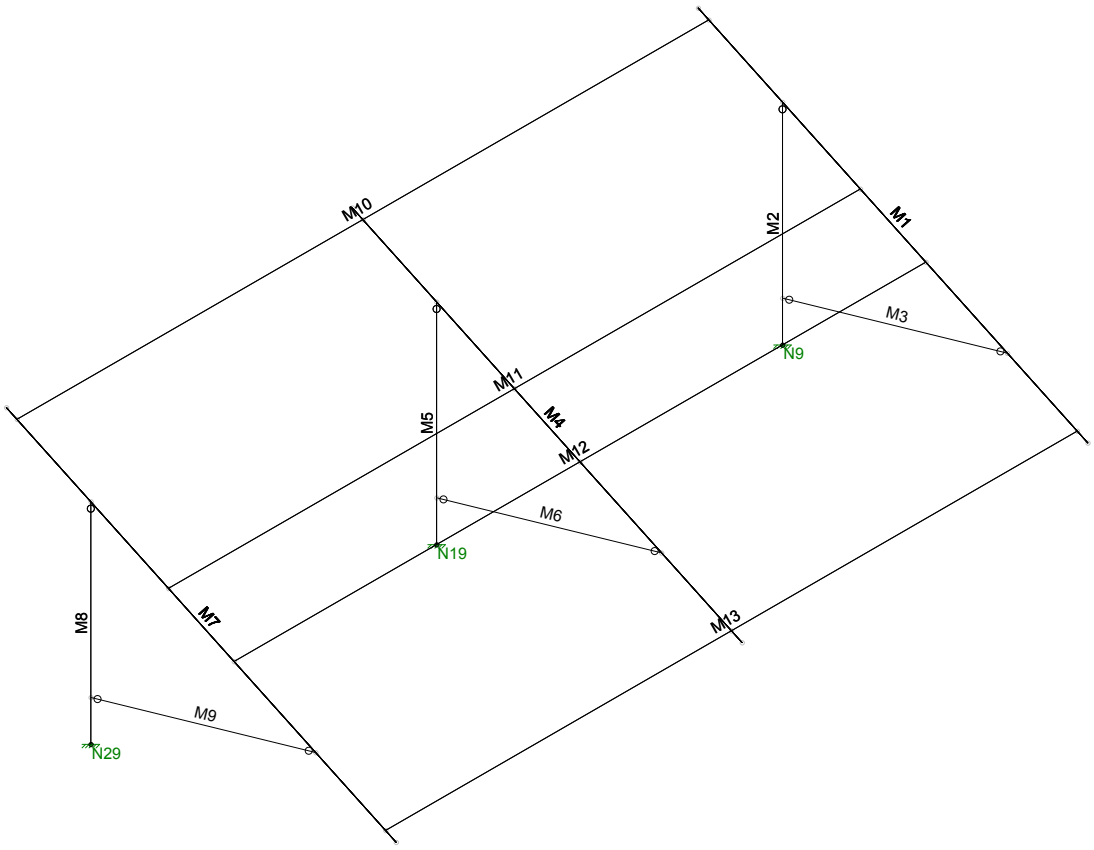


Schletter, Inc.		25° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

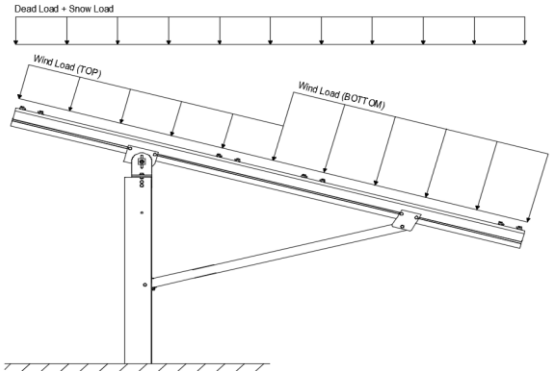
1.2 Construction

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 =	25°
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 =	18.56	psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.82		
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

$Cf+_{TOP}$ =	1.1	*(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.*
$Cf+_{BOTTOM}$ =	1.7		
$Cf-_{TOP}$ =	-2.2	*(Suction)*	
$Cf-_{BOTTOM}$ =	-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

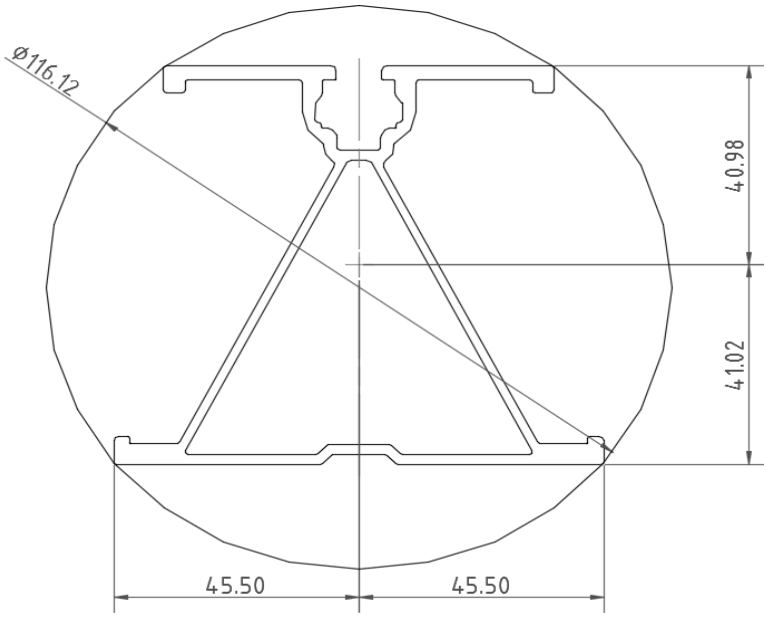
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	108	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.584	k-ft
M_z =	0.110	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	67%	

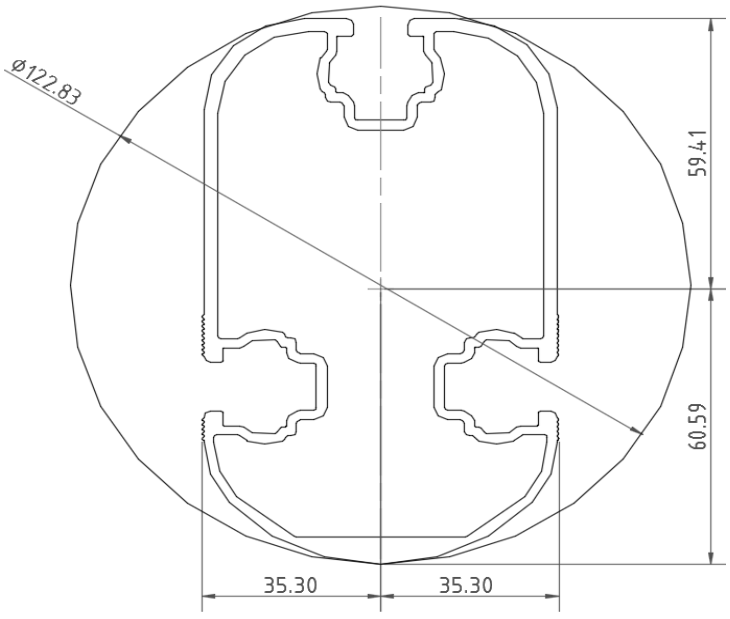


DETAIL VIEW

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 =	3.921	k-ft
M_z =	0.000	k-ft
P_n =	1.836	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	82%	

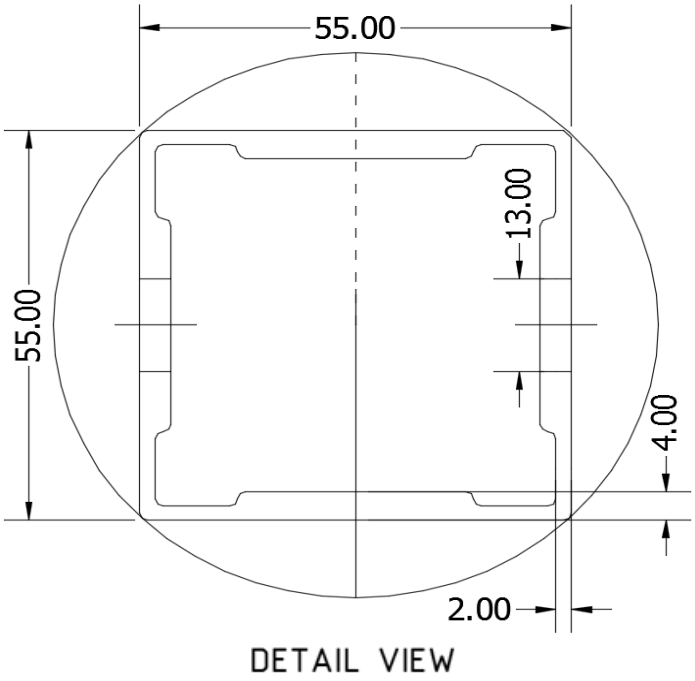


DETAIL VIEW

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).

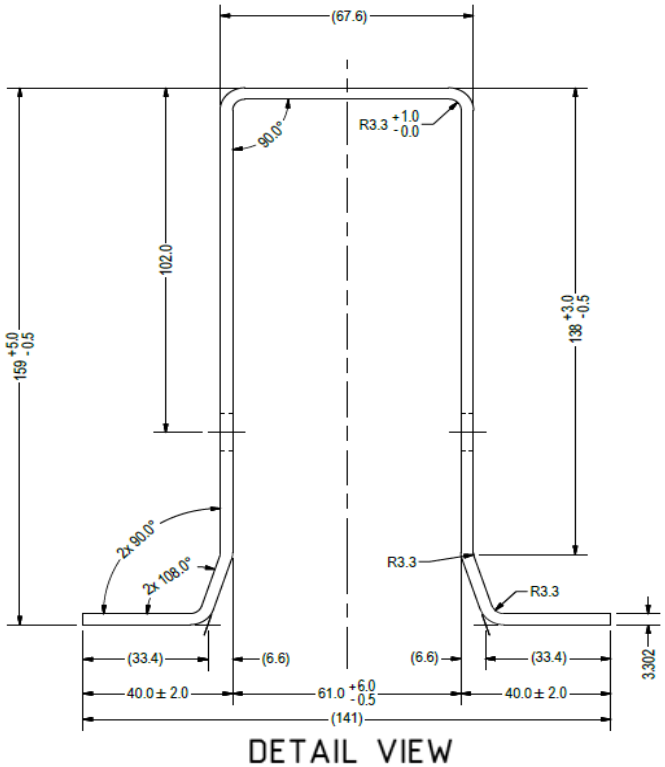
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.532	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	59%	



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 =	81.31	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 =	14.958	k-ft
M_z =	0.000	k-ft
P_r =	6.404	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	k
Utilization =	100%	



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 =	6.22	k
Maximum Lateral Load =	3.27	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)

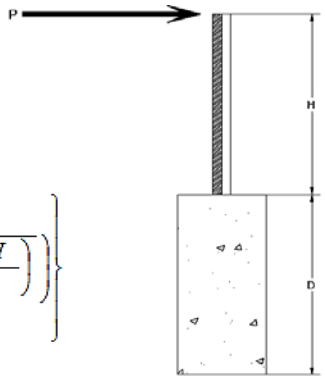
Lateral Force @ Top of Pole, P =	1.48	k
Height of Pole Above Grade, H =	5.78	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.48	k
Height of Pole Above Grade, H =	5.78	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 =	8.00		
Required Footing Depth, D =	12.14	ft	
2nd Trial @ D_2 =	7.70	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.51	ksf	
Lateral Soil Bearing @ D, S_3 =	1.54	ksf	
Constant 2.34P/(S_1B), A =	3.38		
Required Footing Depth, D =	6.60	ft	
3rd Trial @ D_3 =	7.15	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.48	ksf	
Lateral Soil Bearing @ D, S_3 =	1.43	ksf	
Constant 2.34P/(S_1B), A =	3.64		
Required Footing Depth, D =	6.94	ft	
4th Trial @ D_4 =	7.04	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.47	ksf	
Lateral Soil Bearing @ D, S_3 =	1.41	ksf	
Constant 2.34P/(S_1B), A =	3.69		
Required Footing Depth, D =	7.01	ft	
5th Trial @ D_5 =	7.02	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.47	ksf	
Lateral Soil Bearing @ D, S_3 =	1.40	ksf	
Constant 2.34P/(S_1B), A =	3.70		
Required Footing Depth, D =	7.25	ft	

A 2ft diameter x 7.25ft deep footing unrestrained at ground level is required for the racking structure.

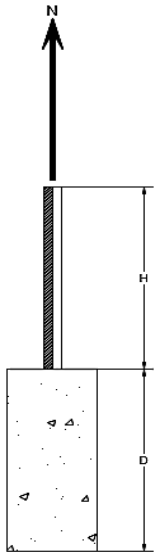
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.97	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 =	1.94	k
Required Concrete Volume, V =	13.35	ft^3
Required Footing Depth, D =	4.25	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.43
2	0.4	0.2	118.10	6.32
3	0.6	0.2	118.10	6.22
4	0.8	0.2	118.10	6.12
5	1	0.2	118.10	6.01
6	1.2	0.2	118.10	5.91
7	1.4	0.2	118.10	5.80
8	1.6	0.2	118.10	5.70
9	1.8	0.2	118.10	5.60
10	2	0.2	118.10	5.49
11	2.2	0.2	118.10	5.39
12	2.4	0.2	118.10	5.29
13	2.6	0.2	118.10	5.18
14	2.8	0.2	118.10	5.08
15	3	0.2	118.10	4.98
16	3.2	0.2	118.10	4.87
17	3.4	0.2	118.10	4.77
18	3.6	0.2	118.10	4.66
19	3.8	0.2	118.10	4.56
20	4	0.2	118.10	4.46
21	4.2	0.2	118.10	4.35
22	4.4	0.2	118.10	4.25
23	0	0.0	0.00	4.25
24	0	0.0	0.00	4.25
25	0	0.0	0.00	4.25
26	0	0.0	0.00	4.25
27	0	0.0	0.00	4.25
28	0	0.0	0.00	4.25
29	0	0.0	0.00	4.25
30	0	0.0	0.00	4.25
31	0	0.0	0.00	4.25
32	0	0.0	0.00	4.25
33	0	0.0	0.00	4.25
34	0	0.0	0.00	4.25
Max	4.4	Sum	1.04	

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



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	7.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.29	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	26.70	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

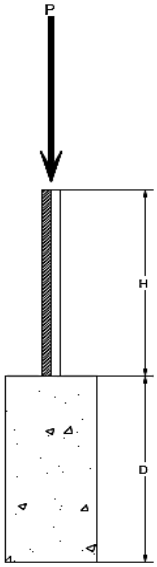
Weight of Concrete

Footing Volume	22.78	ft^3
Weight	3.30	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	4.01	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.62	k
Applied Force =	7.59	k
Utilization =	65%	

A 2ft diameter footing passes at a depth of 7.25ft.



