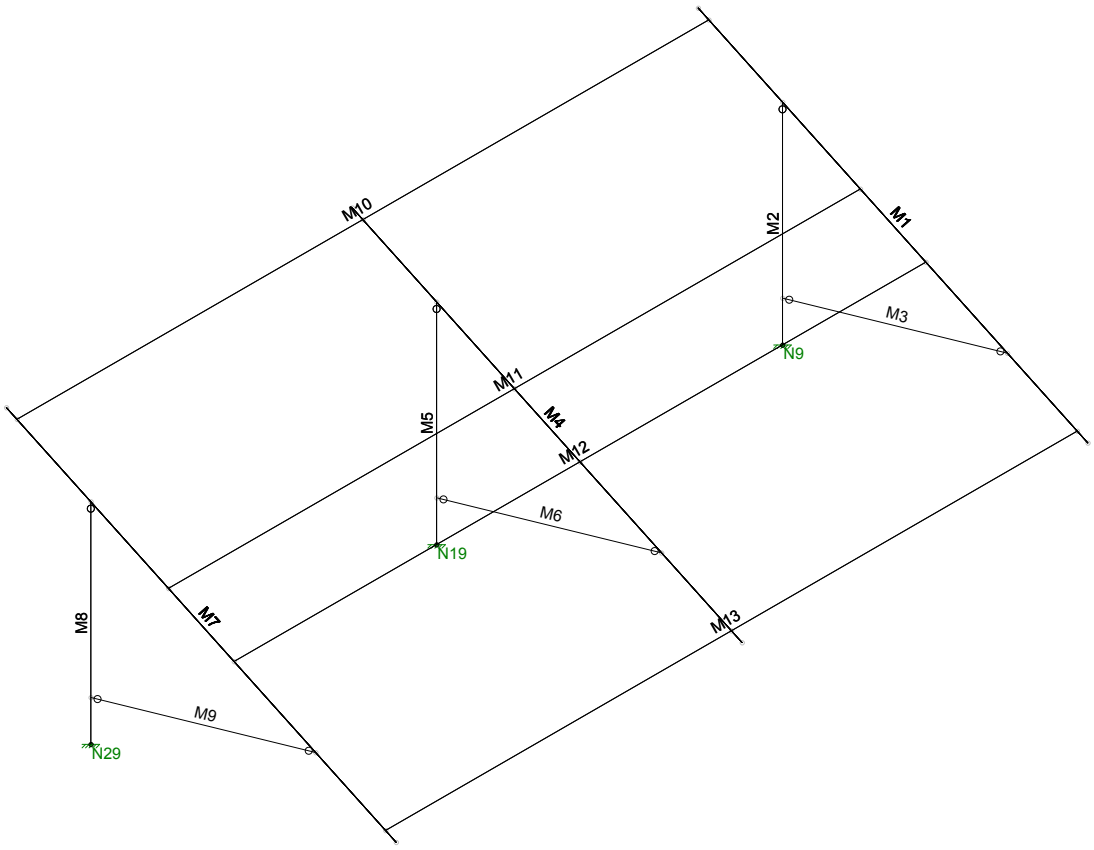


Schletter, Inc.		25° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

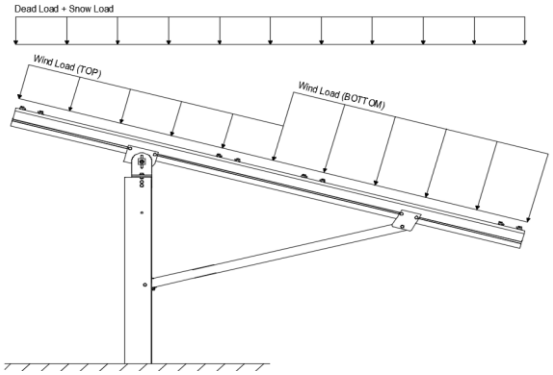
1.2 Construction

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

PV modules are required to meet the following specifications:

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

Modules Per Row =	2
Module Tilt =	25°
Maximum Height Above Grade =	3 ft



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00 psf	
Sloped Roof Snow Load, P_s =	18.56 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	0.82	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V =	130 mph	Exposure Category = C
Height <	15 ft	Importance Category = II

Peak Velocity Pressure, q_z = 26.53 psf *Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

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

Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.

2.4 Seismic Loads - N/A

S_S =	0.00	R =	1.25
S_{DS} =	0.00	C_S =	0
S_1 =	0.00	ρ =	1.3
S_{D1} =	0.00	Ω =	1.25
T_a =	0.00	C_d =	1.25

ASCE 7, Section 12.8.1.3: A maximum S_s of 1.5 may be used to calculate the base shear, C_s, of structures under five stories and with a period, T, of 0.5 or less. Therefore, a S_{ds} of 1.0 was used to calculate C_s.

