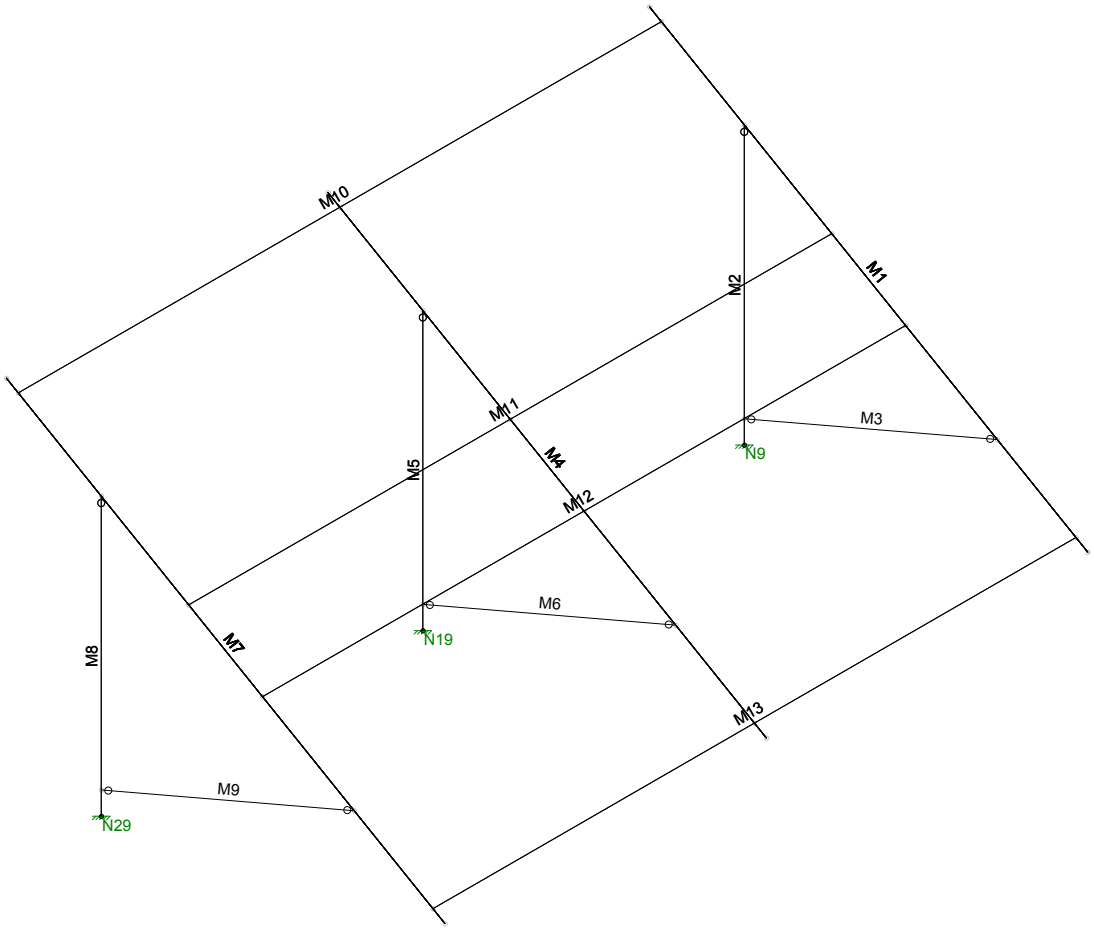


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

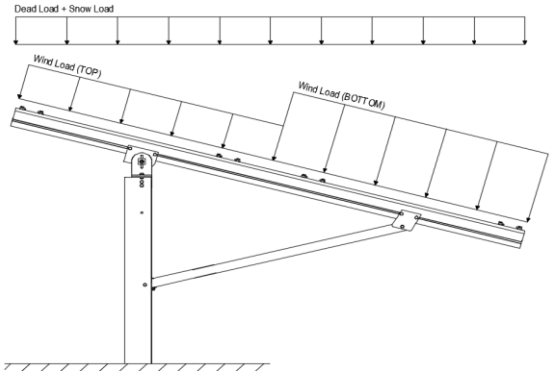
1.2 Construction

Photovoltaic modules are attached to aluminum purlins using clamp fasteners. Purlins are clamped to inclined aluminum girders, which are then connected to galvanized steel posts. Each support structure is equally spaced.

PV modules are required to meet the following specifications:

	Maximum		Minimum
Height =	2000 mm	Height =	1900 mm
Width =	1050 mm	Width =	970 mm
Dead Load =	3.00 psf	Dead Load =	1.75 psf

Modules Per Row =	2
Module Tilt =	30°
Maximum Height Above Grade =	3 ft



Typical loading conditions of the module dead loads, snow loads, and wind loads are shown on the left.

1.3 Technical Codes

- ASCE 7-10 - Chapter 26-31, Wind Loads
- ASCE 7-10 - Chapter 7, Snow Loads
- ASCE 7-10 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2012, 2015
- Aluminum Design Manual, Eighth Edition, 2005

2. LOAD ACTIONS

2.1 Permanent Loads

g_{MAX} =	3.00 psf	*Self-weight of the PV modules.*
g_{MIN} =	1.75 psf	

2.2 Snow Loads

Ground Snow Load, P_g =	30.00 psf	
Sloped Roof Snow Load, P_s =	16.49 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	0.73	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V =	150 mph	Exposure Category = C	
Height <	15 ft	Importance Category = II	
Peak Velocity Pressure, q_z =	35.33 psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*	

Pressure Coefficients

$Cf+_{TOP}$ =	1.15	*(Pressure)*	*Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.*
$Cf+_{BOTTOM}$ =	1.85		
$Cf-_{TOP}$ =	-2.3	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1.1		

2.4 Seismic Loads - N/A

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W [M]
1.238D + 0.875E [O]
1.1785D + 0.65625E + 0.75S [O]
0.362D + 0.875E [O]

(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)

[M] *Uses the minimum allowable module dead load.*
[R] *Include redundancy factor of 1.3.*
[O] *Includes overstrength factor of 1.25. Used to check seismic drift.*

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

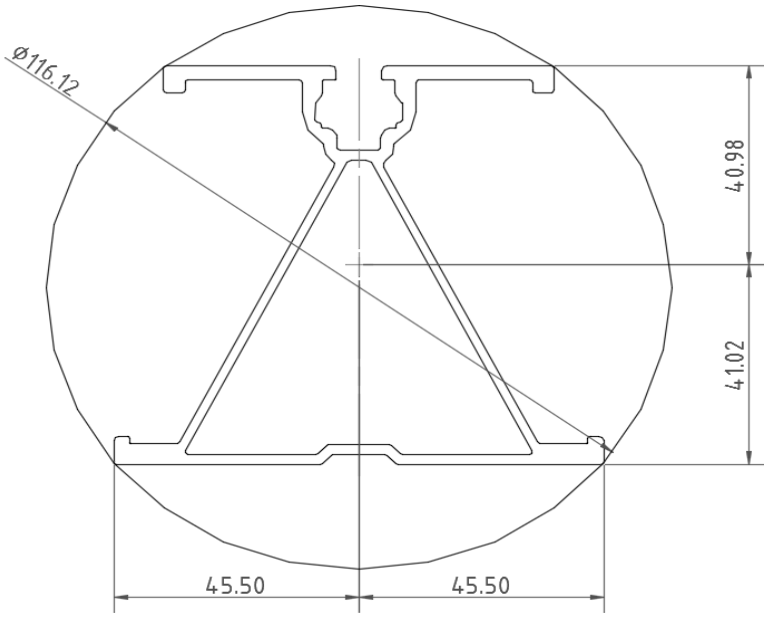
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	78	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 =	1.229	k-ft
M_z =	0.084	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	52%	

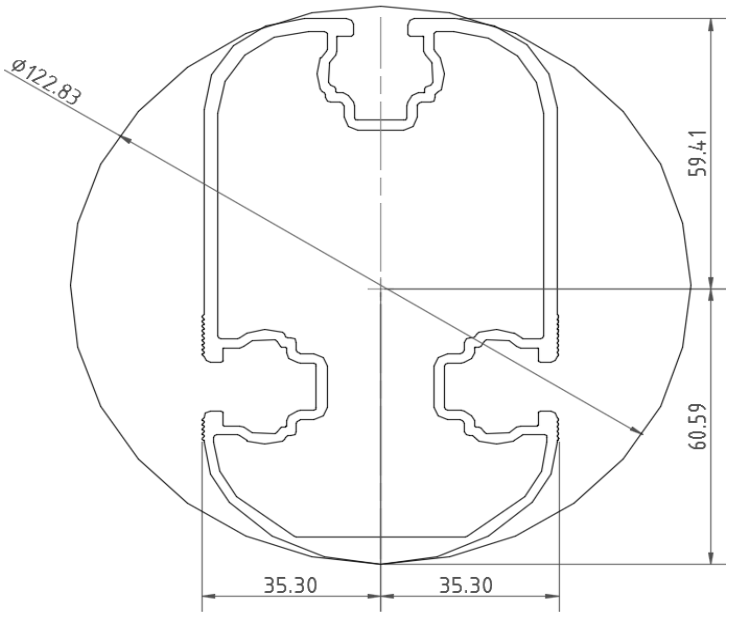


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.043	k-ft
M_z =	0.000	k-ft
P_n =	1.513	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	84%	

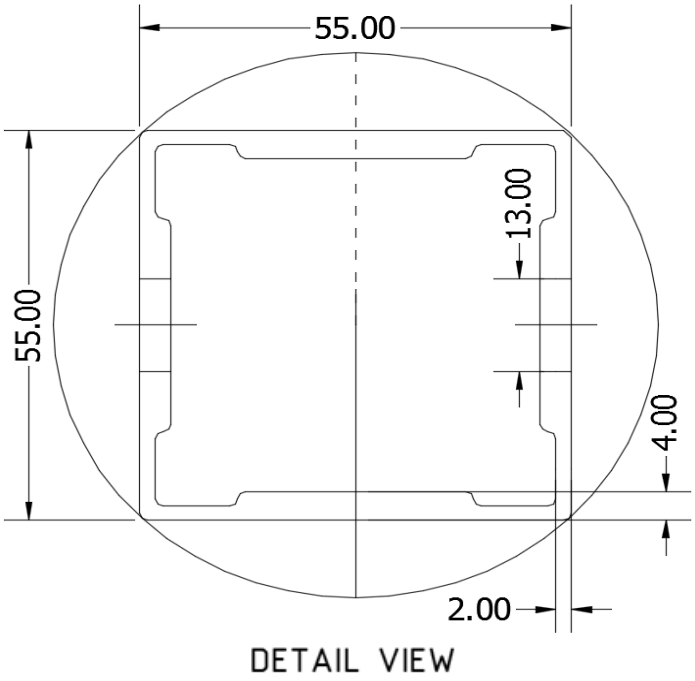


DETAIL VIEW

4.3 Strut Design

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

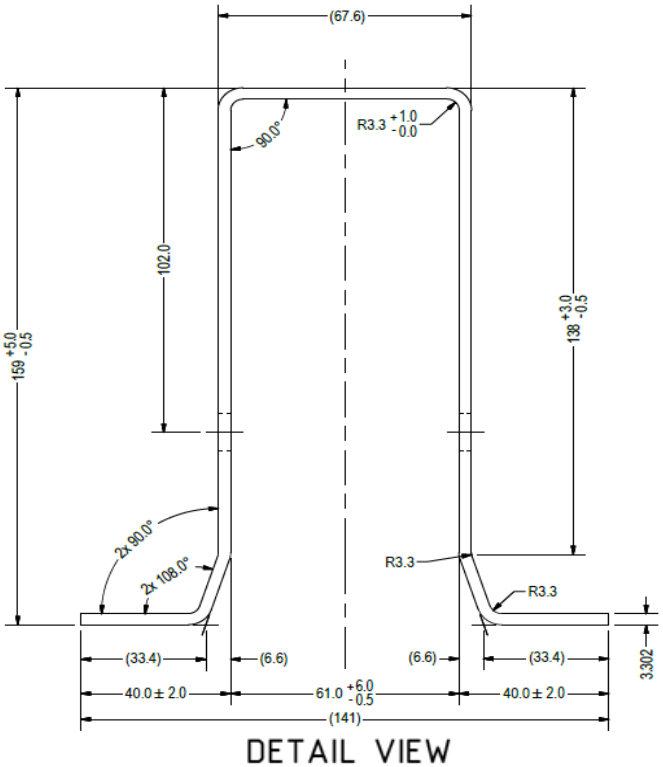
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.553	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	49%	



4.4 Post Design

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

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	89.60	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	11.601	k-ft
M_z =	0.000	k-ft
P_r =	-5.069	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	75%	



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 =	6.57	k
Maximum Lateral Load =	3.93	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

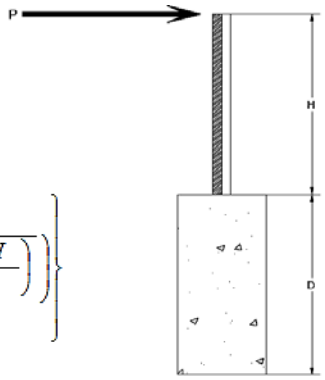
Lateral Force @ Top of Pole, P =	0.67	k
Height of Pole Above Grade, H =	6.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.67	k
Height of Pole Above Grade, H =	6.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf	
Lateral Soil Bearing @ D, S_3 =	0.65	ksf	
Constant 2.34P/(S_1B), A =	3.64		
Required Footing Depth, D =	7.20	ft	
2nd Trial @ D_2 =	5.23	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.35	ksf	
Lateral Soil Bearing @ D, S_3 =	1.05	ksf	
Constant 2.34P/(S_1B), A =	2.26		
Required Footing Depth, D =	5.28	ft	
3rd Trial @ D_3 =	5.25	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.35	ksf	
Lateral Soil Bearing @ D, S_3 =	1.05	ksf	
Constant 2.34P/(S_1B), A =	2.25		
Required Footing Depth, D =	5.27	ft	
4th Trial @ D_4 =	5.26	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.35	ksf	
Lateral Soil Bearing @ D, S_3 =	1.05	ksf	
Constant 2.34P/(S_1B), A =	2.25		
Required Footing Depth, D =	5.26	ft	
5th Trial @ D_5 =	5.26	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.35	ksf	
Lateral Soil Bearing @ D, S_3 =	1.05	ksf	
Constant 2.34P/(S_1B), A =	2.25		
Required Footing Depth, D =	5.50	ft	

