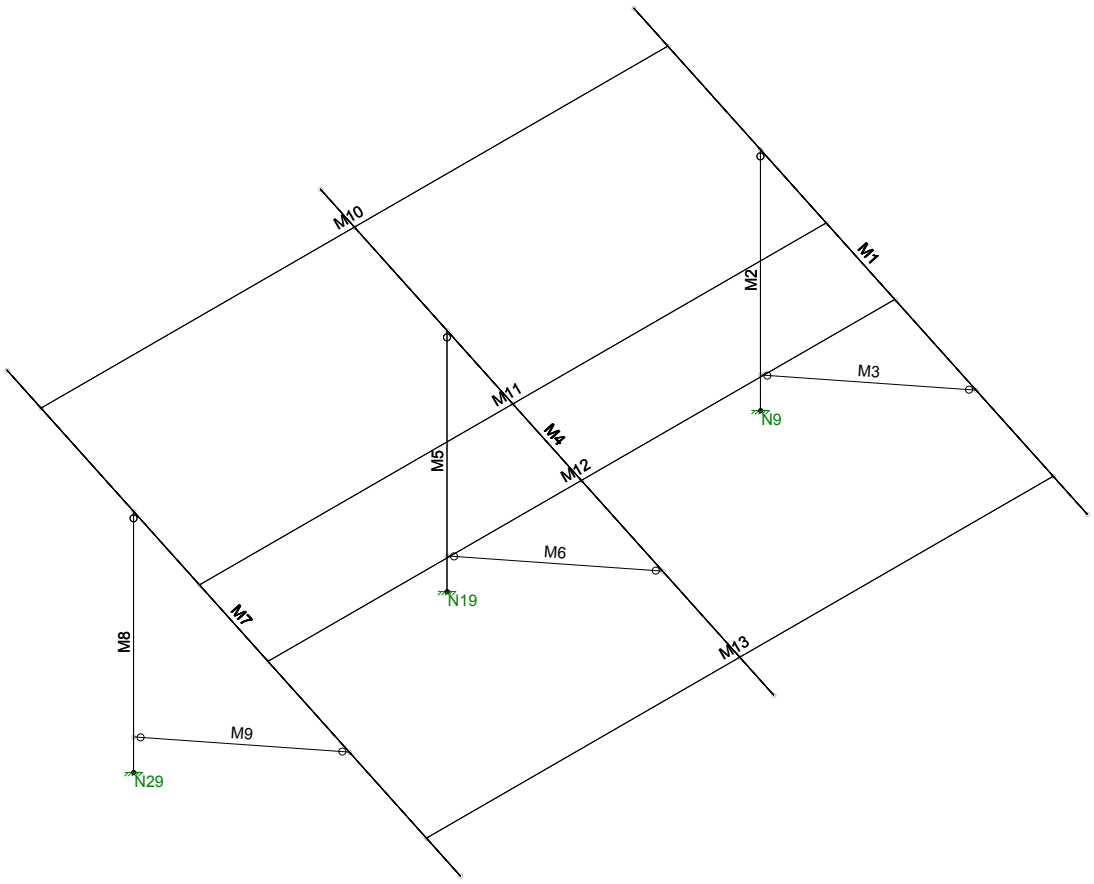


Schletter, Inc.		25° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

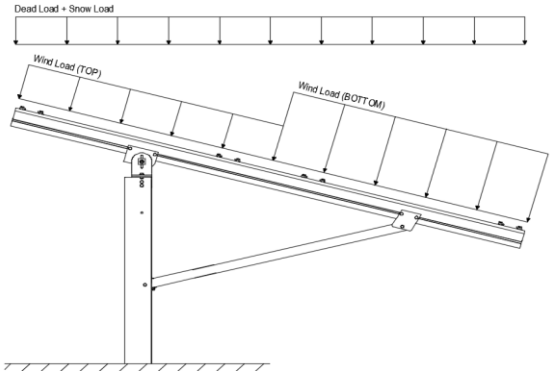
1.2 Construction

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 =	110	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z = 19.00 psf *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.1	*(Pressure)*	*Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.*
$Cf+_{BOTTOM}$ =	1.7		
$Cf-_{TOP}$ =	-2.2	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1		

2.4 Seismic Loads - N/A

S_S =	0.00	R =	1.25	*ASCE 7, Section 12.8.1.3: A maximum S_s of 1.5 may be used to calculate the base shear, C_s, of structures under five stories and with a period, T, of 0.5 or less. Therefore, a S_{ds} of 1.0 was used to calculate C_s.*
S_{DS} =	0.00	C_S =	0	
S_1 =	0.00	ρ =	1.3	
S_{D1} =	0.00	Ω =	1.25	
T_a =	0.00	C_d =	1.25	

2.5 Combination of Loads

ASCE 7 requires that all structures be checked by specified combinations of loads. Applicable load combinations are provided below.

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.8W		
1.2D + 1.6W + 0.5S		
0.9D + 1.6W	M	
1.54D + 1.3E + 0.2S	R	*(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

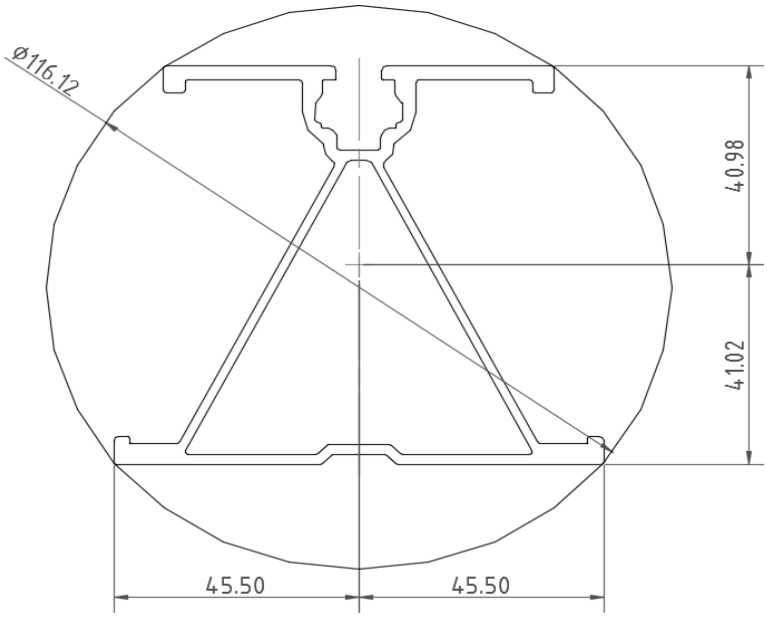
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	114	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.586	k-ft
M_z =	0.171	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	72%	

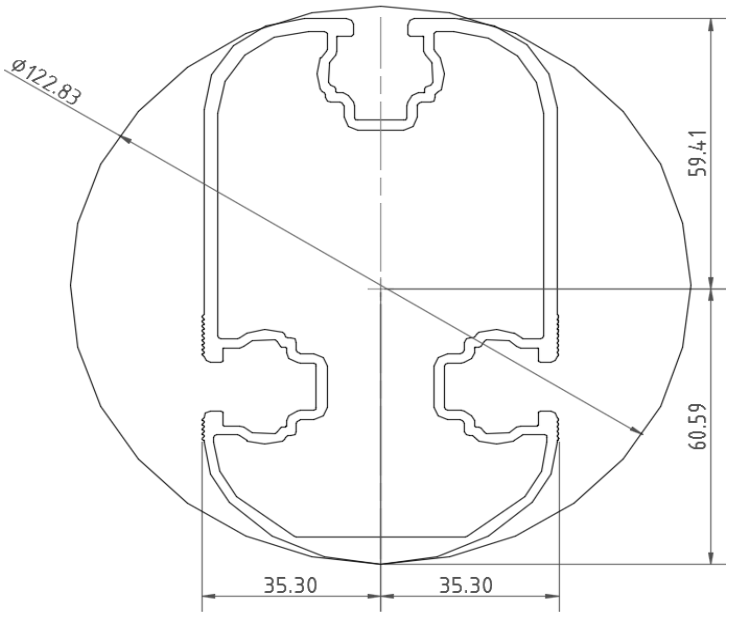


DETAIL VIEW

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 =	4.443	k-ft
M_z =	0.000	k-ft
P_n =	0.019	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	88%	

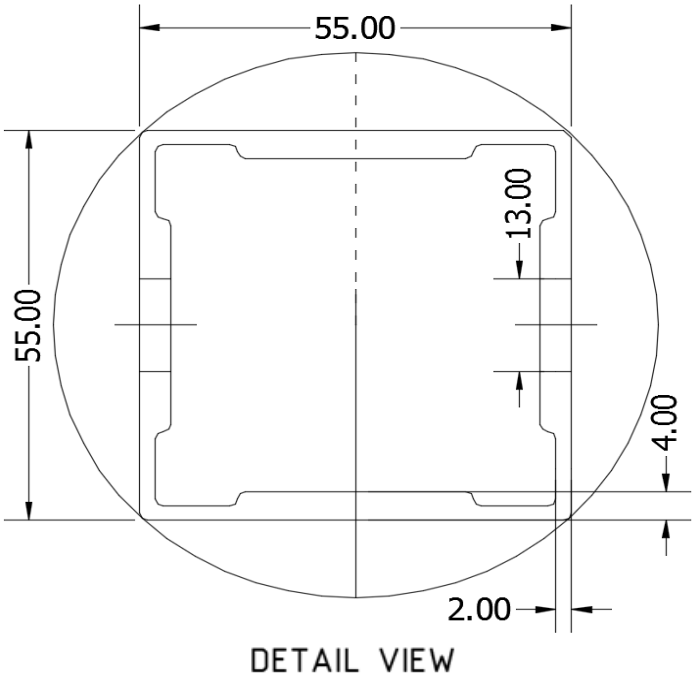


DETAIL VIEW

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).

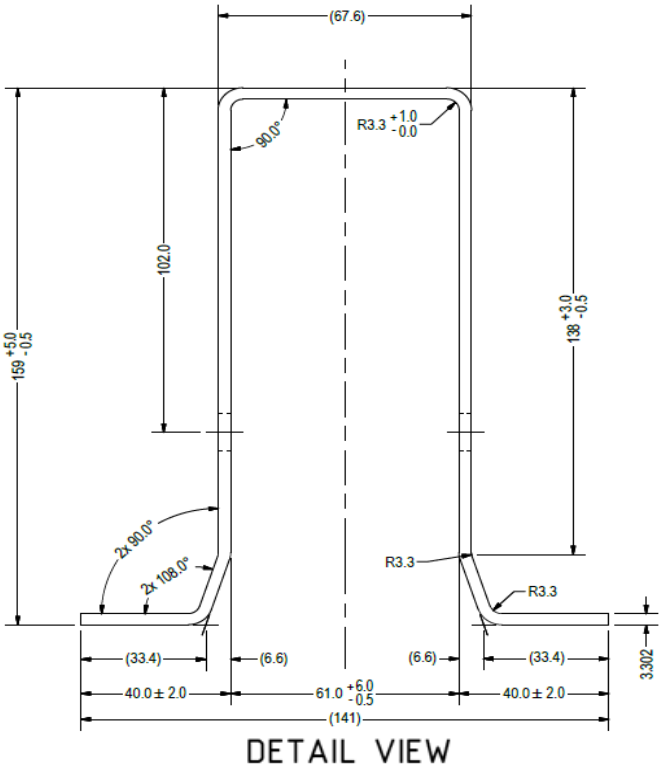
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.005	k-ft
M_z =	0.000	k-ft
P_n =	5.002	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	38%	



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 =	10.425	k-ft
M_z =	0.000	k-ft
P_r =	6.264	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	69%	



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 =	6.83	k
Maximum Lateral Load =	3.29	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 =	1.18	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

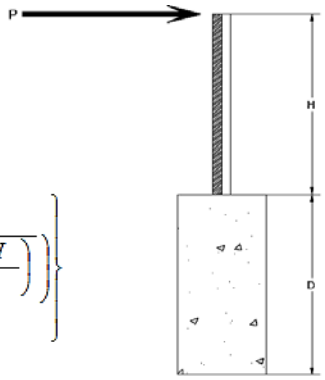
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.18	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 =	6.35	
Required Footing Depth, D =	9.88	ft

2nd Trial @ D_2 =	6.57	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant 2.34P/(S_1B), A =	3.14	
Required Footing Depth, D =	6.02	ft

3rd Trial @ D_3 =	6.29	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.26	ksf
Constant 2.34P/(S_1B), A =	3.28	
Required Footing Depth, D =	6.19	ft

4th Trial @ D_4 =	6.24	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.25	ksf
Constant 2.34P/(S_1B), A =	3.30	
Required Footing Depth, D =	6.23	ft

5th Trial @ D_5 =	6.23	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.25	ksf
Constant 2.34P/(S_1B), A =	3.31	
Required Footing Depth, D =	6.25	ft

A 2ft diameter x 6.25ft deep footing unrestrained at ground level is required for the racking structure.

