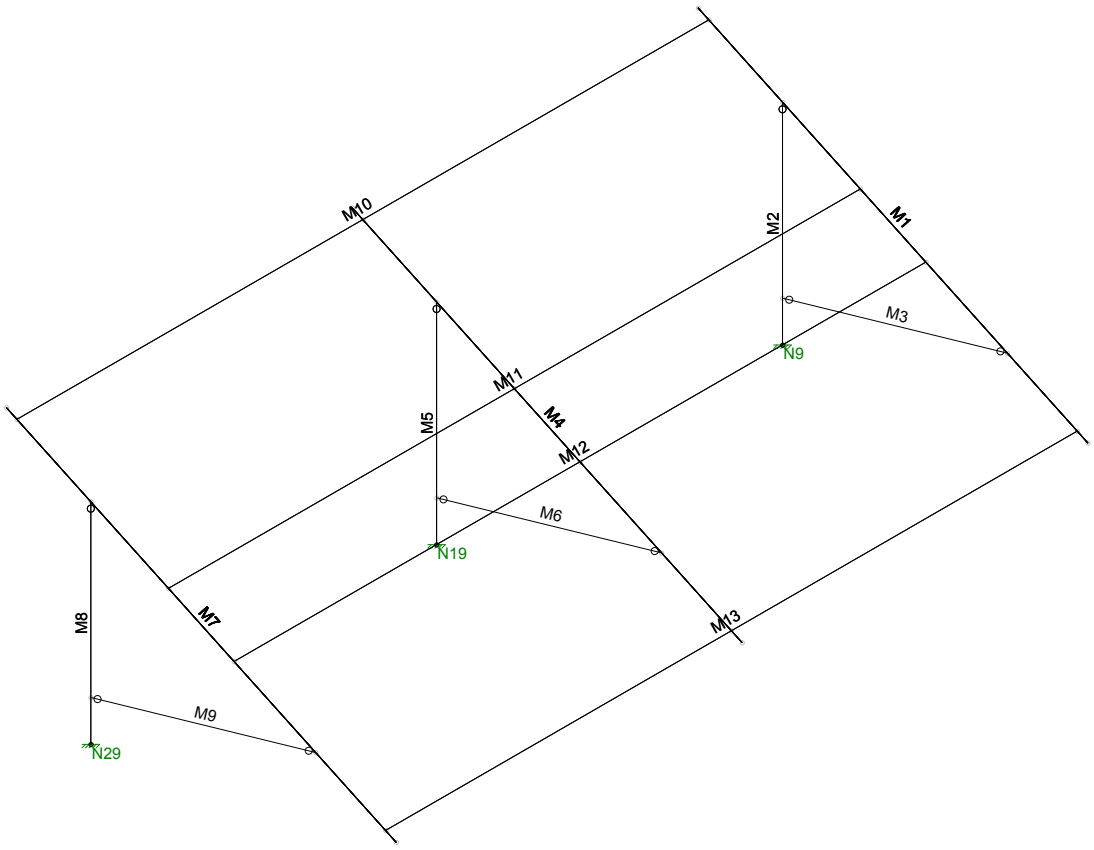


Schletter, Inc.		25° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

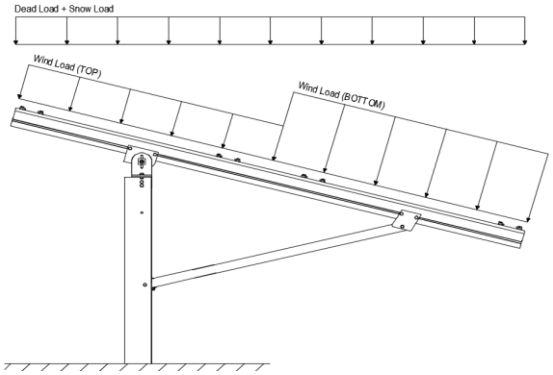
1.2 Construction

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 =	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 7-10 - 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 =	18.56 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	0.82	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V =	160 mph	Exposure Category = C	
Height <	15 ft	Importance Category = II	
Peak Velocity Pressure, q_z =	40.19 psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*	

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 + 0.5W		
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

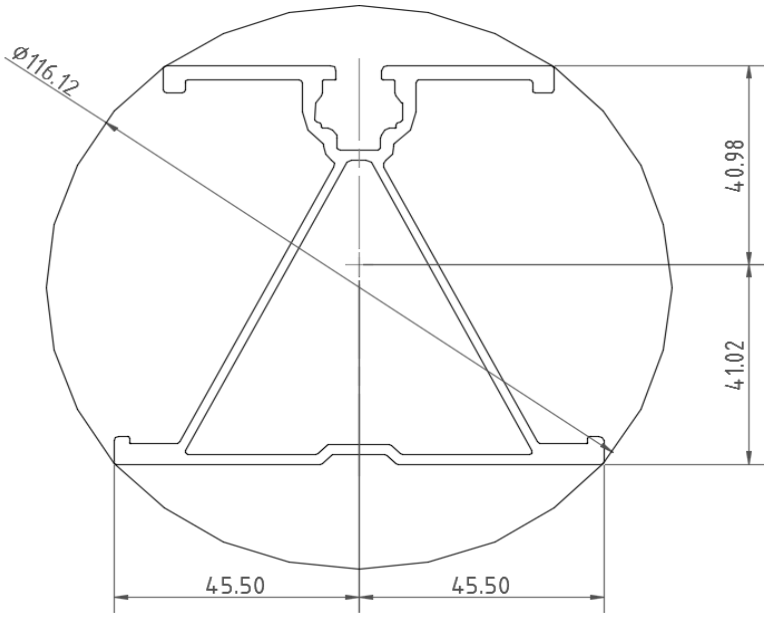
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	72	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 =	0.942	k-ft
M_z =	0.176	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	49%	

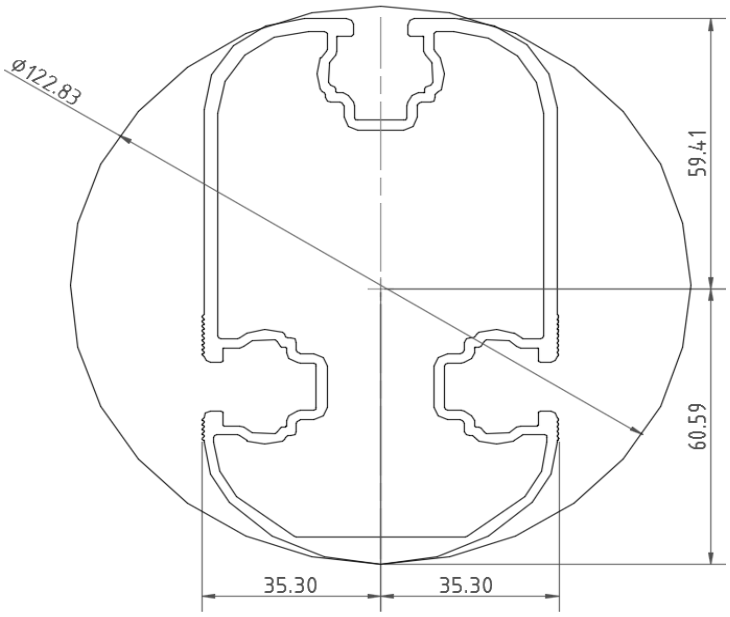


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.097	k-ft
M_z =	0.000	k-ft
P_n =	1.986	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	86%	

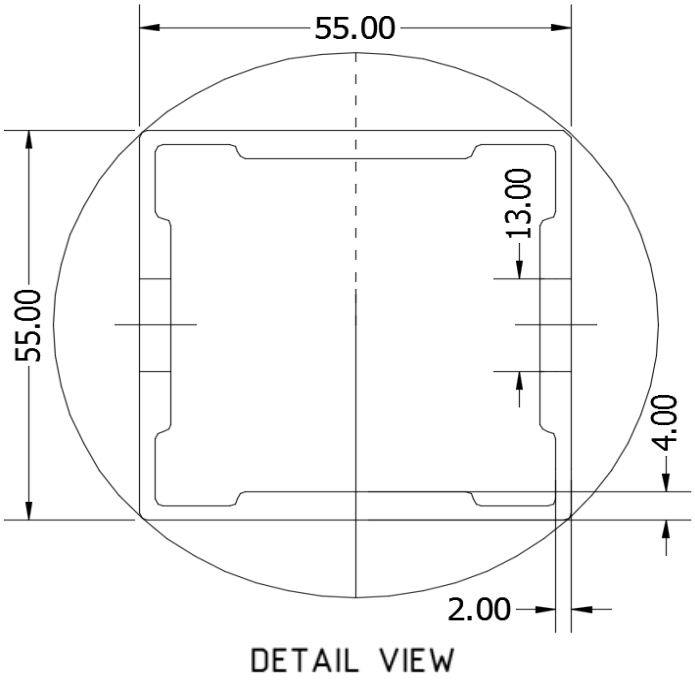


DETAIL VIEW

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).

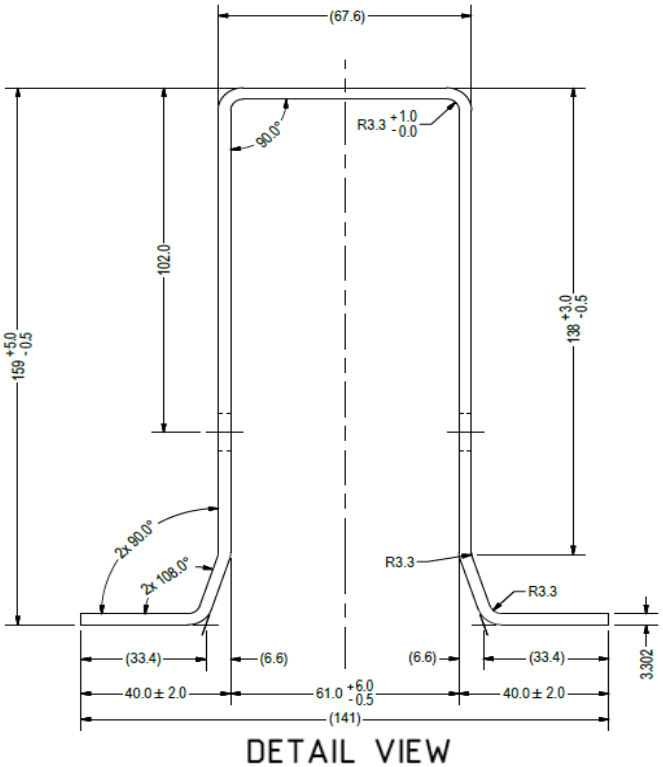
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.205	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	56%	



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 =	11.070	k-ft
M_z =	0.000	k-ft
P_r =	5.680	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	k
Utilization =	77%	



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 =	6.65	k
Maximum Lateral Load =	3.53	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

Lateral Force @ Top of Pole, P =	0.97	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

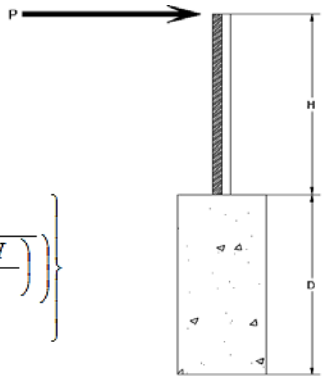
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	0.97	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 =	5.24		
Required Footing Depth, D =	8.93	ft	
2nd Trial @ D_2 =	6.09	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf	
Lateral Soil Bearing @ D, S_3 =	1.22	ksf	
Constant 2.34P/(S_1B), A =	2.80		
Required Footing Depth, D =	5.82	ft	
3rd Trial @ D_3 =	5.96	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf	
Lateral Soil Bearing @ D, S_3 =	1.19	ksf	
Constant 2.34P/(S_1B), A =	2.86		
Required Footing Depth, D =	5.91	ft	
4th Trial @ D_4 =	5.93	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf	
Lateral Soil Bearing @ D, S_3 =	1.19	ksf	
Constant 2.34P/(S_1B), A =	2.87		
Required Footing Depth, D =	5.92	ft	
5th Trial @ D_5 =	5.93	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf	
Lateral Soil Bearing @ D, S_3 =	1.19	ksf	
Constant 2.34P/(S_1B), A =	2.87		
Required Footing Depth, D =	6.00	ft	

A 2ft diameter x 6ft deep footing unrestrained at ground level is required for the racking structure.

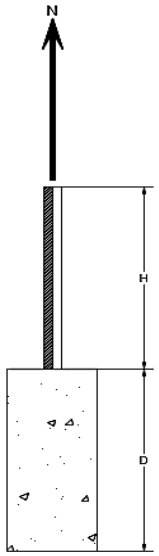
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.05	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 =	1.97	k
Required Concrete Volume, V =	13.57	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.60
2	0.4	0.2	118.10	6.50
3	0.6	0.2	118.10	6.39
4	0.8	0.2	118.10	6.29
5	1	0.2	118.10	6.19
6	1.2	0.2	118.10	6.08
7	1.4	0.2	118.10	5.98
8	1.6	0.2	118.10	5.87
9	1.8	0.2	118.10	5.77
10	2	0.2	118.10	5.67
11	2.2	0.2	118.10	5.56
12	2.4	0.2	118.10	5.46
13	2.6	0.2	118.10	5.36
14	2.8	0.2	118.10	5.25
15	3	0.2	118.10	5.15
16	3.2	0.2	118.10	5.05
17	3.4	0.2	118.10	4.94
18	3.6	0.2	118.10	4.84
19	3.8	0.2	118.10	4.73
20	4	0.2	118.10	4.63
21	4.2	0.2	118.10	4.53
22	4.4	0.2	118.10	4.42
23	4.6	0.2	118.10	4.32
24	0	0.0	0.00	4.32
25	0	0.0	0.00	4.32
26	0	0.0	0.00	4.32
27	0	0.0	0.00	4.32
28	0	0.0	0.00	4.32
29	0	0.0	0.00	4.32
30	0	0.0	0.00	4.32
31	0	0.0	0.00	4.32
32	0	0.0	0.00	4.32
33	0	0.0	0.00	4.32
34	0	0.0	0.00	4.32
Max	4.6	Sum	1.09	

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



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.49	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	18.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

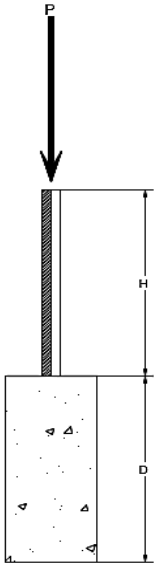
Weight of Concrete

Footing Volume	18.85	ft^3
Weight	2.73	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.83	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.05	k
Applied Force =	6.22	k
Utilization =	62%	

A 2ft diameter footing passes at a depth of 6ft.



