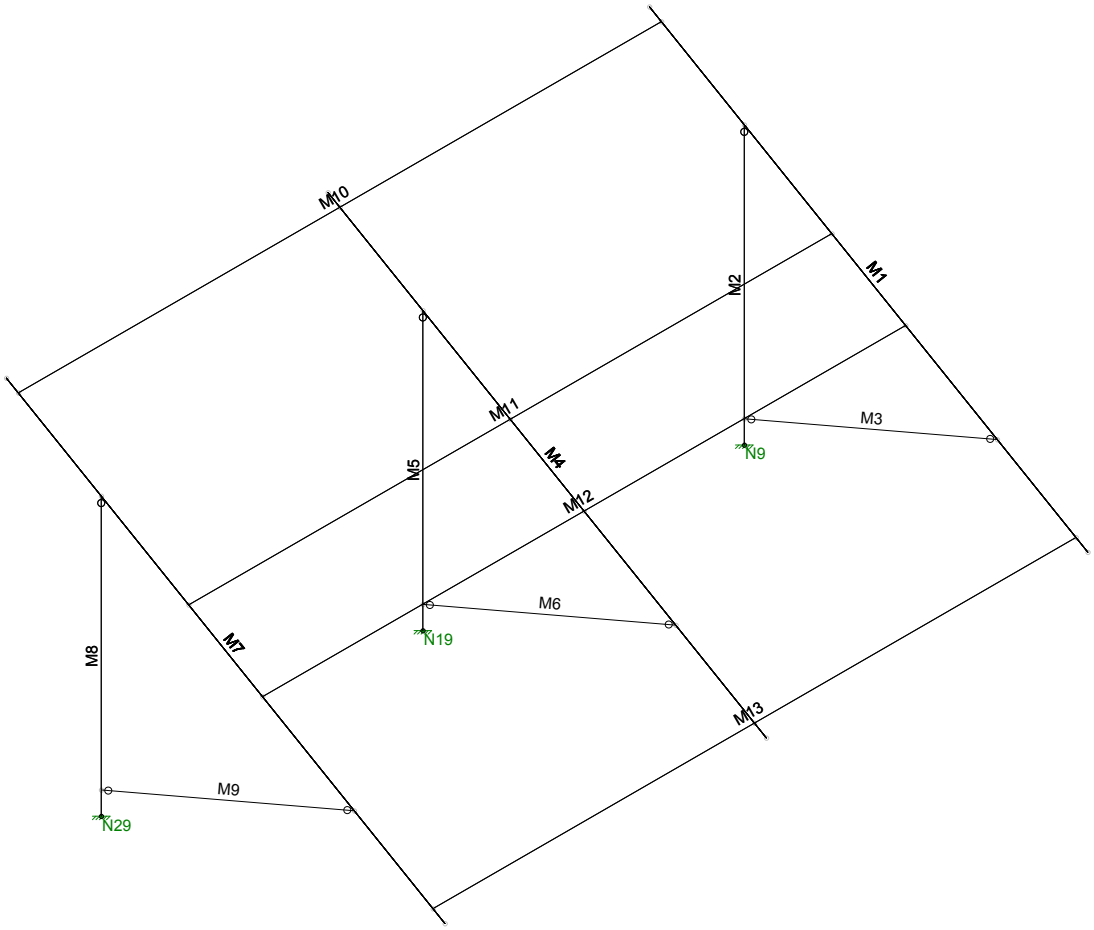


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

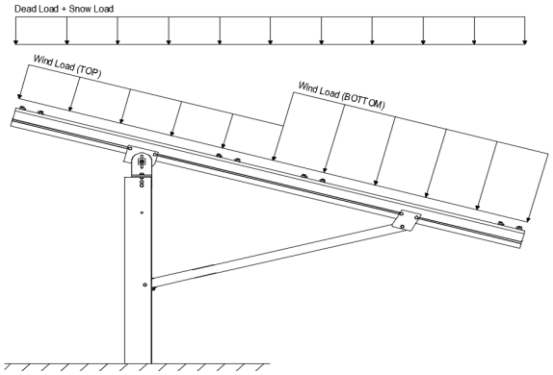
1.2 Construction

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 =	110 mph	Exposure Category = C	
Height <	15 ft	Importance Category = II	
Peak Velocity Pressure, q_z =	19.00 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	*(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)*
0.56D + 1.3E	R	
1.54D + 1.25E + 0.2S	O	
0.56D + 1.25E	O	

Allowable Stress Design, ASD

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

1.0D + 1.0S		
1.0D + 0.6W		
1.0D + 0.75L + 0.45W + 0.75S		
0.6D + 0.6W	M	*(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)*
1.238D + 0.875E	O	
1.1785D + 0.65625E + 0.75S	O	
0.362D + 0.875E	O	

M *Uses the minimum allowable module dead load.*

R *Include redundancy factor of 1.3.*

O *Includes overstrength factor of 1.25. Used to check seismic drift.*

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

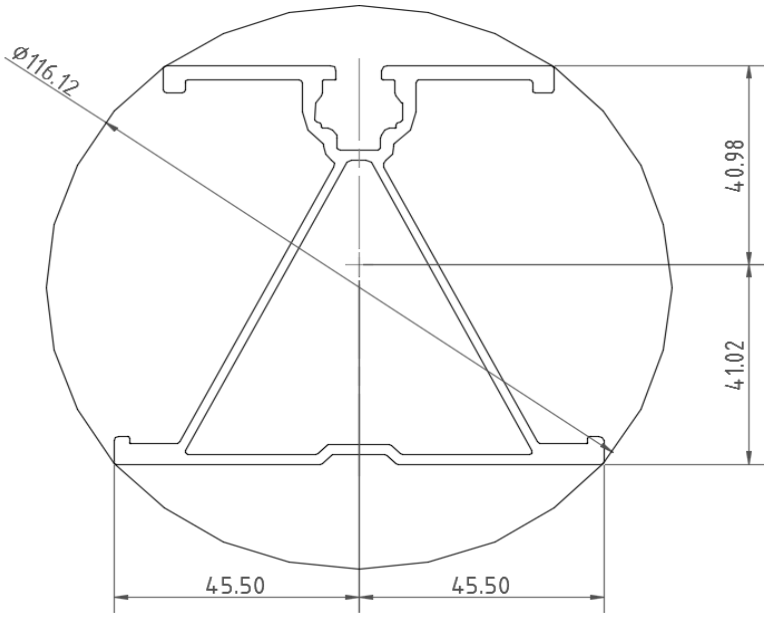
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	132	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 =	1.887	k-ft
M_z =	0.303	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	94%	

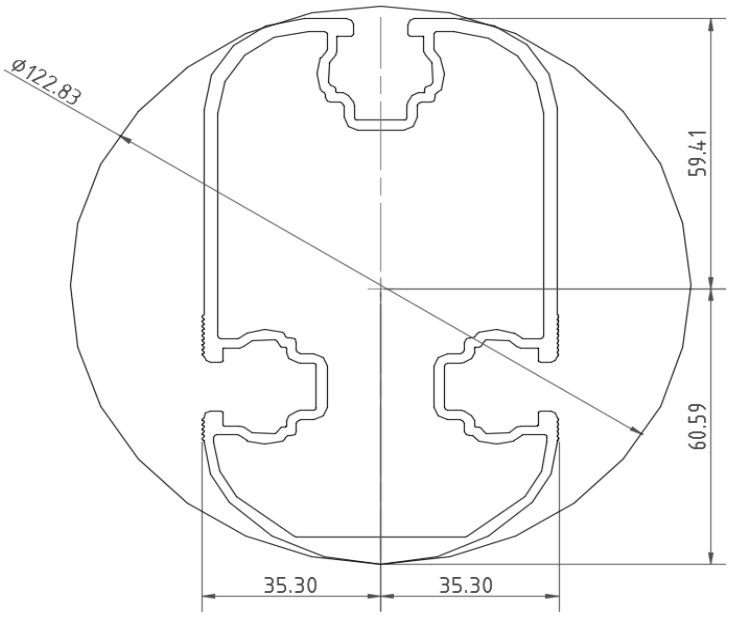


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.663	k-ft
M_z =	0.000	k-ft
P_n =	3.062	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	79%	

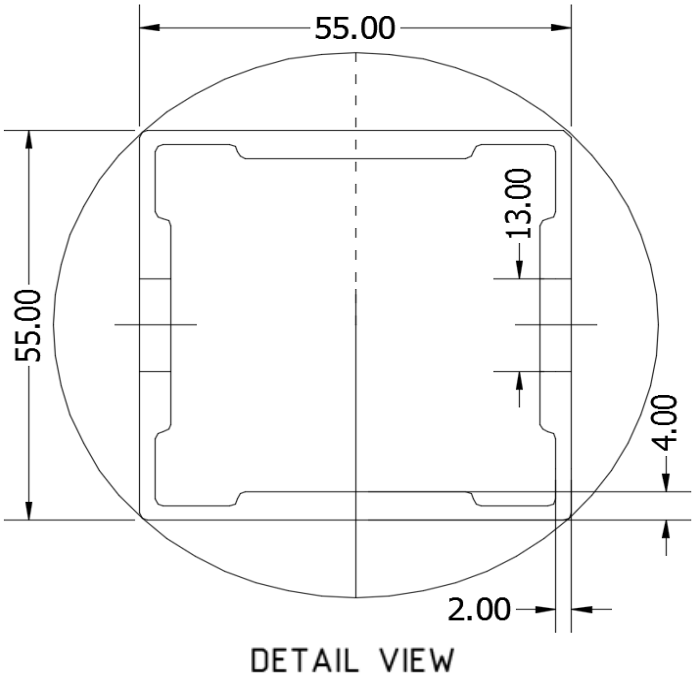


DETAIL VIEW

4.3 Strut Design

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

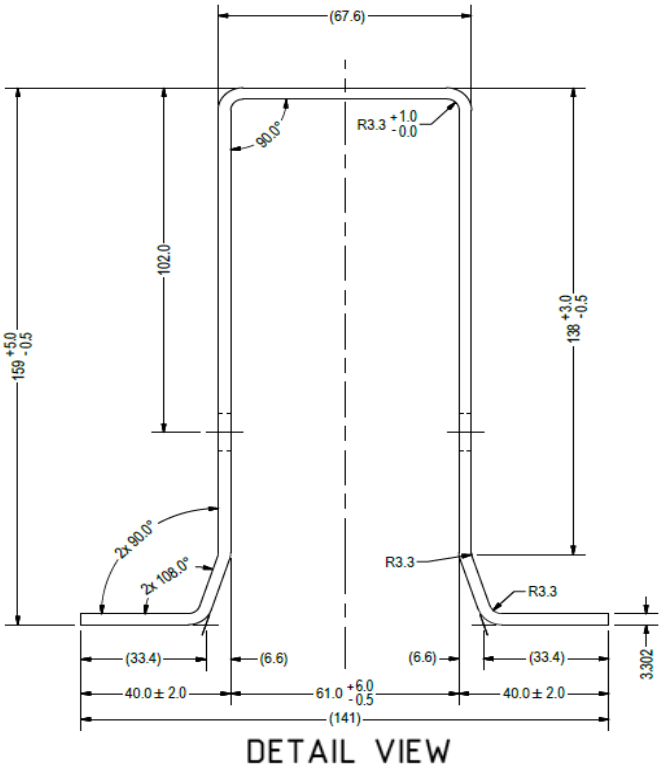
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.734	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	51%	



4.4 Post Design

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

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	89.60	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	13.248	k-ft
M_z =	0.000	k-ft
P_r =	6.618	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	97%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	5.78	k
Maximum Lateral Load =	3.57	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 =	1.17	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

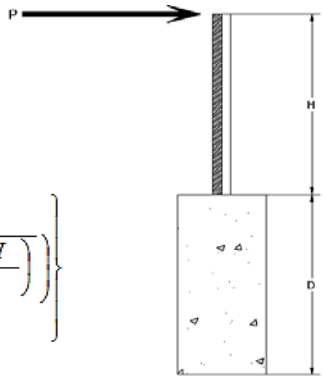
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.17	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 =	6.30	
Required Footing Depth, D =	10.52	ft

2nd Trial @ D_2 =	6.89	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.38	ksf
Constant 2.34P/(S_1B), A =	2.97	
Required Footing Depth, D =	6.30	ft

3rd Trial @ D_3 =	6.59	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.32	ksf
Constant 2.34P/(S_1B), A =	3.11	
Required Footing Depth, D =	6.48	ft

4th Trial @ D_4 =	6.54	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant 2.34P/(S_1B), A =	3.13	
Required Footing Depth, D =	6.52	ft

5th Trial @ D_5 =	6.53	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant 2.34P/(S_1B), A =	3.14	
Required Footing Depth, D =	6.75	ft

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

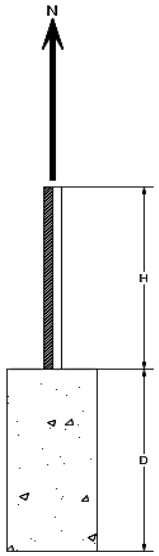
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.64	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	1.70	k
Required Concrete Volume, V =	11.71	ft^3
Required Footing Depth, D =	3.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.70
2	0.4	0.2	118.10	5.59
3	0.6	0.2	118.10	5.49
4	0.8	0.2	118.10	5.39
5	1	0.2	118.10	5.28
6	1.2	0.2	118.10	5.18
7	1.4	0.2	118.10	5.08
8	1.6	0.2	118.10	4.97
9	1.8	0.2	118.10	4.87
10	2	0.2	118.10	4.76
11	2.2	0.2	118.10	4.66
12	2.4	0.2	118.10	4.56
13	2.6	0.2	118.10	4.45
14	2.8	0.2	118.10	4.35
15	3	0.2	118.10	4.25
16	3.2	0.2	118.10	4.14
17	3.4	0.2	118.10	4.04
18	3.6	0.2	118.10	3.93
19	3.8	0.2	118.10	3.83
20	4	0.2	118.10	3.73
21	0	0.0	0.00	3.73
22	0	0.0	0.00	3.73
23	0	0.0	0.00	3.73
24	0	0.0	0.00	3.73
25	0	0.0	0.00	3.73
26	0	0.0	0.00	3.73
27	0	0.0	0.00	3.73
28	0	0.0	0.00	3.73
29	0	0.0	0.00	3.73
30	0	0.0	0.00	3.73
31	0	0.0	0.00	3.73
32	0	0.0	0.00	3.73
33	0	0.0	0.00	3.73
34	0	0.0	0.00	3.73
Max	4	Sum	0.94	