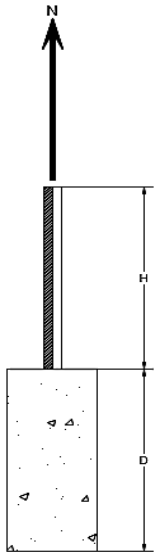
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.27	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	2.14	k
Required Concrete Volume, V =	14.75	ft^3
Required Footing Depth, D =	4.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	7.08
2	0.4	0.2	118.10	6.98
3	0.6	0.2	118.10	6.87
4	0.8	0.2	118.10	6.77
5	1	0.2	118.10	6.67
6	1.2	0.2	118.10	6.56
7	1.4	0.2	118.10	6.46
8	1.6	0.2	118.10	6.35
9	1.8	0.2	118.10	6.25
10	2	0.2	118.10	6.15
11	2.2	0.2	118.10	6.04
12	2.4	0.2	118.10	5.94
13	2.6	0.2	118.10	5.84
14	2.8	0.2	118.10	5.73
15	3	0.2	118.10	5.63
16	3.2	0.2	118.10	5.52
17	3.4	0.2	118.10	5.42
18	3.6	0.2	118.10	5.32
19	3.8	0.2	118.10	5.21
20	4	0.2	118.10	5.11
21	4.2	0.2	118.10	5.01
22	4.4	0.2	118.10	4.90
23	4.6	0.2	118.10	4.80
24	4.8	0.2	118.10	4.69
25	0	0.0	0.00	4.69
26	0	0.0	0.00	4.69
27	0	0.0	0.00	4.69
28	0	0.0	0.00	4.69
29	0	0.0	0.00	4.69
30	0	0.0	0.00	4.69
31	0	0.0	0.00	4.69
32	0	0.0	0.00	4.69
33	0	0.0	0.00	4.69
34	0	0.0	0.00	4.69
Max	4.8	Sum	1.13	

A 2ft diameter x 4.75ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.30	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	20.42	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

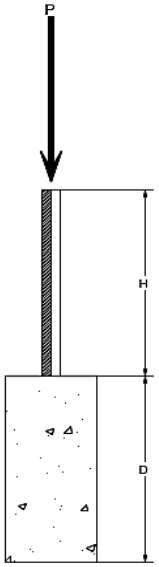
Weight of Concrete

Footing Volume	19.63	ft^3
Weight	2.85	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.06	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.37	k
Applied Force =	7.15	k
Utilization =	69%	

A 2ft diameter footing passes at a depth of 6.25ft.



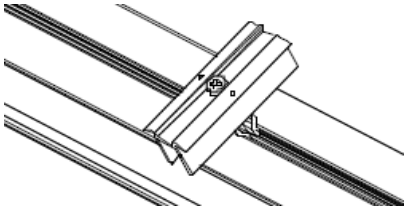
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

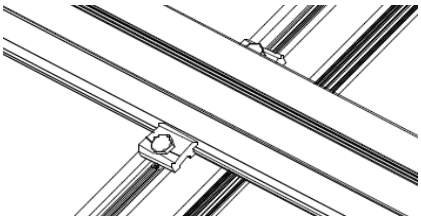
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.627 k
Allowable Uplift	=	1.214 k
Utilization	=	52%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.120 k
Allowable Uplift	=	2.180 k
Utilization	=	97%

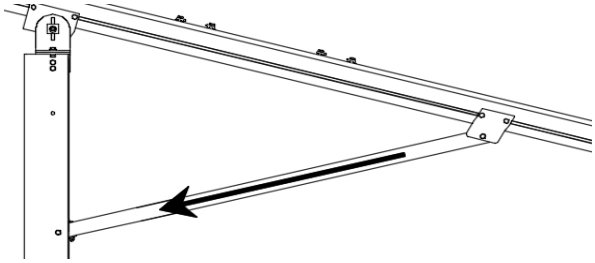


6.2 Strut Connections

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	=	5.002 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	56%

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

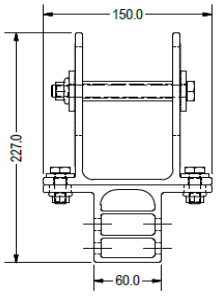


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

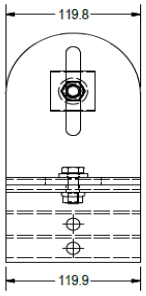
6.3 Girder to Post Connection

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.

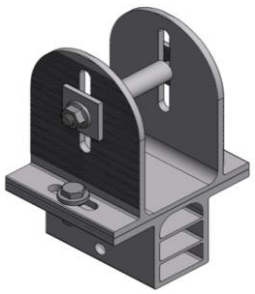
Maximum Tensile Load	=	4.498 k
Allowable Load	=	5.649 k
Utilization	=	80%



FRONT VIEW



SIDE VIEW



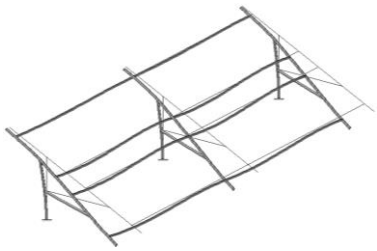
7. SEISMIC DESIGN

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 =	114 in	L_b =	114
J =	0.432	J =	0.432
	315.377		200.561
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	27.5 ksi	φF_L=	28.8
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 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:	Weak Axis:
3.4.14	**3.4.14**
L_b = 61 in	L_b = 61
J = 0.942	J = 0.942
95.1963	95.1963
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$
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= 30.2 ksi	φF_L= 30.2
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 = 1.41113

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

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

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 =	6.26	k	(LRFD Factored Load)
Mr (Strong) =	10.43	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 =	0.1828	<	0.2	
Utilization =	0.69	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.183	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 69%

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	-58.278	-58.278	0	0
2	M11	y	-58.278	-58.278	0	0
3	M12	y	-90.067	-90.067	0	0
4	M13	y	-90.067	-90.067	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	116.557	116.557	0	0
2	M11	y	116.557	116.557	0	0
3	M12	y	52.98	52.98	0	0
4	M13	y	52.98	52.98	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...	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	656.432	2	2329.191	1	238.457	2	.292	1	.004	3	4.969	1
2		min	-911.046	3	-1747.625	3	-264.491	3	-.336	3	-.01	2	.184	15
3	N19	max	2498.889	2	6457.813	2	0	14	0	1	0	15	9.627	1
4		min	-2534.193	3	-5248.446	3	0	2	0	3	0	1	.32	15
5	N29	max	656.432	2	2329.191	1	264.491	3	.336	3	.01	2	4.969	1
6		min	-911.046	3	-1747.625	3	-238.457	2	-.292	1	-.004	3	.184	15
7	Totals:	max	3811.753	2	11111.521	2	0	1						
8		min	-4356.285	3	-8743.696	3	0	12						