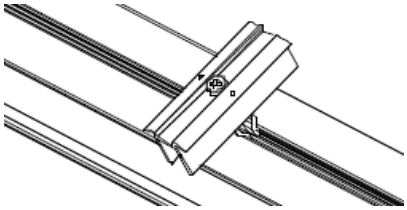
6. DESIGN OF JOINTS AND CONNECTIONS

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.

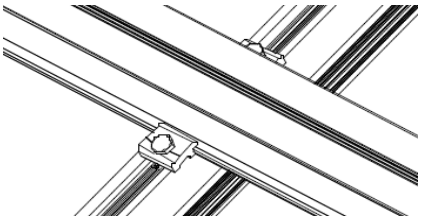
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.982 k
Allowable Uplift	=	1.214 k
Utilization	=	81%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.106 k
Allowable Uplift	=	2.180 k
Utilization	=	97%

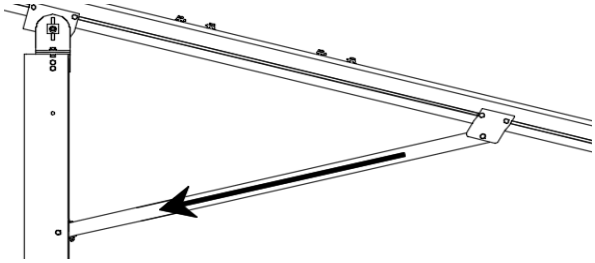


6.2 Strut Connections

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	=	5.205 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	59%

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

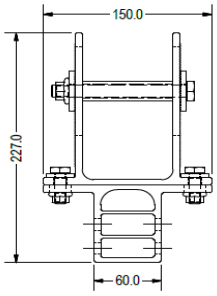


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

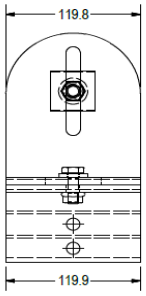
6.3 Girder to Post Connection

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.

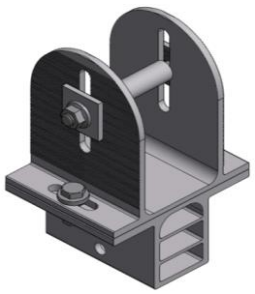
Maximum Tensile Load	=	4.318 k
Allowable Load	=	5.649 k
Utilization	=	76%



FRONT VIEW



SIDE VIEW



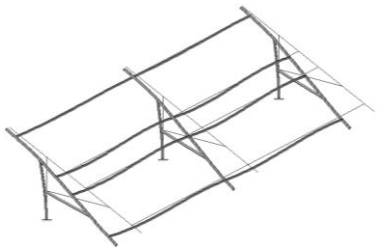
7. SEISMIC DESIGN

7.1 Seismic Drift - N/A

The racking structure has been analyzed under seismic loading. The allowable story drift of the structure must fall within the limits provided by (ASCE 7, Table 12.12-1).

Mean Height, h_{sx}	=	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 =	72 in	L_b =	72
J =	0.432	J =	0.432
	199.186		126.67
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	28.8 ksi	φF_L=	29.7
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)

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 =	81.31	in	
Pr =	5.68	k	(LRFD Factored Load)
Mr (Strong) =	11.07	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 =	0.2044	≥	0.2	
Utilization =	0.77	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.204	≥	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 77%

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	-145.059	-145.059	0	0
2	M11	y	-145.059	-145.059	0	0
3	M12	y	-224.182	-224.182	0	0
4	M13	y	-224.182	-224.182	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	290.117	290.117	0	0
2	M11	y	290.117	290.117	0	0
3	M12	y	131.872	131.872	0	0
4	M13	y	131.872	131.872	0	0

Load Combinations

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

Load Combinations (Continued)

