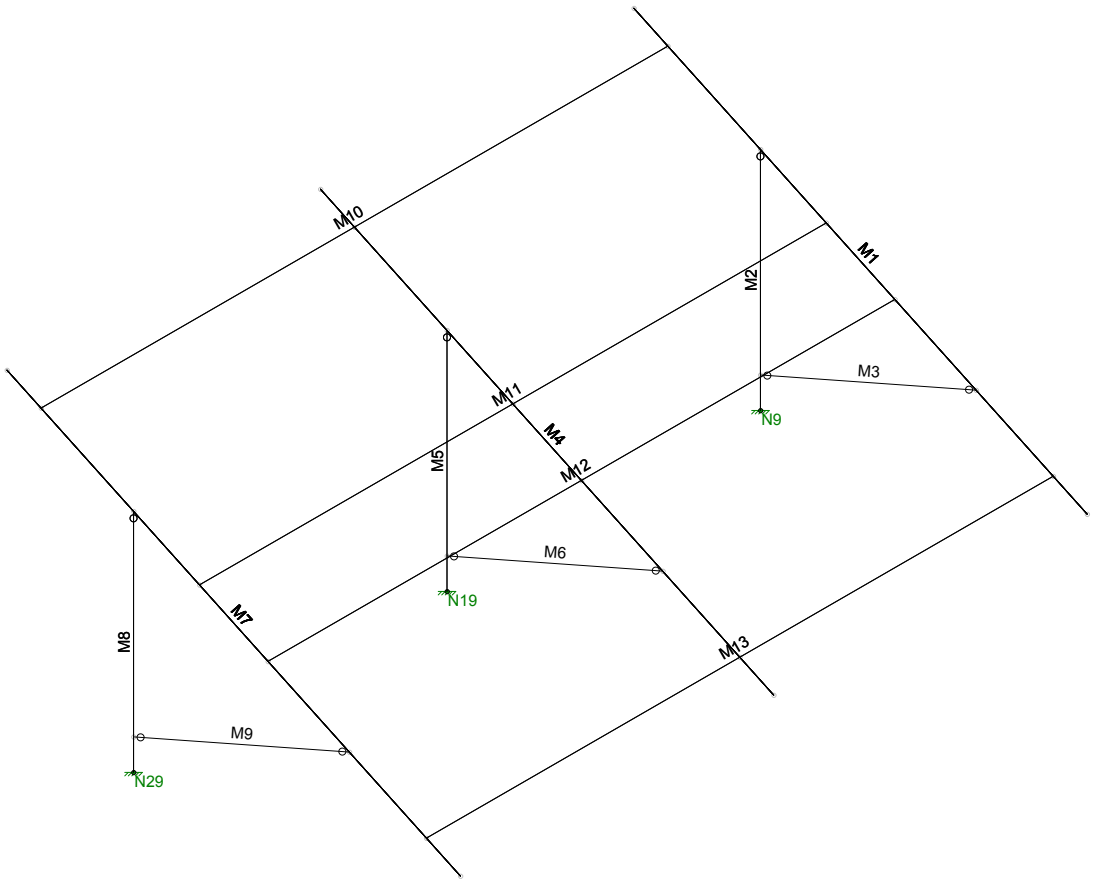


Schletter, Inc.		25° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

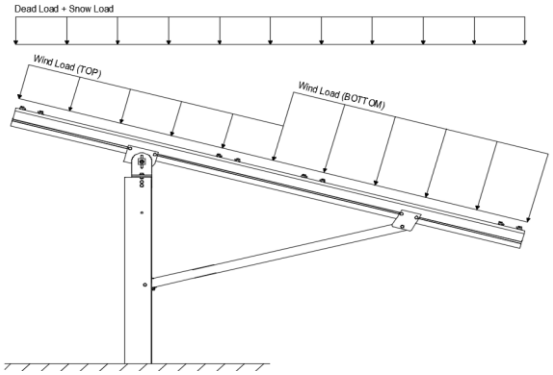
1.2 Construction

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 =	1700	mm	1550	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 =	90	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z = 12.72 psf *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.1	*(Pressure)*
$Cf+_{BOTTOM}$ =	1.7	
$Cf-_{TOP}$ =	-2.2	*(Suction)*
$Cf-_{BOTTOM}$ =	-1	

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.

2.4 Seismic Loads - N/A

S_S =	0.00	R =	1.25
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

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.

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]	*(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 + 1.0W	
1.0D + 0.75L + 0.75W + 0.75S	
0.6D + 1.0W [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

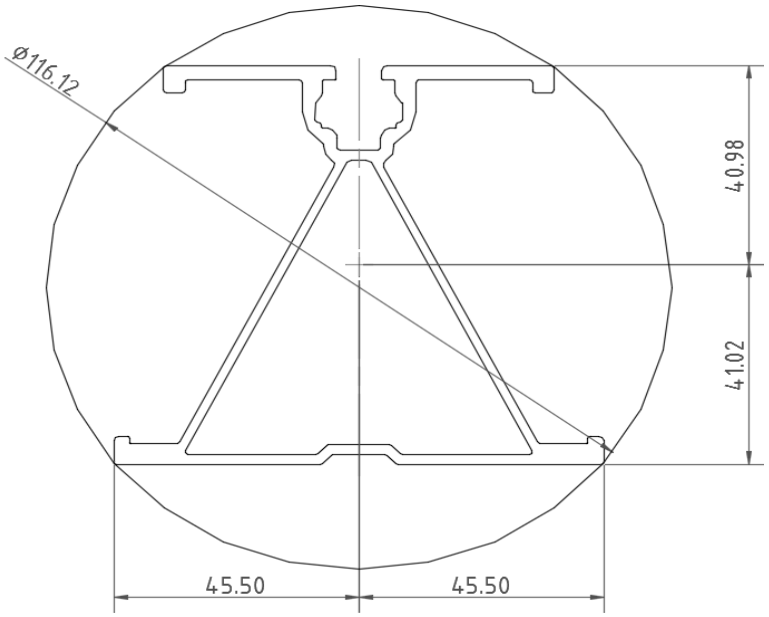
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	138	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 =	1.952	k-ft
M_z =	0.320	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	98%	

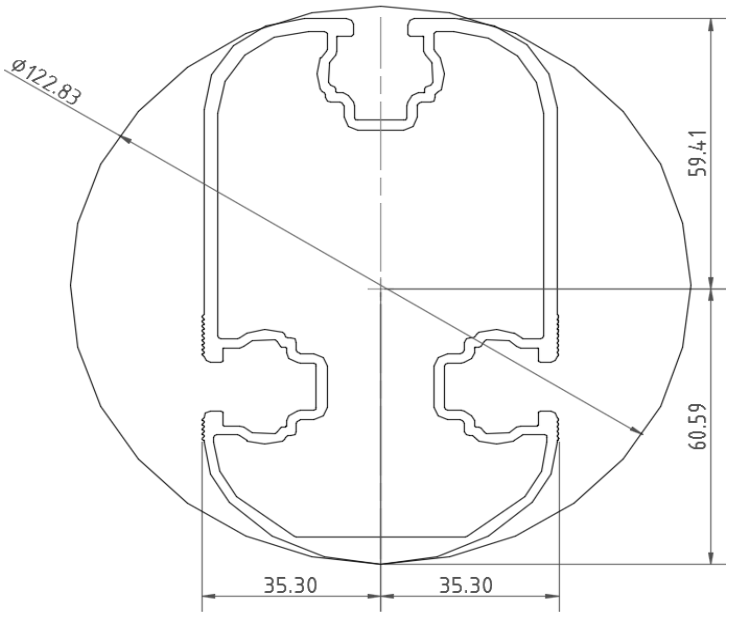


DETAIL VIEW

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 =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	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 =	3.573	k-ft
M_z =	0.000	k-ft
P_n =	0.027	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	71%	

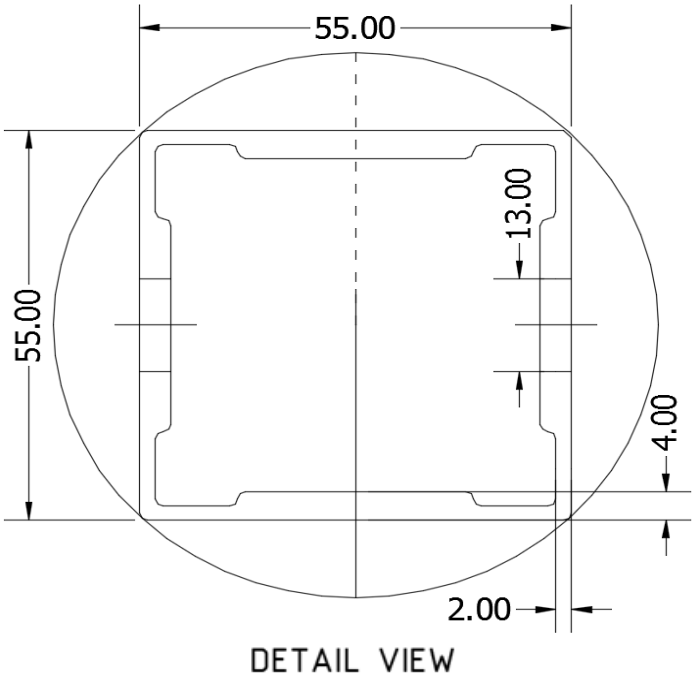


DETAIL VIEW

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).

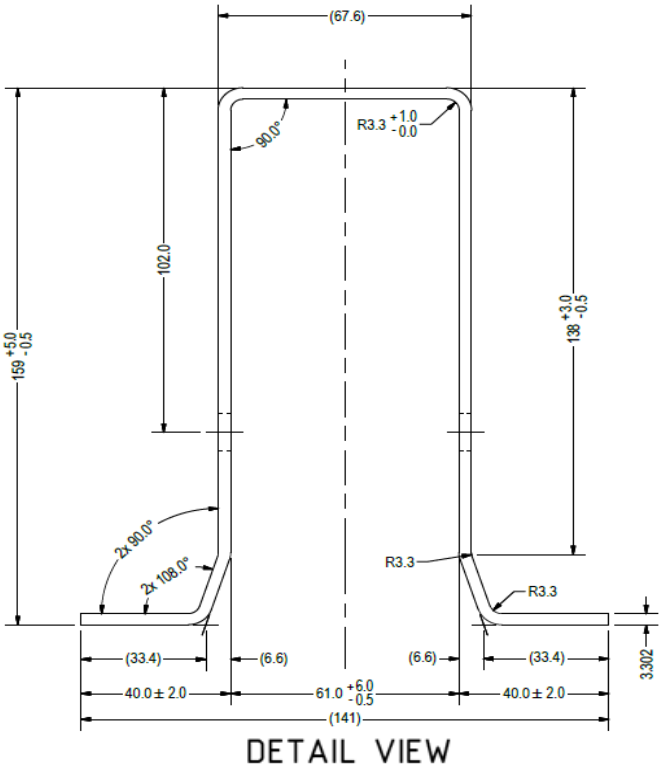
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.398	k-ft
P_n =	4.418	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	61%	



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 =	72.60	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	11.872	k-ft
M_z =	0.000	k-ft
P_r =	6.622	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	78%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	5.38	k
Maximum Lateral Load =	2.67	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 =	1.31	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

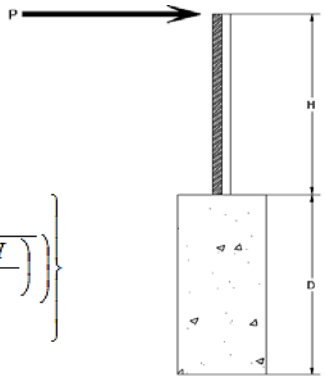
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.31	k
Height of Pole Above Grade, H =	5.05	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 =	7.05	
Required Footing Depth, D =	10.68	ft

2nd Trial @ D_2 =	6.97	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.39	ksf
Constant 2.34P/(S_1B), A =	3.29	
Required Footing Depth, D =	6.21	ft

3rd Trial @ D_3 =	6.59	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.32	ksf
Constant 2.34P/(S_1B), A =	3.48	
Required Footing Depth, D =	6.45	ft

4th Trial @ D_4 =	6.52	ft
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	1.30	ksf
Constant 2.34P/(S_1B), A =	3.52	
Required Footing Depth, D =	6.49	ft

5th Trial @ D_5 =	6.51	ft
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	1.30	ksf
Constant 2.34P/(S_1B), A =	3.52	
Required Footing Depth, D =	6.75	ft

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

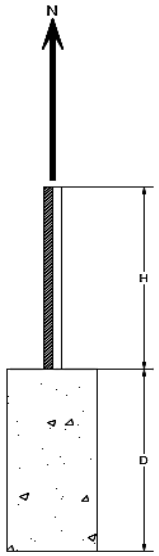
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.57	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 =	1.67	k
Required Concrete Volume, V =	11.54	ft^3
Required Footing Depth, D =	3.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.54
2	0.4	0.2	118.10	5.43
3	0.6	0.2	118.10	5.33
4	0.8	0.2	118.10	5.23
5	1	0.2	118.10	5.12
6	1.2	0.2	118.10	5.02
7	1.4	0.2	118.10	4.92
8	1.6	0.2	118.10	4.81
9	1.8	0.2	118.10	4.71
10	2	0.2	118.10	4.61
11	2.2	0.2	118.10	4.50
12	2.4	0.2	118.10	4.40
13	2.6	0.2	118.10	4.29
14	2.8	0.2	118.10	4.19
15	3	0.2	118.10	4.09
16	3.2	0.2	118.10	3.98
17	3.4	0.2	118.10	3.88
18	3.6	0.2	118.10	3.78
19	3.8	0.2	118.10	3.67
20	0	0.0	0.00	3.67
21	0	0.0	0.00	3.67
22	0	0.0	0.00	3.67
23	0	0.0	0.00	3.67
24	0	0.0	0.00	3.67
25	0	0.0	0.00	3.67
26	0	0.0	0.00	3.67
27	0	0.0	0.00	3.67
28	0	0.0	0.00	3.67
29	0	0.0	0.00	3.67
30	0	0.0	0.00	3.67
31	0	0.0	0.00	3.67
32	0	0.0	0.00	3.67
33	0	0.0	0.00	3.67
34	0	0.0	0.00	3.67
Max	3.8	Sum	0.90	

A 2ft diameter x 3.75ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.29	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	23.56	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