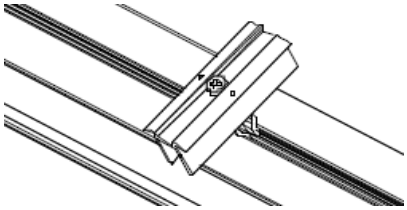
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

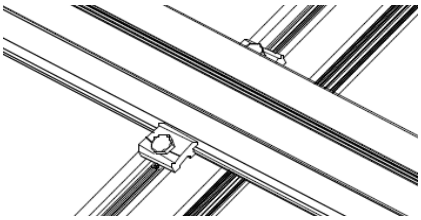
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.607 k
Allowable Uplift	=	1.214 k
Utilization	=	50%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.935 k
Allowable Uplift	=	2.180 k
Utilization	=	89%

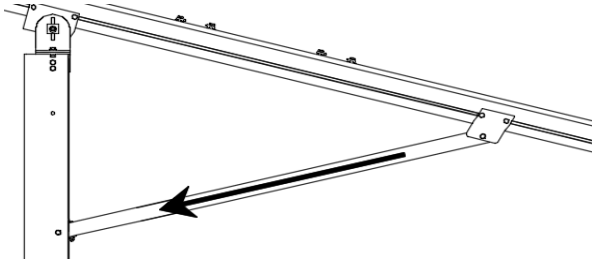


6.2 Strut Connections

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	=	5.532 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	62%

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

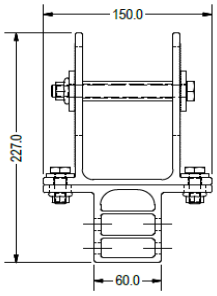


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

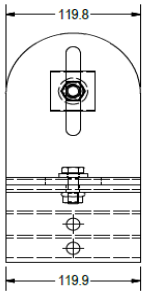
6.3 Girder to Post Connection

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.

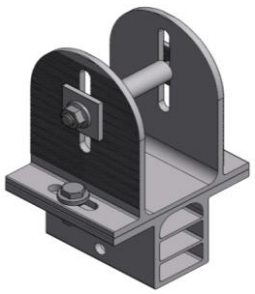
Maximum Tensile Load	=	4.004 k
Allowable Load	=	5.649 k
Utilization	=	71%



FRONT VIEW



SIDE VIEW



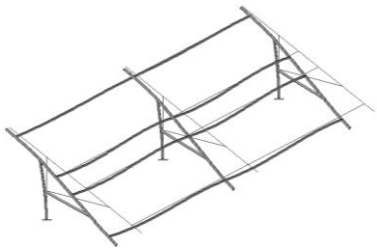
7. SEISMIC DESIGN

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}	=	74.39 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.488 in
Max Drift, Δ_{MAX}	=	0 in
N/A		

The racking structure's reaction to seismic loads is shown to the right. The deflections have been magnified to provide a clear portrayal of potential story drift.



APPENDIX A

A.1 Design of Aluminum Purlins - Aluminum Design Manual, 2005 Edition

Purlin = **S1.5**

Strong Axis:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	108 in	L_b =	108
J =	0.432	J =	0.432
	298.779		190.005
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	27.7 ksi	φF_L=	28.9
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 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:	Weak Axis:
3.4.14	**3.4.14**
L_b = 74.8031 in	L_b = 74.8031
J = 0.942	J = 0.942
116.737	116.737
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$
S1 = 0.51461	S1 = 0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$	$S2 = \left(\frac{C_c}{1.6}\right)^2$
S2 = 1701.56	S2 = 1701.56
φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L= 29.9 ksi	φF_L= 29.9
3.4.16	**3.4.16**
b/t = 24.5	b/t = 24.5
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$
S1 = 12.2	S1 = 12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$	$S2 = \frac{k_1 Bp}{1.6Dp}$
S2 = 46.7	S2 = 46.7
φF_L= φb[Bp-1.6Dp*b/t]	φF_L= φb[Bp-1.6Dp*b/t]
φF_L= 28.2 ksi	φF_L= 28.2 ksi
3.4.16.1 Not Used	**3.4.16.1**
Rb/t = 0.0	N/A for Weak Direction
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$	
S1 = 1.1	
$S2 = C_t$	
S2 = 141.0	
φF_L= 1.17φyFcy	
φF_L= 38.9 ksi	
3.4.18	**3.4.18**
h/t = 24.5	h/t = 24.5
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$
S1 = 36.9	S1 = 36.9
m = 0.65	m = 0.65
C_0 = 27.5	C_0 = 27.5
Cc = 27.5	Cc = 27.5
$S2 = \frac{k_1 Bbr}{mDbr}$	$S2 = \frac{k_1 Bbr}{mDbr}$
S2 = 77.3	S2 = 77.3
φF_L= 1.3φyFcy	φF_L= 1.3φyFcy
φF_L= 43.2 ksi	φF_L= 43.2 ksi
φF_LSt= 28.2 ksi	φF_LWk= 28.2 ksi
Ix = 279836 mm^4	Iy = 279836 mm^4
0.672 in^4	0.672 in^4
y = 27.5 mm	x = 27.5 mm
Sx = 0.621 in^3	Sy = 0.621 in^3
M_{max}St = 1.460 k-ft	M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

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

φF_L = 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

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 =	81.31	in	
Pr =	6.40	k	(LRFD Factored Load)
Mr (Strong) =	14.96	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	116.99			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	18.34	ksi		
Fe =	20.91	ksi		
Pn =	40.9	k		

Torsional/Flexural Torsional Buckling:

Fcr =	13.8471	ksi
Fey =	53.3447	ksi
Fez =	17.7356	ksi
Pn =	30.879	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.2304	≥	0.2	
Utilization =	1.00	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.230	≥	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 100%