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	520.254	2	2309.585	2	89.771	2	.136	1	.001	3	6.989	1
2		min	-875.258	3	-1778.438	3	-107.509	3	-.148	3	-.004	2	.221	15
3	N19	max	2704.643	2	5675.323	2	0	2	0	1	0	2	8.803	1
4		min	-2529.651	3	-5107.483	3	0	4	0	3	0	3	.275	15
5	N29	max	520.254	2	2309.585	2	107.509	3	.148	3	.004	2	6.989	1
6		min	-875.258	3	-1778.438	3	-89.771	2	-.136	1	-.001	3	.221	15
7	Totals:	max	3745.152	2	10294.493	2	0	1						
8		min	-4280.166	3	-8664.36	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	2	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	-2.584	12	320.386	3	7.482	3	.042	3	.213	1	.27	2
4			min	-178.056	1	-729.804	2	-101.935	1	-.157	2	-.004	3	-.117	3
5		3	max	-2.971	12	319.143	3	7.482	3	.042	3	.146	1	.749	2
6			min	-178.829	1	-731.462	2	-101.935	1	-.157	2	0	3	-.327	3
7		4	max	-3.358	12	317.899	3	7.482	3	.042	3	.079	1	1.23	2
8			min	-179.602	1	-733.12	2	-101.935	1	-.157	2	.003	15	-.536	3
9		5	max	661.823	3	656.055	2	17.593	3	0	15	.101	2	1.456	2
10			min	-1726.299	2	-267.937	3	-122.732	1	-.024	2	-.029	3	-.637	3
11		6	max	661.243	3	654.397	2	17.593	3	0	15	.027	2	1.026	2
12			min	-1727.072	2	-269.18	3	-122.732	1	-.024	2	-.018	3	-.461	3
13		7	max	660.664	3	652.739	2	17.593	3	0	15	-.002	15	.597	2
14			min	-1727.845	2	-270.424	3	-122.732	1	-.024	2	-.063	1	-.284	3
15		8	max	660.084	3	651.081	2	17.593	3	0	15	.005	3	.169	2
16			min	-1728.618	2	-271.667	3	-122.732	1	-.024	2	-.144	1	-.106	3
17		9	max	658.536	3	11.517	3	32.169	3	-.001	15	.089	1	-.002	15
18			min	-1855.456	2	.688	15	-169.389	1	-.108	2	.003	15	-.035	2
19		10	max	657.956	3	10.273	3	32.169	3	-.001	15	.029	3	-.002	15
20			min	-1856.229	2	.187	15	-169.389	1	-.108	2	-.025	2	-.038	2
21		11	max	657.376	3	9.03	3	32.169	3	-.001	15	.05	3	-.002	15
22			min	-1857.003	2	-1.072	13	-169.389	1	-.108	2	-.133	1	-.041	2
23		12	max	649.777	3	698.996	3	-1.381	15	.135	3	.108	1	.106	2
24			min	-1977.648	2	-425.115	2	-97.43	3	-.127	2	.003	15	-.267	3
25		13	max	649.197	3	697.752	3	-1.381	15	.135	3	.087	1	.385	2
26			min	-1978.421	2	-426.773	2	-97.43	3	-.127	2	-.025	3	-.725	3
27		14	max	648.617	3	696.508	3	-1.381	15	.135	3	.067	2	.666	2
28			min	-1979.194	2	-428.431	2	-97.43	3	-.127	2	-.089	3	-1.182	3
29		15	max	648.037	3	695.265	3	-1.381	15	.135	3	.06	2	.948	2
30			min	-1979.967	2	-430.089	2	-97.43	3	-.127	2	-.153	3	-1.639	3
31		16	max	179.53	1	434.293	2	.206	3	.084	2	.015	3	.722	2
32			min	2.323	12	-743.355	3	-92.522	1	-.241	3	-.099	1	-1.251	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	178.757	1	432.635	2	.206	3	.084	2	.016	3	.437	2
34			min	1.936	12	-744.598	3	-92.522	1	-.241	3	-.16	1	-.762	3
35		18	max	177.984	1	430.976	2	.206	3	.084	2	.016	3	.154	2
36			min	1.484	3	-745.842	3	-92.522	1	-.241	3	-.221	1	-.273	3
37		19	max	0	1	0	5	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	3	0	1	0	1	0	1
39	M4	1	max	0	1	.006	2	0	1	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	31.62	10	869.578	3	0	1	0	1	0	1	.511	2
42			min	-162.976	1	-1679.981	2	0	1	0	1	0	1	-.271	3
43		3	max	30.976	10	868.334	3	0	1	0	1	0	1	1.614	2
44			min	-163.749	1	-1681.639	2	0	1	0	1	0	1	-.841	3
45		4	max	30.331	10	867.091	3	0	1	0	1	0	1	2.718	2
46			min	-164.522	1	-1683.297	2	0	1	0	1	0	1	-1.41	3
47		5	max	2039.096	3	1730.79	2	0	1	0	1	0	1	3.196	2
48			min	-3964.781	2	-940.601	3	0	1	0	1	0	1	-1.647	3
49		6	max	2038.516	3	1729.132	2	0	1	0	1	0	1	2.06	2
50			min	-3965.554	2	-941.844	3	0	1	0	1	0	1	-1.03	3
51		7	max	2037.936	3	1727.474	2	0	1	0	1	0	1	.926	2
52			min	-3966.327	2	-943.088	3	0	1	0	1	0	1	-.411	3
53		8	max	2037.356	3	1725.815	2	0	1	0	1	0	1	.208	3
54			min	-3967.1	2	-944.331	3	0	1	0	1	0	1	-.207	2
55		9	max	2006.951	3	-.04	3	0	1	0	1	0	1	.507	3
56			min	-3924.709	2	-132.97	2	0	1	0	1	0	1	-.722	2
57		10	max	2006.371	3	-1.284	3	0	1	0	1	0	1	.507	3
58			min	-3925.483	2	-134.628	2	0	1	0	1	0	1	-.635	2
59		11	max	2005.791	3	-2.306	12	0	1	0	1	0	1	.509	3
60			min	-3926.256	2	-136.286	2	0	1	0	1	0	1	-.546	2
61		12	max	1987.489	3	2020.444	3	0	1	0	1	0	1	.01	9
62			min	-3896.251	2	-1476.594	2	0	1	0	1	0	1	-.123	3
63		13	max	1986.909	3	2019.2	3	0	1	0	1	0	1	.915	2
64			min	-3897.024	2	-1478.252	2	0	1	0	1	0	1	-1.448	3
65		14	max	1986.329	3	2017.956	3	0	1	0	1	0	1	1.885	2
66			min	-3897.797	2	-1479.91	2	0	1	0	1	0	1	-2.773	3
67		15	max	1985.749	3	2016.713	3	0	1	0	1	0	1	2.857	2
68			min	-3898.57	2	-1481.568	2	0	1	0	1	0	1	-4.097	3
69		16	max	164.666	1	1334.456	2	0	1	0	1	0	1	2.175	2
70			min	-30.252	10	-1916.058	3	0	1	0	1	0	1	-3.111	3
71		17	max	163.893	1	1332.798	2	0	1	0	1	0	1	1.3	2
72			min	-30.897	10	-1917.301	3	0	1	0	1	0	1	-1.853	3
73		18	max	163.12	1	1331.14	2	0	1	0	1	0	1	.426	2
74			min	-31.541	10	-1918.545	3	0	1	0	1	0	1	-.595	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	2	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	-2.584	12	320.386	3	101.935	1	.157	2	.004	3	.27	2
80			min	-178.056	1	-729.804	2	-7.482	3	-.042	3	-.213	1	-.117	3
81		3	max	-2.971	12	319.143	3	101.935	1	.157	2	0	3	.749	2
82			min	-178.829	1	-731.462	2	-7.482	3	-.042	3	-.146	1	-.327	3
83		4	max	-3.358	12	317.899	3	101.935	1	.157	2	-.003	15	1.23	2
84			min	-179.602	1	-733.12	2	-7.482	3	-.042	3	-.079	1	-.536	3
85		5	max	661.823	3	656.055	2	122.732	1	.024	2	.029	3	1.456	2
86			min	-1726.299	2	-267.937	3	-17.593	3	0	15	-.101	2	-.637	3
87		6	max	661.243	3	654.397	2	122.732	1	.024	2	.018	3	1.026	2
88			min	-1727.072	2	-269.18	3	-17.593	3	0	15	-.027	2	-.461	3
89		7	max	660.664	3	652.739	2	122.732	1	.024	2	.063	1	.597	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	-1727.845	2	-270.424	3	-17.593	3	0	15	.002	15	-.284	3
91		8	max	660.084	3	651.081	2	122.732	1	.024	2	.144	1	.169	2
92			min	-1728.618	2	-271.667	3	-17.593	3	0	15	-.005	3	-.106	3
93		9	max	658.536	3	11.517	3	169.389	1	.108	2	-.003	15	-.002	15
94			min	-1855.456	2	.688	15	-32.169	3	.001	15	-.089	1	-.035	2
95		10	max	657.956	3	10.273	3	169.389	1	.108	2	.025	2	-.002	15
96			min	-1856.229	2	.187	15	-32.169	3	.001	15	-.029	3	-.038	2
97		11	max	657.376	3	9.03	3	169.389	1	.108	2	.133	1	-.002	15
98			min	-1857.003	2	-1.072	13	-32.169	3	.001	15	-.05	3	-.041	2
99		12	max	649.777	3	698.996	3	97.43	3	.127	2	-.003	15	.106	2
100			min	-1977.648	2	-425.115	2	1.381	15	-.135	3	-.108	1	-.267	3
101		13	max	649.197	3	697.752	3	97.43	3	.127	2	.025	3	.385	2
102			min	-1978.421	2	-426.773	2	1.381	15	-.135	3	-.087	1	-.725	3
103		14	max	648.617	3	696.508	3	97.43	3	.127	2	.089	3	.666	2
104			min	-1979.194	2	-428.431	2	1.381	15	-.135	3	-.067	2	-1.182	3
105		15	max	648.037	3	695.265	3	97.43	3	.127	2	.153	3	.948	2
106			min	-1979.967	2	-430.089	2	1.381	15	-.135	3	-.06	2	-1.639	3
107		16	max	179.53	1	434.293	2	92.522	1	.241	3	.099	1	.722	2
108			min	2.323	12	-743.355	3	-.206	3	-.084	2	-.015	3	-1.251	3
109		17	max	178.757	1	432.635	2	92.522	1	.241	3	.16	1	.437	2
110			min	1.936	12	-744.598	3	-.206	3	-.084	2	-.016	3	-.762	3
111		18	max	177.984	1	430.976	2	92.522	1	.241	3	.221	1	.154	2
112			min	1.484	3	-745.842	3	-.206	3	-.084	2	-.016	3	-.273	3
113		19	max	0	1	0	5	0	3	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	92.555	1	429.665	2	-.904	3	.01	2	.252	1	.084	2
116			min	-.205	3	-747.063	3	-177.472	1	-.024	3	-.016	3	-.241	3
117		2	max	92.555	1	308.063	2	.86	3	.01	2	.143	1	.194	3
118			min	-.205	3	-557.436	3	-148.763	1	-.024	3	-.016	3	-.161	2
119		3	max	92.555	1	186.461	2	2.625	3	.01	2	.076	2	.502	3
120			min	-.205	3	-367.808	3	-120.054	1	-.024	3	-.015	3	-.326	2
121		4	max	92.555	1	64.859	2	4.389	3	.01	2	.022	2	.684	3
122			min	-.205	3	-178.181	3	-91.344	1	-.024	3	-.023	9	-.41	2
123		5	max	92.555	1	11.446	3	6.154	3	.01	2	-.003	15	.74	3
124			min	-.205	3	-56.743	2	-62.881	2	-.024	3	-.068	1	-.413	2
125		6	max	92.555	1	201.074	3	7.918	3	.01	2	-.003	12	.669	3
126			min	-.205	3	-178.345	2	-51.272	2	-.024	3	-.101	1	-.334	2
127		7	max	92.555	1	390.701	3	12.166	9	.01	2	.002	3	.472	3
128			min	-.205	3	-299.947	2	-39.662	2	-.024	3	-.114	1	-.175	2
129		8	max	92.555	1	580.329	3	30.909	9	.01	2	.009	3	.148	3
130			min	-.205	3	-421.549	2	-28.053	2	-.024	3	-.115	2	.001	15
131		9	max	92.555	1	769.956	3	52.203	1	.01	2	.017	3	.387	2
132			min	-.205	3	-543.151	2	-19.345	10	-.024	3	-.129	2	-.302	3
133		10	max	92.555	1	959.583	3	16.148	10	.024	3	.026	3	.79	2
134			min	-.205	3	13.568	15	-80.912	1	0	15	-.137	2	-.879	3
135		11	max	92.555	1	543.151	2	19.345	10	.024	3	.017	3	.387	2
136			min	-.205	3	-769.956	3	-52.203	1	-.01	2	-.129	2	-.302	3
137		12	max	92.555	1	421.549	2	28.053	2	.024	3	.009	3	.148	3
138			min	-.205	3	-580.329	3	-30.909	9	-.01	2	-.115	2	.001	15
139		13	max	92.555	1	299.947	2	39.662	2	.024	3	.002	3	.472	3
140			min	-.205	3	-390.701	3	-12.166	9	-.01	2	-.114	1	-.175	2
141		14	max	92.555	1	178.345	2	51.272	2	.024	3	-.003	12	.669	3
142			min	-.205	3	-201.074	3	-7.918	3	-.01	2	-.101	1	-.334	2
143		15	max	92.555	1	56.743	2	62.881	2	.024	3	-.003	15	.74	3
144			min	-.205	3	-11.446	3	-6.154	3	-.01	2	-.068	1	-.413	2
145		16	max	92.555	1	178.181	3	91.344	1	.024	3	.022	2	.684	3
146			min	-.205	3	-64.859	2	-4.389	3	-.01	2	-.023	9	-.41	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
147		17	max	92.555	1	367.808	3	120.054	1	.024	3	.076	2	.502	3
148			min	-.205	3	-186.461	2	-2.625	3	-.01	2	-.015	3	-.326	2
149		18	max	92.555	1	557.436	3	148.763	1	.024	3	.143	1	.194	3
150			min	-.205	3	-308.063	2	-.86	3	-.01	2	-.016	3	-.161	2
151		19	max	92.555	1	747.063	3	177.472	1	.024	3	.252	1	.084	2
152			min	-.205	3	-429.665	2	.904	3	-.01	2	-.016	3	-.241	3
153	M11	1	max	135.759	1	425.984	2	-4.895	12	.005	3	.31	1	.028	1
154			min	-129.428	3	-692.509	3	-192.164	1	-.012	2	.007	12	-.185	3