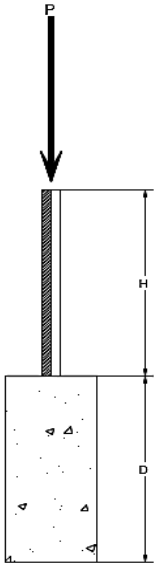
Weight of Concrete

Footing Volume	21.21	ft^3
Weight	3.07	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.53	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.00	k
Applied Force =	7.37	k
Utilization =	67%	

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



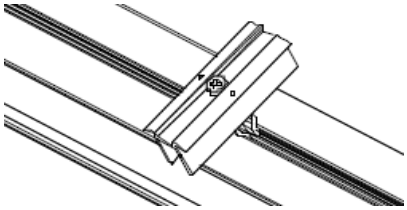
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

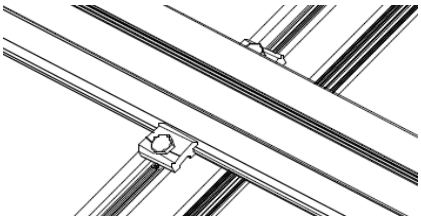
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.415 k
Allowable Uplift	=	1.214 k
Utilization	=	34%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.680 k
Allowable Uplift	=	2.180 k
Utilization	=	77%

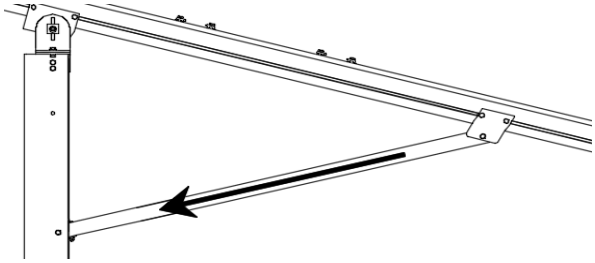


6.2 Strut Connections

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

Maximum Axial Load	=	4.418 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	50%

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

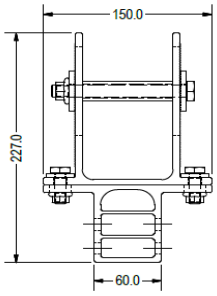


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

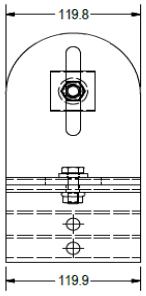
6.3 Girder to Post Connection

In order to connect the girder to the post, custom extruded sections are assembled to create a post head piece. The reliability of calculations is uncertain due to limited standards, therefore the strength of the head piece has been evaluated by load testing.

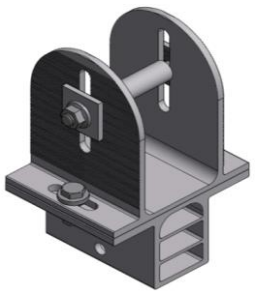
Maximum Tensile Load	=	3.602 k
Allowable Load	=	5.649 k
Utilization	=	64%



FRONT VIEW



SIDE VIEW



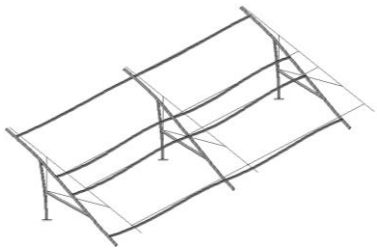
7. SEISMIC DESIGN

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}	=	70.15 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.403 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 =	138 in	L_b =	138
J =	0.432	J =	0.432
	381.773		242.785
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	27.0 ksi	φF_L=	28.3
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 30.5 ksi

3.4.16

b/t = 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 = 63.8189
J = 1.98
89.1294

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

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 = 30.3

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

$\varphi F_L St$= 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

$M_{max}St$ = 5.001 k-ft

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

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= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$S2 = C_t$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

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= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

φF_L = (φccFcy)/(λ²)

φF_L = 13.6667 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 = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	72.60	in	
Pr =	6.62	k	(LRFD Factored Load)
Mr (Strong) =	11.87	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	104.47			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	23.00	ksi		
Fe =	26.23	ksi		
Pn =	51.291	k		

Torsional/Flexural Torsional Buckling:

Fcr =	17.0733	ksi
Fey =	66.8981	ksi
Fez =	21.7595	ksi
Pn =	38.0734	k

Bending (Strong Axis):

Yielding:				
Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.1932	<	0.2	
Utilization =	0.78	<	1.0	OK

Bending (Weak Axis):

Yielding:				
Mn =	14.65	k-ft		
Flange Local Buckling:				
Mn =	14.39	k-ft		
Pr/Pc =	0.193	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 78%

APPENDIX B

B.1

The following pages will contain the results from RISA. Please refer back to Section 2 for load information and Section 4-5 for member and foundation design.

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead Load, Max	DL		-1				4		
2	Dead Load, Min	DL		-1				4		
3	Snow Load	SL						4		
4	Wind Load - Pressure	WL						4		
5	Wind Load - Suction	WL						4		
6	Seismic - Lateral	EL								

Member Distributed Loads (BLC 1 : Dead Load, Max)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-8.366	-8.366	0	0
2	M11	Y	-8.366	-8.366	0	0
3	M12	Y	-8.366	-8.366	0	0
4	M13	Y	-8.366	-8.366	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	-4.45	-4.45	0	0
2	M11	Y	-4.45	-4.45	0	0
3	M12	Y	-4.45	-4.45	0	0
4	M13	Y	-4.45	-4.45	0	0

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-46.9	-46.9	0	0
2	M11	Y	-46.9	-46.9	0	0
3	M12	Y	-46.9	-46.9	0	0
4	M13	Y	-46.9	-46.9	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	-39.013	-39.013	0	0
2	M11	y	-39.013	-39.013	0	0
3	M12	y	-60.293	-60.293	0	0
4	M13	y	-60.293	-60.293	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	78.026	78.026	0	0
2	M11	y	78.026	78.026	0	0
3	M12	y	35.466	35.466	0	0
4	M13	y	35.466	35.466	0	0

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												

Load Combinations (Continued)

