NC	1
280			min	0	1	-.082	1	-.006	1	-1.644e-3	3	946.446	1	NC	1
281		8	max	0	3	-.005	15	.007	3	4.228e-3	2	NC	5	NC	1
282			min	0	1	-.109	1	-.007	1	-1.32e-3	3	708.7	1	NC	1
283		9	max	0	3	-.006	15	.008	3	3.661e-3	2	NC	15	NC	1
284			min	-.001	1	-.14	1	-.009	1	-9.958e-4	3	553.513	1	8775.412	2
285		10	max	0	3	-.007	15	.008	3	3.095e-3	2	NC	15	NC	4
286			min	-.001	1	-.174	1	-.01	1	-6.719e-4	3	446.579	1	7769.593	2
287		11	max	0	3	-.009	15	.009	3	2.529e-3	2	8892.64	15	NC	4
288			min	-.001	1	-.21	1	-.012	1	-3.48e-4	3	369.598	1	7129.466	2
289		12	max	.001	3	-.01	15	.008	3	1.962e-3	2	7518.48	15	NC	4
290			min	-.001	1	-.248	1	-.012	1	-2.412e-5	3	312.342	1	6771.171	2
291		13	max	.001	3	-.012	15	.007	3	1.396e-3	2	6466.625	15	NC	3
292			min	-.001	1	-.289	1	-.013	1	8.685e-6	15	268.543	1	6669.555	2
293		14	max	.001	3	-.014	15	.005	3	8.294e-4	2	5643.504	15	NC	3
294			min	-.002	1	-.331	1	-.013	1	-7.033e-5	9	234.289	1	6846.372	2
295		15	max	.001	3	-.016	15	.002	3	9.476e-4	3	4987.051	15	NC	3
296			min	-.002	1	-.375	1	-.013	1	-2.653e-4	9	206.983	1	7404.25	2
297		16	max	.001	3	-.017	15	0	15	1.272e-3	3	4455.148	15	NC	1
298			min	-.002	1	-.42	1	-.012	1	-7.044e-4	1	184.867	1	8626.128	2
299		17	max	.002	3	-.019	15	0	15	1.595e-3	3	4018.327	15	NC	1
300			min	-.002	1	-.465	1	-.01	1	-1.223e-3	1	166.71	1	NC	1
301		18	max	.002	3	-.021	15	0	10	1.919e-3	3	3655.382	15	NC	1
302			min	-.002	1	-.512	1	-.013	3	-1.741e-3	1	151.629	1	6068.347	3
303		19	max	.002	3	-.023	15	.003	10	2.243e-3	3	3350.852	15	NC	1
304			min	-.002	1	-.558	1	-.02	3	-2.26e-3	1	138.978	1	3813.932	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	-.004	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	-.016	1	0	1	0	1	4779.127	1	NC	1
311		4	max	0	3	-.001	15	0	1	0	1	NC	5	NC	1
312			min	-.001	2	-.037	1	0	1	0	1	2074.272	1	NC	1
313		5	max	.001	3	-.003	15	0	1	0	1	NC	5	NC	1
314			min	-.001	1	-.066	1	0	1	0	1	1168.56	1	NC	1
315		6	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
316			min	-.002	1	-.103	1	0	1	0	1	755.399	1	NC	1
317		7	max	.002	3	-.006	15	0	1	0	1	NC	15	NC	1
318			min	-.002	1	-.146	1	0	1	0	1	532.044	1	NC	1
319		8	max	.002	3	-.007	15	0	1	0	1	NC	15	NC	1
320			min	-.002	1	-.195	1	0	1	0	1	397.473	1	NC	1
321		9	max	.002	3	-.009	15	0	1	0	1	8234.95	15	NC	1
322			min	-.003	1	-.25	1	0	1	0	1	309.912	1	NC	1
323		10	max	.003	3	-.012	15	0	1	0	1	6643.697	15	NC	1