155		2	max	135.759	1	304.382	2	-3.718	12	.005	3	.191	1	.213	3
156			min	-129.428	3	-502.882	3	-163.455	1	-.012	2	.004	12	-.225	2
157		3	max	135.759	1	182.78	2	-2.542	12	.005	3	.104	2	.485	3
158			min	-129.428	3	-313.255	3	-134.745	1	-.012	2	.002	12	-.387	2
159		4	max	135.759	1	61.178	2	-1.366	12	.005	3	.043	2	.631	3
160			min	-129.428	3	-123.627	3	-106.036	1	-.012	2	-.008	9	-.468	2
161		5	max	135.759	1	66	3	.012	3	.005	3	.001	10	.65	3
162			min	-129.428	3	-60.424	2	-77.327	1	-.012	2	-.05	1	-.468	2
163		6	max	135.759	1	255.628	3	1.776	3	.005	3	0	3	.543	3
164			min	-129.428	3	-182.026	2	-62.214	2	-.012	2	-.092	1	-.388	2
165		7	max	135.759	1	445.255	3	4.66	9	.005	3	.003	3	.309	3
166			min	-129.428	3	-303.628	2	-50.604	2	-.012	2	-.114	1	-.226	2
167		8	max	135.759	1	634.882	3	23.403	9	.005	3	.005	3	.018	1
168			min	-129.428	3	-425.231	2	-38.995	2	-.012	2	-.123	2	-.051	3
169		9	max	135.759	1	824.51	3	42.146	9	.005	3	.01	3	.341	2
170			min	-129.428	3	-546.833	2	-27.386	2	-.012	2	-.145	2	-.537	3
171		10	max	135.759	1	-13.552	15	66.22	1	.005	3	.015	3	.746	2
172			min	-129.428	3	-1014.137	3	-21.098	10	-.012	2	-.159	2	-1.15	3
173		11	max	135.759	1	546.833	2	27.386	2	.012	2	.01	3	.341	2
174			min	-129.428	3	-824.51	3	-42.146	9	-.005	3	-.145	2	-.537	3
175		12	max	135.759	1	425.231	2	38.995	2	.012	2	.005	3	.018	1
176			min	-129.428	3	-634.882	3	-23.403	9	-.005	3	-.123	2	-.051	3
177		13	max	135.759	1	303.628	2	50.604	2	.012	2	.003	3	.309	3
178			min	-129.428	3	-445.255	3	-4.66	9	-.005	3	-.114	1	-.226	2
179		14	max	135.759	1	182.026	2	62.214	2	.012	2	0	3	.543	3
180			min	-129.428	3	-255.628	3	-1.776	3	-.005	3	-.092	1	-.388	2
181		15	max	135.759	1	60.424	2	77.327	1	.012	2	.001	10	.65	3
182			min	-129.428	3	-66	3	-.012	3	-.005	3	-.05	1	-.468	2
183		16	max	135.759	1	123.627	3	106.036	1	.012	2	.043	2	.631	3
184			min	-129.428	3	-61.178	2	1.366	12	-.005	3	-.008	9	-.468	2
185		17	max	135.759	1	313.255	3	134.745	1	.012	2	.104	2	.485	3
186			min	-129.428	3	-182.78	2	2.542	12	-.005	3	.002	12	-.387	2
187		18	max	135.759	1	502.882	3	163.455	1	.012	2	.191	1	.213	3
188			min	-129.428	3	-304.382	2	3.718	12	-.005	3	.004	12	-.225	2
189		19	max	135.759	1	692.509	3	192.164	1	.012	2	.31	1	.028	1
190			min	-129.428	3	-425.984	2	4.895	12	-.005	3	.007	12	-.185	3
191	M12	1	max	14.643	3	641.182	2	-.964	3	0	15	.329	1	.084	2
192			min	-45.892	1	-285.059	3	-197.167	1	-.006	1	-.014	3	0	15
193		2	max	14.643	3	466.831	2	.8	3	0	15	.207	1	.201	3
194			min	-45.892	1	-200.928	3	-168.458	1	-.006	1	-.014	3	-.285	2
195		3	max	14.643	3	292.481	2	2.565	3	0	15	.118	2	.307	3
196			min	-45.892	1	-116.797	3	-139.748	1	-.006	1	-.013	3	-.538	2
197		4	max	14.643	3	118.13	2	4.329	3	0	15	.054	2	.356	3
198			min	-45.892	1	-32.667	3	-111.039	1	-.006	1	-.011	3	-.675	2
199		5	max	14.643	3	51.464	3	6.094	3	0	15	.005	10	.35	3
200			min	-45.892	1	-56.221	2	-82.33	1	-.006	1	-.044	1	-.696	2
201		6	max	14.643	3	135.595	3	7.858	3	0	15	-.002	12	.288	3
202			min	-45.892	1	-230.571	2	-67.941	2	-.006	1	-.089	1	-.6	2
203		7	max	14.643	3	219.726	3	9.622	3	0	15	.003	3	.169	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
204			min	-45.892	1	-404.922	2	-56.332	2	-.006	1	-.115	1	-.388	2
205		8	max	14.643	3	303.856	3	21.65	9	0	15	.01	3	-.002	15
206			min	-45.892	1	-579.273	2	-44.723	2	-.006	1	-.128	2	-.063	1
207		9	max	14.643	3	387.987	3	40.393	9	0	15	.018	3	.384	2
208			min	-45.892	1	-753.623	2	-33.114	2	-.006	1	-.154	2	-.236	3
209		10	max	14.643	3	-13.09	15	61.217	1	0	3	.028	3	.945	2
210			min	-45.892	1	-927.974	2	-24.182	10	-.006	1	-.172	2	-.523	3
211		11	max	14.643	3	753.623	2	33.114	2	.006	1	.018	3	.384	2
212			min	-45.892	1	-387.987	3	-40.393	9	0	15	-.154	2	-.236	3
213		12	max	14.643	3	579.273	2	44.723	2	.006	1	.01	3	-.002	15
214			min	-45.892	1	-303.856	3	-21.65	9	0	15	-.128	2	-.063	1
215		13	max	14.643	3	404.922	2	56.332	2	.006	1	.003	3	.169	3
216			min	-45.892	1	-219.726	3	-9.622	3	0	15	-.115	1	-.388	2
217		14	max	14.643	3	230.571	2	67.941	2	.006	1	-.002	12	.288	3
218			min	-45.892	1	-135.595	3	-7.858	3	0	15	-.089	1	-.6	2
219		15	max	14.643	3	56.221	2	82.33	1	.006	1	.005	10	.35	3
220			min	-45.892	1	-51.464	3	-6.094	3	0	15	-.044	1	-.696	2
221		16	max	14.643	3	32.667	3	111.039	1	.006	1	.054	2	.356	3
222			min	-45.892	1	-118.13	2	-4.329	3	0	15	-.011	3	-.675	2
223		17	max	14.643	3	116.797	3	139.748	1	.006	1	.118	2	.307	3
224			min	-45.892	1	-292.481	2	-2.565	3	0	15	-.013	3	-.538	2
225		18	max	14.643	3	200.928	3	168.458	1	.006	1	.207	1	.201	3
226			min	-45.892	1	-466.831	2	-.8	3	0	15	-.014	3	-.285	2
227		19	max	14.643	3	285.059	3	197.167	1	.006	1	.329	1	.084	2
228			min	-45.892	1	-641.182	2	.964	3	0	15	-.014	3	0	15
229	M13	1	max	7.481	3	729.405	2	-2.197	12	.01	3	.247	1	.157	2
230			min	-101.834	1	-321.663	3	-176.985	1	-.025	2	-.007	3	-.042	3
231		2	max	7.481	3	555.055	2	-.865	3	.01	3	.139	1	.144	3
232			min	-101.834	1	-237.532	3	-148.276	1	-.025	2	-.008	3	-.271	2
233		3	max	7.481	3	380.704	2	.899	3	.01	3	.072	2	.275	3
234			min	-101.834	1	-153.401	3	-119.566	1	-.025	2	-.008	3	-.583	2
235		4	max	7.481	3	206.353	2	2.664	3	.01	3	.019	2	.349	3
236			min	-101.834	1	-69.271	3	-90.857	1	-.025	2	-.025	9	-.779	2
237		5	max	7.481	3	34.241	1	4.428	3	.01	3	-.003	15	.367	3
238			min	-101.834	1	.909	15	-62.649	2	-.025	2	-.072	1	-.858	2
239		6	max	7.481	3	98.991	3	6.193	3	.01	3	0	12	.329	3
240			min	-101.834	1	-142.348	2	-51.04	2	-.025	2	-.103	1	-.821	2
241		7	max	7.481	3	183.122	3	12.473	9	.01	3	.004	3	.235	3
242			min	-101.834	1	-316.699	2	-39.431	2	-.025	2	-.116	1	-.668	2
243		8	max	7.481	3	267.252	3	31.215	9	.01	3	.01	3	.085	3
244			min	-101.834	1	-491.049	2	-27.822	2	-.025	2	-.118	2	-.399	2
245		9	max	7.481	3	351.383	3	52.69	1	.01	3	.017	3	.002	10
246			min	-101.834	1	-665.4	2	-19.26	10	-.025	2	-.132	2	-.121	3
247		10	max	7.481	3	839.751	2	16.063	10	.01	3	.025	9	.488	2
248			min	-101.834	1	-435.514	3	-81.399	1	-.025	2	-.139	2	-.383	3
249		11	max	7.481	3	665.4	2	19.26	10	.025	2	.017	3	.002	10
250			min	-101.834	1	-351.383	3	-52.69	1	-.01	3	-.132	2	-.121	3
251		12	max	7.481	3	491.049	2	27.822	2	.025	2	.01	3	.085	3
252			min	-101.834	1	-267.252	3	-31.215	9	-.01	3	-.118	2	-.399	2
253		13	max	7.481	3	316.699	2	39.431	2	.025	2	.004	3	.235	3
254			min	-101.834	1	-183.122	3	-12.473	9	-.01	3	-.116	1	-.668	2
255		14	max	7.481	3	142.348	2	51.04	2	.025	2	0	12	.329	3
256			min	-101.834	1	-98.991	3	-6.193	3	-.01	3	-.103	1	-.821	2
257		15	max	7.481	3	-.909	15	62.649	2	.025	2	-.003	15	.367	3
258			min	-101.834	1	-34.241	1	-4.428	3	-.01	3	-.072	1	-.858	2
259		16	max	7.481	3	69.271	3	90.857	1	.025	2	.019	2	.349	3
260			min	-101.834	1	-206.353	2	-2.664	3	-.01	3	-.025	9	-.779	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	7.481	3	153.401	3	119.566	1	.025	2	.072	2	.275	3
262			min	-101.834	1	-380.704	2	-.899	3	-.01	3	-.008	3	-.583	2
263		18	max	7.481	3	237.532	3	148.276	1	.025	2	.139	1	.144	3
264			min	-101.834	1	-555.055	2	.865	3	-.01	3	-.008	3	-.271	2
265		19	max	7.481	3	321.663	3	176.985	1	.025	2	.247	1	.157	2
266			min	-101.834	1	-729.405	2	2.197	12	-.01	3	-.007	3	-.042	3
267	M2	1	max	2309.585	2	874.853	3	89.93	2	.001	3	.148	3	6.989	1
268			min	-1778.438	3	-516.341	2	-107.378	3	-.004	2	-.136	1	.221	15
269		2	max	2306.663	2	874.853	3	89.93	2	.001	3	.113	3	7.024	1
270			min	-1780.63	3	-516.341	2	-107.378	3	-.004	2	-.11	1	.218	15
271		3	max	2303.742	2	874.853	3	89.93	2	.001	3	.079	3	7.059	1
272			min	-1782.821	3	-516.341	2	-107.378	3	-.004	2	-.084	1	.216	15
273		4	max	2300.82	2	874.853	3	89.93	2	.001	3	.044	3	7.093	1
274			min	-1785.012	3	-516.341	2	-107.378	3	-.004	2	-.058	1	.17	12
275		5	max	1724.31	2	1538.108	2	63.967	2	.001	2	.025	3	6.909	2
276			min	-1545.654	3	19.014	12	-97.724	3	0	3	-.061	1	.085	12
277		6	max	1721.388	2	1538.108	2	63.967	2	.001	2	-.001	15	6.416	2
278			min	-1547.845	3	19.014	12	-97.724	3	0	3	-.042	1	.079	12
279		7	max	1718.466	2	1538.108	2	63.967	2	.001	2	0	15	5.922	2
280			min	-1550.037	3	19.014	12	-97.724	3	0	3	-.038	3	.073	12
281		8	max	1715.545	2	1538.108	2	63.967	2	.001	2	.007	2	5.429	2
282			min	-1552.228	3	19.014	12	-97.724	3	0	3	-.07	3	.067	12
283		9	max	1712.623	2	1538.108	2	63.967	2	.001	2	.028	2	4.935	2
284			min	-1554.419	3	19.014	12	-97.724	3	0	3	-.101	3	.061	12
285		10	max	1709.701	2	1538.108	2	63.967	2	.001	2	.048	2	4.442	2
286			min	-1556.61	3	19.014	12	-97.724	3	0	3	-.132	3	.055	12
287		11	max	1706.779	2	1538.108	2	63.967	2	.001	2	.069	2	3.948	2
288			min	-1558.802	3	19.014	12	-97.724	3	0	3	-.164	3	.049	12
289		12	max	1703.858	2	1538.108	2	63.967	2	.001	2	.089	2	3.455	2
290			min	-1560.993	3	19.014	12	-97.724	3	0	3	-.195	3	.043	12
291		13	max	1700.936	2	1538.108	2	63.967	2	.001	2	.11	2	2.961	2
292			min	-1563.184	3	19.014	12	-97.724	3	0	3	-.226	3	.037	12
293		14	max	1698.014	2	1538.108	2	63.967	2	.001	2	.131	2	2.468	2
294			min	-1565.376	3	19.014	12	-97.724	3	0	3	-.258	3	.031	12
295		15	max	1695.092	2	1538.108	2	63.967	2	.001	2	.151	2	1.974	2
296			min	-1567.567	3	19.014	12	-97.724	3	0	3	-.289	3	.024	12
297		16	max	1692.171	2	1538.108	2	63.967	2	.001	2	.172	2	1.481	2
298			min	-1569.758	3	19.014	12	-97.724	3	0	3	-.32	3	.018	12
299		17	max	1689.249	2	1538.108	2	63.967	2	.001	2	.192	2	.987	2
300			min	-1571.95	3	19.014	12	-97.724	3	0	3	-.352	3	.012	12
301		18	max	1686.327	2	1538.108	2	63.967	2	.001	2	.213	2	.494	2
302			min	-1574.141	3	19.014	12	-97.724	3	0	3	-.383	3	.006	12
303		19	max	1683.405	2	1538.108	2	63.967	2	.001	2	.233	2	0	1
304			min	-1576.332	3	19.014	12	-97.724	3	0	3	-.414	3	0	1
305	M5	1	max	5675.323	2	2527.352	3	0	1	0	1	0	1	8.803	1
306			min	-5107.483	3	-2692.276	2	0	1	0	1	0	1	.275	15