A 2ft diameter x 3.75ft 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 =	6.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.31	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	23.56	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

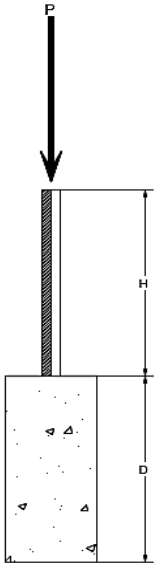
Weight of Concrete

Footing Volume	21.21	ft^3
Weight	3.07	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.53	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.00	k
Applied Force =	7.39	k
Utilization =	67%	

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



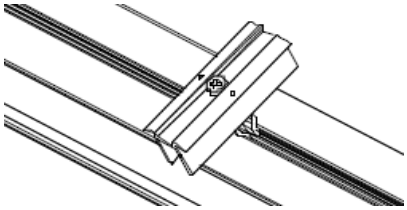
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

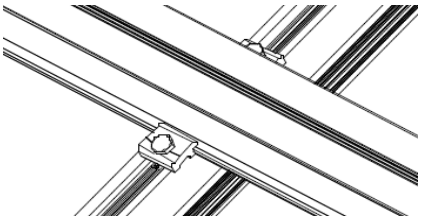
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.476 k
Allowable Uplift	=	1.214 k
Utilization	=	39%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.848 k
Allowable Uplift	=	2.180 k
Utilization	=	85%

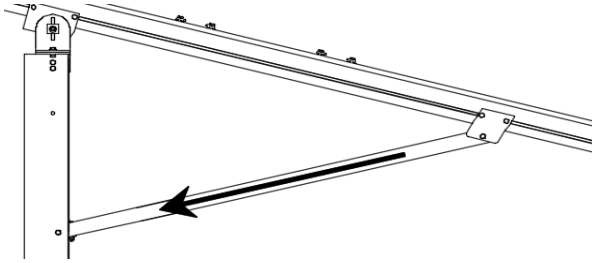


6.2 Strut Connections

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

Maximum Axial Load	=	4.734 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)

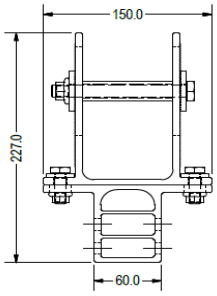


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

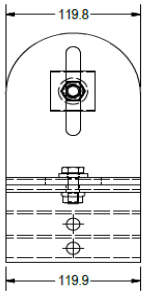
6.3 Girder to Post Connection

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.

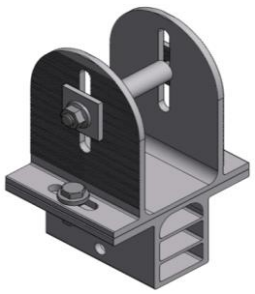
Maximum Tensile Load	=	3.839 k
Allowable Load	=	5.649 k
Utilization	=	68%



FRONT VIEW



SIDE VIEW



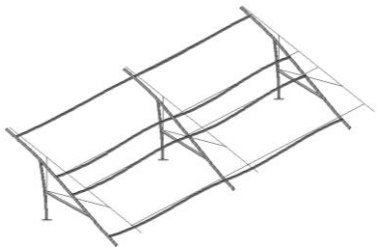
7. SEISMIC DESIGN

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 =	132 in	L_b =	132
J =	0.432	J =	0.432
	365.174		232.229
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	27.1 ksi	φF_L=	28.4
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 = 1.98

80.5199

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.5 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 74.8031

J = 1.98

80.5199

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.5

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

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

φF_L = 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = φyFcy

φF_L = 33.25 ksi

φF_L = 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	89.60	in	
Pr =	6.62	k	(LRFD Factored Load)
Mr (Strong) =	13.25	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 =	0.2842	≥	0.2	
Utilization =	0.97	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.284	≥	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 97%

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	-71.679	-71.679	0	0
2	M11	y	-71.679	-71.679	0	0
3	M12	y	-115.31	-115.31	0	0
4	M13	y	-115.31	-115.31	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	143.359	143.359	0	0
2	M11	y	143.359	143.359	0	0
3	M12	y	68.563	68.563	0	0
4	M13	y	68.563	68.563	0	0

Load Combinations

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

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
8																										
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																		
10	ASD 1.0D + 0.6W	Yes	Y		1	1			4	.6																
11	ASD 1.0D + 0.75L + 0.45W + 0....	Yes	Y		1	1	3	.75	4	.45																
12	ASD 0.6D + 0.6W	Yes	Y		2	.6					5	.6														
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875														
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656														
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875														