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	531.813	2	2459.01	1	328.676	1	.415	1	.005	3	5.375	1
2		min	-739.412	3	-1376.34	3	-281.036	3	-.351	3	-.011	1	.211	15
3	N19	max	2025.257	2	6642.223	1	0	10	0	2	0	3	11.171	1
4		min	-2051.31	3	-4133.592	3	0	3	0	3	0	1	.394	15
5	N29	max	531.813	2	2459.01	1	281.036	3	.351	3	.011	1	5.375	1
6		min	-739.412	3	-1376.34	3	-328.676	1	-.415	1	-.005	3	.211	15
7	Totals:	max	3088.884	2	11560.243	1	0	1						
8		min	-3530.135	3	-6886.272	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	.006	1	0	15	0	1	0	1	0	1
2			min	0	1	0	3	-.001	1	0	1	0	1	0	1
3		2	max	-.221	15	-.473	15	0	15	0	1	0	15	0	4
4			min	-.939	4	-2.011	4	-.001	1	0	1	0	1	0	15
5		3	max	-9.198	15	231.491	3	-.67	3	.062	3	.332	1	.263	2
6			min	-218.456	1	-604.398	2	-207.439	1	-.254	1	.013	15	-.099	3
7		4	max	-9.419	15	230.315	3	-.67	3	.062	3	.203	1	.638	2
8			min	-219.187	1	-605.966	2	-207.439	1	-.254	1	.008	15	-.242	3
9		5	max	-9.639	15	229.138	3	-.67	3	.062	3	.075	1	1.015	2
10			min	-219.919	1	-607.534	2	-207.439	1	-.254	1	-.007	10	-.385	3
11		6	max	303.427	3	535.961	2	29.12	3	.073	1	.144	1	.972	2
12			min	-1219.328	1	-140.455	3	-280.579	1	-.072	3	-.046	3	-.391	3
13		7	max	302.879	3	534.393	2	29.12	3	.073	1	.014	10	.647	1
14			min	-1220.059	1	-141.631	3	-280.579	1	-.072	3	-.031	1	-.304	3
15		8	max	302.33	3	532.825	2	29.12	3	.073	1	-.007	12	.325	1
16			min	-1220.79	1	-142.808	3	-280.579	1	-.072	3	-.205	1	-.215	3
17		9	max	286.747	3	72.517	3	23.08	3	-.004	15	.106	1	.142	1
18			min	-1447.078	1	-66.977	1	-283.874	1	-.212	2	0	10	-.175	3
19		10	max	286.199	3	71.341	3	23.08	3	-.004	15	.056	3	.184	1
20			min	-1447.809	1	-68.545	1	-283.874	1	-.212	2	-.07	1	-.22	3
21		11	max	285.651	3	70.164	3	23.08	3	-.004	15	.071	3	.227	1
22			min	-1448.541	1	-70.114	1	-283.874	1	-.212	2	-.246	1	-.263	3
23		12	max	267.39	3	652.274	3	154.209	2	.403	3	.189	1	.48	1
24			min	-1670.713	1	-584.008	1	-286.581	3	-.465	1	.007	15	-.537	3
25		13	max	266.841	3	651.098	3	154.209	2	.403	3	.248	1	.843	1
26			min	-1671.444	1	-585.577	1	-286.581	3	-.465	1	-.161	3	-.941	3
27		14	max	220.685	1	525.219	1	-6.421	15	.329	1	.052	3	1.192	1
28			min	9.885	15	-577.324	3	-158.805	1	-.43	3	-.063	1	-1.328	3
29		15	max	219.954	1	523.65	1	-6.421	15	.329	1	.03	3	.867	1
30			min	9.665	15	-578.5	3	-158.805	1	-.43	3	-.162	1	-.969	3
31		16	max	219.223	1	522.082	1	-6.421	15	.329	1	.009	3	.542	1
32			min	9.444	15	-579.676	3	-158.805	1	-.43	3	-.261	1	-.61	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	218.491	1	520.514	1	-6.421	15	.329	1	-.009	12	.219	1
34			min	9.223	15	-580.853	3	-158.805	1	-.43	3	-.359	1	-.25	3
35		18	max	.939	4	2.013	4	.001	1	0	1	0	15	0	4
36			min	.221	15	.473	15	0	15	0	1	0	1	0	15
37		19	max	0	1	.002	2	.001	1	0	1	0	1	0	1
38			min	0	1	-.004	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.016	1	0	1	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.221	15	-.473	15	0	1	0	1	0	1	0	4
42			min	-.939	4	-2.009	4	0	1	0	1	0	1	0	15
43		3	max	-15.842	12	723.171	3	0	1	0	1	0	1	.673	2
44			min	-412.009	1	-1748.983	2	0	1	0	1	0	1	-.281	3
45		4	max	-16.208	12	721.995	3	0	1	0	1	0	1	1.759	2
46			min	-412.74	1	-1750.551	2	0	1	0	1	0	1	-.729	3
47		5	max	-16.573	12	720.819	3	0	1	0	1	0	1	2.846	2
48			min	-413.472	1	-1752.119	2	0	1	0	1	0	1	-1.177	3
49		6	max	1076.765	3	1582.288	2	0	1	0	1	0	1	2.71	2
50			min	-3306.192	1	-531.9	3	0	1	0	1	0	1	-1.165	3
51		7	max	1076.217	3	1580.72	2	0	1	0	1	0	1	1.728	2
52			min	-3306.923	1	-533.076	3	0	1	0	1	0	1	-.834	3
53		8	max	1075.668	3	1579.151	2	0	1	0	1	0	1	.764	1
54			min	-3307.655	1	-534.253	3	0	1	0	1	0	1	-.503	3
55		9	max	1053.1	3	221.228	3	0	1	0	1	0	1	.199	1
56			min	-3701.807	1	-240.251	1	0	1	0	1	0	1	-.341	3
57		10	max	1052.551	3	220.052	3	0	1	0	1	0	1	.349	1
58			min	-3702.538	1	-241.82	1	0	1	0	1	0	1	-.478	3
59		11	max	1052.003	3	218.876	3	0	1	0	1	0	1	.499	1
60			min	-3703.269	1	-243.388	1	0	1	0	1	0	1	-.614	3
61		12	max	1034.791	3	1804.435	3	0	1	0	1	0	1	1.242	1
62			min	-4105.652	1	-1766.371	1	0	1	0	1	0	1	-1.382	3
63		13	max	1034.243	3	1803.259	3	0	1	0	1	0	1	2.339	1
64			min	-4106.384	1	-1767.939	1	0	1	0	1	0	1	-2.501	3
65		14	max	414.132	1	1505.286	1	0	1	0	1	0	1	3.392	1
66			min	17.918	12	-1588.203	3	0	1	0	1	0	1	-3.573	3
67		15	max	413.401	1	1503.718	1	0	1	0	1	0	1	2.458	1
68			min	17.552	12	-1589.379	3	0	1	0	1	0	1	-2.587	3
69		16	max	412.669	1	1502.149	1	0	1	0	1	0	1	1.525	1
70			min	17.186	12	-1590.555	3	0	1	0	1	0	1	-1.601	3
71		17	max	411.938	1	1500.581	1	0	1	0	1	0	1	.593	1
72			min	16.821	12	-1591.732	3	0	1	0	1	0	1	-.613	3
73		18	max	.939	4	2.014	4	0	1	0	1	0	1	0	4
74			min	.221	15	.473	15	0	1	0	1	0	1	0	15
75		19	max	0	1	.005	1	0	1	0	1	0	1	0	1
76			min	0	1	-.009	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.001	1	0	1	0	1	0	1
78			min	0	1	0	3	0	15	0	1	0	1	0	1
79		2	max	-.221	15	-.473	15	.001	1	0	1	0	1	0	4
80			min	-.939	4	-2.011	4	0	15	0	1	0	15	0	15
81		3	max	-9.198	15	231.491	3	207.439	1	.254	1	-.013	15	.263	2
82			min	-218.456	1	-604.398	2	.67	3	-.062	3	-.332	1	-.099	3
83		4	max	-9.419	15	230.315	3	207.439	1	.254	1	-.008	15	.638	2
84			min	-219.187	1	-605.966	2	.67	3	-.062	3	-.203	1	-.242	3
85		5	max	-9.639	15	229.138	3	207.439	1	.254	1	.007	10	1.015	2
86			min	-219.919	1	-607.534	2	.67	3	-.062	3	-.075	1	-.385	3
87		6	max	303.427	3	535.961	2	280.579	1	.072	3	.046	3	.972	2
88			min	-1219.328	1	-140.455	3	-29.12	3	-.073	1	-.144	1	-.391	3
89		7	max	302.879	3	534.393	2	280.579	1	.072	3	.031	1	.647	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
90			min	-1220.059	1	-141.631	3	-29.12	3	-.073	1	-.014	10	-.304	3
91		8	max	302.33	3	532.825	2	280.579	1	.072	3	.205	1	.325	1
92			min	-1220.79	1	-142.808	3	-29.12	3	-.073	1	.007	12	-.215	3
93		9	max	286.747	3	72.517	3	283.874	1	.212	2	0	10	.142	1
94			min	-1447.078	1	-66.977	1	-23.08	3	.004	15	-.106	1	-.175	3
95		10	max	286.199	3	71.341	3	283.874	1	.212	2	.07	1	.184	1
96			min	-1447.809	1	-68.545	1	-23.08	3	.004	15	-.056	3	-.22	3
97		11	max	285.651	3	70.164	3	283.874	1	.212	2	.246	1	.227	1
98			min	-1448.541	1	-70.114	1	-23.08	3	.004	15	-.071	3	-.263	3
99		12	max	267.39	3	652.274	3	286.581	3	.465	1	-.007	15	.48	1
100			min	-1670.713	1	-584.008	1	-154.209	2	-.403	3	-.189	1	-.537	3
101		13	max	266.841	3	651.098	3	286.581	3	.465	1	.161	3	.843	1
102			min	-1671.444	1	-585.577	1	-154.209	2	-.403	3	-.248	1	-.941	3
103		14	max	220.685	1	525.219	1	158.805	1	.43	3	.063	1	1.192	1
104			min	9.885	15	-577.324	3	6.421	15	-.329	1	-.052	3	-1.328	3
105		15	max	219.954	1	523.65	1	158.805	1	.43	3	.162	1	.867	1
106			min	9.665	15	-578.5	3	6.421	15	-.329	1	-.03	3	-.969	3
107		16	max	219.223	1	522.082	1	158.805	1	.43	3	.261	1	.542	1
108			min	9.444	15	-579.676	3	6.421	15	-.329	1	-.009	3	-.61	3
109		17	max	218.491	1	520.514	1	158.805	1	.43	3	.359	1	.219	1
110			min	9.223	15	-580.853	3	6.421	15	-.329	1	.009	12	-.25	3
111		18	max	.939	4	2.013	4	0	15	0	1	0	1	0	4
112			min	.221	15	.473	15	-.001	1	0	1	0	15	0	15
113		19	max	0	1	.002	2	0	15	0	1	0	1	0	1
114			min	0	1	-.004	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	158.791	1	517.078	1	-8.783	15	.007	1	.423	1	.329	1
116			min	6.421	15	-583.165	3	-217.384	1	-.015	3	.017	15	-.43	3
117		2	max	158.791	1	376.581	1	-6.853	15	.007	1	.176	1	.217	3
118			min	6.421	15	-429.851	3	-170.465	1	-.015	3	.007	15	-.242	1
119		3	max	158.791	1	236.084	1	-4.924	15	.007	1	.012	2	.668	3
120			min	6.421	15	-276.537	3	-123.547	1	-.015	3	-.016	9	-.634	1
121		4	max	158.791	1	95.587	1	-2.994	15	.007	1	-.006	15	.924	3
122			min	6.421	15	-123.223	3	-76.628	1	-.015	3	-.14	1	-.846	1
123		5	max	158.791	1	30.091	3	-1.065	15	.007	1	-.009	15	.983	3
124			min	6.421	15	-44.91	1	-29.709	1	-.015	3	-.208	1	-.878	1
125		6	max	158.791	1	183.406	3	17.209	1	.007	1	-.009	15	.847	3
126			min	6.421	15	-185.407	1	-1.984	10	-.015	3	-.216	1	-.731	1
127		7	max	158.791	1	336.72	3	64.128	1	.007	1	-.006	15	.515	3
128			min	6.421	15	-325.904	1	2.252	12	-.015	3	-.164	1	-.404	1
129		8	max	158.791	1	490.034	3	111.046	1	.007	1	-.002	15	.102	1
130			min	6.421	15	-466.401	1	4.181	12	-.015	3	-.052	1	-.014	3
131		9	max	158.791	1	643.348	3	157.965	1	.007	1	.12	1	.788	1
132			min	6.421	15	-606.898	1	6.11	12	-.015	3	-.004	10	-.738	3
133		10	max	158.791	1	747.395	1	-8.039	12	.007	1	.351	1	1.653	1
134			min	6.421	15	-796.662	3	-204.883	1	-.015	3	.011	12	-1.658	3
135		11	max	158.791	1	606.898	1	-6.11	12	.015	3	.12	1	.788	1
136			min	6.421	15	-643.348	3	-157.965	1	-.007	1	-.004	10	-.738	3
137		12	max	158.791	1	466.401	1	-4.181	12	.015	3	-.002	15	.102	1
138			min	6.421	15	-490.034	3	-111.046	1	-.007	1	-.052	1	-.014	3
139		13	max	158.791	1	325.904	1	-2.252	12	.015	3	-.006	15	.515	3
140			min	6.421	15	-336.72	3	-64.128	1	-.007	1	-.164	1	-.404	1
141		14	max	158.791	1	185.407	1	1.984	10	.015	3	-.009	15	.847	3
142			min	6.421	15	-183.406	3	-17.209	1	-.007	1	-.216	1	-.731	1
143		15	max	158.791	1	44.91	1	29.709	1	.015	3	-.009	15	.983	3
144			min	6.421	15	-30.091	3	1.065	15	-.007	1	-.208	1	-.878	1
145		16	max	158.791	1	123.223	3	76.628	1	.015	3	-.006	15	.924	3
146			min	6.421	15	-95.587	1	2.994	15	-.007	1	-.14	1	-.846	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	158.791	1	276.537	3	123.547	1	.015	3	.012	2	.668	3
148			min	6.421	15	-236.084	1	4.924	15	-.007	1	-.016	9	-.634	1
149		18	max	158.791	1	429.851	3	170.465	1	.015	3	.176	1	.217	3
150			min	6.421	15	-376.581	1	6.853	15	-.007	1	.007	15	-.242	1
151		19	max	158.791	1	583.165	3	217.384	1	.015	3	.423	1	.329	1
152			min	6.421	15	-517.078	1	8.783	15	-.007	1	.017	15	-.43	3
153	M11	1	max	379.239	1	510.344	1	-9.004	15	0	15	.461	1	.288	1
154			min	-309.583	3	-583.915	3	-222.294	1	-.006	1	.018	15	-.518	3
155		2	max	379.239	1	369.847	1	-7.075	15	0	15	.207	1	.131	3
156			min	-309.583	3	-430.601	3	-175.375	1	-.006	1	.008	15	-.274	1