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W		
1.2D + 1.0W + 0.5S		
0.9D + 1.0W	M	
1.54D + 1.3E + 0.2S	R	*(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)*
0.56D + 1.3E	R	
1.54D + 1.25E + 0.2S	O	
0.56D + 1.25E	O	

Allowable Stress Design, ASD

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

1.0D + 1.0S		
1.0D + 0.6W		
1.0D + 0.75L + 0.45W + 0.75S		
0.6D + 0.6W	M	*(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)*
1.238D + 0.875E	O	
1.1785D + 0.65625E + 0.75S	O	
0.362D + 0.875E	O	

M *Uses the minimum allowable module dead load.*

R *Include redundancy factor of 1.3.*

O *Includes overstrength factor of 1.25. Used to check seismic drift.*

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

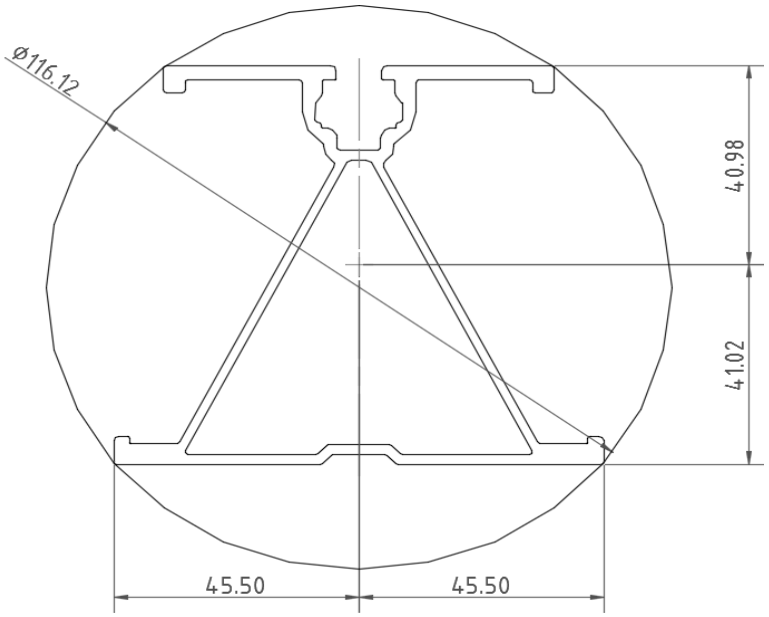
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	102	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 =	1.464	k-ft
M_z =	0.125	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	64%	

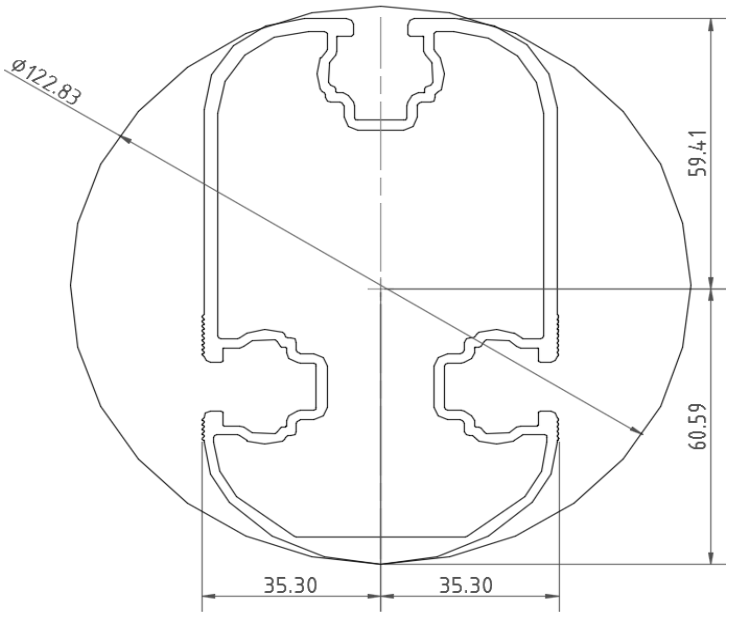


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.908	k-ft
M_z =	0.000	k-ft
P_n =	1.839	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	82%	