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	696.636	2	2511.938	1	212.979	1	.356	1	.007	3	7.122	1
2		min	-979.767	3	-1428.041	3	-208.291	3	-.32	3	-.016	2	.316	15
3	N19	max	2720.487	2	6639.764	1	0	15	0	1	0	15	13.057	1
4		min	-2702.751	3	-4440.093	3	0	1	0	3	0	3	.53	15
5	N29	max	696.636	2	2511.938	1	208.291	3	.32	3	.016	2	7.122	1
6		min	-979.767	3	-1428.041	3	-212.979	1	-.356	1	-.007	3	.316	15
7	Totals:	max	4113.758	2	11663.639	1	0	2						
8		min	-4662.284	3	-7296.174	3	0	3						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.004	1	0	5	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-11.851	15	266.511	3	-8.056	15	.052	3	.419	1	.244	2
4			min	-257.206	1	-664.851	2	-193.008	1	-.252	2	.018	15	-.094	3
5		3	max	-12.127	15	265.323	3	-8.056	15	.052	3	.293	1	.68	2
6			min	-258.12	1	-666.436	2	-193.008	1	-.252	2	.013	15	-.269	3
7		4	max	-12.402	15	264.135	3	-8.056	15	.052	3	.166	1	1.118	2
8			min	-259.035	1	-668.02	2	-193.008	1	-.252	2	.008	15	-.442	3
9		5	max	349.601	3	633.089	2	8.238	3	.061	2	.212	1	1.318	2
10			min	-1170.477	1	-242.823	3	-247.218	1	-.076	3	-.043	3	-.522	3
11		6	max	348.915	3	631.505	2	8.238	3	.061	2	.065	2	.903	2
12			min	-1171.392	1	-244.011	3	-247.218	1	-.076	3	-.038	3	-.363	3
13		7	max	348.229	3	629.92	2	8.238	3	.061	2	-.005	15	.489	2
14			min	-1172.306	1	-245.199	3	-247.218	1	-.076	3	-.112	1	-.202	3
15		8	max	347.543	3	628.336	2	8.238	3	.061	2	-.012	15	.076	2
16			min	-1173.221	1	-246.388	3	-247.218	1	-.076	3	-.274	1	-.041	3
17		9	max	323.086	3	4.472	3	23.714	3	-.003	15	.13	1	.039	3
18			min	-1443.467	1	-19.192	2	-298.982	1	-.19	2	.006	15	-.112	2
19		10	max	322.4	3	3.284	3	23.714	3	-.003	15	.065	3	.036	3
20			min	-1444.382	1	-20.776	2	-298.982	1	-.19	2	-.066	1	-.099	2
21		11	max	321.714	3	2.096	3	23.714	3	-.003	15	.08	3	.034	3
22			min	-1445.297	1	-22.36	2	-298.982	1	-.19	2	-.262	1	-.085	2
23		12	max	293.18	3	630.505	3	74.329	2	.313	3	.191	1	.09	1
24			min	-1710.33	1	-500.657	1	-235.763	3	-.317	1	.009	15	-.166	3
25		13	max	292.494	3	629.317	3	74.329	2	.313	3	.19	1	.419	1
26			min	-1711.245	1	-502.242	1	-235.763	3	-.317	1	-.048	3	-.58	3
27		14	max	291.808	3	628.129	3	74.329	2	.313	3	.189	1	.749	1
28			min	-1712.159	1	-503.826	1	-235.763	3	-.317	1	-.203	3	-.992	3
29		15	max	291.122	3	626.94	3	74.329	2	.313	3	.218	2	1.08	1
30			min	-1713.074	1	-505.411	1	-235.763	3	-.317	1	-.358	3	-1.404	3
31		16	max	259.469	1	498.011	1	-7.167	15	.257	1	.034	3	.822	1
32			min	12.456	15	-639.295	3	-159.29	1	-.446	3	-.235	1	-1.072	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	258.554	1	496.427	1	-7.167	15	.257	1	0	3	.496	1
34			min	12.18	15	-640.483	3	-159.29	1	-.446	3	-.34	1	-.652	3
35		18	max	257.639	1	494.842	1	-7.167	15	.257	1	-.019	15	.17	1
36			min	11.904	15	-641.671	3	-159.29	1	-.446	3	-.444	1	-.231	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	1	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	-15.899	12	852.341	3	0	1	0	1	0	1	.597	2
42			min	-462.957	1	-1909.055	2	0	1	0	1	0	1	-.275	3
43		3	max	-16.357	12	851.152	3	0	1	0	1	0	1	1.85	2
44			min	-463.872	1	-1910.64	2	0	1	0	1	0	1	-.834	3
45		4	max	-16.814	12	849.964	3	0	1	0	1	0	1	3.104	2
46			min	-464.786	1	-1912.224	2	0	1	0	1	0	1	-1.392	3
47		5	max	1262.818	3	1872.995	2	0	1	0	1	0	1	3.663	2
48			min	-3086.115	1	-866.663	3	0	1	0	1	0	1	-1.635	3
49		6	max	1262.132	3	1871.411	2	0	1	0	1	0	1	2.435	2
50			min	-3087.03	1	-867.851	3	0	1	0	1	0	1	-1.066	3
51		7	max	1261.446	3	1869.827	2	0	1	0	1	0	1	1.208	2
52			min	-3087.945	1	-869.04	3	0	1	0	1	0	1	-.496	3
53		8	max	1260.76	3	1868.242	2	0	1	0	1	0	1	.075	3
54			min	-3088.86	1	-870.228	3	0	1	0	1	0	1	-.049	1
55		9	max	1238.726	3	13.169	3	0	1	0	1	0	1	.342	3
56			min	-3525.735	1	-89.629	1	0	1	0	1	0	1	-.594	2
57		10	max	1238.04	3	11.981	3	0	1	0	1	0	1	.334	3
58			min	-3526.65	1	-91.214	1	0	1	0	1	0	1	-.536	2
59		11	max	1237.354	3	10.793	3	0	1	0	1	0	1	.327	3
60			min	-3527.565	1	-92.798	1	0	1	0	1	0	1	-.477	2
61		12	max	1223.473	3	1781.209	3	0	1	0	1	0	1	.069	1
62			min	-3974.867	1	-1595.682	1	0	1	0	1	0	1	-.245	3
63		13	max	1222.787	3	1780.02	3	0	1	0	1	0	1	1.116	1
64			min	-3975.782	1	-1597.267	1	0	1	0	1	0	1	-1.414	3
65		14	max	1222.101	3	1778.832	3	0	1	0	1	0	1	2.165	1
66			min	-3976.696	1	-1598.851	1	0	1	0	1	0	1	-2.581	3
67		15	max	1221.415	3	1777.644	3	0	1	0	1	0	1	3.214	1
68			min	-3977.611	1	-1600.436	1	0	1	0	1	0	1	-3.748	3
69		16	max	463.919	1	1493.502	1	0	1	0	1	0	1	2.447	1
70			min	18.963	12	-1746.447	3	0	1	0	1	0	1	-2.845	3
71		17	max	463.005	1	1491.917	1	0	1	0	1	0	1	1.468	1
72			min	18.505	12	-1747.635	3	0	1	0	1	0	1	-1.699	3
73		18	max	462.09	1	1490.333	1	0	1	0	1	0	1	.489	1
74			min	18.048	12	-1748.823	3	0	1	0	1	0	1	-.552	3
75		19	max	0	1	.001	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	-11.851	15	266.511	3	193.008	1	.252	2	-.018	15	.244	2
80			min	-257.206	1	-664.851	2	8.056	15	-.052	3	-.419	1	-.094	3
81		3	max	-12.127	15	265.323	3	193.008	1	.252	2	-.013	15	.68	2
82			min	-258.12	1	-666.436	2	8.056	15	-.052	3	-.293	1	-.269	3
83		4	max	-12.402	15	264.135	3	193.008	1	.252	2	-.008	15	1.118	2
84			min	-259.035	1	-668.02	2	8.056	15	-.052	3	-.166	1	-.442	3
85		5	max	349.601	3	633.089	2	247.218	1	.076	3	.043	3	1.318	2
86			min	-1170.477	1	-242.823	3	-8.238	3	-.061	2	-.212	1	-.522	3
87		6	max	348.915	3	631.505	2	247.218	1	.076	3	.038	3	.903	2
88			min	-1171.392	1	-244.011	3	-8.238	3	-.061	2	-.065	2	-.363	3
89		7	max	348.229	3	629.92	2	247.218	1	.076	3	.112	1	.489	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	-1172.306	1	-245.199	3	-8.238	3	-.061	2	.005	15	-.202	3
91		8	max	347.543	3	628.336	2	247.218	1	.076	3	.274	1	.076	2
92			min	-1173.221	1	-246.388	3	-8.238	3	-.061	2	.012	15	-.041	3
93		9	max	323.086	3	4.472	3	298.982	1	.19	2	-.006	15	.039	3
94			min	-1443.467	1	-19.192	2	-23.714	3	.003	15	-.13	1	-.112	2
95		10	max	322.4	3	3.284	3	298.982	1	.19	2	.066	1	.036	3
96			min	-1444.382	1	-20.776	2	-23.714	3	.003	15	-.065	3	-.099	2
97		11	max	321.714	3	2.096	3	298.982	1	.19	2	.262	1	.034	3
98			min	-1445.297	1	-22.36	2	-23.714	3	.003	15	-.08	3	-.085	2
99		12	max	293.18	3	630.505	3	235.763	3	.317	1	-.009	15	.09	1
100			min	-1710.33	1	-500.657	1	-74.329	2	-.313	3	-.191	1	-.166	3
101		13	max	292.494	3	629.317	3	235.763	3	.317	1	.048	3	.419	1
102			min	-1711.245	1	-502.242	1	-74.329	2	-.313	3	-.19	1	-.58	3
103		14	max	291.808	3	628.129	3	235.763	3	.317	1	.203	3	.749	1
104			min	-1712.159	1	-503.826	1	-74.329	2	-.313	3	-.189	1	-.992	3
105		15	max	291.122	3	626.94	3	235.763	3	.317	1	.358	3	1.08	1
106			min	-1713.074	1	-505.411	1	-74.329	2	-.313	3	-.218	2	-1.404	3
107		16	max	259.469	1	498.011	1	159.29	1	.446	3	.235	1	.822	1
108			min	12.456	15	-639.295	3	7.167	15	-.257	1	-.034	3	-1.072	3
109		17	max	258.554	1	496.427	1	159.29	1	.446	3	.34	1	.496	1
110			min	12.18	15	-640.483	3	7.167	15	-.257	1	0	3	-.652	3
111		18	max	257.639	1	494.842	1	159.29	1	.446	3	.444	1	.17	1
112			min	11.904	15	-641.671	3	7.167	15	-.257	1	.019	15	-.231	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	159.351	1	493.632	1	-11.629	15	.005	2	.497	1	.257	1
116			min	7.168	15	-642.789	3	-257.298	1	-.017	3	.021	15	-.446	3
117		2	max	159.351	1	356.045	1	-9.119	15	.005	2	.216	1	.236	3
118			min	7.168	15	-474.201	3	-203.153	1	-.017	3	.009	15	-.262	1
119		3	max	159.351	1	218.458	1	-6.609	15	.005	2	.027	2	.713	3
120			min	7.168	15	-305.613	3	-149.007	1	-.017	3	-.011	9	-.613	1
121		4	max	159.351	1	80.871	1	-4.098	15	.005	2	-.006	12	.983	3
122			min	7.168	15	-137.026	3	-94.861	1	-.017	3	-.148	1	-.796	1
123		5	max	159.351	1	31.562	3	-1.588	15	.005	2	-.011	15	1.048	3
124			min	7.168	15	-56.717	1	-40.715	1	-.017	3	-.231	1	-.811	1
125		6	max	159.351	1	200.15	3	13.431	1	.005	2	-.011	15	.906	3
126			min	7.168	15	-194.304	1	-4.186	10	-.017	3	-.248	1	-.657	1
127		7	max	159.351	1	368.737	3	67.576	1	.005	2	-.009	15	.559	3
128			min	7.168	15	-331.891	1	1.12	12	-.017	3	-.198	1	-.336	1
129		8	max	159.351	1	537.325	3	121.722	1	.005	2	-.003	15	.154	1
130			min	7.168	15	-469.478	1	3.672	12	-.017	3	-.082	1	.004	12
131		9	max	159.351	1	705.913	3	175.868	1	.005	2	.099	1	.812	1
132			min	7.168	15	-607.065	1	6.223	12	-.017	3	-.013	10	-.755	3
133		10	max	159.351	1	874.5	3	23.551	10	.017	3	.347	1	1.638	1
134			min	7.168	15	-347.098	10	-230.014	1	0	15	.001	3	-1.721	3
135		11	max	159.351	1	607.065	1	-6.223	12	.017	3	.099	1	.812	1
136			min	7.168	15	-705.913	3	-175.868	1	-.005	2	-.013	10	-.755	3
137		12	max	159.351	1	469.478	1	-3.672	12	.017	3	-.003	15	.154	1
138			min	7.168	15	-537.325	3	-121.722	1	-.005	2	-.082	1	.004	12
139		13	max	159.351	1	331.891	1	-1.12	12	.017	3	-.009	15	.559	3
140			min	7.168	15	-368.737	3	-67.576	1	-.005	2	-.198	1	-.336	1