324			min	-.003	1	-.311	1	0	1	0	1	249.72	1	NC	1
325		11	max	.003	3	-.014	15	0	1	0	1	5498.257	15	NC	1
326			min	-.003	1	-.376	1	0	1	0	1	206.467	1	NC	1
327		12	max	.003	3	-.017	15	0	1	0	1	4646.343	15	NC	1
328			min	-.004	1	-.445	1	0	1	0	1	174.342	1	NC	1
329		13	max	.003	3	-.019	15	0	1	0	1	3994.709	15	NC	1
330			min	-.004	1	-.518	1	0	1	0	1	149.797	1	NC	1
331		14	max	.004	3	-.022	15	0	1	0	1	3485.082	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	-.594	1	0	1	0	1	130.62	1	NC	1
333		15	max	.004	3	-.025	15	0	1	0	1	3078.849	15	NC	1
334			min	-.005	1	-.673	1	0	1	0	1	115.344	1	NC	1
335		16	max	.004	3	-.028	15	0	1	0	1	2749.832	15	NC	1
336			min	-.005	1	-.754	1	0	1	0	1	102.981	1	NC	1
337		17	max	.005	3	-.031	15	0	1	0	1	2479.729	15	NC	1
338			min	-.005	1	-.836	1	0	1	0	1	92.837	1	NC	1
339		18	max	.005	3	-.034	15	0	1	0	1	2255.381	15	NC	1
340			min	-.005	1	-.919	1	0	1	0	1	84.416	1	NC	1
341		19	max	.005	3	-.038	15	0	1	0	1	2067.194	15	NC	1
342			min	-.006	1	-1.003	1	0	1	0	1	77.356	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	2.114e-3	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-5.002e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	2.939e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-7.06e-3	2	8169.391	1	NC	1
349		4	max	0	3	0	15	.002	1	2.615e-3	3	NC	4	NC	1
350			min	0	1	-.021	1	-.002	3	-6.493e-3	2	3623.556	1	NC	1
351		5	max	0	3	-.002	15	.003	1	2.291e-3	3	NC	5	NC	1
352			min	0	1	-.038	1	-.003	3	-5.927e-3	2	2060.814	1	NC	1
353		6	max	0	3	-.002	15	.004	1	1.968e-3	3	NC	5	NC	1
354			min	0	1	-.058	1	-.005	3	-5.36e-3	2	1339.255	1	NC	1
355		7	max	0	3	-.003	15	.006	1	1.644e-3	3	NC	5	NC	1
356			min	0	1	-.082	1	-.006	3	-4.794e-3	2	946.446	1	NC	1
357		8	max	0	3	-.005	15	.007	1	1.32e-3	3	NC	5	NC	1
358			min	0	1	-.109	1	-.007	3	-4.228e-3	2	708.7	1	NC	1
359		9	max	0	3	-.006	15	.009	1	9.958e-4	3	NC	15	NC	1
360			min	-.001	1	-.14	1	-.008	3	-3.661e-3	2	553.513	1	8775.412	2
361		10	max	0	3	-.007	15	.01	1	6.719e-4	3	NC	15	NC	4
362			min	-.001	1	-.174	1	-.008	3	-3.095e-3	2	446.579	1	7769.593	2
363		11	max	0	3	-.009	15	.012	1	3.48e-4	3	8892.64	15	NC	4
364			min	-.001	1	-.21	1	-.009	3	-2.529e-3	2	369.598	1	7129.466	2
365		12	max	.001	3	-.01	15	.012	1	2.412e-5	3	7518.48	15	NC	4
366			min	-.001	1	-.248	1	-.008	3	-1.962e-3	2	312.342	1	6771.171	2