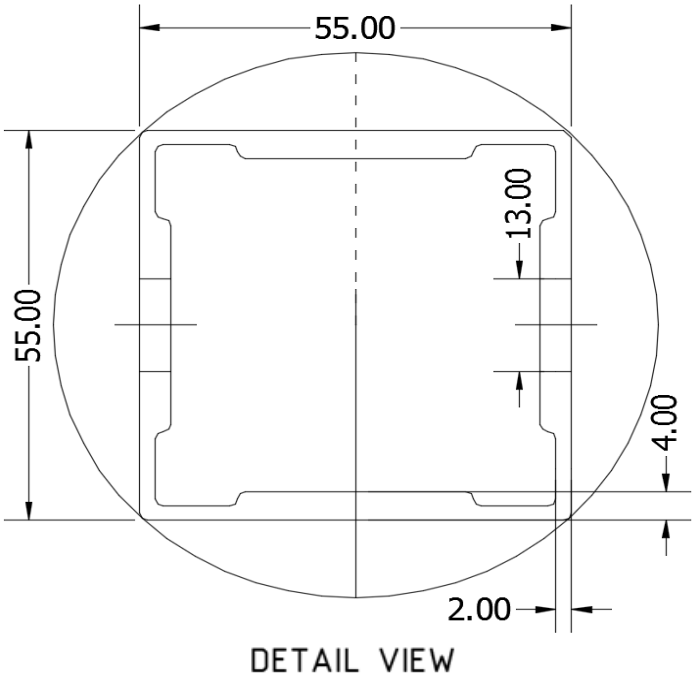


DETAIL VIEW

4.3 Strut Design

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

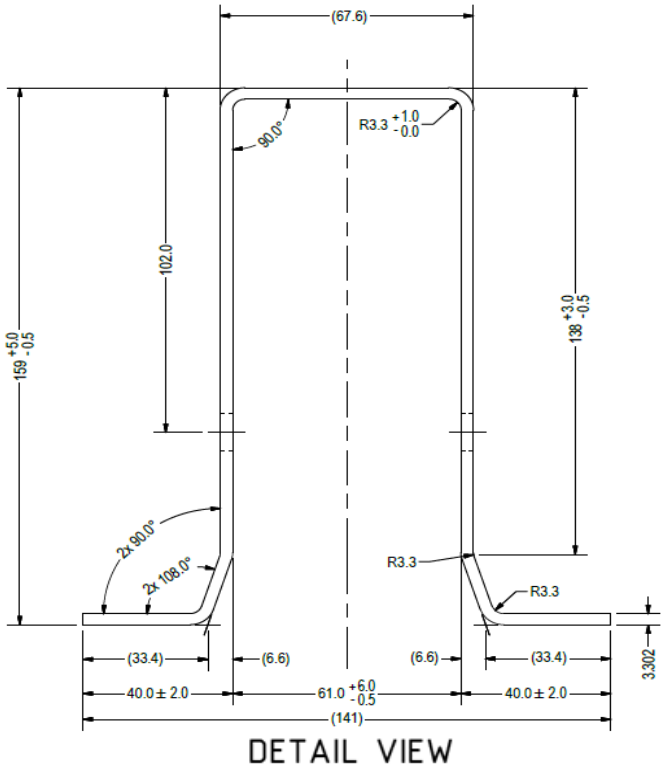
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.430	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	58%	



4.4 Post Design

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

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	81.31	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	14.072	k-ft
M_z =	0.000	k-ft
P_r =	6.145	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	k
Utilization =	94%	



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 =	6.21	k
Maximum Lateral Load =	3.28	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 =	1.37	k
Height of Pole Above Grade, H =	5.78	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

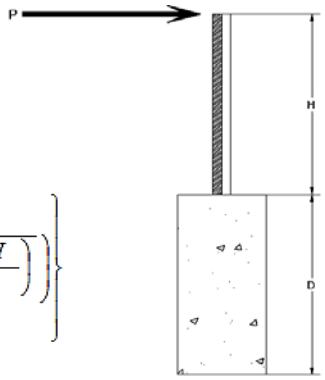
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.37	k
Height of Pole Above Grade, H =	5.78	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf
Constant 2.34P/(S_1B), A =	7.41	
Required Footing Depth, D =	11.48	ft

2nd Trial @ D_2 =	7.36	ft
Lateral Soil Bearing @ D/3, S_1 =	0.49	ksf
Lateral Soil Bearing @ D, S_3 =	1.47	ksf
Constant 2.34P/(S_1B), A =	3.27	
Required Footing Depth, D =	6.46	ft

3rd Trial @ D_3 =	6.91	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.38	ksf
Constant 2.34P/(S_1B), A =	3.49	
Required Footing Depth, D =	6.74	ft

4th Trial @ D_4 =	6.83	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.37	ksf
Constant 2.34P/(S_1B), A =	3.53	
Required Footing Depth, D =	6.80	ft

5th Trial @ D_5 =	6.81	ft
Lateral Soil Bearing @ D/3, S_1 =	0.45	ksf
Lateral Soil Bearing @ D, S_3 =	1.36	ksf
Constant 2.34P/(S_1B), A =	3.54	
Required Footing Depth, D =	7.00	ft

A 2ft diameter x 7ft deep footing unrestrained at ground level is required for the racking structure.

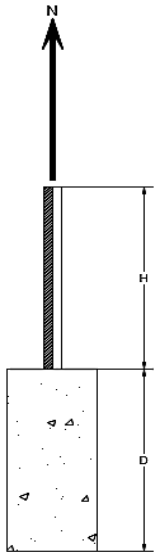
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.85	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 =	1.85	k
Required Concrete Volume, V =	12.79	ft^3
Required Footing Depth, D =	4.25	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.15
2	0.4	0.2	118.10	6.04
3	0.6	0.2	118.10	5.94
4	0.8	0.2	118.10	5.83
5	1	0.2	118.10	5.73
6	1.2	0.2	118.10	5.63
7	1.4	0.2	118.10	5.52
8	1.6	0.2	118.10	5.42
9	1.8	0.2	118.10	5.32
10	2	0.2	118.10	5.21
11	2.2	0.2	118.10	5.11
12	2.4	0.2	118.10	5.01
13	2.6	0.2	118.10	4.90
14	2.8	0.2	118.10	4.80
15	3	0.2	118.10	4.69
16	3.2	0.2	118.10	4.59
17	3.4	0.2	118.10	4.49
18	3.6	0.2	118.10	4.38
19	3.8	0.2	118.10	4.28
20	4	0.2	118.10	4.18
21	4.2	0.2	118.10	4.07
22	0	0.0	0.00	4.07
23	0	0.0	0.00	4.07
24	0	0.0	0.00	4.07
25	0	0.0	0.00	4.07
26	0	0.0	0.00	4.07
27	0	0.0	0.00	4.07
28	0	0.0	0.00	4.07
29	0	0.0	0.00	4.07
30	0	0.0	0.00	4.07
31	0	0.0	0.00	4.07
32	0	0.0	0.00	4.07
33	0	0.0	0.00	4.07
34	0	0.0	0.00	4.07
Max	4.2	Sum	0.99	