141		14	max	159.351	1	194.304	1	4.186	10	.017	3	-.011	15	.906	3
142			min	7.168	15	-200.15	3	-13.431	1	-.005	2	-.248	1	-.657	1
143		15	max	159.351	1	56.717	1	40.715	1	.017	3	-.011	15	1.048	3
144			min	7.168	15	-31.562	3	1.588	15	-.005	2	-.231	1	-.811	1
145		16	max	159.351	1	137.026	3	94.861	1	.017	3	-.006	12	.983	3
146			min	7.168	15	-80.871	1	4.098	15	-.005	2	-.148	1	-.796	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
147		17	max	159.351	1	305.613	3	149.007	1	.017	3	.027	2	.713	3
148			min	7.168	15	-218.458	1	6.609	15	-.005	2	-.011	9	-.613	1
149		18	max	159.351	1	474.201	3	203.153	1	.017	3	.216	1	.236	3
150			min	7.168	15	-356.045	1	9.119	15	-.005	2	.009	15	-.262	1
151		19	max	159.351	1	642.789	3	257.298	1	.017	3	.497	1	.257	1
152			min	7.168	15	-493.632	1	11.629	15	-.005	2	.021	15	-.446	3
153	M11	1	max	296.664	1	486.266	1	-12.017	15	0	15	.555	1	.171	1
154			min	-259.316	3	-629.931	3	-265.194	1	-.01	1	.024	15	-.445	3
155		2	max	296.664	1	348.679	1	-9.507	15	0	15	.264	1	.222	3
156			min	-259.316	3	-461.343	3	-211.048	1	-.01	1	.011	15	-.344	2
157		3	max	296.664	1	211.092	1	-6.997	15	0	15	.039	1	.683	3
158			min	-259.316	3	-292.756	3	-156.902	1	-.01	1	.001	15	-.681	1
159		4	max	296.664	1	73.505	1	-4.487	15	0	15	.013	3	.938	3
160			min	-259.316	3	-124.168	3	-102.756	1	-.01	1	-.119	1	-.855	1
161		5	max	296.664	1	44.42	3	-1.976	15	0	15	-.003	12	.987	3
162			min	-259.316	3	-64.082	1	-48.611	1	-.01	1	-.212	1	-.861	1
163		6	max	296.664	1	213.007	3	7.341	9	0	15	-.011	15	.829	3
164			min	-259.316	3	-201.669	1	-8.44	3	-.01	1	-.238	1	-.699	1
165		7	max	296.664	1	381.595	3	59.681	1	0	15	-.009	15	.466	3
166			min	-259.316	3	-339.256	1	-4.613	3	-.01	1	-.198	1	-.368	1
167		8	max	296.664	1	550.183	3	113.827	1	0	15	-.003	15	.131	1
168			min	-259.316	3	-476.843	1	-.786	3	-.01	1	-.092	1	-.104	3
169		9	max	296.664	1	718.77	3	167.973	1	0	15	.08	1	.798	1
170			min	-259.316	3	-614.43	1	2.572	12	-.01	1	-.027	3	-.879	3
171		10	max	296.664	1	887.358	3	222.118	1	.01	1	.318	1	1.633	1
172			min	-259.316	3	-752.017	1	5.123	12	-.004	10	-.021	3	-1.861	3
173		11	max	296.664	1	614.43	1	-2.572	12	.01	1	.08	1	.798	1
174			min	-259.316	3	-718.77	3	-167.973	1	0	15	-.027	3	-.879	3
175		12	max	296.664	1	476.843	1	.786	3	.01	1	-.003	15	.131	1
176			min	-259.316	3	-550.183	3	-113.827	1	0	15	-.092	1	-.104	3
177		13	max	296.664	1	339.256	1	4.613	3	.01	1	-.009	15	.466	3
178			min	-259.316	3	-381.595	3	-59.681	1	0	15	-.198	1	-.368	1
179		14	max	296.664	1	201.669	1	8.44	3	.01	1	-.011	15	.829	3
180			min	-259.316	3	-213.007	3	-7.341	9	0	15	-.238	1	-.699	1
181		15	max	296.664	1	64.082	1	48.611	1	.01	1	-.003	12	.987	3
182			min	-259.316	3	-44.42	3	1.976	15	0	15	-.212	1	-.861	1
183		16	max	296.664	1	124.168	3	102.756	1	.01	1	.013	3	.938	3
184			min	-259.316	3	-73.505	1	4.487	15	0	15	-.119	1	-.855	1
185		17	max	296.664	1	292.756	3	156.902	1	.01	1	.039	1	.683	3
186			min	-259.316	3	-211.092	1	6.997	15	0	15	.001	15	-.681	1
187		18	max	296.664	1	461.343	3	211.048	1	.01	1	.264	1	.222	3
188			min	-259.316	3	-348.679	1	9.507	15	0	15	.011	15	-.344	2
189		19	max	296.664	1	629.931	3	265.194	1	.01	1	.555	1	.171	1
190			min	-259.316	3	-486.266	1	12.017	15	0	15	.024	15	-.445	3
191	M12	1	max	15.521	3	645.481	2	-12.138	15	0	15	.584	1	.251	2
192			min	-50.35	1	-252.145	3	-269.148	1	-.007	1	.025	15	.004	15
193		2	max	15.521	3	465.33	2	-9.627	15	0	15	.288	1	.316	3
194			min	-50.35	1	-174.974	3	-215.002	1	-.007	1	.012	15	-.428	2
195		3	max	15.521	3	285.18	2	-7.117	15	0	15	.058	1	.483	3
196			min	-50.35	1	-97.804	3	-160.856	1	-.007	1	.002	15	-.887	2
197		4	max	15.521	3	105.029	2	-4.607	15	0	15	0	10	.555	3
198			min	-50.35	1	-20.634	3	-106.711	1	-.007	1	-.105	1	-1.125	2
199		5	max	15.521	3	56.537	3	-2.097	15	0	15	-.009	12	.533	3
200			min	-50.35	1	-75.121	2	-52.565	1	-.007	1	-.203	1	-1.144	2
201		6	max	15.521	3	133.707	3	5.643	9	0	15	-.011	15	.417	3
202			min	-50.35	1	-255.272	2	-9.58	2	-.007	1	-.234	1	-.942	2
203		7	max	15.521	3	210.877	3	55.727	1	0	15	-.009	15	.206	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	-50.35	1	-435.422	2	-.824	3	-.007	1	-.199	1	-.52	2
205		8	max	15.521	3	288.048	3	109.872	1	0	15	-.004	15	.123	2
206			min	-50.35	1	-615.573	2	2.282	12	-.007	1	-.097	1	-.099	3
207		9	max	15.521	3	365.218	3	164.018	1	0	15	.07	1	.985	2
208			min	-50.35	1	-795.723	2	4.834	12	-.007	1	-.019	10	-.498	3
209		10	max	15.521	3	-23.711	15	218.164	1	.003	3	.303	1	2.068	2
210			min	-50.35	1	-975.874	2	-10.658	3	-.007	1	-.007	3	-.991	3
211		11	max	15.521	3	795.723	2	-4.834	12	.007	1	.07	1	.985	2
212			min	-50.35	1	-365.218	3	-164.018	1	0	15	-.019	10	-.498	3
213		12	max	15.521	3	615.573	2	-2.282	12	.007	1	-.004	15	.123	2
214			min	-50.35	1	-288.048	3	-109.872	1	0	15	-.097	1	-.099	3
215		13	max	15.521	3	435.422	2	.824	3	.007	1	-.009	15	.206	3
216			min	-50.35	1	-210.877	3	-55.727	1	0	15	-.199	1	-.52	2
217		14	max	15.521	3	255.272	2	9.58	2	.007	1	-.011	15	.417	3
218			min	-50.35	1	-133.707	3	-5.643	9	0	15	-.234	1	-.942	2
219		15	max	15.521	3	75.121	2	52.565	1	.007	1	-.009	12	.533	3
220			min	-50.35	1	-56.537	3	2.097	15	0	15	-.203	1	-1.144	2
221		16	max	15.521	3	20.634	3	106.711	1	.007	1	0	10	.555	3
222			min	-50.35	1	-105.029	2	4.607	15	0	15	-.105	1	-1.125	2
223		17	max	15.521	3	97.804	3	160.856	1	.007	1	.058	1	.483	3
224			min	-50.35	1	-285.18	2	7.117	15	0	15	.002	15	-.887	2
225		18	max	15.521	3	174.974	3	215.002	1	.007	1	.288	1	.316	3
226			min	-50.35	1	-465.33	2	9.627	15	0	15	.012	15	-.428	2
227		19	max	15.521	3	252.145	3	269.148	1	.007	1	.584	1	.251	2
228			min	-50.35	1	-645.481	2	12.138	15	0	15	.025	15	.004	15
229	M13	1	max	-8.055	15	664.193	2	-11.574	15	.005	3	.484	1	.252	2
230			min	-192.686	1	-267.717	3	-255.584	1	-.021	2	.021	15	-.052	3
231		2	max	-8.055	15	484.043	2	-9.063	15	.005	3	.205	1	.228	3
232			min	-192.686	1	-190.547	3	-201.438	1	-.021	2	.008	15	-.45	2
233		3	max	-8.055	15	303.892	2	-6.553	15	.005	3	.018	2	.414	3
234			min	-192.686	1	-113.376	3	-147.293	1	-.021	2	-.015	9	-.932	2
235		4	max	-8.055	15	123.742	2	-4.043	15	.005	3	-.002	12	.506	3
236			min	-192.686	1	-36.206	3	-93.147	1	-.021	2	-.155	1	-1.193	2
237		5	max	-8.055	15	40.964	3	-1.533	15	.005	3	-.01	12	.503	3
238			min	-192.686	1	-56.409	2	-39.001	1	-.021	2	-.236	1	-1.234	2
239		6	max	-8.055	15	118.135	3	15.145	1	.005	3	-.011	15	.405	3
240			min	-192.686	1	-236.559	2	-4.19	3	-.021	2	-.251	1	-1.055	2
241		7	max	-8.055	15	195.305	3	69.29	1	.005	3	-.009	15	.214	3
242			min	-192.686	1	-416.71	2	-.363	3	-.021	2	-.199	1	-.656	2
243		8	max	-8.055	15	272.475	3	123.436	1	.005	3	-.003	15	-.003	15
244			min	-192.686	1	-596.86	2	2.624	12	-.021	2	-.081	1	-.072	1
245		9	max	-8.055	15	349.645	3	177.582	1	.005	3	.103	1	.803	2
246			min	-192.686	1	-777.011	2	5.176	12	-.021	2	-.016	3	-.452	3
247		10	max	-8.055	15	-22.761	15	231.728	1	.021	2	.353	1	1.863	2
248			min	-192.686	1	-957.161	2	-11.119	3	-.005	3	-.005	3	-.927	3
249		11	max	-8.055	15	777.011	2	-5.176	12	.021	2	.103	1	.803	2
250			min	-192.686	1	-349.645	3	-177.582	1	-.005	3	-.016	3	-.452	3
251		12	max	-8.055	15	596.86	2	-2.624	12	.021	2	-.003	15	-.003	15
252			min	-192.686	1	-272.475	3	-123.436	1	-.005	3	-.081	1	-.072	1
253		13	max	-8.055	15	416.71	2	.363	3	.021	2	-.009	15	.214	3
254			min	-192.686	1	-195.305	3	-69.29	1	-.005	3	-.199	1	-.656	2
255		14	max	-8.055	15	236.559	2	4.19	3	.021	2	-.011	15	.405	3
256			min	-192.686	1	-118.135	3	-15.145	1	-.005	3	-.251	1	-1.055	2
257		15	max	-8.055	15	56.409	2	39.001	1	.021	2	-.01	12	.503	3
258			min	-192.686	1	-40.964	3	1.533	15	-.005	3	-.236	1	-1.234	2
259		16	max	-8.055	15	36.206	3	93.147	1	.021	2	-.002	12	.506	3
260			min	-192.686	1	-123.742	2	4.043	15	-.005	3	-.155	1	-1.193	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	-8.055	15	113.376	3	147.293	1	.021	2	.018	2	.414	3
262			min	-192.686	1	-303.892	2	6.553	15	-.005	3	-.015	9	-.932	2
263		18	max	-8.055	15	190.547	3	201.438	1	.021	2	.205	1	.228	3
264			min	-192.686	1	-484.043	2	9.063	15	-.005	3	.008	15	-.45	2
265		19	max	-8.055	15	267.717	3	255.584	1	.021	2	.484	1	.252	2
266			min	-192.686	1	-664.193	2	11.574	15	-.005	3	.021	15	-.052	3
267	M2	1	max	2511.938	1	979.245	3	213.244	1	.007	3	.32	3	7.122	1
268			min	-1428.041	3	-695.458	2	-208.156	3	-.016	2	-.356	1	.316	15
269		2	max	2508.666	1	979.245	3	213.244	1	.007	3	.246	3	7.187	1
270			min	-1430.494	3	-695.458	2	-208.156	3	-.016	2	-.28	1	.312	15
271		3	max	1921.203	1	1215.413	1	157.357	1	.002	1	.19	3	6.987	1
272			min	-1190.486	3	52.282	15	-185.504	3	-.001	3	-.243	1	.301	15
273		4	max	1917.931	1	1215.413	1	157.357	1	.002	1	.123	3	6.55	1
274			min	-1192.939	3	52.282	15	-185.504	3	-.001	3	-.186	1	.282	15