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	2	0	5	0	1	0	1	0	1
2			min	0	1	-.001	3	-.001	1	0	1	0	1	0	1
3		2	max	-.221	15	-.473	15	0	5	0	1	0	15	0	4
4			min	-.939	4	-2.011	4	-.001	1	0	1	0	1	0	15
5		3	max	-7.827	15	297.491	3	-1.452	12	.065	3	.252	1	.304	2
6			min	-188.186	1	-694.423	2	-156.909	1	-.235	2	.009	15	-.128	3
7		4	max	-8.048	15	296.315	3	-1.452	12	.065	3	.154	1	.735	2
8			min	-188.917	1	-695.992	2	-156.909	1	-.235	2	.006	15	-.312	3
9		5	max	-8.268	15	295.138	3	-1.452	12	.065	3	.057	1	1.168	2
10			min	-189.648	1	-697.56	2	-156.909	1	-.235	2	-.004	10	-.496	3
11		6	max	392.546	3	608.305	2	25.116	3	.037	2	.109	2	1.122	2
12			min	-1247.319	2	-174.668	3	-211.165	1	-.055	3	-.042	3	-.507	3
13		7	max	391.998	3	606.737	2	25.116	3	.037	2	.011	10	.745	2
14			min	-1248.051	2	-175.844	3	-211.165	1	-.055	3	-.027	3	-.398	3
15		8	max	391.449	3	605.169	2	25.116	3	.037	2	-.006	15	.368	2
16			min	-1248.782	2	-177.02	3	-211.165	1	-.055	3	-.156	1	-.289	3
17		9	max	376.412	3	93.96	3	23.777	3	-.002	15	.088	1	.154	1
18			min	-1380.316	1	-64.004	2	-220.885	1	-.187	2	.004	15	-.239	3
19		10	max	375.864	3	92.784	3	23.777	3	-.002	15	.052	3	.191	1
20			min	-1381.047	1	-65.572	2	-220.885	1	-.187	2	-.051	2	-.297	3
21		11	max	375.315	3	91.608	3	23.777	3	-.002	15	.067	3	.231	2
22			min	-1381.779	1	-67.14	2	-220.885	1	-.187	2	-.186	1	-.355	3
23		12	max	356.628	3	809.455	3	116.367	2	.361	3	.142	1	.465	2
24			min	-1574.668	1	-537.842	1	-271.833	3	-.331	2	.005	15	-.695	3
25		13	max	356.08	3	808.279	3	116.367	2	.361	3	.175	1	.799	2
26			min	-1575.399	1	-539.41	1	-271.833	3	-.331	2	-.149	3	-1.197	3
27		14	max	190.334	1	492.609	2	-4.684	15	.231	2	.051	3	1.12	2
28			min	8.505	15	-728.303	3	-121.606	1	-.424	3	-.044	1	-1.677	3
29		15	max	189.603	1	491.04	2	-4.684	15	.231	2	.03	3	.815	2
30			min	8.285	15	-729.48	3	-121.606	1	-.424	3	-.12	1	-1.224	3
31		16	max	188.871	1	489.472	2	-4.684	15	.231	2	.009	3	.511	2
32			min	8.064	15	-730.656	3	-121.606	1	-.424	3	-.195	1	-.771	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	188.14	1	487.904	2	-4.684	15	.231	2	-.008	12	.207	2
34			min	7.843	15	-731.832	3	-121.606	1	-.424	3	-.271	1	-.318	3
35		18	max	.939	4	2.013	4	0	1	0	1	0	15	0	4
36			min	.221	15	.473	15	0	5	0	1	0	1	0	15
37		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
38			min	0	1	-.005	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.015	2	0	1	0	1	0	1	0	1
40			min	0	1	-.004	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	-10.672	12	916.04	3	0	1	0	1	0	1	.75	2
44			min	-325.674	1	-1961.113	2	0	1	0	1	0	1	-.353	3
45		4	max	-11.037	12	914.864	3	0	1	0	1	0	1	1.967	2
46			min	-326.405	1	-1962.681	2	0	1	0	1	0	1	-.922	3
47		5	max	-11.403	12	913.688	3	0	1	0	1	0	1	3.186	2
48			min	-327.137	1	-1964.249	2	0	1	0	1	0	1	-1.489	3
49		6	max	1399.278	3	1799.085	2	0	1	0	1	0	1	3.024	2
50			min	-3452.814	2	-693.976	3	0	1	0	1	0	1	-1.466	3
51		7	max	1398.729	3	1797.517	2	0	1	0	1	0	1	1.908	2
52			min	-3453.545	2	-695.152	3	0	1	0	1	0	1	-1.035	3
53		8	max	1398.181	3	1795.948	2	0	1	0	1	0	1	.793	2
54			min	-3454.276	2	-696.328	3	0	1	0	1	0	1	-.603	3
55		9	max	1383.581	3	270.43	3	0	1	0	1	0	1	.144	1
56			min	-3554.471	2	-235.48	1	0	1	0	1	0	1	-.388	3
57		10	max	1383.032	3	269.253	3	0	1	0	1	0	1	.29	1
58			min	-3555.203	2	-237.048	1	0	1	0	1	0	1	-.555	3
59		11	max	1382.484	3	268.077	3	0	1	0	1	0	1	.438	1
60			min	-3555.934	2	-238.616	1	0	1	0	1	0	1	-.722	3
61		12	max	1375.183	3	2269.507	3	0	1	0	1	0	1	1.148	1
62			min	-3775.123	1	-1697.348	2	0	1	0	1	0	1	-1.685	3
63		13	max	1374.635	3	2268.331	3	0	1	0	1	0	1	2.198	1
64			min	-3775.854	1	-1698.916	2	0	1	0	1	0	1	-3.093	3
65		14	max	327.959	1	1424.499	1	0	1	0	1	0	1	3.205	1
66			min	12.838	12	-1977.621	3	0	1	0	1	0	1	-4.443	3
67		15	max	327.228	1	1422.931	1	0	1	0	1	0	1	2.322	1
68			min	12.472	12	-1978.797	3	0	1	0	1	0	1	-3.215	3
69		16	max	326.497	1	1421.362	1	0	1	0	1	0	1	1.439	1
70			min	12.106	12	-1979.973	3	0	1	0	1	0	1	-1.986	3
71		17	max	325.765	1	1419.794	1	0	1	0	1	0	1	.557	1
72			min	11.741	12	-1981.15	3	0	1	0	1	0	1	-.757	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	.006	2	0	1	0	1	0	1	0	1
76			min	0	1	-.012	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	.001	1	0	1	0	1	0	1
78			min	0	1	-.001	3	0	5	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	5	0	1	0	15	0	15
81		3	max	-7.827	15	297.491	3	156.909	1	.235	2	-.009	15	.304	2
82			min	-188.186	1	-694.423	2	1.452	12	-.065	3	-.252	1	-.128	3
83		4	max	-8.048	15	296.315	3	156.909	1	.235	2	-.006	15	.735	2
84			min	-188.917	1	-695.992	2	1.452	12	-.065	3	-.154	1	-.312	3
85		5	max	-8.268	15	295.138	3	156.909	1	.235	2	.004	10	1.168	2
86			min	-189.648	1	-697.56	2	1.452	12	-.065	3	-.057	1	-.496	3
87		6	max	392.546	3	608.305	2	211.165	1	.055	3	.042	3	1.122	2
88			min	-1247.319	2	-174.668	3	-25.116	3	-.037	2	-.109	2	-.507	3
89		7	max	391.998	3	606.737	2	211.165	1	.055	3	.027	3	.745	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	-1248.051	2	-175.844	3	-25.116	3	-.037	2	-.011	10	-.398	3
91		8	max	391.449	3	605.169	2	211.165	1	.055	3	.156	1	.368	2
92			min	-1248.782	2	-177.02	3	-25.116	3	-.037	2	.006	15	-.289	3
93		9	max	376.412	3	93.96	3	220.885	1	.187	2	-.004	15	.154	1
94			min	-1380.316	1	-64.004	2	-23.777	3	.002	15	-.088	1	-.239	3
95		10	max	375.864	3	92.784	3	220.885	1	.187	2	.051	2	.191	1
96			min	-1381.047	1	-65.572	2	-23.777	3	.002	15	-.052	3	-.297	3
97		11	max	375.315	3	91.608	3	220.885	1	.187	2	.186	1	.231	2
98			min	-1381.779	1	-67.14	2	-23.777	3	.002	15	-.067	3	-.355	3
99		12	max	356.628	3	809.455	3	271.833	3	.331	2	-.005	15	.465	2
100			min	-1574.668	1	-537.842	1	-116.367	2	-.361	3	-.142	1	-.695	3
101		13	max	356.08	3	808.279	3	271.833	3	.331	2	.149	3	.799	2
102			min	-1575.399	1	-539.41	1	-116.367	2	-.361	3	-.175	1	-1.197	3
103		14	max	190.334	1	492.609	2	121.606	1	.424	3	.044	1	1.12	2
104			min	8.505	15	-728.303	3	4.684	15	-.231	2	-.051	3	-1.677	3
105		15	max	189.603	1	491.04	2	121.606	1	.424	3	.12	1	.815	2
106			min	8.285	15	-729.48	3	4.684	15	-.231	2	-.03	3	-1.224	3
107		16	max	188.871	1	489.472	2	121.606	1	.424	3	.195	1	.511	2
108			min	8.064	15	-730.656	3	4.684	15	-.231	2	-.009	3	-.771	3
109		17	max	188.14	1	487.904	2	121.606	1	.424	3	.271	1	.207	2
110			min	7.843	15	-731.832	3	4.684	15	-.231	2	.008	12	-.318	3
111		18	max	.939	4	2.013	4	0	5	0	1	0	1	0	4
112			min	.221	15	.473	15	0	1	0	1	0	15	0	15
113		19	max	0	1	.002	2	0	5	0	1	0	1	0	1
114			min	0	1	-.005	3	0	1	0	1	0	1	0	1
115	M10	1	max	121.604	1	484.572	2	-7.403	15	.009	2	.32	1	.231	2
116			min	4.684	15	-734.152	3	-186.953	1	-.022	3	.012	15	-.424	3
117		2	max	121.604	1	352.383	2	-5.809	15	.009	2	.143	1	.249	3
118			min	4.684	15	-542.427	3	-148.194	1	-.022	3	.005	15	-.213	1
119		3	max	121.604	1	220.193	2	-4.215	15	.009	2	.029	2	.721	3
120			min	4.684	15	-350.701	3	-109.435	1	-.022	3	-.007	9	-.515	1
121		4	max	121.604	1	88.004	2	-2.621	15	.009	2	0	10	.99	3
122			min	4.684	15	-158.976	3	-70.677	1	-.022	3	-.088	1	-.676	1
123		5	max	121.604	1	32.749	3	-1.027	15	.009	2	-.006	15	1.056	3
124			min	4.684	15	-45.564	1	-31.918	1	-.022	3	-.142	1	-.699	2
125		6	max	121.604	1	224.475	3	8.931	9	.009	2	-.006	15	.921	3
126			min	4.684	15	-177.895	1	-7.802	2	-.022	3	-.156	1	-.582	2
127		7	max	121.604	1	416.2	3	45.6	1	.009	2	-.005	15	.582	3
128			min	4.684	15	-310.226	1	-2.224	10	-.022	3	-.128	1	-.326	2
129		8	max	121.604	1	607.925	3	84.359	1	.009	2	-.002	15	.075	1
130			min	4.684	15	-442.557	1	2.179	10	-.022	3	-.059	1	.002	15
131		9	max	121.604	1	799.651	3	123.117	1	.009	2	.05	1	.612	1
132			min	4.684	15	-574.888	1	3.904	12	-.022	3	-.023	10	-.701	3
133		10	max	121.604	1	707.219	1	-5.498	12	.009	2	.201	1	1.289	1
134			min	4.684	15	-991.376	3	-161.876	1	-.022	3	-.014	10	-1.646	3
135		11	max	121.604	1	574.888	1	-3.904	12	.022	3	.05	1	.612	1
136			min	4.684	15	-799.651	3	-123.117	1	-.009	2	-.023	10	-.701	3
137		12	max	121.604	1	442.557	1	-2.179	10	.022	3	-.002	15	.075	1
138			min	4.684	15	-607.925	3	-84.359	1	-.009	2	-.059	1	.002	15
139		13	max	121.604	1	310.226	1	2.224	10	.022	3	-.005	15	.582	3
140			min	4.684	15	-416.2	3	-45.6	1	-.009	2	-.128	1	-.326	2
141		14	max	121.604	1	177.895	1	7.802	2	.022	3	-.006	15	.921	3
142			min	4.684	15	-224.475	3	-8.931	9	-.009	2	-.156	1	-.582	2
143		15	max	121.604	1	45.564	1	31.918	1	.022	3	-.006	15	1.056	3
144			min	4.684	15	-32.749	3	1.027	15	-.009	2	-.142	1	-.699	2
145		16	max	121.604	1	158.976	3	70.677	1	.022	3	0	10	.99	3
146			min	4.684	15	-88.004	2	2.621	15	-.009	2	-.088	1	-.676	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	121.604	1	350.701	3	109.435	1	.022	3	.029	2	.721	3
148			min	4.684	15	-220.193	2	4.215	15	-.009	2	-.007	9	-.515	1
149		18	max	121.604	1	542.427	3	148.194	1	.022	3	.143	1	.249	3
150			min	4.684	15	-352.383	2	5.809	15	-.009	2	.005	15	-.213	1
151		19	max	121.604	1	734.152	3	186.953	1	.022	3	.32	1	.231	2
152			min	4.684	15	-484.572	2	7.403	15	-.009	2	.012	15	-.424	3
153	M11	1	max	274.166	1	472.033	1	-7.651	15	0	15	.356	1	.174	1
154			min	-295.504	3	-720.088	3	-192.784	1	-.006	1	.013	15	-.475	3
155		2	max	274.166	1	339.702	1	-6.057	15	0	15	.173	1	.183	3
156			min	-295.504	3	-528.362	3	-154.025	1	-.006	1	.006	15	-.28	2
157		3	max	274.166	1	207.371	1	-4.463	15	0	15	.037	2	.64	3
158			min	-295.504	3	-336.637	3	-115.266	1	-.006	1	0	15	-.563	2
159		4	max	274.166	1	75.04	1	-2.869	15	0	15	.01	3	.894	3
160			min	-295.504	3	-144.911	3	-76.507	1	-.006	1	-.07	1	-.707	2
161		5	max	274.166	1	46.814	3	-1.275	15	0	15	0	3	.946	3
162			min	-295.504	3	-62.005	2	-37.749	1	-.006	1	-.13	1	-.711	2
163		6	max	274.166	1	238.539	3	4.973	9	0	15	-.005	12	.795	3