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



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	7.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.07	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	25.13	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

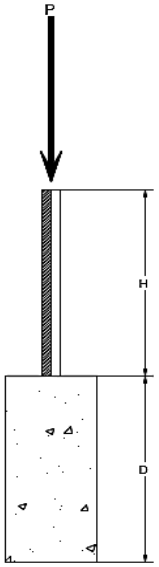
Weight of Concrete

Footing Volume	21.99	ft^3
Weight	3.19	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.77	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.31	k
Applied Force =	7.25	k
Utilization =	64%	

A 2ft diameter footing passes at a depth of 7ft.



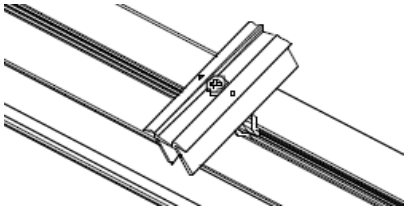
6. DESIGN OF JOINTS AND CONNECTIONS

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.

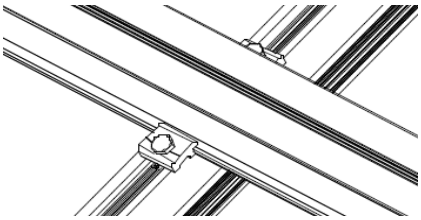
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.642 k
Allowable Uplift	=	1.214 k
Utilization	=	53%



Fastening of Purlins to Girders

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

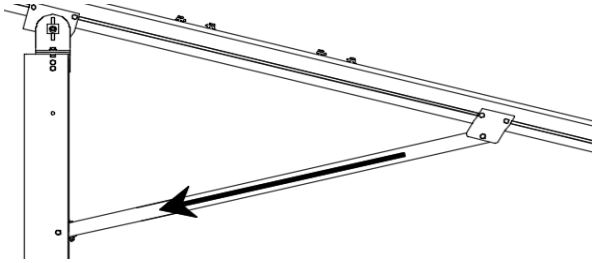


6.2 Strut Connections

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

Maximum Axial Load	=	5.430 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	61%

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

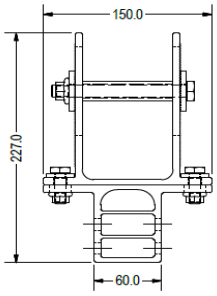


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

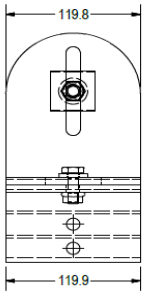
6.3 Girder to Post Connection

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.

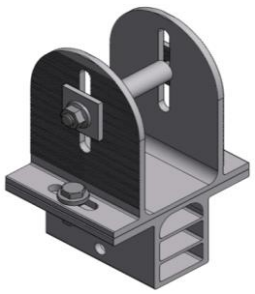
Maximum Tensile Load	=	4.001 k
Allowable Load	=	5.649 k
Utilization	=	71%



FRONT VIEW



SIDE VIEW



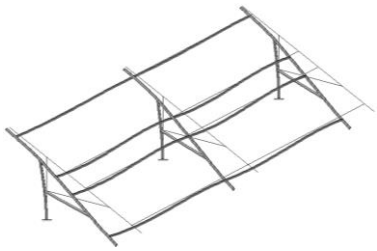
7. SEISMIC DESIGN

7.1 Seismic Drift - N/A

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

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

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



APPENDIX A

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

Purlin = **S1.5**

Strong Axis:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	102 in	L_b =	102
J =	0.432	J =	0.432
	282.18		179.449
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	
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=	27.9 ksi	φF_L=	29.0
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 81.7717 in
J = 1.98
105.231

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 81.7717
J = 1.98
114.202

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L = φb[Bt-Dt*√(Rb/t)]

φF_L = 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L St$ = 30.1 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

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

$\varphi F_L Wk$ = 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φyFcy

φF_L = 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L = φc[Bt-Dt*√(Rb/t)]

φF_L = 30.80 ksi

φF_L = 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

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 =	81.31 in	
Pr =	6.15 k	(LRFD Factored Load)
Mr (Strong) =	14.07 k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00 k-ft	(LRFD Factored Load)

Flexural Buckling:

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

Torsional/Flexural Torsional Buckling:

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

Bending (Strong Axis):

Yielding:

Mn =	21.95 k-ft

Flange Local Buckling:

Mn =	19.207 k-ft

Pr/Pc =	0.2211	≥	0.2	
Utilization =	0.94	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65 k-ft

Flange Local Buckling:

Mn =	14.39 k-ft

Pr/Pc =	0.221	≥	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 94%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-55.176	-55.176	0	0
2	M11	Y	-55.176	-55.176	0	0
3	M12	Y	-55.176	-55.176	0	0
4	M13	Y	-55.176	-55.176	0	0

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-95.761	-95.761	0	0
2	M11	y	-95.761	-95.761	0	0
3	M12	y	-147.995	-147.995	0	0
4	M13	y	-147.995	-147.995	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	191.523	191.523	0	0
2	M11	y	191.523	191.523	0	0
3	M12	y	87.056	87.056	0	0
4	M13	y	87.056	87.056	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 + 0.5W	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	512.672	2	2394.804	1	148.172	1	.239	1	.002	3	7.846	1
2		min	-811.82	3	-1584.64	3	-151.842	3	-.203	3	-.005	2	.272	15
3	N19	max	2477.191	2	6180.243	1	0	2	0	9	0	1	13.014	1
4		min	-2379.268	3	-4775.243	3	0	3	0	15	0	15	.421	15
5	N29	max	512.672	2	2394.804	1	151.842	3	.203	3	.005	2	7.846	1
6		min	-811.82	3	-1584.64	3	-148.172	1	-.239	1	-.002	3	.272	15
7	Totals:	max	3502.535	2	10969.851	1	0	2						
8		min	-4002.907	3	-7944.523	3	0	3						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.004	1	0	3	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-6.507	12	277.831	3	5.13	3	.048	3	.321	1	.255	2
4			min	-217.568	1	-684.609	2	-154.551	1	-.208	2	.006	12	-.101	3
5		3	max	-6.894	12	276.588	3	5.13	3	.048	3	.22	1	.705	2
6			min	-218.341	1	-686.267	2	-154.551	1	-.208	2	.007	12	-.283	3
7		4	max	-7.28	12	275.344	3	5.13	3	.048	3	.118	1	1.156	2
8			min	-219.114	1	-687.926	2	-154.551	1	-.208	2	.004	15	-.464	3
9		5	max	579.222	3	637.681	2	19.456	3	0	15	.161	1	1.364	2
10			min	-1653.668	2	-244.135	3	-189.796	1	-.028	3	-.039	3	-.549	3
11		6	max	578.642	3	636.023	2	19.456	3	0	15	.047	2	.946	2
12			min	-1654.441	2	-245.379	3	-189.796	1	-.028	3	-.026	3	-.389	3
13		7	max	578.062	3	634.365	2	19.456	3	0	15	-.003	15	.529	2
14			min	-1655.215	2	-246.622	3	-189.796	1	-.028	3	-.088	1	-.227	3
15		8	max	577.482	3	632.707	2	19.456	3	0	15	0	3	.113	2
16			min	-1655.988	2	-247.866	3	-189.796	1	-.028	3	-.212	1	-.065	3
17		9	max	568.879	3	4.867	9	36.871	3	-.002	15	.113	1	.013	3
18			min	-1855.928	1	-2.053	2	-238.129	1	-.157	2	.004	15	-.079	2
19		10	max	568.299	3	3.485	9	36.871	3	-.002	15	.043	3	.012	3
20			min	-1856.701	1	-3.711	2	-238.129	1	-.157	2	-.043	1	-.077	2
21		11	max	567.719	3	2.103	9	36.871	3	-.002	15	.067	3	.012	3
22			min	-1857.474	1	-5.369	2	-238.129	1	-.157	2	-.2	1	-.074	2
23		12	max	554.807	3	643.575	3	15.216	10	.216	3	.152	1	.091	1
24			min	-2085.384	1	-466.674	1	-142.615	3	-.22	1	.005	15	-.195	3
25		13	max	554.227	3	642.332	3	15.216	10	.216	3	.135	1	.398	1
26			min	-2086.157	1	-468.332	1	-142.615	3	-.22	1	-.034	3	-.617	3
27		14	max	553.647	3	641.088	3	15.216	10	.216	3	.117	1	.706	1
28			min	-2086.93	1	-469.99	1	-142.615	3	-.22	1	-.128	3	-1.038	3
29		15	max	553.067	3	639.845	3	15.216	10	.216	3	.115	2	1.015	1
30			min	-2087.703	1	-471.648	1	-142.615	3	-.22	1	-.221	3	-1.459	3
31		16	max	219.423	1	467.853	1	-3.348	12	.147	1	.015	3	.772	1
32			min	6.029	12	-663.428	3	-139.067	1	-.32	3	-.154	1	-1.113	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
33		17	max	218.65	1	466.195	1	-3.348	12	.147	1	.012	3	.466	1
34			min	5.643	12	-664.672	3	-139.067	1	-.32	3	-.245	1	-.678	3