275		5	max	1914.66	1	1215.413	1	157.357	1	.002	1	.056	3	6.113	1
276			min	-1195.393	3	52.282	15	-185.504	3	-.001	3	-.129	1	.263	15
277		6	max	1911.388	1	1215.413	1	157.357	1	.002	1	-.003	15	5.677	1
278			min	-1197.847	3	52.282	15	-185.504	3	-.001	3	-.073	1	.244	15
279		7	max	1908.117	1	1215.413	1	157.357	1	.002	1	.015	2	5.24	1
280			min	-1200.3	3	52.282	15	-185.504	3	-.001	3	-.077	3	.225	15
281		8	max	1904.845	1	1215.413	1	157.357	1	.002	1	.067	2	4.803	1
282			min	-1202.754	3	52.282	15	-185.504	3	-.001	3	-.144	3	.207	15
283		9	max	1901.574	1	1215.413	1	157.357	1	.002	1	.12	2	4.367	1
284			min	-1205.207	3	52.282	15	-185.504	3	-.001	3	-.21	3	.188	15
285		10	max	1898.302	1	1215.413	1	157.357	1	.002	1	.172	2	3.93	1
286			min	-1207.661	3	52.282	15	-185.504	3	-.001	3	-.277	3	.169	15
287		11	max	1895.031	1	1215.413	1	157.357	1	.002	1	.224	2	3.493	1
288			min	-1210.115	3	52.282	15	-185.504	3	-.001	3	-.344	3	.15	15
289		12	max	1891.759	1	1215.413	1	157.357	1	.002	1	.277	2	3.057	1
290			min	-1212.568	3	52.282	15	-185.504	3	-.001	3	-.41	3	.131	15
291		13	max	1888.488	1	1215.413	1	157.357	1	.002	1	.329	2	2.62	1
292			min	-1215.022	3	52.282	15	-185.504	3	-.001	3	-.477	3	.113	15
293		14	max	1885.217	1	1215.413	1	157.357	1	.002	1	.381	2	2.183	1
294			min	-1217.475	3	52.282	15	-185.504	3	-.001	3	-.543	3	.094	15
295		15	max	1881.945	1	1215.413	1	157.357	1	.002	1	.436	1	1.747	1
296			min	-1219.929	3	52.282	15	-185.504	3	-.001	3	-.61	3	.075	15
297		16	max	1878.674	1	1215.413	1	157.357	1	.002	1	.492	1	1.31	1
298			min	-1222.383	3	52.282	15	-185.504	3	-.001	3	-.677	3	.056	15
299		17	max	1875.402	1	1215.413	1	157.357	1	.002	1	.549	1	.873	1
300			min	-1224.836	3	52.282	15	-185.504	3	-.001	3	-.743	3	.038	15
301		18	max	1872.131	1	1215.413	1	157.357	1	.002	1	.605	1	.437	1
302			min	-1227.29	3	52.282	15	-185.504	3	-.001	3	-.81	3	.019	15
303		19	max	1868.859	1	1215.413	1	157.357	1	.002	1	.662	1	0	1
304			min	-1229.743	3	52.282	15	-185.504	3	-.001	3	-.877	3	0	1
305	M5	1	max	6639.764	1	2699.503	3	0	1	0	1	0	1	13.057	1
306			min	-4440.093	3	-2714.386	2	0	1	0	1	0	1	.53	15
307		2	max	6636.492	1	2699.503	3	0	1	0	1	0	1	13.66	1
308			min	-4442.547	3	-2714.386	2	0	1	0	1	0	1	.537	15
309		3	max	5006.857	1	2348.215	1	0	1	0	1	0	1	13.498	1
310			min	-3614.404	3	91.008	15	0	1	0	1	0	1	.523	15
311		4	max	5003.586	1	2348.215	1	0	1	0	1	0	1	12.655	1
312			min	-3616.858	3	91.008	15	0	1	0	1	0	1	.49	15
313		5	max	5000.314	1	2348.215	1	0	1	0	1	0	1	11.811	1
314			min	-3619.311	3	91.008	15	0	1	0	1	0	1	.458	15
315		6	max	4997.043	1	2348.215	1	0	1	0	1	0	1	10.967	1
316			min	-3621.765	3	91.008	15	0	1	0	1	0	1	.425	15
317		7	max	4993.771	1	2348.215	1	0	1	0	1	0	1	10.124	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	-3624.218	3	91.008	15	0	1	0	1	0	1	.392	15
319		8	max	4990.5	1	2348.215	1	0	1	0	1	0	1	9.28	1
320			min	-3626.672	3	91.008	15	0	1	0	1	0	1	.36	15
321		9	max	4987.228	1	2348.215	1	0	1	0	1	0	1	8.436	1
322			min	-3629.125	3	91.008	15	0	1	0	1	0	1	.327	15
323		10	max	4983.957	1	2348.215	1	0	1	0	1	0	1	7.593	1
324			min	-3631.579	3	91.008	15	0	1	0	1	0	1	.294	15
325		11	max	4980.685	1	2348.215	1	0	1	0	1	0	1	6.749	1
326			min	-3634.033	3	91.008	15	0	1	0	1	0	1	.262	15
327		12	max	4977.414	1	2348.215	1	0	1	0	1	0	1	5.906	1
328			min	-3636.486	3	91.008	15	0	1	0	1	0	1	.229	15
329		13	max	4974.142	1	2348.215	1	0	1	0	1	0	1	5.062	1
330			min	-3638.94	3	91.008	15	0	1	0	1	0	1	.196	15
331		14	max	4970.871	1	2348.215	1	0	1	0	1	0	1	4.218	1
332			min	-3641.393	3	91.008	15	0	1	0	1	0	1	.163	15
333		15	max	4967.6	1	2348.215	1	0	1	0	1	0	1	3.375	1
334			min	-3643.847	3	91.008	15	0	1	0	1	0	1	.131	15
335		16	max	4964.328	1	2348.215	1	0	1	0	1	0	1	2.531	1
336			min	-3646.301	3	91.008	15	0	1	0	1	0	1	.098	15
337		17	max	4961.057	1	2348.215	1	0	1	0	1	0	1	1.687	1
338			min	-3648.754	3	91.008	15	0	1	0	1	0	1	.065	15
339		18	max	4957.785	1	2348.215	1	0	1	0	1	0	1	.844	1
340			min	-3651.208	3	91.008	15	0	1	0	1	0	1	.033	15
341		19	max	4954.514	1	2348.215	1	0	1	0	1	0	1	0	1
342			min	-3653.661	3	91.008	15	0	1	0	1	0	1	0	1
343	M8	1	max	2511.938	1	979.245	3	208.156	3	.016	2	.356	1	7.122	1
344			min	-1428.041	3	-695.458	2	-213.244	1	-.007	3	-.32	3	.316	15
345		2	max	2508.666	1	979.245	3	208.156	3	.016	2	.28	1	7.187	1
346			min	-1430.494	3	-695.458	2	-213.244	1	-.007	3	-.246	3	.312	15
347		3	max	1921.203	1	1215.413	1	185.504	3	.001	3	.243	1	6.987	1
348			min	-1190.486	3	52.282	15	-157.357	1	-.002	1	-.19	3	.301	15
349		4	max	1917.931	1	1215.413	1	185.504	3	.001	3	.186	1	6.55	1
350			min	-1192.939	3	52.282	15	-157.357	1	-.002	1	-.123	3	.282	15
351		5	max	1914.66	1	1215.413	1	185.504	3	.001	3	.129	1	6.113	1
352			min	-1195.393	3	52.282	15	-157.357	1	-.002	1	-.056	3	.263	15
353		6	max	1911.388	1	1215.413	1	185.504	3	.001	3	.073	1	5.677	1
354			min	-1197.847	3	52.282	15	-157.357	1	-.002	1	.003	15	.244	15
355		7	max	1908.117	1	1215.413	1	185.504	3	.001	3	.077	3	5.24	1
356			min	-1200.3	3	52.282	15	-157.357	1	-.002	1	-.015	2	.225	15
357		8	max	1904.845	1	1215.413	1	185.504	3	.001	3	.144	3	4.803	1
358			min	-1202.754	3	52.282	15	-157.357	1	-.002	1	-.067	2	.207	15
359		9	max	1901.574	1	1215.413	1	185.504	3	.001	3	.21	3	4.367	1
360			min	-1205.207	3	52.282	15	-157.357	1	-.002	1	-.12	2	.188	15
361		10	max	1898.302	1	1215.413	1	185.504	3	.001	3	.277	3	3.93	1
362			min	-1207.661	3	52.282	15	-157.357	1	-.002	1	-.172	2	.169	15
363		11	max	1895.031	1	1215.413	1	185.504	3	.001	3	.344	3	3.493	1
364			min	-1210.115	3	52.282	15	-157.357	1	-.002	1	-.224	2	.15	15
365		12	max	1891.759	1	1215.413	1	185.504	3	.001	3	.41	3	3.057	1
366			min	-1212.568	3	52.282	15	-157.357	1	-.002	1	-.277	2	.131	15
367		13	max	1888.488	1	1215.413	1	185.504	3	.001	3	.477	3	2.62	1
368			min	-1215.022	3	52.282	15	-157.357	1	-.002	1	-.329	2	.113	15
369		14	max	1885.217	1	1215.413	1	185.504	3	.001	3	.543	3	2.183	1
370			min	-1217.475	3	52.282	15	-157.357	1	-.002	1	-.381	2	.094	15
371		15	max	1881.945	1	1215.413	1	185.504	3	.001	3	.61	3	1.747	1
372			min	-1219.929	3	52.282	15	-157.357	1	-.002	1	-.436	1	.075	15
373		16	max	1878.674	1	1215.413	1	185.504	3	.001	3	.677	3	1.31	1
374			min	-1222.383	3	52.282	15	-157.357	1	-.002	1	-.492	1	.056	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	1875.402	1	1215.413	1	185.504	3	.001	3	.743	3	.873	1
376			min	-1224.836	3	52.282	15	-157.357	1	-.002	1	-.549	1	.038	15
377		18	max	1872.131	1	1215.413	1	185.504	3	.001	3	.81	3	.437	1
378			min	-1227.29	3	52.282	15	-157.357	1	-.002	1	-.605	1	.019	15
379		19	max	1868.859	1	1215.413	1	185.504	3	.001	3	.877	3	0	1
380			min	-1229.743	3	52.282	15	-157.357	1	-.002	1	-.662	1	0	1
381	M3	1	max	1633.317	2	5.617	4	57.218	2	.016	3	.001	3	0	1
382			min	-626.697	3	1.32	15	-23.18	3	-.036	2	-.004	1	0	1
383		2	max	1633.108	2	4.993	4	57.218	2	.016	3	.016	2	0	15
384			min	-626.854	3	1.174	15	-23.18	3	-.036	2	-.007	3	-.002	4
385		3	max	1632.899	2	4.369	4	57.218	2	.016	3	.037	2	0	15
386			min	-627.01	3	1.027	15	-23.18	3	-.036	2	-.015	3	-.004	4
387		4	max	1632.691	2	3.745	4	57.218	2	.016	3	.057	2	-.001	15
388			min	-627.167	3	.88	15	-23.18	3	-.036	2	-.023	3	-.005	4
389		5	max	1632.482	2	3.121	4	57.218	2	.016	3	.078	2	-.001	15
390			min	-627.323	3	.734	15	-23.18	3	-.036	2	-.032	3	-.006	4
391		6	max	1632.274	2	2.497	4	57.218	2	.016	3	.098	2	-.002	15
392			min	-627.48	3	.587	15	-23.18	3	-.036	2	-.04	3	-.007	4
393		7	max	1632.065	2	1.872	4	57.218	2	.016	3	.118	2	-.002	15
394			min	-627.636	3	.44	15	-23.18	3	-.036	2	-.048	3	-.008	4
395		8	max	1631.856	2	1.248	4	57.218	2	.016	3	.139	2	-.002	15
396			min	-627.793	3	.293	15	-23.18	3	-.036	2	-.057	3	-.009	4
397		9	max	1631.648	2	.624	4	57.218	2	.016	3	.159	2	-.002	15
398			min	-627.949	3	.147	15	-23.18	3	-.036	2	-.065	3	-.009	4
399		10	max	1631.439	2	0	1	57.218	2	.016	3	.18	2	-.002	15
400			min	-628.106	3	0	1	-23.18	3	-.036	2	-.073	3	-.009	4
401		11	max	1631.231	2	-.147	15	57.218	2	.016	3	.2	2	-.002	15
402			min	-628.262	3	-.624	4	-23.18	3	-.036	2	-.081	3	-.009	4
403		12	max	1631.022	2	-.293	15	57.218	2	.016	3	.221	2	-.002	15
404			min	-628.418	3	-1.248	4	-23.18	3	-.036	2	-.09	3	-.009	4
405		13	max	1630.813	2	-.44	15	57.218	2	.016	3	.241	2	-.002	15
406			min	-628.575	3	-1.872	4	-23.18	3	-.036	2	-.098	3	-.008	4
407		14	max	1630.605	2	-.587	15	57.218	2	.016	3	.261	2	-.002	15
408			min	-628.731	3	-2.497	4	-23.18	3	-.036	2	-.106	3	-.007	4
409		15	max	1630.396	2	-.734	15	57.218	2	.016	3	.282	2	-.001	15
410			min	-628.888	3	-3.121	4	-23.18	3	-.036	2	-.114	3	-.006	4
411		16	max	1630.187	2	-.88	15	57.218	2	.016	3	.302	2	-.001	15
412			min	-629.044	3	-3.745	4	-23.18	3	-.036	2	-.123	3	-.005	4