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	-55.176	-55.176	0	0
2	M11	Y	-55.176	-55.176	0	0
3	M12	Y	-55.176	-55.176	0	0
4	M13	Y	-55.176	-55.176	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	-56.664	-56.664	0	0
2	M11	y	-56.664	-56.664	0	0
3	M12	y	-87.571	-87.571	0	0
4	M13	y	-87.571	-87.571	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	113.327	113.327	0	0
2	M11	y	113.327	113.327	0	0
3	M12	y	51.512	51.512	0	0
4	M13	y	51.512	51.512	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...	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	521.726	2	2473.049	1	167.004	1	.266	1	.002	3	8.047	1
2		min	-814.278	3	-1581.133	3	-164.475	3	-.218	3	-.006	2	.282	15
3	N19	max	2467.633	2	6440.513	1	0	2	0	1	0	1	13.917	1
4		min	-2384.088	3	-4778.088	3	0	13	0	3	0	3	.451	15
5	N29	max	521.726	2	2473.049	1	164.475	3	.218	3	.006	2	8.047	1
6		min	-814.278	3	-1581.133	3	-167.004	1	-.266	1	-.002	3	.282	15
7	Totals:	max	3511.085	2	11386.611	1	0	14						
8		min	-4012.645	3	-7940.354	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	3	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-7.028	12	275.728	3	4.926	3	.05	3	.344	1	.256	2
4			min	-225.689	1	-687.231	2	-166.151	1	-.219	2	.007	12	-.101	3
5		3	max	-7.414	12	274.485	3	4.926	3	.05	3	.235	1	.708	2
6			min	-226.463	1	-688.889	2	-166.151	1	-.219	2	.008	15	-.281	3
7		4	max	-7.801	12	273.241	3	4.926	3	.05	3	.126	1	1.16	2
8			min	-227.236	1	-690.547	2	-166.151	1	-.219	2	.005	15	-.461	3
9		5	max	576.003	3	643.645	2	20.508	3	0	15	.176	1	1.368	2
10			min	-1664.882	2	-244.254	3	-205.023	1	-.033	3	-.042	3	-.545	3
11		6	max	575.423	3	641.987	2	20.508	3	0	15	.052	2	.947	2
12			min	-1665.655	2	-245.498	3	-205.023	1	-.033	3	-.028	3	-.384	3
13		7	max	574.843	3	640.328	2	20.508	3	0	15	-.003	15	.526	2
14			min	-1666.428	2	-246.742	3	-205.023	1	-.033	3	-.093	1	-.223	3
15		8	max	574.263	3	638.67	2	20.508	3	0	15	-.001	12	.106	2
16			min	-1667.201	2	-247.985	3	-205.023	1	-.033	3	-.227	1	-.06	3
17		9	max	564.649	3	4.355	9	38.83	3	-.003	15	.117	1	.018	3
18			min	-1907.021	1	-3.999	2	-253.679	1	-.169	2	.004	15	-.087	2
19		10	max	564.069	3	2.974	9	38.83	3	-.003	15	.047	3	.018	3
20			min	-1907.794	1	-5.657	2	-253.679	1	-.169	2	-.049	1	-.083	2
21		11	max	563.489	3	1.592	9	38.83	3	-.003	15	.073	3	.019	3
22			min	-1908.567	1	-7.316	2	-253.679	1	-.169	2	-.216	1	-.079	2
23		12	max	549.7	3	644.905	3	23.798	2	.238	3	.16	1	.092	1
24			min	-2143.852	1	-487.809	1	-155.1	3	-.251	1	.006	15	-.189	3
25		13	max	549.12	3	643.662	3	23.798	2	.238	3	.146	1	.413	1
26			min	-2144.625	1	-489.467	1	-155.1	3	-.251	1	-.037	3	-.612	3
27		14	max	548.54	3	642.418	3	23.798	2	.238	3	.132	1	.734	1
28			min	-2145.398	1	-491.125	1	-155.1	3	-.251	1	-.139	3	-1.033	3
29		15	max	547.96	3	641.175	3	23.798	2	.238	3	.132	2	1.057	1
30			min	-2146.171	1	-492.783	1	-155.1	3	-.251	1	-.241	3	-1.455	3
31		16	max	227.56	1	487.775	1	-3.993	12	.17	1	.015	3	.804	1
32			min	6.467	12	-662.001	3	-148.952	1	-.343	3	-.166	1	-1.11	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	226.787	1	486.117	1	-3.993	12	.17	1	.011	3	.485	1
34			min	6.081	12	-663.245	3	-148.952	1	-.343	3	-.264	1	-.676	3
35		18	max	226.014	1	484.459	1	-3.993	12	.17	1	.008	3	.166	1
36			min	5.694	12	-664.488	3	-148.952	1	-.343	3	-.362	1	-.24	3
37		19	max	0	1	0	5	0	1	0	1	0	1	0	1
38			min	0	1	-.001	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.007	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	-8.315	10	825.866	3	0	1	0	1	0	1	.556	2
42			min	-326.093	1	-1817.803	2	0	1	0	1	0	1	-.26	3
43		3	max	-8.959	10	824.623	3	0	1	0	1	0	1	1.749	2
44			min	-326.866	1	-1819.461	2	0	1	0	1	0	1	-.801	3
45		4	max	-9.604	10	823.379	3	0	1	0	1	0	1	2.944	2
46			min	-327.64	1	-1821.119	2	0	1	0	1	0	1	-1.342	3
47		5	max	1892.973	3	1810.027	2	0	1	0	1	0	1	3.472	2
48			min	-4327.473	2	-856.964	3	0	1	0	1	0	1	-1.573	3
49		6	max	1892.393	3	1808.369	2	0	1	0	1	0	1	2.285	2
50			min	-4328.246	2	-858.208	3	0	1	0	1	0	1	-1.011	3
51		7	max	1891.813	3	1806.711	2	0	1	0	1	0	1	1.099	2
52			min	-4329.019	2	-859.451	3	0	1	0	1	0	1	-.447	3
53		8	max	1891.233	3	1805.053	2	0	1	0	1	0	1	.117	3
54			min	-4329.793	2	-860.695	3	0	1	0	1	0	1	-.11	1
55		9	max	1861.082	3	18.733	3	0	1	0	1	0	1	.385	3
56			min	-4471.68	1	-114.002	2	0	1	0	1	0	1	-.64	2
57		10	max	1860.502	3	17.49	3	0	1	0	1	0	1	.373	3
58			min	-4472.453	1	-115.66	2	0	1	0	1	0	1	-.565	2
59		11	max	1859.922	3	16.246	3	0	1	0	1	0	1	.362	3
60			min	-4473.226	1	-117.318	2	0	1	0	1	0	1	-.488	2
61		12	max	1838.12	3	1874.588	3	0	1	0	1	0	1	.062	1
62			min	-4780.129	1	-1622.464	1	0	1	0	1	0	1	-.234	3
63		13	max	1837.54	3	1873.345	3	0	1	0	1	0	1	1.127	1
64			min	-4780.902	1	-1624.122	1	0	1	0	1	0	1	-1.464	3
65		14	max	1836.96	3	1872.101	3	0	1	0	1	0	1	2.193	1
66			min	-4781.675	1	-1625.78	1	0	1	0	1	0	1	-2.693	3
67		15	max	1836.38	3	1870.857	3	0	1	0	1	0	1	3.261	1
68			min	-4782.448	1	-1627.438	1	0	1	0	1	0	1	-3.921	3
69		16	max	326.991	1	1514.669	1	0	1	0	1	0	1	2.483	1
70			min	8.514	10	-1827.288	3	0	1	0	1	0	1	-2.977	3
71		17	max	326.218	1	1513.011	1	0	1	0	1	0	1	1.489	1
72			min	7.87	10	-1828.531	3	0	1	0	1	0	1	-1.777	3
73		18	max	325.445	1	1511.353	1	0	1	0	1	0	1	.497	1
74			min	7.226	10	-1829.775	3	0	1	0	1	0	1	-.577	3
75		19	max	0	1	0	2	0	1	0	1	0	1	0	1
76			min	0	1	-.003	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	3	0	1	0	1	0	1
79		2	max	-7.028	12	275.728	3	166.151	1	.219	2	-.007	12	.256	2
80			min	-225.689	1	-687.231	2	-4.926	3	-.05	3	-.344	1	-.101	3
81		3	max	-7.414	12	274.485	3	166.151	1	.219	2	-.008	15	.708	2
82			min	-226.463	1	-688.889	2	-4.926	3	-.05	3	-.235	1	-.281	3
83		4	max	-7.801	12	273.241	3	166.151	1	.219	2	-.005	15	1.16	2
84			min	-227.236	1	-690.547	2	-4.926	3	-.05	3	-.126	1	-.461	3
85		5	max	576.003	3	643.645	2	205.023	1	.033	3	.042	3	1.368	2
86			min	-1664.882	2	-244.254	3	-20.508	3	0	15	-.176	1	-.545	3
87		6	max	575.423	3	641.987	2	205.023	1	.033	3	.028	3	.947	2
88			min	-1665.655	2	-245.498	3	-20.508	3	0	15	-.052	2	-.384	3
89		7	max	574.843	3	640.328	2	205.023	1	.033	3	.093	1	.526	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	-1666.428	2	-246.742	3	-20.508	3	0	15	.003	15	-.223	3
91		8	max	574.263	3	638.67	2	205.023	1	.033	3	.227	1	.106	2
92			min	-1667.201	2	-247.985	3	-20.508	3	0	15	.001	12	-.06	3
93		9	max	564.649	3	4.355	9	253.679	1	.169	2	-.004	15	.018	3
94			min	-1907.021	1	-3.999	2	-38.83	3	.003	15	-.117	1	-.087	2
95		10	max	564.069	3	2.974	9	253.679	1	.169	2	.049	1	.018	3
96			min	-1907.794	1	-5.657	2	-38.83	3	.003	15	-.047	3	-.083	2
97		11	max	563.489	3	1.592	9	253.679	1	.169	2	.216	1	.019	3
98			min	-1908.567	1	-7.316	2	-38.83	3	.003	15	-.073	3	-.079	2
99		12	max	549.7	3	644.905	3	155.1	3	.251	1	-.006	15	.092	1
100			min	-2143.852	1	-487.809	1	-23.798	2	-.238	3	-.16	1	-.189	3
101		13	max	549.12	3	643.662	3	155.1	3	.251	1	.037	3	.413	1
102			min	-2144.625	1	-489.467	1	-23.798	2	-.238	3	-.146	1	-.612	3
103		14	max	548.54	3	642.418	3	155.1	3	.251	1	.139	3	.734	1
104			min	-2145.398	1	-491.125	1	-23.798	2	-.238	3	-.132	1	-1.033	3
105		15	max	547.96	3	641.175	3	155.1	3	.251	1	.241	3	1.057	1
106			min	-2146.171	1	-492.783	1	-23.798	2	-.238	3	-.132	2	-1.455	3
107		16	max	227.56	1	487.775	1	148.952	1	.343	3	.166	1	.804	1
108			min	6.467	12	-662.001	3	3.993	12	-.17	1	-.015	3	-1.11	3
109		17	max	226.787	1	486.117	1	148.952	1	.343	3	.264	1	.485	1
110			min	6.081	12	-663.245	3	3.993	12	-.17	1	-.011	3	-.676	3
111		18	max	226.014	1	484.459	1	148.952	1	.343	3	.362	1	.166	1
112			min	5.694	12	-664.488	3	3.993	12	-.17	1	-.008	3	-.24	3
113		19	max	0	1	0	5	0	5	0	1	0	1	0	1
114			min	0	1	-.001	3	0	1	0	1	0	1	0	1
115	M10	1	max	148.997	1	483.509	1	-5.307	12	.004	1	.411	1	.17	1
116			min	3.995	12	-665.67	3	-225.881	1	-.018	3	-.006	3	-.343	3
117		2	max	148.997	1	345.827	1	-3.543	12	.004	1	.207	1	.235	3
118			min	3.995	12	-490.023	3	-182.817	1	-.018	3	-.012	3	-.245	1
119		3	max	148.997	1	208.145	1	-1.778	12	.004	1	.067	2	.637	3
120			min	3.995	12	-314.376	3	-139.753	1	-.018	3	-.016	3	-.522	1
121		4	max	148.997	1	70.462	1	.311	3	.004	1	.011	10	.864	3
122			min	3.995	12	-138.729	3	-96.689	1	-.018	3	-.072	1	-.661	1
123		5	max	148.997	1	36.919	3	2.958	3	.004	1	-.006	15	.915	3
124			min	3.995	12	-67.22	1	-53.625	1	-.018	3	-.148	1	-.663	1
125		6	max	148.997	1	212.566	3	5.605	3	.004	1	-.007	15	.79	3
126			min	3.995	12	-204.902	1	-25.455	2	-.018	3	-.18	1	-.527	1
127		7	max	148.997	1	388.213	3	32.503	1	.004	1	-.003	12	.489	3
128			min	3.995	12	-342.585	1	-11.172	10	-.018	3	-.169	1	-.253	1
129		8	max	148.997	1	563.861	3	75.567	1	.004	1	.006	3	.158	1
130			min	3.995	12	-480.267	1	-6.377	10	-.018	3	-.115	1	.004	15
131		9	max	148.997	1	739.508	3	118.631	1	.004	1	.022	9	.707	1
132			min	3.995	12	-617.949	1	-1.581	10	-.018	3	-.085	2	-.638	3
133		10	max	148.997	1	915.155	3	16.191	3	.018	3	.123	1	1.394	1
134			min	3.995	12	20.405	15	-161.695	1	0	15	-.056	10	-1.466	3
135		11	max	148.997	1	617.949	1	1.581	10	.018	3	.022	9	.707	1
136			min	3.995	12	-739.508	3	-118.631	1	-.004	1	-.085	2	-.638	3
137		12	max	148.997	1	480.267	1	6.377	10	.018	3	.006	3	.158	1
138			min	3.995	12	-563.861	3	-75.567	1	-.004	1	-.115	1	.004	15
139		13	max	148.997	1	342.585	1	11.172	10	.018	3	-.003	12	.489	3
140			min	3.995	12	-388.213	3	-32.503	1	-.004	1	-.169	1	-.253	1
141		14	max	148.997	1	204.902	1	25.455	2	.018	3	-.007	15	.79	3
142			min	3.995	12	-212.566	3	-5.605	3	-.004	1	-.18	1	-.527	1
143		15	max	148.997	1	67.22	1	53.625	1	.018	3	-.006	15	.915	3
144			min	3.995	12	-36.919	3	-2.958	3	-.004	1	-.148	1	-.663	1
145		16	max	148.997	1	138.729	3	96.689	1	.018	3	.011	10	.864	3
146			min	3.995	12	-70.462	1	-.311	3	-.004	1	-.072	1	-.661	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	148.997	1	314.376	3	139.753	1	.018	3	.067	2	.637	3
148			min	3.995	12	-208.145	1	1.778	12	-.004	1	-.016	3	-.522	1
149		18	max	148.997	1	490.023	3	182.817	1	.018	3	.207	1	.235	3
150			min	3.995	12	-345.827	1	3.543	12	-.004	1	-.012	3	-.245	1
151		19	max	148.997	1	665.67	3	225.881	1	.018	3	.411	1	.17	1
152			min	3.995	12	-483.509	1	5.307	12	-.004	1	-.006	3	-.343	3
153	M11	1	max	231.051	1	486.104	1	-8.837	12	.003	3	.469	1	.112	1
154			min	-193.701	3	-648.66	3	-235.513	1	-.014	1	.016	15	-.333	3
155		2	max	231.051	1	348.421	1	-7.073	12	.003	3	.255	1	.228	3
156			min	-193.701	3	-473.013	3	-192.449	1	-.014	1	.008	15	-.308	2
157		3	max	231.051	1	210.739	1	-5.308	12	.003	3	.085	2	.613	3
158			min	-193.701	3	-297.366	3	-149.385	1	-.014	1	.002	15	-.585	1
159		4	max	231.051	1	73.057	1	-3.544	12	.003	3	.016	10	.822	3
160			min	-193.701	3	-121.718	3	-106.321	1	-.014	1	-.044	1	-.726	1
161		5	max	231.051	1	53.929	3	-1.779	12	.003	3	-.002	12	.856	3
162			min	-193.701	3	-64.682	2	-63.257	1	-.014	1	-.129	1	-.731	1
163		6	max	231.051	1	229.576	3	-.005	3	.003	3	-.003	12	.714	3
164			min	-193.701	3	-202.308	1	-30.093	2	-.014	1	-.171	1	-.597	1
165		7	max	231.051	1	405.224	3	24.293	9	.003	3	-.002	12	.397	3
166			min	-193.701	3	-339.99	1	-12.722	10	-.014	1	-.169	1	-.326	1
167		8	max	231.051	1	580.871	3	65.936	1	.003	3	0	3	.083	1
168			min	-193.701	3	-477.673	1	-7.926	10	-.014	1	-.125	1	-.096	3
169		9	max	231.051	1	756.518	3	109	1	.003	3	.01	9	.629	1
170			min	-193.701	3	-615.355	1	-3.131	10	-.014	1	-.095	2	-.765	3
171		10	max	231.051	1	932.165	3	152.064	1	.006	9	.104	9	1.313	1
172			min	-193.701	3	-753.037	1	1.665	10	-.014	1	-.064	2	-1.609	3
173		11	max	231.051	1	615.355	1	3.131	10	.014	1	.01	9	.629	1
174			min	-193.701	3	-756.518	3	-109	1	-.003	3	-.095	2	-.765	3
175		12	max	231.051	1	477.673	1	7.926	10	.014	1	0	3	.083	1
176			min	-193.701	3	-580.871	3	-65.936	1	-.003	3	-.125	1	-.096	3
177		13	max	231.051	1	339.99	1	12.722	10	.014	1	-.002	12	.397	3
178			min	-193.701	3	-405.224	3	-24.293	9	-.003	3	-.169	1	-.326	1
179		14	max	231.051	1	202.308	1	30.093	2	.014	1	-.003	12	.714	3
180			min	-193.701	3	-229.576	3	.005	3	-.003	3	-.171	1	-.597	1
181		15	max	231.051	1	64.682	2	63.257	1	.014	1	-.002	12	.856	3
182			min	-193.701	3	-53.929	3	1.779	12	-.003	3	-.129	1	-.731	1