157		3	max	379.239	1	229.35	1	-5.145	15	0	15	.018	2	.583	3
158			min	-309.583	3	-277.287	3	-128.457	1	-.006	1	0	15	-.657	1
159		4	max	379.239	1	88.853	1	-3.216	15	0	15	.004	3	.839	3
160			min	-309.583	3	-123.973	3	-81.538	1	-.006	1	-.122	1	-.86	1
161		5	max	379.239	1	29.341	3	-1.287	15	0	15	-.004	12	.9	3
162			min	-309.583	3	-51.644	1	-34.62	1	-.006	1	-.196	1	-.884	1
163		6	max	379.239	1	182.656	3	12.299	1	0	15	-.008	12	.764	3
164			min	-309.583	3	-192.141	1	-3.126	3	-.006	1	-.21	1	-.728	1
165		7	max	379.239	1	335.97	3	59.217	1	0	15	-.006	15	.433	3
166			min	-309.583	3	-332.638	1	-.232	3	-.006	1	-.164	1	-.393	1
167		8	max	379.239	1	489.284	3	106.136	1	0	15	-.002	15	.122	1
168			min	-309.583	3	-473.135	1	1.929	12	-.006	1	-.059	1	-.094	3
169		9	max	379.239	1	642.598	3	153.054	1	0	15	.107	1	.816	1
170			min	-309.583	3	-613.632	1	3.858	12	-.006	1	-.006	3	-.818	3
171		10	max	379.239	1	754.129	1	-5.788	12	.006	1	.332	1	1.69	1
172			min	-309.583	3	-795.912	3	-199.973	1	-.001	3	.002	12	-1.737	3
173		11	max	379.239	1	613.632	1	-3.858	12	.006	1	.107	1	.816	1
174			min	-309.583	3	-642.598	3	-153.054	1	0	15	-.006	3	-.818	3
175		12	max	379.239	1	473.135	1	-1.929	12	.006	1	-.002	15	.122	1
176			min	-309.583	3	-489.284	3	-106.136	1	0	15	-.059	1	-.094	3
177		13	max	379.239	1	332.638	1	.232	3	.006	1	-.006	15	.433	3
178			min	-309.583	3	-335.97	3	-59.217	1	0	15	-.164	1	-.393	1
179		14	max	379.239	1	192.141	1	3.126	3	.006	1	-.008	12	.764	3
180			min	-309.583	3	-182.656	3	-12.299	1	0	15	-.21	1	-.728	1
181		15	max	379.239	1	51.644	1	34.62	1	.006	1	-.004	12	.9	3
182			min	-309.583	3	-29.341	3	1.287	15	0	15	-.196	1	-.884	1
183		16	max	379.239	1	123.973	3	81.538	1	.006	1	.004	3	.839	3
184			min	-309.583	3	-88.853	1	3.216	15	0	15	-.122	1	-.86	1
185		17	max	379.239	1	277.287	3	128.457	1	.006	1	.018	2	.583	3
186			min	-309.583	3	-229.35	1	5.145	15	0	15	0	15	-.657	1
187		18	max	379.239	1	430.601	3	175.375	1	.006	1	.207	1	.131	3
188			min	-309.583	3	-369.847	1	7.075	15	0	15	.008	15	-.274	1
189		19	max	379.239	1	583.915	3	222.294	1	.006	1	.461	1	.288	1
190			min	-309.583	3	-510.344	1	9.004	15	0	15	.018	15	-.518	3
191	M12	1	max	43.131	2	592.194	2	-9.097	15	0	12	.486	1	.281	2
192			min	-19.54	9	-216.86	3	-225.551	1	-.007	1	.019	15	.006	15
193		2	max	43.131	2	428.055	2	-7.167	15	0	12	.227	1	.277	3
194			min	-19.54	9	-150.557	3	-178.633	1	-.007	1	.009	15	-.391	1
195		3	max	43.131	2	263.917	2	-5.238	15	0	12	.033	2	.427	3
196			min	-19.54	9	-84.255	3	-131.714	1	-.007	1	0	15	-.823	1
197		4	max	43.131	2	99.778	2	-3.308	15	0	12	-.003	10	.493	3
198			min	-19.54	9	-17.952	3	-84.796	1	-.007	1	-.109	1	-1.049	1
199		5	max	43.131	2	48.351	3	-1.379	15	0	12	-.008	12	.473	3
200			min	-19.54	9	-66.875	1	-37.877	1	-.007	1	-.188	1	-1.067	2
201		6	max	43.131	2	114.653	3	9.041	1	0	12	-.008	15	.369	3
202			min	-19.54	9	-229.125	1	-3.474	10	-.007	1	-.206	1	-.88	2
203		7	max	43.131	2	180.956	3	55.96	1	0	12	-.006	15	.18	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	-19.54	9	-392.637	2	1.596	12	-.007	1	-.165	1	-.484	2
205		8	max	43.131	2	247.258	3	102.878	1	0	12	-.002	15	.123	2
206			min	-19.54	9	-556.775	2	3.525	12	-.007	1	-.063	1	-.093	3
207		9	max	43.131	2	313.561	3	149.797	1	0	12	.098	1	.939	2
208			min	-19.54	9	-720.914	2	5.455	12	-.007	1	-.008	10	-.452	3
209		10	max	43.131	2	885.052	2	-7.384	12	.007	1	.32	1	1.965	2
210			min	-19.54	9	-379.863	3	-196.715	1	0	12	.009	12	-.895	3
211		11	max	43.131	2	720.914	2	-5.455	12	.007	1	.098	1	.939	2
212			min	-19.54	9	-313.561	3	-149.797	1	0	12	-.008	10	-.452	3
213		12	max	43.131	2	556.775	2	-3.525	12	.007	1	-.002	15	.123	2
214			min	-19.54	9	-247.258	3	-102.878	1	0	12	-.063	1	-.093	3
215		13	max	43.131	2	392.637	2	-1.596	12	.007	1	-.006	15	.18	3
216			min	-19.54	9	-180.956	3	-55.96	1	0	12	-.165	1	-.484	2
217		14	max	43.131	2	229.125	1	3.474	10	.007	1	-.008	15	.369	3
218			min	-19.54	9	-114.653	3	-9.041	1	0	12	-.206	1	-.88	2
219		15	max	43.131	2	66.875	1	37.877	1	.007	1	-.008	12	.473	3
220			min	-19.54	9	-48.351	3	1.379	15	0	12	-.188	1	-1.067	2
221		16	max	43.131	2	17.952	3	84.796	1	.007	1	-.003	10	.493	3
222			min	-19.54	9	-99.778	2	3.308	15	0	12	-.109	1	-1.049	1
223		17	max	43.131	2	84.255	3	131.714	1	.007	1	.033	2	.427	3
224			min	-19.54	9	-263.917	2	5.238	15	0	12	0	15	-.823	1
225		18	max	43.131	2	150.557	3	178.633	1	.007	1	.227	1	.277	3
226			min	-19.54	9	-428.055	2	7.167	15	0	12	.009	15	-.391	1
227		19	max	43.131	2	216.86	3	225.551	1	.007	1	.486	1	.281	2
228			min	-19.54	9	-592.194	2	9.097	15	0	12	.019	15	.006	15
229	M13	1	max	-.671	3	601.737	2	-8.756	15	.006	3	.416	1	.254	1
230			min	-207.248	1	-233.877	3	-216.519	1	-.019	1	.016	15	-.062	3
231		2	max	-.671	3	437.598	2	-6.827	15	.006	3	.169	1	.194	3
232			min	-207.248	1	-167.575	3	-169.601	1	-.019	1	.006	15	-.414	2
233		3	max	-.671	3	273.46	2	-4.897	15	.006	3	.009	10	.366	3
234			min	-207.248	1	-101.272	3	-122.682	1	-.019	1	-.018	9	-.868	2
235		4	max	-.671	3	111.169	1	-2.968	15	.006	3	-.004	12	.453	3
236			min	-207.248	1	-34.969	3	-75.764	1	-.019	1	-.144	1	-1.113	2
237		5	max	-.671	3	31.333	3	-1.039	15	.006	3	-.008	12	.456	3
238			min	-207.248	1	-54.817	2	-28.845	1	-.019	1	-.211	1	-1.147	2
239		6	max	-.671	3	97.636	3	18.073	1	.006	3	-.009	15	.373	3
240			min	-207.248	1	-218.955	2	-1.62	10	-.019	1	-.218	1	-.974	1
241		7	max	-.671	3	163.938	3	64.992	1	.006	3	-.006	15	.206	3
242			min	-207.248	1	-383.094	2	1.768	12	-.019	1	-.165	1	-.598	1
243		8	max	-.671	3	230.241	3	111.91	1	.006	3	-.002	15	.008	10
244			min	-207.248	1	-547.232	2	3.697	12	-.019	1	-.052	1	-.046	3
245		9	max	-.671	3	296.543	3	158.829	1	.006	3	.121	1	.811	2
246			min	-207.248	1	-711.371	2	5.626	12	-.019	1	-.004	10	-.382	3
247		10	max	-.671	3	875.509	2	205.747	1	.019	1	.354	1	1.824	2
248			min	-207.248	1	-862.331	1	-105.371	11	0	15	.009	12	-.804	3
249		11	max	-.671	3	711.371	2	-5.626	12	.019	1	.121	1	.811	2
250			min	-207.248	1	-296.543	3	-158.829	1	-.006	3	-.004	10	-.382	3
251		12	max	-.671	3	547.232	2	-3.697	12	.019	1	-.002	15	.008	10
252			min	-207.248	1	-230.241	3	-111.91	1	-.006	3	-.052	1	-.046	3
253		13	max	-.671	3	383.094	2	-1.768	12	.019	1	-.006	15	.206	3
254			min	-207.248	1	-163.938	3	-64.992	1	-.006	3	-.165	1	-.598	1
255		14	max	-.671	3	218.955	2	1.62	10	.019	1	-.009	15	.373	3
256			min	-207.248	1	-97.636	3	-18.073	1	-.006	3	-.218	1	-.974	1
257		15	max	-.671	3	54.817	2	28.845	1	.019	1	-.008	12	.456	3
258			min	-207.248	1	-31.333	3	1.039	15	-.006	3	-.211	1	-1.147	2
259		16	max	-.671	3	34.969	3	75.764	1	.019	1	-.004	12	.453	3
260			min	-207.248	1	-111.169	1	2.968	15	-.006	3	-.144	1	-1.113	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	-.671	3	101.272	3	122.682	1	.019	1	.009	10	.366	3
262			min	-207.248	1	-273.46	2	4.897	15	-.006	3	-.018	9	-.868	2
263		18	max	-.671	3	167.575	3	169.601	1	.019	1	.169	1	.194	3
264			min	-207.248	1	-437.598	2	6.827	15	-.006	3	.006	15	-.414	2
265		19	max	-.671	3	233.877	3	216.519	1	.019	1	.416	1	.254	1
266			min	-207.248	1	-601.737	2	8.756	15	-.006	3	.016	15	-.062	3
267	M2	1	max	2459.01	1	739.026	3	329.039	1	.005	3	.351	3	5.375	1
268			min	-1376.34	3	-530.677	2	-280.864	3	-.011	1	-.415	1	.211	15
269		2	max	2456.455	1	739.026	3	329.039	1	.005	3	.272	3	5.412	1
270			min	-1378.256	3	-530.677	2	-280.864	3	-.011	1	-.323	1	.209	15
271		3	max	2453.9	1	739.026	3	329.039	1	.005	3	.194	3	5.45	1
272			min	-1380.172	3	-530.677	2	-280.864	3	-.011	1	-.231	1	.207	15
273		4	max	1851.716	1	1252.746	1	254.29	1	.002	1	.14	3	5.272	1
274			min	-1189.621	3	47.281	15	-251.563	3	-.001	3	-.196	1	.199	15
275		5	max	1849.162	1	1252.746	1	254.29	1	.002	1	.07	3	4.921	1
276			min	-1191.537	3	47.281	15	-251.563	3	-.001	3	-.124	1	.186	15
277		6	max	1846.607	1	1252.746	1	254.29	1	.002	1	0	12	4.569	1
278			min	-1193.453	3	47.281	15	-251.563	3	-.001	3	-.053	1	.172	15
279		7	max	1844.052	1	1252.746	1	254.29	1	.002	1	.034	2	4.218	1
280			min	-1195.369	3	47.281	15	-251.563	3	-.001	3	-.072	3	.159	15
281		8	max	1841.497	1	1252.746	1	254.29	1	.002	1	.096	2	3.866	1
282			min	-1197.285	3	47.281	15	-251.563	3	-.001	3	-.142	3	.146	15
283		9	max	1838.942	1	1252.746	1	254.29	1	.002	1	.161	1	3.515	1
284			min	-1199.202	3	47.281	15	-251.563	3	-.001	3	-.213	3	.133	15
285		10	max	1836.387	1	1252.746	1	254.29	1	.002	1	.232	1	3.163	1
286			min	-1201.118	3	47.281	15	-251.563	3	-.001	3	-.283	3	.119	15
287		11	max	1833.832	1	1252.746	1	254.29	1	.002	1	.304	1	2.812	1
288			min	-1203.034	3	47.281	15	-251.563	3	-.001	3	-.354	3	.106	15
289		12	max	1831.277	1	1252.746	1	254.29	1	.002	1	.375	1	2.46	1
290			min	-1204.95	3	47.281	15	-251.563	3	-.001	3	-.424	3	.093	15
291		13	max	1828.722	1	1252.746	1	254.29	1	.002	1	.446	1	2.109	1
292			min	-1206.866	3	47.281	15	-251.563	3	-.001	3	-.495	3	.08	15
293		14	max	1826.168	1	1252.746	1	254.29	1	.002	1	.518	1	1.757	1
294			min	-1208.782	3	47.281	15	-251.563	3	-.001	3	-.566	3	.066	15
295		15	max	1823.613	1	1252.746	1	254.29	1	.002	1	.589	1	1.406	1
296			min	-1210.699	3	47.281	15	-251.563	3	-.001	3	-.636	3	.053	15
297		16	max	1821.058	1	1252.746	1	254.29	1	.002	1	.66	1	1.054	1
298			min	-1212.615	3	47.281	15	-251.563	3	-.001	3	-.707	3	.04	15
299		17	max	1818.503	1	1252.746	1	254.29	1	.002	1	.732	1	.703	1
300			min	-1214.531	3	47.281	15	-251.563	3	-.001	3	-.777	3	.027	15
301		18	max	1815.948	1	1252.746	1	254.29	1	.002	1	.803	1	.351	1
302			min	-1216.447	3	47.281	15	-251.563	3	-.001	3	-.848	3	.013	15
303		19	max	1813.393	1	1252.746	1	254.29	1	.002	1	.875	1	0	1
304			min	-1218.363	3	47.281	15	-251.563	3	-.001	3	-.919	3	0	1
305	M5	1	max	6642.223	1	2048.917	3	0	1	0	1	0	1	11.171	1
306			min	-4133.592	3	-2018.246	2	0	1	0	1	0	1	.394	15
307		2	max	6639.668	1	2048.917	3	0	1	0	1	0	1	11.525	1