164			min	-295.504	3	-194.194	2	-9.77	2	-.006	1	-.15	1	-.576	2
165		7	max	274.166	1	430.265	3	39.769	1	0	15	-.005	15	.442	3
166			min	-295.504	3	-326.384	2	-3.658	3	-.006	1	-.128	1	-.301	2
167		8	max	274.166	1	621.99	3	78.528	1	0	15	-.002	15	.113	2
168			min	-295.504	3	-458.573	2	-1.268	3	-.006	1	-.066	1	-.113	3
169		9	max	274.166	1	813.715	3	117.287	1	0	15	.042	9	.667	2
170			min	-295.504	3	-590.763	2	.986	12	-.006	1	-.025	2	-.871	3
171		10	max	274.166	1	722.952	2	-2.58	12	.006	1	.182	1	1.36	2
172			min	-295.504	3	-1005.441	3	-156.045	1	0	15	-.015	10	-1.831	3
173		11	max	274.166	1	590.763	2	-.986	12	.006	1	.042	9	.667	2
174			min	-295.504	3	-813.715	3	-117.287	1	0	15	-.025	2	-.871	3
175		12	max	274.166	1	458.573	2	1.268	3	.006	1	-.002	15	.113	2
176			min	-295.504	3	-621.99	3	-78.528	1	0	15	-.066	1	-.113	3
177		13	max	274.166	1	326.384	2	3.658	3	.006	1	-.005	15	.442	3
178			min	-295.504	3	-430.265	3	-39.769	1	0	15	-.128	1	-.301	2
179		14	max	274.166	1	194.194	2	9.77	2	.006	1	-.005	12	.795	3
180			min	-295.504	3	-238.539	3	-4.973	9	0	15	-.15	1	-.576	2
181		15	max	274.166	1	62.005	2	37.749	1	.006	1	0	3	.946	3
182			min	-295.504	3	-46.814	3	1.275	15	0	15	-.13	1	-.711	2
183		16	max	274.166	1	144.911	3	76.507	1	.006	1	.01	3	.894	3
184			min	-295.504	3	-75.04	1	2.869	15	0	15	-.07	1	-.707	2
185		17	max	274.166	1	336.637	3	115.266	1	.006	1	.037	2	.64	3
186			min	-295.504	3	-207.371	1	4.463	15	0	15	0	15	-.563	2
187		18	max	274.166	1	528.362	3	154.025	1	.006	1	.173	1	.183	3
188			min	-295.504	3	-339.702	1	6.057	15	0	15	.006	15	-.28	2
189		19	max	274.166	1	720.088	3	192.784	1	.006	1	.356	1	.174	1
190			min	-295.504	3	-472.033	1	7.651	15	0	15	.013	15	-.475	3
191	M12	1	max	33.066	2	665.581	2	-7.735	15	0	3	.378	1	.225	2
192			min	-20.89	9	-272.787	3	-196.171	1	-.007	1	.014	15	.003	15
193		2	max	33.066	2	479.704	2	-6.141	15	0	3	.191	1	.303	3
194			min	-20.89	9	-188.436	3	-157.413	1	-.007	1	.007	15	-.38	2
195		3	max	33.066	2	293.826	2	-4.547	15	0	3	.052	2	.457	3
196			min	-20.89	9	-104.085	3	-118.654	1	-.007	1	0	15	-.788	2
197		4	max	33.066	2	107.948	2	-2.953	15	0	3	.007	10	.522	3
198			min	-20.89	9	-19.734	3	-79.895	1	-.007	1	-.06	1	-1	2
199		5	max	33.066	2	64.617	3	-1.359	15	0	3	-.005	12	.499	3
200			min	-20.89	9	-77.929	2	-41.136	1	-.007	1	-.123	1	-1.016	2
201		6	max	33.066	2	148.967	3	3.648	9	0	3	-.006	15	.386	3
202			min	-20.89	9	-263.807	2	-13.317	2	-.007	1	-.146	1	-.835	2
203		7	max	33.066	2	233.318	3	36.381	1	0	3	-.005	15	.184	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	-20.89	9	-449.685	2	-4.514	10	-.007	1	-.128	1	-.459	2
205		8	max	33.066	2	317.669	3	75.14	1	0	3	-.002	15	.114	2
206			min	-20.89	9	-635.562	2	-.111	10	-.007	1	-.07	1	-.107	3
207		9	max	33.066	2	402.02	3	113.899	1	0	3	.039	9	.883	2
208			min	-20.89	9	-821.44	2	3.177	12	-.007	1	-.033	2	-.486	3
209		10	max	33.066	2	1007.317	2	104.948	9	.007	1	.171	1	1.848	2
210			min	-20.89	9	-486.371	3	-152.658	1	0	3	-.021	10	-.955	3
211		11	max	33.066	2	821.44	2	-3.177	12	.007	1	.039	9	.883	2
212			min	-20.89	9	-402.02	3	-113.899	1	0	3	-.033	2	-.486	3
213		12	max	33.066	2	635.562	2	.111	10	.007	1	-.002	15	.114	2
214			min	-20.89	9	-317.669	3	-75.14	1	0	3	-.07	1	-.107	3
215		13	max	33.066	2	449.685	2	4.514	10	.007	1	-.005	15	.184	3
216			min	-20.89	9	-233.318	3	-36.381	1	0	3	-.128	1	-.459	2
217		14	max	33.066	2	263.807	2	13.317	2	.007	1	-.006	15	.386	3
218			min	-20.89	9	-148.967	3	-3.648	9	0	3	-.146	1	-.835	2
219		15	max	33.066	2	77.929	2	41.136	1	.007	1	-.005	12	.499	3
220			min	-20.89	9	-64.617	3	1.359	15	0	3	-.123	1	-1.016	2
221		16	max	33.066	2	19.734	3	79.895	1	.007	1	.007	10	.522	3
222			min	-20.89	9	-107.948	2	2.953	15	0	3	-.06	1	-1	2
223		17	max	33.066	2	104.085	3	118.654	1	.007	1	.052	2	.457	3
224			min	-20.89	9	-293.826	2	4.547	15	0	3	0	15	-.788	2
225		18	max	33.066	2	188.436	3	157.413	1	.007	1	.191	1	.303	3
226			min	-20.89	9	-479.704	2	6.141	15	0	3	.007	15	-.38	2
227		19	max	33.066	2	272.787	3	196.171	1	.007	1	.378	1	.225	2
228			min	-20.89	9	-665.581	2	7.735	15	0	3	.014	15	.003	15
229	M13	1	max	-1.452	12	691.766	2	-7.386	15	.008	3	.315	1	.235	2
230			min	-156.787	1	-299.887	3	-186.359	1	-.022	2	.012	15	-.065	3
231		2	max	-1.452	12	505.888	2	-5.792	15	.008	3	.139	1	.207	3
232			min	-156.787	1	-215.537	3	-147.6	1	-.022	2	.005	15	-.397	2
233		3	max	-1.452	12	320.01	2	-4.198	15	.008	3	.026	2	.39	3
234			min	-156.787	1	-131.186	3	-108.841	1	-.022	2	-.008	9	-.833	2
235		4	max	-1.452	12	134.133	2	-2.604	15	.008	3	0	10	.484	3
236			min	-156.787	1	-46.835	3	-70.083	1	-.022	2	-.091	1	-1.073	2
237		5	max	-1.452	12	37.516	3	-1.01	15	.008	3	-.005	12	.488	3
238			min	-156.787	1	-51.745	2	-31.324	1	-.022	2	-.145	1	-1.117	2
239		6	max	-1.452	12	121.867	3	9.198	9	.008	3	-.006	15	.404	3
240			min	-156.787	1	-237.622	2	-7.259	2	-.022	2	-.157	1	-.964	2
241		7	max	-1.452	12	206.218	3	46.194	1	.008	3	-.005	15	.231	3
242			min	-156.787	1	-423.5	2	-1.939	10	-.022	2	-.129	1	-.615	2
243		8	max	-1.452	12	290.569	3	84.952	1	.008	3	-.002	15	-.003	15
244			min	-156.787	1	-609.378	2	1.783	12	-.022	2	-.06	1	-.084	1
245		9	max	-1.452	12	374.919	3	123.711	1	.008	3	.051	1	.672	2
246			min	-156.787	1	-795.255	2	3.377	12	-.022	2	-.023	10	-.382	3
247		10	max	-1.452	12	981.133	2	110.498	9	.02	1	.202	1	1.609	2
248			min	-156.787	1	-459.27	3	-162.47	1	-.022	2	-.013	10	-.822	3
249		11	max	-1.452	12	795.255	2	-3.377	12	.022	2	.051	1	.672	2
250			min	-156.787	1	-374.919	3	-123.711	1	-.008	3	-.023	10	-.382	3
251		12	max	-1.452	12	609.378	2	-1.783	12	.022	2	-.002	15	-.003	15
252			min	-156.787	1	-290.569	3	-84.952	1	-.008	3	-.06	1	-.084	1
253		13	max	-1.452	12	423.5	2	1.939	10	.022	2	-.005	15	.231	3
254			min	-156.787	1	-206.218	3	-46.194	1	-.008	3	-.129	1	-.615	2
255		14	max	-1.452	12	237.622	2	7.259	2	.022	2	-.006	15	.404	3
256			min	-156.787	1	-121.867	3	-9.198	9	-.008	3	-.157	1	-.964	2
257		15	max	-1.452	12	51.745	2	31.324	1	.022	2	-.005	12	.488	3
258			min	-156.787	1	-37.516	3	1.01	15	-.008	3	-.145	1	-1.117	2
259		16	max	-1.452	12	46.835	3	70.083	1	.022	2	0	10	.484	3
260			min	-156.787	1	-134.133	2	2.604	15	-.008	3	-.091	1	-1.073	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	-1.452	12	131.186	3	108.841	1	.022	2	.026	2	.39	3
262			min	-156.787	1	-320.01	2	4.198	15	-.008	3	-.008	9	-.833	2
263		18	max	-1.452	12	215.537	3	147.6	1	.022	2	.139	1	.207	3
264			min	-156.787	1	-505.888	2	5.792	15	-.008	3	.005	15	-.397	2
265		19	max	-1.452	12	299.887	3	186.359	1	.022	2	.315	1	.235	2
266			min	-156.787	1	-691.766	2	7.386	15	-.008	3	.012	15	-.065	3
267	M2	1	max	2329.191	1	910.465	3	238.685	2	.004	3	.336	3	4.969	1
268			min	-1747.625	3	-655.103	2	-264.282	3	-.01	2	-.292	1	.184	15
269		2	max	2326.636	1	910.465	3	238.685	2	.004	3	.262	3	5.026	1
270			min	-1749.541	3	-655.103	2	-264.282	3	-.01	2	-.227	1	.182	15
271		3	max	2324.081	1	910.465	3	238.685	2	.004	3	.187	3	5.084	1
272			min	-1751.457	3	-655.103	2	-264.282	3	-.01	2	-.163	1	.181	15
273		4	max	1725.416	1	1170.893	1	176.991	2	.002	2	.136	3	4.928	1
274			min	-1507.389	3	41.223	15	-238.063	3	-.001	3	-.14	1	.173	15
275		5	max	1722.861	1	1170.893	1	176.991	2	.002	2	.069	3	4.599	1
276			min	-1509.305	3	41.223	15	-238.063	3	-.001	3	-.091	1	.162	15
277		6	max	1720.306	1	1170.893	1	176.991	2	.002	2	.003	3	4.271	1
278			min	-1511.221	3	41.223	15	-238.063	3	-.001	3	-.042	1	.15	15
279		7	max	1717.751	1	1170.893	1	176.991	2	.002	2	.023	2	3.942	1
280			min	-1513.137	3	41.223	15	-238.063	3	-.001	3	-.064	3	.139	15
281		8	max	1715.196	1	1170.893	1	176.991	2	.002	2	.072	2	3.614	1
282			min	-1515.054	3	41.223	15	-238.063	3	-.001	3	-.131	3	.127	15
283		9	max	1712.642	1	1170.893	1	176.991	2	.002	2	.122	2	3.285	1
284			min	-1516.97	3	41.223	15	-238.063	3	-.001	3	-.198	3	.116	15
285		10	max	1710.087	1	1170.893	1	176.991	2	.002	2	.172	2	2.957	1
286			min	-1518.886	3	41.223	15	-238.063	3	-.001	3	-.265	3	.104	15
287		11	max	1707.532	1	1170.893	1	176.991	2	.002	2	.221	2	2.628	1
288			min	-1520.802	3	41.223	15	-238.063	3	-.001	3	-.331	3	.093	15
289		12	max	1704.977	1	1170.893	1	176.991	2	.002	2	.271	2	2.3	1
290			min	-1522.718	3	41.223	15	-238.063	3	-.001	3	-.398	3	.081	15
291		13	max	1702.422	1	1170.893	1	176.991	2	.002	2	.321	2	1.971	1
292			min	-1524.634	3	41.223	15	-238.063	3	-.001	3	-.465	3	.069	15
293		14	max	1699.867	1	1170.893	1	176.991	2	.002	2	.37	2	1.643	1
294			min	-1526.551	3	41.223	15	-238.063	3	-.001	3	-.532	3	.058	15
295		15	max	1697.312	1	1170.893	1	176.991	2	.002	2	.42	2	1.314	1
296			min	-1528.467	3	41.223	15	-238.063	3	-.001	3	-.599	3	.046	15
297		16	max	1694.757	1	1170.893	1	176.991	2	.002	2	.47	2	.986	1
298			min	-1530.383	3	41.223	15	-238.063	3	-.001	3	-.665	3	.035	15
299		17	max	1692.202	1	1170.893	1	176.991	2	.002	2	.519	2	.657	1
300			min	-1532.299	3	41.223	15	-238.063	3	-.001	3	-.732	3	.023	15
301		18	max	1689.648	1	1170.893	1	176.991	2	.002	2	.569	2	.329	1
302			min	-1534.215	3	41.223	15	-238.063	3	-.001	3	-.799	3	.012	15
303		19	max	1687.093	1	1170.893	1	176.991	2	.002	2	.619	2	0	1
304			min	-1536.131	3	41.223	15	-238.063	3	-.001	3	-.866	3	0	1
305	M5	1	max	6457.813	2	2530.716	3	0	1	0	1	0	1	9.627	1
306			min	-5248.446	3	-2491.296	2	0	1	0	1	0	1	.32	15
307		2	max	6455.258	2	2530.716	3	0	1	0	1	0	1	10.044	1
308			min	-5250.362	3	-2491.296	2	0	1	0	1	0	1	.323	15
309		3	max	6452.703	2	2530.716	3	0	1	0	1	0	1	10.46	1
310			min	-5252.279	3	-2491.296	2	0	1	0	1	0	1	.327	15
311		4	max	4619.447	1	2439.982	1	0	1	0	1	0	1	10.269	1
312			min	-4400.491	3	75.213	15	0	1	0	1	0	1	.317	15
313		5	max	4616.893	1	2439.982	1	0	1	0	1	0	1	9.584	1
314			min	-4402.408	3	75.213	15	0	1	0	1	0	1	.295	15