183		16	max	231.051	1	121.718	3	106.321	1	.014	1	.016	10	.822	3
184			min	-193.701	3	-73.057	1	3.544	12	-.003	3	-.044	1	-.726	1
185		17	max	231.051	1	297.366	3	149.385	1	.014	1	.085	2	.613	3
186			min	-193.701	3	-210.739	1	5.308	12	-.003	3	.002	15	-.585	1
187		18	max	231.051	1	473.013	3	192.449	1	.014	1	.255	1	.228	3
188			min	-193.701	3	-348.421	1	7.073	12	-.003	3	.008	15	-.308	2
189		19	max	231.051	1	648.66	3	235.513	1	.014	1	.469	1	.112	1
190			min	-193.701	3	-486.104	1	8.837	12	-.003	3	.016	15	-.333	3
191	M12	1	max	18.407	3	639.945	2	-6.215	12	0	3	.496	1	.165	2
192			min	-47.116	1	-250.414	3	-240.057	1	-.01	1	.003	12	.003	15
193		2	max	18.407	3	462.488	2	-4.451	12	0	3	.277	1	.274	3
194			min	-47.116	1	-173.671	3	-196.993	1	-.01	1	-.004	3	-.387	2
195		3	max	18.407	3	285.03	2	-2.686	12	0	3	.102	2	.409	3
196			min	-47.116	1	-96.927	3	-153.929	1	-.01	1	-.009	3	-.76	2
197		4	max	18.407	3	107.573	2	-.922	12	0	3	.024	2	.468	3
198			min	-47.116	1	-20.184	3	-110.865	1	-.01	1	-.036	9	-.957	2
199		5	max	18.407	3	56.559	3	1.555	3	0	3	-.005	10	.45	3
200			min	-47.116	1	-69.885	2	-67.801	1	-.01	1	-.12	1	-.975	2
201		6	max	18.407	3	133.303	3	4.202	3	0	3	-.006	12	.355	3
202			min	-47.116	1	-247.343	2	-34.46	2	-.01	1	-.166	1	-.817	2
203		7	max	18.407	3	210.046	3	22.358	9	0	3	-.002	12	.183	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	-47.116	1	-424.8	2	-17.046	2	-.01	1	-.17	1	-.481	2
205		8	max	18.407	3	286.789	3	61.392	1	0	3	.005	3	.033	2
206			min	-47.116	1	-602.258	2	-10.238	10	-.01	1	-.13	1	-.065	3
207		9	max	18.407	3	363.532	3	104.456	1	0	3	.016	3	.724	2
208			min	-47.116	1	-779.716	2	-5.442	10	-.01	1	-.104	2	-.39	3
209		10	max	18.407	3	440.276	3	147.52	1	0	3	.098	9	1.592	2
210			min	-47.116	1	-957.173	2	-.647	10	-.01	1	-.078	2	-.792	3
211		11	max	18.407	3	779.716	2	5.442	10	.01	1	.016	3	.724	2
212			min	-47.116	1	-363.532	3	-104.456	1	0	3	-.104	2	-.39	3
213		12	max	18.407	3	602.258	2	10.238	10	.01	1	.005	3	.033	2
214			min	-47.116	1	-286.789	3	-61.392	1	0	3	-.13	1	-.065	3
215		13	max	18.407	3	424.8	2	17.046	2	.01	1	-.002	12	.183	3
216			min	-47.116	1	-210.046	3	-22.358	9	0	3	-.17	1	-.481	2
217		14	max	18.407	3	247.343	2	34.46	2	.01	1	-.006	12	.355	3
218			min	-47.116	1	-133.303	3	-4.202	3	0	3	-.166	1	-.817	2
219		15	max	18.407	3	69.885	2	67.801	1	.01	1	-.005	10	.45	3
220			min	-47.116	1	-56.559	3	-1.555	3	0	3	-.12	1	-.975	2
221		16	max	18.407	3	20.184	3	110.865	1	.01	1	.024	2	.468	3
222			min	-47.116	1	-107.573	2	.922	12	0	3	-.036	9	-.957	2
223		17	max	18.407	3	96.927	3	153.929	1	.01	1	.102	2	.409	3
224			min	-47.116	1	-285.03	2	2.686	12	0	3	-.009	3	-.76	2
225		18	max	18.407	3	173.671	3	196.993	1	.01	1	.277	1	.274	3
226			min	-47.116	1	-462.488	2	4.451	12	0	3	-.004	3	-.387	2
227		19	max	18.407	3	250.414	3	240.057	1	.01	1	.496	1	.165	2
228			min	-47.116	1	-639.945	2	6.215	12	0	3	.003	12	.003	15
229	M13	1	max	4.926	3	686.416	2	-6.641	12	.008	3	.4	1	.219	2
230			min	-165.928	1	-277.016	3	-224.187	1	-.026	2	.006	12	-.05	3
231		2	max	4.926	3	508.958	2	-4.876	12	.008	3	.197	1	.189	3
232			min	-165.928	1	-200.273	3	-181.123	1	-.026	2	0	3	-.379	2
233		3	max	4.926	3	331.501	2	-3.112	12	.008	3	.06	2	.351	3
234			min	-165.928	1	-123.529	3	-138.058	1	-.026	2	-.006	3	-.799	2
235		4	max	4.926	3	154.043	2	-1.347	12	.008	3	.008	10	.436	3
236			min	-165.928	1	-46.786	3	-94.994	1	-.026	2	-.079	1	-1.042	2
237		5	max	4.926	3	29.957	3	.82	3	.008	3	-.006	15	.444	3
238			min	-165.928	1	-23.415	2	-51.93	1	-.026	2	-.153	1	-1.107	2
239		6	max	4.926	3	106.701	3	3.467	3	.008	3	-.005	12	.376	3
240			min	-165.928	1	-200.872	2	-24.029	2	-.026	2	-.183	1	-.995	2
241		7	max	4.926	3	183.444	3	34.198	1	.008	3	-.002	12	.231	3
242			min	-165.928	1	-378.33	2	-10.449	10	-.026	2	-.17	1	-.705	2
243		8	max	4.926	3	260.187	3	77.262	1	.008	3	.005	3	.009	3
244			min	-165.928	1	-555.787	2	-5.654	10	-.026	2	-.115	1	-.26	1
245		9	max	4.926	3	336.93	3	120.326	1	.008	3	.023	9	.406	2
246			min	-165.928	1	-733.245	2	-.858	10	-.026	2	-.084	2	-.29	3
247		10	max	4.926	3	910.703	2	-3.937	10	.008	3	.126	1	1.228	2
248			min	-165.928	1	-413.674	3	-163.39	1	-.026	2	-.054	10	-.665	3
249		11	max	4.926	3	733.245	2	.858	10	.026	2	.023	9	.406	2
250			min	-165.928	1	-336.93	3	-120.326	1	-.008	3	-.084	2	-.29	3
251		12	max	4.926	3	555.787	2	5.654	10	.026	2	.005	3	.009	3
252			min	-165.928	1	-260.187	3	-77.262	1	-.008	3	-.115	1	-.26	1
253		13	max	4.926	3	378.33	2	10.449	10	.026	2	-.002	12	.231	3
254			min	-165.928	1	-183.444	3	-34.198	1	-.008	3	-.17	1	-.705	2
255		14	max	4.926	3	200.872	2	24.029	2	.026	2	-.005	12	.376	3
256			min	-165.928	1	-106.701	3	-3.467	3	-.008	3	-.183	1	-.995	2
257		15	max	4.926	3	23.415	2	51.93	1	.026	2	-.006	15	.444	3
258			min	-165.928	1	-29.957	3	-.82	3	-.008	3	-.153	1	-1.107	2
259		16	max	4.926	3	46.786	3	94.994	1	.026	2	.008	10	.436	3
260			min	-165.928	1	-154.043	2	1.347	12	-.008	3	-.079	1	-1.042	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
261		17	max	4.926	3	123.529	3	138.058	1	.026	2	.06	2	.351	3
262			min	-165.928	1	-331.501	2	3.112	12	-.008	3	-.006	3	-.799	2
263		18	max	4.926	3	200.273	3	181.123	1	.026	2	.197	1	.189	3
264			min	-165.928	1	-508.958	2	4.876	12	-.008	3	0	3	-.379	2
265		19	max	4.926	3	277.016	3	224.187	1	.026	2	.4	1	.219	2
266			min	-165.928	1	-686.416	2	6.641	12	-.008	3	.006	12	-.05	3
267	M2	1	max	2473.049	1	813.867	3	167.344	1	.002	3	.218	3	8.047	1
268			min	-1581.133	3	-518.043	2	-164.304	3	-.006	2	-.266	1	.282	15
269		2	max	2470.128	1	813.867	3	167.344	1	.002	3	.166	3	8.074	1
270			min	-1583.324	3	-518.043	2	-164.304	3	-.006	2	-.213	1	.279	15
271		3	max	2467.206	1	813.867	3	167.344	1	.002	3	.113	3	8.101	1
272			min	-1585.516	3	-518.043	2	-164.304	3	-.006	2	-.159	1	.277	15
273		4	max	2464.284	1	813.867	3	167.344	1	.002	3	.06	3	8.127	1
274			min	-1587.707	3	-518.043	2	-164.304	3	-.006	2	-.105	1	.274	15
275		5	max	1953.561	1	1747.254	1	126.636	1	.002	1	.03	3	7.849	1
276			min	-1377.422	3	43.066	12	-149.36	3	0	3	-.105	1	.193	12
277		6	max	1950.639	1	1747.254	1	126.636	1	.002	1	-.002	15	7.288	1
278			min	-1379.613	3	43.066	12	-149.36	3	0	3	-.065	1	.18	12
279		7	max	1947.717	1	1747.254	1	126.636	1	.002	1	.004	10	6.728	1
280			min	-1381.804	3	43.066	12	-149.36	3	0	3	-.066	3	.166	12
281		8	max	1944.795	1	1747.254	1	126.636	1	.002	1	.036	2	6.167	1
282			min	-1383.996	3	43.066	12	-149.36	3	0	3	-.114	3	.152	12
283		9	max	1941.874	1	1747.254	1	126.636	1	.002	1	.073	2	5.606	1
284			min	-1386.187	3	43.066	12	-149.36	3	0	3	-.161	3	.138	12
285		10	max	1938.952	1	1747.254	1	126.636	1	.002	1	.11	2	5.046	1
286			min	-1388.378	3	43.066	12	-149.36	3	0	3	-.209	3	.124	12
287		11	max	1936.03	1	1747.254	1	126.636	1	.002	1	.147	2	4.485	1
288			min	-1390.57	3	43.066	12	-149.36	3	0	3	-.257	3	.111	12
289		12	max	1933.109	1	1747.254	1	126.636	1	.002	1	.184	2	3.924	1
290			min	-1392.761	3	43.066	12	-149.36	3	0	3	-.305	3	.097	12
291		13	max	1930.187	1	1747.254	1	126.636	1	.002	1	.221	2	3.364	1
292			min	-1394.952	3	43.066	12	-149.36	3	0	3	-.353	3	.083	12
293		14	max	1927.265	1	1747.254	1	126.636	1	.002	1	.26	1	2.803	1
294			min	-1397.143	3	43.066	12	-149.36	3	0	3	-.401	3	.069	12
295		15	max	1924.343	1	1747.254	1	126.636	1	.002	1	.301	1	2.243	1
296			min	-1399.335	3	43.066	12	-149.36	3	0	3	-.449	3	.055	12
297		16	max	1921.422	1	1747.254	1	126.636	1	.002	1	.341	1	1.682	1
298			min	-1401.526	3	43.066	12	-149.36	3	0	3	-.497	3	.041	12
299		17	max	1918.5	1	1747.254	1	126.636	1	.002	1	.382	1	1.121	1
300			min	-1403.717	3	43.066	12	-149.36	3	0	3	-.545	3	.028	12
301		18	max	1915.578	1	1747.254	1	126.636	1	.002	1	.423	1	.561	1
302			min	-1405.909	3	43.066	12	-149.36	3	0	3	-.593	3	.014	12
303		19	max	1912.656	1	1747.254	1	126.636	1	.002	1	.463	1	0	1
304			min	-1408.1	3	43.066	12	-149.36	3	0	3	-.641	3	0	1
305	M5	1	max	6440.513	1	2381.88	3	0	1	0	1	0	1	13.917	1
306			min	-4778.088	3	-2449.629	2	0	1	0	1	0	1	.451	15
307		2	max	6437.591	1	2381.88	3	0	1	0	1	0	1	14.417	1
308			min	-4780.279	3	-2449.629	2	0	1	0	1	0	1	.457	15
309		3	max	6434.669	1	2381.88	3	0	1	0	1	0	1	14.916	1
310			min	-4782.47	3	-2449.629	2	0	1	0	1	0	1	.462	15
311		4	max	6431.747	1	2381.88	3	0	1	0	1	0	1	15.415	1
312			min	-4784.662	3	-2449.629	2	0	1	0	1	0	1	.038	3
313		5	max	5131.189	1	3360.257	1	0	1	0	1	0	1	15.095	1
314			min	-4083.123	3	-70.75	3	0	1	0	1	0	1	-.318	3
315		6	max	5128.267	1	3360.257	1	0	1	0	1	0	1	14.016	1
316			min	-4085.315	3	-70.75	3	0	1	0	1	0	1	-.295	3
317		7	max	5125.346	1	3360.257	1	0	1	0	1	0	1	12.938	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	-4087.506	3	-70.75	3	0	1	0	1	0	1	-.272	3
319		8	max	5122.424	1	3360.257	1	0	1	0	1	0	1	11.86	1
320			min	-4089.697	3	-70.75	3	0	1	0	1	0	1	-.25	3
321		9	max	5119.502	1	3360.257	1	0	1	0	1	0	1	10.782	1
322			min	-4091.889	3	-70.75	3	0	1	0	1	0	1	-.227	3
323		10	max	5116.581	1	3360.257	1	0	1	0	1	0	1	9.704	1
324			min	-4094.08	3	-70.75	3	0	1	0	1	0	1	-.204	3
325		11	max	5113.659	1	3360.257	1	0	1	0	1	0	1	8.625	1
326			min	-4096.271	3	-70.75	3	0	1	0	1	0	1	-.182	3
327		12	max	5110.737	1	3360.257	1	0	1	0	1	0	1	7.547	1
328			min	-4098.463	3	-70.75	3	0	1	0	1	0	1	-.159	3
329		13	max	5107.815	1	3360.257	1	0	1	0	1	0	1	6.469	1
330			min	-4100.654	3	-70.75	3	0	1	0	1	0	1	-.136	3
331		14	max	5104.894	1	3360.257	1	0	1	0	1	0	1	5.391	1
332			min	-4102.845	3	-70.75	3	0	1	0	1	0	1	-.114	3
333		15	max	5101.972	1	3360.257	1	0	1	0	1	0	1	4.313	1
334			min	-4105.036	3	-70.75	3	0	1	0	1	0	1	-.091	3
335		16	max	5099.05	1	3360.257	1	0	1	0	1	0	1	3.235	1
336			min	-4107.228	3	-70.75	3	0	1	0	1	0	1	-.068	3
337		17	max	5096.128	1	3360.257	1	0	1	0	1	0	1	2.156	1
338			min	-4109.419	3	-70.75	3	0	1	0	1	0	1	-.045	3
339		18	max	5093.207	1	3360.257	1	0	1	0	1	0	1	1.078	1
340			min	-4111.61	3	-70.75	3	0	1	0	1	0	1	-.023	3
341		19	max	5090.285	1	3360.257	1	0	1	0	1	0	1	0	1
342			min	-4113.802	3	-70.75	3	0	1	0	1	0	1	0	1
343	M8	1	max	2473.049	1	813.867	3	164.304	3	.006	2	.266	1	8.047	1
344			min	-1581.133	3	-518.043	2	-167.344	1	-.002	3	-.218	3	.282	15
345		2	max	2470.128	1	813.867	3	164.304	3	.006	2	.213	1	8.074	1
346			min	-1583.324	3	-518.043	2	-167.344	1	-.002	3	-.166	3	.279	15
347		3	max	2467.206	1	813.867	3	164.304	3	.006	2	.159	1	8.101	1
348			min	-1585.516	3	-518.043	2	-167.344	1	-.002	3	-.113	3	.277	15
349		4	max	2464.284	1	813.867	3	164.304	3	.006	2	.105	1	8.127	1
350			min	-1587.707	3	-518.043	2	-167.344	1	-.002	3	-.06	3	.274	15
351		5	max	1953.561	1	1747.254	1	149.36	3	0	3	.105	1	7.849	1
352			min	-1377.422	3	43.066	12	-126.636	1	-.002	1	-.03	3	.193	12
353		6	max	1950.639	1	1747.254	1	149.36	3	0	3	.065	1	7.288	1
354			min	-1379.613	3	43.066	12	-126.636	1	-.002	1	.002	15	.18	12
355		7	max	1947.717	1	1747.254	1	149.36	3	0	3	.066	3	6.728	1
356			min	-1381.804	3	43.066	12	-126.636	1	-.002	1	-.004	10	.166	12
357		8	max	1944.795	1	1747.254	1	149.36	3	0	3	.114	3	6.167	1
358			min	-1383.996	3	43.066	12	-126.636	1	-.002	1	-.036	2	.152	12
359		9	max	1941.874	1	1747.254	1	149.36	3	0	3	.161	3	5.606	1
360			min	-1386.187	3	43.066	12	-126.636	1	-.002	1	-.073	2	.138	12
361		10	max	1938.952	1	1747.254	1	149.36	3	0	3	.209	3	5.046	1
362			min	-1388.378	3	43.066	12	-126.636	1	-.002	1	-.11	2	.124	12
363		11	max	1936.03	1	1747.254	1	149.36	3	0	3	.257	3	4.485	1
364			min	-1390.57	3	43.066	12	-126.636	1	-.002	1	-.147	2	.111	12
365		12	max	1933.109	1	1747.254	1	149.36	3	0	3	.305	3	3.924	1
366			min	-1392.761	3	43.066	12	-126.636	1	-.002	1	-.184	2	.097	12
367		13	max	1930.187	1	1747.254	1	149.36	3	0	3	.353	3	3.364	1
368			min	-1394.952	3	43.066	12	-126.636	1	-.002	1	-.221	2	.083	12
369		14	max	1927.265	1	1747.254	1	149.36	3	0	3	.401	3	2.803	1
370			min	-1397.143	3	43.066	12	-126.636	1	-.002	1	-.26	1	.069	12
371		15	max	1924.343	1	1747.254	1	149.36	3	0	3	.449	3	2.243	1
372			min	-1399.335	3	43.066	12	-126.636	1	-.002	1	-.301	1	.055	12
373		16	max	1921.422	1	1747.254	1	149.36	3	0	3	.497	3	1.682	1
374			min	-1401.526	3	43.066	12	-126.636	1	-.002	1	-.341	1	.041	12