307		2	max	5672.401	2	2527.352	3	0	1	0	1	0	1	9.328	1
308			min	-5109.674	3	-2692.276	2	0	1	0	1	0	1	.279	15
309		3	max	5669.479	2	2527.352	3	0	1	0	1	0	1	9.853	1
310			min	-5111.865	3	-2692.276	2	0	1	0	1	0	1	.284	15
311		4	max	5666.558	2	2527.352	3	0	1	0	1	0	1	10.622	2
312			min	-5114.057	3	-2692.276	2	0	1	0	1	0	1	-.118	3
313		5	max	4286.837	2	2369.148	2	0	1	0	1	0	1	10.642	2
314			min	-4358.718	3	-109.032	3	0	1	0	1	0	1	-.49	3
315		6	max	4283.915	2	2369.148	2	0	1	0	1	0	1	9.882	2
316			min	-4360.909	3	-109.032	3	0	1	0	1	0	1	-.455	3
317		7	max	4280.994	2	2369.148	2	0	1	0	1	0	1	9.122	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
318			min	-4363.1	3	-109.032	3	0	1	0	1	0	1	-.42	3
319		8	max	4278.072	2	2369.148	2	0	1	0	1	0	1	8.362	2
320			min	-4365.291	3	-109.032	3	0	1	0	1	0	1	-.385	3
321		9	max	4275.15	2	2369.148	2	0	1	0	1	0	1	7.602	2
322			min	-4367.483	3	-109.032	3	0	1	0	1	0	1	-.35	3
323		10	max	4272.229	2	2369.148	2	0	1	0	1	0	1	6.842	2
324			min	-4369.674	3	-109.032	3	0	1	0	1	0	1	-.315	3
325		11	max	4269.307	2	2369.148	2	0	1	0	1	0	1	6.081	2
326			min	-4371.865	3	-109.032	3	0	1	0	1	0	1	-.28	3
327		12	max	4266.385	2	2369.148	2	0	1	0	1	0	1	5.321	2
328			min	-4374.057	3	-109.032	3	0	1	0	1	0	1	-.245	3
329		13	max	4263.463	2	2369.148	2	0	1	0	1	0	1	4.561	2
330			min	-4376.248	3	-109.032	3	0	1	0	1	0	1	-.21	3
331		14	max	4260.542	2	2369.148	2	0	1	0	1	0	1	3.801	2
332			min	-4378.439	3	-109.032	3	0	1	0	1	0	1	-.175	3
333		15	max	4257.62	2	2369.148	2	0	1	0	1	0	1	3.041	2
334			min	-4380.631	3	-109.032	3	0	1	0	1	0	1	-.14	3
335		16	max	4254.698	2	2369.148	2	0	1	0	1	0	1	2.281	2
336			min	-4382.822	3	-109.032	3	0	1	0	1	0	1	-.105	3
337		17	max	4251.776	2	2369.148	2	0	1	0	1	0	1	1.52	2
338			min	-4385.013	3	-109.032	3	0	1	0	1	0	1	-.07	3
339		18	max	4248.855	2	2369.148	2	0	1	0	1	0	1	.76	2
340			min	-4387.204	3	-109.032	3	0	1	0	1	0	1	-.035	3
341		19	max	4245.933	2	2369.148	2	0	1	0	1	0	1	0	1
342			min	-4389.396	3	-109.032	3	0	1	0	1	0	1	0	1
343	M8	1	max	2309.585	2	874.853	3	107.378	3	.004	2	.136	1	6.989	1
344			min	-1778.438	3	-516.341	2	-89.93	2	-.001	3	-.148	3	.221	15
345		2	max	2306.663	2	874.853	3	107.378	3	.004	2	.11	1	7.024	1
346			min	-1780.63	3	-516.341	2	-89.93	2	-.001	3	-.113	3	.218	15
347		3	max	2303.742	2	874.853	3	107.378	3	.004	2	.084	1	7.059	1
348			min	-1782.821	3	-516.341	2	-89.93	2	-.001	3	-.079	3	.216	15
349		4	max	2300.82	2	874.853	3	107.378	3	.004	2	.058	1	7.093	1
350			min	-1785.012	3	-516.341	2	-89.93	2	-.001	3	-.044	3	.17	12
351		5	max	1724.31	2	1538.108	2	97.724	3	0	3	.061	1	6.909	2
352			min	-1545.654	3	19.014	12	-63.967	2	-.001	2	-.025	3	.085	12
353		6	max	1721.388	2	1538.108	2	97.724	3	0	3	.042	1	6.416	2
354			min	-1547.845	3	19.014	12	-63.967	2	-.001	2	.001	15	.079	12
355		7	max	1718.466	2	1538.108	2	97.724	3	0	3	.038	3	5.922	2
356			min	-1550.037	3	19.014	12	-63.967	2	-.001	2	0	15	.073	12
357		8	max	1715.545	2	1538.108	2	97.724	3	0	3	.07	3	5.429	2
358			min	-1552.228	3	19.014	12	-63.967	2	-.001	2	-.007	2	.067	12
359		9	max	1712.623	2	1538.108	2	97.724	3	0	3	.101	3	4.935	2
360			min	-1554.419	3	19.014	12	-63.967	2	-.001	2	-.028	2	.061	12
361		10	max	1709.701	2	1538.108	2	97.724	3	0	3	.132	3	4.442	2
362			min	-1556.61	3	19.014	12	-63.967	2	-.001	2	-.048	2	.055	12
363		11	max	1706.779	2	1538.108	2	97.724	3	0	3	.164	3	3.948	2
364			min	-1558.802	3	19.014	12	-63.967	2	-.001	2	-.069	2	.049	12
365		12	max	1703.858	2	1538.108	2	97.724	3	0	3	.195	3	3.455	2
366			min	-1560.993	3	19.014	12	-63.967	2	-.001	2	-.089	2	.043	12
367		13	max	1700.936	2	1538.108	2	97.724	3	0	3	.226	3	2.961	2
368			min	-1563.184	3	19.014	12	-63.967	2	-.001	2	-.11	2	.037	12
369		14	max	1698.014	2	1538.108	2	97.724	3	0	3	.258	3	2.468	2
370			min	-1565.376	3	19.014	12	-63.967	2	-.001	2	-.131	2	.031	12
371		15	max	1695.092	2	1538.108	2	97.724	3	0	3	.289	3	1.974	2
372			min	-1567.567	3	19.014	12	-63.967	2	-.001	2	-.151	2	.024	12
373		16	max	1692.171	2	1538.108	2	97.724	3	0	3	.32	3	1.481	2
374			min	-1569.758	3	19.014	12	-63.967	2	-.001	2	-.172	2	.018	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	1689.249	2	1538.108	2	97.724	3	0	3	.352	3	.987	2
376			min	-1571.95	3	19.014	12	-63.967	2	-.001	2	-.192	2	.012	12
377		18	max	1686.327	2	1538.108	2	97.724	3	0	3	.383	3	.494	2
378			min	-1574.141	3	19.014	12	-63.967	2	-.001	2	-.213	2	.006	12
379		19	max	1683.405	2	1538.108	2	97.724	3	0	3	.414	3	0	1
380			min	-1576.332	3	19.014	12	-63.967	2	-.001	2	-.233	2	0	1
381	M3	1	max	2122.622	2	5.879	4	25.475	2	.013	3	.004	2	0	1
382			min	-885.259	3	1.382	15	-10.1	3	-.03	2	-.002	3	0	1
383		2	max	2122.475	2	5.226	4	25.475	2	.013	3	.013	2	0	15
384			min	-885.369	3	1.228	15	-10.1	3	-.03	2	-.005	3	-.002	4
385		3	max	2122.329	2	4.572	4	25.475	2	.013	3	.022	2	0	15
386			min	-885.479	3	1.075	15	-10.1	3	-.03	2	-.009	3	-.004	4
387		4	max	2122.182	2	3.919	4	25.475	2	.013	3	.031	2	-.001	15
388			min	-885.589	3	.921	15	-10.1	3	-.03	2	-.013	3	-.005	4
389		5	max	2122.036	2	3.266	4	25.475	2	.013	3	.04	2	-.002	15
390			min	-885.699	3	.768	15	-10.1	3	-.03	2	-.016	3	-.007	4
391		6	max	2121.889	2	2.613	4	25.475	2	.013	3	.049	2	-.002	15
392			min	-885.809	3	.614	15	-10.1	3	-.03	2	-.02	3	-.008	4
393		7	max	2121.742	2	1.96	4	25.475	2	.013	3	.059	2	-.002	15
394			min	-885.919	3	.461	15	-10.1	3	-.03	2	-.023	3	-.008	4
395		8	max	2121.596	2	1.306	4	25.475	2	.013	3	.068	2	-.002	15
396			min	-886.029	3	.307	15	-10.1	3	-.03	2	-.027	3	-.009	4
397		9	max	2121.449	2	.653	4	25.475	2	.013	3	.077	2	-.002	15
398			min	-886.139	3	.154	15	-10.1	3	-.03	2	-.031	3	-.009	4
399		10	max	2121.302	2	0	1	25.475	2	.013	3	.086	2	-.002	15
400			min	-886.249	3	0	1	-10.1	3	-.03	2	-.034	3	-.009	4
401		11	max	2121.156	2	-.154	15	25.475	2	.013	3	.095	2	-.002	15
402			min	-886.359	3	-.653	4	-10.1	3	-.03	2	-.038	3	-.009	4
403		12	max	2121.009	2	-.307	15	25.475	2	.013	3	.104	2	-.002	15
404			min	-886.469	3	-1.306	4	-10.1	3	-.03	2	-.041	3	-.009	4
405		13	max	2120.863	2	-.461	15	25.475	2	.013	3	.113	2	-.002	15
406			min	-886.579	3	-1.96	4	-10.1	3	-.03	2	-.045	3	-.008	4
407		14	max	2120.716	2	-.614	15	25.475	2	.013	3	.122	2	-.002	15
408			min	-886.689	3	-2.613	4	-10.1	3	-.03	2	-.049	3	-.008	4
409		15	max	2120.569	2	-.768	15	25.475	2	.013	3	.131	2	-.002	15
410			min	-886.799	3	-3.266	4	-10.1	3	-.03	2	-.052	3	-.007	4
411		16	max	2120.423	2	-.921	15	25.475	2	.013	3	.14	2	-.001	15
412			min	-886.909	3	-3.919	4	-10.1	3	-.03	2	-.056	3	-.005	4
413		17	max	2120.276	2	-1.075	15	25.475	2	.013	3	.15	2	0	15
414			min	-887.019	3	-4.572	4	-10.1	3	-.03	2	-.059	3	-.004	4
415		18	max	2120.13	2	-1.228	15	25.475	2	.013	3	.159	2	0	15
416			min	-887.129	3	-5.226	4	-10.1	3	-.03	2	-.063	3	-.002	4
417		19	max	2119.983	2	-1.382	15	25.475	2	.013	3	.168	2	0	1
418			min	-887.239	3	-5.879	4	-10.1	3	-.03	2	-.067	3	0	1
419	M6	1	max	5204.538	2	5.879	4	0	1	0	1	0	1	0	1
420			min	-2744.866	3	1.382	15	0	1	0	1	0	1	0	1
421		2	max	5204.392	2	5.226	4	0	1	0	1	0	1	0	15
422			min	-2744.976	3	1.228	15	0	1	0	1	0	1	-.002	4
423		3	max	5204.245	2	4.572	4	0	1	0	1	0	1	0	15
424			min	-2745.086	3	1.075	15	0	1	0	1	0	1	-.004	4
425		4	max	5204.099	2	3.919	4	0	1	0	1	0	1	-.001	15
426			min	-2745.196	3	.921	15	0	1	0	1	0	1	-.005	4
427		5	max	5203.952	2	3.266	4	0	1	0	1	0	1	-.002	15
428			min	-2745.306	3	.768	15	0	1	0	1	0	1	-.007	4
429		6	max	5203.805	2	2.613	4	0	1	0	1	0	1	-.002	15
430			min	-2745.416	3	.614	15	0	1	0	1	0	1	-.008	4
431		7	max	5203.659	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	-2745.526	3	.461	15	0	1	0	1	0	1	-.008	4
433		8	max	5203.512	2	1.306	4	0	1	0	1	0	1	-.002	15
434			min	-2745.636	3	.307	15	0	1	0	1	0	1	-.009	4
435		9	max	5203.365	2	.653	4	0	1	0	1	0	1	-.002	15
436			min	-2745.746	3	.154	15	0	1	0	1	0	1	-.009	4
437		10	max	5203.219	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2745.856	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	5203.072	2	-.154	15	0	1	0	1	0	1	-.002	15
440			min	-2745.966	3	-.653	4	0	1	0	1	0	1	-.009	4
441		12	max	5202.926	2	-.307	15	0	1	0	1	0	1	-.002	15
442			min	-2746.076	3	-1.306	4	0	1	0	1	0	1	-.009	4
443		13	max	5202.779	2	-.461	15	0	1	0	1	0	1	-.002	15
444			min	-2746.186	3	-1.96	4	0	1	0	1	0	1	-.008	4
445		14	max	5202.632	2	-.614	15	0	1	0	1	0	1	-.002	15
446			min	-2746.296	3	-2.613	4	0	1	0	1	0	1	-.008	4
447		15	max	5202.486	2	-.768	15	0	1	0	1	0	1	-.002	15
448			min	-2746.406	3	-3.266	4	0	1	0	1	0	1	-.007	4
449		16	max	5202.339	2	-.921	15	0	1	0	1	0	1	-.001	15
450			min	-2746.516	3	-3.919	4	0	1	0	1	0	1	-.005	4
451		17	max	5202.193	2	-1.075	15	0	1	0	1	0	1	0	15
452			min	-2746.626	3	-4.572	4	0	1	0	1	0	1	-.004	4
453		18	max	5202.046	2	-1.228	15	0	1	0	1	0	1	0	15
454			min	-2746.736	3	-5.226	4	0	1	0	1	0	1	-.002	4
455		19	max	5201.899	2	-1.382	15	0	1	0	1	0	1	0	1
456			min	-2746.846	3	-5.879	4	0	1	0	1	0	1	0	1
457	M9	1	max	2122.622	2	5.879	4	10.1	3	.03	2	.002	3	0	1
458			min	-885.259	3	1.382	15	-25.475	2	-.013	3	-.004	2	0	1
459		2	max	2122.475	2	5.226	4	10.1	3	.03	2	.005	3	0	15
460			min	-885.369	3	1.228	15	-25.475	2	-.013	3	-.013	2	-.002	4
461		3	max	2122.329	2	4.572	4	10.1	3	.03	2	.009	3	0	15
462			min	-885.479	3	1.075	15	-25.475	2	-.013	3	-.022	2	-.004	4
463		4	max	2122.182	2	3.919	4	10.1	3	.03	2	.013	3	-.001	15
464			min	-885.589	3	.921	15	-25.475	2	-.013	3	-.031	2	-.005	4
465		5	max	2122.036	2	3.266	4	10.1	3	.03	2	.016	3	-.002	15
466			min	-885.699	3	.768	15	-25.475	2	-.013	3	-.04	2	-.007	4
467		6	max	2121.889	2	2.613	4	10.1	3	.03	2	.02	3	-.002	15
468			min	-885.809	3	.614	15	-25.475	2	-.013	3	-.049	2	-.008	4
469		7	max	2121.742	2	1.96	4	10.1	3	.03	2	.023	3	-.002	15
470			min	-885.919	3	.461	15	-25.475	2	-.013	3	-.059	2	-.008	4