308			min	-4135.508	3	-2018.246	2	0	1	0	1	0	1	.398	15
309		3	max	6637.113	1	2048.917	3	0	1	0	1	0	1	11.879	1
310			min	-4137.424	3	-2018.246	2	0	1	0	1	0	1	.402	15
311		4	max	4943.396	1	2758.839	1	0	1	0	1	0	1	11.611	1
312			min	-3475.333	3	92.435	15	0	1	0	1	0	1	.389	15
313		5	max	4940.841	1	2758.839	1	0	1	0	1	0	1	10.837	1
314			min	-3477.249	3	92.435	15	0	1	0	1	0	1	.363	15
315		6	max	4938.287	1	2758.839	1	0	1	0	1	0	1	10.063	1
316			min	-3479.166	3	92.435	15	0	1	0	1	0	1	.337	15
317		7	max	4935.732	1	2758.839	1	0	1	0	1	0	1	9.289	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	-3481.082	3	92.435	15	0	1	0	1	0	1	.311	15
319		8	max	4933.177	1	2758.839	1	0	1	0	1	0	1	8.515	1
320			min	-3482.998	3	92.435	15	0	1	0	1	0	1	.285	15
321		9	max	4930.622	1	2758.839	1	0	1	0	1	0	1	7.741	1
322			min	-3484.914	3	92.435	15	0	1	0	1	0	1	.259	15
323		10	max	4928.067	1	2758.839	1	0	1	0	1	0	1	6.967	1
324			min	-3486.83	3	92.435	15	0	1	0	1	0	1	.233	15
325		11	max	4925.512	1	2758.839	1	0	1	0	1	0	1	6.193	1
326			min	-3488.746	3	92.435	15	0	1	0	1	0	1	.207	15
327		12	max	4922.957	1	2758.839	1	0	1	0	1	0	1	5.418	1
328			min	-3490.663	3	92.435	15	0	1	0	1	0	1	.182	15
329		13	max	4920.402	1	2758.839	1	0	1	0	1	0	1	4.644	1
330			min	-3492.579	3	92.435	15	0	1	0	1	0	1	.156	15
331		14	max	4917.847	1	2758.839	1	0	1	0	1	0	1	3.87	1
332			min	-3494.495	3	92.435	15	0	1	0	1	0	1	.13	15
333		15	max	4915.293	1	2758.839	1	0	1	0	1	0	1	3.096	1
334			min	-3496.411	3	92.435	15	0	1	0	1	0	1	.104	15
335		16	max	4912.738	1	2758.839	1	0	1	0	1	0	1	2.322	1
336			min	-3498.327	3	92.435	15	0	1	0	1	0	1	.078	15
337		17	max	4910.183	1	2758.839	1	0	1	0	1	0	1	1.548	1
338			min	-3500.243	3	92.435	15	0	1	0	1	0	1	.052	15
339		18	max	4907.628	1	2758.839	1	0	1	0	1	0	1	.774	1
340			min	-3502.16	3	92.435	15	0	1	0	1	0	1	.026	15
341		19	max	4905.073	1	2758.839	1	0	1	0	1	0	1	0	1
342			min	-3504.076	3	92.435	15	0	1	0	1	0	1	0	1
343	M8	1	max	2459.01	1	739.026	3	280.864	3	.011	1	.415	1	5.375	1
344			min	-1376.34	3	-530.677	2	-329.039	1	-.005	3	-.351	3	.211	15
345		2	max	2456.455	1	739.026	3	280.864	3	.011	1	.323	1	5.412	1
346			min	-1378.256	3	-530.677	2	-329.039	1	-.005	3	-.272	3	.209	15
347		3	max	2453.9	1	739.026	3	280.864	3	.011	1	.231	1	5.45	1
348			min	-1380.172	3	-530.677	2	-329.039	1	-.005	3	-.194	3	.207	15
349		4	max	1851.716	1	1252.746	1	251.563	3	.001	3	.196	1	5.272	1
350			min	-1189.621	3	47.281	15	-254.29	1	-.002	1	-.14	3	.199	15
351		5	max	1849.162	1	1252.746	1	251.563	3	.001	3	.124	1	4.921	1
352			min	-1191.537	3	47.281	15	-254.29	1	-.002	1	-.07	3	.186	15
353		6	max	1846.607	1	1252.746	1	251.563	3	.001	3	.053	1	4.569	1
354			min	-1193.453	3	47.281	15	-254.29	1	-.002	1	0	12	.172	15
355		7	max	1844.052	1	1252.746	1	251.563	3	.001	3	.072	3	4.218	1
356			min	-1195.369	3	47.281	15	-254.29	1	-.002	1	-.034	2	.159	15
357		8	max	1841.497	1	1252.746	1	251.563	3	.001	3	.142	3	3.866	1
358			min	-1197.285	3	47.281	15	-254.29	1	-.002	1	-.096	2	.146	15
359		9	max	1838.942	1	1252.746	1	251.563	3	.001	3	.213	3	3.515	1
360			min	-1199.202	3	47.281	15	-254.29	1	-.002	1	-.161	1	.133	15
361		10	max	1836.387	1	1252.746	1	251.563	3	.001	3	.283	3	3.163	1
362			min	-1201.118	3	47.281	15	-254.29	1	-.002	1	-.232	1	.119	15
363		11	max	1833.832	1	1252.746	1	251.563	3	.001	3	.354	3	2.812	1
364			min	-1203.034	3	47.281	15	-254.29	1	-.002	1	-.304	1	.106	15
365		12	max	1831.277	1	1252.746	1	251.563	3	.001	3	.424	3	2.46	1
366			min	-1204.95	3	47.281	15	-254.29	1	-.002	1	-.375	1	.093	15
367		13	max	1828.722	1	1252.746	1	251.563	3	.001	3	.495	3	2.109	1
368			min	-1206.866	3	47.281	15	-254.29	1	-.002	1	-.446	1	.08	15
369		14	max	1826.168	1	1252.746	1	251.563	3	.001	3	.566	3	1.757	1
370			min	-1208.782	3	47.281	15	-254.29	1	-.002	1	-.518	1	.066	15
371		15	max	1823.613	1	1252.746	1	251.563	3	.001	3	.636	3	1.406	1
372			min	-1210.699	3	47.281	15	-254.29	1	-.002	1	-.589	1	.053	15
373		16	max	1821.058	1	1252.746	1	251.563	3	.001	3	.707	3	1.054	1
374			min	-1212.615	3	47.281	15	-254.29	1	-.002	1	-.66	1	.04	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
375		17	max	1818.503	1	1252.746	1	251.563	3	.001	3	.777	3	.703	1
376			min	-1214.531	3	47.281	15	-254.29	1	-.002	1	-.732	1	.027	15
377		18	max	1815.948	1	1252.746	1	251.563	3	.001	3	.848	3	.351	1
378			min	-1216.447	3	47.281	15	-254.29	1	-.002	1	-.803	1	.013	15
379		19	max	1813.393	1	1252.746	1	251.563	3	.001	3	.919	3	0	1
380			min	-1218.363	3	47.281	15	-254.29	1	-.002	1	-.875	1	0	1
381	M3	1	max	1528.96	2	4.588	4	73.776	1	.021	3	.006	2	0	1
382			min	-486.318	3	1.079	15	-29.796	3	-.048	2	-.003	3	0	1
383		2	max	1528.786	2	4.078	4	73.776	1	.021	3	.027	1	0	15
384			min	-486.449	3	.959	15	-29.796	3	-.048	2	-.012	3	-.001	4
385		3	max	1528.612	2	3.569	4	73.776	1	.021	3	.049	1	0	15
386			min	-486.58	3	.839	15	-29.796	3	-.048	2	-.02	3	-.002	4
387		4	max	1528.437	2	3.059	4	73.776	1	.021	3	.07	1	0	15
388			min	-486.711	3	.719	15	-29.796	3	-.048	2	-.029	3	-.003	4
389		5	max	1528.263	2	2.549	4	73.776	1	.021	3	.092	1	0	15
390			min	-486.842	3	.599	15	-29.796	3	-.048	2	-.038	3	-.004	4
391		6	max	1528.088	2	2.039	4	73.776	1	.021	3	.114	1	-.001	15
392			min	-486.972	3	.479	15	-29.796	3	-.048	2	-.047	3	-.005	4
393		7	max	1527.914	2	1.529	4	73.776	1	.021	3	.135	1	-.001	15
394			min	-487.103	3	.36	15	-29.796	3	-.048	2	-.055	3	-.005	4
395		8	max	1527.74	2	1.02	4	73.776	1	.021	3	.157	1	-.001	15
396			min	-487.234	3	.24	15	-29.796	3	-.048	2	-.064	3	-.006	4
397		9	max	1527.565	2	.51	4	73.776	1	.021	3	.178	1	-.001	15
398			min	-487.365	3	.12	15	-29.796	3	-.048	2	-.073	3	-.006	4
399		10	max	1527.391	2	0	1	73.776	1	.021	3	.2	1	-.001	15
400			min	-487.496	3	0	1	-29.796	3	-.048	2	-.081	3	-.006	4
401		11	max	1527.217	2	-.12	15	73.776	1	.021	3	.221	1	-.001	15
402			min	-487.626	3	-.51	4	-29.796	3	-.048	2	-.09	3	-.006	4
403		12	max	1527.042	2	-.24	15	73.776	1	.021	3	.243	1	-.001	15
404			min	-487.757	3	-1.02	4	-29.796	3	-.048	2	-.099	3	-.006	4
405		13	max	1526.868	2	-.36	15	73.776	1	.021	3	.265	1	-.001	15
406			min	-487.888	3	-1.529	4	-29.796	3	-.048	2	-.108	3	-.005	4
407		14	max	1526.693	2	-.479	15	73.776	1	.021	3	.286	1	-.001	15
408			min	-488.019	3	-2.039	4	-29.796	3	-.048	2	-.116	3	-.005	4
409		15	max	1526.519	2	-.599	15	73.776	1	.021	3	.308	1	0	15
410			min	-488.15	3	-2.549	4	-29.796	3	-.048	2	-.125	3	-.004	4
411		16	max	1526.345	2	-.719	15	73.776	1	.021	3	.329	1	0	15
412			min	-488.28	3	-3.059	4	-29.796	3	-.048	2	-.134	3	-.003	4
413		17	max	1526.17	2	-.839	15	73.776	1	.021	3	.351	1	0	15
414			min	-488.411	3	-3.569	4	-29.796	3	-.048	2	-.142	3	-.002	4
415		18	max	1525.996	2	-.959	15	73.776	1	.021	3	.373	1	0	15
416			min	-488.542	3	-4.078	4	-29.796	3	-.048	2	-.151	3	-.001	4
417		19	max	1525.821	2	-1.079	15	73.776	1	.021	3	.394	1	0	1
418			min	-488.673	3	-4.588	4	-29.796	3	-.048	2	-.16	3	0	1
419	M6	1	max	4434.848	2	4.588	4	0	1	0	1	0	1	0	1
420			min	-1666.298	3	1.079	15	0	1	0	1	0	1	0	1
421		2	max	4434.674	2	4.078	4	0	1	0	1	0	1	0	15
422			min	-1666.428	3	.959	15	0	1	0	1	0	1	-.001	4
423		3	max	4434.5	2	3.569	4	0	1	0	1	0	1	0	15
424			min	-1666.559	3	.839	15	0	1	0	1	0	1	-.002	4
425		4	max	4434.325	2	3.059	4	0	1	0	1	0	1	0	15
426			min	-1666.69	3	.719	15	0	1	0	1	0	1	-.003	4
427		5	max	4434.151	2	2.549	4	0	1	0	1	0	1	0	15
428			min	-1666.821	3	.599	15	0	1	0	1	0	1	-.004	4
429		6	max	4433.977	2	2.039	4	0	1	0	1	0	1	-.001	15
430			min	-1666.952	3	.479	15	0	1	0	1	0	1	-.005	4
431		7	max	4433.802	2	1.529	4	0	1	0	1	0	1	-.001	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	-1667.082	3	.36	15	0	1	0	1	0	1	-.005	4
433		8	max	4433.628	2	1.02	4	0	1	0	1	0	1	-.001	15
434			min	-1667.213	3	.24	15	0	1	0	1	0	1	-.006	4
435		9	max	4433.453	2	.51	4	0	1	0	1	0	1	-.001	15
436			min	-1667.344	3	.12	15	0	1	0	1	0	1	-.006	4
437		10	max	4433.279	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1667.475	3	0	1	0	1	0	1	0	1	-.006	4
439		11	max	4433.105	2	-.12	15	0	1	0	1	0	1	-.001	15
440			min	-1667.605	3	-.51	4	0	1	0	1	0	1	-.006	4
441		12	max	4432.93	2	-.24	15	0	1	0	1	0	1	-.001	15
442			min	-1667.736	3	-1.02	4	0	1	0	1	0	1	-.006	4
443		13	max	4432.756	2	-.36	15	0	1	0	1	0	1	-.001	15
444			min	-1667.867	3	-1.529	4	0	1	0	1	0	1	-.005	4
445		14	max	4432.581	2	-.479	15	0	1	0	1	0	1	-.001	15
446			min	-1667.998	3	-2.039	4	0	1	0	1	0	1	-.005	4
447		15	max	4432.407	2	-.599	15	0	1	0	1	0	1	0	15
448			min	-1668.129	3	-2.549	4	0	1	0	1	0	1	-.004	4
449		16	max	4432.233	2	-.719	15	0	1	0	1	0	1	0	15
450			min	-1668.259	3	-3.059	4	0	1	0	1	0	1	-.003	4
451		17	max	4432.058	2	-.839	15	0	1	0	1	0	1	0	15
452			min	-1668.39	3	-3.569	4	0	1	0	1	0	1	-.002	4
453		18	max	4431.884	2	-.959	15	0	1	0	1	0	1	0	15
454			min	-1668.521	3	-4.078	4	0	1	0	1	0	1	-.001	4
455		19	max	4431.71	2	-1.079	15	0	1	0	1	0	1	0	1
456			min	-1668.652	3	-4.588	4	0	1	0	1	0	1	0	1
457	M9	1	max	1528.96	2	4.588	4	29.796	3	.048	2	.003	3	0	1
458			min	-486.318	3	1.079	15	-73.776	1	-.021	3	-.006	2	0	1
459		2	max	1528.786	2	4.078	4	29.796	3	.048	2	.012	3	0	15
460			min	-486.449	3	.959	15	-73.776	1	-.021	3	-.027	1	-.001	4
461		3	max	1528.612	2	3.569	4	29.796	3	.048	2	.02	3	0	15
462			min	-486.58	3	.839	15	-73.776	1	-.021	3	-.049	1	-.002	4
463		4	max	1528.437	2	3.059	4	29.796	3	.048	2	.029	3	0	15
464			min	-486.711	3	.719	15	-73.776	1	-.021	3	-.07	1	-.003	4
465		5	max	1528.263	2	2.549	4	29.796	3	.048	2	.038	3	0	15
466			min	-486.842	3	.599	15	-73.776	1	-.021	3	-.092	1	-.004	4
467		6	max	1528.088	2	2.039	4	29.796	3	.048	2	.047	3	-.001	15
468			min	-486.972	3	.479	15	-73.776	1	-.021	3	-.114	1	-.005	4
469		7	max	1527.914	2	1.529	4	29.796	3	.048	2	.055	3	-.001	15
470			min	-487.103	3	.36	15	-73.776	1	-.021	3	-.135	1	-.005	4
471		8	max	1527.74	2	1.02	4	29.796	3	.048	2	.064	3	-.001	15
472			min	-487.234	3	.24	15	-73.776	1	-.021	3	-.157	1	-.006	4