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	1918.5	1	1747.254	1	149.36	3	0	3	.545	3	1.121	1
376			min	-1403.717	3	43.066	12	-126.636	1	-.002	1	-.382	1	.028	12
377		18	max	1915.578	1	1747.254	1	149.36	3	0	3	.593	3	.561	1
378			min	-1405.909	3	43.066	12	-126.636	1	-.002	1	-.423	1	.014	12
379		19	max	1912.656	1	1747.254	1	149.36	3	0	3	.641	3	0	1
380			min	-1408.1	3	43.066	12	-126.636	1	-.002	1	-.463	1	0	1
381	M3	1	max	2039.766	2	5.879	4	40.909	2	.02	3	.007	2	0	1
382			min	-780.758	3	1.382	15	-15.576	3	-.05	2	-.003	3	0	1
383		2	max	2039.619	2	5.226	4	40.909	2	.02	3	.021	2	0	15
384			min	-780.868	3	1.228	15	-15.576	3	-.05	2	-.008	3	-.002	4
385		3	max	2039.473	2	4.572	4	40.909	2	.02	3	.036	2	0	15
386			min	-780.978	3	1.075	15	-15.576	3	-.05	2	-.014	3	-.004	4
387		4	max	2039.326	2	3.919	4	40.909	2	.02	3	.05	2	-.001	15
388			min	-781.088	3	.921	15	-15.576	3	-.05	2	-.019	3	-.005	4
389		5	max	2039.179	2	3.266	4	40.909	2	.02	3	.065	2	-.002	15
390			min	-781.198	3	.768	15	-15.576	3	-.05	2	-.025	3	-.007	4
391		6	max	2039.033	2	2.613	4	40.909	2	.02	3	.08	2	-.002	15
392			min	-781.308	3	.614	15	-15.576	3	-.05	2	-.03	3	-.008	4
393		7	max	2038.886	2	1.96	4	40.909	2	.02	3	.094	2	-.002	15
394			min	-781.418	3	.461	15	-15.576	3	-.05	2	-.036	3	-.008	4
395		8	max	2038.74	2	1.306	4	40.909	2	.02	3	.109	2	-.002	15
396			min	-781.528	3	.307	15	-15.576	3	-.05	2	-.042	3	-.009	4
397		9	max	2038.593	2	.653	4	40.909	2	.02	3	.123	2	-.002	15
398			min	-781.638	3	.154	15	-15.576	3	-.05	2	-.047	3	-.009	4
399		10	max	2038.446	2	0	1	40.909	2	.02	3	.138	2	-.002	15
400			min	-781.748	3	0	1	-15.576	3	-.05	2	-.053	3	-.009	4
401		11	max	2038.3	2	-.154	15	40.909	2	.02	3	.153	2	-.002	15
402			min	-781.858	3	-.653	4	-15.576	3	-.05	2	-.058	3	-.009	4
403		12	max	2038.153	2	-.307	15	40.909	2	.02	3	.167	2	-.002	15
404			min	-781.968	3	-1.306	4	-15.576	3	-.05	2	-.064	3	-.009	4
405		13	max	2038.007	2	-.461	15	40.909	2	.02	3	.182	2	-.002	15
406			min	-782.077	3	-1.96	4	-15.576	3	-.05	2	-.069	3	-.008	4
407		14	max	2037.86	2	-.614	15	40.909	2	.02	3	.196	2	-.002	15
408			min	-782.187	3	-2.613	4	-15.576	3	-.05	2	-.075	3	-.008	4
409		15	max	2037.713	2	-.768	15	40.909	2	.02	3	.211	2	-.002	15
410			min	-782.297	3	-3.266	4	-15.576	3	-.05	2	-.081	3	-.007	4
411		16	max	2037.567	2	-.921	15	40.909	2	.02	3	.226	2	-.001	15
412			min	-782.407	3	-3.919	4	-15.576	3	-.05	2	-.086	3	-.005	4
413		17	max	2037.42	2	-1.075	15	40.909	2	.02	3	.24	2	0	15
414			min	-782.517	3	-4.572	4	-15.576	3	-.05	2	-.092	3	-.004	4
415		18	max	2037.274	2	-1.228	15	40.909	2	.02	3	.255	2	0	15
416			min	-782.627	3	-5.226	4	-15.576	3	-.05	2	-.097	3	-.002	4
417		19	max	2037.127	2	-1.382	15	40.909	2	.02	3	.269	2	0	1
418			min	-782.737	3	-5.879	4	-15.576	3	-.05	2	-.103	3	0	1
419	M6	1	max	5532.337	2	5.879	4	0	1	0	1	0	1	0	1
420			min	-2552.643	3	1.382	15	0	1	0	1	0	1	0	1
421		2	max	5532.191	2	5.226	4	0	1	0	1	0	1	0	15
422			min	-2552.753	3	1.228	15	0	1	0	1	0	1	-.002	4
423		3	max	5532.044	2	4.572	4	0	1	0	1	0	1	0	15
424			min	-2552.863	3	1.075	15	0	1	0	1	0	1	-.004	4
425		4	max	5531.897	2	3.919	4	0	1	0	1	0	1	-.001	15
426			min	-2552.973	3	.921	15	0	1	0	1	0	1	-.005	4
427		5	max	5531.751	2	3.266	4	0	1	0	1	0	1	-.002	15
428			min	-2553.083	3	.768	15	0	1	0	1	0	1	-.007	4
429		6	max	5531.604	2	2.613	4	0	1	0	1	0	1	-.002	15
430			min	-2553.193	3	.614	15	0	1	0	1	0	1	-.008	4
431		7	max	5531.458	2	1.96	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	-2553.303	3	.461	15	0	1	0	1	0	1	-.008	4
433		8	max	5531.311	2	1.306	4	0	1	0	1	0	1	-.002	15
434			min	-2553.413	3	.307	15	0	1	0	1	0	1	-.009	4
435		9	max	5531.164	2	.653	4	0	1	0	1	0	1	-.002	15
436			min	-2553.523	3	.154	15	0	1	0	1	0	1	-.009	4
437		10	max	5531.018	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2553.633	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	5530.871	2	-.154	15	0	1	0	1	0	1	-.002	15
440			min	-2553.743	3	-.653	4	0	1	0	1	0	1	-.009	4
441		12	max	5530.725	2	-.307	15	0	1	0	1	0	1	-.002	15
442			min	-2553.853	3	-1.306	4	0	1	0	1	0	1	-.009	4
443		13	max	5530.578	2	-.461	15	0	1	0	1	0	1	-.002	15
444			min	-2553.963	3	-1.96	4	0	1	0	1	0	1	-.008	4
445		14	max	5530.431	2	-.614	15	0	1	0	1	0	1	-.002	15
446			min	-2554.073	3	-2.613	4	0	1	0	1	0	1	-.008	4
447		15	max	5530.285	2	-.768	15	0	1	0	1	0	1	-.002	15
448			min	-2554.183	3	-3.266	4	0	1	0	1	0	1	-.007	4
449		16	max	5530.138	2	-.921	15	0	1	0	1	0	1	-.001	15
450			min	-2554.293	3	-3.919	4	0	1	0	1	0	1	-.005	4
451		17	max	5529.991	2	-1.075	15	0	1	0	1	0	1	0	15
452			min	-2554.403	3	-4.572	4	0	1	0	1	0	1	-.004	4
453		18	max	5529.845	2	-1.228	15	0	1	0	1	0	1	0	15
454			min	-2554.513	3	-5.226	4	0	1	0	1	0	1	-.002	4
455		19	max	5529.698	2	-1.382	15	0	1	0	1	0	1	0	1
456			min	-2554.623	3	-5.879	4	0	1	0	1	0	1	0	1
457	M9	1	max	2039.766	2	5.879	4	15.576	3	.05	2	.003	3	0	1
458			min	-780.758	3	1.382	15	-40.909	2	-.02	3	-.007	2	0	1
459		2	max	2039.619	2	5.226	4	15.576	3	.05	2	.008	3	0	15
460			min	-780.868	3	1.228	15	-40.909	2	-.02	3	-.021	2	-.002	4
461		3	max	2039.473	2	4.572	4	15.576	3	.05	2	.014	3	0	15
462			min	-780.978	3	1.075	15	-40.909	2	-.02	3	-.036	2	-.004	4
463		4	max	2039.326	2	3.919	4	15.576	3	.05	2	.019	3	-.001	15
464			min	-781.088	3	.921	15	-40.909	2	-.02	3	-.05	2	-.005	4
465		5	max	2039.179	2	3.266	4	15.576	3	.05	2	.025	3	-.002	15
466			min	-781.198	3	.768	15	-40.909	2	-.02	3	-.065	2	-.007	4
467		6	max	2039.033	2	2.613	4	15.576	3	.05	2	.03	3	-.002	15
468			min	-781.308	3	.614	15	-40.909	2	-.02	3	-.08	2	-.008	4
469		7	max	2038.886	2	1.96	4	15.576	3	.05	2	.036	3	-.002	15
470			min	-781.418	3	.461	15	-40.909	2	-.02	3	-.094	2	-.008	4
471		8	max	2038.74	2	1.306	4	15.576	3	.05	2	.042	3	-.002	15
472			min	-781.528	3	.307	15	-40.909	2	-.02	3	-.109	2	-.009	4
473		9	max	2038.593	2	.653	4	15.576	3	.05	2	.047	3	-.002	15
474			min	-781.638	3	.154	15	-40.909	2	-.02	3	-.123	2	-.009	4
475		10	max	2038.446	2	0	1	15.576	3	.05	2	.053	3	-.002	15
476			min	-781.748	3	0	1	-40.909	2	-.02	3	-.138	2	-.009	4
477		11	max	2038.3	2	-.154	15	15.576	3	.05	2	.058	3	-.002	15
478			min	-781.858	3	-.653	4	-40.909	2	-.02	3	-.153	2	-.009	4
479		12	max	2038.153	2	-.307	15	15.576	3	.05	2	.064	3	-.002	15
480			min	-781.968	3	-1.306	4	-40.909	2	-.02	3	-.167	2	-.009	4
481		13	max	2038.007	2	-.461	15	15.576	3	.05	2	.069	3	-.002	15
482			min	-782.077	3	-1.96	4	-40.909	2	-.02	3	-.182	2	-.008	4
483		14	max	2037.86	2	-.614	15	15.576	3	.05	2	.075	3	-.002	15
484			min	-782.187	3	-2.613	4	-40.909	2	-.02	3	-.196	2	-.008	4
485		15	max	2037.713	2	-.768	15	15.576	3	.05	2	.081	3	-.002	15
486			min	-782.297	3	-3.266	4	-40.909	2	-.02	3	-.211	2	-.007	4
487		16	max	2037.567	2	-.921	15	15.576	3	.05	2	.086	3	-.001	15
488			min	-782.407	3	-3.919	4	-40.909	2	-.02	3	-.226	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	2037.42	2	-1.075	15	15.576	3	.05	2	.092	3	0	15
490			min	-782.517	3	-4.572	4	-40.909	2	-.02	3	-.24	2	-.004	4
491		18	max	2037.274	2	-1.228	15	15.576	3	.05	2	.097	3	0	15
492			min	-782.627	3	-5.226	4	-40.909	2	-.02	3	-.255	2	-.002	4
493		19	max	2037.127	2	-1.382	15	15.576	3	.05	2	.103	3	0	1
494			min	-782.737	3	-5.879	4	-40.909	2	-.02	3	-.269	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	-.018	15	.077	3	.014	1	9.563e-3	3	NC	3	NC	1
2			min	-.536	1	-1.12	1	0	3	-2.822e-2	2	95.148	1	NC	1
3		2	max	-.018	15	.047	3	0	3	9.24e-3	3	7597.067	12	NC	3
4			min	-.536	1	-.969	1	-.01	1	-2.68e-2	2	105.852	1	6251.719	1
5		3	max	-.018	15	.018	3	0	3	8.605e-3	3	3892.425	12	NC	3
6			min	-.536	1	-.822	1	-.022	1	-2.401e-2	2	118.926	1	4235.293	1
7		4	max	-.018	15	-.006	12	.001	3	7.971e-3	3	3897.039	15	NC	3
8			min	-.536	1	-.685	1	-.025	1	-2.123e-2	2	134.383	1	4069.417	1
9		5	max	-.018	15	-.016	12	.002	3	7.632e-3	3	4327.279	15	NC	3
10			min	-.536	1	-.565	1	-.022	1	-1.921e-2	2	151.658	1	4591.719	1
11		6	max	-.018	15	-.016	15	.003	3	8.053e-3	3	4784.4	15	NC	3
12			min	-.535	1	-.465	1	-.015	1	-1.915e-2	2	169.908	1	6562.382	1
13		7	max	-.018	15	-.013	15	.002	3	8.473e-3	3	5284.96	15	NC	1
14			min	-.534	1	-.378	1	-.005	1	-1.909e-2	2	189.645	1	NC	1
15		8	max	-.018	15	-.01	15	0	9	8.894e-3	3	5861.287	15	NC	1
16			min	-.534	1	-.299	1	0	10	-1.904e-2	2	212.139	1	NC	1
17		9	max	-.018	15	-.008	15	0	10	9.722e-3	3	6574.27	15	NC	1
18			min	-.533	1	-.221	1	0	3	-1.79e-2	2	240.111	1	NC	1
19		10	max	-.018	15	-.005	15	.001	1	1.093e-2	3	7507.317	15	NC	1
20			min	-.532	1	-.142	1	-.001	3	-1.575e-2	2	277.332	1	NC	1
21		11	max	-.018	15	-.002	15	.001	1	1.214e-2	3	8778.807	15	NC	1
22			min	-.531	1	-.061	1	0	3	-1.379e-2	1	329.117	1	NC	1
23		12	max	-.018	15	.021	1	.004	3	1.13e-2	3	NC	15	NC	1
24			min	-.531	1	-.031	3	-.006	1	-1.134e-2	1	406.223	1	NC	1
25		13	max	-.018	15	.101	1	.011	3	8.265e-3	3	NC	15	NC	1
26			min	-.53	1	-.028	3	-.008	1	-8.141e-3	1	528.061	1	NC	1
27		14	max	-.018	15	.175	1	.016	3	5.234e-3	3	NC	5	NC	1
28			min	-.529	1	-.016	3	-.007	2	-4.946e-3	1	729.503	1	7949.358	3
29		15	max	-.018	15	.238	1	.016	3	2.204e-3	3	NC	5	NC	1
30			min	-.528	1	.008	15	-.002	2	-1.752e-3	1	1077.535	1	8010.961	3
31		16	max	-.018	15	.285	1	.013	1	5.792e-3	3	NC	3	NC	2
32			min	-.528	1	.01	15	0	15	-3.35e-3	1	1669.721	1	6986.882	1
33		17	max	-.018	15	.319	1	.016	1	1.016e-2	3	NC	5	NC	2
34			min	-.528	1	.011	15	0	15	-5.51e-3	1	2633.972	3	5724.666	1
35		18	max	-.018	15	.345	1	.008	1	1.452e-2	3	NC	2	NC	2
36			min	-.528	1	.013	15	0	15	-7.67e-3	1	1072.115	3	7603.24	1
37		19	max	-.018	15	.37	1	0	15	1.675e-2	3	NC	1	NC	1
38			min	-.528	1	.014	15	-.012	1	-8.771e-3	1	662.152	3	NC	1
39	M4	1	max	-.008	12	.288	3	0	1	0	1	NC	3	NC	1
40			min	-1.011	1	-2.206	1	0	1	0	1	51.574	1	NC	1
41		2	max	-.008	12	.206	3	0	1	0	1	2802.086	12	NC	1
42			min	-1.011	1	-1.898	1	0	1	0	1	58.086	1	NC	1
43		3	max	-.008	12	.128	3	0	1	0	1	2185.011	15	NC	1
44			min	-1.011	1	-1.597	1	0	1	0	1	66.254	1	NC	1
45		4	max	-.008	12	.062	3	0	1	0	1	2469.24	15	NC	1