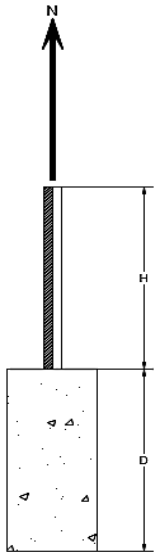
A 2ft diameter x 5.5ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.01	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	1.97	k
Required Concrete Volume, V =	13.62	ft^3
Required Footing Depth, D =	4.50	ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.51
2	0.4	0.2	118.10	6.41
3	0.6	0.2	118.10	6.30
4	0.8	0.2	118.10	6.20
5	1	0.2	118.10	6.10
6	1.2	0.2	118.10	5.99
7	1.4	0.2	118.10	5.89
8	1.6	0.2	118.10	5.79
9	1.8	0.2	118.10	5.68
10	2	0.2	118.10	5.58
11	2.2	0.2	118.10	5.48
12	2.4	0.2	118.10	5.37
13	2.6	0.2	118.10	5.27
14	2.8	0.2	118.10	5.16
15	3	0.2	118.10	5.06
16	3.2	0.2	118.10	4.96
17	3.4	0.2	118.10	4.85
18	3.6	0.2	118.10	4.75
19	3.8	0.2	118.10	4.65
20	4	0.2	118.10	4.54
21	4.2	0.2	118.10	4.44
22	4.4	0.2	118.10	4.33
23	0	0.0	0.00	4.33
24	0	0.0	0.00	4.33
25	0	0.0	0.00	4.33
26	0	0.0	0.00	4.33
27	0	0.0	0.00	4.33
28	0	0.0	0.00	4.33
29	0	0.0	0.00	4.33
30	0	0.0	0.00	4.33
31	0	0.0	0.00	4.33
32	0	0.0	0.00	4.33
33	0	0.0	0.00	4.33
34	0	0.0	0.00	4.33
Max	4.4	Sum	1.04	

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 =	5.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.46	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	15.71	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

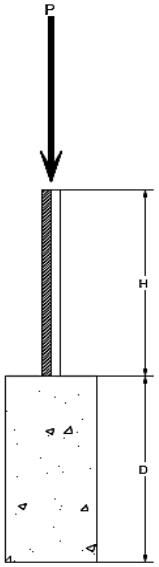
Weight of Concrete

Footing Volume	17.28	ft^3
Weight	2.51	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.36	k
1/3 Increase for Wind =	1.33	
Total Resistance =	9.42	k
Applied Force =	5.96	k
Utilization =	63%	

A 2ft diameter footing passes at a depth of 5.5ft.



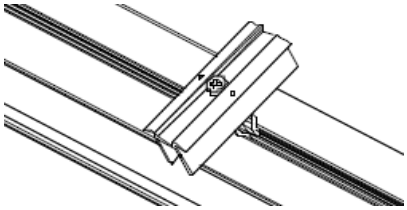
6. DESIGN OF JOINTS AND CONNECTIONS

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.

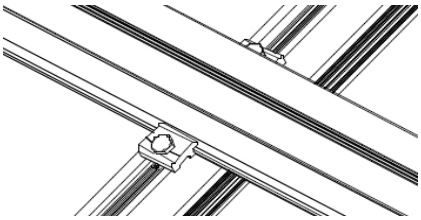
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.901 k
Allowable Uplift	=	1.214 k
Utilization	=	74%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.093 k
Allowable Uplift	=	2.180 k
Utilization	=	96%

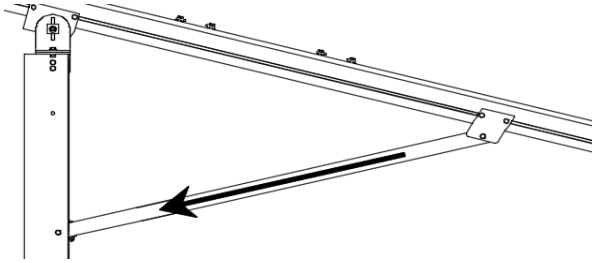


6.2 Strut Connections

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	=	4.553 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	51%

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

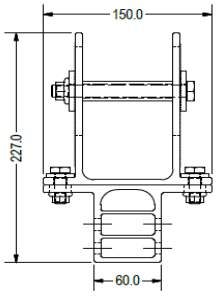


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

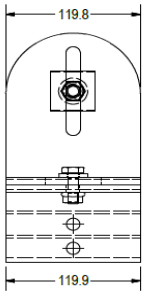
6.3 Girder to Post Connection

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.

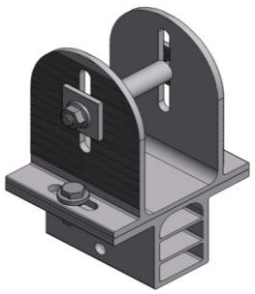
Maximum Tensile Load	=	4.292 k
Allowable Load	=	5.649 k
Utilization	=	76%



FRONT VIEW



SIDE VIEW



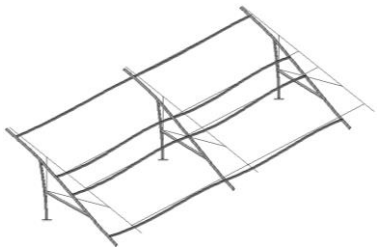
7. SEISMIC DESIGN

7.1 Seismic Drift - N/A

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

Mean Height, h_{sx}	=	79.13 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.583 in
Max Drift, Δ_{MAX}	=	0 in
N/A		

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



APPENDIX A

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

Purlin = **S1.5**

Strong Axis:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	78 in	L_b =	78
J =	0.432	J =	0.432
	215.785		137.226
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	28.6 ksi	φF_L=	29.6
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 81.7717 in
J = 1.98
105.231

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

S1 = 0.51461

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

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 30.1 ksi

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 81.7717
J = 1.98
114.202

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

S1 = 0.51461

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

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 29.9

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

S2 = 46.7
φF_L = φb[Bp-1.6Dp*b/t]
φF_L = 31.6 ksi

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L = φb[Bt-Dt*√(Rb/t)]

φF_L = 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L St$ = 30.1 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

$M_{max}St$ = 4.935 k-ft

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

$\varphi F_L Wk$ = 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φyFcy

φF_L = 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L = φc[Bt-Dt*√(Rb/t)]

φF_L = 30.80 ksi

φF_L = 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 74.8031 in

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 74.8031

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

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

φF_L = 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = φyFcy

φF_L = 33.25 ksi

φF_L = 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	89.60	in	
Pr =	-5.07	k	(LRFD Factored Load)
Mr (Strong) =	11.60	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	128.92		
4.71√(E/Fy) =	103.55	=> kL/r	> 4.71√(E/Fy)
Fcr =	15.10	ksi	
Fe =	17.22	ksi	
Pn =	33.677	k	

Torsional/Flexural Torsional Buckling:

Fcr =	11.6026	ksi
Fey =	43.9243	ksi
Fez =	14.9387	ksi
Pn =	25.8738	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1505	<	0.2	
Utilization =	0.75	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.151	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 75%

APPENDIX B

B.1

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

Basic Load Cases

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

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-9.843	-9.843	0	0
2	M11	Y	-9.843	-9.843	0	0
3	M12	Y	-9.843	-9.843	0	0
4	M13	Y	-9.843	-9.843	0	0

Member Distributed Loads (BLC 2 : Dead Load, Min)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-5.454	-5.454	0	0
2	M11	Y	-5.454	-5.454	0	0
3	M12	Y	-5.454	-5.454	0	0
4	M13	Y	-5.454	-5.454	0	0

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-46.866	-46.866	0	0
2	M11	Y	-46.866	-46.866	0	0
3	M12	Y	-46.866	-46.866	0	0
4	M13	Y	-46.866	-46.866	0	0

Member Distributed Loads (BLC 4 : Wind Load - Pressure)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-133.288	-133.288	0	0
2	M11	y	-133.288	-133.288	0	0
3	M12	y	-214.42	-214.42	0	0
4	M13	y	-214.42	-214.42	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	266.576	266.576	0	0
2	M11	y	266.576	266.576	0	0
3	M12	y	127.493	127.493	0	0
4	M13	y	127.493	127.493	0	0

Load Combinations

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

Load Combinations (Continued)