315		6	max	4614.338	1	2439.982	1	0	1	0	1	0	1	8.9	1
316			min	-4404.324	3	75.213	15	0	1	0	1	0	1	.274	15
317		7	max	4611.783	1	2439.982	1	0	1	0	1	0	1	8.215	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	-4406.24	3	75.213	15	0	1	0	1	0	1	.253	15
319		8	max	4609.228	1	2439.982	1	0	1	0	1	0	1	7.531	1
320			min	-4408.156	3	75.213	15	0	1	0	1	0	1	.232	15
321		9	max	4606.673	1	2439.982	1	0	1	0	1	0	1	6.846	1
322			min	-4410.072	3	75.213	15	0	1	0	1	0	1	.211	15
323		10	max	4604.118	1	2439.982	1	0	1	0	1	0	1	6.161	1
324			min	-4411.988	3	75.213	15	0	1	0	1	0	1	.19	15
325		11	max	4601.563	1	2439.982	1	0	1	0	1	0	1	5.477	1
326			min	-4413.905	3	75.213	15	0	1	0	1	0	1	.169	15
327		12	max	4599.008	1	2439.982	1	0	1	0	1	0	1	4.792	1
328			min	-4415.821	3	75.213	15	0	1	0	1	0	1	.148	15
329		13	max	4596.453	1	2439.982	1	0	1	0	1	0	1	4.108	1
330			min	-4417.737	3	75.213	15	0	1	0	1	0	1	.127	15
331		14	max	4593.899	1	2439.982	1	0	1	0	1	0	1	3.423	1
332			min	-4419.653	3	75.213	15	0	1	0	1	0	1	.106	15
333		15	max	4591.344	1	2439.982	1	0	1	0	1	0	1	2.738	1
334			min	-4421.569	3	75.213	15	0	1	0	1	0	1	.084	15
335		16	max	4588.789	1	2439.982	1	0	1	0	1	0	1	2.054	1
336			min	-4423.485	3	75.213	15	0	1	0	1	0	1	.063	15
337		17	max	4586.234	1	2439.982	1	0	1	0	1	0	1	1.369	1
338			min	-4425.402	3	75.213	15	0	1	0	1	0	1	.042	15
339		18	max	4583.679	1	2439.982	1	0	1	0	1	0	1	.685	1
340			min	-4427.318	3	75.213	15	0	1	0	1	0	1	.021	15
341		19	max	4581.124	1	2439.982	1	0	1	0	1	0	1	0	1
342			min	-4429.234	3	75.213	15	0	1	0	1	0	1	0	1
343	M8	1	max	2329.191	1	910.465	3	264.282	3	.01	2	.292	1	4.969	1
344			min	-1747.625	3	-655.103	2	-238.685	2	-.004	3	-.336	3	.184	15
345		2	max	2326.636	1	910.465	3	264.282	3	.01	2	.227	1	5.026	1
346			min	-1749.541	3	-655.103	2	-238.685	2	-.004	3	-.262	3	.182	15
347		3	max	2324.081	1	910.465	3	264.282	3	.01	2	.163	1	5.084	1
348			min	-1751.457	3	-655.103	2	-238.685	2	-.004	3	-.187	3	.181	15
349		4	max	1725.416	1	1170.893	1	238.063	3	.001	3	.14	1	4.928	1
350			min	-1507.389	3	41.223	15	-176.991	2	-.002	2	-.136	3	.173	15
351		5	max	1722.861	1	1170.893	1	238.063	3	.001	3	.091	1	4.599	1
352			min	-1509.305	3	41.223	15	-176.991	2	-.002	2	-.069	3	.162	15
353		6	max	1720.306	1	1170.893	1	238.063	3	.001	3	.042	1	4.271	1
354			min	-1511.221	3	41.223	15	-176.991	2	-.002	2	-.003	3	.15	15
355		7	max	1717.751	1	1170.893	1	238.063	3	.001	3	.064	3	3.942	1
356			min	-1513.137	3	41.223	15	-176.991	2	-.002	2	-.023	2	.139	15
357		8	max	1715.196	1	1170.893	1	238.063	3	.001	3	.131	3	3.614	1
358			min	-1515.054	3	41.223	15	-176.991	2	-.002	2	-.072	2	.127	15
359		9	max	1712.642	1	1170.893	1	238.063	3	.001	3	.198	3	3.285	1
360			min	-1516.97	3	41.223	15	-176.991	2	-.002	2	-.122	2	.116	15
361		10	max	1710.087	1	1170.893	1	238.063	3	.001	3	.265	3	2.957	1
362			min	-1518.886	3	41.223	15	-176.991	2	-.002	2	-.172	2	.104	15
363		11	max	1707.532	1	1170.893	1	238.063	3	.001	3	.331	3	2.628	1
364			min	-1520.802	3	41.223	15	-176.991	2	-.002	2	-.221	2	.093	15
365		12	max	1704.977	1	1170.893	1	238.063	3	.001	3	.398	3	2.3	1
366			min	-1522.718	3	41.223	15	-176.991	2	-.002	2	-.271	2	.081	15
367		13	max	1702.422	1	1170.893	1	238.063	3	.001	3	.465	3	1.971	1
368			min	-1524.634	3	41.223	15	-176.991	2	-.002	2	-.321	2	.069	15
369		14	max	1699.867	1	1170.893	1	238.063	3	.001	3	.532	3	1.643	1
370			min	-1526.551	3	41.223	15	-176.991	2	-.002	2	-.37	2	.058	15
371		15	max	1697.312	1	1170.893	1	238.063	3	.001	3	.599	3	1.314	1
372			min	-1528.467	3	41.223	15	-176.991	2	-.002	2	-.42	2	.046	15
373		16	max	1694.757	1	1170.893	1	238.063	3	.001	3	.665	3	.986	1
374			min	-1530.383	3	41.223	15	-176.991	2	-.002	2	-.47	2	.035	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	1692.202	1	1170.893	1	238.063	3	.001	3	.732	3	.657	1
376			min	-1532.299	3	41.223	15	-176.991	2	-.002	2	-.519	2	.023	15
377		18	max	1689.648	1	1170.893	1	238.063	3	.001	3	.799	3	.329	1
378			min	-1534.215	3	41.223	15	-176.991	2	-.002	2	-.569	2	.012	15
379		19	max	1687.093	1	1170.893	1	238.063	3	.001	3	.866	3	0	1
380			min	-1536.131	3	41.223	15	-176.991	2	-.002	2	-.619	2	0	1
381	M3	1	max	1744.424	2	4.588	4	61.029	2	.019	3	.005	2	0	1
382			min	-620.13	3	1.079	15	-26.797	3	-.04	2	-.003	3	0	1
383		2	max	1744.249	2	4.078	4	61.029	2	.019	3	.023	2	0	15
384			min	-620.261	3	.959	15	-26.797	3	-.04	2	-.011	3	-.001	4
385		3	max	1744.075	2	3.569	4	61.029	2	.019	3	.041	2	0	15
386			min	-620.391	3	.839	15	-26.797	3	-.04	2	-.018	3	-.002	4
387		4	max	1743.901	2	3.059	4	61.029	2	.019	3	.059	2	0	15
388			min	-620.522	3	.719	15	-26.797	3	-.04	2	-.026	3	-.003	4
389		5	max	1743.726	2	2.549	4	61.029	2	.019	3	.077	2	0	15
390			min	-620.653	3	.599	15	-26.797	3	-.04	2	-.034	3	-.004	4
391		6	max	1743.552	2	2.039	4	61.029	2	.019	3	.094	2	-.001	15
392			min	-620.784	3	.479	15	-26.797	3	-.04	2	-.042	3	-.005	4
393		7	max	1743.378	2	1.529	4	61.029	2	.019	3	.112	2	-.001	15
394			min	-620.915	3	.36	15	-26.797	3	-.04	2	-.05	3	-.005	4
395		8	max	1743.203	2	1.02	4	61.029	2	.019	3	.13	2	-.001	15
396			min	-621.045	3	.24	15	-26.797	3	-.04	2	-.058	3	-.006	4
397		9	max	1743.029	2	.51	4	61.029	2	.019	3	.148	2	-.001	15
398			min	-621.176	3	.12	15	-26.797	3	-.04	2	-.065	3	-.006	4
399		10	max	1742.854	2	0	1	61.029	2	.019	3	.166	2	-.001	15
400			min	-621.307	3	0	1	-26.797	3	-.04	2	-.073	3	-.006	4
401		11	max	1742.68	2	-.12	15	61.029	2	.019	3	.184	2	-.001	15
402			min	-621.438	3	-.51	4	-26.797	3	-.04	2	-.081	3	-.006	4
403		12	max	1742.506	2	-.24	15	61.029	2	.019	3	.202	2	-.001	15
404			min	-621.569	3	-1.02	4	-26.797	3	-.04	2	-.089	3	-.006	4
405		13	max	1742.331	2	-.36	15	61.029	2	.019	3	.219	2	-.001	15
406			min	-621.699	3	-1.529	4	-26.797	3	-.04	2	-.097	3	-.005	4
407		14	max	1742.157	2	-.479	15	61.029	2	.019	3	.237	2	-.001	15
408			min	-621.83	3	-2.039	4	-26.797	3	-.04	2	-.105	3	-.005	4
409		15	max	1741.982	2	-.599	15	61.029	2	.019	3	.255	2	0	15
410			min	-621.961	3	-2.549	4	-26.797	3	-.04	2	-.112	3	-.004	4
411		16	max	1741.808	2	-.719	15	61.029	2	.019	3	.273	2	0	15
412			min	-622.092	3	-3.059	4	-26.797	3	-.04	2	-.12	3	-.003	4
413		17	max	1741.634	2	-.839	15	61.029	2	.019	3	.291	2	0	15
414			min	-622.222	3	-3.569	4	-26.797	3	-.04	2	-.128	3	-.002	4
415		18	max	1741.459	2	-.959	15	61.029	2	.019	3	.309	2	0	15
416			min	-622.353	3	-4.078	4	-26.797	3	-.04	2	-.136	3	-.001	4
417		19	max	1741.285	2	-1.079	15	61.029	2	.019	3	.326	2	0	1
418			min	-622.484	3	-4.588	4	-26.797	3	-.04	2	-.144	3	0	1
419	M6	1	max	5002.399	2	4.588	4	0	1	0	1	0	1	0	1
420			min	-2141.411	3	1.079	15	0	1	0	1	0	1	0	1
421		2	max	5002.224	2	4.078	4	0	1	0	1	0	1	0	15
422			min	-2141.542	3	.959	15	0	1	0	1	0	1	-.001	4
423		3	max	5002.05	2	3.569	4	0	1	0	1	0	1	0	15
424			min	-2141.672	3	.839	15	0	1	0	1	0	1	-.002	4
425		4	max	5001.875	2	3.059	4	0	1	0	1	0	1	0	15
426			min	-2141.803	3	.719	15	0	1	0	1	0	1	-.003	4
427		5	max	5001.701	2	2.549	4	0	1	0	1	0	1	0	15
428			min	-2141.934	3	.599	15	0	1	0	1	0	1	-.004	4
429		6	max	5001.527	2	2.039	4	0	1	0	1	0	1	-.001	15
430			min	-2142.065	3	.479	15	0	1	0	1	0	1	-.005	4
431		7	max	5001.352	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	-2142.196	3	.36	15	0	1	0	1	0	1	-.005	4
433		8	max	5001.178	2	1.02	4	0	1	0	1	0	1	-.001	15
434			min	-2142.326	3	.24	15	0	1	0	1	0	1	-.006	4
435		9	max	5001.003	2	.51	4	0	1	0	1	0	1	-.001	15
436			min	-2142.457	3	.12	15	0	1	0	1	0	1	-.006	4
437		10	max	5000.829	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2142.588	3	0	1	0	1	0	1	0	1	-.006	4
439		11	max	5000.655	2	-.12	15	0	1	0	1	0	1	-.001	15
440			min	-2142.719	3	-.51	4	0	1	0	1	0	1	-.006	4
441		12	max	5000.48	2	-.24	15	0	1	0	1	0	1	-.001	15
442			min	-2142.85	3	-1.02	4	0	1	0	1	0	1	-.006	4
443		13	max	5000.306	2	-.36	15	0	1	0	1	0	1	-.001	15
444			min	-2142.98	3	-1.529	4	0	1	0	1	0	1	-.005	4
445		14	max	5000.132	2	-.479	15	0	1	0	1	0	1	-.001	15
446			min	-2143.111	3	-2.039	4	0	1	0	1	0	1	-.005	4
447		15	max	4999.957	2	-.599	15	0	1	0	1	0	1	0	15
448			min	-2143.242	3	-2.549	4	0	1	0	1	0	1	-.004	4
449		16	max	4999.783	2	-.719	15	0	1	0	1	0	1	0	15
450			min	-2143.373	3	-3.059	4	0	1	0	1	0	1	-.003	4
451		17	max	4999.608	2	-.839	15	0	1	0	1	0	1	0	15
452			min	-2143.504	3	-3.569	4	0	1	0	1	0	1	-.002	4
453		18	max	4999.434	2	-.959	15	0	1	0	1	0	1	0	15
454			min	-2143.634	3	-4.078	4	0	1	0	1	0	1	-.001	4
455		19	max	4999.26	2	-1.079	15	0	1	0	1	0	1	0	1
456			min	-2143.765	3	-4.588	4	0	1	0	1	0	1	0	1
457	M9	1	max	1744.424	2	4.588	4	26.797	3	.04	2	.003	3	0	1
458			min	-620.13	3	1.079	15	-61.029	2	-.019	3	-.005	2	0	1
459		2	max	1744.249	2	4.078	4	26.797	3	.04	2	.011	3	0	15
460			min	-620.261	3	.959	15	-61.029	2	-.019	3	-.023	2	-.001	4
461		3	max	1744.075	2	3.569	4	26.797	3	.04	2	.018	3	0	15
462			min	-620.391	3	.839	15	-61.029	2	-.019	3	-.041	2	-.002	4
463		4	max	1743.901	2	3.059	4	26.797	3	.04	2	.026	3	0	15
464			min	-620.522	3	.719	15	-61.029	2	-.019	3	-.059	2	-.003	4
465		5	max	1743.726	2	2.549	4	26.797	3	.04	2	.034	3	0	15
466			min	-620.653	3	.599	15	-61.029	2	-.019	3	-.077	2	-.004	4
467		6	max	1743.552	2	2.039	4	26.797	3	.04	2	.042	3	-.001	15
468			min	-620.784	3	.479	15	-61.029	2	-.019	3	-.094	2	-.005	4
469		7	max	1743.378	2	1.529	4	26.797	3	.04	2	.05	3	-.001	15
470			min	-620.915	3	.36	15	-61.029	2	-.019	3	-.112	2	-.005	4
471		8	max	1743.203	2	1.02	4	26.797	3	.04	2	.058	3	-.001	15
472			min	-621.045	3	.24	15	-61.029	2	-.019	3	-.13	2	-.006	4
473		9	max	1743.029	2	.51	4	26.797	3	.04	2	.065	3	-.001	15
474			min	-621.176	3	.12	15	-61.029	2	-.019	3	-.148	2	-.006	4
475		10	max	1742.854	2	0	1	26.797	3	.04	2	.073	3	-.001	15
476			min	-621.307	3	0	1	-61.029	2	-.019	3	-.166	2	-.006	4