46			min	-1.011	1	-1.321	1	0	1	0	1	76.088	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	-.008	12	.018	3	0	1	0	1	2783.877	15	NC	1
48			min	-1.01	1	-1.086	1	0	1	0	1	87.053	1	NC	1
49		6	max	-.009	12	-.002	3	0	1	0	1	3110.552	15	NC	1
50			min	-1.009	1	-.9	1	0	1	0	1	98.27	1	NC	1
51		7	max	-.009	12	-.006	12	0	1	0	1	3461.509	15	NC	1
52			min	-1.007	1	-.746	1	0	1	0	1	110.035	1	NC	1
53		8	max	-.01	12	-.004	12	0	1	0	1	3866.764	15	NC	1
54			min	-1.005	1	-.607	1	0	1	0	1	123.374	1	NC	1
55		9	max	-.01	12	-.003	12	0	1	0	1	4390.342	15	NC	1
56			min	-1.003	1	-.465	1	0	1	0	1	140.713	1	NC	1
57		10	max	-.011	12	-.006	12	0	1	0	1	5126.535	15	NC	1
58			min	-1.002	1	-.314	1	0	1	0	1	165.645	1	NC	1
59		11	max	-.011	12	-.005	15	0	1	0	1	6220.603	15	NC	1
60			min	-1	1	-.154	1	0	1	0	1	203.735	1	NC	1
61		12	max	-.012	12	.014	1	0	1	0	1	8002.835	15	NC	1
62			min	-.998	1	-.038	3	0	1	0	1	268.457	1	NC	1
63		13	max	-.012	12	.181	1	0	1	0	1	NC	15	NC	1
64			min	-.996	1	-.053	3	0	1	0	1	392.871	1	NC	1
65		14	max	-.012	12	.331	1	0	1	0	1	NC	5	NC	1
66			min	-.994	1	-.045	3	0	1	0	1	425.984	3	NC	1
67		15	max	-.013	12	.447	1	0	1	0	1	NC	5	NC	1
68			min	-.992	1	.004	12	0	1	0	1	500.695	3	NC	1
69		16	max	-.013	12	.513	1	0	1	0	1	NC	2	NC	1
70			min	-.992	1	.016	15	0	1	0	1	815.934	3	NC	1
71		17	max	-.013	12	.54	1	0	1	0	1	NC	1	NC	1
72			min	-.992	1	.017	15	0	1	0	1	7925.492	3	NC	1
73		18	max	-.013	12	.545	1	0	1	0	1	NC	1	NC	1
74			min	-.992	1	.018	15	0	1	0	1	856.698	3	NC	1
75		19	max	-.013	12	.645	3	0	1	0	1	NC	1	NC	1
76			min	-.992	1	.018	15	0	1	0	1	396.835	3	NC	1
77	M7	1	max	-.018	15	.077	3	0	3	2.822e-2	2	NC	3	NC	1
78			min	-.536	1	-1.12	1	-.014	1	-9.563e-3	3	95.148	1	NC	1
79		2	max	-.018	15	.047	3	.01	1	2.68e-2	2	7597.067	12	NC	3
80			min	-.536	1	-.969	1	0	3	-9.24e-3	3	105.852	1	6251.719	1
81		3	max	-.018	15	.018	3	.022	1	2.401e-2	2	3892.425	12	NC	3
82			min	-.536	1	-.822	1	0	3	-8.605e-3	3	118.926	1	4235.293	1
83		4	max	-.018	15	-.006	12	.025	1	2.123e-2	2	3897.039	15	NC	3
84			min	-.536	1	-.685	1	-.001	3	-7.971e-3	3	134.383	1	4069.417	1
85		5	max	-.018	15	-.016	12	.022	1	1.921e-2	2	4327.279	15	NC	3
86			min	-.536	1	-.565	1	-.002	3	-7.632e-3	3	151.658	1	4591.719	1
87		6	max	-.018	15	-.016	15	.015	1	1.915e-2	2	4784.4	15	NC	3
88			min	-.535	1	-.465	1	-.003	3	-8.053e-3	3	169.908	1	6562.382	1
89		7	max	-.018	15	-.013	15	.005	1	1.909e-2	2	5284.96	15	NC	1
90			min	-.534	1	-.378	1	-.002	3	-8.473e-3	3	189.645	1	NC	1
91		8	max	-.018	15	-.01	15	0	10	1.904e-2	2	5861.287	15	NC	1
92			min	-.534	1	-.299	1	0	9	-8.894e-3	3	212.139	1	NC	1
93		9	max	-.018	15	-.008	15	0	3	1.79e-2	2	6574.27	15	NC	1
94			min	-.533	1	-.221	1	0	10	-9.722e-3	3	240.111	1	NC	1
95		10	max	-.018	15	-.005	15	.001	3	1.575e-2	2	7507.317	15	NC	1
96			min	-.532	1	-.142	1	-.001	1	-1.093e-2	3	277.332	1	NC	1
97		11	max	-.018	15	-.002	15	0	3	1.379e-2	1	8778.807	15	NC	1
98			min	-.531	1	-.061	1	-.001	1	-1.214e-2	3	329.117	1	NC	1
99		12	max	-.018	15	.021	1	.006	1	1.134e-2	1	NC	15	NC	1
100			min	-.531	1	-.031	3	-.004	3	-1.13e-2	3	406.223	1	NC	1
101		13	max	-.018	15	.101	1	.008	1	8.141e-3	1	NC	15	NC	1
102			min	-.53	1	-.028	3	-.011	3	-8.265e-3	3	528.061	1	NC	1
103		14	max	-.018	15	.175	1	.007	2	4.946e-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	-.529	1	-.016	3	-.016	3	-5.234e-3	3	729.503	1	7949.358	3
105		15	max	-.018	15	.238	1	.002	2	1.752e-3	1	NC	5	NC	1
106			min	-.528	1	.008	15	-.016	3	-2.204e-3	3	1077.535	1	8010.961	3
107		16	max	-.018	15	.285	1	0	15	3.35e-3	1	NC	3	NC	2
108			min	-.528	1	.01	15	-.013	1	-5.792e-3	3	1669.721	1	6986.882	1
109		17	max	-.018	15	.319	1	0	15	5.51e-3	1	NC	5	NC	2
110			min	-.528	1	.011	15	-.016	1	-1.016e-2	3	2633.972	3	5724.666	1
111		18	max	-.018	15	.345	1	0	15	7.67e-3	1	NC	2	NC	2
112			min	-.528	1	.013	15	-.008	1	-1.452e-2	3	1072.115	3	7603.24	1
113		19	max	-.018	15	.37	1	.012	1	8.771e-3	1	NC	1	NC	1
114			min	-.528	1	.014	15	0	15	-1.675e-2	3	662.152	3	NC	1
115	M10	1	max	.001	1	.358	1	.528	1	1.037e-2	3	NC	1	NC	1
116			min	0	12	.013	15	.018	15	1.497e-4	15	NC	1	NC	1
117		2	max	.001	1	.457	3	.589	1	1.192e-2	3	NC	4	NC	3
118			min	0	12	.01	15	.02	15	1.385e-4	15	1048.419	3	3536.087	1
119		3	max	0	1	.646	3	.684	1	1.346e-2	3	NC	5	NC	3
120			min	0	12	.008	15	.023	15	1.274e-4	15	547.437	3	1386.698	1
121		4	max	0	1	.785	3	.787	1	1.5e-2	3	NC	5	NC	3
122			min	0	12	.007	15	.026	15	1.163e-4	15	404.715	3	836.15	1
123		5	max	0	1	.857	3	.878	1	1.655e-2	3	NC	5	NC	3
124			min	0	12	.007	15	.027	12	-1.158e-5	10	356.745	3	617.287	1
125		6	max	0	1	.857	3	.947	1	1.809e-2	3	NC	5	NC	3
126			min	0	12	.008	15	.025	12	-1.977e-4	10	356.539	3	516.061	1
127		7	max	0	1	.796	3	.987	1	1.963e-2	3	NC	4	NC	3
128			min	0	12	.011	15	.022	12	-3.839e-4	10	396.581	3	470.464	1
129		8	max	0	1	.697	3	1.002	1	2.118e-2	3	NC	4	NC	3
130			min	0	12	.014	15	.018	12	-6.141e-4	2	484.515	3	456.307	1
131		9	max	0	1	.598	3	.998	1	2.272e-2	3	NC	5	NC	3
132			min	0	12	.017	15	.014	12	-9.581e-4	2	622.382	3	459.668	1
133		10	max	0	1	.551	3	.992	1	2.426e-2	3	NC	5	NC	3
134			min	0	1	.018	15	.013	12	-1.302e-3	2	719.735	3	465.296	1
135		11	max	0	12	.598	3	.998	1	2.272e-2	3	NC	5	NC	3
136			min	0	1	.017	15	.014	12	-9.581e-4	2	622.382	3	459.668	1
137		12	max	0	12	.697	3	1.002	1	2.118e-2	3	NC	4	NC	3
138			min	0	1	.014	15	.018	12	-6.141e-4	2	484.515	3	456.307	1
139		13	max	0	12	.796	3	.987	1	1.963e-2	3	NC	4	NC	3
140			min	0	1	.011	15	.022	12	-3.839e-4	10	396.581	3	470.464	1
141		14	max	0	12	.857	3	.947	1	1.809e-2	3	NC	5	NC	3
142			min	0	1	.008	15	.025	12	-1.977e-4	10	356.539	3	516.061	1
143		15	max	0	12	.857	3	.878	1	1.655e-2	3	NC	5	NC	3
144			min	0	1	.007	15	.027	12	-1.158e-5	10	356.745	3	617.287	1
145		16	max	0	12	.785	3	.787	1	1.5e-2	3	NC	5	NC	3
146			min	0	1	.007	15	.026	15	1.163e-4	15	404.715	3	836.15	1
147		17	max	0	12	.646	3	.684	1	1.346e-2	3	NC	5	NC	3
148			min	0	1	.008	15	.023	15	1.274e-4	15	547.437	3	1386.698	1
149		18	max	0	12	.457	3	.589	1	1.192e-2	3	NC	4	NC	3
150			min	-.001	1	.01	15	.02	15	1.385e-4	15	1048.419	3	3536.087	1
151		19	max	0	12	.358	1	.528	1	1.037e-2	3	NC	1	NC	1
152			min	-.001	1	.013	15	.018	15	1.497e-4	15	NC	1	NC	1
153	M11	1	max	.002	1	0	15	.531	1	1.037e-2	1	NC	1	NC	1
154			min	-.002	3	-.031	3	.018	15	6.281e-5	3	NC	1	NC	1
155		2	max	.002	1	.127	3	.576	1	1.157e-2	1	NC	5	NC	3
156			min	-.001	3	-.172	1	.018	12	-1.861e-4	3	1366.569	3	4752.149	1
157		3	max	.002	1	.268	3	.663	1	1.278e-2	1	NC	5	NC	3
158			min	-.001	3	-.301	1	.017	12	-4.351e-4	3	721.877	3	1635.168	1
159		4	max	.001	1	.361	3	.764	1	1.399e-2	1	NC	5	NC	3
160			min	-.001	3	-.385	1	.017	12	-6.84e-4	3	549.739	3	928.323	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	.391	3	.858	1	1.52e-2	1	NC	5	NC	3
162			min	0	3	-.413	1	.017	12	-9.329e-4	3	511.228	3	660.933	1
163		6	max	0	1	.354	3	.932	1	1.64e-2	1	NC	5	NC	3
164			min	0	3	-.383	1	.016	12	-1.182e-3	3	560.564	3	538.686	1
165		7	max	0	1	.261	3	.98	1	1.761e-2	1	NC	5	NC	3
166			min	0	3	-.307	1	.015	12	-1.431e-3	3	738.199	3	481.583	1
167		8	max	0	1	.138	3	1.001	1	1.882e-2	1	NC	5	NC	3
168			min	0	3	-.205	1	.013	12	-1.68e-3	3	1160.869	1	459.909	1
169		9	max	0	1	.024	3	1.002	1	2.003e-2	1	NC	4	NC	3
170			min	0	3	-.111	1	.012	12	-1.929e-3	3	2340.869	1	458.143	1
171		10	max	0	1	-.002	15	.999	1	2.123e-2	1	NC	3	NC	3
172			min	0	1	-.069	1	.011	12	-2.178e-3	3	4215.329	2	461.638	1
173		11	max	0	3	.024	3	1.002	1	2.003e-2	1	NC	4	NC	3
174			min	0	1	-.111	1	.012	12	-1.929e-3	3	2340.869	1	458.143	1
175		12	max	0	3	.138	3	1.001	1	1.882e-2	1	NC	5	NC	3
176			min	0	1	-.205	1	.013	12	-1.68e-3	3	1160.869	1	459.909	1
177		13	max	0	3	.261	3	.98	1	1.761e-2	1	NC	5	NC	3
178			min	0	1	-.307	1	.015	12	-1.431e-3	3	738.199	3	481.583	1
179		14	max	0	3	.354	3	.932	1	1.64e-2	1	NC	5	NC	3
180			min	0	1	-.383	1	.016	12	-1.182e-3	3	560.564	3	538.686	1
181		15	max	0	3	.391	3	.858	1	1.52e-2	1	NC	5	NC	3
182			min	-.001	1	-.413	1	.017	12	-9.329e-4	3	511.228	3	660.933	1
183		16	max	.001	3	.361	3	.764	1	1.399e-2	1	NC	5	NC	3
184			min	-.001	1	-.385	1	.017	12	-6.84e-4	3	549.739	3	928.323	1
185		17	max	.001	3	.268	3	.663	1	1.278e-2	1	NC	5	NC	3
186			min	-.002	1	-.301	1	.017	12	-4.351e-4	3	721.877	3	1635.168	1
187		18	max	.001	3	.127	3	.576	1	1.157e-2	1	NC	5	NC	3
188			min	-.002	1	-.172	1	.018	12	-1.861e-4	3	1366.569	3	4752.149	1
189		19	max	.002	3	0	15	.531	1	1.037e-2	1	NC	1	NC	1
190			min	-.002	1	-.031	3	.018	15	6.281e-5	3	NC	1	NC	1
191	M12	1	max	0	3	-.009	15	.533	1	9.91e-3	1	NC	1	NC	1
192			min	0	1	-.261	1	.018	15	1.328e-4	12	NC	1	NC	1
193		2	max	0	3	.069	3	.572	1	1.081e-2	1	NC	5	NC	3
194			min	0	1	-.478	1	.019	15	1.259e-4	12	954.131	2	5629.124	1
195		3	max	0	3	.151	3	.655	1	1.171e-2	1	NC	5	NC	3
196			min	0	1	-.666	1	.022	15	1.189e-4	12	510.317	2	1778.042	1
197		4	max	0	3	.202	3	.755	1	1.261e-2	1	NC	5	NC	3
198			min	0	1	-.799	1	.023	12	1.12e-4	12	385.036	2	975.816	1
199		5	max	0	3	.215	3	.85	1	1.351e-2	1	NC	15	NC	3
200			min	0	1	-.862	1	.022	12	1.05e-4	12	346.172	2	681.657	1
201		6	max	0	3	.194	3	.927	1	1.441e-2	1	NC	15	NC	3
202			min	0	1	-.855	1	.02	12	9.81e-5	12	353.684	2	548.497	1
203		7	max	0	3	.144	3	.978	1	1.532e-2	1	NC	5	NC	3
204			min	0	1	-.788	1	.017	12	8.761e-5	3	404.636	2	485.654	1
205		8	max	0	3	.081	3	1.003	1	1.622e-2	1	NC	5	NC	3
206			min	0	1	-.686	1	.014	12	7.352e-5	3	508.491	1	460.322	1
207		9	max	0	3	.023	3	1.007	1	1.712e-2	1	NC	5	NC	3
208			min	0	1	-.586	1	.011	12	5.943e-5	3	663.737	1	456.095	1
209		10	max	0	1	-.003	12	1.004	1	1.802e-2	1	NC	5	NC	3
210			min	0	1	-.54	1	.01	12	4.534e-5	3	774.874	1	458.568	1
211		11	max	0	1	.023	3	1.007	1	1.712e-2	1	NC	5	NC	3
212			min	0	3	-.586	1	.011	12	5.943e-5	3	663.737	1	456.095	1
213		12	max	0	1	.081	3	1.003	1	1.622e-2	1	NC	5	NC	3
214			min	0	3	-.686	1	.014	12	7.352e-5	3	508.491	1	460.322	1
215		13	max	0	1	.144	3	.978	1	1.532e-2	1	NC	5	NC	3
216			min	0	3	-.788	1	.017	12	8.761e-5	3	404.636	2	485.654	1
217		14	max	0	1	.194	3	.927	1	1.441e-2	1	NC	15	NC	3