471		8	max	2121.596	2	1.306	4	10.1	3	.03	2	.027	3	-.002	15
472			min	-886.029	3	.307	15	-25.475	2	-.013	3	-.068	2	-.009	4
473		9	max	2121.449	2	.653	4	10.1	3	.03	2	.031	3	-.002	15
474			min	-886.139	3	.154	15	-25.475	2	-.013	3	-.077	2	-.009	4
475		10	max	2121.302	2	0	1	10.1	3	.03	2	.034	3	-.002	15
476			min	-886.249	3	0	1	-25.475	2	-.013	3	-.086	2	-.009	4
477		11	max	2121.156	2	-.154	15	10.1	3	.03	2	.038	3	-.002	15
478			min	-886.359	3	-.653	4	-25.475	2	-.013	3	-.095	2	-.009	4
479		12	max	2121.009	2	-.307	15	10.1	3	.03	2	.041	3	-.002	15
480			min	-886.469	3	-1.306	4	-25.475	2	-.013	3	-.104	2	-.009	4
481		13	max	2120.863	2	-.461	15	10.1	3	.03	2	.045	3	-.002	15
482			min	-886.579	3	-1.96	4	-25.475	2	-.013	3	-.113	2	-.008	4
483		14	max	2120.716	2	-.614	15	10.1	3	.03	2	.049	3	-.002	15
484			min	-886.689	3	-2.613	4	-25.475	2	-.013	3	-.122	2	-.008	4
485		15	max	2120.569	2	-.768	15	10.1	3	.03	2	.052	3	-.002	15
486			min	-886.799	3	-3.266	4	-25.475	2	-.013	3	-.131	2	-.007	4
487		16	max	2120.423	2	-.921	15	10.1	3	.03	2	.056	3	-.001	15
488			min	-886.909	3	-3.919	4	-25.475	2	-.013	3	-.14	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	2120.276	2	-1.075	15	10.1	3	.03	2	.059	3	0	15
490			min	-887.019	3	-4.572	4	-25.475	2	-.013	3	-.15	2	-.004	4
491		18	max	2120.13	2	-1.228	15	10.1	3	.03	2	.063	3	0	15
492			min	-887.129	3	-5.226	4	-25.475	2	-.013	3	-.159	2	-.002	4
493		19	max	2119.983	2	-1.382	15	10.1	3	.03	2	.067	3	0	1
494			min	-887.239	3	-5.879	4	-25.475	2	-.013	3	-.168	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	-.013	12	.124	3	.008	1	6.581e-3	3	NC	3	NC	1
2			min	-.468	1	-1.05	2	0	3	-1.833e-2	2	104.479	2	NC	1
3		2	max	-.013	12	.084	3	0	3	6.309e-3	3	6012.446	12	NC	1
4			min	-.468	1	-.898	2	-.006	1	-1.731e-2	2	117.72	2	NC	1
5		3	max	-.013	12	.046	3	0	3	5.775e-3	3	4453.596	15	NC	3
6			min	-.467	1	-.749	2	-.014	1	-1.531e-2	2	134.308	2	7043.943	1
7		4	max	-.013	12	.012	3	.001	3	5.242e-3	3	4937.416	15	NC	3
8			min	-.467	1	-.612	2	-.015	1	-1.33e-2	2	152.909	1	6868.813	1
9		5	max	-.013	12	-.009	12	.002	3	4.899e-3	3	5472.601	15	NC	3
10			min	-.467	1	-.494	2	-.013	1	-1.178e-2	2	173.14	1	7954.325	1
11		6	max	-.013	12	-.012	15	.002	3	5.049e-3	3	6042.501	15	NC	1
12			min	-.467	1	-.402	1	-.008	1	-1.147e-2	2	194.601	1	NC	1
13		7	max	-.013	12	-.01	15	.001	3	5.199e-3	3	6667.496	15	NC	1
14			min	-.466	1	-.325	1	-.003	2	-1.117e-2	2	217.83	1	NC	1
15		8	max	-.013	12	-.008	15	0	1	5.349e-3	3	7386.156	15	NC	1
16			min	-.465	1	-.254	1	0	15	-1.086e-2	2	244.218	1	NC	1
17		9	max	-.013	12	-.006	15	0	15	5.752e-3	3	8269.579	15	NC	1
18			min	-.465	1	-.186	1	0	3	-1.e-2	2	276.809	1	NC	1
19		10	max	-.014	12	-.004	15	0	2	6.393e-3	3	9414.851	15	NC	1
20			min	-.464	1	-.117	1	0	3	-8.622e-3	2	319.826	1	NC	1
21		11	max	-.014	12	-.002	15	0	1	7.035e-3	3	NC	15	NC	1
22			min	-.463	1	-.048	1	0	3	-7.242e-3	2	379.123	1	NC	1
23		12	max	-.014	12	.024	2	.002	3	6.533e-3	3	NC	15	NC	1
24			min	-.463	1	-.043	3	-.003	1	-5.745e-3	2	466.36	1	NC	1
25		13	max	-.014	15	.092	2	.007	3	4.816e-3	3	NC	5	NC	1
26			min	-.462	1	-.04	3	-.004	2	-4.124e-3	2	602.216	1	NC	1
27		14	max	-.014	15	.154	2	.01	3	3.1e-3	3	NC	5	NC	1
28			min	-.461	1	-.026	3	-.003	2	-2.503e-3	2	823.052	1	NC	1
29		15	max	-.014	15	.208	1	.009	3	1.383e-3	3	NC	5	NC	1
30			min	-.461	1	.005	12	0	15	-8.823e-4	2	1197.305	1	NC	1
31		16	max	-.014	15	.249	1	.009	1	3.948e-3	3	NC	5	NC	1
32			min	-.46	1	.008	15	0	15	-1.674e-3	2	1826.638	1	NC	1
33		17	max	-.014	15	.279	1	.01	1	7.016e-3	3	NC	4	NC	2
34			min	-.461	1	.009	15	0	15	-2.748e-3	2	3016.777	1	8829.277	1
35		18	max	-.014	15	.304	1	.005	1	1.008e-2	3	NC	4	NC	1
36			min	-.461	1	.01	15	0	15	-3.823e-3	2	1324.82	3	NC	1
37		19	max	-.014	15	.326	1	0	15	1.165e-2	3	NC	1	NC	1
38			min	-.461	1	.011	15	-.007	1	-4.371e-3	2	709.085	3	NC	1
39	M4	1	max	0	3	.299	3	0	1	0	1	NC	3	NC	1
40			min	-.689	2	-1.682	2	0	1	0	1	71.549	2	NC	1
41		2	max	0	3	.217	3	0	1	0	1	3186.634	15	NC	1
42			min	-.689	2	-1.423	2	0	1	0	1	82.31	2	NC	1
43		3	max	0	3	.139	3	0	1	0	1	3575.737	15	NC	1
44			min	-.689	2	-1.172	2	0	1	0	1	96.389	2	NC	1
45		4	max	0	3	.074	3	0	1	0	1	4032.372	15	NC	1
46			min	-.689	2	-.945	2	0	1	0	1	113.945	2	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	0	3	.032	3	0	1	0	1	4532.453	15	NC	1
48			min	-.688	2	-.762	2	0	1	0	1	133.675	2	NC	1
49		6	max	0	3	.015	3	0	1	0	1	5043.798	15	NC	1
50			min	-.687	2	-.628	2	0	1	0	1	151.849	1	NC	1
51		7	max	-.002	3	.014	3	0	1	0	1	5587.731	15	NC	1
52			min	-.685	2	-.526	2	0	1	0	1	170.033	1	NC	1
53		8	max	-.003	3	.019	3	0	1	0	1	6215.703	15	NC	1
54			min	-.684	2	-.439	2	0	1	0	1	190.39	1	NC	1
55		9	max	-.003	3	.021	3	0	1	0	1	7035.414	15	NC	1
56			min	-.682	2	-.347	2	0	1	0	1	217.407	1	NC	1
57		10	max	-.004	3	.015	3	0	1	0	1	8203.949	15	NC	1
58			min	-.68	2	-.244	2	0	1	0	1	257.768	1	NC	1
59		11	max	-.005	3	0	3	0	1	0	1	9965.914	15	NC	1
60			min	-.679	2	-.131	2	0	1	0	1	322.298	1	NC	1
61		12	max	-.006	12	.002	9	0	1	0	1	NC	15	NC	1
62			min	-.677	2	-.022	3	0	1	0	1	439.719	1	NC	1
63		13	max	-.006	12	.116	1	0	1	0	1	NC	5	NC	1
64			min	-.676	2	-.044	3	0	1	0	1	413.687	3	NC	1
65		14	max	-.006	12	.222	2	0	1	0	1	NC	5	NC	1
66			min	-.674	2	-.043	3	0	1	0	1	414.886	3	NC	1
67		15	max	-.007	12	.302	2	0	1	0	1	NC	2	NC	1
68			min	-.673	2	.001	3	0	1	0	1	476.038	3	NC	1
69		16	max	-.007	12	.338	2	0	1	0	1	NC	4	NC	1
70			min	-.672	2	.01	15	0	1	0	1	740.237	3	NC	1
71		17	max	-.007	12	.346	1	0	1	0	1	NC	4	NC	1
72			min	-.672	2	.01	15	0	1	0	1	3386.182	2	NC	1
73		18	max	-.007	12	.446	3	0	1	0	1	NC	4	NC	1
74			min	-.672	2	.011	15	0	1	0	1	965.249	3	NC	1
75		19	max	-.007	12	.638	3	0	1	0	1	NC	1	NC	1
76			min	-.672	2	.011	15	0	1	0	1	418.118	3	NC	1
77	M7	1	max	-.013	12	.124	3	0	3	1.833e-2	2	NC	3	NC	1
78			min	-.468	1	-1.05	2	-.008	1	-6.581e-3	3	104.479	2	NC	1
79		2	max	-.013	12	.084	3	.006	1	1.731e-2	2	6012.446	12	NC	1
80			min	-.468	1	-.898	2	0	3	-6.309e-3	3	117.72	2	NC	1
81		3	max	-.013	12	.046	3	.014	1	1.531e-2	2	4453.596	15	NC	3
82			min	-.467	1	-.749	2	0	3	-5.775e-3	3	134.308	2	7043.943	1
83		4	max	-.013	12	.012	3	.015	1	1.33e-2	2	4937.416	15	NC	3
84			min	-.467	1	-.612	2	-.001	3	-5.242e-3	3	152.909	1	6868.813	1
85		5	max	-.013	12	-.009	12	.013	1	1.178e-2	2	5472.601	15	NC	3
86			min	-.467	1	-.494	2	-.002	3	-4.899e-3	3	173.14	1	7954.325	1
87		6	max	-.013	12	-.012	15	.008	1	1.147e-2	2	6042.501	15	NC	1
88			min	-.467	1	-.402	1	-.002	3	-5.049e-3	3	194.601	1	NC	1
89		7	max	-.013	12	-.01	15	.003	2	1.117e-2	2	6667.496	15	NC	1
90			min	-.466	1	-.325	1	-.001	3	-5.199e-3	3	217.83	1	NC	1
91		8	max	-.013	12	-.008	15	0	15	1.086e-2	2	7386.156	15	NC	1
92			min	-.465	1	-.254	1	0	1	-5.349e-3	3	244.218	1	NC	1
93		9	max	-.013	12	-.006	15	0	3	1.e-2	2	8269.579	15	NC	1
94			min	-.465	1	-.186	1	0	15	-5.752e-3	3	276.809	1	NC	1
95		10	max	-.014	12	-.004	15	0	3	8.622e-3	2	9414.851	15	NC	1
96			min	-.464	1	-.117	1	0	2	-6.393e-3	3	319.826	1	NC	1
97		11	max	-.014	12	-.002	15	0	3	7.242e-3	2	NC	15	NC	1
98			min	-.463	1	-.048	1	0	1	-7.035e-3	3	379.123	1	NC	1
99		12	max	-.014	12	.024	2	.003	1	5.745e-3	2	NC	15	NC	1
100			min	-.463	1	-.043	3	-.002	3	-6.533e-3	3	466.36	1	NC	1
101		13	max	-.014	15	.092	2	.004	2	4.124e-3	2	NC	5	NC	1
102			min	-.462	1	-.04	3	-.007	3	-4.816e-3	3	602.216	1	NC	1
103		14	max	-.014	15	.154	2	.003	2	2.503e-3	2	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
104			min	-.461	1	-.026	3	-.01	3	-3.1e-3	3	823.052	1	NC	1
105		15	max	-.014	15	.208	1	0	15	8.823e-4	2	NC	5	NC	1
106			min	-.461	1	.005	12	-.009	3	-1.383e-3	3	1197.305	1	NC	1
107		16	max	-.014	15	.249	1	0	15	1.674e-3	2	NC	5	NC	1
108			min	-.46	1	.008	15	-.009	1	-3.948e-3	3	1826.638	1	NC	1
109		17	max	-.014	15	.279	1	0	15	2.748e-3	2	NC	4	NC	2
110			min	-.461	1	.009	15	-.01	1	-7.016e-3	3	3016.777	1	8829.277	1
111		18	max	-.014	15	.304	1	0	15	3.823e-3	2	NC	4	NC	1
112			min	-.461	1	.01	15	-.005	1	-1.008e-2	3	1324.82	3	NC	1
113		19	max	-.014	15	.326	1	.007	1	4.371e-3	2	NC	1	NC	1
114			min	-.461	1	.011	15	0	15	-1.165e-2	3	709.085	3	NC	1
115	M10	1	max	0	1	.315	1	.461	1	1.177e-2	3	NC	1	NC	1
116			min	0	3	.011	15	.014	15	1.309e-4	15	NC	1	NC	1
117		2	max	0	1	.373	3	.483	1	1.317e-2	3	NC	4	NC	3
118			min	0	3	.01	15	.015	15	1.185e-4	15	1523.689	3	6569.992	1
119		3	max	0	1	.461	3	.515	1	1.456e-2	3	NC	4	NC	3
120			min	0	3	.009	15	.015	12	1.06e-4	15	788.825	3	2662.839	1
121		4	max	0	1	.532	3	.551	1	1.595e-2	3	NC	4	NC	3
122			min	0	3	.009	15	.015	12	9.36e-5	15	568.608	3	1597.704	1
123		5	max	0	1	.578	3	.586	1	1.735e-2	3	NC	4	NC	3
124			min	0	3	.009	15	.013	12	-2.107e-4	10	479.698	3	1151.269	1
125		6	max	0	1	.6	3	.616	1	1.874e-2	3	NC	4	NC	3
126			min	0	3	.009	15	.012	12	-6.863e-4	2	448.031	3	927.296	1
127		7	max	0	1	.598	3	.639	1	2.013e-2	3	NC	4	NC	3
128			min	0	3	.009	15	.01	12	-1.262e-3	2	450.844	3	806.807	1
129		8	max	0	1	.579	3	.654	1	2.153e-2	3	NC	4	NC	3
130			min	0	3	.01	15	.009	12	-1.839e-3	2	478.2	3	733.761	2
131		9	max	0	1	.556	3	.668	2	2.292e-2	3	NC	1	NC	3
132			min	0	3	.011	15	.008	12	-2.415e-3	2	517.971	3	684.89	2
133		10	max	0	1	.544	3	.672	2	2.431e-2	3	NC	1	NC	3
134			min	0	1	.011	15	.007	12	-2.991e-3	2	541.536	3	669.372	2
135		11	max	0	3	.556	3	.668	2	2.292e-2	3	NC	1	NC	3
136			min	0	1	.011	15	.008	12	-2.415e-3	2	517.971	3	684.89	2
137		12	max	0	3	.579	3	.654	1	2.153e-2	3	NC	4	NC	3
138			min	0	1	.01	15	.009	12	-1.839e-3	2	478.2	3	733.761	2
139		13	max	0	3	.598	3	.639	1	2.013e-2	3	NC	4	NC	3
140			min	0	1	.009	15	.01	12	-1.262e-3	2	450.844	3	806.807	1
141		14	max	0	3	.6	3	.616	1	1.874e-2	3	NC	4	NC	3
142			min	0	1	.009	15	.012	12	-6.863e-4	2	448.031	3	927.296	1
143		15	max	0	3	.578	3	.586	1	1.735e-2	3	NC	4	NC	3
144			min	0	1	.009	15	.013	12	-2.107e-4	10	479.698	3	1151.269	1