413		17	max	1629.979	2	-1.027	15	57.218	2	.016	3	.323	2	0	15
414			min	-629.201	3	-4.369	4	-23.18	3	-.036	2	-.131	3	-.004	4
415		18	max	1629.77	2	-1.174	15	57.218	2	.016	3	.343	2	0	15
416			min	-629.357	3	-4.993	4	-23.18	3	-.036	2	-.139	3	-.002	4
417		19	max	1629.562	2	-1.32	15	57.218	2	.016	3	.363	2	0	1
418			min	-629.514	3	-5.617	4	-23.18	3	-.036	2	-.148	3	0	1
419	M6	1	max	4734.044	2	5.617	4	0	1	0	1	0	1	0	1
420			min	-2138.504	3	1.32	15	0	1	0	1	0	1	0	1
421		2	max	4733.835	2	4.993	4	0	1	0	1	0	1	0	15
422			min	-2138.661	3	1.174	15	0	1	0	1	0	1	-.002	4
423		3	max	4733.627	2	4.369	4	0	1	0	1	0	1	0	15
424			min	-2138.817	3	1.027	15	0	1	0	1	0	1	-.004	4
425		4	max	4733.418	2	3.745	4	0	1	0	1	0	1	-.001	15
426			min	-2138.973	3	.88	15	0	1	0	1	0	1	-.005	4
427		5	max	4733.209	2	3.121	4	0	1	0	1	0	1	-.001	15
428			min	-2139.13	3	.734	15	0	1	0	1	0	1	-.006	4
429		6	max	4733.001	2	2.497	4	0	1	0	1	0	1	-.002	15
430			min	-2139.286	3	.587	15	0	1	0	1	0	1	-.007	4
431		7	max	4732.792	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	-2139.443	3	.44	15	0	1	0	1	0	1	-.008	4
433		8	max	4732.584	2	1.248	4	0	1	0	1	0	1	-.002	15
434			min	-2139.599	3	.293	15	0	1	0	1	0	1	-.009	4
435		9	max	4732.375	2	.624	4	0	1	0	1	0	1	-.002	15
436			min	-2139.756	3	.147	15	0	1	0	1	0	1	-.009	4
437		10	max	4732.166	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2139.912	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	4731.958	2	-.147	15	0	1	0	1	0	1	-.002	15
440			min	-2140.069	3	-.624	4	0	1	0	1	0	1	-.009	4
441		12	max	4731.749	2	-.293	15	0	1	0	1	0	1	-.002	15
442			min	-2140.225	3	-1.248	4	0	1	0	1	0	1	-.009	4
443		13	max	4731.541	2	-.44	15	0	1	0	1	0	1	-.002	15
444			min	-2140.382	3	-1.872	4	0	1	0	1	0	1	-.008	4
445		14	max	4731.332	2	-.587	15	0	1	0	1	0	1	-.002	15
446			min	-2140.538	3	-2.497	4	0	1	0	1	0	1	-.007	4
447		15	max	4731.123	2	-.734	15	0	1	0	1	0	1	-.001	15
448			min	-2140.694	3	-3.121	4	0	1	0	1	0	1	-.006	4
449		16	max	4730.915	2	-.88	15	0	1	0	1	0	1	-.001	15
450			min	-2140.851	3	-3.745	4	0	1	0	1	0	1	-.005	4
451		17	max	4730.706	2	-1.027	15	0	1	0	1	0	1	0	15
452			min	-2141.007	3	-4.369	4	0	1	0	1	0	1	-.004	4
453		18	max	4730.498	2	-1.174	15	0	1	0	1	0	1	0	15
454			min	-2141.164	3	-4.993	4	0	1	0	1	0	1	-.002	4
455		19	max	4730.289	2	-1.32	15	0	1	0	1	0	1	0	1
456			min	-2141.32	3	-5.617	4	0	1	0	1	0	1	0	1
457	M9	1	max	1633.317	2	5.617	4	23.18	3	.036	2	.004	1	0	1
458			min	-626.697	3	1.32	15	-57.218	2	-.016	3	-.001	3	0	1
459		2	max	1633.108	2	4.993	4	23.18	3	.036	2	.007	3	0	15
460			min	-626.854	3	1.174	15	-57.218	2	-.016	3	-.016	2	-.002	4
461		3	max	1632.899	2	4.369	4	23.18	3	.036	2	.015	3	0	15
462			min	-627.01	3	1.027	15	-57.218	2	-.016	3	-.037	2	-.004	4
463		4	max	1632.691	2	3.745	4	23.18	3	.036	2	.023	3	-.001	15
464			min	-627.167	3	.88	15	-57.218	2	-.016	3	-.057	2	-.005	4
465		5	max	1632.482	2	3.121	4	23.18	3	.036	2	.032	3	-.001	15
466			min	-627.323	3	.734	15	-57.218	2	-.016	3	-.078	2	-.006	4
467		6	max	1632.274	2	2.497	4	23.18	3	.036	2	.04	3	-.002	15
468			min	-627.48	3	.587	15	-57.218	2	-.016	3	-.098	2	-.007	4
469		7	max	1632.065	2	1.872	4	23.18	3	.036	2	.048	3	-.002	15
470			min	-627.636	3	.44	15	-57.218	2	-.016	3	-.118	2	-.008	4
471		8	max	1631.856	2	1.248	4	23.18	3	.036	2	.057	3	-.002	15
472			min	-627.793	3	.293	15	-57.218	2	-.016	3	-.139	2	-.009	4
473		9	max	1631.648	2	.624	4	23.18	3	.036	2	.065	3	-.002	15
474			min	-627.949	3	.147	15	-57.218	2	-.016	3	-.159	2	-.009	4
475		10	max	1631.439	2	0	1	23.18	3	.036	2	.073	3	-.002	15
476			min	-628.106	3	0	1	-57.218	2	-.016	3	-.18	2	-.009	4
477		11	max	1631.231	2	-.147	15	23.18	3	.036	2	.081	3	-.002	15
478			min	-628.262	3	-.624	4	-57.218	2	-.016	3	-.2	2	-.009	4
479		12	max	1631.022	2	-.293	15	23.18	3	.036	2	.09	3	-.002	15
480			min	-628.418	3	-1.248	4	-57.218	2	-.016	3	-.221	2	-.009	4
481		13	max	1630.813	2	-.44	15	23.18	3	.036	2	.098	3	-.002	15
482			min	-628.575	3	-1.872	4	-57.218	2	-.016	3	-.241	2	-.008	4
483		14	max	1630.605	2	-.587	15	23.18	3	.036	2	.106	3	-.002	15
484			min	-628.731	3	-2.497	4	-57.218	2	-.016	3	-.261	2	-.007	4
485		15	max	1630.396	2	-.734	15	23.18	3	.036	2	.114	3	-.001	15
486			min	-628.888	3	-3.121	4	-57.218	2	-.016	3	-.282	2	-.006	4
487		16	max	1630.187	2	-.88	15	23.18	3	.036	2	.123	3	-.001	15
488			min	-629.044	3	-3.745	4	-57.218	2	-.016	3	-.302	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	1629.979	2	-1.027	15	23.18	3	.036	2	.131	3	0	15
490			min	-629.201	3	-4.369	4	-57.218	2	-.016	3	-.323	2	-.004	4
491		18	max	1629.77	2	-1.174	15	23.18	3	.036	2	.139	3	0	15
492			min	-629.357	3	-4.993	4	-57.218	2	-.016	3	-.343	2	-.002	4
493		19	max	1629.562	2	-1.32	15	23.18	3	.036	2	.148	3	0	1
494			min	-629.514	3	-5.617	4	-57.218	2	-.016	3	-.363	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	-.022	15	-.033	15	.018	1	1.073e-2	3	NC	3	NC	1
2			min	-.522	1	-.856	1	0	15	-3.12e-2	2	116.188	1	NC	1
3		2	max	-.022	15	-.029	15	0	15	1.04e-2	3	NC	3	NC	3
4			min	-.521	1	-.723	1	-.012	1	-2.957e-2	2	130.352	1	5028.726	1
5		3	max	-.022	15	-.024	15	-.001	15	9.738e-3	3	NC	12	NC	3
6			min	-.521	1	-.594	1	-.028	1	-2.637e-2	2	147.944	1	3384.799	1
7		4	max	-.022	15	-.02	15	0	12	9.081e-3	3	NC	12	NC	3
8			min	-.521	1	-.474	1	-.031	1	-2.316e-2	2	169.048	1	3234.88	1
9		5	max	-.022	15	-.016	15	.001	3	8.88e-3	3	NC	12	NC	3
10			min	-.521	1	-.371	1	-.028	1	-2.108e-2	2	192.821	1	3654.008	1
11		6	max	-.022	15	-.013	15	.002	3	9.85e-3	3	NC	3	NC	3
12			min	-.521	1	-.286	1	-.018	1	-2.185e-2	2	217.85	1	5212.545	1
13		7	max	-.022	15	-.01	15	.002	3	1.082e-2	3	NC	3	NC	1
14			min	-.52	1	-.215	1	-.007	1	-2.263e-2	2	244.783	1	NC	1
15		8	max	-.022	15	-.007	15	0	3	1.179e-2	3	8118.581	12	NC	1
16			min	-.52	1	-.15	1	0	2	-2.341e-2	2	275.519	1	NC	1
17		9	max	-.022	15	-.004	15	0	2	1.312e-2	3	6420.843	15	NC	1
18			min	-.519	1	-.086	1	-.001	3	-2.254e-2	2	314.41	1	NC	1
19		10	max	-.022	15	-.001	15	.002	1	1.479e-2	3	7363.108	15	NC	1
20			min	-.519	1	-.034	3	-.002	3	-2.013e-2	2	367.743	1	NC	1
21		11	max	-.022	15	.046	1	0	1	1.647e-2	3	8663.627	15	NC	1
22			min	-.518	1	-.016	3	0	15	-1.792e-2	1	444.845	1	NC	1
23		12	max	-.022	15	.114	1	.006	3	1.539e-2	3	NC	15	NC	1
24			min	-.517	1	.002	12	-.008	1	-1.501e-2	1	566.092	1	NC	1
25		13	max	-.022	15	.181	1	.016	3	1.14e-2	3	NC	15	NC	1
26			min	-.517	1	.007	15	-.012	1	-1.097e-2	1	773.063	1	7907.129	3
27		14	max	-.022	15	.242	1	.023	3	7.415e-3	3	NC	5	NC	1
28			min	-.516	1	.01	15	-.012	2	-6.941e-3	1	964.608	3	5479.402	3
29		15	max	-.022	15	.29	1	.023	3	3.427e-3	3	NC	2	NC	1
30			min	-.515	1	.013	15	-.006	2	-2.907e-3	1	741.089	3	5521.789	3
31		16	max	-.022	15	.323	1	.016	1	8.093e-3	3	NC	2	NC	2
32			min	-.515	1	.014	15	0	10	-5.415e-3	1	551.563	3	5477.846	1
33		17	max	-.022	15	.343	1	.02	1	1.377e-2	3	NC	2	NC	2
34			min	-.515	1	.016	15	0	15	-8.69e-3	1	417.594	3	4502.685	1
35		18	max	-.022	15	.355	1	.01	1	1.946e-2	3	NC	1	NC	2
36			min	-.515	1	.017	15	0	15	-1.197e-2	1	328.138	3	6044.159	1
37		19	max	-.022	15	.432	3	0	15	2.235e-2	3	NC	1	NC	1
38			min	-.516	1	.018	15	-.015	1	-1.364e-2	1	268.538	3	NC	1
39	M4	1	max	-.039	15	-.052	12	0	1	0	1	NC	3	NC	1
40			min	-1.006	1	-1.783	1	0	1	0	1	60.63	1	NC	1
41		2	max	-.039	15	-.053	15	0	1	0	1	5156.034	12	NC	1
42			min	-1.006	1	-1.489	1	0	1	0	1	69.351	1	NC	1
43		3	max	-.039	15	-.044	15	0	1	0	1	2694.658	12	NC	1
44			min	-1.005	1	-1.203	1	0	1	0	1	80.645	1	NC	1
45		4	max	-.039	15	-.035	15	0	1	0	1	2350.484	15	NC	1
46			min	-1.005	1	-.942	1	0	1	0	1	94.682	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	-.039	15	-.028	15	0	1	0	1	2674.053	15	NC	1
48			min	-1.005	1	-.726	1	0	1	0	1	110.693	1	NC	1
49		6	max	-.039	15	-.022	15	0	1	0	1	3009.799	15	NC	1
50			min	-1.004	1	-.56	1	0	1	0	1	127.09	1	NC	1
51		7	max	-.039	15	-.017	15	0	1	0	1	3368.756	15	NC	1
52			min	-1.002	1	-.429	1	0	1	0	1	144.088	1	NC	1
53		8	max	-.039	15	-.012	15	0	1	0	1	7981.05	12	NC	1
54			min	-1.001	1	-.314	1	0	1	0	1	163.189	1	NC	1
55		9	max	-.039	15	-.008	15	0	1	0	1	NC	3	NC	1
56			min	-1	1	-.197	1	0	1	0	1	188.467	1	NC	1
57		10	max	-.039	15	-.003	15	0	1	0	1	5147.843	12	NC	1
58			min	-.998	1	-.071	1	0	1	0	1	226.358	1	NC	1
59		11	max	-.039	15	.062	1	0	1	0	1	6244.36	15	NC	1
60			min	-.997	1	-.012	3	0	1	0	1	287.877	1	NC	1
61		12	max	-.039	15	.204	1	0	1	0	1	8201.306	15	NC	1
62			min	-.995	1	.008	15	0	1	0	1	403.774	1	NC	1
63		13	max	-.039	15	.344	1	0	1	0	1	NC	10	NC	1
64			min	-.994	1	.013	15	0	1	0	1	673.897	1	NC	1
65		14	max	-.039	15	.468	1	0	1	0	1	NC	5	NC	1
66			min	-.992	1	.018	15	0	1	0	1	903.868	3	NC	1
67		15	max	-.039	15	.558	1	0	1	0	1	NC	1	NC	1
68			min	-.991	1	.022	15	0	1	0	1	579.225	3	NC	1
69		16	max	-.039	15	.599	1	0	1	0	1	NC	4	NC	1
70			min	-.991	1	.024	15	0	1	0	1	363.722	3	NC	1