35		18	max	217.877	1	464.537	1	-3.348	12	.147	1	.009	3	.16	1
36			min	5.256	12	-665.915	3	-139.067	1	-.32	3	-.337	1	-.241	3
37		19	max	0	1	0	5	0	1	0	1	0	1	0	1
38			min	0	1	-.001	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.007	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	-3.83	10	823.756	3	0	1	0	1	0	1	.544	2
42			min	-299.273	1	-1780.228	2	0	1	0	1	0	1	-.259	3
43		3	max	-4.474	10	822.512	3	0	1	0	1	0	1	1.712	2
44			min	-300.046	1	-1781.886	2	0	1	0	1	0	1	-.799	3
45		4	max	-5.118	10	821.269	3	0	1	0	1	0	1	2.882	2
46			min	-300.819	1	-1783.544	2	0	1	0	1	0	1	-1.338	3
47		5	max	1893.724	3	1780.056	2	0	1	0	1	0	1	3.398	2
48			min	-4231.755	2	-859.239	3	0	1	0	1	0	1	-1.568	3
49		6	max	1893.144	3	1778.398	2	0	1	0	1	0	1	2.23	2
50			min	-4232.528	2	-860.482	3	0	1	0	1	0	1	-1.004	3
51		7	max	1892.564	3	1776.74	2	0	1	0	1	0	1	1.064	2
52			min	-4233.301	2	-861.726	3	0	1	0	1	0	1	-.439	3
53		8	max	1891.984	3	1775.082	2	0	1	0	1	0	1	.127	3
54			min	-4234.074	2	-862.969	3	0	1	0	1	0	1	-.121	1
55		9	max	1862.458	3	16.963	3	0	1	0	1	0	1	.396	3
56			min	-4288.742	2	-116.158	2	0	1	0	1	0	1	-.644	2
57		10	max	1861.878	3	15.72	3	0	1	0	1	0	1	.385	3
58			min	-4289.516	2	-117.816	2	0	1	0	1	0	1	-.568	2
59		11	max	1861.298	3	14.476	3	0	1	0	1	0	1	.375	3
60			min	-4290.289	2	-119.474	2	0	1	0	1	0	1	-.49	2
61		12	max	1840.388	3	1875.219	3	0	1	0	1	0	1	.052	1
62			min	-4548.673	1	-1567	1	0	1	0	1	0	1	-.22	3
63		13	max	1839.808	3	1873.975	3	0	1	0	1	0	1	1.081	1
64			min	-4549.447	1	-1568.658	1	0	1	0	1	0	1	-1.45	3
65		14	max	1839.228	3	1872.732	3	0	1	0	1	0	1	2.111	1
66			min	-4550.22	1	-1570.316	1	0	1	0	1	0	1	-2.679	3
67		15	max	1838.648	3	1871.488	3	0	1	0	1	0	1	3.142	1
68			min	-4550.993	1	-1571.975	1	0	1	0	1	0	1	-3.908	3
69		16	max	300.201	1	1460.492	1	0	1	0	1	0	1	2.392	1
70			min	4.18	10	-1822.145	3	0	1	0	1	0	1	-2.967	3
71		17	max	299.428	1	1458.834	1	0	1	0	1	0	1	1.434	1
72			min	3.536	10	-1823.388	3	0	1	0	1	0	1	-1.771	3
73		18	max	298.655	1	1457.175	1	0	1	0	1	0	1	.478	1
74			min	2.891	10	-1824.632	3	0	1	0	1	0	1	-.574	3
75		19	max	0	1	0	2	0	1	0	1	0	1	0	1
76			min	0	1	-.003	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.004	1	0	1	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	-6.507	12	277.831	3	154.551	1	.208	2	-.006	12	.255	2
80			min	-217.568	1	-684.609	2	-5.13	3	-.048	3	-.321	1	-.101	3
81		3	max	-6.894	12	276.588	3	154.551	1	.208	2	-.007	12	.705	2
82			min	-218.341	1	-686.267	2	-5.13	3	-.048	3	-.22	1	-.283	3
83		4	max	-7.28	12	275.344	3	154.551	1	.208	2	-.004	15	1.156	2
84			min	-219.114	1	-687.926	2	-5.13	3	-.048	3	-.118	1	-.464	3
85		5	max	579.222	3	637.681	2	189.796	1	.028	3	.039	3	1.364	2
86			min	-1653.668	2	-244.135	3	-19.456	3	0	15	-.161	1	-.549	3
87		6	max	578.642	3	636.023	2	189.796	1	.028	3	.026	3	.946	2
88			min	-1654.441	2	-245.379	3	-19.456	3	0	15	-.047	2	-.389	3
89		7	max	578.062	3	634.365	2	189.796	1	.028	3	.088	1	.529	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	-1655.215	2	-246.622	3	-19.456	3	0	15	.003	15	-.227	3
91		8	max	577.482	3	632.707	2	189.796	1	.028	3	.212	1	.113	2
92			min	-1655.988	2	-247.866	3	-19.456	3	0	15	0	3	-.065	3
93		9	max	568.879	3	4.867	9	238.129	1	.157	2	-.004	15	.013	3
94			min	-1855.928	1	-2.053	2	-36.871	3	.002	15	-.113	1	-.079	2
95		10	max	568.299	3	3.485	9	238.129	1	.157	2	.043	1	.012	3