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	750.743	2	2183.156	2	89.343	2	.134	2	.003	3	5.455	1
2		min	-1117.354	3	-1641.353	3	-114.377	3	-.179	3	-.008	2	.223	15
3	N19	max	3018.718	2	5693.518	2	0	3	0	15	0	15	7.16	1
4		min	-2888.188	3	-5036.73	3	0	2	0	3	0	1	.286	15
5	N29	max	750.743	2	2183.156	2	114.377	3	.179	3	.008	2	5.455	1
6		min	-1117.354	3	-1641.353	3	-89.343	2	-.134	2	-.003	3	.223	15
7	Totals:	max	4520.204	2	10059.83	2	0	2						
8		min	-5122.897	3	-8319.436	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	.003	2	0	5	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-7.662	15	313.137	3	-3.327	15	.033	3	.197	1	.259	2
4			min	-173.928	1	-700.134	2	-90.679	1	-.154	2	.008	15	-.114	3
5		3	max	-7.938	15	311.949	3	-3.327	15	.033	3	.138	1	.719	2
6			min	-174.843	1	-701.718	2	-90.679	1	-.154	2	.005	15	-.319	3
7		4	max	-8.214	15	310.76	3	-3.327	15	.033	3	.078	1	1.18	2
8			min	-175.757	1	-703.303	2	-90.679	1	-.154	2	.003	15	-.523	3
9		5	max	401.722	3	635.238	2	-3.815	15	0	15	.089	2	1.395	2
10			min	-1111.031	2	-267.35	3	-112.764	1	-.028	3	-.017	3	-.621	3
11		6	max	401.036	3	633.653	2	-3.815	15	0	15	.027	2	.979	2
12			min	-1111.946	2	-268.539	3	-112.764	1	-.028	3	-.021	3	-.445	3
13		7	max	400.35	3	632.069	2	-3.815	15	0	15	-.002	15	.564	2
14			min	-1112.861	2	-269.727	3	-112.764	1	-.028	3	-.059	1	-.268	3
15		8	max	399.663	3	630.485	2	-3.815	15	0	15	-.005	15	.15	2
16			min	-1113.776	2	-270.915	3	-112.764	1	-.028	3	-.133	1	-.091	3
17		9	max	371.73	3	18.039	3	-1.256	3	-.001	15	.079	1	-.002	15
18			min	-1219.59	2	-7.942	2	-153.946	1	-.096	2	.003	15	-.046	2
19		10	max	371.044	3	16.85	3	-1.256	3	-.001	15	.033	3	-.002	15
20			min	-1220.504	2	-9.526	2	-153.946	1	-.096	2	-.026	2	-.041	2
21		11	max	370.358	3	15.662	3	-1.256	3	-.001	15	.032	3	-.002	15
22			min	-1221.419	2	-11.11	2	-153.946	1	-.096	2	-.123	1	-.034	2
23		12	max	336.522	3	705.385	3	12.147	10	.145	3	.1	1	.113	2
24			min	-1329.059	1	-424.447	2	-139.991	3	-.119	2	.004	15	-.261	3
25		13	max	335.836	3	704.197	3	12.147	10	.145	3	.083	1	.392	2
26			min	-1329.974	1	-426.032	2	-139.991	3	-.119	2	-.016	3	-.723	3
27		14	max	335.15	3	703.009	3	12.147	10	.145	3	.073	2	.672	2
28			min	-1330.889	1	-427.616	2	-139.991	3	-.119	2	-.108	3	-1.185	3
29		15	max	334.464	3	701.82	3	12.147	10	.145	3	.08	2	.954	2
30			min	-1331.804	1	-429.2	2	-139.991	3	-.119	2	-.2	3	-1.646	3
31		16	max	175.936	1	436.352	2	-3.101	15	.108	2	.013	3	.726	2
32			min	8.231	15	-746.441	3	-78.304	1	-.279	3	-.103	1	-1.256	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	175.021	1	434.768	2	-3.101	15	.108	2	-.006	15	.441	2
34			min	7.955	15	-747.629	3	-78.304	1	-.279	3	-.154	1	-.766	3
35		18	max	174.106	1	433.183	2	-3.101	15	.108	2	-.008	15	.156	2
36			min	7.679	15	-748.818	3	-78.304	1	-.279	3	-.206	1	-.275	3
37		19	max	0	1	0	2	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.007	2	0	1	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	8.635	3	957.032	3	0	1	0	1	0	1	.555	2
42			min	-230.803	1	-1804.933	2	0	1	0	1	0	1	-.302	3
43		3	max	7.949	3	955.844	3	0	1	0	1	0	1	1.74	2
44			min	-231.717	1	-1806.517	2	0	1	0	1	0	1	-.93	3
45		4	max	7.263	3	954.656	3	0	1	0	1	0	1	2.926	2
46			min	-232.632	1	-1808.102	2	0	1	0	1	0	1	-1.557	3
47		5	max	1480.37	3	1831.709	2	0	1	0	1	0	1	3.444	2
48			min	-2817.64	2	-1012.007	3	0	1	0	1	0	1	-1.822	3
49		6	max	1479.684	3	1830.125	2	0	1	0	1	0	1	2.242	2
50			min	-2818.554	2	-1013.195	3	0	1	0	1	0	1	-1.157	3
51		7	max	1478.998	3	1828.541	2	0	1	0	1	0	1	1.042	2
52			min	-2819.469	2	-1014.383	3	0	1	0	1	0	1	-.492	3
53		8	max	1478.312	3	1826.956	2	0	1	0	1	0	1	.174	3
54			min	-2820.384	2	-1015.572	3	0	1	0	1	0	1	-.157	2
55		9	max	1491.412	3	-1.43	15	0	1	0	1	0	1	.493	3
56			min	-2852.322	2	-109.061	2	0	1	0	1	0	1	-.706	2
57		10	max	1490.726	3	-1.908	15	0	1	0	1	0	1	.5	3
58			min	-2853.237	2	-110.645	2	0	1	0	1	0	1	-.634	2
59		11	max	1490.04	3	-2.386	15	0	1	0	1	0	1	.508	3
60			min	-2854.152	2	-112.23	2	0	1	0	1	0	1	-.561	2
61		12	max	1514.947	3	1995.248	3	0	1	0	1	0	1	.008	9
62			min	-2896.345	2	-1441.539	2	0	1	0	1	0	1	-.119	3
63		13	max	1514.261	3	1994.06	3	0	1	0	1	0	1	.866	2
64			min	-2897.26	2	-1443.124	2	0	1	0	1	0	1	-1.428	3
65		14	max	1513.575	3	1992.871	3	0	1	0	1	0	1	1.813	2
66			min	-2898.175	2	-1444.708	2	0	1	0	1	0	1	-2.736	3
67		15	max	1512.889	3	1991.683	3	0	1	0	1	0	1	2.762	2
68			min	-2899.089	2	-1446.292	2	0	1	0	1	0	1	-4.043	3
69		16	max	232.275	1	1291.692	2	0	1	0	1	0	1	2.102	2
70			min	-4.366	3	-1891.924	3	0	1	0	1	0	1	-3.07	3
71		17	max	231.361	1	1290.107	2	0	1	0	1	0	1	1.255	2
72			min	-5.052	3	-1893.113	3	0	1	0	1	0	1	-1.828	3
73		18	max	230.446	1	1288.523	2	0	1	0	1	0	1	.409	2
74			min	-5.738	3	-1894.301	3	0	1	0	1	0	1	-.585	3
75		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
76			min	0	1	-.005	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.003	2	0	1	0	1	0	1	0	1
78			min	0	1	0	3	0	5	0	1	0	1	0	1
79		2	max	-7.662	15	313.137	3	90.679	1	.154	2	-.008	15	.259	2
80			min	-173.928	1	-700.134	2	3.327	15	-.033	3	-.197	1	-.114	3
81		3	max	-7.938	15	311.949	3	90.679	1	.154	2	-.005	15	.719	2
82			min	-174.843	1	-701.718	2	3.327	15	-.033	3	-.138	1	-.319	3
83		4	max	-8.214	15	310.76	3	90.679	1	.154	2	-.003	15	1.18	2
84			min	-175.757	1	-703.303	2	3.327	15	-.033	3	-.078	1	-.523	3
85		5	max	401.722	3	635.238	2	112.764	1	.028	3	.017	3	1.395	2
86			min	-1111.031	2	-267.35	3	3.815	15	0	15	-.089	2	-.621	3
87		6	max	401.036	3	633.653	2	112.764	1	.028	3	.021	3	.979	2
88			min	-1111.946	2	-268.539	3	3.815	15	0	15	-.027	2	-.445	3
89		7	max	400.35	3	632.069	2	112.764	1	.028	3	.059	1	.564	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	-1112.861	2	-269.727	3	3.815	15	0	15	.002	15	-.268	3
91		8	max	399.663	3	630.485	2	112.764	1	.028	3	.133	1	.15	2
92			min	-1113.776	2	-270.915	3	3.815	15	0	15	.005	15	-.091	3
93		9	max	371.73	3	18.039	3	153.946	1	.096	2	-.003	15	-.002	15
94			min	-1219.59	2	-7.942	2	1.256	3	.001	15	-.079	1	-.046	2
95		10	max	371.044	3	16.85	3	153.946	1	.096	2	.026	2	-.002	15
96			min	-1220.504	2	-9.526	2	1.256	3	.001	15	-.033	3	-.041	2
97		11	max	370.358	3	15.662	3	153.946	1	.096	2	.123	1	-.002	15
98			min	-1221.419	2	-11.11	2	1.256	3	.001	15	-.032	3	-.034	2
99		12	max	336.522	3	705.385	3	139.991	3	.119	2	-.004	15	.113	2
100			min	-1329.059	1	-424.447	2	-12.147	10	-.145	3	-.1	1	-.261	3
101		13	max	335.836	3	704.197	3	139.991	3	.119	2	.016	3	.392	2
102			min	-1329.974	1	-426.032	2	-12.147	10	-.145	3	-.083	1	-.723	3
103		14	max	335.15	3	703.009	3	139.991	3	.119	2	.108	3	.672	2
104			min	-1330.889	1	-427.616	2	-12.147	10	-.145	3	-.073	2	-1.185	3
105		15	max	334.464	3	701.82	3	139.991	3	.119	2	.2	3	.954	2
106			min	-1331.804	1	-429.2	2	-12.147	10	-.145	3	-.08	2	-1.646	3
107		16	max	175.936	1	436.352	2	78.304	1	.279	3	.103	1	.726	2
108			min	8.231	15	-746.441	3	3.101	15	-.108	2	-.013	3	-1.256	3
109		17	max	175.021	1	434.768	2	78.304	1	.279	3	.154	1	.441	2
110			min	7.955	15	-747.629	3	3.101	15	-.108	2	.006	15	-.766	3
111		18	max	174.106	1	433.183	2	78.304	1	.279	3	.206	1	.156	2
112			min	7.679	15	-748.818	3	3.101	15	-.108	2	.008	15	-.275	3
113		19	max	0	1	0	2	0	5	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	78.337	1	431.603	2	-7.403	15	.011	2	.232	1	.108	2
116			min	3.101	15	-749.852	3	-173.366	1	-.024	3	.009	15	-.279	3
117		2	max	78.337	1	312.167	2	-5.92	15	.011	2	.118	1	.195	3
118			min	3.101	15	-561.242	3	-141.371	1	-.024	3	.004	15	-.161	2
119		3	max	78.337	1	192.73	2	-4.437	15	.011	2	.045	2	.532	3
120			min	3.101	15	-372.632	3	-109.376	1	-.024	3	0	15	-.343	2
121		4	max	78.337	1	73.293	2	-2.953	15	.011	2	.007	10	.733	3
122			min	3.101	15	-184.022	3	-77.381	1	-.024	3	-.04	1	-.439	2
123		5	max	78.337	1	4.588	3	-1.47	15	.011	2	-.004	15	.798	3
124			min	3.101	15	-46.144	2	-45.385	1	-.024	3	-.084	1	-.449	2
125		6	max	78.337	1	193.198	3	.064	14	.011	2	-.005	15	.726	3
126			min	3.101	15	-165.58	2	-26.384	2	-.024	3	-.105	1	-.373	2
127		7	max	78.337	1	381.808	3	21.076	9	.011	2	-.004	15	.519	3
128			min	3.101	15	-285.017	2	-13.005	2	-.024	3	-.104	1	-.21	2
129		8	max	78.337	1	570.418	3	50.6	1	.011	2	-.002	15	.175	3
130			min	3.101	15	-404.454	2	-7.77	3	-.024	3	-.079	1	.002	15
131		9	max	78.337	1	759.028	3	82.596	1	.011	2	.004	9	.374	2
132			min	3.101	15	-523.89	2	-5.508	3	-.024	3	-.07	2	-.305	3
133		10	max	78.337	1	947.638	3	-.917	10	.024	3	.058	9	.796	2
134			min	3.101	15	14.087	15	-114.591	1	0	15	-.055	2	-.922	3
135		11	max	78.337	1	523.89	2	5.508	3	.024	3	.004	9	.374	2
136			min	3.101	15	-759.028	3	-82.596	1	-.011	2	-.07	2	-.305	3
137		12	max	78.337	1	404.454	2	7.77	3	.024	3	-.002	15	.175	3
138			min	3.101	15	-570.418	3	-50.6	1	-.011	2	-.079	1	.002	15
139		13	max	78.337	1	285.017	2	13.005	2	.024	3	-.004	15	.519	3
140			min	3.101	15	-381.808	3	-21.076	9	-.011	2	-.104	1	-.21	2
141		14	max	78.337	1	165.58	2	26.384	2	.024	3	-.005	15	.726	3
142			min	3.101	15	-193.198	3	-.064	14	-.011	2	-.105	1	-.373	2
143		15	max	78.337	1	46.144	2	45.385	1	.024	3	-.004	15	.798	3
144			min	3.101	15	-4.588	3	1.47	15	-.011	2	-.084	1	-.449	2
145		16	max	78.337	1	184.022	3	77.381	1	.024	3	.007	10	.733	3
146			min	3.101	15	-73.293	2	2.953	15	-.011	2	-.04	1	-.439	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
147		17	max	78.337	1	372.632	3	109.376	1	.024	3	.045	2	.532	3
148			min	3.101	15	-192.73	2	4.437	15	-.011	2	0	15	-.343	2
149		18	max	78.337	1	561.242	3	141.371	1	.024	3	.118	1	.195	3
150			min	3.101	15	-312.167	2	5.92	15	-.011	2	.004	15	-.161	2
151		19	max	78.337	1	749.852	3	173.366	1	.024	3	.232	1	.108	2
152			min	3.101	15	-431.603	2	7.403	15	-.011	2	.009	15	-.279	3
153	M11	1	max	128.063	1	411.1	2	-7.901	15	.002	3	.283	1	.029	1
154			min	-138.614	3	-691.448	3	-185.304	1	-.008	2	.011	15	-.216	3