71		17	max	-.039	15	.602	1	0	1	0	1	NC	4	NC	1
72			min	-.991	1	.025	15	0	1	0	1	244.766	3	NC	1
73		18	max	-.039	15	.723	3	0	1	0	1	NC	4	NC	1
74			min	-.991	1	.025	15	0	1	0	1	178.342	3	NC	1
75		19	max	-.039	15	.947	3	0	1	0	1	NC	1	NC	1
76			min	-.991	1	.025	15	0	1	0	1	139.17	3	NC	1
77	M7	1	max	-.022	15	-.033	15	0	15	3.12e-2	2	NC	3	NC	1
78			min	-.522	1	-.856	1	-.018	1	-1.073e-2	3	116.188	1	NC	1
79		2	max	-.022	15	-.029	15	.012	1	2.957e-2	2	NC	3	NC	3
80			min	-.521	1	-.723	1	0	15	-1.04e-2	3	130.352	1	5028.726	1
81		3	max	-.022	15	-.024	15	.028	1	2.637e-2	2	NC	12	NC	3
82			min	-.521	1	-.594	1	.001	15	-9.738e-3	3	147.944	1	3384.799	1
83		4	max	-.022	15	-.02	15	.031	1	2.316e-2	2	NC	12	NC	3
84			min	-.521	1	-.474	1	0	12	-9.081e-3	3	169.048	1	3234.88	1
85		5	max	-.022	15	-.016	15	.028	1	2.108e-2	2	NC	12	NC	3
86			min	-.521	1	-.371	1	-.001	3	-8.88e-3	3	192.821	1	3654.008	1
87		6	max	-.022	15	-.013	15	.018	1	2.185e-2	2	NC	3	NC	3
88			min	-.521	1	-.286	1	-.002	3	-9.85e-3	3	217.85	1	5212.545	1
89		7	max	-.022	15	-.01	15	.007	1	2.263e-2	2	NC	3	NC	1
90			min	-.52	1	-.215	1	-.002	3	-1.082e-2	3	244.783	1	NC	1
91		8	max	-.022	15	-.007	15	0	2	2.341e-2	2	8118.581	12	NC	1
92			min	-.52	1	-.15	1	0	3	-1.179e-2	3	275.519	1	NC	1
93		9	max	-.022	15	-.004	15	.001	3	2.254e-2	2	6420.843	15	NC	1
94			min	-.519	1	-.086	1	0	2	-1.312e-2	3	314.41	1	NC	1
95		10	max	-.022	15	-.001	15	.002	3	2.013e-2	2	7363.108	15	NC	1
96			min	-.519	1	-.034	3	-.002	1	-1.479e-2	3	367.743	1	NC	1
97		11	max	-.022	15	.046	1	0	15	1.792e-2	1	8663.627	15	NC	1
98			min	-.518	1	-.016	3	0	1	-1.647e-2	3	444.845	1	NC	1
99		12	max	-.022	15	.114	1	.008	1	1.501e-2	1	NC	15	NC	1
100			min	-.517	1	.002	12	-.006	3	-1.539e-2	3	566.092	1	NC	1
101		13	max	-.022	15	.181	1	.012	1	1.097e-2	1	NC	15	NC	1
102			min	-.517	1	.007	15	-.016	3	-1.14e-2	3	773.063	1	7907.129	3
103		14	max	-.022	15	.242	1	.012	2	6.941e-3	1	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	-.516	1	.01	15	-.023	3	-7.415e-3	3	964.608	3	5479.402	3
105		15	max	-.022	15	.29	1	.006	2	2.907e-3	1	NC	2	NC	1
106			min	-.515	1	.013	15	-.023	3	-3.427e-3	3	741.089	3	5521.789	3
107		16	max	-.022	15	.323	1	0	10	5.415e-3	1	NC	2	NC	2
108			min	-.515	1	.014	15	-.016	1	-8.093e-3	3	551.563	3	5477.846	1
109		17	max	-.022	15	.343	1	0	15	8.69e-3	1	NC	2	NC	2
110			min	-.515	1	.016	15	-.02	1	-1.377e-2	3	417.594	3	4502.685	1
111		18	max	-.022	15	.355	1	0	15	1.197e-2	1	NC	1	NC	2
112			min	-.515	1	.017	15	-.01	1	-1.946e-2	3	328.138	3	6044.159	1
113		19	max	-.022	15	.432	3	.015	1	1.364e-2	1	NC	1	NC	1
114			min	-.516	1	.018	15	0	15	-2.235e-2	3	268.538	3	NC	1
115	M10	1	max	.002	1	.385	3	.516	1	1.215e-2	3	NC	1	NC	1
116			min	0	15	.017	15	.022	15	-1.027e-3	2	NC	1	NC	1
117		2	max	.001	1	.724	3	.615	1	1.395e-2	3	NC	5	NC	3
118			min	0	15	-.022	10	.027	15	-1.583e-3	2	777.77	3	2655.415	1
119		3	max	.001	1	1.038	3	.767	1	1.575e-2	3	NC	5	NC	5
120			min	0	15	-.167	2	.033	15	-2.14e-3	2	404.354	3	1049.166	1
121		4	max	.001	1	1.269	3	.921	1	1.754e-2	3	NC	5	NC	15
122			min	0	15	-.272	2	.039	15	-2.696e-3	2	298.679	3	651.263	1
123		5	max	0	1	1.385	3	1.041	1	1.934e-2	3	NC	5	NC	15
124			min	0	15	-.291	2	.044	15	-3.252e-3	2	263.904	3	502.727	1
125		6	max	0	1	1.38	3	1.107	1	2.114e-2	3	NC	5	NC	15
126			min	0	15	-.222	2	.046	15	-3.809e-3	2	265.415	3	446.548	1
127		7	max	0	1	1.269	3	1.115	1	2.294e-2	3	NC	5	NC	15
128			min	0	15	-.082	2	.046	15	-4.365e-3	2	298.781	3	440.298	1
129		8	max	0	1	1.093	3	1.078	1	2.473e-2	3	NC	4	NC	15
130			min	0	15	.014	10	.043	15	-4.921e-3	2	372.701	3	469.665	1
131		9	max	0	1	.92	3	1.022	1	2.653e-2	3	NC	5	NC	15
132			min	0	15	.022	15	.04	15	-5.478e-3	2	493.863	3	521.448	1
133		10	max	0	1	.837	3	.991	1	2.833e-2	3	NC	5	NC	5
134			min	0	1	.025	15	.039	15	-6.034e-3	2	583.67	3	555.263	1
135		11	max	0	15	.92	3	1.022	1	2.653e-2	3	NC	5	NC	15
136			min	0	1	.022	15	.04	15	-5.478e-3	2	493.863	3	521.448	1
137		12	max	0	15	1.093	3	1.078	1	2.473e-2	3	NC	4	NC	15
138			min	0	1	.014	10	.043	15	-4.921e-3	2	372.701	3	469.665	1
139		13	max	0	15	1.269	3	1.115	1	2.294e-2	3	NC	5	NC	15
140			min	0	1	-.082	2	.046	15	-4.365e-3	2	298.781	3	440.298	1
141		14	max	0	15	1.38	3	1.107	1	2.114e-2	3	NC	5	NC	15
142			min	0	1	-.222	2	.046	15	-3.809e-3	2	265.415	3	446.548	1
143		15	max	0	15	1.385	3	1.041	1	1.934e-2	3	NC	5	NC	15
144			min	0	1	-.291	2	.044	15	-3.252e-3	2	263.904	3	502.727	1
145		16	max	0	15	1.269	3	.921	1	1.754e-2	3	NC	5	NC	15
146			min	-.001	1	-.272	2	.039	15	-2.696e-3	2	298.679	3	651.263	1
147		17	max	0	15	1.038	3	.767	1	1.575e-2	3	NC	5	NC	5
148			min	-.001	1	-.167	2	.033	15	-2.14e-3	2	404.354	3	1049.166	1
149		18	max	0	15	.724	3	.615	1	1.395e-2	3	NC	5	NC	3
150			min	-.001	1	-.022	10	.027	15	-1.583e-3	2	777.77	3	2655.415	1
151		19	max	0	15	.385	3	.516	1	1.215e-2	3	NC	1	NC	1
152			min	-.002	1	.017	15	.022	15	-1.027e-3	2	NC	1	NC	1
153	M11	1	max	.003	1	.081	1	.518	1	8.65e-3	1	NC	1	NC	1
154			min	-.003	3	-.006	3	.022	15	3.748e-4	15	NC	1	NC	1
155		2	max	.003	1	.26	3	.593	1	9.676e-3	1	NC	5	NC	3
156			min	-.002	3	-.18	2	.025	15	4.094e-4	15	992.843	3	3496.247	1
157		3	max	.002	1	.501	3	.733	1	1.07e-2	1	NC	5	NC	3
158			min	-.002	3	-.379	2	.031	15	4.439e-4	15	520.192	3	1226.581	1
159		4	max	.002	1	.664	3	.883	1	1.173e-2	1	NC	15	NC	5
160			min	-.002	3	-.506	1	.038	15	4.785e-4	15	393.925	3	722.082	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	.002	1	.717	3	1.006	1	1.275e-2	1	NC	15	NC	15
162			min	-.002	3	-.536	1	.042	15	5.13e-4	15	364.784	3	540.048	1
163		6	max	.001	1	.656	3	1.081	1	1.378e-2	1	NC	5	NC	15
164			min	-.001	3	-.466	1	.045	15	5.476e-4	15	398.583	3	468.995	1
165		7	max	.001	1	.498	3	1.099	1	1.481e-2	1	NC	5	NC	15
166			min	0	3	-.324	2	.045	15	5.821e-4	15	523.069	3	453.981	1
167		8	max	0	1	.288	3	1.072	1	1.583e-2	1	NC	5	NC	15
168			min	0	3	-.144	2	.043	15	6.167e-4	15	898.284	3	476.373	1
169		9	max	0	1	.091	3	1.024	1	1.686e-2	1	NC	1	NC	15
170			min	0	3	.003	15	.04	15	6.513e-4	15	2710.819	3	521.579	1
171		10	max	0	1	.134	1	.996	1	1.788e-2	1	NC	3	NC	5
172			min	0	1	0	3	.039	15	6.858e-4	15	4931.733	1	551.785	1
173		11	max	0	3	.091	3	1.024	1	1.686e-2	1	NC	1	NC	15
174			min	0	1	.003	15	.04	15	6.513e-4	15	2710.819	3	521.579	1
175		12	max	0	3	.288	3	1.072	1	1.583e-2	1	NC	5	NC	15
176			min	0	1	-.144	2	.043	15	6.167e-4	15	898.284	3	476.373	1
177		13	max	0	3	.498	3	1.099	1	1.481e-2	1	NC	5	NC	15
178			min	-.001	1	-.324	2	.045	15	5.821e-4	15	523.069	3	453.981	1
179		14	max	.001	3	.656	3	1.081	1	1.378e-2	1	NC	5	NC	15
180			min	-.001	1	-.466	1	.045	15	5.476e-4	15	398.583	3	468.995	1
181		15	max	.002	3	.717	3	1.006	1	1.275e-2	1	NC	15	NC	15
182			min	-.002	1	-.536	1	.042	15	5.13e-4	15	364.784	3	540.048	1
183		16	max	.002	3	.664	3	.883	1	1.173e-2	1	NC	15	NC	5
184			min	-.002	1	-.506	1	.038	15	4.785e-4	15	393.925	3	722.082	1
185		17	max	.002	3	.501	3	.733	1	1.07e-2	1	NC	5	NC	3
186			min	-.002	1	-.379	2	.031	15	4.439e-4	15	520.192	3	1226.581	1
187		18	max	.002	3	.26	3	.593	1	9.676e-3	1	NC	5	NC	3
188			min	-.003	1	-.18	2	.025	15	4.094e-4	15	992.843	3	3496.247	1
189		19	max	.003	3	.081	1	.518	1	8.65e-3	1	NC	1	NC	1
190			min	-.003	1	-.006	3	.022	15	3.748e-4	15	NC	1	NC	1
191	M12	1	max	0	3	-.006	15	.519	1	8.103e-3	1	NC	1	NC	1
192			min	0	1	-.12	1	.022	15	3.505e-4	15	NC	1	NC	1
193		2	max	0	3	.108	3	.583	1	8.852e-3	1	NC	5	NC	3
194			min	0	1	-.449	1	.025	15	3.774e-4	15	757.116	2	4140.965	1
195		3	max	0	3	.242	3	.717	1	9.6e-3	1	NC	5	NC	5
196			min	0	1	-.732	1	.031	15	4.043e-4	15	406.902	2	1337.28	1
197		4	max	0	3	.32	3	.866	1	1.035e-2	1	NC	15	NC	5
198			min	0	1	-.921	2	.037	15	4.312e-4	15	312.067	2	762.396	1
199		5	max	0	3	.333	3	.991	1	1.11e-2	1	NC	15	NC	15
200			min	0	1	-.987	2	.042	15	4.581e-4	15	289.498	2	560.046	1
201		6	max	0	3	.283	3	1.069	1	1.185e-2	1	NC	15	NC	15
202			min	0	1	-.925	1	.045	15	4.85e-4	15	312.613	2	480.375	1
203		7	max	0	3	.186	3	1.093	1	1.259e-2	1	NC	15	NC	15
204			min	0	1	-.765	1	.045	15	5.119e-4	15	395.435	2	460.413	1
205		8	max	0	3	.064	3	1.071	1	1.334e-2	1	NC	5	NC	15
206			min	0	1	-.55	1	.043	15	5.388e-4	15	612.056	2	478.943	1
207		9	max	0	3	-.013	15	1.027	1	1.409e-2	1	NC	3	NC	15
208			min	0	1	-.35	1	.04	15	5.657e-4	15	1143.521	1	520.585	1
209		10	max	0	1	-.01	15	1	1	1.484e-2	1	NC	5	NC	5
210			min	0	1	-.259	1	.039	15	5.926e-4	15	1897.573	1	548.868	1
211		11	max	0	1	-.013	15	1.027	1	1.409e-2	1	NC	3	NC	15
212			min	0	3	-.35	1	.04	15	5.657e-4	15	1143.521	1	520.585	1
213		12	max	0	1	.064	3	1.071	1	1.334e-2	1	NC	5	NC	15
214			min	0	3	-.55	1	.043	15	5.388e-4	15	612.056	2	478.943	1
215		13	max	0	1	.186	3	1.093	1	1.259e-2	1	NC	15	NC	15
216			min	0	3	-.765	1	.045	15	5.119e-4	15	395.435	2	460.413	1
217		14	max	0	1	.283	3	1.069	1	1.185e-2	1	NC	15	NC	15