367		13	max	.001	3	-.012	15	.013	1	-8.685e-6	15	6466.625	15	NC	3
368			min	-.001	1	-.289	1	-.007	3	-1.396e-3	2	268.543	1	6669.555	2
369		14	max	.001	3	-.014	15	.013	1	7.033e-5	9	5643.504	15	NC	3
370			min	-.002	1	-.331	1	-.005	3	-8.294e-4	2	234.289	1	6846.372	2
371		15	max	.001	3	-.016	15	.013	1	2.653e-4	9	4987.051	15	NC	3
372			min	-.002	1	-.375	1	-.002	3	-9.476e-4	3	206.983	1	7404.25	2
373		16	max	.001	3	-.017	15	.012	1	7.044e-4	1	4455.148	15	NC	1
374			min	-.002	1	-.42	1	0	15	-1.272e-3	3	184.867	1	8626.128	2
375		17	max	.002	3	-.019	15	.01	1	1.223e-3	1	4018.327	15	NC	1
376			min	-.002	1	-.465	1	0	15	-1.595e-3	3	166.71	1	NC	1
377		18	max	.002	3	-.021	15	.013	3	1.741e-3	1	3655.382	15	NC	1
378			min	-.002	1	-.512	1	0	10	-1.919e-3	3	151.629	1	6068.347	3
379		19	max	.002	3	-.023	15	.02	3	2.26e-3	1	3350.852	15	NC	1
380			min	-.002	1	-.558	1	-.003	10	-2.243e-3	3	138.978	1	3813.932	3
381	M3	1	max	.005	1	0	15	0	3	2.787e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	1	-1.087e-3	3	NC	1	NC	1
383		2	max	.004	1	-.002	15	.013	3	3.238e-3	2	NC	1	NC	4
384			min	0	15	-.038	1	-.03	2	-1.297e-3	3	NC	1	2558.284	2
385		3	max	.003	1	-.004	15	.025	3	3.69e-3	2	NC	1	NC	5
386			min	0	15	-.073	1	-.058	2	-1.506e-3	3	NC	1	1289.074	2
387		4	max	.003	3	-.005	15	.037	3	4.141e-3	2	NC	1	NC	5
388			min	0	15	-.109	1	-.086	2	-1.716e-3	3	NC	1	871.766	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	.048	3	4.592e-3	2	NC	1	NC	5
390			min	0	10	-.144	1	-.112	2	-1.926e-3	3	NC	1	667.809	2
391		6	max	.004	3	-.009	15	.059	3	5.044e-3	2	NC	1	NC	5
392			min	0	10	-.179	1	-.136	2	-2.136e-3	3	NC	1	549.671	2
393		7	max	.004	3	-.011	15	.068	3	5.495e-3	2	NC	1	NC	5
394			min	-.001	2	-.214	1	-.157	2	-2.346e-3	3	8990.605	4	475.035	2
395		8	max	.005	3	-.012	15	.075	3	5.946e-3	2	NC	1	NC	5
396			min	-.002	2	-.249	1	-.175	2	-2.556e-3	3	8301.976	4	425.993	2
397		9	max	.005	3	-.014	15	.082	3	6.398e-3	2	NC	1	NC	5
398			min	-.003	2	-.283	1	-.189	2	-2.765e-3	3	7931.316	4	393.883	2
399		10	max	.005	3	-.015	15	.086	3	6.849e-3	2	NC	1	NC	5
400			min	-.004	2	-.317	1	-.198	2	-2.975e-3	3	7814.056	4	374.291	2
401		11	max	.005	3	-.016	15	.088	3	7.3e-3	2	NC	1	NC	5
402			min	-.004	2	-.351	1	-.202	2	-3.185e-3	3	7931.316	4	365.145	2
403		12	max	.006	3	-.018	15	.088	3	7.752e-3	2	NC	1	NC	5
404			min	-.005	2	-.385	1	-.201	2	-3.395e-3	3	8301.976	4	366.018	2