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	-.855	1	.02	12	9.81e-5	12	353.684	2	548.497	1
219		15	max	0	1	.215	3	.85	1	1.351e-2	1	NC	15	NC	3
220			min	0	3	-.862	1	.022	12	1.05e-4	12	346.172	2	681.657	1
221		16	max	0	1	.202	3	.755	1	1.261e-2	1	NC	5	NC	3
222			min	0	3	-.799	1	.023	12	1.12e-4	12	385.036	2	975.816	1
223		17	max	0	1	.151	3	.655	1	1.171e-2	1	NC	5	NC	3
224			min	0	3	-.666	1	.022	15	1.189e-4	12	510.317	2	1778.042	1
225		18	max	0	1	.069	3	.572	1	1.081e-2	1	NC	5	NC	3
226			min	0	3	-.478	1	.019	15	1.259e-4	12	954.131	2	5629.124	1
227		19	max	0	1	-.009	15	.533	1	9.91e-3	1	NC	1	NC	1
228			min	0	3	-.261	1	.018	15	1.328e-4	12	NC	1	NC	1
229	M13	1	max	0	3	.062	3	.536	1	1.911e-2	1	NC	1	NC	1
230			min	-.001	1	-1.046	1	.018	15	-3.847e-3	3	NC	1	NC	1
231		2	max	0	3	.176	3	.602	1	2.133e-2	1	NC	5	NC	3
232			min	-.001	1	-1.373	1	.02	15	-4.571e-3	3	637.929	2	3261.54	1
233		3	max	0	3	.274	3	.701	1	2.354e-2	1	NC	15	NC	3
234			min	-.001	1	-1.674	1	.021	12	-5.294e-3	3	333.172	2	1313.61	1
235		4	max	0	3	.346	3	.805	1	2.576e-2	1	NC	15	NC	3
236			min	0	1	-1.917	1	.021	12	-6.018e-3	3	241.124	2	802.463	1
237		5	max	0	3	.383	3	.898	1	2.797e-2	1	8496.984	15	NC	3
238			min	0	1	-2.085	1	.02	12	-6.742e-3	3	203.428	2	596.91	1
239		6	max	0	3	.385	3	.967	1	3.019e-2	1	7779.284	15	NC	3
240			min	0	1	-2.172	1	.018	12	-7.466e-3	3	189.286	2	501.399	1
241		7	max	0	3	.359	3	1.007	1	3.24e-2	1	7611.184	15	NC	3
242			min	0	1	-2.186	1	.015	12	-8.189e-3	3	189.03	2	458.483	1
243		8	max	0	3	.314	3	1.021	1	3.462e-2	1	7794.046	15	NC	3
244			min	0	1	-2.147	1	.012	12	-8.913e-3	3	196.33	1	445.495	1
245		9	max	0	3	.269	3	1.017	1	3.683e-2	1	8145.731	15	NC	3
246			min	0	1	-2.088	1	.009	12	-9.637e-3	3	207.405	1	449.169	1
247		10	max	0	1	.248	3	1.011	1	3.905e-2	1	8361.212	15	NC	3
248			min	0	1	-2.056	1	.008	12	-1.036e-2	3	214.013	1	454.764	1
249		11	max	0	1	.269	3	1.017	1	3.683e-2	1	8145.731	15	NC	3
250			min	0	3	-2.088	1	.009	12	-9.637e-3	3	207.405	1	449.169	1
251		12	max	0	1	.314	3	1.021	1	3.462e-2	1	7794.046	15	NC	3
252			min	0	3	-2.147	1	.012	12	-8.913e-3	3	196.33	1	445.495	1
253		13	max	0	1	.359	3	1.007	1	3.24e-2	1	7611.184	15	NC	3
254			min	0	3	-2.186	1	.015	12	-8.189e-3	3	189.03	2	458.483	1
255		14	max	0	1	.385	3	.967	1	3.019e-2	1	7779.284	15	NC	3
256			min	0	3	-2.172	1	.018	12	-7.466e-3	3	189.286	2	501.399	1
257		15	max	0	1	.383	3	.898	1	2.797e-2	1	8496.984	15	NC	3
258			min	0	3	-2.085	1	.02	12	-6.742e-3	3	203.428	2	596.91	1
259		16	max	0	1	.346	3	.805	1	2.576e-2	1	NC	15	NC	3
260			min	0	3	-1.917	1	.021	12	-6.018e-3	3	241.124	2	802.463	1
261		17	max	.001	1	.274	3	.701	1	2.354e-2	1	NC	15	NC	3
262			min	0	3	-1.674	1	.021	12	-5.294e-3	3	333.172	2	1313.61	1
263		18	max	.001	1	.176	3	.602	1	2.133e-2	1	NC	5	NC	3
264			min	0	3	-1.373	1	.02	15	-4.571e-3	3	637.929	2	3261.54	1
265		19	max	.001	1	.062	3	.536	1	1.911e-2	1	NC	1	NC	1
266			min	0	3	-1.046	1	.018	15	-3.847e-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	1.833e-3	2	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-7.07e-4	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	3.666e-3	2	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-1.414e-3	3	7683.924	1	NC	1
273		4	max	0	3	0	15	.001	3	5.499e-3	2	NC	3	NC	1
274			min	0	1	-.02	1	-.001	1	-2.121e-3	3	3408.176	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
275		5	max	0	3	-.001	15	.002	3	6.097e-3	2	NC	3	NC	1
276			min	0	1	-.036	1	-.002	1	-2.321e-3	3	1906.289	1	NC	1
277		6	max	0	3	-.002	15	.002	3	5.553e-3	2	NC	3	NC	1
278			min	0	1	-.057	1	-.003	1	-2.052e-3	3	1217.964	1	NC	1
279		7	max	0	3	-.003	15	.003	3	5.008e-3	2	NC	5	NC	1
280			min	0	1	-.082	1	-.004	1	-1.784e-3	3	850.044	1	NC	1
281		8	max	0	3	-.004	15	.004	3	4.464e-3	2	NC	5	NC	1
282			min	0	1	-.11	1	-.006	1	-1.515e-3	3	630.454	1	NC	1
283		9	max	0	3	-.005	15	.004	3	3.92e-3	2	NC	15	NC	1
284			min	-.001	1	-.142	1	-.007	1	-1.246e-3	3	488.811	1	NC	1
285		10	max	0	3	-.006	15	.004	3	3.375e-3	2	NC	15	NC	1
286			min	-.001	1	-.177	1	-.008	1	-9.776e-4	3	392.013	1	NC	1
287		11	max	0	3	-.007	15	.004	3	2.831e-3	2	9492.826	15	NC	1
288			min	-.001	1	-.215	1	-.009	1	-7.089e-4	3	322.908	1	9772.257	2
289		12	max	0	3	-.009	15	.004	3	2.286e-3	2	7999.35	15	NC	3
290			min	-.001	1	-.255	1	-.009	1	-4.402e-4	3	271.811	1	9252.527	2
291		13	max	.001	3	-.01	15	.003	3	1.742e-3	2	6861.555	15	NC	3
292			min	-.001	1	-.298	1	-.01	1	-1.715e-4	3	232.941	1	9086.335	2
293		14	max	.001	3	-.012	15	.001	3	1.198e-3	2	5974.441	15	NC	3
294			min	-.002	1	-.342	1	-.01	1	1.245e-5	15	202.674	1	9302.22	2
295		15	max	.001	3	-.013	15	0	15	6.532e-4	2	5269.205	15	NC	1
296			min	-.002	1	-.388	1	-.01	1	-2.176e-5	9	178.639	1	NC	1
297		16	max	.001	3	-.015	15	0	15	6.347e-4	3	4699.457	15	NC	1
298			min	-.002	1	-.435	1	-.009	1	-2.468e-4	9	159.239	1	NC	1
299		17	max	.001	3	-.016	15	0	15	9.034e-4	3	4232.732	15	NC	1
300			min	-.002	1	-.483	1	-.008	1	-7.942e-4	1	143.36	1	NC	1
301		18	max	.001	3	-.018	15	0	10	1.172e-3	3	3845.843	15	NC	1
302			min	-.002	1	-.532	1	-.011	3	-1.342e-3	1	130.207	1	6483.428	3
303		19	max	.002	3	-.02	15	.002	10	1.441e-3	3	3521.868	15	NC	1
304			min	-.002	1	-.581	1	-.016	3	-1.891e-3	1	119.2	1	4430.508	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	3	NC	1
310			min	0	1	-.016	1	0	1	0	1	4471.031	1	NC	1
311		4	max	0	3	-.001	15	0	1	0	1	NC	3	NC	1
312			min	-.001	1	-.036	1	0	1	0	1	1943.669	1	NC	1
313		5	max	.001	3	-.002	15	0	1	0	1	NC	3	NC	1
314			min	-.001	1	-.065	1	0	1	0	1	1068.729	1	NC	1
315		6	max	.001	3	-.003	15	0	1	0	1	NC	3	NC	1
316			min	-.002	1	-.103	1	0	1	0	1	673.902	1	NC	1
317		7	max	.002	3	-.005	15	0	1	0	1	NC	3	NC	1
318			min	-.002	1	-.149	1	0	1	0	1	466.118	1	NC	1
319		8	max	.002	3	-.006	15	0	1	0	1	NC	3	NC	1
320			min	-.002	1	-.202	1	0	1	0	1	343.471	1	NC	1
321		9	max	.002	3	-.008	15	0	1	0	1	NC	3	NC	1
322			min	-.003	1	-.262	1	0	1	0	1	265.01	1	NC	1
323		10	max	.002	3	-.01	12	0	1	0	1	NC	3	NC	1
324			min	-.003	1	-.327	1	0	1	0	1	211.73	1	NC	1
325		11	max	.003	3	-.011	12	0	1	0	1	NC	3	NC	1
326			min	-.003	1	-.399	1	0	1	0	1	173.884	1	NC	1
327		12	max	.003	3	-.011	12	0	1	0	1	NC	3	NC	1
328			min	-.004	1	-.475	1	0	1	0	1	146.015	1	NC	1
329		13	max	.003	3	-.012	12	0	1	0	1	NC	3	NC	1
330			min	-.004	1	-.555	1	0	1	0	1	124.886	1	NC	1
331		14	max	.003	3	-.013	12	0	1	0	1	NC	3	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	-.639	1	0	1	0	1	108.48	1	NC	1
333		15	max	.004	3	-.013	12	0	1	0	1	NC	3	NC	1
334			min	-.005	1	-.726	1	0	1	0	1	95.483	1	NC	1
335		16	max	.004	3	-.014	12	0	1	0	1	NC	3	NC	1
336			min	-.005	1	-.815	1	0	1	0	1	85.014	1	NC	1
337		17	max	.004	3	-.014	12	0	1	0	1	NC	3	NC	1
338			min	-.005	1	-.906	1	0	1	0	1	76.462	1	NC	1
339		18	max	.004	3	-.015	12	0	1	0	1	NC	3	NC	1
340			min	-.005	1	-.999	1	0	1	0	1	69.388	1	NC	1
341		19	max	.005	3	-.016	12	0	1	0	1	NC	3	NC	1
342			min	-.006	1	-1.092	1	0	1	0	1	63.478	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	7.07e-4	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-1.833e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	1.414e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-3.666e-3	2	7683.924	1	NC	1
349		4	max	0	3	0	15	.001	1	2.121e-3	3	NC	3	NC	1
350			min	0	1	-.02	1	-.001	3	-5.499e-3	2	3408.176	1	NC	1
351		5	max	0	3	-.001	15	.002	1	2.321e-3	3	NC	3	NC	1
352			min	0	1	-.036	1	-.002	3	-6.097e-3	2	1906.289	1	NC	1
353		6	max	0	3	-.002	15	.003	1	2.052e-3	3	NC	3	NC	1
354			min	0	1	-.057	1	-.002	3	-5.553e-3	2	1217.964	1	NC	1
355		7	max	0	3	-.003	15	.004	1	1.784e-3	3	NC	5	NC	1
356			min	0	1	-.082	1	-.003	3	-5.008e-3	2	850.044	1	NC	1
357		8	max	0	3	-.004	15	.006	1	1.515e-3	3	NC	5	NC	1
358			min	0	1	-.11	1	-.004	3	-4.464e-3	2	630.454	1	NC	1