155		2	max	128.063	1	291.664	2	-6.417	15	.002	3	.161	1	.215	3
156			min	-138.614	3	-502.838	3	-153.309	1	-.008	2	.006	15	-.231	2
157		3	max	128.063	1	172.227	2	-4.934	15	.002	3	.063	2	.51	3
158			min	-138.614	3	-314.228	3	-121.314	1	-.008	2	.002	15	-.399	2
159		4	max	128.063	1	52.79	2	-3.451	15	.002	3	.024	3	.669	3
160			min	-138.614	3	-125.618	3	-89.319	1	-.008	2	-.019	9	-.48	2
161		5	max	128.063	1	62.992	3	-1.967	15	.002	3	.006	3	.691	3
162			min	-138.614	3	-66.646	2	-57.324	1	-.008	2	-.067	1	-.475	2
163		6	max	128.063	1	251.602	3	-.484	15	.002	3	-.004	15	.578	3
164			min	-138.614	3	-186.083	2	-33.133	2	-.008	2	-.097	1	-.384	2
165		7	max	128.063	1	440.212	3	14.004	9	.002	3	-.004	15	.328	3
166			min	-138.614	3	-305.52	2	-19.754	2	-.008	2	-.104	1	-.206	2
167		8	max	128.063	1	628.822	3	38.662	1	.002	3	-.003	15	.058	2
168			min	-138.614	3	-424.956	2	-17.191	3	-.008	2	-.088	1	-.058	3
169		9	max	128.063	1	817.432	3	70.657	1	.002	3	0	15	.408	2
170			min	-138.614	3	-544.393	2	-14.929	3	-.008	2	-.08	2	-.58	3
171		10	max	128.063	1	360.515	10	102.653	1	.008	2	.042	9	.844	2
172			min	-138.614	3	-1006.042	3	1.734	10	0	15	-.07	2	-1.239	3
173		11	max	128.063	1	544.393	2	14.929	3	.008	2	0	15	.408	2
174			min	-138.614	3	-817.432	3	-70.657	1	-.002	3	-.08	2	-.58	3
175		12	max	128.063	1	424.956	2	17.191	3	.008	2	-.003	15	.058	2
176			min	-138.614	3	-628.822	3	-38.662	1	-.002	3	-.088	1	-.058	3
177		13	max	128.063	1	305.52	2	19.754	2	.008	2	-.004	15	.328	3
178			min	-138.614	3	-440.212	3	-14.004	9	-.002	3	-.104	1	-.206	2
179		14	max	128.063	1	186.083	2	33.133	2	.008	2	-.004	15	.578	3
180			min	-138.614	3	-251.602	3	.484	15	-.002	3	-.097	1	-.384	2
181		15	max	128.063	1	66.646	2	57.324	1	.008	2	.006	3	.691	3
182			min	-138.614	3	-62.992	3	1.967	15	-.002	3	-.067	1	-.475	2
183		16	max	128.063	1	125.618	3	89.319	1	.008	2	.024	3	.669	3
184			min	-138.614	3	-52.79	2	3.451	15	-.002	3	-.019	9	-.48	2
185		17	max	128.063	1	314.228	3	121.314	1	.008	2	.063	2	.51	3
186			min	-138.614	3	-172.227	2	4.934	15	-.002	3	.002	15	-.399	2
187		18	max	128.063	1	502.838	3	153.309	1	.008	2	.161	1	.215	3
188			min	-138.614	3	-291.664	2	6.417	15	-.002	3	.006	15	-.231	2
189		19	max	128.063	1	691.448	3	185.304	1	.008	2	.283	1	.029	1
190			min	-138.614	3	-411.1	2	7.901	15	-.002	3	.011	15	-.216	3
191	M12	1	max	4.245	3	635.722	2	-7.994	15	0	15	.3	1	.095	2
192			min	-40.704	1	-290.401	3	-189.308	1	-.004	3	.011	15	.001	15
193		2	max	4.245	3	457.69	2	-6.51	15	0	15	.175	1	.221	3
194			min	-40.704	1	-202.24	3	-157.313	1	-.004	3	.006	15	-.3	2
195		3	max	4.245	3	279.657	2	-5.027	15	0	15	.077	2	.336	3
196			min	-40.704	1	-114.078	3	-125.318	1	-.004	3	.002	15	-.566	2
197		4	max	4.245	3	101.625	2	-3.544	15	0	15	.025	2	.386	3
198			min	-40.704	1	-25.917	3	-93.323	1	-.004	3	-.016	9	-.704	2
199		5	max	4.245	3	62.244	3	-2.06	15	0	15	-.001	12	.373	3
200			min	-40.704	1	-76.407	2	-61.327	1	-.004	3	-.062	1	-.713	2
201		6	max	4.245	3	150.405	3	-.577	15	0	15	-.004	15	.296	3
202			min	-40.704	1	-254.439	2	-37.974	2	-.004	3	-.095	1	-.593	2
203		7	max	4.245	3	238.566	3	12.686	9	0	15	-.004	15	.156	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	-40.704	1	-432.471	2	-24.595	2	-.004	3	-.104	1	-.345	2
205		8	max	4.245	3	326.728	3	34.658	1	0	15	-.003	15	.031	2
206			min	-40.704	1	-610.503	2	-12.59	10	-.004	3	-.091	1	-.048	3
207		9	max	4.245	3	414.889	3	66.653	1	0	15	0	15	.537	2
208			min	-40.704	1	-788.535	2	-9.159	3	-.004	3	-.088	2	-.316	3
209		10	max	4.245	3	-13.901	15	98.649	1	.004	3	.039	9	1.17	2
210			min	-40.704	1	-966.567	2	-4.394	10	0	15	-.081	2	-.648	3
211		11	max	4.245	3	788.535	2	9.159	3	.004	3	0	15	.537	2
212			min	-40.704	1	-414.889	3	-66.653	1	0	15	-.088	2	-.316	3
213		12	max	4.245	3	610.503	2	12.59	10	.004	3	-.003	15	.031	2
214			min	-40.704	1	-326.728	3	-34.658	1	0	15	-.091	1	-.048	3
215		13	max	4.245	3	432.471	2	24.595	2	.004	3	-.004	15	.156	3
216			min	-40.704	1	-238.566	3	-12.686	9	0	15	-.104	1	-.345	2
217		14	max	4.245	3	254.439	2	37.974	2	.004	3	-.004	15	.296	3
218			min	-40.704	1	-150.405	3	.577	15	0	15	-.095	1	-.593	2
219		15	max	4.245	3	76.407	2	61.327	1	.004	3	-.001	12	.373	3
220			min	-40.704	1	-62.244	3	2.06	15	0	15	-.062	1	-.713	2
221		16	max	4.245	3	25.917	3	93.323	1	.004	3	.025	2	.386	3
222			min	-40.704	1	-101.625	2	3.544	15	0	15	-.016	9	-.704	2
223		17	max	4.245	3	114.078	3	125.318	1	.004	3	.077	2	.336	3
224			min	-40.704	1	-279.657	2	5.027	15	0	15	.002	15	-.566	2
225		18	max	4.245	3	202.24	3	157.313	1	.004	3	.175	1	.221	3
226			min	-40.704	1	-457.69	2	6.51	15	0	15	.006	15	-.3	2
227		19	max	4.245	3	290.401	3	189.308	1	.004	3	.3	1	.095	2
228			min	-40.704	1	-635.722	2	7.994	15	0	15	.011	15	.001	15
229	M13	1	max	-3.326	15	699.486	2	-7.386	15	.009	3	.228	1	.154	2
230			min	-90.585	1	-314.347	3	-172.804	1	-.024	2	.009	15	-.033	3
231		2	max	-3.326	15	521.454	2	-5.902	15	.009	3	.114	1	.162	3
232			min	-90.585	1	-226.186	3	-140.809	1	-.024	2	.004	15	-.287	2
233		3	max	-3.326	15	343.422	2	-4.419	15	.009	3	.041	2	.293	3
234			min	-90.585	1	-138.025	3	-108.814	1	-.024	2	0	15	-.599	2
235		4	max	-3.326	15	165.39	2	-2.936	15	.009	3	.008	3	.361	3
236			min	-90.585	1	-49.864	3	-76.819	1	-.024	2	-.043	1	-.783	2
237		5	max	-3.326	15	38.297	3	-1.452	15	.009	3	-.003	12	.365	3
238			min	-90.585	1	-12.642	2	-44.824	1	-.024	2	-.087	1	-.838	2
239		6	max	-3.326	15	126.459	3	.305	9	.009	3	-.005	15	.306	3
240			min	-90.585	1	-190.674	2	-25.857	2	-.024	2	-.107	1	-.765	2
241		7	max	-3.326	15	214.62	3	21.326	9	.009	3	-.004	15	.183	3
242			min	-90.585	1	-368.706	2	-12.478	2	-.024	2	-.105	1	-.563	2
243		8	max	-3.326	15	302.781	3	51.162	1	.009	3	-.002	15	-.004	12
244			min	-90.585	1	-546.738	2	-9.169	3	-.024	2	-.08	1	-.232	2
245		9	max	-3.326	15	390.942	3	83.157	1	.009	3	.004	9	.227	2
246			min	-90.585	1	-724.77	2	-6.907	3	-.024	2	-.071	2	-.255	3
247		10	max	-3.326	15	-12.53	15	115.153	1	.024	2	.058	9	.815	2
248			min	-90.585	1	-902.802	2	1.192	10	0	15	-.056	2	-.569	3
249		11	max	-3.326	15	724.77	2	6.907	3	.024	2	.004	9	.227	2
250			min	-90.585	1	-390.942	3	-83.157	1	-.009	3	-.071	2	-.255	3
251		12	max	-3.326	15	546.738	2	9.169	3	.024	2	-.002	15	-.004	12
252			min	-90.585	1	-302.781	3	-51.162	1	-.009	3	-.08	1	-.232	2
253		13	max	-3.326	15	368.706	2	12.478	2	.024	2	-.004	15	.183	3
254			min	-90.585	1	-214.62	3	-21.326	9	-.009	3	-.105	1	-.563	2
255		14	max	-3.326	15	190.674	2	25.857	2	.024	2	-.005	15	.306	3
256			min	-90.585	1	-126.459	3	-.305	9	-.009	3	-.107	1	-.765	2
257		15	max	-3.326	15	12.642	2	44.824	1	.024	2	-.003	12	.365	3
258			min	-90.585	1	-38.297	3	1.452	15	-.009	3	-.087	1	-.838	2
259		16	max	-3.326	15	49.864	3	76.819	1	.024	2	.008	3	.361	3
260			min	-90.585	1	-165.39	2	2.936	15	-.009	3	-.043	1	-.783	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	-3.326	15	138.025	3	108.814	1	.024	2	.041	2	.293	3
262			min	-90.585	1	-343.422	2	4.419	15	-.009	3	0	15	-.599	2
263		18	max	-3.326	15	226.186	3	140.809	1	.024	2	.114	1	.162	3
264			min	-90.585	1	-521.454	2	5.902	15	-.009	3	.004	15	-.287	2
265		19	max	-3.326	15	314.347	3	172.804	1	.024	2	.228	1	.154	2
266			min	-90.585	1	-699.486	2	7.386	15	-.009	3	.009	15	-.033	3
267	M2	1	max	2183.156	2	1116.673	3	89.429	2	.003	3	.179	3	5.455	1
268			min	-1641.353	3	-749.631	2	-114.29	3	-.008	2	-.134	2	.223	15
269		2	max	2179.884	2	1116.673	3	89.429	2	.003	3	.138	3	5.542	1
270			min	-1643.807	3	-749.631	2	-114.29	3	-.008	2	-.103	1	.22	15
271		3	max	1519.268	2	940.081	1	61.099	2	0	2	.106	3	5.404	1
272			min	-1369.115	3	36.886	15	-103.528	3	0	3	-.091	1	.212	15
273		4	max	1515.996	2	940.081	1	61.099	2	0	2	.069	3	5.066	1
274			min	-1371.569	3	36.886	15	-103.528	3	0	3	-.072	1	.199	15
275		5	max	1512.725	2	940.081	1	61.099	2	0	2	.032	3	4.728	1
276			min	-1374.022	3	36.886	15	-103.528	3	0	3	-.053	1	.186	15
277		6	max	1509.453	2	940.081	1	61.099	2	0	2	-.001	15	4.391	1
278			min	-1376.476	3	36.886	15	-103.528	3	0	3	-.034	1	.172	15
279		7	max	1506.182	2	940.081	1	61.099	2	0	2	0	10	4.053	1
280			min	-1378.93	3	36.886	15	-103.528	3	0	3	-.043	3	.159	15
281		8	max	1502.91	2	940.081	1	61.099	2	0	2	.02	2	3.715	1
282			min	-1381.383	3	36.886	15	-103.528	3	0	3	-.08	3	.146	15
283		9	max	1499.639	2	940.081	1	61.099	2	0	2	.042	2	3.377	1
284			min	-1383.837	3	36.886	15	-103.528	3	0	3	-.117	3	.133	15
285		10	max	1496.367	2	940.081	1	61.099	2	0	2	.063	2	3.04	1
286			min	-1386.29	3	36.886	15	-103.528	3	0	3	-.154	3	.119	15
287		11	max	1493.096	2	940.081	1	61.099	2	0	2	.085	2	2.702	1
288			min	-1388.744	3	36.886	15	-103.528	3	0	3	-.191	3	.106	15
289		12	max	1489.825	2	940.081	1	61.099	2	0	2	.107	2	2.364	1
290			min	-1391.197	3	36.886	15	-103.528	3	0	3	-.229	3	.093	15
291		13	max	1486.553	2	940.081	1	61.099	2	0	2	.129	2	2.026	1
292			min	-1393.651	3	36.886	15	-103.528	3	0	3	-.266	3	.08	15
293		14	max	1483.282	2	940.081	1	61.099	2	0	2	.151	2	1.689	1
294			min	-1396.105	3	36.886	15	-103.528	3	0	3	-.303	3	.066	15
295		15	max	1480.01	2	940.081	1	61.099	2	0	2	.173	2	1.351	1
296			min	-1398.558	3	36.886	15	-103.528	3	0	3	-.34	3	.053	15
297		16	max	1476.739	2	940.081	1	61.099	2	0	2	.195	2	1.013	1
298			min	-1401.012	3	36.886	15	-103.528	3	0	3	-.377	3	.04	15
299		17	max	1473.467	2	940.081	1	61.099	2	0	2	.217	2	.675	1
300			min	-1403.465	3	36.886	15	-103.528	3	0	3	-.415	3	.027	15
301		18	max	1470.196	2	940.081	1	61.099	2	0	2	.239	2	.338	1
302			min	-1405.919	3	36.886	15	-103.528	3	0	3	-.452	3	.013	15
303		19	max	1466.924	2	940.081	1	61.099	2	0	2	.261	2	0	1
304			min	-1408.373	3	36.886	15	-103.528	3	0	3	-.489	3	0	1
305	M5	1	max	5693.518	2	2884.787	3	0	1	0	1	0	1	7.16	1
306			min	-5036.73	3	-3015.226	2	0	1	0	1	0	1	.286	15