145		16	max	0	3	.532	3	.551	1	1.595e-2	3	NC	4	NC	3
146			min	0	1	.009	15	.015	12	9.36e-5	15	568.608	3	1597.704	1
147		17	max	0	3	.461	3	.515	1	1.456e-2	3	NC	4	NC	3
148			min	0	1	.009	15	.015	12	1.06e-4	15	788.825	3	2662.839	1
149		18	max	0	3	.373	3	.483	1	1.317e-2	3	NC	4	NC	3
150			min	0	1	.01	15	.015	15	1.185e-4	15	1523.689	3	6569.992	1
151		19	max	0	3	.315	1	.461	1	1.177e-2	3	NC	1	NC	1
152			min	0	1	.011	15	.014	15	1.309e-4	15	NC	1	NC	1
153	M11	1	max	0	1	0	15	.463	1	8.869e-3	1	NC	1	NC	1
154			min	0	3	-.043	3	.014	12	-6.156e-5	3	NC	1	NC	1
155		2	max	0	1	.017	3	.478	1	9.556e-3	2	NC	4	NC	2
156			min	0	3	-.06	2	.012	12	-3.67e-4	3	2424.735	3	9603.626	1
157		3	max	0	1	.069	3	.507	1	1.029e-2	2	NC	4	NC	3
158			min	0	3	-.104	2	.011	12	-6.724e-4	3	1290	3	3299.152	1
159		4	max	0	1	.104	3	.542	1	1.102e-2	2	NC	5	NC	3
160			min	0	3	-.133	2	.01	12	-9.779e-4	3	978.758	3	1824.734	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
161		5	max	0	1	.118	3	.578	1	1.175e-2	2	NC	5	NC	3
162			min	0	3	-.147	2	.009	12	-1.283e-3	3	895.836	3	1250.971	1
163		6	max	0	1	.109	3	.611	1	1.248e-2	2	NC	5	NC	3
164			min	0	3	-.144	2	.008	12	-1.589e-3	3	948.579	3	973.623	1
165		7	max	0	1	.081	3	.637	1	1.322e-2	2	NC	5	NC	3
166			min	0	3	-.128	2	.007	12	-1.894e-3	3	1160.418	3	826.103	1
167		8	max	0	1	.043	3	.657	2	1.395e-2	2	NC	4	NC	3
168			min	0	3	-.104	2	.006	12	-2.2e-3	3	1529.844	2	732.445	2
169		9	max	0	1	.007	3	.672	2	1.468e-2	2	NC	4	NC	5
170			min	0	3	-.081	2	.006	12	-2.505e-3	3	2028.417	2	677.807	2
171		10	max	0	1	-.002	15	.678	2	1.541e-2	2	NC	4	NC	5
172			min	0	1	-.07	2	.005	12	-2.81e-3	3	2394.933	2	660.35	2
173		11	max	0	3	.007	3	.672	2	1.468e-2	2	NC	4	NC	5
174			min	0	1	-.081	2	.006	12	-2.505e-3	3	2028.417	2	677.807	2
175		12	max	0	3	.043	3	.657	2	1.395e-2	2	NC	4	NC	3
176			min	0	1	-.104	2	.006	12	-2.2e-3	3	1529.844	2	732.445	2
177		13	max	0	3	.081	3	.637	1	1.322e-2	2	NC	5	NC	3
178			min	0	1	-.128	2	.007	12	-1.894e-3	3	1160.418	3	826.103	1
179		14	max	0	3	.109	3	.611	1	1.248e-2	2	NC	5	NC	3
180			min	0	1	-.144	2	.008	12	-1.589e-3	3	948.579	3	973.623	1
181		15	max	0	3	.118	3	.578	1	1.175e-2	2	NC	5	NC	3
182			min	0	1	-.147	2	.009	12	-1.283e-3	3	895.836	3	1250.971	1
183		16	max	0	3	.104	3	.542	1	1.102e-2	2	NC	5	NC	3
184			min	0	1	-.133	2	.01	12	-9.779e-4	3	978.758	3	1824.734	1
185		17	max	0	3	.069	3	.507	1	1.029e-2	2	NC	4	NC	3
186			min	0	1	-.104	2	.011	12	-6.724e-4	3	1290	3	3299.152	1
187		18	max	0	3	.017	3	.478	1	9.556e-3	2	NC	4	NC	2
188			min	0	1	-.06	2	.012	12	-3.67e-4	3	2424.735	3	9603.626	1
189		19	max	0	3	0	15	.463	1	8.869e-3	1	NC	1	NC	1
190			min	0	1	-.043	3	.014	12	-6.156e-5	3	NC	1	NC	1
191	M12	1	max	0	3	-.007	15	.465	1	8.7e-3	1	NC	1	NC	1
192			min	0	1	-.221	1	.013	12	-2.353e-4	3	NC	1	NC	1
193		2	max	0	3	.002	3	.478	1	9.042e-3	1	NC	4	NC	1
194			min	0	1	-.302	2	.013	12	-1.857e-4	3	1701.986	2	NC	1
195		3	max	0	3	.037	3	.506	1	9.385e-3	1	NC	5	NC	3
196			min	0	1	-.377	2	.013	12	-1.36e-4	3	902.787	2	3547.362	1
197		4	max	0	3	.061	3	.541	1	9.727e-3	1	NC	5	NC	3
198			min	0	1	-.433	2	.012	12	-8.636e-5	3	667.377	2	1899.815	1
199		5	max	0	3	.073	3	.578	1	1.007e-2	1	NC	5	NC	3
200			min	0	1	-.466	2	.011	12	-3.67e-5	3	579.308	2	1279.012	1
201		6	max	0	3	.072	3	.612	1	1.041e-2	1	NC	5	NC	3
202			min	0	1	-.475	2	.009	12	1.295e-5	3	559.909	2	983.634	1
203		7	max	0	3	.061	3	.639	1	1.075e-2	1	NC	5	NC	3
204			min	0	1	-.462	2	.007	12	6.26e-5	3	587.806	2	827.528	1
205		8	max	0	3	.045	3	.66	2	1.11e-2	1	NC	5	NC	3
206			min	0	1	-.437	2	.006	12	1.055e-4	12	656.259	2	728.278	2
207		9	max	0	3	.029	3	.677	2	1.144e-2	1	NC	5	NC	5
208			min	0	1	-.409	2	.004	3	1.362e-4	12	749.626	2	671.089	2
209		10	max	0	1	.021	3	.683	2	1.178e-2	1	NC	5	NC	5
210			min	0	1	-.396	2	.003	3	1.67e-4	12	806.004	2	652.785	2
211		11	max	0	1	.029	3	.677	2	1.144e-2	1	NC	5	NC	5
212			min	0	3	-.409	2	.004	3	1.362e-4	12	749.626	2	671.089	2
213		12	max	0	1	.045	3	.66	2	1.11e-2	1	NC	5	NC	3
214			min	0	3	-.437	2	.006	12	1.055e-4	12	656.259	2	728.278	2
215		13	max	0	1	.061	3	.639	1	1.075e-2	1	NC	5	NC	3
216			min	0	3	-.462	2	.007	12	6.26e-5	3	587.806	2	827.528	1
217		14	max	0	1	.072	3	.612	1	1.041e-2	1	NC	5	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	-.475	2	.009	12	1.295e-5	3	559.909	2	983.634	1
219		15	max	0	1	.073	3	.578	1	1.007e-2	1	NC	5	NC	3
220			min	0	3	-.466	2	.011	12	-3.67e-5	3	579.308	2	1279.012	1
221		16	max	0	1	.061	3	.541	1	9.727e-3	1	NC	5	NC	3
222			min	0	3	-.433	2	.012	12	-8.636e-5	3	667.377	2	1899.815	1
223		17	max	0	1	.037	3	.506	1	9.385e-3	1	NC	5	NC	3
224			min	0	3	-.377	2	.013	12	-1.36e-4	3	902.787	2	3547.362	1
225		18	max	0	1	.002	3	.478	1	9.042e-3	1	NC	4	NC	1
226			min	0	3	-.302	2	.013	12	-1.857e-4	3	1701.986	2	NC	1
227		19	max	0	1	-.007	15	.465	1	8.7e-3	1	NC	1	NC	1
228			min	0	3	-.221	1	.013	12	-2.353e-4	3	NC	1	NC	1
229	M13	1	max	0	3	.104	3	.468	1	1.935e-2	2	NC	1	NC	1
230			min	0	1	-.975	2	.013	12	-5.063e-3	3	NC	1	NC	1
231		2	max	0	3	.156	3	.491	1	2.085e-2	2	NC	5	NC	3
232			min	0	1	-1.122	2	.012	12	-5.652e-3	3	982.251	2	6085.523	1
233		3	max	0	3	.204	3	.525	1	2.234e-2	2	NC	5	NC	3
234			min	0	1	-1.259	2	.011	12	-6.24e-3	3	507.062	2	2514.151	1
235		4	max	0	3	.241	3	.562	1	2.384e-2	2	NC	5	NC	3
236			min	0	1	-1.377	2	.01	12	-6.829e-3	3	358.96	2	1523.612	1
237		5	max	0	3	.267	3	.598	1	2.533e-2	2	NC	5	NC	3
238			min	0	1	-1.467	2	.009	12	-7.417e-3	3	293.153	2	1104.283	1
239		6	max	0	3	.279	3	.629	1	2.683e-2	2	NC	15	NC	3
240			min	0	1	-1.527	2	.007	12	-8.006e-3	3	261.181	2	892.586	1
241		7	max	0	3	.281	3	.653	1	2.832e-2	2	NC	15	NC	3
242			min	0	1	-1.558	2	.005	12	-8.594e-3	3	247.061	2	778.222	1
243		8	max	0	3	.274	3	.67	2	2.982e-2	2	NC	15	NC	5
244			min	0	1	-1.567	2	.003	3	-9.183e-3	3	243.6	2	703.884	2
245		9	max	0	3	.264	3	.684	2	3.131e-2	2	NC	15	NC	5
246			min	0	1	-1.561	2	0	3	-9.771e-3	3	245.865	2	657.928	2
247		10	max	0	1	.259	3	.689	2	3.281e-2	2	NC	15	NC	5
248			min	0	1	-1.556	2	0	3	-1.036e-2	3	248.231	2	643.329	2
249		11	max	0	1	.264	3	.684	2	3.131e-2	2	NC	15	NC	5
250			min	0	3	-1.561	2	0	3	-9.771e-3	3	245.865	2	657.928	2
251		12	max	0	1	.274	3	.67	2	2.982e-2	2	NC	15	NC	5
252			min	0	3	-1.567	2	.003	3	-9.183e-3	3	243.6	2	703.884	2
253		13	max	0	1	.281	3	.653	1	2.832e-2	2	NC	15	NC	3
254			min	0	3	-1.558	2	.005	12	-8.594e-3	3	247.061	2	778.222	1
255		14	max	0	1	.279	3	.629	1	2.683e-2	2	NC	15	NC	3
256			min	0	3	-1.527	2	.007	12	-8.006e-3	3	261.181	2	892.586	1
257		15	max	0	1	.267	3	.598	1	2.533e-2	2	NC	5	NC	3
258			min	0	3	-1.467	2	.009	12	-7.417e-3	3	293.153	2	1104.283	1
259		16	max	0	1	.241	3	.562	1	2.384e-2	2	NC	5	NC	3
260			min	0	3	-1.377	2	.01	12	-6.829e-3	3	358.96	2	1523.612	1
261		17	max	0	1	.204	3	.525	1	2.234e-2	2	NC	5	NC	3
262			min	0	3	-1.259	2	.011	12	-6.24e-3	3	507.062	2	2514.151	1
263		18	max	0	1	.156	3	.491	1	2.085e-2	2	NC	5	NC	3
264			min	0	3	-1.122	2	.012	12	-5.652e-3	3	982.251	2	6085.523	1
265		19	max	0	1	.104	3	.468	1	1.935e-2	2	NC	1	NC	1
266			min	0	3	-.975	2	.013	12	-5.063e-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	1.132e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	2	-4.551e-4	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	2.264e-3	2	NC	3	NC	1
272			min	0	2	-.008	1	0	1	-9.103e-4	3	8849.635	1	NC	1
273		4	max	0	3	0	15	0	3	3.395e-3	2	NC	3	NC	1
274			min	0	2	-.018	1	0	1	-1.365e-3	3	3921.246	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	0	15	.001	3	3.764e-3	2	NC	3	NC	1
276			min	0	2	-.032	1	-.001	1	-1.494e-3	3	2191.341	1	NC	1
277		6	max	0	3	-.002	15	.002	3	3.427e-3	2	NC	3	NC	1
278			min	0	2	-.05	1	-.002	1	-1.32e-3	3	1399.129	1	NC	1
279		7	max	0	3	-.002	15	.002	3	3.091e-3	2	NC	3	NC	1
280			min	0	2	-.071	1	-.002	1	-1.146e-3	3	976.021	1	NC	1
281		8	max	0	3	-.003	15	.003	3	2.754e-3	2	NC	5	NC	1
282			min	0	2	-.096	1	-.003	1	-9.727e-4	3	723.639	1	NC	1
283		9	max	0	3	-.004	15	.003	3	2.417e-3	2	NC	5	NC	1
284			min	0	2	-.124	1	-.004	1	-7.99e-4	3	560.914	1	NC	1
285		10	max	0	3	-.005	15	.003	3	2.081e-3	2	NC	12	NC	1
286			min	-.001	2	-.154	1	-.004	1	-6.252e-4	3	449.747	1	NC	1
287		11	max	0	3	-.006	15	.003	3	1.744e-3	2	NC	15	NC	1
288			min	-.001	2	-.187	1	-.005	1	-4.515e-4	3	370.405	1	NC	1
289		12	max	.001	3	-.007	15	.003	3	1.407e-3	2	NC	15	NC	1
290			min	-.001	2	-.222	1	-.005	1	-2.778e-4	3	311.751	1	NC	1
291		13	max	.001	3	-.008	15	.002	3	1.07e-3	2	8795.034	15	NC	1
292			min	-.001	2	-.259	1	-.006	1	-1.041e-4	3	267.142	1	NC	1
293		14	max	.001	3	-.009	15	.001	3	7.336e-4	2	7658.386	15	NC	1
294			min	-.001	2	-.298	1	-.006	1	4.787e-6	15	232.41	1	NC	1
295		15	max	.001	3	-.01	15	0	3	3.969e-4	2	6754.699	15	NC	1
296			min	-.002	2	-.338	1	-.006	1	-2.128e-5	9	204.832	1	NC	1
297		16	max	.001	3	-.012	15	0	15	4.171e-4	3	6024.574	15	NC	1
298			min	-.002	2	-.38	1	-.006	1	-1.204e-4	9	182.577	1	NC	1
299		17	max	.002	3	-.013	15	0	15	5.908e-4	3	5426.433	15	NC	1
300			min	-.002	2	-.422	1	-.006	1	-4.069e-4	1	164.362	1	NC	1
301		18	max	.002	3	-.014	15	0	15	7.646e-4	3	4930.579	15	NC	1
302			min	-.002	2	-.464	1	-.006	3	-6.967e-4	1	149.275	1	NC	1
303		19	max	.002	3	-.015	15	0	15	9.383e-4	3	4515.34	15	NC	1
304			min	-.002	2	-.507	1	-.009	3	-9.864e-4	1	136.651	1	7590.867	3
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	1	0	1	NC	1	NC	1
308			min	0	2	-.002	1	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	3	NC	1
310			min	0	2	-.01	1	0	1	0	1	7101.987	1	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	3	NC	1
312			min	-.001	2	-.023	1	0	1	0	1	3042.618	1	NC	1
313		5	max	.001	3	-.001	15	0	1	0	1	NC	3	NC	1
314			min	-.001	2	-.042	1	0	1	0	1	1652.964	1	NC	1
315		6	max	.001	3	-.002	15	0	1	0	1	NC	3	NC	1
316			min	-.002	2	-.067	1	0	1	0	1	1032.919	1	NC	1