473		9	max	1527.565	2	.51	4	29.796	3	.048	2	.073	3	-.001	15
474			min	-487.365	3	.12	15	-73.776	1	-.021	3	-.178	1	-.006	4
475		10	max	1527.391	2	0	1	29.796	3	.048	2	.081	3	-.001	15
476			min	-487.496	3	0	1	-73.776	1	-.021	3	-.2	1	-.006	4
477		11	max	1527.217	2	-.12	15	29.796	3	.048	2	.09	3	-.001	15
478			min	-487.626	3	-.51	4	-73.776	1	-.021	3	-.221	1	-.006	4
479		12	max	1527.042	2	-.24	15	29.796	3	.048	2	.099	3	-.001	15
480			min	-487.757	3	-1.02	4	-73.776	1	-.021	3	-.243	1	-.006	4
481		13	max	1526.868	2	-.36	15	29.796	3	.048	2	.108	3	-.001	15
482			min	-487.888	3	-1.529	4	-73.776	1	-.021	3	-.265	1	-.005	4
483		14	max	1526.693	2	-.479	15	29.796	3	.048	2	.116	3	-.001	15
484			min	-488.019	3	-2.039	4	-73.776	1	-.021	3	-.286	1	-.005	4
485		15	max	1526.519	2	-.599	15	29.796	3	.048	2	.125	3	0	15
486			min	-488.15	3	-2.549	4	-73.776	1	-.021	3	-.308	1	-.004	4
487		16	max	1526.345	2	-.719	15	29.796	3	.048	2	.134	3	0	15
488			min	-488.28	3	-3.059	4	-73.776	1	-.021	3	-.329	1	-.003	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	1526.17	2	-.839	15	29.796	3	.048	2	.142	3	0	15
490			min	-488.411	3	-3.569	4	-73.776	1	-.021	3	-.351	1	-.002	4
491		18	max	1525.996	2	-.959	15	29.796	3	.048	2	.151	3	0	15
492			min	-488.542	3	-4.078	4	-73.776	1	-.021	3	-.373	1	-.001	4
493		19	max	1525.821	2	-1.079	15	29.796	3	.048	2	.16	3	0	1
494			min	-488.673	3	-4.588	4	-73.776	1	-.021	3	-.394	1	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	-.01	15	.023	3	.032	1	1.057e-2	3	NC	3	NC	3
2			min	-.266	1	-.643	1	.001	15	-2.926e-2	1	191.828	1	2213.199	1
3		2	max	-.01	15	.005	3	.01	1	1.057e-2	3	NC	12	NC	3
4			min	-.266	1	-.546	1	0	12	-2.926e-2	1	222.94	1	3504.852	1
5		3	max	-.01	15	-.01	12	0	15	1.008e-2	3	6866.958	15	NC	2
6			min	-.266	1	-.448	1	-.009	1	-2.726e-2	1	266.148	1	7046.306	1
7		4	max	-.01	15	-.013	15	0	15	9.334e-3	3	8150.43	15	NC	1
8			min	-.266	1	-.354	1	-.017	1	-2.42e-2	1	327.361	1	NC	1
9		5	max	-.01	15	-.01	15	0	3	8.586e-3	3	9845.002	15	NC	1
10			min	-.266	1	-.268	1	-.018	1	-2.114e-2	1	413.624	1	NC	1
11		6	max	-.01	15	-.008	15	.001	3	8.794e-3	3	NC	15	NC	1
12			min	-.265	1	-.197	1	-.015	1	-2.041e-2	1	529.886	1	NC	1
13		7	max	-.01	15	-.005	15	.002	3	9.663e-3	3	NC	15	NC	2
14			min	-.265	1	-.14	1	-.007	1	-2.128e-2	1	685.172	1	6418.86	1
15		8	max	-.01	15	-.004	15	0	3	1.053e-2	3	NC	5	NC	2
16			min	-.264	1	-.092	1	-.002	2	-2.216e-2	1	910.263	1	4878.339	1
17		9	max	-.01	15	-.002	15	0	15	1.159e-2	3	NC	5	NC	2
18			min	-.264	1	-.051	3	0	1	-2.195e-2	1	1298.692	1	4810.855	1
19		10	max	-.01	15	.003	10	0	1	1.297e-2	3	NC	2	NC	2
20			min	-.263	1	-.044	3	0	3	-1.983e-2	1	1986.522	3	4704.387	1
21		11	max	-.01	15	.034	1	.002	3	1.435e-2	3	NC	5	NC	2
22			min	-.263	1	-.034	3	-.002	1	-1.77e-2	1	2315.912	3	5038.641	1
23		12	max	-.01	15	.071	1	.007	3	1.175e-2	3	NC	4	NC	2
24			min	-.262	1	-.021	3	-.009	1	-1.335e-2	1	2139.796	2	6922.126	1
25		13	max	-.01	15	.101	1	.013	3	6.899e-3	3	NC	4	NC	2
26			min	-.261	1	-.001	3	-.01	1	-7.755e-3	1	1642.115	2	7553.207	1
27		14	max	-.01	15	.12	1	.012	3	2.27e-3	3	NC	3	NC	2
28			min	-.261	1	.005	15	-.006	2	-2.367e-3	1	1480.738	2	5354.612	1
29		15	max	-.01	15	.122	1	.008	3	7.447e-3	3	NC	4	NC	2
30			min	-.261	1	.005	15	0	10	-6.322e-3	1	1566.993	2	3752.472	1
31		16	max	-.01	15	.148	3	.012	1	1.262e-2	3	NC	4	NC	3
32			min	-.261	1	.005	15	0	15	-1.028e-2	1	1072.492	3	3302.031	1
33		17	max	-.01	15	.222	3	.008	1	1.78e-2	3	NC	4	NC	3
34			min	-.261	1	.004	15	0	15	-1.423e-2	1	676.432	3	3711.047	1
35		18	max	-.01	15	.298	3	0	15	2.118e-2	3	NC	4	NC	2
36			min	-.261	1	-.002	10	-.009	1	-1.681e-2	1	488.114	3	6823.005	1
37		19	max	-.01	15	.374	3	-.001	15	2.118e-2	3	NC	1	NC	1
38			min	-.261	1	-.016	10	-.028	1	-1.681e-2	1	381.941	3	NC	1
39	M4	1	max	-.02	15	.159	3	0	1	0	1	NC	3	NC	1
40			min	-.582	1	-1.519	1	0	1	0	1	89.239	1	NC	1
41		2	max	-.02	15	.098	3	0	1	0	1	3606.66	12	NC	1
42			min	-.582	1	-1.28	1	0	1	0	1	106.118	1	NC	1
43		3	max	-.02	15	.038	3	0	1	0	1	3875.211	15	NC	1
44			min	-.582	1	-1.041	1	0	1	0	1	130.945	1	NC	1
45		4	max	-.02	15	-.014	12	0	1	0	1	4832.823	15	NC	1
46			min	-.581	1	-.81	1	0	1	0	1	169.079	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	-.02	15	-.02	15	0	1	0	1	6232.296	15	NC	1
48			min	-.581	1	-.603	1	0	1	0	1	228.855	1	NC	1
49		6	max	-.02	15	-.015	15	0	1	0	1	8212.645	15	NC	1
50			min	-.58	1	-.435	1	0	1	0	1	320.536	1	NC	1
51		7	max	-.02	15	-.01	15	0	1	0	1	NC	15	NC	1
52			min	-.579	1	-.306	1	0	1	0	1	464.642	1	NC	1
53		8	max	-.02	15	-.007	15	0	1	0	1	NC	5	NC	1
54			min	-.578	1	-.2	1	0	1	0	1	495.089	3	NC	1
55		9	max	-.019	15	-.004	15	0	1	0	1	NC	5	NC	1
56			min	-.577	1	-.107	3	0	1	0	1	503.697	3	NC	1
57		10	max	-.019	15	.003	10	0	1	0	1	NC	1	NC	1
58			min	-.575	1	-.098	3	0	1	0	1	521.612	3	NC	1
59		11	max	-.019	15	.079	1	0	1	0	1	NC	4	NC	1
60			min	-.574	1	-.083	3	0	1	0	1	555.679	3	NC	1
61		12	max	-.019	15	.161	1	0	1	0	1	NC	5	NC	1
62			min	-.572	1	-.059	3	0	1	0	1	608.677	2	NC	1
63		13	max	-.019	15	.227	1	0	1	0	1	NC	5	NC	1
64			min	-.571	1	-.016	3	0	1	0	1	502.439	2	NC	1
65		14	max	-.019	15	.26	1	0	1	0	1	NC	5	NC	1
66			min	-.569	1	.009	15	0	1	0	1	469.274	2	NC	1
67		15	max	-.019	15	.248	1	0	1	0	1	NC	5	NC	1
68			min	-.569	1	.009	15	0	1	0	1	505.316	2	NC	1
69		16	max	-.019	15	.348	3	0	1	0	1	NC	5	NC	1
70			min	-.569	1	.008	15	0	1	0	1	614.389	1	NC	1
71		17	max	-.019	15	.531	3	0	1	0	1	NC	5	NC	1
72			min	-.57	1	.006	15	0	1	0	1	360.087	3	NC	1
73		18	max	-.019	15	.722	3	0	1	0	1	NC	5	NC	1
74			min	-.57	1	-.025	10	0	1	0	1	237.802	3	NC	1
75		19	max	-.019	15	.913	3	0	1	0	1	NC	1	NC	1
76			min	-.57	1	-.092	2	0	1	0	1	177.639	3	NC	1
77	M7	1	max	-.01	15	.023	3	-.001	15	2.926e-2	1	NC	3	NC	3
78			min	-.266	1	-.643	1	-.032	1	-1.057e-2	3	191.828	1	2213.199	1
79		2	max	-.01	15	.005	3	0	12	2.926e-2	1	NC	12	NC	3
80			min	-.266	1	-.546	1	-.01	1	-1.057e-2	3	222.94	1	3504.852	1
81		3	max	-.01	15	-.01	12	.009	1	2.726e-2	1	6866.958	15	NC	2
82			min	-.266	1	-.448	1	0	15	-1.008e-2	3	266.148	1	7046.306	1
83		4	max	-.01	15	-.013	15	.017	1	2.42e-2	1	8150.43	15	NC	1
84			min	-.266	1	-.354	1	0	15	-9.334e-3	3	327.361	1	NC	1
85		5	max	-.01	15	-.01	15	.018	1	2.114e-2	1	9845.002	15	NC	1
86			min	-.266	1	-.268	1	0	3	-8.586e-3	3	413.624	1	NC	1
87		6	max	-.01	15	-.008	15	.015	1	2.041e-2	1	NC	15	NC	1
88			min	-.265	1	-.197	1	-.001	3	-8.794e-3	3	529.886	1	NC	1
89		7	max	-.01	15	-.005	15	.007	1	2.128e-2	1	NC	15	NC	2
90			min	-.265	1	-.14	1	-.002	3	-9.663e-3	3	685.172	1	6418.86	1
91		8	max	-.01	15	-.004	15	.002	2	2.216e-2	1	NC	5	NC	2
92			min	-.264	1	-.092	1	0	3	-1.053e-2	3	910.263	1	4878.339	1
93		9	max	-.01	15	-.002	15	0	1	2.195e-2	1	NC	5	NC	2
94			min	-.264	1	-.051	3	0	15	-1.159e-2	3	1298.692	1	4810.855	1
95		10	max	-.01	15	.003	10	0	3	1.983e-2	1	NC	2	NC	2
96			min	-.263	1	-.044	3	0	1	-1.297e-2	3	1986.522	3	4704.387	1
97		11	max	-.01	15	.034	1	.002	1	1.77e-2	1	NC	5	NC	2
98			min	-.263	1	-.034	3	-.002	3	-1.435e-2	3	2315.912	3	5038.641	1
99		12	max	-.01	15	.071	1	.009	1	1.335e-2	1	NC	4	NC	2
100			min	-.262	1	-.021	3	-.007	3	-1.175e-2	3	2139.796	2	6922.126	1
101		13	max	-.01	15	.101	1	.01	1	7.755e-3	1	NC	4	NC	2
102			min	-.261	1	-.001	3	-.013	3	-6.899e-3	3	1642.115	2	7553.207	1
103		14	max	-.01	15	.12	1	.006	2	2.367e-3	1	NC	3	NC	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
104			min	-.261	1	.005	15	-.012	3	-2.27e-3	3	1480.738	2	5354.612	1
105		15	max	-.01	15	.122	1	0	10	6.322e-3	1	NC	4	NC	2
106			min	-.261	1	.005	15	-.008	3	-7.447e-3	3	1566.993	2	3752.472	1
107		16	max	-.01	15	.148	3	0	15	1.028e-2	1	NC	4	NC	3
108			min	-.261	1	.005	15	-.012	1	-1.262e-2	3	1072.492	3	3302.031	1
109		17	max	-.01	15	.222	3	0	15	1.423e-2	1	NC	4	NC	3
110			min	-.261	1	.004	15	-.008	1	-1.78e-2	3	676.432	3	3711.047	1
111		18	max	-.01	15	.298	3	.009	1	1.681e-2	1	NC	4	NC	2
112			min	-.261	1	-.002	10	0	15	-2.118e-2	3	488.114	3	6823.005	1
113		19	max	-.01	15	.374	3	.028	1	1.681e-2	1	NC	1	NC	1
114			min	-.261	1	-.016	10	.001	15	-2.118e-2	3	381.941	3	NC	1
115	M10	1	max	.002	1	.271	3	.261	1	1.025e-2	3	NC	1	NC	1
116			min	0	15	.003	10	.01	15	-3.245e-3	2	NC	1	NC	1
117		2	max	.002	1	.609	3	.345	1	1.196e-2	3	NC	5	NC	3
118			min	0	15	-.206	2	.013	15	-3.986e-3	2	818.497	3	3278.854	1
119		3	max	.001	1	.92	3	.477	1	1.367e-2	3	NC	5	NC	3
120			min	0	15	-.419	1	.018	15	-4.728e-3	2	425.671	3	1281.604	1
121		4	max	.001	1	1.147	3	.606	1	1.538e-2	3	NC	15	NC	5
122			min	0	15	-.575	1	.023	15	-5.47e-3	2	315.4	3	800.844	1
123		5	max	0	1	1.256	3	.7	1	1.709e-2	3	NC	15	NC	5
124			min	0	15	-.623	1	.027	15	-6.212e-3	2	280.434	3	629.094	1
125		6	max	0	1	1.239	3	.741	1	1.88e-2	3	NC	15	NC	5
126			min	0	15	-.559	1	.028	15	-6.954e-3	2	285.122	3	575.076	1
127		7	max	0	1	1.116	3	.727	1	2.051e-2	3	NC	5	NC	5
128			min	0	15	-.407	2	.027	15	-7.695e-3	2	326.936	3	592.034	1
129		8	max	0	1	.927	3	.672	1	2.222e-2	3	NC	5	NC	5
130			min	0	15	-.231	2	.024	15	-8.437e-3	2	420.838	3	671.513	1
131		9	max	0	1	.743	3	.605	1	2.393e-2	3	NC	4	NC	5
132			min	0	15	-.068	2	.021	15	-9.251e-3	1	585.567	3	803.395	1
133		10	max	0	1	.656	3	.57	1	2.564e-2	3	NC	1	NC	5
134			min	0	1	-.011	10	.019	15	-1.007e-2	1	717.759	3	894.591	1
135		11	max	0	15	.743	3	.605	1	2.393e-2	3	NC	4	NC	5
136			min	0	1	-.068	2	.021	15	-9.251e-3	1	585.567	3	803.395	1
137		12	max	0	15	.927	3	.672	1	2.222e-2	3	NC	5	NC	5
138			min	0	1	-.231	2	.024	15	-8.437e-3	2	420.838	3	671.513	1
139		13	max	0	15	1.116	3	.727	1	2.051e-2	3	NC	5	NC	5
140			min	0	1	-.407	2	.027	15	-7.695e-3	2	326.936	3	592.034	1
141		14	max	0	15	1.239	3	.741	1	1.88e-2	3	NC	15	NC	5
142			min	0	1	-.559	1	.028	15	-6.954e-3	2	285.122	3	575.076	1
143		15	max	0	15	1.256	3	.7	1	1.709e-2	3	NC	15	NC	5
144			min	0	1	-.623	1	.027	15	-6.212e-3	2	280.434	3	629.094	1
145		16	max	0	15	1.147	3	.606	1	1.538e-2	3	NC	15	NC	5
146			min	-.001	1	-.575	1	.023	15	-5.47e-3	2	315.4	3	800.844	1