96			min	-1856.701	1	-3.711	2	-36.871	3	.002	15	-.043	3	-.077	2
97		11	max	567.719	3	2.103	9	238.129	1	.157	2	.2	1	.012	3
98			min	-1857.474	1	-5.369	2	-36.871	3	.002	15	-.067	3	-.074	2
99		12	max	554.807	3	643.575	3	142.615	3	.22	1	-.005	15	.091	1
100			min	-2085.384	1	-466.674	1	-15.216	10	-.216	3	-.152	1	-.195	3
101		13	max	554.227	3	642.332	3	142.615	3	.22	1	.034	3	.398	1
102			min	-2086.157	1	-468.332	1	-15.216	10	-.216	3	-.135	1	-.617	3
103		14	max	553.647	3	641.088	3	142.615	3	.22	1	.128	3	.706	1
104			min	-2086.93	1	-469.99	1	-15.216	10	-.216	3	-.117	1	-1.038	3
105		15	max	553.067	3	639.845	3	142.615	3	.22	1	.221	3	1.015	1
106			min	-2087.703	1	-471.648	1	-15.216	10	-.216	3	-.115	2	-1.459	3
107		16	max	219.423	1	467.853	1	139.067	1	.32	3	.154	1	.772	1
108			min	6.029	12	-663.428	3	3.348	12	-.147	1	-.015	3	-1.113	3
109		17	max	218.65	1	466.195	1	139.067	1	.32	3	.245	1	.466	1
110			min	5.643	12	-664.672	3	3.348	12	-.147	1	-.012	3	-.678	3
111		18	max	217.877	1	464.537	1	139.067	1	.32	3	.337	1	.16	1
112			min	5.256	12	-665.915	3	3.348	12	-.147	1	-.009	3	-.241	3
113		19	max	0	1	0	5	0	5	0	1	0	1	0	1
114			min	0	1	-.001	3	0	1	0	1	0	1	0	1
115	M10	1	max	139.113	1	463.587	1	-4.869	12	.005	1	.383	1	.147	1
116			min	3.35	12	-667.102	3	-217.674	1	-.018	3	-.007	3	-.32	3
117		2	max	139.113	1	331.146	1	-3.203	12	.005	1	.197	1	.227	3
118			min	3.35	12	-491.58	3	-177.002	1	-.018	3	-.012	3	-.229	1
119		3	max	139.113	1	198.705	1	-1.536	12	.005	1	.07	2	.609	3
120			min	3.35	12	-316.058	3	-136.331	1	-.018	3	-.015	3	-.479	1
121		4	max	139.113	1	66.264	1	.758	3	.005	1	.012	10	.824	3
122			min	3.35	12	-140.535	3	-95.659	1	-.018	3	-.061	1	-.604	1
123		5	max	139.113	1	34.987	3	3.258	3	.005	1	-.005	15	.874	3
124			min	3.35	12	-66.177	1	-54.988	1	-.018	3	-.132	1	-.604	1
125		6	max	139.113	1	210.509	3	5.758	3	.005	1	-.006	15	.758	3
126			min	3.35	12	-198.618	1	-28.967	2	-.018	3	-.165	1	-.479	1
127		7	max	139.113	1	386.031	3	27.016	9	.005	1	-.002	12	.477	3
128			min	3.35	12	-331.059	1	-12.534	10	-.018	3	-.159	1	-.229	1
129		8	max	139.113	1	561.554	3	67.027	1	.005	1	.006	3	.146	1
130			min	3.35	12	-463.5	1	-8.005	10	-.018	3	-.115	1	.004	15
131		9	max	139.113	1	737.076	3	107.699	1	.005	1	.017	3	.647	1
132			min	3.35	12	-595.941	1	-3.475	10	-.018	3	-.094	2	-.584	3
133		10	max	139.113	1	912.598	3	148.37	1	.018	3	.101	9	1.272	1
134			min	3.35	12	-728.382	1	1.054	10	-.005	1	-.067	2	-1.363	3
135		11	max	139.113	1	595.941	1	3.475	10	.018	3	.017	3	.647	1
136			min	3.35	12	-737.076	3	-107.699	1	-.005	1	-.094	2	-.584	3
137		12	max	139.113	1	463.5	1	8.005	10	.018	3	.006	3	.146	1
138			min	3.35	12	-561.554	3	-67.027	1	-.005	1	-.115	1	.004	15
139		13	max	139.113	1	331.059	1	12.534	10	.018	3	-.002	12	.477	3
140			min	3.35	12	-386.031	3	-27.016	9	-.005	1	-.159	1	-.229	1
141		14	max	139.113	1	198.618	1	28.967	2	.018	3	-.006	15	.758	3
142			min	3.35	12	-210.509	3	-5.758	3	-.005	1	-.165	1	-.479	1
143		15	max	139.113	1	66.177	1	54.988	1	.018	3	-.005	15	.874	3
144			min	3.35	12	-34.987	3	-3.258	3	-.005	1	-.132	1	-.604	1
145		16	max	139.113	1	140.535	3	95.659	1	.018	3	.012	10	.824	3
146			min	3.35	12	-66.264	1	-.758	3	-.005	1	-.061	1	-.604	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	139.113	1	316.058	3	136.331	1	.018	3	.07	2	.609	3