477		11	max	1742.68	2	-.12	15	26.797	3	.04	2	.081	3	-.001	15
478			min	-621.438	3	-.51	4	-61.029	2	-.019	3	-.184	2	-.006	4
479		12	max	1742.506	2	-.24	15	26.797	3	.04	2	.089	3	-.001	15
480			min	-621.569	3	-1.02	4	-61.029	2	-.019	3	-.202	2	-.006	4
481		13	max	1742.331	2	-.36	15	26.797	3	.04	2	.097	3	-.001	15
482			min	-621.699	3	-1.529	4	-61.029	2	-.019	3	-.219	2	-.005	4
483		14	max	1742.157	2	-.479	15	26.797	3	.04	2	.105	3	-.001	15
484			min	-621.83	3	-2.039	4	-61.029	2	-.019	3	-.237	2	-.005	4
485		15	max	1741.982	2	-.599	15	26.797	3	.04	2	.112	3	0	15
486			min	-621.961	3	-2.549	4	-61.029	2	-.019	3	-.255	2	-.004	4
487		16	max	1741.808	2	-.719	15	26.797	3	.04	2	.12	3	0	15
488			min	-622.092	3	-3.059	4	-61.029	2	-.019	3	-.273	2	-.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	1741.634	2	-.839	15	26.797	3	.04	2	.128	3	0	15
490			min	-622.222	3	-3.569	4	-61.029	2	-.019	3	-.291	2	-.002	4
491		18	max	1741.459	2	-.959	15	26.797	3	.04	2	.136	3	0	15
492			min	-622.353	3	-4.078	4	-61.029	2	-.019	3	-.309	2	-.001	4
493		19	max	1741.285	2	-1.079	15	26.797	3	.04	2	.144	3	0	1
494			min	-622.484	3	-4.588	4	-61.029	2	-.019	3	-.326	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	-.009	15	.044	3	.024	1	9.867e-3	3	NC	3	NC	3
2			min	-.248	1	-.617	1	0	15	-2.529e-2	2	201.939	1	2953.185	1
3		2	max	-.009	15	.018	3	.007	1	9.867e-3	3	8535.404	12	NC	3
4			min	-.248	1	-.522	1	0	15	-2.529e-2	2	235.704	1	4686.674	1
5		3	max	-.009	15	-.006	12	0	15	9.353e-3	3	7791.806	15	NC	2
6			min	-.248	1	-.427	1	-.007	1	-2.345e-2	2	283.083	1	9467.112	1
7		4	max	-.009	15	-.011	15	0	15	8.566e-3	3	9225.878	15	NC	1
8			min	-.248	1	-.335	1	-.013	1	-2.062e-2	2	351.099	1	NC	1
9		5	max	-.009	15	-.009	15	0	3	7.778e-3	3	NC	15	NC	1
10			min	-.248	1	-.252	1	-.014	1	-1.78e-2	2	448.542	1	NC	1
11		6	max	-.009	15	-.007	15	.001	3	7.851e-3	3	NC	15	NC	1
12			min	-.248	1	-.184	1	-.011	1	-1.691e-2	2	582.302	1	NC	1
13		7	max	-.009	15	-.005	15	.002	3	8.519e-3	3	NC	5	NC	2
14			min	-.247	1	-.129	1	-.005	1	-1.736e-2	2	764.42	1	8408.148	1
15		8	max	-.009	15	-.003	15	0	3	9.187e-3	3	NC	5	NC	2
16			min	-.247	1	-.083	1	-.001	2	-1.781e-2	2	1034.639	1	6414.938	1
17		9	max	-.009	15	-.002	15	0	15	1.011e-2	3	NC	2	NC	2
18			min	-.246	1	-.064	3	0	3	-1.728e-2	2	1237.827	3	6342.395	1
19		10	max	-.009	15	.005	2	0	2	1.149e-2	3	NC	5	NC	2
20			min	-.246	1	-.057	3	0	3	-1.502e-2	2	1326.937	3	6156.467	1
21		11	max	-.009	15	.034	2	.001	3	1.287e-2	3	NC	1	NC	2
22			min	-.245	1	-.046	3	0	2	-1.276e-2	2	1495.502	3	6488.501	1
23		12	max	-.009	15	.068	1	.006	3	1.06e-2	3	NC	4	NC	2
24			min	-.245	1	-.03	3	-.006	1	-9.408e-3	2	1772.914	2	8609.448	1
25		13	max	-.009	15	.095	1	.011	3	6.257e-3	3	NC	4	NC	2
26			min	-.244	1	-.004	3	-.007	2	-5.428e-3	2	1405.814	2	9120.819	1
27		14	max	-.009	15	.112	1	.011	3	2.123e-3	3	NC	3	NC	2
28			min	-.243	1	.004	15	-.004	2	-1.618e-3	1	1288.74	2	6662.317	1
29		15	max	-.009	15	.113	1	.007	3	7.232e-3	3	NC	4	NC	2
30			min	-.243	1	.004	15	0	10	-4.377e-3	2	1374.249	2	4817.569	1
31		16	max	-.009	15	.184	3	.01	1	1.234e-2	3	NC	4	NC	3
32			min	-.243	1	.004	15	0	15	-7.158e-3	2	954.169	3	4291.49	1
33		17	max	-.009	15	.277	3	.006	1	1.745e-2	3	NC	4	NC	3
34			min	-.244	1	.004	15	0	15	-9.938e-3	2	575.661	3	4848.294	1
35		18	max	-.009	15	.373	3	0	15	2.078e-2	3	NC	4	NC	2
36			min	-.244	1	-.003	10	-.006	1	-1.175e-2	2	406.953	3	8923.669	1
37		19	max	-.009	15	.47	3	0	15	2.078e-2	3	NC	1	NC	1
38			min	-.244	1	-.019	10	-.021	1	-1.175e-2	2	314.818	3	NC	1
39	M4	1	max	-.016	15	.223	3	0	1	0	1	NC	3	NC	1
40			min	-.513	1	-1.388	1	0	1	0	1	100.486	1	NC	1
41		2	max	-.016	15	.145	3	0	1	0	1	3992.221	15	NC	1
42			min	-.513	1	-1.166	1	0	1	0	1	120.539	1	NC	1
43		3	max	-.016	15	.067	3	0	1	0	1	4817.124	15	NC	1
44			min	-.513	1	-.943	1	0	1	0	1	150.686	1	NC	1
45		4	max	-.016	15	-.006	12	0	1	0	1	6021.337	15	NC	1
46			min	-.513	1	-.729	1	0	1	0	1	198.467	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	-.016	15	-.016	15	0	1	0	1	7790.07	15	NC	1
48			min	-.513	1	-.538	1	0	1	0	1	276.784	1	NC	1
49		6	max	-.016	15	-.012	15	0	1	0	1	NC	15	NC	1
50			min	-.512	1	-.385	1	0	1	0	1	404.318	1	NC	1
51		7	max	-.016	15	-.009	15	0	1	0	1	NC	15	NC	1
52			min	-.511	1	-.269	1	0	1	0	1	386.537	3	NC	1
53		8	max	-.016	15	-.006	15	0	1	0	1	NC	2	NC	1
54			min	-.509	1	-.175	1	0	1	0	1	381.906	3	NC	1
55		9	max	-.016	15	-.003	15	0	1	0	1	NC	5	NC	1
56			min	-.508	1	-.124	3	0	1	0	1	386.147	3	NC	1
57		10	max	-.016	15	.003	10	0	1	0	1	NC	4	NC	1
58			min	-.507	1	-.115	3	0	1	0	1	396.375	3	NC	1
59		11	max	-.016	15	.071	1	0	1	0	1	NC	4	NC	1
60			min	-.506	1	-.099	3	0	1	0	1	416.89	3	NC	1
61		12	max	-.016	15	.144	1	0	1	0	1	NC	5	NC	1
62			min	-.504	1	-.073	3	0	1	0	1	453.704	3	NC	1
63		13	max	-.016	15	.202	1	0	1	0	1	NC	5	NC	1
64			min	-.503	1	-.024	3	0	1	0	1	427.825	2	NC	1
65		14	max	-.016	15	.229	1	0	1	0	1	NC	5	NC	1
66			min	-.501	1	.007	15	0	1	0	1	405.455	2	NC	1
67		15	max	-.016	15	.22	3	0	1	0	1	NC	3	NC	1
68			min	-.501	1	.007	15	0	1	0	1	439.767	2	NC	1
69		16	max	-.016	15	.416	3	0	1	0	1	NC	5	NC	1
70			min	-.502	1	.006	15	0	1	0	1	542.677	2	NC	1
71		17	max	-.016	15	.639	3	0	1	0	1	NC	5	NC	1
72			min	-.502	1	.005	15	0	1	0	1	321.705	3	NC	1
73		18	max	-.016	15	.873	3	0	1	0	1	NC	4	NC	1
74			min	-.502	1	-.049	2	0	1	0	1	206.13	3	NC	1
75		19	max	-.016	15	1.106	3	0	1	0	1	NC	1	NC	1
76			min	-.502	1	-.134	2	0	1	0	1	151.762	3	NC	1
77	M7	1	max	-.009	15	.044	3	0	15	2.529e-2	2	NC	3	NC	3
78			min	-.248	1	-.617	1	-.024	1	-9.867e-3	3	201.939	1	2953.185	1
79		2	max	-.009	15	.018	3	0	15	2.529e-2	2	8535.404	12	NC	3
80			min	-.248	1	-.522	1	-.007	1	-9.867e-3	3	235.704	1	4686.674	1
81		3	max	-.009	15	-.006	12	.007	1	2.345e-2	2	7791.806	15	NC	2
82			min	-.248	1	-.427	1	0	15	-9.353e-3	3	283.083	1	9467.112	1
83		4	max	-.009	15	-.011	15	.013	1	2.062e-2	2	9225.878	15	NC	1
84			min	-.248	1	-.335	1	0	15	-8.566e-3	3	351.099	1	NC	1
85		5	max	-.009	15	-.009	15	.014	1	1.78e-2	2	NC	15	NC	1
86			min	-.248	1	-.252	1	0	3	-7.778e-3	3	448.542	1	NC	1
87		6	max	-.009	15	-.007	15	.011	1	1.691e-2	2	NC	15	NC	1
88			min	-.248	1	-.184	1	-.001	3	-7.851e-3	3	582.302	1	NC	1
89		7	max	-.009	15	-.005	15	.005	1	1.736e-2	2	NC	5	NC	2
90			min	-.247	1	-.129	1	-.002	3	-8.519e-3	3	764.42	1	8408.148	1
91		8	max	-.009	15	-.003	15	.001	2	1.781e-2	2	NC	5	NC	2
92			min	-.247	1	-.083	1	0	3	-9.187e-3	3	1034.639	1	6414.938	1
93		9	max	-.009	15	-.002	15	0	3	1.728e-2	2	NC	2	NC	2
94			min	-.246	1	-.064	3	0	15	-1.011e-2	3	1237.827	3	6342.395	1
95		10	max	-.009	15	.005	2	0	3	1.502e-2	2	NC	5	NC	2
96			min	-.246	1	-.057	3	0	2	-1.149e-2	3	1326.937	3	6156.467	1
97		11	max	-.009	15	.034	2	0	2	1.276e-2	2	NC	1	NC	2
98			min	-.245	1	-.046	3	-.001	3	-1.287e-2	3	1495.502	3	6488.501	1
99		12	max	-.009	15	.068	1	.006	1	9.408e-3	2	NC	4	NC	2
100			min	-.245	1	-.03	3	-.006	3	-1.06e-2	3	1772.914	2	8609.448	1
101		13	max	-.009	15	.095	1	.007	2	5.428e-3	2	NC	4	NC	2
102			min	-.244	1	-.004	3	-.011	3	-6.257e-3	3	1405.814	2	9120.819	1
103		14	max	-.009	15	.112	1	.004	2	1.618e-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	-.243	1	.004	15	-.011	3	-2.123e-3	3	1288.74	2	6662.317	1
105		15	max	-.009	15	.113	1	0	10	4.377e-3	2	NC	4	NC	2
106			min	-.243	1	.004	15	-.007	3	-7.232e-3	3	1374.249	2	4817.569	1
107		16	max	-.009	15	.184	3	0	15	7.158e-3	2	NC	4	NC	3
108			min	-.243	1	.004	15	-.01	1	-1.234e-2	3	954.169	3	4291.49	1
109		17	max	-.009	15	.277	3	0	15	9.938e-3	2	NC	4	NC	3
110			min	-.244	1	.004	15	-.006	1	-1.745e-2	3	575.661	3	4848.294	1
111		18	max	-.009	15	.373	3	.006	1	1.175e-2	2	NC	4	NC	2
112			min	-.244	1	-.003	10	0	15	-2.078e-2	3	406.953	3	8923.669	1
113		19	max	-.009	15	.47	3	.021	1	1.175e-2	2	NC	1	NC	1
114			min	-.244	1	-.019	10	0	15	-2.078e-2	3	314.818	3	NC	1
115	M10	1	max	.001	1	.34	3	.244	1	1.295e-2	3	NC	1	NC	1
116			min	0	15	.003	10	.009	15	-3.684e-3	2	NC	1	NC	1
117		2	max	0	1	.611	3	.292	1	1.498e-2	3	NC	5	NC	3
118			min	0	15	-.13	2	.01	15	-4.535e-3	2	841.461	3	4706.382	1
119		3	max	0	1	.861	3	.366	1	1.702e-2	3	NC	5	NC	3
120			min	0	15	-.264	2	.013	15	-5.386e-3	2	437.321	3	1855.559	1
121		4	max	0	1	1.049	3	.443	1	1.906e-2	3	NC	5	NC	5
122			min	0	15	-.354	2	.016	15	-6.237e-3	2	321.345	3	1144.974	1
123		5	max	0	1	1.151	3	.504	1	2.11e-2	3	NC	5	NC	5
124			min	0	15	-.385	2	.018	15	-7.088e-3	2	280.906	3	875.817	1
125		6	max	0	1	1.162	3	.54	1	2.313e-2	3	NC	5	NC	5
126			min	0	15	-.355	2	.019	15	-7.939e-3	2	277.409	3	768.076	1
127		7	max	0	1	1.092	3	.55	1	2.517e-2	3	NC	5	NC	5
128			min	0	15	-.275	2	.019	15	-8.79e-3	2	303.105	3	744.29	1
129		8	max	0	1	.972	3	.537	1	2.721e-2	3	NC	5	NC	5
130			min	0	15	-.167	2	.018	15	-9.641e-3	2	360.459	3	776.29	1
131		9	max	0	1	.85	3	.515	1	2.925e-2	3	NC	4	NC	5
132			min	0	15	-.066	2	.016	15	-1.049e-2	2	446.516	3	840.867	1
133		10	max	0	1	.792	3	.502	1	3.128e-2	3	NC	4	NC	5
134			min	0	1	-.025	10	.016	15	-1.134e-2	2	504.228	3	883.317	1
135		11	max	0	15	.85	3	.515	1	2.925e-2	3	NC	4	NC	5
136			min	0	1	-.066	2	.016	15	-1.049e-2	2	446.516	3	840.867	1
137		12	max	0	15	.972	3	.537	1	2.721e-2	3	NC	5	NC	5
138			min	0	1	-.167	2	.018	15	-9.641e-3	2	360.459	3	776.29	1
139		13	max	0	15	1.092	3	.55	1	2.517e-2	3	NC	5	NC	5
140			min	0	1	-.275	2	.019	15	-8.79e-3	2	303.105	3	744.29	1
141		14	max	0	15	1.162	3	.54	1	2.313e-2	3	NC	5	NC	5
142			min	0	1	-.355	2	.019	15	-7.939e-3	2	277.409	3	768.076	1
143		15	max	0	15	1.151	3	.504	1	2.11e-2	3	NC	5	NC	5
144			min	0	1	-.385	2	.018	15	-7.088e-3	2	280.906	3	875.817	1
145		16	max	0	15	1.049	3	.443	1	1.906e-2	3	NC	5	NC	5
146			min	0	1	-.354	2	.016	15	-6.237e-3	2	321.345	3	1144.974	1
147		17	max	0	15	.861	3	.366	1	1.702e-2	3	NC	5	NC	3
148			min	0	1	-.264	2	.013	15	-5.386e-3	2	437.321	3	1855.559	1