317		7	max	.002	3	-.003	15	0	1	0	1	NC	3	NC	1
318			min	-.002	2	-.098	1	0	1	0	1	710.117	1	NC	1
319		8	max	.002	3	-.004	15	0	1	0	1	NC	3	NC	1
320			min	-.002	2	-.133	1	0	1	0	1	521.015	1	NC	1
321		9	max	.002	3	-.005	15	0	1	0	1	NC	3	NC	1
322			min	-.002	2	-.173	1	0	1	0	1	400.708	1	NC	1
323		10	max	.002	3	-.006	15	0	1	0	1	NC	3	NC	1
324			min	-.003	2	-.217	1	0	1	0	1	319.356	1	NC	1
325		11	max	.003	3	-.008	15	0	1	0	1	NC	3	NC	1
326			min	-.003	2	-.265	2	0	1	0	1	261.743	2	NC	1
327		12	max	.003	3	-.008	12	0	1	0	1	NC	3	NC	1
328			min	-.003	2	-.317	2	0	1	0	1	218.849	2	NC	1
329		13	max	.003	3	-.009	12	0	1	0	1	NC	3	NC	1
330			min	-.003	2	-.372	2	0	1	0	1	186.526	2	NC	1
331		14	max	.004	3	-.009	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	2	-.429	2	0	1	0	1	161.553	2	NC	1
333		15	max	.004	3	-.009	12	0	1	0	1	NC	3	NC	1
334			min	-.004	2	-.489	2	0	1	0	1	141.854	2	NC	1
335		16	max	.004	3	-.009	12	0	1	0	1	NC	3	NC	1
336			min	-.004	2	-.55	2	0	1	0	1	126.045	2	NC	1
337		17	max	.004	3	-.009	12	0	1	0	1	NC	3	NC	1
338			min	-.004	2	-.612	2	0	1	0	1	113.17	2	NC	1
339		18	max	.005	3	-.009	12	0	1	0	1	NC	3	NC	1
340			min	-.005	2	-.676	2	0	1	0	1	102.552	2	NC	1
341		19	max	.005	3	-.009	12	0	1	0	1	NC	3	NC	1
342			min	-.005	2	-.74	2	0	1	0	1	93.702	2	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	2	4.551e-4	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-1.132e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	9.103e-4	3	NC	3	NC	1
348			min	0	2	-.008	1	0	3	-2.264e-3	2	8849.635	1	NC	1
349		4	max	0	3	0	15	0	1	1.365e-3	3	NC	3	NC	1
350			min	0	2	-.018	1	0	3	-3.395e-3	2	3921.246	1	NC	1
351		5	max	0	3	0	15	.001	1	1.494e-3	3	NC	3	NC	1
352			min	0	2	-.032	1	-.001	3	-3.764e-3	2	2191.341	1	NC	1
353		6	max	0	3	-.002	15	.002	1	1.32e-3	3	NC	3	NC	1
354			min	0	2	-.05	1	-.002	3	-3.427e-3	2	1399.129	1	NC	1
355		7	max	0	3	-.002	15	.002	1	1.146e-3	3	NC	3	NC	1
356			min	0	2	-.071	1	-.002	3	-3.091e-3	2	976.021	1	NC	1
357		8	max	0	3	-.003	15	.003	1	9.727e-4	3	NC	5	NC	1
358			min	0	2	-.096	1	-.003	3	-2.754e-3	2	723.639	1	NC	1
359		9	max	0	3	-.004	15	.004	1	7.99e-4	3	NC	5	NC	1
360			min	0	2	-.124	1	-.003	3	-2.417e-3	2	560.914	1	NC	1
361		10	max	0	3	-.005	15	.004	1	6.252e-4	3	NC	12	NC	1
362			min	-.001	2	-.154	1	-.003	3	-2.081e-3	2	449.747	1	NC	1
363		11	max	0	3	-.006	15	.005	1	4.515e-4	3	NC	15	NC	1
364			min	-.001	2	-.187	1	-.003	3	-1.744e-3	2	370.405	1	NC	1
365		12	max	.001	3	-.007	15	.005	1	2.778e-4	3	NC	15	NC	1
366			min	-.001	2	-.222	1	-.003	3	-1.407e-3	2	311.751	1	NC	1
367		13	max	.001	3	-.008	15	.006	1	1.041e-4	3	8795.034	15	NC	1
368			min	-.001	2	-.259	1	-.002	3	-1.07e-3	2	267.142	1	NC	1
369		14	max	.001	3	-.009	15	.006	1	-4.787e-6	15	7658.386	15	NC	1
370			min	-.001	2	-.298	1	-.001	3	-7.336e-4	2	232.41	1	NC	1
371		15	max	.001	3	-.01	15	.006	1	2.128e-5	9	6754.699	15	NC	1
372			min	-.002	2	-.338	1	0	3	-3.969e-4	2	204.832	1	NC	1
373		16	max	.001	3	-.012	15	.006	1	1.204e-4	9	6024.574	15	NC	1
374			min	-.002	2	-.38	1	0	15	-4.171e-4	3	182.577	1	NC	1
375		17	max	.002	3	-.013	15	.006	1	4.069e-4	1	5426.433	15	NC	1
376			min	-.002	2	-.422	1	0	15	-5.908e-4	3	164.362	1	NC	1
377		18	max	.002	3	-.014	15	.006	3	6.967e-4	1	4930.579	15	NC	1
378			min	-.002	2	-.464	1	0	15	-7.646e-4	3	149.275	1	NC	1
379		19	max	.002	3	-.015	15	.009	3	9.864e-4	1	4515.34	15	NC	1
380			min	-.002	2	-.507	1	0	15	-9.383e-4	3	136.651	1	7590.867	3
381	M3	1	max	.023	1	0	15	0	3	9.856e-4	2	NC	1	NC	1
382			min	0	15	-.007	1	0	1	-3.301e-4	3	NC	1	NC	1
383		2	max	.022	1	-.002	12	.008	3	1.423e-3	2	NC	1	NC	3
384			min	0	15	-.047	1	-.017	2	-5.192e-4	3	NC	1	4539.04	2
385		3	max	.021	1	-.003	12	.014	3	1.861e-3	2	NC	1	NC	4
386			min	0	15	-.087	1	-.033	2	-7.083e-4	3	NC	1	2298.219	2
387		4	max	.021	1	-.004	12	.02	3	2.298e-3	2	NC	1	NC	4
388			min	0	15	-.127	1	-.048	2	-8.973e-4	3	NC	1	1561.042	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	.02	1	-.006	12	.026	3	2.736e-3	2	NC	1	NC	4
390			min	0	15	-.166	2	-.062	2	-1.086e-3	3	NC	1	1200.6	2
391		6	max	.019	1	-.007	12	.031	3	3.173e-3	2	NC	1	NC	5
392			min	0	15	-.206	2	-.075	2	-1.275e-3	3	9670.313	4	991.817	2
393		7	max	.019	1	-.008	12	.036	3	3.611e-3	2	NC	1	NC	5
394			min	0	15	-.245	2	-.086	2	-1.465e-3	3	8575.823	4	860.017	2
395		8	max	.018	1	-.009	12	.04	3	4.049e-3	2	NC	1	NC	5
396			min	0	15	-.284	2	-.096	2	-1.654e-3	3	7918.965	4	773.609	2
397		9	max	.017	1	-.01	12	.043	3	4.486e-3	2	NC	3	NC	5
398			min	0	15	-.323	2	-.103	2	-1.843e-3	3	7565.404	4	717.336	2
399		10	max	.017	1	-.011	12	.044	3	4.924e-3	2	NC	3	NC	5
400			min	0	15	-.362	2	-.107	2	-2.032e-3	3	7453.555	4	683.456	2
401		11	max	.016	1	-.011	12	.045	3	5.361e-3	2	NC	3	NC	5
402			min	0	15	-.4	2	-.109	2	-2.221e-3	3	7565.404	4	668.391	2
403		12	max	.015	1	-.012	12	.045	3	5.799e-3	2	NC	1	NC	5
404			min	0	15	-.438	2	-.108	2	-2.41e-3	3	7918.965	4	671.523	2
405		13	max	.014	1	-.012	12	.043	3	6.236e-3	2	NC	1	NC	5
406			min	0	15	-.476	2	-.103	2	-2.599e-3	3	8575.823	4	695.221	2
407		14	max	.014	1	-.012	12	.04	3	6.674e-3	2	NC	1	NC	5
408			min	0	15	-.514	2	-.095	2	-2.788e-3	3	9670.313	4	746.258	2
409		15	max	.013	1	-.013	12	.035	3	7.112e-3	2	NC	1	NC	5
410			min	0	15	-.552	2	-.083	2	-2.977e-3	3	NC	1	840.19	2
411		16	max	.012	1	-.013	12	.029	3	7.549e-3	2	NC	1	NC	5
412			min	0	15	-.589	2	-.066	2	-3.166e-3	3	NC	1	1015.097	2
413		17	max	.012	1	-.013	12	.021	3	7.987e-3	2	NC	1	NC	4
414			min	0	15	-.626	2	-.045	2	-3.355e-3	3	NC	1	1387.055	2
415		18	max	.011	1	-.013	12	.01	3	8.424e-3	2	NC	1	NC	4
416			min	0	15	-.664	2	-.019	2	-3.544e-3	3	NC	1	2539.025	2
417		19	max	.01	1	-.013	12	.014	1	8.862e-3	2	NC	1	NC	1
418			min	0	15	-.701	2	-.002	3	-3.733e-3	3	NC	1	NC	1
419	M6	1	max	.03	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.01	1	0	1	0	1	NC	1	NC	1
421		2	max	.028	1	0	3	0	1	0	1	NC	1	NC	1
422			min	0	15	-.069	2	0	1	0	1	NC	1	NC	1
423		3	max	.026	1	0	3	0	1	0	1	NC	1	NC	1
424			min	0	15	-.129	2	0	1	0	1	NC	1	NC	1
425		4	max	.025	1	.002	3	0	1	0	1	NC	1	NC	1
426			min	0	15	-.189	2	0	1	0	1	NC	1	NC	1
427		5	max	.023	1	.002	3	0	1	0	1	NC	1	NC	1
428			min	0	15	-.248	2	0	1	0	1	NC	1	NC	1
429		6	max	.021	1	.003	3	0	1	0	1	NC	1	NC	1
430			min	0	15	-.308	2	0	1	0	1	9670.313	4	NC	1
431		7	max	.02	1	.005	3	0	1	0	1	NC	1	NC	1
432			min	0	15	-.367	2	0	1	0	1	8575.823	4	NC	1
433		8	max	.018	1	.006	3	0	1	0	1	NC	1	NC	1
434			min	0	15	-.426	2	0	1	0	1	7918.965	4	NC	1
435		9	max	.016	1	.007	3	0	1	0	1	NC	5	NC	1
436			min	0	15	-.485	2	0	1	0	1	7565.404	4	NC	1
437		10	max	.016	3	.009	3	0	1	0	1	NC	5	NC	1
438			min	0	15	-.543	2	0	1	0	1	7453.555	4	NC	1
439		11	max	.017	3	.011	3	0	1	0	1	NC	5	NC	1
440			min	0	15	-.601	2	0	1	0	1	6756.494	3	NC	1
441		12	max	.019	3	.013	3	0	1	0	1	NC	1	NC	1
442			min	0	15	-.66	2	0	1	0	1	5747.784	3	NC	1
443		13	max	.02	3	.015	3	0	1	0	1	NC	1	NC	1
444			min	0	10	-.717	2	0	1	0	1	4946.623	3	NC	1
445		14	max	.021	3	.017	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	-.002	10	-.775	2	0	1	0	1	4302.992	3	NC	1
447		15	max	.022	3	.02	3	0	1	0	1	NC	1	NC	1
448			min	-.003	10	-.833	2	0	1	0	1	3780.8	3	NC	1
449		16	max	.023	3	.022	3	0	1	0	1	NC	1	NC	1
450			min	-.004	2	-.89	2	0	1	0	1	3353.528	3	NC	1
451		17	max	.024	3	.025	3	0	1	0	1	NC	1	NC	1
452			min	-.007	2	-.947	2	0	1	0	1	3001.394	3	NC	1
453		18	max	.025	3	.028	3	0	1	0	1	NC	1	NC	1
454			min	-.009	2	-1.004	2	0	1	0	1	2709.464	3	NC	1
455		19	max	.026	3	.031	3	0	1	0	1	NC	1	NC	1
456			min	-.011	2	-1.061	2	0	1	0	1	2466.35	3	NC	1
457	M9	1	max	.023	1	0	15	0	1	3.301e-4	3	NC	1	NC	1
458			min	0	15	-.007	1	0	3	-9.856e-4	2	NC	1	NC	1
459		2	max	.022	1	-.002	12	.017	2	5.192e-4	3	NC	1	NC	3
460			min	0	15	-.047	1	-.008	3	-1.423e-3	2	NC	1	4539.04	2
461		3	max	.021	1	-.003	12	.033	2	7.083e-4	3	NC	1	NC	4
462			min	0	15	-.087	1	-.014	3	-1.861e-3	2	NC	1	2298.219	2
463		4	max	.021	1	-.004	12	.048	2	8.973e-4	3	NC	1	NC	4
464			min	0	15	-.127	1	-.02	3	-2.298e-3	2	NC	1	1561.042	2
465		5	max	.02	1	-.006	12	.062	2	1.086e-3	3	NC	1	NC	4
466			min	0	15	-.166	2	-.026	3	-2.736e-3	2	NC	1	1200.6	2
467		6	max	.019	1	-.007	12	.075	2	1.275e-3	3	NC	1	NC	5
468			min	0	15	-.206	2	-.031	3	-3.173e-3	2	9670.313	4	991.817	2
469		7	max	.019	1	-.008	12	.086	2	1.465e-3	3	NC	1	NC	5
470			min	0	15	-.245	2	-.036	3	-3.611e-3	2	8575.823	4	860.017	2
471		8	max	.018	1	-.009	12	.096	2	1.654e-3	3	NC	1	NC	5
472			min	0	15	-.284	2	-.04	3	-4.049e-3	2	7918.965	4	773.609	2
473		9	max	.017	1	-.01	12	.103	2	1.843e-3	3	NC	3	NC	5
474			min	0	15	-.323	2	-.043	3	-4.486e-3	2	7565.404	4	717.336	2
475		10	max	.017	1	-.011	12	.107	2	2.032e-3	3	NC	3	NC	5
476			min	0	15	-.362	2	-.044	3	-4.924e-3	2	7453.555	4	683.456	2
477		11	max	.016	1	-.011	12	.109	2	2.221e-3	3	NC	3	NC	5
478			min	0	15	-.4	2	-.045	3	-5.361e-3	2	7565.404	4	668.391	2
479		12	max	.015	1	-.012	12	.108	2	2.41e-3	3	NC	1	NC	5
480			min	0	15	-.438	2	-.045	3	-5.799e-3	2	7918.965	4	671.523	2
481		13	max	.014	1	-.012	12	.103	2	2.599e-3	3	NC	1	NC	5
482			min	0	15	-.476	2	-.043	3	-6.236e-3	2	8575.823	4	695.221	2
483		14	max	.014	1	-.012	12	.095	2	2.788e-3	3	NC	1	NC	5
484			min	0	15	-.514	2	-.04	3	-6.674e-3	2	9670.313	4	746.258	2
485		15	max	.013	1	-.013	12	.083	2	2.977e-3	3	NC	1	NC	5
486			min	0	15	-.552	2	-.035	3	-7.112e-3	2	NC	1	840.19	2
487		16	max	.012	1	-.013	12	.066	2	3.166e-3	3	NC	1	NC	5
488			min	0	15	-.589	2	-.029	3	-7.549e-3	2	NC	1	1015.097	2
489		17	max	.012	1	-.013	12	.045	2	3.355e-3	3	NC	1	NC	4
490			min	0	15	-.626	2	-.021	3	-7.987e-3	2	NC	1	1387.055	2
491		18	max	.011	1	-.013	12	.019	2	3.544e-3	3	NC	1	NC	4
492			min	0	15	-.664	2	-.01	3	-8.424e-3	2	NC	1	2539.025	2
493		19	max	.01	1	-.013	12	.002	3	3.733e-3	3	NC	1	NC	1
494			min	0	15	-.701	2	-.014	1	-8.862e-3	2	NC	1	NC	1