147		17	max	0	15	.92	3	.477	1	1.367e-2	3	NC	5	NC	3
148			min	-.001	1	-.419	1	.018	15	-4.728e-3	2	425.671	3	1281.604	1
149		18	max	0	15	.609	3	.345	1	1.196e-2	3	NC	5	NC	3
150			min	-.002	1	-.206	2	.013	15	-3.986e-3	2	818.497	3	3278.854	1
151		19	max	0	15	.271	3	.261	1	1.025e-2	3	NC	1	NC	1
152			min	-.002	1	.003	10	.01	15	-3.245e-3	2	NC	1	NC	1
153	M11	1	max	.004	1	.048	1	.263	1	4.967e-3	1	NC	1	NC	1
154			min	-.003	3	-.03	3	.01	15	1.912e-4	15	NC	1	NC	1
155		2	max	.004	1	.216	3	.33	1	5.652e-3	1	NC	5	NC	3
156			min	-.003	3	-.217	1	.013	15	2.117e-4	15	1042.506	1	4107.673	1
157		3	max	.003	1	.447	3	.452	1	6.336e-3	1	NC	5	NC	3
158			min	-.003	3	-.448	1	.017	15	2.322e-4	15	556.535	1	1456.436	1
159		4	max	.003	1	.604	3	.579	1	7.021e-3	1	NC	15	NC	3
160			min	-.002	3	-.596	1	.022	15	2.527e-4	15	428.614	1	872.308	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
161		5	max	.002	1	.655	3	.675	1	7.705e-3	1	NC	15	NC	3
162			min	-.002	3	-.634	1	.025	15	2.731e-4	15	402.703	3	668.348	1
163		6	max	.002	1	.592	3	.722	1	8.39e-3	1	NC	5	NC	5
164			min	-.002	3	-.56	1	.027	15	2.936e-4	15	443.796	3	600.19	1
165		7	max	.001	1	.431	3	.716	1	9.074e-3	1	NC	5	NC	5
166			min	-.001	3	-.394	1	.026	15	3.141e-4	15	597.984	3	608.768	1
167		8	max	0	1	.217	3	.668	1	9.759e-3	1	NC	5	NC	5
168			min	0	3	-.178	1	.024	15	3.346e-4	15	1116.384	3	680.781	1
169		9	max	0	1	.019	1	.606	1	1.044e-2	1	NC	2	NC	5
170			min	0	3	0	15	.021	15	3.551e-4	15	5841.472	3	803.537	1
171		10	max	0	1	.109	1	.573	1	1.113e-2	1	NC	4	NC	5
172			min	0	1	-.075	3	.019	15	3.755e-4	15	4497.218	1	888.376	1
173		11	max	0	3	.019	1	.606	1	1.044e-2	1	NC	2	NC	5
174			min	0	1	0	15	.021	15	3.551e-4	15	5841.472	3	803.537	1
175		12	max	0	3	.217	3	.668	1	9.759e-3	1	NC	5	NC	5
176			min	0	1	-.178	1	.024	15	3.346e-4	15	1116.384	3	680.781	1
177		13	max	.001	3	.431	3	.716	1	9.074e-3	1	NC	5	NC	5
178			min	-.001	1	-.394	1	.026	15	3.141e-4	15	597.984	3	608.768	1
179		14	max	.002	3	.592	3	.722	1	8.39e-3	1	NC	5	NC	5
180			min	-.002	1	-.56	1	.027	15	2.936e-4	15	443.796	3	600.19	1
181		15	max	.002	3	.655	3	.675	1	7.705e-3	1	NC	15	NC	3
182			min	-.002	1	-.634	1	.025	15	2.731e-4	15	402.703	3	668.348	1
183		16	max	.002	3	.604	3	.579	1	7.021e-3	1	NC	15	NC	3
184			min	-.003	1	-.596	1	.022	15	2.527e-4	15	428.614	1	872.308	1
185		17	max	.003	3	.447	3	.452	1	6.336e-3	1	NC	5	NC	3
186			min	-.003	1	-.448	1	.017	15	2.322e-4	15	556.535	1	1456.436	1
187		18	max	.003	3	.216	3	.33	1	5.652e-3	1	NC	5	NC	3
188			min	-.004	1	-.217	1	.013	15	2.117e-4	15	1042.506	1	4107.673	1
189		19	max	.003	3	.048	1	.263	1	4.967e-3	1	NC	1	NC	1
190			min	-.004	1	-.03	3	.01	15	1.912e-4	15	NC	1	NC	1
191	M12	1	max	0	2	-.003	15	.264	1	5.901e-3	1	NC	1	NC	1
192			min	0	9	-.063	1	.01	15	2.229e-4	15	NC	1	NC	1
193		2	max	0	2	.109	3	.32	1	6.678e-3	1	NC	5	NC	2
194			min	0	9	-.412	1	.012	15	2.467e-4	15	790.511	1	4918.509	1
195		3	max	0	2	.235	3	.437	1	7.455e-3	1	NC	5	NC	3
196			min	0	9	-.713	1	.017	15	2.705e-4	15	424.666	1	1598.029	1
197		4	max	0	2	.307	3	.562	1	8.232e-3	1	NC	15	NC	5
198			min	0	9	-.91	1	.021	15	2.943e-4	15	326.141	1	925.628	1
199		5	max	0	2	.317	3	.661	1	9.009e-3	1	NC	15	NC	5
200			min	0	9	-.972	1	.025	15	3.18e-4	15	303.651	1	696.103	1
201		6	max	0	2	.265	3	.711	1	9.786e-3	1	NC	15	NC	5
202			min	0	9	-.899	1	.026	15	3.418e-4	15	330.305	1	617.09	1
203		7	max	0	2	.167	3	.71	1	1.056e-2	1	NC	5	NC	5
204			min	0	9	-.714	1	.026	15	3.656e-4	15	424.14	1	619.276	1
205		8	max	0	2	.046	3	.667	1	1.134e-2	1	NC	5	NC	5
206			min	0	9	-.469	1	.024	15	3.894e-4	15	680.292	1	685.598	1
207		9	max	0	2	-.007	15	.608	1	1.212e-2	1	NC	3	NC	5
208			min	0	9	-.242	1	.021	15	4.132e-4	15	1544.006	1	801.536	1
209		10	max	0	1	-.005	15	.577	1	1.289e-2	1	NC	4	NC	5
210			min	0	1	-.138	1	.019	15	4.37e-4	15	3682.12	1	881.734	1
211		11	max	0	9	-.007	15	.608	1	1.212e-2	1	NC	3	NC	5
212			min	0	2	-.242	1	.021	15	4.132e-4	15	1544.006	1	801.536	1
213		12	max	0	9	.046	3	.667	1	1.134e-2	1	NC	5	NC	5
214			min	0	2	-.469	1	.024	15	3.894e-4	15	680.292	1	685.598	1
215		13	max	0	9	.167	3	.71	1	1.056e-2	1	NC	5	NC	5
216			min	0	2	-.714	1	.026	15	3.656e-4	15	424.14	1	619.276	1
217		14	max	0	9	.265	3	.711	1	9.786e-3	1	NC	15	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
218			min	0	2	-.899	1	.026	15	3.418e-4	15	330.305	1	617.09	1
219		15	max	0	9	.317	3	.661	1	9.009e-3	1	NC	15	NC	5
220			min	0	2	-.972	1	.025	15	3.18e-4	15	303.651	1	696.103	1
221		16	max	0	9	.307	3	.562	1	8.232e-3	1	NC	15	NC	5
222			min	0	2	-.91	1	.021	15	2.943e-4	15	326.141	1	925.628	1
223		17	max	0	9	.235	3	.437	1	7.455e-3	1	NC	5	NC	3
224			min	0	2	-.713	1	.017	15	2.705e-4	15	424.666	1	1598.029	1
225		18	max	0	9	.109	3	.32	1	6.678e-3	1	NC	5	NC	2
226			min	0	2	-.412	1	.012	15	2.467e-4	15	790.511	1	4918.509	1
227		19	max	0	9	-.003	15	.264	1	5.901e-3	1	NC	1	NC	1
228			min	0	2	-.063	1	.01	15	2.229e-4	15	NC	1	NC	1
229	M13	1	max	0	3	-.002	3	.266	1	1.309e-2	1	NC	1	NC	1
230			min	-.002	1	-.512	1	.01	15	-2.482e-3	3	NC	1	NC	1
231		2	max	0	3	.158	3	.355	1	1.52e-2	1	NC	5	NC	3
232			min	-.002	1	-.961	1	.014	15	-3.108e-3	3	614.209	1	3108.974	1
233		3	max	0	3	.294	3	.489	1	1.731e-2	1	NC	15	NC	3
234			min	-.002	1	-1.36	1	.019	15	-3.733e-3	3	325.332	1	1238.022	1
235		4	max	0	3	.383	3	.62	1	1.942e-2	1	9202.228	15	NC	5
236			min	-.002	1	-1.65	1	.024	15	-4.358e-3	3	242.462	1	779.95	1
237		5	max	0	3	.414	3	.714	1	2.153e-2	1	8093.479	15	NC	5
238			min	-.001	1	-1.799	1	.027	15	-4.984e-3	3	214.386	1	615.294	1
239		6	max	0	3	.387	3	.755	1	2.364e-2	1	8008.623	15	NC	15
240			min	-.001	1	-1.802	1	.028	15	-5.609e-3	3	213.852	1	563.692	1
241		7	max	0	3	.313	3	.741	1	2.575e-2	1	8727.993	15	NC	5
242			min	0	1	-1.681	1	.027	15	-6.235e-3	3	235.926	1	580.728	1
243		8	max	0	3	.213	3	.685	1	2.786e-2	1	NC	15	NC	5
244			min	0	1	-1.486	1	.024	15	-6.86e-3	3	283.401	1	658.252	1
245		9	max	0	3	.12	3	.617	1	2.997e-2	1	NC	15	NC	5
246			min	0	1	-1.29	1	.021	15	-7.485e-3	3	354.621	1	786.029	1
247		10	max	0	1	.077	3	.582	1	3.208e-2	1	NC	15	NC	5
248			min	0	1	-1.197	1	.02	15	-8.111e-3	3	402.586	1	873.928	1
249		11	max	0	1	.12	3	.617	1	2.997e-2	1	NC	15	NC	5
250			min	0	3	-1.29	1	.021	15	-7.485e-3	3	354.621	1	786.029	1
251		12	max	0	1	.213	3	.685	1	2.786e-2	1	NC	15	NC	5
252			min	0	3	-1.486	1	.024	15	-6.86e-3	3	283.401	1	658.252	1
253		13	max	0	1	.313	3	.741	1	2.575e-2	1	8727.993	15	NC	5
254			min	0	3	-1.681	1	.027	15	-6.235e-3	3	235.926	1	580.728	1
255		14	max	.001	1	.387	3	.755	1	2.364e-2	1	8008.623	15	NC	15
256			min	0	3	-1.802	1	.028	15	-5.609e-3	3	213.852	1	563.692	1
257		15	max	.001	1	.414	3	.714	1	2.153e-2	1	8093.479	15	NC	5
258			min	0	3	-1.799	1	.027	15	-4.984e-3	3	214.386	1	615.294	1
259		16	max	.002	1	.383	3	.62	1	1.942e-2	1	9202.228	15	NC	5
260			min	0	3	-1.65	1	.024	15	-4.358e-3	3	242.462	1	779.95	1
261		17	max	.002	1	.294	3	.489	1	1.731e-2	1	NC	15	NC	3
262			min	0	3	-1.36	1	.019	15	-3.733e-3	3	325.332	1	1238.022	1
263		18	max	.002	1	.158	3	.355	1	1.52e-2	1	NC	5	NC	3
264			min	0	3	-.961	1	.014	15	-3.108e-3	3	614.209	1	3108.974	1
265		19	max	.002	1	-.002	3	.266	1	1.309e-2	1	NC	1	NC	1
266			min	0	3	-.512	1	.01	15	-2.482e-3	3	NC	1	NC	1
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	3	3.184e-3	1	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-1.326e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	6.368e-3	1	NC	1	NC	1
272			min	0	1	-.005	1	0	1	-2.652e-3	3	NC	1	NC	1
273		4	max	0	3	0	15	.001	3	7.43e-3	1	NC	3	NC	1
274			min	0	1	-.01	1	-.002	1	-3.076e-3	3	5775.539	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	.002	3	6.778e-3	2	NC	3	NC	1
276			min	0	1	-.019	1	-.003	1	-2.768e-3	3	3236.706	1	NC	1
277		6	max	0	3	-.001	15	.003	3	6.165e-3	2	NC	5	NC	1
278			min	0	1	-.029	1	-.004	1	-2.46e-3	3	2084.475	1	9005.403	3
279		7	max	0	3	-.002	15	.004	3	5.551e-3	2	NC	5	NC	4
280			min	0	1	-.041	1	-.005	1	-2.151e-3	3	1464.571	1	7242.053	3
281		8	max	0	3	-.002	15	.005	3	4.938e-3	2	NC	5	NC	4
282			min	0	1	-.055	1	-.006	1	-1.843e-3	3	1092.12	1	6103.627	3
283		9	max	0	3	-.003	15	.006	3	4.324e-3	2	NC	5	NC	4
284			min	0	1	-.071	1	-.008	1	-1.535e-3	3	850.463	1	5346.27	3
285		10	max	0	3	-.003	15	.006	3	3.711e-3	2	NC	5	NC	4
286			min	0	1	-.089	1	-.009	1	-1.226e-3	3	684.504	1	4844.127	3
287		11	max	0	3	-.004	15	.006	3	3.098e-3	2	NC	15	NC	4
288			min	-.001	1	-.107	1	-.009	1	-9.178e-4	3	565.474	1	4530.542	3
289		12	max	0	3	-.005	15	.006	3	2.484e-3	2	NC	15	NC	4
290			min	-.001	1	-.127	1	-.01	1	-6.094e-4	3	477.144	1	4373.214	3
291		13	max	0	3	-.006	15	.006	3	1.871e-3	2	NC	15	NC	4
292			min	-.001	1	-.148	1	-.01	1	-3.011e-4	3	409.741	1	4366.9	3
293		14	max	0	3	-.006	15	.004	3	1.258e-3	2	9380.596	15	NC	4
294			min	-.001	1	-.17	1	-.009	1	5.39e-6	12	357.113	1	4536.091	3
295		15	max	0	3	-.007	15	.003	3	6.443e-4	2	8283.742	15	NC	4
296			min	-.001	1	-.192	1	-.008	1	-1.197e-4	9	315.221	1	4957.166	3
297		16	max	0	3	-.008	15	0	3	6.241e-4	3	7395.949	15	NC	4
298			min	-.002	1	-.215	1	-.006	1	-4.825e-4	1	281.336	1	5828.524	3
299		17	max	.001	3	-.009	15	0	10	9.324e-4	3	6667.515	15	NC	4
300			min	-.002	1	-.239	1	-.004	1	-1.142e-3	1	253.55	1	7767.758	3
301		18	max	.001	3	-.01	15	.002	2	1.241e-3	3	6062.802	15	NC	1
302			min	-.002	1	-.263	1	-.007	3	-1.801e-3	1	230.494	1	NC	1
303		19	max	.001	3	-.011	15	.006	2	1.549e-3	3	5555.752	15	NC	1
304			min	-.002	1	-.287	1	-.012	3	-2.461e-3	1	211.171	1	NC	1
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	-.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	1	-.009	1	0	1	0	1	6419.566	1	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	0	1	-.022	1	0	1	0	1	2751.856	1	NC	1
313		5	max	0	3	-.001	15	0	1	0	1	NC	5	NC	1
314			min	-.001	1	-.04	1	0	1	0	1	1522.745	1	NC	1
315		6	max	0	3	-.002	15	0	1	0	1	NC	5	NC	1
316			min	-.002	1	-.062	1	0	1	0	1	973.676	1	NC	1