307		2	max	5690.247	2	2884.787	3	0	1	0	1	0	1	7.796	1
308			min	-5039.183	3	-3015.226	2	0	1	0	1	0	1	.291	15
309		3	max	3924.209	2	1363.338	1	0	1	0	1	0	1	7.837	1
310			min	-4088.192	3	49.473	15	0	1	0	1	0	1	.284	15
311		4	max	3920.938	2	1363.338	1	0	1	0	1	0	1	7.347	1
312			min	-4090.646	3	49.473	15	0	1	0	1	0	1	.267	15
313		5	max	3917.666	2	1363.338	1	0	1	0	1	0	1	6.857	1
314			min	-4093.099	3	49.473	15	0	1	0	1	0	1	.249	15
315		6	max	3914.395	2	1363.338	1	0	1	0	1	0	1	6.367	1
316			min	-4095.553	3	49.473	15	0	1	0	1	0	1	.231	15
317		7	max	3911.124	2	1363.338	1	0	1	0	1	0	1	5.878	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	-4098.006	3	49.473	15	0	1	0	1	0	1	.213	15
319		8	max	3907.852	2	1363.338	1	0	1	0	1	0	1	5.388	1
320			min	-4100.46	3	49.473	15	0	1	0	1	0	1	.196	15
321		9	max	3904.581	2	1363.338	1	0	1	0	1	0	1	4.898	1
322			min	-4102.914	3	49.473	15	0	1	0	1	0	1	.178	15
323		10	max	3901.309	2	1363.338	1	0	1	0	1	0	1	4.408	1
324			min	-4105.367	3	49.473	15	0	1	0	1	0	1	.16	15
325		11	max	3898.038	2	1363.338	1	0	1	0	1	0	1	3.918	1
326			min	-4107.821	3	49.473	15	0	1	0	1	0	1	.142	15
327		12	max	3894.766	2	1363.338	1	0	1	0	1	0	1	3.429	1
328			min	-4110.274	3	49.473	15	0	1	0	1	0	1	.124	15
329		13	max	3891.495	2	1363.338	1	0	1	0	1	0	1	2.939	1
330			min	-4112.728	3	49.473	15	0	1	0	1	0	1	.107	15
331		14	max	3888.223	2	1363.338	1	0	1	0	1	0	1	2.449	1
332			min	-4115.182	3	49.473	15	0	1	0	1	0	1	.089	15
333		15	max	3884.952	2	1363.338	1	0	1	0	1	0	1	1.959	1
334			min	-4117.635	3	49.473	15	0	1	0	1	0	1	.071	15
335		16	max	3881.681	2	1363.338	1	0	1	0	1	0	1	1.469	1
336			min	-4120.089	3	49.473	15	0	1	0	1	0	1	.053	15
337		17	max	3878.409	2	1363.338	1	0	1	0	1	0	1	.98	1
338			min	-4122.542	3	49.473	15	0	1	0	1	0	1	.036	15
339		18	max	3875.138	2	1363.338	1	0	1	0	1	0	1	.49	1
340			min	-4124.996	3	49.473	15	0	1	0	1	0	1	.018	15
341		19	max	3871.866	2	1363.338	1	0	1	0	1	0	1	0	1
342			min	-4127.449	3	49.473	15	0	1	0	1	0	1	0	1
343	M8	1	max	2183.156	2	1116.673	3	114.29	3	.008	2	.134	2	5.455	1
344			min	-1641.353	3	-749.631	2	-89.429	2	-.003	3	-.179	3	.223	15
345		2	max	2179.884	2	1116.673	3	114.29	3	.008	2	.103	1	5.542	1
346			min	-1643.807	3	-749.631	2	-89.429	2	-.003	3	-.138	3	.22	15
347		3	max	1519.268	2	940.081	1	103.528	3	0	3	.091	1	5.404	1
348			min	-1369.115	3	36.886	15	-61.099	2	0	2	-.106	3	.212	15
349		4	max	1515.996	2	940.081	1	103.528	3	0	3	.072	1	5.066	1
350			min	-1371.569	3	36.886	15	-61.099	2	0	2	-.069	3	.199	15
351		5	max	1512.725	2	940.081	1	103.528	3	0	3	.053	1	4.728	1
352			min	-1374.022	3	36.886	15	-61.099	2	0	2	-.032	3	.186	15
353		6	max	1509.453	2	940.081	1	103.528	3	0	3	.034	1	4.391	1
354			min	-1376.476	3	36.886	15	-61.099	2	0	2	.001	15	.172	15
355		7	max	1506.182	2	940.081	1	103.528	3	0	3	.043	3	4.053	1
356			min	-1378.93	3	36.886	15	-61.099	2	0	2	0	10	.159	15
357		8	max	1502.91	2	940.081	1	103.528	3	0	3	.08	3	3.715	1
358			min	-1381.383	3	36.886	15	-61.099	2	0	2	-.02	2	.146	15
359		9	max	1499.639	2	940.081	1	103.528	3	0	3	.117	3	3.377	1
360			min	-1383.837	3	36.886	15	-61.099	2	0	2	-.042	2	.133	15
361		10	max	1496.367	2	940.081	1	103.528	3	0	3	.154	3	3.04	1
362			min	-1386.29	3	36.886	15	-61.099	2	0	2	-.063	2	.119	15
363		11	max	1493.096	2	940.081	1	103.528	3	0	3	.191	3	2.702	1
364			min	-1388.744	3	36.886	15	-61.099	2	0	2	-.085	2	.106	15
365		12	max	1489.825	2	940.081	1	103.528	3	0	3	.229	3	2.364	1
366			min	-1391.197	3	36.886	15	-61.099	2	0	2	-.107	2	.093	15
367		13	max	1486.553	2	940.081	1	103.528	3	0	3	.266	3	2.026	1
368			min	-1393.651	3	36.886	15	-61.099	2	0	2	-.129	2	.08	15
369		14	max	1483.282	2	940.081	1	103.528	3	0	3	.303	3	1.689	1
370			min	-1396.105	3	36.886	15	-61.099	2	0	2	-.151	2	.066	15
371		15	max	1480.01	2	940.081	1	103.528	3	0	3	.34	3	1.351	1
372			min	-1398.558	3	36.886	15	-61.099	2	0	2	-.173	2	.053	15
373		16	max	1476.739	2	940.081	1	103.528	3	0	3	.377	3	1.013	1
374			min	-1401.012	3	36.886	15	-61.099	2	0	2	-.195	2	.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	1473.467	2	940.081	1	103.528	3	0	3	.415	3	.675	1
376			min	-1403.465	3	36.886	15	-61.099	2	0	2	-.217	2	.027	15
377		18	max	1470.196	2	940.081	1	103.528	3	0	3	.452	3	.338	1
378			min	-1405.919	3	36.886	15	-61.099	2	0	2	-.239	2	.013	15
379		19	max	1466.924	2	940.081	1	103.528	3	0	3	.489	3	0	1
380			min	-1408.373	3	36.886	15	-61.099	2	0	2	-.261	2	0	1
381	M3	1	max	1679.416	2	5.617	4	28.017	2	.008	3	0	3	0	1
382			min	-715.858	3	1.32	15	-11.089	3	-.017	2	-.002	2	0	1
383		2	max	1679.207	2	4.993	4	28.017	2	.008	3	.008	2	0	15
384			min	-716.015	3	1.174	15	-11.089	3	-.017	2	-.003	3	-.002	4
385		3	max	1678.999	2	4.369	4	28.017	2	.008	3	.018	2	0	15
386			min	-716.171	3	1.027	15	-11.089	3	-.017	2	-.007	3	-.004	4
387		4	max	1678.79	2	3.745	4	28.017	2	.008	3	.028	2	-.001	15
388			min	-716.327	3	.88	15	-11.089	3	-.017	2	-.011	3	-.005	4
389		5	max	1678.581	2	3.121	4	28.017	2	.008	3	.038	2	-.001	15
390			min	-716.484	3	.734	15	-11.089	3	-.017	2	-.015	3	-.006	4
391		6	max	1678.373	2	2.497	4	28.017	2	.008	3	.048	2	-.002	15
392			min	-716.64	3	.587	15	-11.089	3	-.017	2	-.019	3	-.007	4
393		7	max	1678.164	2	1.872	4	28.017	2	.008	3	.058	2	-.002	15
394			min	-716.797	3	.44	15	-11.089	3	-.017	2	-.023	3	-.008	4
395		8	max	1677.956	2	1.248	4	28.017	2	.008	3	.068	2	-.002	15
396			min	-716.953	3	.293	15	-11.089	3	-.017	2	-.027	3	-.009	4
397		9	max	1677.747	2	.624	4	28.017	2	.008	3	.078	2	-.002	15
398			min	-717.11	3	.147	15	-11.089	3	-.017	2	-.031	3	-.009	4
399		10	max	1677.538	2	0	1	28.017	2	.008	3	.088	2	-.002	15
400			min	-717.266	3	0	1	-11.089	3	-.017	2	-.035	3	-.009	4
401		11	max	1677.33	2	-.147	15	28.017	2	.008	3	.098	2	-.002	15
402			min	-717.423	3	-.624	4	-11.089	3	-.017	2	-.039	3	-.009	4
403		12	max	1677.121	2	-.293	15	28.017	2	.008	3	.108	2	-.002	15
404			min	-717.579	3	-1.248	4	-11.089	3	-.017	2	-.043	3	-.009	4
405		13	max	1676.913	2	-.44	15	28.017	2	.008	3	.118	2	-.002	15
406			min	-717.736	3	-1.872	4	-11.089	3	-.017	2	-.047	3	-.008	4
407		14	max	1676.704	2	-.587	15	28.017	2	.008	3	.128	2	-.002	15
408			min	-717.892	3	-2.497	4	-11.089	3	-.017	2	-.051	3	-.007	4
409		15	max	1676.495	2	-.734	15	28.017	2	.008	3	.138	2	-.001	15
410			min	-718.048	3	-3.121	4	-11.089	3	-.017	2	-.055	3	-.006	4
411		16	max	1676.287	2	-.88	15	28.017	2	.008	3	.148	2	-.001	15
412			min	-718.205	3	-3.745	4	-11.089	3	-.017	2	-.059	3	-.005	4
413		17	max	1676.078	2	-1.027	15	28.017	2	.008	3	.158	2	0	15
414			min	-718.361	3	-4.369	4	-11.089	3	-.017	2	-.063	3	-.004	4
415		18	max	1675.87	2	-1.174	15	28.017	2	.008	3	.168	2	0	15
416			min	-718.518	3	-4.993	4	-11.089	3	-.017	2	-.067	3	-.002	4
417		19	max	1675.661	2	-1.32	15	28.017	2	.008	3	.178	2	0	1
418			min	-718.674	3	-5.617	4	-11.089	3	-.017	2	-.071	3	0	1
419	M6	1	max	4552.949	2	5.617	4	0	1	0	1	0	1	0	1
420			min	-2449.523	3	1.32	15	0	1	0	1	0	1	0	1
421		2	max	4552.741	2	4.993	4	0	1	0	1	0	1	0	15
422			min	-2449.679	3	1.174	15	0	1	0	1	0	1	-.002	4
423		3	max	4552.532	2	4.369	4	0	1	0	1	0	1	0	15
424			min	-2449.836	3	1.027	15	0	1	0	1	0	1	-.004	4
425		4	max	4552.324	2	3.745	4	0	1	0	1	0	1	-.001	15
426			min	-2449.992	3	.88	15	0	1	0	1	0	1	-.005	4
427		5	max	4552.115	2	3.121	4	0	1	0	1	0	1	-.001	15
428			min	-2450.149	3	.734	15	0	1	0	1	0	1	-.006	4
429		6	max	4551.906	2	2.497	4	0	1	0	1	0	1	-.002	15
430			min	-2450.305	3	.587	15	0	1	0	1	0	1	-.007	4
431		7	max	4551.698	2	1.872	4	0	1	0	1	0	1	-.002	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
432			min	-2450.462	3	.44	15	0	1	0	1	0	1	-.008	4
433		8	max	4551.489	2	1.248	4	0	1	0	1	0	1	-.002	15
434			min	-2450.618	3	.293	15	0	1	0	1	0	1	-.009	4
435		9	max	4551.281	2	.624	4	0	1	0	1	0	1	-.002	15
436			min	-2450.775	3	.147	15	0	1	0	1	0	1	-.009	4
437		10	max	4551.072	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2450.931	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	4550.863	2	-.147	15	0	1	0	1	0	1	-.002	15
440			min	-2451.087	3	-.624	4	0	1	0	1	0	1	-.009	4
441		12	max	4550.655	2	-.293	15	0	1	0	1	0	1	-.002	15
442			min	-2451.244	3	-1.248	4	0	1	0	1	0	1	-.009	4
443		13	max	4550.446	2	-.44	15	0	1	0	1	0	1	-.002	15
444			min	-2451.4	3	-1.872	4	0	1	0	1	0	1	-.008	4
445		14	max	4550.238	2	-.587	15	0	1	0	1	0	1	-.002	15
446			min	-2451.557	3	-2.497	4	0	1	0	1	0	1	-.007	4
447		15	max	4550.029	2	-.734	15	0	1	0	1	0	1	-.001	15
448			min	-2451.713	3	-3.121	4	0	1	0	1	0	1	-.006	4
449		16	max	4549.82	2	-.88	15	0	1	0	1	0	1	-.001	15
450			min	-2451.87	3	-3.745	4	0	1	0	1	0	1	-.005	4
451		17	max	4549.612	2	-1.027	15	0	1	0	1	0	1	0	15
452			min	-2452.026	3	-4.369	4	0	1	0	1	0	1	-.004	4
453		18	max	4549.403	2	-1.174	15	0	1	0	1	0	1	0	15
454			min	-2452.183	3	-4.993	4	0	1	0	1	0	1	-.002	4
455		19	max	4549.195	2	-1.32	15	0	1	0	1	0	1	0	1
456			min	-2452.339	3	-5.617	4	0	1	0	1	0	1	0	1
457	M9	1	max	1679.416	2	5.617	4	11.089	3	.017	2	.002	2	0	1
458			min	-715.858	3	1.32	15	-28.017	2	-.008	3	0	3	0	1
459		2	max	1679.207	2	4.993	4	11.089	3	.017	2	.003	3	0	15
460			min	-716.015	3	1.174	15	-28.017	2	-.008	3	-.008	2	-.002	4
461		3	max	1678.999	2	4.369	4	11.089	3	.017	2	.007	3	0	15
462			min	-716.171	3	1.027	15	-28.017	2	-.008	3	-.018	2	-.004	4
463		4	max	1678.79	2	3.745	4	11.089	3	.017	2	.011	3	-.001	15
464			min	-716.327	3	.88	15	-28.017	2	-.008	3	-.028	2	-.005	4
465		5	max	1678.581	2	3.121	4	11.089	3	.017	2	.015	3	-.001	15
466			min	-716.484	3	.734	15	-28.017	2	-.008	3	-.038	2	-.006	4
467		6	max	1678.373	2	2.497	4	11.089	3	.017	2	.019	3	-.002	15
468			min	-716.64	3	.587	15	-28.017	2	-.008	3	-.048	2	-.007	4
469		7	max	1678.164	2	1.872	4	11.089	3	.017	2	.023	3	-.002	15
470			min	-716.797	3	.44	15	-28.017	2	-.008	3	-.058	2	-.008	4
471		8	max	1677.956	2	1.248	4	11.089	3	.017	2	.027	3	-.002	15
472			min	-716.953	3	.293	15	-28.017	2	-.008	3	-.068	2	-.009	4