405		13	max	.006	3	-.019	15	.085	3	8.203e-3	2	NC	1	NC	5
406			min	-.006	2	-.419	1	-.193	2	-3.605e-3	3	8990.605	4	378.127	2
407		14	max	.006	3	-.02	15	.079	3	8.654e-3	2	NC	1	NC	5
408			min	-.006	2	-.452	1	-.178	2	-3.815e-3	3	NC	1	405.076	2
409		15	max	.007	3	-.021	15	.07	3	9.106e-3	2	NC	1	NC	5
410			min	-.007	2	-.486	1	-.157	2	-4.025e-3	3	NC	1	455.21	2
411		16	max	.007	3	-.022	15	.058	3	9.557e-3	2	NC	1	NC	5
412			min	-.008	2	-.519	1	-.127	2	-4.234e-3	3	NC	1	549.005	2
413		17	max	.007	3	-.023	15	.043	3	1.001e-2	2	NC	1	NC	5
414			min	-.009	2	-.552	1	-.088	2	-4.444e-3	3	NC	1	748.932	2
415		18	max	.008	3	-.024	15	.023	3	1.046e-2	2	NC	1	NC	5
416			min	-.009	2	-.584	1	-.041	2	-4.654e-3	3	NC	1	1368.786	2
417		19	max	.008	3	-.025	15	.024	1	1.091e-2	2	NC	1	NC	1
418			min	-.01	2	-.617	1	0	3	-4.864e-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	-.067	1	0	1	0	1	NC	1	NC	1
423		3	max	.007	3	-.006	15	0	1	0	1	NC	1	NC	1
424			min	0	10	-.131	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	10	-.194	1	0	1	0	1	NC	1	NC	1
427		5	max	.009	3	-.011	15	0	1	0	1	NC	1	NC	1
428			min	-.003	2	-.258	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	-.005	2	-.321	1	0	1	0	1	NC	1	NC	1
431		7	max	.011	3	-.016	15	0	1	0	1	NC	1	NC	1
432			min	-.007	2	-.384	1	0	1	0	1	8990.605	4	NC	1
433		8	max	.012	3	-.018	15	0	1	0	1	NC	1	NC	1
434			min	-.01	2	-.446	1	0	1	0	1	8301.976	4	NC	1
435		9	max	.013	3	-.021	15	0	1	0	1	NC	1	NC	1
436			min	-.012	2	-.509	1	0	1	0	1	7931.316	4	NC	1
437		10	max	.014	3	-.023	15	0	1	0	1	NC	1	NC	1
438			min	-.014	2	-.571	1	0	1	0	1	7814.056	4	NC	1
439		11	max	.015	3	-.025	15	0	1	0	1	NC	1	NC	1
440			min	-.016	2	-.633	1	0	1	0	1	7931.316	4	NC	1
441		12	max	.016	3	-.028	15	0	1	0	1	NC	1	NC	1
442			min	-.018	2	-.695	1	0	1	0	1	8301.976	4	NC	1
443		13	max	.017	3	-.03	15	0	1	0	1	NC	1	NC	1
444			min	-.02	2	-.757	1	0	1	0	1	8990.605	4	NC	1
445		14	max	.018	3	-.032	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	-.818	1	0	1	0	1	NC	1	NC	1
447		15	max	.019	3	-.034	15	0	1	0	1	NC	1	NC	1
448			min	-.024	2	-.88	1	0	1	0	1	NC	1	NC	1
449		16	max	.02	3	-.036	15	0	1	0	1	NC	1	NC	1
450			min	-.026	2	-.941	1	0	1	0	1	NC	1	NC	1
451		17	max	.021	3	-.038	15	0	1	0	1	NC	1	NC	1
452			min	-.028	2	-1.002	1	0	1	0	1	NC	1	NC	1
453		18	max	.022	3	-.04	15	0	1	0	1	NC	1	NC	1
454			min	-.031	2	-1.062	1	0	1	0	1	NC	1	NC	1