317		7	max	.001	3	-.003	15	0	1	0	1	NC	5	NC	1
318			min	-.002	1	-.089	1	0	1	0	1	680.994	1	NC	1
319		8	max	.001	3	-.004	15	0	1	0	1	NC	15	NC	1
320			min	-.002	1	-.12	1	0	1	0	1	506.208	1	NC	1
321		9	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
322			min	-.002	1	-.154	1	0	1	0	1	393.286	1	NC	1
323		10	max	.002	3	-.007	15	0	1	0	1	9294.097	15	NC	1
324			min	-.003	1	-.192	1	0	1	0	1	315.984	1	NC	1
325		11	max	.002	3	-.008	15	0	1	0	1	7676.744	15	NC	1
326			min	-.003	1	-.232	1	0	1	0	1	260.677	1	NC	1
327		12	max	.002	3	-.009	15	0	1	0	1	6476.793	15	NC	1
328			min	-.003	1	-.276	1	0	1	0	1	219.715	1	NC	1
329		13	max	.002	3	-.011	15	0	1	0	1	5561.303	15	NC	1
330			min	-.003	1	-.321	1	0	1	0	1	188.508	1	NC	1
331		14	max	.002	3	-.013	15	0	1	0	1	4846.592	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
332			min	-.004	1	-.369	1	0	1	0	1	164.173	1	NC	1
333		15	max	.003	3	-.014	15	0	1	0	1	4277.753	15	NC	1
334			min	-.004	1	-.418	1	0	1	0	1	144.825	1	NC	1
335		16	max	.003	3	-.016	15	0	1	0	1	3817.689	15	NC	1
336			min	-.004	1	-.469	1	0	1	0	1	129.189	1	NC	1
337		17	max	.003	3	-.018	15	0	1	0	1	3440.459	15	NC	1
338			min	-.004	1	-.521	1	0	1	0	1	116.378	1	NC	1
339		18	max	.003	3	-.019	15	0	1	0	1	3127.483	15	NC	1
340			min	-.005	1	-.573	1	0	1	0	1	105.757	1	NC	1
341		19	max	.003	3	-.021	15	0	1	0	1	2865.191	15	NC	1
342			min	-.005	1	-.626	1	0	1	0	1	96.86	1	NC	1
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	15	0	1	1.326e-3	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-3.184e-3	1	NC	1	NC	1
347		3	max	0	3	0	15	0	1	2.652e-3	3	NC	1	NC	1
348			min	0	1	-.005	1	0	3	-6.368e-3	1	NC	1	NC	1
349		4	max	0	3	0	15	.002	1	3.076e-3	3	NC	3	NC	1
350			min	0	1	-.01	1	-.001	3	-7.43e-3	1	5775.539	1	NC	1
351		5	max	0	3	0	15	.003	1	2.768e-3	3	NC	3	NC	1
352			min	0	1	-.019	1	-.002	3	-6.778e-3	2	3236.706	1	NC	1
353		6	max	0	3	-.001	15	.004	1	2.46e-3	3	NC	5	NC	1
354			min	0	1	-.029	1	-.003	3	-6.165e-3	2	2084.475	1	9005.403	3
355		7	max	0	3	-.002	15	.005	1	2.151e-3	3	NC	5	NC	4
356			min	0	1	-.041	1	-.004	3	-5.551e-3	2	1464.571	1	7242.053	3
357		8	max	0	3	-.002	15	.006	1	1.843e-3	3	NC	5	NC	4
358			min	0	1	-.055	1	-.005	3	-4.938e-3	2	1092.12	1	6103.627	3
359		9	max	0	3	-.003	15	.008	1	1.535e-3	3	NC	5	NC	4
360			min	0	1	-.071	1	-.006	3	-4.324e-3	2	850.463	1	5346.27	3
361		10	max	0	3	-.003	15	.009	1	1.226e-3	3	NC	5	NC	4
362			min	0	1	-.089	1	-.006	3	-3.711e-3	2	684.504	1	4844.127	3
363		11	max	0	3	-.004	15	.009	1	9.178e-4	3	NC	15	NC	4
364			min	-.001	1	-.107	1	-.006	3	-3.098e-3	2	565.474	1	4530.542	3
365		12	max	0	3	-.005	15	.01	1	6.094e-4	3	NC	15	NC	4
366			min	-.001	1	-.127	1	-.006	3	-2.484e-3	2	477.144	1	4373.214	3
367		13	max	0	3	-.006	15	.01	1	3.011e-4	3	NC	15	NC	4
368			min	-.001	1	-.148	1	-.006	3	-1.871e-3	2	409.741	1	4366.9	3
369		14	max	0	3	-.006	15	.009	1	-5.39e-6	12	9380.596	15	NC	4
370			min	-.001	1	-.17	1	-.004	3	-1.258e-3	2	357.113	1	4536.091	3
371		15	max	0	3	-.007	15	.008	1	1.197e-4	9	8283.742	15	NC	4
372			min	-.001	1	-.192	1	-.003	3	-6.443e-4	2	315.221	1	4957.166	3
373		16	max	0	3	-.008	15	.006	1	4.825e-4	1	7395.949	15	NC	4
374			min	-.002	1	-.215	1	0	3	-6.241e-4	3	281.336	1	5828.524	3
375		17	max	.001	3	-.009	15	.004	1	1.142e-3	1	6667.515	15	NC	4
376			min	-.002	1	-.239	1	0	10	-9.324e-4	3	253.55	1	7767.758	3
377		18	max	.001	3	-.01	15	.007	3	1.801e-3	1	6062.802	15	NC	1
378			min	-.002	1	-.263	1	-.002	2	-1.241e-3	3	230.494	1	NC	1
379		19	max	.001	3	-.011	15	.012	3	2.461e-3	1	5555.752	15	NC	1
380			min	-.002	1	-.287	1	-.006	2	-1.549e-3	3	211.171	1	NC	1
381	M3	1	max	.006	1	0	15	.001	3	2.932e-3	2	NC	1	NC	1
382			min	0	15	-.003	1	-.001	1	-1.12e-3	3	NC	1	NC	1
383		2	max	.006	1	-.001	15	.012	3	3.492e-3	2	NC	1	NC	4
384			min	0	15	-.023	1	-.027	1	-1.373e-3	3	NC	1	2397.11	1
385		3	max	.005	1	-.002	15	.022	3	4.053e-3	2	NC	1	NC	5
386			min	0	15	-.043	1	-.051	1	-1.626e-3	3	NC	1	1212.234	1
387		4	max	.005	1	-.003	15	.032	3	4.613e-3	2	NC	1	NC	5
388			min	0	15	-.064	1	-.075	1	-1.878e-3	3	NC	1	822.487	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
389		5	max	.004	1	-.004	15	.041	3	5.173e-3	2	NC	1	NC	5
390			min	0	15	-.084	1	-.097	1	-2.131e-3	3	NC	1	631.936	1
391		6	max	.004	1	-.005	15	.05	3	5.734e-3	2	NC	1	NC	5
392			min	0	15	-.104	1	-.117	1	-2.384e-3	3	NC	1	521.56	1
393		7	max	.003	3	-.005	15	.057	3	6.294e-3	2	NC	1	NC	5
394			min	0	10	-.124	1	-.135	1	-2.636e-3	3	NC	1	451.865	1
395		8	max	.003	3	-.006	15	.064	3	6.855e-3	2	NC	1	NC	15
396			min	0	10	-.144	1	-.149	1	-2.889e-3	3	NC	1	406.145	1
397		9	max	.004	3	-.007	15	.069	3	7.415e-3	2	NC	1	NC	15
398			min	0	10	-.163	1	-.161	1	-3.142e-3	3	NC	1	376.327	1
399		10	max	.004	3	-.008	15	.072	3	7.976e-3	2	NC	1	NC	15
400			min	0	10	-.183	1	-.168	1	-3.394e-3	3	NC	1	358.31	1
401		11	max	.004	3	-.009	15	.074	3	8.536e-3	2	NC	1	NC	15
402			min	-.001	2	-.203	1	-.171	1	-3.647e-3	3	NC	1	350.191	1
403		12	max	.004	3	-.009	15	.073	3	9.096e-3	2	NC	1	NC	15
404			min	-.002	2	-.222	1	-.169	1	-3.9e-3	3	NC	1	351.625	1
405		13	max	.004	3	-.01	15	.071	3	9.657e-3	2	NC	1	NC	15
406			min	-.002	2	-.241	1	-.162	1	-4.152e-3	3	NC	1	363.833	1
407		14	max	.004	3	-.011	15	.066	3	1.022e-2	2	NC	1	NC	15
408			min	-.003	2	-.261	1	-.15	2	-4.405e-3	3	NC	1	390.341	1
409		15	max	.004	3	-.011	15	.058	3	1.078e-2	2	NC	1	NC	5
410			min	-.003	2	-.28	1	-.132	2	-4.658e-3	3	NC	1	439.26	1
411		16	max	.005	3	-.012	15	.048	3	1.134e-2	2	NC	1	NC	5
412			min	-.004	2	-.299	1	-.107	2	-4.91e-3	3	NC	1	530.462	1
413		17	max	.005	3	-.012	15	.035	3	1.19e-2	2	NC	1	NC	5
414			min	-.004	2	-.318	1	-.075	2	-5.163e-3	3	NC	1	724.525	1
415		18	max	.005	3	-.013	15	.019	3	1.246e-2	2	NC	1	NC	5
416			min	-.005	2	-.337	1	-.036	2	-5.416e-3	3	NC	1	1325.714	1
417		19	max	.005	3	-.013	15	.018	1	1.302e-2	2	NC	1	NC	1
418			min	-.005	2	-.356	1	0	3	-5.668e-3	3	NC	1	NC	1
419	M6	1	max	.013	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.007	1	0	1	0	1	NC	1	NC	1
421		2	max	.011	1	-.002	15	0	1	0	1	NC	1	NC	1
422			min	0	15	-.05	1	0	1	0	1	NC	1	NC	1
423		3	max	.01	1	-.003	15	0	1	0	1	NC	1	NC	1
424			min	0	15	-.094	1	0	1	0	1	NC	1	NC	1
425		4	max	.008	1	-.005	15	0	1	0	1	NC	1	NC	1
426			min	0	15	-.138	1	0	1	0	1	NC	1	NC	1
427		5	max	.007	1	-.007	15	0	1	0	1	NC	1	NC	1
428			min	0	15	-.182	1	0	1	0	1	NC	1	NC	1
429		6	max	.007	3	-.008	15	0	1	0	1	NC	1	NC	1
430			min	0	10	-.226	1	0	1	0	1	NC	1	NC	1
431		7	max	.008	3	-.01	15	0	1	0	1	NC	1	NC	1
432			min	0	10	-.269	1	0	1	0	1	NC	1	NC	1
433		8	max	.009	3	-.011	15	0	1	0	1	NC	1	NC	1
434			min	-.002	2	-.313	1	0	1	0	1	NC	1	NC	1
435		9	max	.009	3	-.013	15	0	1	0	1	NC	1	NC	1
436			min	-.003	2	-.356	1	0	1	0	1	NC	1	NC	1
437		10	max	.01	3	-.014	15	0	1	0	1	NC	1	NC	1
438			min	-.005	2	-.399	1	0	1	0	1	NC	1	NC	1
439		11	max	.01	3	-.016	15	0	1	0	1	NC	1	NC	1
440			min	-.006	2	-.443	1	0	1	0	1	NC	1	NC	1
441		12	max	.011	3	-.017	15	0	1	0	1	NC	1	NC	1
442			min	-.008	2	-.486	1	0	1	0	1	NC	1	NC	1
443		13	max	.011	3	-.019	15	0	1	0	1	NC	1	NC	1
444			min	-.009	2	-.529	1	0	1	0	1	NC	1	NC	1
445		14	max	.012	3	-.02	15	0	1	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
446			min	-.011	2	-.572	1	0	1	0	1	NC	1	NC	1
447		15	max	.012	3	-.021	15	0	1	0	1	NC	1	NC	1
448			min	-.012	2	-.615	1	0	1	0	1	NC	1	NC	1
449		16	max	.013	3	-.022	15	0	1	0	1	NC	1	NC	1
450			min	-.014	2	-.657	1	0	1	0	1	NC	1	NC	1
451		17	max	.014	3	-.024	15	0	1	0	1	NC	1	NC	1
452			min	-.015	2	-.7	1	0	1	0	1	NC	1	NC	1
453		18	max	.014	3	-.025	15	0	1	0	1	NC	1	NC	1
454			min	-.017	2	-.743	1	0	1	0	1	NC	1	NC	1
455		19	max	.015	3	-.026	15	0	1	0	1	NC	1	NC	1
456			min	-.018	2	-.785	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.006	1	0	15	.001	1	1.12e-3	3	NC	1	NC	1
458			min	0	15	-.003	1	-.001	3	-2.932e-3	2	NC	1	NC	1
459		2	max	.006	1	-.001	15	.027	1	1.373e-3	3	NC	1	NC	4
460			min	0	15	-.023	1	-.012	3	-3.492e-3	2	NC	1	2397.11	1
461		3	max	.005	1	-.002	15	.051	1	1.626e-3	3	NC	1	NC	5
462			min	0	15	-.043	1	-.022	3	-4.053e-3	2	NC	1	1212.234	1
463		4	max	.005	1	-.003	15	.075	1	1.878e-3	3	NC	1	NC	5
464			min	0	15	-.064	1	-.032	3	-4.613e-3	2	NC	1	822.487	1
465		5	max	.004	1	-.004	15	.097	1	2.131e-3	3	NC	1	NC	5
466			min	0	15	-.084	1	-.041	3	-5.173e-3	2	NC	1	631.936	1
467		6	max	.004	1	-.005	15	.117	1	2.384e-3	3	NC	1	NC	5
468			min	0	15	-.104	1	-.05	3	-5.734e-3	2	NC	1	521.56	1
469		7	max	.003	3	-.005	15	.135	1	2.636e-3	3	NC	1	NC	5
470			min	0	10	-.124	1	-.057	3	-6.294e-3	2	NC	1	451.865	1
471		8	max	.003	3	-.006	15	.149	1	2.889e-3	3	NC	1	NC	15
472			min	0	10	-.144	1	-.064	3	-6.855e-3	2	NC	1	406.145	1
473		9	max	.004	3	-.007	15	.161	1	3.142e-3	3	NC	1	NC	15
474			min	0	10	-.163	1	-.069	3	-7.415e-3	2	NC	1	376.327	1
475		10	max	.004	3	-.008	15	.168	1	3.394e-3	3	NC	1	NC	15
476			min	0	10	-.183	1	-.072	3	-7.976e-3	2	NC	1	358.31	1
477		11	max	.004	3	-.009	15	.171	1	3.647e-3	3	NC	1	NC	15
478			min	-.001	2	-.203	1	-.074	3	-8.536e-3	2	NC	1	350.191	1
479		12	max	.004	3	-.009	15	.169	1	3.9e-3	3	NC	1	NC	15
480			min	-.002	2	-.222	1	-.073	3	-9.096e-3	2	NC	1	351.625	1
481		13	max	.004	3	-.01	15	.162	1	4.152e-3	3	NC	1	NC	15
482			min	-.002	2	-.241	1	-.071	3	-9.657e-3	2	NC	1	363.833	1
483		14	max	.004	3	-.011	15	.15	2	4.405e-3	3	NC	1	NC	15
484			min	-.003	2	-.261	1	-.066	3	-1.022e-2	2	NC	1	390.341	1
485		15	max	.004	3	-.011	15	.132	2	4.658e-3	3	NC	1	NC	5
486			min	-.003	2	-.28	1	-.058	3	-1.078e-2	2	NC	1	439.26	1
487		16	max	.005	3	-.012	15	.107	2	4.91e-3	3	NC	1	NC	5
488			min	-.004	2	-.299	1	-.048	3	-1.134e-2	2	NC	1	530.462	1
489		17	max	.005	3	-.012	15	.075	2	5.163e-3	3	NC	1	NC	5
490			min	-.004	2	-.318	1	-.035	3	-1.19e-2	2	NC	1	724.525	1
491		18	max	.005	3	-.013	15	.036	2	5.416e-3	3	NC	1	NC	5
492			min	-.005	2	-.337	1	-.019	3	-1.246e-2	2	NC	1	1325.714	1
493		19	max	.005	3	-.013	15	0	3	5.668e-3	3	NC	1	NC	1
494			min	-.005	2	-.356	1	-.018	1	-1.302e-2	2	NC	1	NC	1