149		18	max	0	15	.611	3	.292	1	1.498e-2	3	NC	5	NC	3
150			min	0	1	-.13	2	.01	15	-4.535e-3	2	841.461	3	4706.382	1
151		19	max	0	15	.34	3	.244	1	1.295e-2	3	NC	1	NC	1
152			min	-.001	1	.003	10	.009	15	-3.684e-3	2	NC	1	NC	1
153	M11	1	max	.002	1	.047	1	.245	1	4.563e-3	1	NC	1	NC	1
154			min	-.003	3	-.04	3	.009	15	1.656e-4	15	NC	1	NC	1
155		2	max	.002	1	.139	3	.282	1	5.154e-3	1	NC	5	NC	3
156			min	-.002	3	-.106	2	.01	15	1.814e-4	15	1269.619	3	6131.015	1
157		3	max	.002	1	.304	3	.351	1	5.745e-3	1	NC	5	NC	3
158			min	-.002	3	-.233	2	.012	15	1.973e-4	15	661.957	3	2155.387	1
159		4	max	.002	1	.414	3	.425	1	6.335e-3	1	NC	5	NC	3
160			min	-.002	3	-.311	2	.015	15	2.131e-4	15	501.991	3	1262.943	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
161		5	max	.001	1	.446	3	.488	1	6.926e-3	1	NC	5	NC	3
162			min	-.001	3	-.328	2	.017	15	2.289e-4	15	468.765	3	936.521	1
163		6	max	.001	1	.396	3	.529	1	7.517e-3	1	NC	5	NC	5
164			min	-.001	3	-.283	2	.018	15	2.448e-4	15	522.415	3	803.272	1
165		7	max	0	1	.277	3	.543	1	8.108e-3	1	NC	5	NC	5
166			min	0	3	-.188	2	.018	15	2.606e-4	15	717.755	3	764.485	1
167		8	max	0	1	.121	3	.535	1	8.699e-3	1	NC	4	NC	5
168			min	0	3	-.067	2	.017	15	2.764e-4	15	1413.845	3	784.904	1
169		9	max	0	1	.049	1	.517	1	9.29e-3	1	NC	1	NC	5
170			min	0	3	-.024	3	.016	15	2.923e-4	15	NC	1	839.301	1
171		10	max	0	1	.098	1	.505	1	9.881e-3	1	NC	4	NC	5
172			min	0	1	-.09	3	.016	15	3.081e-4	15	4485.386	1	876.517	1
173		11	max	0	3	.049	1	.517	1	9.29e-3	1	NC	1	NC	5
174			min	0	1	-.024	3	.016	15	2.923e-4	15	NC	1	839.301	1
175		12	max	0	3	.121	3	.535	1	8.699e-3	1	NC	4	NC	5
176			min	0	1	-.067	2	.017	15	2.764e-4	15	1413.845	3	784.904	1
177		13	max	0	3	.277	3	.543	1	8.108e-3	1	NC	5	NC	5
178			min	0	1	-.188	2	.018	15	2.606e-4	15	717.755	3	764.485	1
179		14	max	.001	3	.396	3	.529	1	7.517e-3	1	NC	5	NC	5
180			min	-.001	1	-.283	2	.018	15	2.448e-4	15	522.415	3	803.272	1
181		15	max	.001	3	.446	3	.488	1	6.926e-3	1	NC	5	NC	3
182			min	-.001	1	-.328	2	.017	15	2.289e-4	15	468.765	3	936.521	1
183		16	max	.002	3	.414	3	.425	1	6.335e-3	1	NC	5	NC	3
184			min	-.002	1	-.311	2	.015	15	2.131e-4	15	501.991	3	1262.943	1
185		17	max	.002	3	.304	3	.351	1	5.745e-3	1	NC	5	NC	3
186			min	-.002	1	-.233	2	.012	15	1.973e-4	15	661.957	3	2155.387	1
187		18	max	.002	3	.139	3	.282	1	5.154e-3	1	NC	5	NC	3
188			min	-.002	1	-.106	2	.01	15	1.814e-4	15	1269.619	3	6131.015	1
189		19	max	.003	3	.047	1	.245	1	4.563e-3	1	NC	1	NC	1
190			min	-.002	1	-.04	3	.009	15	1.656e-4	15	NC	1	NC	1
191	M12	1	max	0	2	-.002	15	.246	1	5.531e-3	1	NC	1	NC	1
192			min	0	9	-.066	3	.009	15	1.946e-4	15	NC	1	NC	1
193		2	max	0	2	.049	3	.277	1	6.177e-3	1	NC	5	NC	2
194			min	0	9	-.267	2	.01	15	2.125e-4	15	995.518	2	7389.022	1
195		3	max	0	2	.138	3	.343	1	6.824e-3	1	NC	5	NC	3
196			min	0	9	-.464	2	.012	15	2.303e-4	15	535.303	2	2368.983	1
197		4	max	0	2	.187	3	.417	1	7.471e-3	1	NC	5	NC	3
198			min	0	9	-.593	2	.015	15	2.481e-4	15	411.104	2	1338.998	1
199		5	max	0	2	.19	3	.481	1	8.117e-3	1	NC	5	NC	5
200			min	0	9	-.635	2	.017	15	2.659e-4	15	382.351	2	972.953	1
201		6	max	0	2	.15	3	.523	1	8.764e-3	1	NC	5	NC	5
202			min	0	9	-.588	2	.018	15	2.838e-4	15	414.814	2	822.866	1
203		7	max	0	2	.077	3	.541	1	9.41e-3	1	NC	5	NC	5
204			min	0	9	-.469	2	.018	15	3.016e-4	15	529.553	2	774.396	1
205		8	max	0	2	-.008	15	.536	1	1.006e-2	1	NC	5	NC	5
206			min	0	9	-.311	2	.017	15	3.194e-4	15	837.22	2	787.417	1
207		9	max	0	2	-.005	15	.519	1	1.07e-2	1	NC	4	NC	5
208			min	0	9	-.179	1	.016	15	3.372e-4	15	1815.004	2	835.375	1
209		10	max	0	1	-.004	15	.509	1	1.135e-2	1	NC	4	NC	5
210			min	0	1	-.126	3	.016	15	3.551e-4	15	3501.631	1	869.304	1
211		11	max	0	9	-.005	15	.519	1	1.07e-2	1	NC	4	NC	5
212			min	0	2	-.179	1	.016	15	3.372e-4	15	1815.004	2	835.375	1
213		12	max	0	9	-.008	15	.536	1	1.006e-2	1	NC	5	NC	5
214			min	0	2	-.311	2	.017	15	3.194e-4	15	837.22	2	787.417	1
215		13	max	0	9	.077	3	.541	1	9.41e-3	1	NC	5	NC	5
216			min	0	2	-.469	2	.018	15	3.016e-4	15	529.553	2	774.396	1
217		14	max	0	9	.15	3	.523	1	8.764e-3	1	NC	5	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
218			min	0	2	-.588	2	.018	15	2.838e-4	15	414.814	2	822.866	1
219		15	max	0	9	.19	3	.481	1	8.117e-3	1	NC	5	NC	5
220			min	0	2	-.635	2	.017	15	2.659e-4	15	382.351	2	972.953	1
221		16	max	0	9	.187	3	.417	1	7.471e-3	1	NC	5	NC	3
222			min	0	2	-.593	2	.015	15	2.481e-4	15	411.104	2	1338.998	1
223		17	max	0	9	.138	3	.343	1	6.824e-3	1	NC	5	NC	3
224			min	0	2	-.464	2	.012	15	2.303e-4	15	535.303	2	2368.983	1
225		18	max	0	9	.049	3	.277	1	6.177e-3	1	NC	5	NC	2
226			min	0	2	-.267	2	.01	15	2.125e-4	15	995.518	2	7389.022	1
227		19	max	0	9	-.002	15	.246	1	5.531e-3	1	NC	1	NC	1
228			min	0	2	-.066	3	.009	15	1.946e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.01	3	.248	1	1.28e-2	2	NC	1	NC	1
230			min	-.001	1	-.489	1	.009	15	-3.425e-3	3	NC	1	NC	1
231		2	max	0	12	.133	3	.299	1	1.487e-2	2	NC	5	NC	3
232			min	-.001	1	-.774	1	.011	15	-4.201e-3	3	711.946	2	4466.169	1
233		3	max	0	12	.239	3	.375	1	1.695e-2	2	NC	5	NC	3
234			min	-.001	1	-1.054	2	.013	15	-4.977e-3	3	375.742	2	1790.181	1
235		4	max	0	12	.311	3	.453	1	1.902e-2	2	NC	15	NC	3
236			min	0	1	-1.268	2	.016	15	-5.753e-3	3	277.672	2	1112.804	1
237		5	max	0	12	.34	3	.515	1	2.109e-2	2	NC	15	NC	5
238			min	0	1	-1.389	2	.018	15	-6.529e-3	3	242.04	2	854.403	1
239		6	max	0	12	.328	3	.552	1	2.316e-2	2	NC	15	NC	5
240			min	0	1	-1.413	2	.019	15	-7.305e-3	3	236.122	2	750.62	1
241		7	max	0	12	.28	3	.561	1	2.523e-2	2	NC	15	NC	5
242			min	0	1	-1.353	2	.019	15	-8.081e-3	3	251.812	2	727.654	1
243		8	max	0	12	.212	3	.549	1	2.731e-2	2	NC	15	NC	5
244			min	0	1	-1.239	2	.018	15	-8.857e-3	3	287.752	2	758.379	1
245		9	max	0	12	.148	3	.526	1	2.938e-2	2	NC	15	NC	5
246			min	0	1	-1.136	1	.017	15	-9.633e-3	3	338.008	2	820.254	1
247		10	max	0	1	.118	3	.513	1	3.145e-2	2	NC	15	NC	5
248			min	0	1	-1.089	1	.016	15	-1.041e-2	3	369.197	2	860.815	1
249		11	max	0	1	.148	3	.526	1	2.938e-2	2	NC	15	NC	5
250			min	0	12	-1.136	1	.017	15	-9.633e-3	3	338.008	2	820.254	1
251		12	max	0	1	.212	3	.549	1	2.731e-2	2	NC	15	NC	5
252			min	0	12	-1.239	2	.018	15	-8.857e-3	3	287.752	2	758.379	1
253		13	max	0	1	.28	3	.561	1	2.523e-2	2	NC	15	NC	5
254			min	0	12	-1.353	2	.019	15	-8.081e-3	3	251.812	2	727.654	1
255		14	max	0	1	.328	3	.552	1	2.316e-2	2	NC	15	NC	5
256			min	0	12	-1.413	2	.019	15	-7.305e-3	3	236.122	2	750.62	1
257		15	max	0	1	.34	3	.515	1	2.109e-2	2	NC	15	NC	5
258			min	0	12	-1.389	2	.018	15	-6.529e-3	3	242.04	2	854.403	1
259		16	max	0	1	.311	3	.453	1	1.902e-2	2	NC	15	NC	3
260			min	0	12	-1.268	2	.016	15	-5.753e-3	3	277.672	2	1112.804	1
261		17	max	.001	1	.239	3	.375	1	1.695e-2	2	NC	5	NC	3
262			min	0	12	-1.054	2	.013	15	-4.977e-3	3	375.742	2	1790.181	1
263		18	max	.001	1	.133	3	.299	1	1.487e-2	2	NC	5	NC	3
264			min	0	12	-.774	1	.011	15	-4.201e-3	3	711.946	2	4466.169	1
265		19	max	.001	1	.01	3	.248	1	1.28e-2	2	NC	1	NC	1
266			min	0	12	-.489	1	.009	15	-3.425e-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	2.69e-3	2	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-1.191e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	5.381e-3	2	NC	1	NC	1
272			min	0	1	-.004	1	0	1	-2.381e-3	3	NC	1	NC	1
273		4	max	0	3	0	15	.001	3	6.301e-3	2	NC	3	NC	1
274			min	0	1	-.01	1	-.001	1	-2.76e-3	3	6236.192	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	5.783e-3	2	NC	4	NC	1
276			min	0	1	-.017	1	-.002	1	-2.48e-3	3	3486.547	1	NC	1
277		6	max	0	3	0	15	.003	3	5.266e-3	2	NC	5	NC	1
278			min	0	1	-.027	1	-.003	1	-2.2e-3	3	2242.338	1	9704.93	3
279		7	max	0	3	-.001	15	.004	3	4.749e-3	2	NC	5	NC	1
280			min	0	1	-.039	1	-.004	1	-1.92e-3	3	1574.117	1	7787.432	3
281		8	max	0	3	-.002	15	.005	3	4.231e-3	2	NC	5	NC	1
282			min	0	1	-.052	1	-.005	1	-1.64e-3	3	1173.099	1	6551.74	3
283		9	max	0	3	-.002	15	.006	3	3.714e-3	2	NC	5	NC	1
284			min	0	1	-.066	1	-.005	1	-1.361e-3	3	913.12	1	5730.537	3
285		10	max	0	3	-.003	15	.006	3	3.197e-3	2	NC	5	NC	4
286			min	0	1	-.082	1	-.006	1	-1.081e-3	3	734.686	1	5186.094	3
287		11	max	0	3	-.004	15	.006	3	2.679e-3	2	NC	5	NC	4
288			min	0	1	-.1	1	-.007	1	-8.006e-4	3	606.769	1	4845.47	3
289		12	max	0	3	-.004	15	.006	3	2.162e-3	2	NC	15	NC	4
290			min	-.001	1	-.118	1	-.007	1	-5.207e-4	3	511.88	1	4673.158	3
291		13	max	0	3	-.005	15	.006	3	1.645e-3	2	NC	15	NC	4
292			min	-.001	1	-.138	1	-.007	1	-2.407e-4	3	439.495	1	4662.912	3
293		14	max	.001	3	-.006	15	.004	3	1.127e-3	2	NC	15	NC	4
294			min	-.001	1	-.158	1	-.007	1	5.904e-6	15	382.99	1	4840.397	3
295		15	max	.001	3	-.006	15	.003	3	6.101e-4	2	9498.117	15	NC	4
296			min	-.001	1	-.179	1	-.006	1	-8.963e-5	9	338.022	1	5286.664	3
297		16	max	.001	3	-.007	15	0	3	5.992e-4	3	8480.293	15	NC	4
298			min	-.001	1	-.201	1	-.005	1	-2.87e-4	1	301.656	1	6212.752	3
299		17	max	.001	3	-.008	15	0	15	8.791e-4	3	7645.15	15	NC	1
300			min	-.002	1	-.223	1	-.003	1	-7.701e-4	1	271.839	1	8276.027	3
301		18	max	.001	3	-.009	15	.001	2	1.159e-3	3	6951.839	15	NC	1
302			min	-.002	1	-.245	1	-.006	3	-1.253e-3	1	247.103	1	NC	1
303		19	max	.001	3	-.01	15	.004	2	1.439e-3	3	6370.49	15	NC	1
304			min	-.002	1	-.268	1	-.011	3	-1.736e-3	1	226.373	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	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	-.008	1	0	1	0	1	7488.946	1	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	0	2	-.019	1	0	1	0	1	3178.543	1	NC	1
313		5	max	.001	3	-.001	15	0	1	0	1	NC	5	NC	1
314			min	-.001	2	-.035	1	0	1	0	1	1748.738	1	NC	1
315		6	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
316			min	-.001	2	-.054	1	0	1	0	1	1114.602	1	NC	1
317		7	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