359		9	max	0	3	-.005	15	.007	1	1.246e-3	3	NC	15	NC	1
360			min	-.001	1	-.142	1	-.004	3	-3.92e-3	2	488.811	1	NC	1
361		10	max	0	3	-.006	15	.008	1	9.776e-4	3	NC	15	NC	1
362			min	-.001	1	-.177	1	-.004	3	-3.375e-3	2	392.013	1	NC	1
363		11	max	0	3	-.007	15	.009	1	7.089e-4	3	9492.826	15	NC	1
364			min	-.001	1	-.215	1	-.004	3	-2.831e-3	2	322.908	1	9772.257	2
365		12	max	0	3	-.009	15	.009	1	4.402e-4	3	7999.35	15	NC	3
366			min	-.001	1	-.255	1	-.004	3	-2.286e-3	2	271.811	1	9252.527	2
367		13	max	.001	3	-.01	15	.01	1	1.715e-4	3	6861.555	15	NC	3
368			min	-.001	1	-.298	1	-.003	3	-1.742e-3	2	232.941	1	9086.335	2
369		14	max	.001	3	-.012	15	.01	1	-1.245e-5	15	5974.441	15	NC	3
370			min	-.002	1	-.342	1	-.001	3	-1.198e-3	2	202.674	1	9302.22	2
371		15	max	.001	3	-.013	15	.01	1	2.176e-5	9	5269.205	15	NC	1
372			min	-.002	1	-.388	1	0	15	-6.532e-4	2	178.639	1	NC	1
373		16	max	.001	3	-.015	15	.009	1	2.468e-4	9	4699.457	15	NC	1
374			min	-.002	1	-.435	1	0	15	-6.347e-4	3	159.239	1	NC	1
375		17	max	.001	3	-.016	15	.008	1	7.942e-4	1	4232.732	15	NC	1
376			min	-.002	1	-.483	1	0	15	-9.034e-4	3	143.36	1	NC	1
377		18	max	.001	3	-.018	15	.011	3	1.342e-3	1	3845.843	15	NC	1
378			min	-.002	1	-.532	1	0	10	-1.172e-3	3	130.207	1	6483.428	3
379		19	max	.002	3	-.02	15	.016	3	1.891e-3	1	3521.868	15	NC	1
380			min	-.002	1	-.581	1	-.002	10	-1.441e-3	3	119.2	1	4430.508	3
381	M3	1	max	.026	1	0	15	.001	3	1.602e-3	2	NC	1	NC	1
382			min	0	15	-.008	1	-.002	1	-5.247e-4	3	NC	1	NC	1
383		2	max	.025	1	-.002	15	.012	3	2.317e-3	2	NC	1	NC	4
384			min	0	15	-.054	1	-.028	2	-8.178e-4	3	NC	1	2821.181	2
385		3	max	.025	1	-.004	15	.022	3	3.032e-3	2	NC	1	NC	5
386			min	0	15	-.099	1	-.053	2	-1.111e-3	3	NC	1	1428.557	2
387		4	max	.024	1	-.006	15	.031	3	3.747e-3	2	NC	1	NC	5
388			min	0	15	-.144	1	-.078	2	-1.404e-3	3	NC	1	970.412	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	.023	1	-.008	15	.04	3	4.463e-3	2	NC	1	NC	5
390			min	0	15	-.19	1	-.101	2	-1.697e-3	3	NC	1	746.401	2
391		6	max	.022	1	-.01	15	.048	3	5.178e-3	2	NC	1	NC	5
392			min	0	15	-.235	1	-.122	2	-1.99e-3	3	9670.313	4	616.645	2
393		7	max	.022	1	-.011	15	.055	3	5.893e-3	2	NC	1	NC	5
394			min	0	15	-.28	1	-.14	2	-2.283e-3	3	8575.823	4	534.734	2
395		8	max	.021	1	-.013	15	.061	3	6.608e-3	2	NC	1	NC	5
396			min	0	15	-.324	1	-.155	2	-2.576e-3	3	7918.965	4	481.036	2
397		9	max	.02	1	-.015	15	.066	3	7.324e-3	2	NC	3	NC	5
398			min	0	15	-.369	1	-.166	2	-2.869e-3	3	7565.404	4	446.069	2
399		10	max	.019	1	-.016	12	.069	3	8.039e-3	2	NC	3	NC	5
400			min	0	15	-.413	1	-.174	2	-3.162e-3	3	7453.555	4	425.023	2
401		11	max	.018	1	-.017	12	.07	3	8.754e-3	2	NC	3	NC	5
402			min	0	15	-.457	1	-.177	2	-3.455e-3	3	7565.404	4	415.674	2
403		12	max	.018	1	-.018	12	.07	3	9.469e-3	2	NC	1	NC	5
404			min	0	15	-.501	1	-.175	2	-3.748e-3	3	7918.965	4	417.64	2
405		13	max	.017	1	-.019	12	.067	3	1.018e-2	2	NC	1	NC	5
406			min	0	15	-.544	1	-.168	2	-4.041e-3	3	8575.823	4	432.396	2
407		14	max	.016	1	-.02	12	.062	3	1.09e-2	2	NC	1	NC	5
408			min	0	15	-.587	1	-.155	2	-4.334e-3	3	9670.313	4	464.157	2
409		15	max	.015	1	-.021	12	.055	3	1.162e-2	2	NC	1	NC	5
410			min	0	15	-.631	1	-.135	2	-4.627e-3	3	NC	1	522.599	2
411		16	max	.015	1	-.022	12	.045	3	1.233e-2	2	NC	1	NC	5
412			min	0	15	-.673	1	-.109	2	-4.92e-3	3	NC	1	631.413	2
413		17	max	.014	1	-.022	12	.033	3	1.305e-2	2	NC	1	NC	5
414			min	0	15	-.716	1	-.075	2	-5.214e-3	3	NC	1	862.807	2
415		18	max	.013	1	-.023	12	.017	3	1.376e-2	2	NC	1	NC	5
416			min	0	15	-.759	1	-.033	2	-5.507e-3	3	NC	1	1579.429	2
417		19	max	.012	1	-.024	12	.024	1	1.448e-2	2	NC	1	NC	1
418			min	0	15	-.802	1	-.002	3	-5.8e-3	3	NC	1	NC	1
419	M6	1	max	.046	1	0	15	0	1	0	1	NC	1	NC	1
420			min	.001	15	-.015	1	0	1	0	1	NC	1	NC	1
421		2	max	.044	1	0	12	0	1	0	1	NC	1	NC	1
422			min	.001	15	-.1	1	0	1	0	1	NC	1	NC	1
423		3	max	.042	1	-.001	3	0	1	0	1	NC	1	NC	1
424			min	.001	15	-.186	1	0	1	0	1	NC	1	NC	1
425		4	max	.04	1	-.001	3	0	1	0	1	NC	1	NC	1
426			min	.001	15	-.271	1	0	1	0	1	NC	1	NC	1
427		5	max	.038	1	-.001	3	0	1	0	1	NC	1	NC	1
428			min	.001	15	-.356	1	0	1	0	1	NC	1	NC	1
429		6	max	.036	1	-.001	3	0	1	0	1	NC	1	NC	1
430			min	.001	15	-.441	1	0	1	0	1	9670.313	4	NC	1
431		7	max	.034	1	-.001	3	0	1	0	1	NC	1	NC	1
432			min	.001	15	-.526	1	0	1	0	1	8575.823	4	NC	1
433		8	max	.032	1	0	3	0	1	0	1	NC	1	NC	1
434			min	.001	15	-.611	1	0	1	0	1	7918.965	4	NC	1
435		9	max	.03	1	0	3	0	1	0	1	NC	3	NC	1
436			min	.001	15	-.695	1	0	1	0	1	7565.404	4	NC	1
437		10	max	.028	1	0	3	0	1	0	1	NC	3	NC	1
438			min	.001	15	-.779	1	0	1	0	1	7453.555	4	NC	1
439		11	max	.025	1	.002	3	0	1	0	1	NC	3	NC	1
440			min	0	15	-.863	1	0	1	0	1	7565.404	4	NC	1
441		12	max	.023	1	.003	3	0	1	0	1	NC	1	NC	1
442			min	0	15	-.947	1	0	1	0	1	7918.965	4	NC	1
443		13	max	.021	1	.004	3	0	1	0	1	NC	1	NC	1
444			min	0	15	-1.031	1	0	1	0	1	8575.823	4	NC	1
445		14	max	.02	3	.005	3	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	0	15	-1.114	1	0	1	0	1	9670.313	4	NC	1
447		15	max	.021	3	.007	3	0	1	0	1	NC	1	NC	1
448			min	0	10	-1.197	1	0	1	0	1	NC	1	NC	1
449		16	max	.022	3	.009	3	0	1	0	1	NC	1	NC	1
450			min	0	10	-1.28	1	0	1	0	1	8220.13	3	NC	1
451		17	max	.023	3	.01	3	0	1	0	1	NC	1	NC	1
452			min	-.002	10	-1.363	1	0	1	0	1	6902.823	3	NC	1
453		18	max	.024	3	.012	3	0	1	0	1	NC	1	NC	1
454			min	-.003	10	-1.445	1	0	1	0	1	5917.266	3	NC	1
455		19	max	.025	3	.014	3	0	1	0	1	NC	1	NC	1
456			min	-.005	10	-1.528	1	0	1	0	1	5165.063	3	NC	1
457	M9	1	max	.026	1	0	15	.002	1	5.247e-4	3	NC	1	NC	1
458			min	0	15	-.008	1	-.001	3	-1.602e-3	2	NC	1	NC	1
459		2	max	.025	1	-.002	15	.028	2	8.178e-4	3	NC	1	NC	4
460			min	0	15	-.054	1	-.012	3	-2.317e-3	2	NC	1	2821.181	2
461		3	max	.025	1	-.004	15	.053	2	1.111e-3	3	NC	1	NC	5
462			min	0	15	-.099	1	-.022	3	-3.032e-3	2	NC	1	1428.557	2
463		4	max	.024	1	-.006	15	.078	2	1.404e-3	3	NC	1	NC	5
464			min	0	15	-.144	1	-.031	3	-3.747e-3	2	NC	1	970.412	2
465		5	max	.023	1	-.008	15	.101	2	1.697e-3	3	NC	1	NC	5
466			min	0	15	-.19	1	-.04	3	-4.463e-3	2	NC	1	746.401	2
467		6	max	.022	1	-.01	15	.122	2	1.99e-3	3	NC	1	NC	5
468			min	0	15	-.235	1	-.048	3	-5.178e-3	2	9670.313	4	616.645	2
469		7	max	.022	1	-.011	15	.14	2	2.283e-3	3	NC	1	NC	5
470			min	0	15	-.28	1	-.055	3	-5.893e-3	2	8575.823	4	534.734	2
471		8	max	.021	1	-.013	15	.155	2	2.576e-3	3	NC	1	NC	5
472			min	0	15	-.324	1	-.061	3	-6.608e-3	2	7918.965	4	481.036	2
473		9	max	.02	1	-.015	15	.166	2	2.869e-3	3	NC	3	NC	5
474			min	0	15	-.369	1	-.066	3	-7.324e-3	2	7565.404	4	446.069	2
475		10	max	.019	1	-.016	12	.174	2	3.162e-3	3	NC	3	NC	5
476			min	0	15	-.413	1	-.069	3	-8.039e-3	2	7453.555	4	425.023	2
477		11	max	.018	1	-.017	12	.177	2	3.455e-3	3	NC	3	NC	5
478			min	0	15	-.457	1	-.07	3	-8.754e-3	2	7565.404	4	415.674	2
479		12	max	.018	1	-.018	12	.175	2	3.748e-3	3	NC	1	NC	5
480			min	0	15	-.501	1	-.07	3	-9.469e-3	2	7918.965	4	417.64	2
481		13	max	.017	1	-.019	12	.168	2	4.041e-3	3	NC	1	NC	5
482			min	0	15	-.544	1	-.067	3	-1.018e-2	2	8575.823	4	432.396	2
483		14	max	.016	1	-.02	12	.155	2	4.334e-3	3	NC	1	NC	5
484			min	0	15	-.587	1	-.062	3	-1.09e-2	2	9670.313	4	464.157	2
485		15	max	.015	1	-.021	12	.135	2	4.627e-3	3	NC	1	NC	5
486			min	0	15	-.631	1	-.055	3	-1.162e-2	2	NC	1	522.599	2
487		16	max	.015	1	-.022	12	.109	2	4.92e-3	3	NC	1	NC	5
488			min	0	15	-.673	1	-.045	3	-1.233e-2	2	NC	1	631.413	2
489		17	max	.014	1	-.022	12	.075	2	5.214e-3	3	NC	1	NC	5
490			min	0	15	-.716	1	-.033	3	-1.305e-2	2	NC	1	862.807	2
491		18	max	.013	1	-.023	12	.033	2	5.507e-3	3	NC	1	NC	5
492			min	0	15	-.759	1	-.017	3	-1.376e-2	2	NC	1	1579.429	2
493		19	max	.012	1	-.024	12	.002	3	5.8e-3	3	NC	1	NC	1
494			min	0	15	-.802	1	-.024	1	-1.448e-2	2	NC	1	NC	1