473		9	max	1677.747	2	.624	4	11.089	3	.017	2	.031	3	-.002	15
474			min	-717.11	3	.147	15	-28.017	2	-.008	3	-.078	2	-.009	4
475		10	max	1677.538	2	0	1	11.089	3	.017	2	.035	3	-.002	15
476			min	-717.266	3	0	1	-28.017	2	-.008	3	-.088	2	-.009	4
477		11	max	1677.33	2	-.147	15	11.089	3	.017	2	.039	3	-.002	15
478			min	-717.423	3	-.624	4	-28.017	2	-.008	3	-.098	2	-.009	4
479		12	max	1677.121	2	-.293	15	11.089	3	.017	2	.043	3	-.002	15
480			min	-717.579	3	-1.248	4	-28.017	2	-.008	3	-.108	2	-.009	4
481		13	max	1676.913	2	-.44	15	11.089	3	.017	2	.047	3	-.002	15
482			min	-717.736	3	-1.872	4	-28.017	2	-.008	3	-.118	2	-.008	4
483		14	max	1676.704	2	-.587	15	11.089	3	.017	2	.051	3	-.002	15
484			min	-717.892	3	-2.497	4	-28.017	2	-.008	3	-.128	2	-.007	4
485		15	max	1676.495	2	-.734	15	11.089	3	.017	2	.055	3	-.001	15
486			min	-718.048	3	-3.121	4	-28.017	2	-.008	3	-.138	2	-.006	4
487		16	max	1676.287	2	-.88	15	11.089	3	.017	2	.059	3	-.001	15
488			min	-718.205	3	-3.745	4	-28.017	2	-.008	3	-.148	2	-.005	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
489		17	max	1676.078	2	-1.027	15	11.089	3	.017	2	.063	3	0	15
490			min	-718.361	3	-4.369	4	-28.017	2	-.008	3	-.158	2	-.004	4
491		18	max	1675.87	2	-1.174	15	11.089	3	.017	2	.067	3	0	15
492			min	-718.518	3	-4.993	4	-28.017	2	-.008	3	-.168	2	-.002	4
493		19	max	1675.661	2	-1.32	15	11.089	3	.017	2	.071	3	0	1
494			min	-718.674	3	-5.617	4	-28.017	2	-.008	3	-.178	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	-.016	15	-.023	15	.008	1	5.528e-3	3	NC	3	NC	1
2			min	-.403	1	-.692	1	0	15	-1.649e-2	2	146.556	1	NC	1
3		2	max	-.016	15	-.02	15	0	15	5.311e-3	3	NC	12	NC	1
4			min	-.403	1	-.581	1	-.006	1	-1.549e-2	2	165.623	1	NC	1
5		3	max	-.016	15	-.017	15	0	15	4.885e-3	3	8154.307	12	NC	2
6			min	-.403	1	-.472	1	-.013	1	-1.353e-2	2	189.672	1	7456.549	1
7		4	max	-.016	15	-.014	15	0	15	4.459e-3	3	6258.876	12	NC	3
8			min	-.403	1	-.372	1	-.014	1	-1.157e-2	2	219.002	1	7242.613	1
9		5	max	-.016	15	-.011	15	0	12	4.253e-3	3	6163.285	12	NC	2
10			min	-.403	1	-.286	1	-.012	1	-1.016e-2	2	252.549	1	8404.302	1
11		6	max	-.016	15	-.009	15	0	3	4.608e-3	3	8062.609	12	NC	1
12			min	-.402	1	-.217	1	-.008	1	-1.014e-2	2	288.22	1	NC	1
13		7	max	-.016	15	-.007	15	.001	3	4.964e-3	3	NC	12	NC	1
14			min	-.402	1	-.159	1	-.003	2	-1.013e-2	2	326.722	1	NC	1
15		8	max	-.016	15	-.005	15	0	3	5.32e-3	3	NC	3	NC	1
16			min	-.402	1	-.107	1	0	10	-1.011e-2	2	370.538	1	NC	1
17		9	max	-.016	15	-.003	15	0	10	5.962e-3	3	8856.419	15	NC	1
18			min	-.401	1	-.071	3	0	3	-9.477e-3	2	425.783	1	NC	1
19		10	max	-.016	15	.002	10	0	2	6.872e-3	3	NC	15	NC	1
20			min	-.401	1	-.05	3	-.001	3	-8.252e-3	2	501.513	1	NC	1
21		11	max	-.016	15	.044	2	0	1	7.782e-3	3	NC	15	NC	1
22			min	-.4	1	-.029	3	0	3	-7.027e-3	2	611.201	1	NC	1
23		12	max	-.016	15	.094	1	.003	3	7.357e-3	3	NC	15	NC	1
24			min	-.4	1	-.008	3	-.003	1	-5.662e-3	2	784.562	1	NC	1
25		13	max	-.016	15	.144	1	.008	3	5.514e-3	3	NC	5	NC	1
26			min	-.399	1	.005	15	-.004	2	-4.147e-3	2	1083.637	1	NC	1
27		14	max	-.016	15	.189	1	.012	3	3.671e-3	3	NC	5	NC	1
28			min	-.399	1	.007	15	-.004	2	-2.632e-3	2	965.76	3	NC	1
29		15	max	-.016	15	.225	1	.013	3	1.828e-3	3	NC	2	NC	1
30			min	-.398	1	.009	15	0	10	-1.118e-3	2	703.933	3	9917.896	3
31		16	max	-.016	15	.248	1	.009	1	4.812e-3	3	NC	5	NC	1
32			min	-.398	1	.01	15	0	15	-2.183e-3	2	504.341	3	NC	1
33		17	max	-.016	15	.287	3	.01	1	8.361e-3	3	NC	1	NC	2
34			min	-.398	1	.011	15	0	15	-3.552e-3	2	372.69	3	9110.844	1
35		18	max	-.016	15	.398	3	.005	1	1.191e-2	3	NC	1	NC	1
36			min	-.398	1	.012	15	0	15	-4.92e-3	2	288.417	3	NC	1
37		19	max	-.016	15	.513	3	0	15	1.372e-2	3	NC	1	NC	1
38			min	-.398	1	.013	15	-.007	1	-5.618e-3	2	233.691	3	NC	1
39	M4	1	max	-.021	15	-.009	3	0	1	0	1	NC	3	NC	1
40			min	-.583	1	-1.195	2	0	1	0	1	103.019	1	NC	1
41		2	max	-.021	15	-.029	15	0	1	0	1	4243.047	12	NC	1
42			min	-.583	1	-.962	2	0	1	0	1	120.19	1	NC	1
43		3	max	-.021	15	-.024	15	0	1	0	1	3845.793	15	NC	1
44			min	-.582	1	-.736	2	0	1	0	1	143.369	1	NC	1
45		4	max	-.021	15	-.019	15	0	1	0	1	4380.24	15	NC	1
46			min	-.582	1	-.564	1	0	1	0	1	173.334	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	-.021	15	-.015	15	0	1	0	1	4969.023	15	NC	1
48			min	-.582	1	-.427	1	0	1	0	1	208.211	1	NC	1
49		6	max	-.021	15	-.012	15	0	1	0	1	5567.236	15	NC	1
50			min	-.581	1	-.33	1	0	1	0	1	243.029	1	NC	1
51		7	max	-.021	15	-.01	15	0	1	0	1	6196.898	15	NC	1
52			min	-.58	1	-.257	1	0	1	0	1	277.389	1	NC	1
53		8	max	-.021	15	-.007	15	0	1	0	1	6919.494	15	NC	1
54			min	-.579	1	-.197	1	0	1	0	1	314.799	1	NC	1
55		9	max	-.021	15	-.005	15	0	1	0	1	8646.49	12	NC	1
56			min	-.578	1	-.133	1	0	1	0	1	366.425	1	NC	1
57		10	max	-.021	15	-.002	15	0	1	0	1	NC	3	NC	1
58			min	-.577	1	-.064	2	0	1	0	1	450.865	1	NC	1
59		11	max	-.021	15	.019	1	0	1	0	1	NC	15	NC	1
60			min	-.576	1	0	15	0	1	0	1	605.036	1	NC	1
61		12	max	-.021	15	.107	1	0	1	0	1	NC	10	NC	1
62			min	-.575	1	.004	15	0	1	0	1	964.249	1	NC	1
63		13	max	-.021	15	.195	1	0	1	0	1	NC	5	NC	1
64			min	-.574	1	.007	15	0	1	0	1	2170.789	9	NC	1
65		14	max	-.021	15	.271	1	0	1	0	1	NC	5	NC	1
66			min	-.573	1	.01	15	0	1	0	1	1347.335	2	NC	1
67		15	max	-.021	15	.322	1	0	1	0	1	NC	4	NC	1
68			min	-.572	1	.012	15	0	1	0	1	890.802	3	NC	1
69		16	max	-.021	15	.336	1	0	1	0	1	NC	4	NC	1
70			min	-.572	1	.013	15	0	1	0	1	473.201	3	NC	1
71		17	max	-.021	15	.479	3	0	1	0	1	NC	4	NC	1
72			min	-.572	1	.013	15	0	1	0	1	290.529	3	NC	1
73		18	max	-.021	15	.696	3	0	1	0	1	NC	4	NC	1
74			min	-.572	1	.013	15	0	1	0	1	201.196	3	NC	1
75		19	max	-.021	15	.921	3	0	1	0	1	NC	1	NC	1
76			min	-.572	1	.013	15	0	1	0	1	152.47	3	NC	1
77	M7	1	max	-.016	15	-.023	15	0	15	1.649e-2	2	NC	3	NC	1
78			min	-.403	1	-.692	1	-.008	1	-5.528e-3	3	146.556	1	NC	1
79		2	max	-.016	15	-.02	15	.006	1	1.549e-2	2	NC	12	NC	1
80			min	-.403	1	-.581	1	0	15	-5.311e-3	3	165.623	1	NC	1
81		3	max	-.016	15	-.017	15	.013	1	1.353e-2	2	8154.307	12	NC	2
82			min	-.403	1	-.472	1	0	15	-4.885e-3	3	189.672	1	7456.549	1
83		4	max	-.016	15	-.014	15	.014	1	1.157e-2	2	6258.876	12	NC	3
84			min	-.403	1	-.372	1	0	15	-4.459e-3	3	219.002	1	7242.613	1
85		5	max	-.016	15	-.011	15	.012	1	1.016e-2	2	6163.285	12	NC	2
86			min	-.403	1	-.286	1	0	12	-4.253e-3	3	252.549	1	8404.302	1
87		6	max	-.016	15	-.009	15	.008	1	1.014e-2	2	8062.609	12	NC	1
88			min	-.402	1	-.217	1	0	3	-4.608e-3	3	288.22	1	NC	1
89		7	max	-.016	15	-.007	15	.003	2	1.013e-2	2	NC	12	NC	1
90			min	-.402	1	-.159	1	-.001	3	-4.964e-3	3	326.722	1	NC	1
91		8	max	-.016	15	-.005	15	0	10	1.011e-2	2	NC	3	NC	1
92			min	-.402	1	-.107	1	0	3	-5.32e-3	3	370.538	1	NC	1
93		9	max	-.016	15	-.003	15	0	3	9.477e-3	2	8856.419	15	NC	1
94			min	-.401	1	-.071	3	0	10	-5.962e-3	3	425.783	1	NC	1
95		10	max	-.016	15	.002	10	.001	3	8.252e-3	2	NC	15	NC	1
96			min	-.401	1	-.05	3	0	2	-6.872e-3	3	501.513	1	NC	1
97		11	max	-.016	15	.044	2	0	3	7.027e-3	2	NC	15	NC	1
98			min	-.4	1	-.029	3	0	1	-7.782e-3	3	611.201	1	NC	1
99		12	max	-.016	15	.094	1	.003	1	5.662e-3	2	NC	15	NC	1
100			min	-.4	1	-.008	3	-.003	3	-7.357e-3	3	784.562	1	NC	1
101		13	max	-.016	15	.144	1	.004	2	4.147e-3	2	NC	5	NC	1
102			min	-.399	1	.005	15	-.008	3	-5.514e-3	3	1083.637	1	NC	1
103		14	max	-.016	15	.189	1	.004	2	2.632e-3	2	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
104			min	-.399	1	.007	15	-.012	3	-3.671e-3	3	965.76	3	NC	1
105		15	max	-.016	15	.225	1	0	10	1.118e-3	2	NC	2	NC	1
106			min	-.398	1	.009	15	-.013	3	-1.828e-3	3	703.933	3	9917.896	3
107		16	max	-.016	15	.248	1	0	15	2.183e-3	2	NC	5	NC	1
108			min	-.398	1	.01	15	-.009	1	-4.812e-3	3	504.341	3	NC	1
109		17	max	-.016	15	.287	3	0	15	3.552e-3	2	NC	1	NC	2
110			min	-.398	1	.011	15	-.01	1	-8.361e-3	3	372.69	3	9110.844	1
111		18	max	-.016	15	.398	3	0	15	4.92e-3	2	NC	1	NC	1
112			min	-.398	1	.012	15	-.005	1	-1.191e-2	3	288.417	3	NC	1
113		19	max	-.016	15	.513	3	.007	1	5.618e-3	2	NC	1	NC	1
114			min	-.398	1	.013	15	0	15	-1.372e-2	3	233.691	3	NC	1
115	M10	1	max	0	1	.457	3	.398	1	1.459e-2	3	NC	1	NC	1
116			min	0	15	.013	15	.016	15	-1.182e-3	2	NC	1	NC	1
117		2	max	0	1	.578	3	.421	1	1.614e-2	3	NC	4	NC	2
118			min	0	15	.012	15	.017	15	-1.876e-3	2	1289.222	3	6852.439	1
119		3	max	0	1	.691	3	.454	1	1.768e-2	3	NC	4	NC	4
120			min	0	15	.011	15	.018	15	-2.571e-3	2	665.466	3	2809.88	1
121		4	max	0	1	.783	3	.489	1	1.923e-2	3	NC	4	NC	5
122			min	0	15	.011	15	.019	15	-3.266e-3	2	478.091	3	1719.435	1
123		5	max	0	1	.845	3	.521	1	2.077e-2	3	NC	4	NC	5
124			min	0	15	.011	15	.02	15	-3.96e-3	2	401.741	3	1270.524	1
125		6	max	0	1	.875	3	.546	1	2.232e-2	3	NC	4	NC	5
126			min	0	15	.011	15	.021	15	-4.655e-3	2	373.405	3	1054.048	1
127		7	max	0	1	.874	3	.563	1	2.386e-2	3	NC	4	NC	5
128			min	0	15	.011	15	.021	15	-5.349e-3	2	373.515	3	947.678	1
129		8	max	0	1	.853	3	.571	1	2.541e-2	3	NC	4	NC	5
130			min	0	15	.012	15	.021	15	-6.044e-3	2	393.406	3	902.9	1
131		9	max	0	1	.825	3	.573	1	2.696e-2	3	NC	1	NC	5
132			min	0	15	.013	15	.021	15	-6.738e-3	2	423.157	3	893.621	1
133		10	max	0	1	.811	3	.572	1	2.85e-2	3	NC	1	NC	5
134			min	0	1	.013	15	.021	15	-7.433e-3	2	440.816	3	896.577	1
135		11	max	0	15	.825	3	.573	1	2.696e-2	3	NC	1	NC	5
136			min	0	1	.013	15	.021	15	-6.738e-3	2	423.157	3	893.621	1
137		12	max	0	15	.853	3	.571	1	2.541e-2	3	NC	4	NC	5
138			min	0	1	.012	15	.021	15	-6.044e-3	2	393.406	3	902.9	1
139		13	max	0	15	.874	3	.563	1	2.386e-2	3	NC	4	NC	5
140			min	0	1	.011	15	.021	15	-5.349e-3	2	373.515	3	947.678	1
141		14	max	0	15	.875	3	.546	1	2.232e-2	3	NC	4	NC	5
142			min	0	1	.011	15	.021	15	-4.655e-3	2	373.405	3	1054.048	1
143		15	max	0	15	.845	3	.521	1	2.077e-2	3	NC	4	NC	5
144			min	0	1	.011	15	.02	15	-3.96e-3	2	401.741	3	1270.524	1
145		16	max	0	15	.783	3	.489	1	1.923e-2	3	NC	4	NC	5
146			min	0	1	.011	15	.019	15	-3.266e-3	2	478.091	3	1719.435	1