318			min	-.002	1	-.078	1	0	1	0	1	777.976	1	NC	1
319		8	max	.002	3	-.003	15	0	1	0	1	NC	5	NC	1
320			min	-.002	1	-.105	1	0	1	0	1	577.49	1	NC	1
321		9	max	.002	3	-.004	15	0	1	0	1	NC	15	NC	1
322			min	-.002	1	-.135	1	0	1	0	1	448.211	1	NC	1
323		10	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
324			min	-.002	1	-.168	1	0	1	0	1	359.834	1	NC	1
325		11	max	.002	3	-.006	15	0	1	0	1	9443.006	15	NC	1
326			min	-.003	1	-.204	1	0	1	0	1	296.673	1	NC	1
327		12	max	.003	3	-.008	15	0	1	0	1	7966.451	15	NC	1
328			min	-.003	1	-.242	1	0	1	0	1	249.934	1	NC	1
329		13	max	.003	3	-.009	15	0	1	0	1	6840.035	15	NC	1
330			min	-.003	1	-.283	1	0	1	0	1	214.35	1	NC	1
331		14	max	.003	3	-.01	15	0	1	0	1	5960.727	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	-.003	1	-.325	1	0	1	0	1	186.619	1	NC	1
333		15	max	.003	3	-.012	15	0	1	0	1	5260.929	15	NC	1
334			min	-.004	1	-.368	1	0	1	0	1	164.581	1	NC	1
335		16	max	.004	3	-.013	15	0	1	0	1	4694.982	15	NC	1
336			min	-.004	1	-.413	1	0	1	0	1	146.779	1	NC	1
337		17	max	.004	3	-.014	15	0	1	0	1	4230.955	15	NC	1
338			min	-.004	1	-.458	1	0	1	0	1	132.199	1	NC	1
339		18	max	.004	3	-.016	15	0	1	0	1	3845.984	15	NC	1
340			min	-.004	1	-.505	1	0	1	0	1	120.114	1	NC	1
341		19	max	.004	3	-.017	15	0	1	0	1	3523.367	15	NC	1
342			min	-.005	1	-.551	1	0	1	0	1	109.994	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	1.191e-3	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-2.69e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	2.381e-3	3	NC	1	NC	1
348			min	0	1	-.004	1	0	3	-5.381e-3	2	NC	1	NC	1
349		4	max	0	3	0	15	.001	1	2.76e-3	3	NC	3	NC	1
350			min	0	1	-.01	1	-.001	3	-6.301e-3	2	6236.192	1	NC	1
351		5	max	0	3	0	15	.002	1	2.48e-3	3	NC	4	NC	1
352			min	0	1	-.017	1	-.002	3	-5.783e-3	2	3486.547	1	NC	1
353		6	max	0	3	0	15	.003	1	2.2e-3	3	NC	5	NC	1
354			min	0	1	-.027	1	-.003	3	-5.266e-3	2	2242.338	1	9704.93	3
355		7	max	0	3	-.001	15	.004	1	1.92e-3	3	NC	5	NC	1
356			min	0	1	-.039	1	-.004	3	-4.749e-3	2	1574.117	1	7787.432	3
357		8	max	0	3	-.002	15	.005	1	1.64e-3	3	NC	5	NC	1
358			min	0	1	-.052	1	-.005	3	-4.231e-3	2	1173.099	1	6551.74	3
359		9	max	0	3	-.002	15	.005	1	1.361e-3	3	NC	5	NC	1
360			min	0	1	-.066	1	-.006	3	-3.714e-3	2	913.12	1	5730.537	3
361		10	max	0	3	-.003	15	.006	1	1.081e-3	3	NC	5	NC	4
362			min	0	1	-.082	1	-.006	3	-3.197e-3	2	734.686	1	5186.094	3
363		11	max	0	3	-.004	15	.007	1	8.006e-4	3	NC	5	NC	4
364			min	0	1	-.1	1	-.006	3	-2.679e-3	2	606.769	1	4845.47	3
365		12	max	0	3	-.004	15	.007	1	5.207e-4	3	NC	15	NC	4
366			min	-.001	1	-.118	1	-.006	3	-2.162e-3	2	511.88	1	4673.158	3
367		13	max	0	3	-.005	15	.007	1	2.407e-4	3	NC	15	NC	4
368			min	-.001	1	-.138	1	-.006	3	-1.645e-3	2	439.495	1	4662.912	3
369		14	max	.001	3	-.006	15	.007	1	-5.904e-6	15	NC	15	NC	4
370			min	-.001	1	-.158	1	-.004	3	-1.127e-3	2	382.99	1	4840.397	3
371		15	max	.001	3	-.006	15	.006	1	8.963e-5	9	9498.117	15	NC	4
372			min	-.001	1	-.179	1	-.003	3	-6.101e-4	2	338.022	1	5286.664	3
373		16	max	.001	3	-.007	15	.005	1	2.87e-4	1	8480.293	15	NC	4
374			min	-.001	1	-.201	1	0	3	-5.992e-4	3	301.656	1	6212.752	3
375		17	max	.001	3	-.008	15	.003	1	7.701e-4	1	7645.15	15	NC	1
376			min	-.002	1	-.223	1	0	15	-8.791e-4	3	271.839	1	8276.027	3
377		18	max	.001	3	-.009	15	.006	3	1.253e-3	1	6951.839	15	NC	1
378			min	-.002	1	-.245	1	-.001	2	-1.159e-3	3	247.103	1	NC	1
379		19	max	.001	3	-.01	15	.011	3	1.736e-3	1	6370.49	15	NC	1
380			min	-.002	1	-.268	1	-.004	2	-1.439e-3	3	226.373	1	NC	1
381	M3	1	max	.006	1	0	15	0	3	2.505e-3	2	NC	1	NC	1
382			min	0	15	-.003	1	0	1	-9.942e-4	3	NC	1	NC	1
383		2	max	.005	1	0	15	.011	3	2.981e-3	2	NC	1	NC	4
384			min	0	15	-.022	1	-.022	2	-1.223e-3	3	NC	1	2887.089	2
385		3	max	.005	1	-.002	15	.02	3	3.457e-3	2	NC	1	NC	4
386			min	0	15	-.041	1	-.043	2	-1.451e-3	3	NC	1	1460.28	2
387		4	max	.004	1	-.003	15	.029	3	3.933e-3	2	NC	1	NC	5
388			min	0	15	-.06	1	-.063	2	-1.68e-3	3	NC	1	990.943	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
389		5	max	.004	1	-.003	15	.037	3	4.409e-3	2	NC	1	NC	5
390			min	0	15	-.078	1	-.082	2	-1.908e-3	3	NC	1	761.477	2
391		6	max	.004	3	-.004	15	.045	3	4.885e-3	2	NC	1	NC	5
392			min	0	15	-.097	1	-.098	2	-2.137e-3	3	NC	1	628.56	2
393		7	max	.004	3	-.005	15	.052	3	5.361e-3	2	NC	1	NC	5
394			min	0	10	-.116	1	-.113	2	-2.365e-3	3	NC	1	544.635	2
395		8	max	.004	3	-.006	15	.057	3	5.837e-3	2	NC	1	NC	5
396			min	0	10	-.134	1	-.126	2	-2.594e-3	3	NC	1	489.584	2
397		9	max	.004	3	-.006	15	.062	3	6.312e-3	2	NC	1	NC	5
398			min	0	10	-.153	1	-.136	2	-2.822e-3	3	NC	1	453.689	2
399		10	max	.004	3	-.007	15	.065	3	6.788e-3	2	NC	1	NC	5
400			min	-.001	2	-.171	1	-.142	2	-3.051e-3	3	NC	1	432.011	2
401		11	max	.005	3	-.008	15	.066	3	7.264e-3	2	NC	1	NC	5
402			min	-.002	2	-.19	1	-.145	2	-3.279e-3	3	NC	1	422.26	2
403		12	max	.005	3	-.008	15	.066	3	7.74e-3	2	NC	1	NC	5
404			min	-.002	2	-.208	1	-.144	2	-3.508e-3	3	NC	1	424.025	2
405		13	max	.005	3	-.009	15	.063	3	8.216e-3	2	NC	1	NC	5
406			min	-.003	2	-.226	1	-.138	2	-3.736e-3	3	NC	1	438.783	2
407		14	max	.005	3	-.009	15	.059	3	8.692e-3	2	NC	1	NC	5
408			min	-.003	2	-.244	1	-.128	2	-3.965e-3	3	NC	1	470.786	2
409		15	max	.006	3	-.01	15	.052	3	9.168e-3	2	NC	1	NC	5
410			min	-.004	2	-.262	1	-.112	2	-4.193e-3	3	NC	1	529.825	2
411		16	max	.006	3	-.01	15	.043	3	9.644e-3	2	NC	1	NC	5
412			min	-.005	2	-.28	1	-.091	2	-4.422e-3	3	NC	1	639.872	2
413		17	max	.006	3	-.011	15	.031	3	1.012e-2	2	NC	1	NC	5
414			min	-.005	2	-.297	1	-.064	2	-4.65e-3	3	NC	1	874.015	2
415		18	max	.006	3	-.011	15	.017	3	1.06e-2	2	NC	1	NC	4
416			min	-.006	2	-.315	1	-.031	2	-4.879e-3	3	NC	1	1599.342	2
417		19	max	.006	3	-.012	15	.013	1	1.107e-2	2	NC	1	NC	1
418			min	-.006	2	-.333	1	0	3	-5.107e-3	3	NC	1	NC	1
419	M6	1	max	.011	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.006	1	0	1	0	1	NC	1	NC	1
421		2	max	.01	1	-.002	15	0	1	0	1	NC	1	NC	1
422			min	0	15	-.045	1	0	1	0	1	NC	1	NC	1
423		3	max	.008	1	-.003	15	0	1	0	1	NC	1	NC	1
424			min	0	15	-.083	1	0	1	0	1	NC	1	NC	1
425		4	max	.007	3	-.004	15	0	1	0	1	NC	1	NC	1
426			min	0	15	-.122	1	0	1	0	1	NC	1	NC	1
427		5	max	.008	3	-.006	15	0	1	0	1	NC	1	NC	1
428			min	0	15	-.161	1	0	1	0	1	NC	1	NC	1
429		6	max	.009	3	-.007	15	0	1	0	1	NC	1	NC	1
430			min	0	10	-.2	1	0	1	0	1	NC	1	NC	1
431		7	max	.01	3	-.008	15	0	1	0	1	NC	1	NC	1
432			min	-.002	10	-.239	1	0	1	0	1	NC	1	NC	1
433		8	max	.01	3	-.009	15	0	1	0	1	NC	1	NC	1
434			min	-.003	2	-.277	1	0	1	0	1	NC	1	NC	1
435		9	max	.011	3	-.011	15	0	1	0	1	NC	1	NC	1
436			min	-.005	2	-.316	1	0	1	0	1	NC	1	NC	1
437		10	max	.012	3	-.012	15	0	1	0	1	NC	1	NC	1
438			min	-.007	2	-.354	1	0	1	0	1	NC	1	NC	1
439		11	max	.013	3	-.013	15	0	1	0	1	NC	1	NC	1
440			min	-.008	2	-.392	1	0	1	0	1	NC	1	NC	1
441		12	max	.013	3	-.014	15	0	1	0	1	NC	1	NC	1
442			min	-.01	2	-.43	1	0	1	0	1	NC	1	NC	1
443		13	max	.014	3	-.015	15	0	1	0	1	NC	1	NC	1
444			min	-.012	2	-.468	1	0	1	0	1	NC	1	NC	1
445		14	max	.015	3	-.016	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	-.013	2	-.506	1	0	1	0	1	NC	1	NC	1
447		15	max	.015	3	-.017	15	0	1	0	1	NC	1	NC	1
448			min	-.015	2	-.544	1	0	1	0	1	NC	1	NC	1
449		16	max	.016	3	-.018	15	0	1	0	1	NC	1	NC	1
450			min	-.017	2	-.582	1	0	1	0	1	NC	1	NC	1
451		17	max	.017	3	-.019	15	0	1	0	1	NC	1	NC	1
452			min	-.018	2	-.62	1	0	1	0	1	NC	1	NC	1
453		18	max	.018	3	-.02	15	0	1	0	1	NC	1	NC	1
454			min	-.02	2	-.657	1	0	1	0	1	NC	1	NC	1
455		19	max	.018	3	-.021	15	0	1	0	1	NC	1	NC	1
456			min	-.022	2	-.695	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.006	1	0	15	0	1	9.942e-4	3	NC	1	NC	1
458			min	0	15	-.003	1	0	3	-2.505e-3	2	NC	1	NC	1
459		2	max	.005	1	0	15	.022	2	1.223e-3	3	NC	1	NC	4
460			min	0	15	-.022	1	-.011	3	-2.981e-3	2	NC	1	2887.089	2
461		3	max	.005	1	-.002	15	.043	2	1.451e-3	3	NC	1	NC	4
462			min	0	15	-.041	1	-.02	3	-3.457e-3	2	NC	1	1460.28	2
463		4	max	.004	1	-.003	15	.063	2	1.68e-3	3	NC	1	NC	5
464			min	0	15	-.06	1	-.029	3	-3.933e-3	2	NC	1	990.943	2
465		5	max	.004	1	-.003	15	.082	2	1.908e-3	3	NC	1	NC	5
466			min	0	15	-.078	1	-.037	3	-4.409e-3	2	NC	1	761.477	2
467		6	max	.004	3	-.004	15	.098	2	2.137e-3	3	NC	1	NC	5
468			min	0	15	-.097	1	-.045	3	-4.885e-3	2	NC	1	628.56	2
469		7	max	.004	3	-.005	15	.113	2	2.365e-3	3	NC	1	NC	5
470			min	0	10	-.116	1	-.052	3	-5.361e-3	2	NC	1	544.635	2
471		8	max	.004	3	-.006	15	.126	2	2.594e-3	3	NC	1	NC	5
472			min	0	10	-.134	1	-.057	3	-5.837e-3	2	NC	1	489.584	2
473		9	max	.004	3	-.006	15	.136	2	2.822e-3	3	NC	1	NC	5
474			min	0	10	-.153	1	-.062	3	-6.312e-3	2	NC	1	453.689	2
475		10	max	.004	3	-.007	15	.142	2	3.051e-3	3	NC	1	NC	5
476			min	-.001	2	-.171	1	-.065	3	-6.788e-3	2	NC	1	432.011	2
477		11	max	.005	3	-.008	15	.145	2	3.279e-3	3	NC	1	NC	5
478			min	-.002	2	-.19	1	-.066	3	-7.264e-3	2	NC	1	422.26	2
479		12	max	.005	3	-.008	15	.144	2	3.508e-3	3	NC	1	NC	5
480			min	-.002	2	-.208	1	-.066	3	-7.74e-3	2	NC	1	424.025	2
481		13	max	.005	3	-.009	15	.138	2	3.736e-3	3	NC	1	NC	5
482			min	-.003	2	-.226	1	-.063	3	-8.216e-3	2	NC	1	438.783	2
483		14	max	.005	3	-.009	15	.128	2	3.965e-3	3	NC	1	NC	5
484			min	-.003	2	-.244	1	-.059	3	-8.692e-3	2	NC	1	470.786	2
485		15	max	.006	3	-.01	15	.112	2	4.193e-3	3	NC	1	NC	5
486			min	-.004	2	-.262	1	-.052	3	-9.168e-3	2	NC	1	529.825	2
487		16	max	.006	3	-.01	15	.091	2	4.422e-3	3	NC	1	NC	5
488			min	-.005	2	-.28	1	-.043	3	-9.644e-3	2	NC	1	639.872	2
489		17	max	.006	3	-.011	15	.064	2	4.65e-3	3	NC	1	NC	5
490			min	-.005	2	-.297	1	-.031	3	-1.012e-2	2	NC	1	874.015	2
491		18	max	.006	3	-.011	15	.031	2	4.879e-3	3	NC	1	NC	4
492			min	-.006	2	-.315	1	-.017	3	-1.06e-2	2	NC	1	1599.342	2
493		19	max	.006	3	-.012	15	0	3	5.107e-3	3	NC	1	NC	1
494			min	-.006	2	-.333	1	-.013	1	-1.107e-2	2	NC	1	NC	1