455		19	max	.023	3	-.042	15	0	1	0	1	NC	1	NC	1
456			min	-.033	2	-1.123	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.005	1	0	15	0	1	1.087e-3	3	NC	1	NC	1
458			min	0	15	-.002	1	0	3	-2.787e-3	2	NC	1	NC	1
459		2	max	.004	1	-.002	15	.03	2	1.297e-3	3	NC	1	NC	4
460			min	0	15	-.038	1	-.013	3	-3.238e-3	2	NC	1	2558.284	2
461		3	max	.003	1	-.004	15	.058	2	1.506e-3	3	NC	1	NC	5
462			min	0	15	-.073	1	-.025	3	-3.69e-3	2	NC	1	1289.074	2
463		4	max	.003	3	-.005	15	.086	2	1.716e-3	3	NC	1	NC	5
464			min	0	15	-.109	1	-.037	3	-4.141e-3	2	NC	1	871.766	2
465		5	max	.004	3	-.007	15	.112	2	1.926e-3	3	NC	1	NC	5
466			min	0	10	-.144	1	-.048	3	-4.592e-3	2	NC	1	667.809	2
467		6	max	.004	3	-.009	15	.136	2	2.136e-3	3	NC	1	NC	5
468			min	0	10	-.179	1	-.059	3	-5.044e-3	2	NC	1	549.671	2
469		7	max	.004	3	-.011	15	.157	2	2.346e-3	3	NC	1	NC	5
470			min	-.001	2	-.214	1	-.068	3	-5.495e-3	2	8990.605	4	475.035	2
471		8	max	.005	3	-.012	15	.175	2	2.556e-3	3	NC	1	NC	5
472			min	-.002	2	-.249	1	-.075	3	-5.946e-3	2	8301.976	4	425.993	2
473		9	max	.005	3	-.014	15	.189	2	2.765e-3	3	NC	1	NC	5
474			min	-.003	2	-.283	1	-.082	3	-6.398e-3	2	7931.316	4	393.883	2
475		10	max	.005	3	-.015	15	.198	2	2.975e-3	3	NC	1	NC	5
476			min	-.004	2	-.317	1	-.086	3	-6.849e-3	2	7814.056	4	374.291	2
477		11	max	.005	3	-.016	15	.202	2	3.185e-3	3	NC	1	NC	5
478			min	-.004	2	-.351	1	-.088	3	-7.3e-3	2	7931.316	4	365.145	2
479		12	max	.006	3	-.018	15	.201	2	3.395e-3	3	NC	1	NC	5
480			min	-.005	2	-.385	1	-.088	3	-7.752e-3	2	8301.976	4	366.018	2
481		13	max	.006	3	-.019	15	.193	2	3.605e-3	3	NC	1	NC	5
482			min	-.006	2	-.419	1	-.085	3	-8.203e-3	2	8990.605	4	378.127	2
483		14	max	.006	3	-.02	15	.178	2	3.815e-3	3	NC	1	NC	5
484			min	-.006	2	-.452	1	-.079	3	-8.654e-3	2	NC	1	405.076	2
485		15	max	.007	3	-.021	15	.157	2	4.025e-3	3	NC	1	NC	5
486			min	-.007	2	-.486	1	-.07	3	-9.106e-3	2	NC	1	455.21	2
487		16	max	.007	3	-.022	15	.127	2	4.234e-3	3	NC	1	NC	5
488			min	-.008	2	-.519	1	-.058	3	-9.557e-3	2	NC	1	549.005	2
489		17	max	.007	3	-.023	15	.088	2	4.444e-3	3	NC	1	NC	5
490			min	-.009	2	-.552	1	-.043	3	-1.001e-2	2	NC	1	748.932	2
491		18	max	.008	3	-.024	15	.041	2	4.654e-3	3	NC	1	NC	5
492			min	-.009	2	-.584	1	-.023	3	-1.046e-2	2	NC	1	1368.786	2
493		19	max	.008	3	-.025	15	0	3	4.864e-3	3	NC	1	NC	1
494			min	-.01	2	-.617	1	-.024	1	-1.091e-2	2	NC	1	NC	1