147		17	max	0	15	.691	3	.454	1	1.768e-2	3	NC	4	NC	4
148			min	0	1	.011	15	.018	15	-2.571e-3	2	665.466	3	2809.88	1
149		18	max	0	15	.578	3	.421	1	1.614e-2	3	NC	4	NC	2
150			min	0	1	.012	15	.017	15	-1.876e-3	2	1289.222	3	6852.439	1
151		19	max	0	15	.457	3	.398	1	1.459e-2	3	NC	1	NC	1
152			min	0	1	.013	15	.016	15	-1.182e-3	2	NC	1	NC	1
153	M11	1	max	0	1	.069	1	.4	1	6.495e-3	1	NC	1	NC	1
154			min	0	3	-.018	3	.016	15	2.61e-4	15	NC	1	NC	1
155		2	max	0	1	.054	3	.415	1	6.999e-3	1	NC	4	NC	1
156			min	0	3	.001	15	.016	15	2.75e-4	15	2152.103	3	NC	1
157		3	max	0	1	.118	3	.444	1	7.504e-3	1	NC	4	NC	3
158			min	0	3	-.032	2	.017	15	2.889e-4	15	1142.468	3	3504.249	1
159		4	max	0	1	.162	3	.479	1	8.008e-3	1	NC	5	NC	5
160			min	0	3	-.06	2	.019	15	3.029e-4	15	866.835	3	1979.08	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
161		5	max	0	1	.178	3	.512	1	8.513e-3	1	NC	5	NC	5
162			min	0	3	-.069	2	.02	15	3.169e-4	15	795.235	3	1391.757	1
163		6	max	0	1	.166	3	.54	1	9.018e-3	1	NC	4	NC	5
164			min	0	3	-.058	2	.021	15	3.309e-4	15	846.811	3	1115.039	1
165		7	max	0	1	.131	3	.56	1	9.522e-3	1	NC	4	NC	5
166			min	0	3	-.032	2	.021	15	3.448e-4	15	1048.22	3	976.265	1
167		8	max	0	1	.082	3	.571	1	1.003e-2	1	NC	4	NC	5
168			min	0	3	-.002	10	.021	15	3.588e-4	15	1555.046	3	911.268	1
169		9	max	0	1	.051	1	.575	1	1.053e-2	1	NC	4	NC	5
170			min	0	3	.002	15	.021	15	3.728e-4	15	2852.753	3	889.098	1
171		10	max	0	1	.063	1	.576	1	1.104e-2	1	NC	1	NC	5
172			min	0	1	.002	15	.021	15	3.867e-4	15	4651.541	3	886.958	1
173		11	max	0	3	.051	1	.575	1	1.053e-2	1	NC	4	NC	5
174			min	0	1	.002	15	.021	15	3.728e-4	15	2852.753	3	889.098	1
175		12	max	0	3	.082	3	.571	1	1.003e-2	1	NC	4	NC	5
176			min	0	1	-.002	10	.021	15	3.588e-4	15	1555.046	3	911.268	1
177		13	max	0	3	.131	3	.56	1	9.522e-3	1	NC	4	NC	5
178			min	0	1	-.032	2	.021	15	3.448e-4	15	1048.22	3	976.265	1
179		14	max	0	3	.166	3	.54	1	9.018e-3	1	NC	4	NC	5
180			min	0	1	-.058	2	.021	15	3.309e-4	15	846.811	3	1115.039	1
181		15	max	0	3	.178	3	.512	1	8.513e-3	1	NC	5	NC	5
182			min	0	1	-.069	2	.02	15	3.169e-4	15	795.235	3	1391.757	1
183		16	max	0	3	.162	3	.479	1	8.008e-3	1	NC	5	NC	5
184			min	0	1	-.06	2	.019	15	3.029e-4	15	866.835	3	1979.08	1
185		17	max	0	3	.118	3	.444	1	7.504e-3	1	NC	4	NC	3
186			min	0	1	-.032	2	.017	15	2.889e-4	15	1142.468	3	3504.249	1
187		18	max	0	3	.054	3	.415	1	6.999e-3	1	NC	4	NC	1
188			min	0	1	.001	15	.016	15	2.75e-4	15	2152.103	3	NC	1
189		19	max	0	3	.069	1	.4	1	6.495e-3	1	NC	1	NC	1
190			min	0	1	-.018	3	.016	15	2.61e-4	15	NC	1	NC	1
191	M12	1	max	0	3	-.004	15	.401	1	6.323e-3	1	NC	1	NC	1
192			min	0	1	-.084	1	.016	15	2.483e-4	15	NC	1	NC	1
193		2	max	0	3	-.005	15	.415	1	6.519e-3	1	NC	4	NC	1
194			min	0	1	-.151	1	.016	15	2.557e-4	15	1807.212	2	NC	1
195		3	max	0	3	0	3	.443	1	6.715e-3	1	NC	5	NC	3
196			min	0	1	-.223	2	.017	15	2.631e-4	15	970.877	2	3784.33	1
197		4	max	0	3	.022	3	.477	1	6.912e-3	1	NC	5	NC	5
198			min	0	1	-.275	2	.019	15	2.705e-4	15	735.658	2	2069.305	1
199		5	max	0	3	.029	3	.511	1	7.108e-3	1	NC	5	NC	5
200			min	0	1	-.298	2	.02	15	2.779e-4	15	664.542	2	1428.671	1
201		6	max	0	3	.021	3	.539	1	7.305e-3	1	NC	5	NC	5
202			min	0	1	-.291	2	.021	15	2.853e-4	15	683.066	2	1130.498	1
203		7	max	0	3	0	3	.56	1	7.501e-3	1	NC	5	NC	5
204			min	0	1	-.261	2	.021	15	2.927e-4	15	788.27	2	980.734	1
205		8	max	0	3	-.007	15	.573	1	7.697e-3	1	NC	5	NC	5
206			min	0	1	-.216	2	.021	15	3.002e-4	15	1015.792	2	909.048	1
207		9	max	0	3	-.006	15	.578	1	7.894e-3	1	NC	5	NC	5
208			min	0	1	-.182	1	.021	15	3.076e-4	15	1405.528	2	882.634	1
209		10	max	0	1	-.006	15	.579	1	8.09e-3	1	NC	4	NC	5
210			min	0	1	-.167	1	.021	15	3.15e-4	15	1713.159	2	878.802	1
211		11	max	0	1	-.006	15	.578	1	7.894e-3	1	NC	5	NC	5
212			min	0	3	-.182	1	.021	15	3.076e-4	15	1405.528	2	882.634	1
213		12	max	0	1	-.007	15	.573	1	7.697e-3	1	NC	5	NC	5
214			min	0	3	-.216	2	.021	15	3.002e-4	15	1015.792	2	909.048	1
215		13	max	0	1	0	3	.56	1	7.501e-3	1	NC	5	NC	5
216			min	0	3	-.261	2	.021	15	2.927e-4	15	788.27	2	980.734	1
217		14	max	0	1	.021	3	.539	1	7.305e-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	3	-.291	2	.021	15	2.853e-4	15	683.066	2	1130.498	1
219		15	max	0	1	.029	3	.511	1	7.108e-3	1	NC	5	NC	5
220			min	0	3	-.298	2	.02	15	2.779e-4	15	664.542	2	1428.671	1
221		16	max	0	1	.022	3	.477	1	6.912e-3	1	NC	5	NC	5
222			min	0	3	-.275	2	.019	15	2.705e-4	15	735.658	2	2069.305	1
223		17	max	0	1	0	3	.443	1	6.715e-3	1	NC	5	NC	3
224			min	0	3	-.223	2	.017	15	2.631e-4	15	970.877	2	3784.33	1
225		18	max	0	1	-.005	15	.415	1	6.519e-3	1	NC	4	NC	1
226			min	0	3	-.151	1	.016	15	2.557e-4	15	1807.212	2	NC	1
227		19	max	0	1	-.004	15	.401	1	6.323e-3	1	NC	1	NC	1
228			min	0	3	-.084	1	.016	15	2.483e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.022	15	.403	1	1.555e-2	2	NC	1	NC	1
230			min	0	1	-.638	1	.016	15	-2.036e-3	3	NC	1	NC	1
231		2	max	0	15	-.024	15	.427	1	1.71e-2	2	NC	5	NC	3
232			min	0	1	-.767	2	.017	15	-2.607e-3	3	1093.69	2	6418.739	1
233		3	max	0	15	-.012	12	.461	1	1.866e-2	2	NC	5	NC	3
234			min	0	1	-.898	2	.018	15	-3.179e-3	3	569.68	2	2676.394	1
235		4	max	0	15	.015	3	.497	1	2.021e-2	2	NC	5	NC	5
236			min	0	1	-1.005	2	.019	15	-3.75e-3	3	409.796	2	1651.605	1
237		5	max	0	15	.029	3	.53	1	2.177e-2	2	NC	5	NC	5
238			min	0	1	-1.08	2	.02	15	-4.322e-3	3	342.444	2	1226.153	1
239		6	max	0	15	.028	3	.556	1	2.332e-2	2	NC	5	NC	5
240			min	0	1	-1.12	2	.021	15	-4.893e-3	3	314.408	2	1019.908	1
241		7	max	0	15	.014	3	.573	1	2.488e-2	2	NC	5	NC	5
242			min	0	1	-1.13	2	.021	15	-5.465e-3	3	308.557	2	918.158	1
243		8	max	0	15	-.007	3	.581	1	2.643e-2	2	NC	5	NC	5
244			min	0	1	-1.116	2	.022	15	-6.036e-3	3	316.984	2	875.083	1
245		9	max	0	15	-.021	12	.583	1	2.799e-2	2	NC	5	NC	5
246			min	0	1	-1.094	2	.021	15	-6.608e-3	3	332.247	2	865.91	1
247		10	max	0	1	-.027	12	.583	1	2.954e-2	2	NC	5	NC	5
248			min	0	1	-1.081	2	.021	15	-7.179e-3	3	341.536	2	868.572	1
249		11	max	0	1	-.021	12	.583	1	2.799e-2	2	NC	5	NC	5
250			min	0	15	-1.094	2	.021	15	-6.608e-3	3	332.247	2	865.91	1
251		12	max	0	1	-.007	3	.581	1	2.643e-2	2	NC	5	NC	5
252			min	0	15	-1.116	2	.022	15	-6.036e-3	3	316.984	2	875.083	1
253		13	max	0	1	.014	3	.573	1	2.488e-2	2	NC	5	NC	5
254			min	0	15	-1.13	2	.021	15	-5.465e-3	3	308.557	2	918.158	1
255		14	max	0	1	.028	3	.556	1	2.332e-2	2	NC	5	NC	5
256			min	0	15	-1.12	2	.021	15	-4.893e-3	3	314.408	2	1019.908	1
257		15	max	0	1	.029	3	.53	1	2.177e-2	2	NC	5	NC	5
258			min	0	15	-1.08	2	.02	15	-4.322e-3	3	342.444	2	1226.153	1
259		16	max	0	1	.015	3	.497	1	2.021e-2	2	NC	5	NC	5
260			min	0	15	-1.005	2	.019	15	-3.75e-3	3	409.796	2	1651.605	1
261		17	max	0	1	-.012	12	.461	1	1.866e-2	2	NC	5	NC	3
262			min	0	15	-.898	2	.018	15	-3.179e-3	3	569.68	2	2676.394	1
263		18	max	0	1	-.024	15	.427	1	1.71e-2	2	NC	5	NC	3
264			min	0	15	-.767	2	.017	15	-2.607e-3	3	1093.69	2	6418.739	1
265		19	max	0	1	-.022	15	.403	1	1.555e-2	2	NC	1	NC	1
266			min	0	15	-.638	1	.016	15	-2.036e-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	2.79e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	2	-1.142e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	3.939e-3	2	NC	2	NC	1
272			min	0	2	-.008	1	0	2	-1.586e-3	3	9980.657	1	NC	1
273		4	max	0	3	0	15	.001	3	3.625e-3	2	NC	4	NC	1
274			min	0	2	-.018	1	0	2	-1.407e-3	3	4420.626	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
275		5	max	0	3	-.001	15	.002	3	3.31e-3	2	NC	4	NC	1
276			min	0	2	-.031	1	-.001	2	-1.228e-3	3	2512.538	1	NC	1
277		6	max	0	3	-.002	15	.003	3	2.996e-3	2	NC	5	NC	1
278			min	0	2	-.048	1	-.002	1	-1.049e-3	3	1632.235	1	NC	1
279		7	max	0	3	-.003	15	.003	3	2.682e-3	2	NC	5	NC	1
280			min	0	2	-.067	1	-.003	1	-8.705e-4	3	1153.232	1	NC	1
281		8	max	0	3	-.004	15	.004	3	2.367e-3	2	NC	5	NC	1
282			min	0	2	-.09	1	-.004	1	-6.916e-4	3	863.406	1	NC	1
283		9	max	0	3	-.005	15	.005	3	2.053e-3	2	NC	5	NC	1
284			min	0	2	-.115	1	-.004	1	-5.127e-4	3	674.265	1	NC	1
285		10	max	0	3	-.006	15	.005	3	1.738e-3	2	NC	15	NC	1
286			min	0	2	-.143	1	-.005	1	-3.337e-4	3	543.955	1	NC	1
287		11	max	0	3	-.007	15	.005	3	1.424e-3	2	NC	15	NC	1
288			min	-.001	2	-.172	1	-.006	1	-1.548e-4	3	450.158	1	NC	1
289		12	max	.001	3	-.008	15	.005	3	1.11e-3	2	9630.361	15	NC	1
290			min	-.001	2	-.204	1	-.006	1	9.299e-6	15	380.401	1	NC	1
291		13	max	.001	3	-.009	15	.004	3	7.954e-4	2	8283.173	15	NC	1
292			min	-.001	2	-.237	1	-.007	1	3.269e-6	15	327.045	1	NC	1
293		14	max	.001	3	-.011	15	.003	3	4.81e-4	2	7228.917	15	NC	1
294			min	-.001	2	-.272	1	-.007	1	-3.895e-5	9	285.317	1	NC	1
295		15	max	.001	3	-.012	15	.001	3	5.609e-4	3	6388.115	15	NC	1
296			min	-.001	2	-.308	1	-.007	1	-1.245e-4	9	252.056	1	NC	1
297		16	max	.001	3	-.014	15	0	15	7.398e-4	3	5706.828	15	NC	1
298			min	-.002	2	-.345	1	-.007	1	-3.269e-4	1	225.118	1	NC	1
299		17	max	.002	3	-.015	15	0	15	9.187e-4	3	5147.319	15	NC	1
300			min	-.002	2	-.382	1	-.006	1	-5.872e-4	1	203.004	1	NC	1
301		18	max	.002	3	-.017	15	0	15	1.098e-3	3	4682.431	15	NC	1
302			min	-.002	2	-.42	1	-.008	3	-8.476e-4	1	184.636	1	NC	1
303		19	max	.002	3	-.018	15	0	10	1.277e-3	3	4292.359	15	NC	1
304			min	-.002	2	-.459	1	-.012	3	-1.108e-3	1	169.229	1	6375.325	3
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	1	0	1	NC	1	NC	1
308			min	0	2	-.002	1	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	3	NC	1
310			min	0	2	-.01	1	0	1	0	1	7514.262	1	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	0	2	-.024	1	0	1	0	1	3217.173	1	NC	1
313		5	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
314			min	-.001	2	-.043	1	0	1	0	1	1801.915	1	NC	1
315		6	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
316			min	-.001	2	-.067	1	0	1	0	1	1161.093	1	NC	1
317		7	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