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	-.925	1	.045	15	4.85e-4	15	312.613	2	480.375	1
219		15	max	0	1	.333	3	.991	1	1.11e-2	1	NC	15	NC	15
220			min	0	3	-.987	2	.042	15	4.581e-4	15	289.498	2	560.046	1
221		16	max	0	1	.32	3	.866	1	1.035e-2	1	NC	15	NC	5
222			min	0	3	-.921	2	.037	15	4.312e-4	15	312.067	2	762.396	1
223		17	max	0	1	.242	3	.717	1	9.6e-3	1	NC	5	NC	5
224			min	0	3	-.732	1	.031	15	4.043e-4	15	406.902	2	1337.28	1
225		18	max	0	1	.108	3	.583	1	8.852e-3	1	NC	5	NC	3
226			min	0	3	-.449	1	.025	15	3.774e-4	15	757.116	2	4140.965	1
227		19	max	0	1	-.006	15	.519	1	8.103e-3	1	NC	1	NC	1
228			min	0	3	-.12	1	.022	15	3.505e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.031	15	.522	1	1.681e-2	1	NC	1	NC	1
230			min	-.002	1	-.791	1	.022	15	-1.3e-3	3	NC	1	NC	1
231		2	max	0	15	.053	3	.628	1	1.908e-2	1	NC	5	NC	3
232			min	-.002	1	-1.229	1	.027	15	-1.827e-3	3	577.492	2	2477.1	1
233		3	max	0	15	.181	3	.785	1	2.135e-2	1	NC	15	NC	5
234			min	-.002	1	-1.622	1	.034	15	-2.355e-3	3	305.867	2	1002.924	1
235		4	max	0	15	.261	3	.941	1	2.363e-2	1	8324.892	15	NC	15
236			min	-.001	1	-1.916	1	.04	15	-2.882e-3	3	227.422	2	629.769	1
237		5	max	0	15	.282	3	1.061	1	2.59e-2	1	7189.063	15	NC	15
238			min	-.001	1	-2.082	1	.045	15	-3.409e-3	3	200.104	2	489.351	1
239		6	max	0	15	.244	3	1.126	1	2.817e-2	1	6920.143	15	NC	15
240			min	0	1	-2.115	1	.047	15	-3.936e-3	3	197.949	2	436.464	1
241		7	max	0	15	.159	3	1.133	1	3.044e-2	1	7241.537	15	NC	15
242			min	0	1	-2.033	1	.046	15	-4.463e-3	3	212.505	1	431.484	1
243		8	max	0	15	.05	3	1.094	1	3.271e-2	1	8064.517	15	NC	15
244			min	0	1	-1.878	1	.044	15	-4.99e-3	3	242.728	1	460.955	1
245		9	max	0	15	-.038	12	1.037	1	3.498e-2	1	NC	12	NC	15
246			min	0	1	-1.717	1	.041	15	-5.517e-3	3	284.974	1	512.065	1
247		10	max	0	1	-.058	15	1.006	1	3.725e-2	1	NC	3	NC	5
248			min	0	1	-1.639	1	.039	15	-6.045e-3	3	311.152	1	545.268	1
249		11	max	0	1	-.038	12	1.037	1	3.498e-2	1	NC	12	NC	15
250			min	0	15	-1.717	1	.041	15	-5.517e-3	3	284.974	1	512.065	1
251		12	max	0	1	.05	3	1.094	1	3.271e-2	1	8064.517	15	NC	15
252			min	0	15	-1.878	1	.044	15	-4.99e-3	3	242.728	1	460.955	1
253		13	max	0	1	.159	3	1.133	1	3.044e-2	1	7241.537	15	NC	15
254			min	0	15	-2.033	1	.046	15	-4.463e-3	3	212.505	1	431.484	1
255		14	max	0	1	.244	3	1.126	1	2.817e-2	1	6920.143	15	NC	15
256			min	0	15	-2.115	1	.047	15	-3.936e-3	3	197.949	2	436.464	1
257		15	max	.001	1	.282	3	1.061	1	2.59e-2	1	7189.063	15	NC	15
258			min	0	15	-2.082	1	.045	15	-3.409e-3	3	200.104	2	489.351	1
259		16	max	.001	1	.261	3	.941	1	2.363e-2	1	8324.892	15	NC	15
260			min	0	15	-1.916	1	.04	15	-2.882e-3	3	227.422	2	629.769	1
261		17	max	.002	1	.181	3	.785	1	2.135e-2	1	NC	15	NC	5
262			min	0	15	-1.622	1	.034	15	-2.355e-3	3	305.867	2	1002.924	1
263		18	max	.002	1	.053	3	.628	1	1.908e-2	1	NC	5	NC	3
264			min	0	15	-1.229	1	.027	15	-1.827e-3	3	577.492	2	2477.1	1
265		19	max	.002	1	-.031	15	.522	1	1.681e-2	1	NC	1	NC	1
266			min	0	15	-.791	1	.022	15	-1.3e-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	5.731e-3	2	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-2.371e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	.001	3	8.084e-3	2	NC	2	NC	1
272			min	0	1	-.01	1	-.001	1	-3.299e-3	3	7653.258	1	NC	1
273		4	max	0	3	0	15	.002	3	7.429e-3	2	NC	4	NC	1
274			min	0	1	-.023	1	-.002	1	-2.94e-3	3	3400.774	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	6.773e-3	2	NC	5	NC	1
276			min	0	1	-.04	1	-.004	1	-2.582e-3	3	1935.669	1	NC	1
277		6	max	0	3	-.003	15	.005	3	6.117e-3	2	NC	5	NC	1
278			min	0	1	-.062	1	-.006	1	-2.224e-3	3	1258.497	1	NC	1
279		7	max	0	3	-.004	15	.006	3	5.462e-3	2	NC	5	NC	1
280			min	0	1	-.087	1	-.008	1	-1.865e-3	3	889.632	1	NC	1
281		8	max	0	3	-.005	15	.007	3	4.806e-3	2	NC	15	NC	3
282			min	0	1	-.116	1	-.01	1	-1.507e-3	3	666.291	1	8206.232	2
283		9	max	0	3	-.006	15	.008	3	4.15e-3	2	NC	15	NC	4
284			min	-.001	1	-.149	1	-.012	1	-1.149e-3	3	520.466	1	7013.656	2
285		10	max	0	3	-.008	15	.009	3	3.495e-3	2	9708.085	15	NC	4
286			min	-.001	1	-.185	1	-.013	1	-7.904e-4	3	419.963	1	6227.944	2
287		11	max	0	3	-.01	15	.009	3	2.839e-3	2	8039.143	15	NC	4
288			min	-.001	1	-.223	1	-.015	1	-4.321e-4	3	347.6	1	5728.481	2
289		12	max	0	3	-.011	15	.009	3	2.183e-3	2	6796.802	15	NC	4
290			min	-.001	1	-.264	1	-.016	1	-7.379e-5	3	293.772	1	5451.396	2
291		13	max	0	3	-.013	15	.007	3	1.528e-3	2	5845.863	15	NC	3
292			min	-.002	1	-.307	1	-.017	1	1.211e-5	15	252.592	1	5378.585	2
293		14	max	.001	3	-.015	15	.005	3	8.72e-4	2	5101.721	15	NC	3
294			min	-.002	1	-.352	1	-.017	1	-1.003e-4	9	220.382	1	5529.095	2
295		15	max	.001	3	-.017	15	.002	3	1.001e-3	3	4508.263	15	NC	3
296			min	-.002	1	-.399	1	-.016	1	-3.747e-4	9	194.705	1	5987.052	2
297		16	max	.001	3	-.019	15	0	15	1.359e-3	3	4027.406	15	NC	3
298			min	-.002	1	-.446	1	-.015	1	-9.988e-4	1	173.906	1	6982.614	2
299		17	max	.001	3	-.021	15	0	15	1.718e-3	3	3632.509	15	NC	3
300			min	-.002	1	-.495	1	-.012	1	-1.658e-3	1	156.83	1	9237.046	2
301		18	max	.001	3	-.023	15	.001	10	2.076e-3	3	3304.401	15	NC	1
302			min	-.002	1	-.544	1	-.014	3	-2.317e-3	1	142.646	1	5575.992	3
303		19	max	.001	3	-.026	15	.005	2	2.434e-3	3	3029.102	15	NC	1
304			min	-.002	1	-.594	1	-.022	3	-2.975e-3	1	130.748	1	3522.529	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	1	-.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	1	-.019	1	0	1	0	1	4149.271	1	NC	1
311		4	max	0	3	-.002	15	0	1	0	1	NC	5	NC	1
312			min	-.001	1	-.043	1	0	1	0	1	1811.62	1	NC	1
313		5	max	.001	3	-.003	15	0	1	0	1	NC	5	NC	1
314			min	-.001	1	-.076	1	0	1	0	1	1023.212	1	NC	1
315		6	max	.001	3	-.005	15	0	1	0	1	NC	5	NC	1
316			min	-.002	1	-.117	1	0	1	0	1	662.384	1	NC	1
317		7	max	.002	3	-.007	15	0	1	0	1	NC	15	NC	1
318			min	-.002	1	-.166	1	0	1	0	1	466.952	1	NC	1
319		8	max	.002	3	-.009	15	0	1	0	1	8909.986	15	NC	1
320			min	-.002	1	-.222	1	0	1	0	1	349.061	1	NC	1
321		9	max	.002	3	-.011	15	0	1	0	1	6958.907	15	NC	1
322			min	-.003	1	-.285	1	0	1	0	1	272.288	1	NC	1
323		10	max	.002	3	-.014	15	0	1	0	1	5614.491	15	NC	1
324			min	-.003	1	-.354	1	0	1	0	1	219.478	1	NC	1
325		11	max	.003	3	-.017	15	0	1	0	1	4646.669	15	NC	1
326			min	-.003	1	-.428	1	0	1	0	1	181.512	1	NC	1
327		12	max	.003	3	-.02	15	0	1	0	1	3926.818	15	NC	1
328			min	-.004	1	-.506	1	0	1	0	1	153.303	1	NC	1
329		13	max	.003	3	-.023	15	0	1	0	1	3376.177	15	NC	1
330			min	-.004	1	-.589	1	0	1	0	1	131.743	1	NC	1
331		14	max	.003	3	-.026	15	0	1	0	1	2945.518	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	-.675	1	0	1	0	1	114.893	1	NC	1
333		15	max	.003	3	-.03	15	0	1	0	1	2602.222	15	NC	1
334			min	-.005	1	-.765	1	0	1	0	1	101.469	1	NC	1
335		16	max	.004	3	-.033	15	0	1	0	1	2324.171	15	NC	1
336			min	-.005	1	-.857	1	0	1	0	1	90.602	1	NC	1
337		17	max	.004	3	-.037	15	0	1	0	1	2095.904	15	NC	1
338			min	-.005	1	-.95	1	0	1	0	1	81.684	1	NC	1
339		18	max	.004	3	-.041	15	0	1	0	1	1906.3	15	NC	1
340			min	-.006	1	-1.045	1	0	1	0	1	74.28	1	NC	1
341		19	max	.004	3	-.044	15	0	1	0	1	1747.255	15	NC	1
342			min	-.006	1	-1.14	1	0	1	0	1	68.072	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	2.371e-3	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-5.731e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	.001	1	3.299e-3	3	NC	2	NC	1
348			min	0	1	-.01	1	-.001	3	-8.084e-3	2	7653.258	1	NC	1
349		4	max	0	3	0	15	.002	1	2.94e-3	3	NC	4	NC	1
350			min	0	1	-.023	1	-.002	3	-7.429e-3	2	3400.774	1	NC	1
351		5	max	0	3	-.002	15	.004	1	2.582e-3	3	NC	5	NC	1
352			min	0	1	-.04	1	-.003	3	-6.773e-3	2	1935.669	1	NC	1
353		6	max	0	3	-.003	15	.006	1	2.224e-3	3	NC	5	NC	1
354			min	0	1	-.062	1	-.005	3	-6.117e-3	2	1258.497	1	NC	1
355		7	max	0	3	-.004	15	.008	1	1.865e-3	3	NC	5	NC	1
356			min	0	1	-.087	1	-.006	3	-5.462e-3	2	889.632	1	NC	1
357		8	max	0	3	-.005	15	.01	1	1.507e-3	3	NC	15	NC	3
358			min	0	1	-.116	1	-.007	3	-4.806e-3	2	666.291	1	8206.232	2
359		9	max	0	3	-.006	15	.012	1	1.149e-3	3	NC	15	NC	4
360			min	-.001	1	-.149	1	-.008	3	-4.15e-3	2	520.466	1	7013.656	2
361		10	max	0	3	-.008	15	.013	1	7.904e-4	3	9708.085	15	NC	4
362			min	-.001	1	-.185	1	-.009	3	-3.495e-3	2	419.963	1	6227.944	2
363		11	max	0	3	-.01	15	.015	1	4.321e-4	3	8039.143	15	NC	4
364			min	-.001	1	-.223	1	-.009	3	-2.839e-3	2	347.6	1	5728.481	2
365		12	max	0	3	-.011	15	.016	1	7.379e-5	3	6796.802	15	NC	4
366			min	-.001	1	-.264	1	-.009	3	-2.183e-3	2	293.772	1	5451.396	2
367		13	max	0	3	-.013	15	.017	1	-1.211e-5	15	5845.863	15	NC	3
368			min	-.002	1	-.307	1	-.007	3	-1.528e-3	2	252.592	1	5378.585	2
369		14	max	.001	3	-.015	15	.017	1	1.003e-4	9	5101.721	15	NC	3
370			min	-.002	1	-.352	1	-.005	3	-8.72e-4	2	220.382	1	5529.095	2
371		15	max	.001	3	-.017	15	.016	1	3.747e-4	9	4508.263	15	NC	3
372			min	-.002	1	-.399	1	-.002	3	-1.001e-3	3	194.705	1	5987.052	2
373		16	max	.001	3	-.019	15	.015	1	9.988e-4	1	4027.406	15	NC	3
374			min	-.002	1	-.446	1	0	15	-1.359e-3	3	173.906	1	6982.614	2
375		17	max	.001	3	-.021	15	.012	1	1.658e-3	1	3632.509	15	NC	3
376			min	-.002	1	-.495	1	0	15	-1.718e-3	3	156.83	1	9237.046	2
377		18	max	.001	3	-.023	15	.014	3	2.317e-3	1	3304.401	15	NC	1
378			min	-.002	1	-.544	1	-.001	10	-2.076e-3	3	142.646	1	5575.992	3
379		19	max	.001	3	-.026	15	.022	3	2.975e-3	1	3029.102	15	NC	1
380			min	-.002	1	-.594	1	-.005	2	-2.434e-3	3	130.748	1	3522.529	3
381	M3	1	max	.005	1	0	15	0	3	3.187e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	1	-1.226e-3	3	NC	1	NC	1
383		2	max	.004	1	-.002	15	.015	3	3.706e-3	2	NC	1	NC	4
384			min	0	15	-.04	1	-.034	2	-1.46e-3	3	NC	1	2232.977	2
385		3	max	.004	1	-.004	15	.028	3	4.224e-3	2	NC	1	NC	5
386			min	0	15	-.078	1	-.067	2	-1.694e-3	3	NC	1	1125.171	2
387		4	max	.003	1	-.006	15	.042	3	4.743e-3	2	NC	1	NC	5
388			min	0	15	-.115	1	-.099	2	-1.927e-3	3	NC	1	760.93	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	.003	3	-.008	15	.054	3	5.262e-3	2	NC	1	NC	5
390			min	0	10	-.152	1	-.128	2	-2.161e-3	3	NC	1	582.91	2
391		6	max	.003	3	-.01	15	.066	3	5.781e-3	2	NC	1	NC	5
392			min	0	10	-.19	1	-.156	2	-2.395e-3	3	NC	1	479.795	2
393		7	max	.004	3	-.011	15	.076	3	6.299e-3	2	NC	1	NC	15
394			min	-.001	2	-.227	1	-.18	2	-2.628e-3	3	8990.605	4	414.65	2
395		8	max	.004	3	-.013	15	.085	3	6.818e-3	2	NC	1	NC	15
396			min	-.002	2	-.264	1	-.2	2	-2.862e-3	3	8301.976	4	371.845	2
397		9	max	.004	3	-.015	15	.091	3	7.337e-3	2	NC	1	NC	15
398			min	-.002	2	-.3	1	-.216	2	-3.095e-3	3	7931.316	4	343.819	2
399		10	max	.005	3	-.016	15	.096	3	7.855e-3	2	NC	1	NC	15
400			min	-.003	2	-.337	1	-.227	2	-3.329e-3	3	7814.056	4	326.719	2
401		11	max	.005	3	-.018	15	.098	3	8.374e-3	2	NC	1	NC	15
402			min	-.004	2	-.373	1	-.232	2	-3.563e-3	3	7931.316	4	318.737	2
403		12	max	.005	3	-.019	15	.098	3	8.893e-3	2	NC	1	NC	15
404			min	-.004	2	-.409	1	-.23	2	-3.796e-3	3	8301.976	4	319.502	2
405		13	max	.005	3	-.021	15	.095	3	9.412e-3	2	NC	1	NC	15
406			min	-.005	2	-.444	1	-.221	2	-4.03e-3	3	8990.605	4	330.073	2
407		14	max	.006	3	-.022	15	.088	3	9.93e-3	2	NC	1	NC	15
408			min	-.006	2	-.48	1	-.205	2	-4.263e-3	3	NC	1	353.599	2
409		15	max	.006	3	-.023	15	.079	3	1.045e-2	2	NC	1	NC	15
410			min	-.006	2	-.515	1	-.179	2	-4.497e-3	3	NC	1	397.363	2
411		16	max	.006	3	-.025	15	.065	3	1.097e-2	2	NC	1	NC	5
412			min	-.007	2	-.55	1	-.145	2	-4.731e-3	3	NC	1	479.241	2
413		17	max	.006	3	-.026	15	.048	3	1.149e-2	2	NC	1	NC	5
414			min	-.008	2	-.586	1	-.101	2	-4.964e-3	3	NC	1	653.765	2
415		18	max	.007	3	-.027	15	.026	3	1.201e-2	2	NC	1	NC	5
416			min	-.008	2	-.621	1	-.047	2	-5.198e-3	3	NC	1	1194.859	2
417		19	max	.007	3	-.028	15	.03	1	1.252e-2	2	NC	1	NC	1
418			min	-.009	2	-.655	1	0	3	-5.432e-3	3	NC	1	NC	1
419	M6	1	max	.009	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	.007	1	-.003	15	0	1	0	1	NC	1	NC	1
422			min	0	15	-.076	1	0	1	0	1	NC	1	NC	1
423		3	max	.006	3	-.006	15	0	1	0	1	NC	1	NC	1
424			min	0	10	-.148	1	0	1	0	1	NC	1	NC	1
425		4	max	.007	3	-.01	15	0	1	0	1	NC	1	NC	1
426			min	0	10	-.22	1	0	1	0	1	NC	1	NC	1
427		5	max	.008	3	-.013	15	0	1	0	1	NC	1	NC	1
428			min	-.002	2	-.291	1	0	1	0	1	NC	1	NC	1
429		6	max	.009	3	-.016	15	0	1	0	1	NC	1	NC	1
430			min	-.004	2	-.363	1	0	1	0	1	NC	1	NC	1
431		7	max	.01	3	-.019	15	0	1	0	1	NC	1	NC	1
432			min	-.006	2	-.434	1	0	1	0	1	8990.605	4	NC	1
433		8	max	.011	3	-.021	15	0	1	0	1	NC	1	NC	1
434			min	-.008	2	-.505	1	0	1	0	1	8301.976	4	NC	1
435		9	max	.011	3	-.024	15	0	1	0	1	NC	1	NC	1
436			min	-.01	2	-.575	1	0	1	0	1	7931.316	4	NC	1
437		10	max	.012	3	-.027	15	0	1	0	1	NC	1	NC	1
438			min	-.012	2	-.646	1	0	1	0	1	7814.056	4	NC	1
439		11	max	.013	3	-.03	15	0	1	0	1	NC	1	NC	1
440			min	-.014	2	-.716	1	0	1	0	1	7931.316	4	NC	1
441		12	max	.014	3	-.032	15	0	1	0	1	NC	1	NC	1
442			min	-.016	2	-.786	1	0	1	0	1	8301.976	4	NC	1
443		13	max	.015	3	-.035	15	0	1	0	1	NC	1	NC	1
444			min	-.018	2	-.856	1	0	1	0	1	8990.605	4	NC	1
445		14	max	.016	3	-.037	15	0	1	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
446			min	-.02	2	-.926	1	0	1	0	1	NC	1	NC	1
447		15	max	.017	3	-.04	15	0	1	0	1	NC	1	NC	1
448			min	-.022	2	-.995	1	0	1	0	1	NC	1	NC	1
449		16	max	.018	3	-.042	15	0	1	0	1	NC	1	NC	1
450			min	-.024	2	-1.065	1	0	1	0	1	NC	1	NC	1
451		17	max	.019	3	-.045	15	0	1	0	1	NC	1	NC	1
452			min	-.026	2	-1.134	1	0	1	0	1	NC	1	NC	1
453		18	max	.019	3	-.047	15	0	1	0	1	NC	1	NC	1
454			min	-.028	2	-1.203	1	0	1	0	1	NC	1	NC	1
455		19	max	.02	3	-.049	15	0	1	0	1	NC	1	NC	1
456			min	-.03	2	-1.272	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.005	1	0	15	0	1	1.226e-3	3	NC	1	NC	1
458			min	0	15	-.002	1	0	3	-3.187e-3	2	NC	1	NC	1
459		2	max	.004	1	-.002	15	.034	2	1.46e-3	3	NC	1	NC	4
460			min	0	15	-.04	1	-.015	3	-3.706e-3	2	NC	1	2232.977	2
461		3	max	.004	1	-.004	15	.067	2	1.694e-3	3	NC	1	NC	5
462			min	0	15	-.078	1	-.028	3	-4.224e-3	2	NC	1	1125.171	2
463		4	max	.003	1	-.006	15	.099	2	1.927e-3	3	NC	1	NC	5
464			min	0	15	-.115	1	-.042	3	-4.743e-3	2	NC	1	760.93	2
465		5	max	.003	3	-.008	15	.128	2	2.161e-3	3	NC	1	NC	5
466			min	0	10	-.152	1	-.054	3	-5.262e-3	2	NC	1	582.91	2
467		6	max	.003	3	-.01	15	.156	2	2.395e-3	3	NC	1	NC	5
468			min	0	10	-.19	1	-.066	3	-5.781e-3	2	NC	1	479.795	2
469		7	max	.004	3	-.011	15	.18	2	2.628e-3	3	NC	1	NC	15
470			min	-.001	2	-.227	1	-.076	3	-6.299e-3	2	8990.605	4	414.65	2
471		8	max	.004	3	-.013	15	.2	2	2.862e-3	3	NC	1	NC	15
472			min	-.002	2	-.264	1	-.085	3	-6.818e-3	2	8301.976	4	371.845	2
473		9	max	.004	3	-.015	15	.216	2	3.095e-3	3	NC	1	NC	15
474			min	-.002	2	-.3	1	-.091	3	-7.337e-3	2	7931.316	4	343.819	2
475		10	max	.005	3	-.016	15	.227	2	3.329e-3	3	NC	1	NC	15
476			min	-.003	2	-.337	1	-.096	3	-7.855e-3	2	7814.056	4	326.719	2
477		11	max	.005	3	-.018	15	.232	2	3.563e-3	3	NC	1	NC	15
478			min	-.004	2	-.373	1	-.098	3	-8.374e-3	2	7931.316	4	318.737	2
479		12	max	.005	3	-.019	15	.23	2	3.796e-3	3	NC	1	NC	15
480			min	-.004	2	-.409	1	-.098	3	-8.893e-3	2	8301.976	4	319.502	2
481		13	max	.005	3	-.021	15	.221	2	4.03e-3	3	NC	1	NC	15
482			min	-.005	2	-.444	1	-.095	3	-9.412e-3	2	8990.605	4	330.073	2
483		14	max	.006	3	-.022	15	.205	2	4.263e-3	3	NC	1	NC	15
484			min	-.006	2	-.48	1	-.088	3	-9.93e-3	2	NC	1	353.599	2
485		15	max	.006	3	-.023	15	.179	2	4.497e-3	3	NC	1	NC	15
486			min	-.006	2	-.515	1	-.079	3	-1.045e-2	2	NC	1	397.363	2
487		16	max	.006	3	-.025	15	.145	2	4.731e-3	3	NC	1	NC	5
488			min	-.007	2	-.55	1	-.065	3	-1.097e-2	2	NC	1	479.241	2
489		17	max	.006	3	-.026	15	.101	2	4.964e-3	3	NC	1	NC	5
490			min	-.008	2	-.586	1	-.048	3	-1.149e-2	2	NC	1	653.765	2
491		18	max	.007	3	-.027	15	.047	2	5.198e-3	3	NC	1	NC	5
492			min	-.008	2	-.621	1	-.026	3	-1.201e-2	2	NC	1	1194.859	2
493		19	max	.007	3	-.028	15	0	3	5.432e-3	3	NC	1	NC	1
494			min	-.009	2	-.655	1	-.03	1	-1.252e-2	2	NC	1	NC	1