318			min	-.002	2	-.095	1	0	1	0	1	816.129	1	NC	1
319		8	max	.002	3	-.005	15	0	1	0	1	NC	5	NC	1
320			min	-.002	2	-.127	1	0	1	0	1	608.858	1	NC	1
321		9	max	.002	3	-.006	15	0	1	0	1	NC	15	NC	1
322			min	-.002	2	-.164	1	0	1	0	1	474.251	1	NC	1
323		10	max	.003	3	-.008	15	0	1	0	1	NC	15	NC	1
324			min	-.003	2	-.203	1	0	1	0	1	381.849	1	NC	1
325		11	max	.003	3	-.009	15	0	1	0	1	8561.141	15	NC	1
326			min	-.003	2	-.246	1	0	1	0	1	315.522	1	NC	1
327		12	max	.003	3	-.011	15	0	1	0	1	7234.031	15	NC	1
328			min	-.003	2	-.291	1	0	1	0	1	266.303	1	NC	1
329		13	max	.003	3	-.012	15	0	1	0	1	6219.046	15	NC	1
330			min	-.003	2	-.339	1	0	1	0	1	228.723	1	NC	1
331		14	max	.004	3	-.014	15	0	1	0	1	5425.333	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	2	-.389	1	0	1	0	1	199.378	1	NC	1
333		15	max	.004	3	-.016	15	0	1	0	1	4792.707	15	NC	1
334			min	-.004	2	-.441	1	0	1	0	1	176.015	1	NC	1
335		16	max	.004	3	-.018	15	0	1	0	1	4280.366	15	NC	1
336			min	-.004	2	-.494	1	0	1	0	1	157.114	1	NC	1
337		17	max	.004	3	-.02	15	0	1	0	1	3859.795	15	NC	1
338			min	-.004	2	-.548	1	0	1	0	1	141.611	1	NC	1
339		18	max	.005	3	-.022	15	0	1	0	1	3510.485	15	NC	1
340			min	-.005	2	-.603	1	0	1	0	1	128.746	1	NC	1
341		19	max	.005	3	-.024	15	0	1	0	1	3217.494	15	NC	1
342			min	-.005	2	-.658	1	0	1	0	1	117.961	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	2	1.142e-3	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-2.79e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	2	1.586e-3	3	NC	2	NC	1
348			min	0	2	-.008	1	0	3	-3.939e-3	2	9980.657	1	NC	1
349		4	max	0	3	0	15	0	2	1.407e-3	3	NC	4	NC	1
350			min	0	2	-.018	1	-.001	3	-3.625e-3	2	4420.626	1	NC	1
351		5	max	0	3	-.001	15	.001	2	1.228e-3	3	NC	4	NC	1
352			min	0	2	-.031	1	-.002	3	-3.31e-3	2	2512.538	1	NC	1
353		6	max	0	3	-.002	15	.002	1	1.049e-3	3	NC	5	NC	1
354			min	0	2	-.048	1	-.003	3	-2.996e-3	2	1632.235	1	NC	1
355		7	max	0	3	-.003	15	.003	1	8.705e-4	3	NC	5	NC	1
356			min	0	2	-.067	1	-.003	3	-2.682e-3	2	1153.232	1	NC	1
357		8	max	0	3	-.004	15	.004	1	6.916e-4	3	NC	5	NC	1
358			min	0	2	-.09	1	-.004	3	-2.367e-3	2	863.406	1	NC	1
359		9	max	0	3	-.005	15	.004	1	5.127e-4	3	NC	5	NC	1
360			min	0	2	-.115	1	-.005	3	-2.053e-3	2	674.265	1	NC	1
361		10	max	0	3	-.006	15	.005	1	3.337e-4	3	NC	15	NC	1
362			min	0	2	-.143	1	-.005	3	-1.738e-3	2	543.955	1	NC	1
363		11	max	0	3	-.007	15	.006	1	1.548e-4	3	NC	15	NC	1
364			min	-.001	2	-.172	1	-.005	3	-1.424e-3	2	450.158	1	NC	1
365		12	max	.001	3	-.008	15	.006	1	-9.299e-6	15	9630.361	15	NC	1
366			min	-.001	2	-.204	1	-.005	3	-1.11e-3	2	380.401	1	NC	1
367		13	max	.001	3	-.009	15	.007	1	-3.269e-6	15	8283.173	15	NC	1
368			min	-.001	2	-.237	1	-.004	3	-7.954e-4	2	327.045	1	NC	1
369		14	max	.001	3	-.011	15	.007	1	3.895e-5	9	7228.917	15	NC	1
370			min	-.001	2	-.272	1	-.003	3	-4.81e-4	2	285.317	1	NC	1
371		15	max	.001	3	-.012	15	.007	1	1.245e-4	9	6388.115	15	NC	1
372			min	-.001	2	-.308	1	-.001	3	-5.609e-4	3	252.056	1	NC	1
373		16	max	.001	3	-.014	15	.007	1	3.269e-4	1	5706.828	15	NC	1
374			min	-.002	2	-.345	1	0	15	-7.398e-4	3	225.118	1	NC	1
375		17	max	.002	3	-.015	15	.006	1	5.872e-4	1	5147.319	15	NC	1
376			min	-.002	2	-.382	1	0	15	-9.187e-4	3	203.004	1	NC	1
377		18	max	.002	3	-.017	15	.008	3	8.476e-4	1	4682.431	15	NC	1
378			min	-.002	2	-.42	1	0	15	-1.098e-3	3	184.636	1	NC	1
379		19	max	.002	3	-.018	15	.012	3	1.108e-3	1	4292.359	15	NC	1
380			min	-.002	2	-.459	1	0	10	-1.277e-3	3	169.229	1	6375.325	3
381	M3	1	max	.004	1	0	15	0	3	1.557e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	2	-5.792e-4	3	NC	1	NC	1
383		2	max	.003	1	-.002	15	.007	3	1.805e-3	2	NC	1	NC	3
384			min	0	15	-.031	1	-.017	2	-6.951e-4	3	NC	1	4567.37	2
385		3	max	.003	3	-.003	15	.014	3	2.054e-3	2	NC	1	NC	4
386			min	0	15	-.061	1	-.033	2	-8.11e-4	3	NC	1	2301.262	2
387		4	max	.003	3	-.005	15	.02	3	2.302e-3	2	NC	1	NC	4
388			min	0	15	-.09	1	-.048	2	-9.269e-4	3	NC	1	1556.186	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	3	-.006	15	.026	3	2.551e-3	2	NC	1	NC	4
390			min	0	10	-.119	1	-.063	2	-1.043e-3	3	NC	1	1192.038	2
391		6	max	.004	3	-.007	15	.032	3	2.799e-3	2	NC	1	NC	5
392			min	0	2	-.148	1	-.076	2	-1.159e-3	3	NC	1	981.113	2
393		7	max	.004	3	-.009	15	.037	3	3.048e-3	2	NC	1	NC	5
394			min	-.001	2	-.177	1	-.088	2	-1.274e-3	3	8990.605	4	847.855	2
395		8	max	.005	3	-.01	15	.041	3	3.297e-3	2	NC	1	NC	5
396			min	-.002	2	-.206	1	-.097	2	-1.39e-3	3	8301.976	4	760.291	2
397		9	max	.005	3	-.011	15	.044	3	3.545e-3	2	NC	1	NC	5
398			min	-.003	2	-.234	1	-.105	2	-1.506e-3	3	7931.316	4	702.956	2
399		10	max	.005	3	-.012	15	.047	3	3.794e-3	2	NC	1	NC	5
400			min	-.003	2	-.262	1	-.11	2	-1.622e-3	3	7814.056	4	667.967	2
401		11	max	.005	3	-.013	15	.048	3	4.042e-3	2	NC	1	NC	5
402			min	-.004	2	-.29	1	-.113	2	-1.738e-3	3	7931.316	4	651.622	2
403		12	max	.006	3	-.014	15	.048	3	4.291e-3	2	NC	1	NC	5
404			min	-.005	2	-.318	1	-.112	2	-1.854e-3	3	8301.976	4	653.161	2
405		13	max	.006	3	-.015	15	.046	3	4.539e-3	2	NC	1	NC	5
406			min	-.005	2	-.345	1	-.107	2	-1.97e-3	3	8990.605	4	674.75	2
407		14	max	.006	3	-.016	15	.043	3	4.788e-3	2	NC	1	NC	5
408			min	-.006	2	-.373	1	-.099	2	-2.086e-3	3	NC	1	722.82	2
409		15	max	.007	3	-.017	15	.038	3	5.037e-3	2	NC	1	NC	5
410			min	-.007	2	-.4	1	-.087	2	-2.201e-3	3	NC	1	812.257	2
411		16	max	.007	3	-.018	15	.032	3	5.285e-3	2	NC	1	NC	5
412			min	-.007	2	-.427	1	-.07	2	-2.317e-3	3	NC	1	979.599	2
413		17	max	.007	3	-.018	15	.024	3	5.534e-3	2	NC	1	NC	4
414			min	-.008	2	-.454	1	-.048	2	-2.433e-3	3	NC	1	1336.302	2
415		18	max	.008	3	-.019	15	.013	3	5.782e-3	2	NC	1	NC	4
416			min	-.009	2	-.48	1	-.022	2	-2.549e-3	3	NC	1	2442.243	2
417		19	max	.008	3	-.02	15	.013	1	6.031e-3	2	NC	1	NC	1
418			min	-.01	2	-.507	1	0	15	-2.665e-3	3	NC	1	NC	1
419	M6	1	max	.005	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.003	1	0	1	0	1	NC	1	NC	1
421		2	max	.005	3	-.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	.006	3	-.004	15	0	1	0	1	NC	1	NC	1
424			min	0	10	-.087	1	0	1	0	1	NC	1	NC	1
425		4	max	.007	3	-.006	15	0	1	0	1	NC	1	NC	1
426			min	-.002	2	-.13	1	0	1	0	1	NC	1	NC	1
427		5	max	.008	3	-.008	15	0	1	0	1	NC	1	NC	1
428			min	-.004	2	-.172	1	0	1	0	1	NC	1	NC	1
429		6	max	.009	3	-.009	15	0	1	0	1	NC	1	NC	1
430			min	-.006	2	-.214	1	0	1	0	1	NC	1	NC	1
431		7	max	.01	3	-.011	15	0	1	0	1	NC	1	NC	1
432			min	-.008	2	-.256	1	0	1	0	1	8990.605	4	NC	1
433		8	max	.011	3	-.013	15	0	1	0	1	NC	1	NC	1
434			min	-.01	2	-.297	1	0	1	0	1	8301.976	4	NC	1
435		9	max	.012	3	-.014	15	0	1	0	1	NC	1	NC	1
436			min	-.012	2	-.339	1	0	1	0	1	7931.316	4	NC	1
437		10	max	.013	3	-.016	15	0	1	0	1	NC	1	NC	1
438			min	-.014	2	-.38	1	0	1	0	1	7814.056	4	NC	1
439		11	max	.014	3	-.017	15	0	1	0	1	NC	1	NC	1
440			min	-.015	2	-.421	1	0	1	0	1	7931.316	4	NC	1
441		12	max	.015	3	-.019	15	0	1	0	1	NC	1	NC	1
442			min	-.017	2	-.462	1	0	1	0	1	8301.976	4	NC	1
443		13	max	.016	3	-.02	15	0	1	0	1	NC	1	NC	1
444			min	-.019	2	-.502	1	0	1	0	1	8990.605	4	NC	1
445		14	max	.017	3	-.021	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	-.021	2	-.543	1	0	1	0	1	NC	1	NC	1
447		15	max	.018	3	-.022	15	0	1	0	1	NC	1	NC	1
448			min	-.023	2	-.583	1	0	1	0	1	NC	1	NC	1
449		16	max	.019	3	-.023	15	0	1	0	1	NC	1	NC	1
450			min	-.025	2	-.623	1	0	1	0	1	NC	1	NC	1
451		17	max	.02	3	-.025	15	0	1	0	1	NC	1	NC	1
452			min	-.027	2	-.663	1	0	1	0	1	NC	1	NC	1
453		18	max	.021	3	-.026	15	0	1	0	1	NC	1	NC	1
454			min	-.029	2	-.703	1	0	1	0	1	NC	1	NC	1
455		19	max	.022	3	-.027	15	0	1	0	1	NC	1	NC	1
456			min	-.03	2	-.742	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.004	1	0	15	0	2	5.792e-4	3	NC	1	NC	1
458			min	0	15	-.002	1	0	3	-1.557e-3	2	NC	1	NC	1
459		2	max	.003	1	-.002	15	.017	2	6.951e-4	3	NC	1	NC	3
460			min	0	15	-.031	1	-.007	3	-1.805e-3	2	NC	1	4567.37	2
461		3	max	.003	3	-.003	15	.033	2	8.11e-4	3	NC	1	NC	4
462			min	0	15	-.061	1	-.014	3	-2.054e-3	2	NC	1	2301.262	2
463		4	max	.003	3	-.005	15	.048	2	9.269e-4	3	NC	1	NC	4
464			min	0	15	-.09	1	-.02	3	-2.302e-3	2	NC	1	1556.186	2
465		5	max	.004	3	-.006	15	.063	2	1.043e-3	3	NC	1	NC	4
466			min	0	10	-.119	1	-.026	3	-2.551e-3	2	NC	1	1192.038	2
467		6	max	.004	3	-.007	15	.076	2	1.159e-3	3	NC	1	NC	5
468			min	0	2	-.148	1	-.032	3	-2.799e-3	2	NC	1	981.113	2
469		7	max	.004	3	-.009	15	.088	2	1.274e-3	3	NC	1	NC	5
470			min	-.001	2	-.177	1	-.037	3	-3.048e-3	2	8990.605	4	847.855	2
471		8	max	.005	3	-.01	15	.097	2	1.39e-3	3	NC	1	NC	5
472			min	-.002	2	-.206	1	-.041	3	-3.297e-3	2	8301.976	4	760.291	2
473		9	max	.005	3	-.011	15	.105	2	1.506e-3	3	NC	1	NC	5
474			min	-.003	2	-.234	1	-.044	3	-3.545e-3	2	7931.316	4	702.956	2
475		10	max	.005	3	-.012	15	.11	2	1.622e-3	3	NC	1	NC	5
476			min	-.003	2	-.262	1	-.047	3	-3.794e-3	2	7814.056	4	667.967	2
477		11	max	.005	3	-.013	15	.113	2	1.738e-3	3	NC	1	NC	5
478			min	-.004	2	-.29	1	-.048	3	-4.042e-3	2	7931.316	4	651.622	2
479		12	max	.006	3	-.014	15	.112	2	1.854e-3	3	NC	1	NC	5
480			min	-.005	2	-.318	1	-.048	3	-4.291e-3	2	8301.976	4	653.161	2
481		13	max	.006	3	-.015	15	.107	2	1.97e-3	3	NC	1	NC	5
482			min	-.005	2	-.345	1	-.046	3	-4.539e-3	2	8990.605	4	674.75	2
483		14	max	.006	3	-.016	15	.099	2	2.086e-3	3	NC	1	NC	5
484			min	-.006	2	-.373	1	-.043	3	-4.788e-3	2	NC	1	722.82	2
485		15	max	.007	3	-.017	15	.087	2	2.201e-3	3	NC	1	NC	5
486			min	-.007	2	-.4	1	-.038	3	-5.037e-3	2	NC	1	812.257	2
487		16	max	.007	3	-.018	15	.07	2	2.317e-3	3	NC	1	NC	5
488			min	-.007	2	-.427	1	-.032	3	-5.285e-3	2	NC	1	979.599	2
489		17	max	.007	3	-.018	15	.048	2	2.433e-3	3	NC	1	NC	4
490			min	-.008	2	-.454	1	-.024	3	-5.534e-3	2	NC	1	1336.302	2
491		18	max	.008	3	-.019	15	.022	2	2.549e-3	3	NC	1	NC	4
492			min	-.009	2	-.48	1	-.013	3	-5.782e-3	2	NC	1	2442.243	2
493		19	max	.008	3	-.02	15	0	15	2.665e-3	3	NC	1	NC	1
494			min	-.01	2	-.507	1	-.013	1	-6.031e-3	2	NC	1	NC	1