148			min	3.35	12	-198.705	1	1.536	12	-.005	1	-.015	3	-.479	1
149		18	max	139.113	1	491.58	3	177.002	1	.018	3	.197	1	.227	3
150			min	3.35	12	-331.146	1	3.203	12	-.005	1	-.012	3	-.229	1
151		19	max	139.113	1	667.102	3	217.674	1	.018	3	.383	1	.147	1
152			min	3.35	12	-463.587	1	4.869	12	-.005	1	-.007	3	-.32	3
153	M11	1	max	210.371	1	466.488	1	-8.28	12	.003	3	.441	1	.093	1
154			min	-179.273	3	-646.406	3	-228.006	1	-.013	1	.015	15	-.303	3
155		2	max	210.371	1	334.047	1	-6.614	12	.003	3	.245	1	.225	3
156			min	-179.273	3	-470.884	3	-187.335	1	-.013	1	.008	15	-.293	2
157		3	max	210.371	1	201.606	1	-4.947	12	.003	3	.089	2	.587	3
158			min	-179.273	3	-295.362	3	-146.663	1	-.013	1	.002	15	-.538	1
159		4	max	210.371	1	69.165	1	-3.281	12	.003	3	.018	2	.783	3
160			min	-179.273	3	-119.84	3	-105.992	1	-.013	1	-.034	9	-.666	1
161		5	max	210.371	1	55.683	3	-1.614	12	.003	3	-.002	12	.813	3
162			min	-179.273	3	-64.335	2	-65.32	1	-.013	1	-.113	1	-.669	1
163		6	max	210.371	1	231.205	3	.138	3	.003	3	-.003	12	.677	3
164			min	-179.273	3	-195.717	1	-34.356	2	-.013	1	-.155	1	-.547	1
165		7	max	210.371	1	406.727	3	20.817	9	.003	3	-.002	12	.376	3
166			min	-179.273	3	-328.158	1	-17.909	2	-.013	1	-.16	1	-.299	1
167		8	max	210.371	1	582.249	3	56.695	1	.003	3	.001	3	.073	1
168			min	-179.273	3	-460.599	1	-9.923	10	-.013	1	-.125	1	-.091	3
169		9	max	210.371	1	757.772	3	97.366	1	.003	3	.007	3	.571	1
170			min	-179.273	3	-593.04	1	-5.394	10	-.013	1	-.105	2	-.724	3
171		10	max	210.371	1	933.294	3	138.038	1	0	15	.084	9	1.193	1
172			min	-179.273	3	-725.481	1	-.865	10	-.013	1	-.083	2	-1.522	3
173		11	max	210.371	1	593.04	1	5.394	10	.013	1	.007	3	.571	1
174			min	-179.273	3	-757.772	3	-97.366	1	-.003	3	-.105	2	-.724	3
175		12	max	210.371	1	460.599	1	9.923	10	.013	1	.001	3	.073	1
176			min	-179.273	3	-582.249	3	-56.695	1	-.003	3	-.125	1	-.091	3
177		13	max	210.371	1	328.158	1	17.909	2	.013	1	-.002	12	.376	3
178			min	-179.273	3	-406.727	3	-20.817	9	-.003	3	-.16	1	-.299	1
179		14	max	210.371	1	195.717	1	34.356	2	.013	1	-.003	12	.677	3
180			min	-179.273	3	-231.205	3	-.138	3	-.003	3	-.155	1	-.547	1
181		15	max	210.371	1	64.335	2	65.32	1	.013	1	-.002	12	.813	3
182			min	-179.273	3	-55.683	3	1.614	12	-.003	3	-.113	1	-.669	1
183		16	max	210.371	1	119.84	3	105.992	1	.013	1	.018	2	.783	3
184			min	-179.273	3	-69.165	1	3.281	12	-.003	3	-.034	9	-.666	1
185		17	max	210.371	1	295.362	3	146.663	1	.013	1	.089	2	.587	3
186			min	-179.273	3	-201.606	1	4.947	12	-.003	3	.002	15	-.538	1
187		18	max	210.371	1	470.884	3	187.335	1	.013	1	.245	1	.225	3
188			min	-179.273	3	-334.047	1	6.614	12	-.003	3	.008	15	-.293	2
189		19	max	210.371	1	646.406	3	228.006	1	.013	1	.441	1	.093	1
190			min	-179.273	3	-466.488	1	8.28	12	-.003	3	.015	15	-.303	3
191	M12	1	max	17.493	3	631.971	2	-5.688	12	0	3	.466	1	.147	2
192			min	-46.957	1	-251.266	3	-232.534	1	-.01	1	0	3	.002	15
193		2	max	17.493	3	456.928	2	-4.021	12	0	3	.266	1	.26	3
194			min	-46.957	1	-174.407	3	-191.862	1	-.01	1	-.006	3	-.367	2
195		3	max	17.493	3	281.886	2	-2.355	12	0	3	.106	2	.388	3
196			min	-46.957	1	-97.548	3	-151.191	1	-.01	1	-.01	3	-.716	2
197		4	max	17.493	3	106.844	2	-.522	3	0	3	.03	2	.444	3
198			min	-46.957	1	-20.689	3	-110.519	1	-.01	1	-.029	9	-.899	2
199		5	max	17.493	3	56.17	3	1.978	3	0	3	-.003	10	.427	3
200			min	-46.957	1	-68.199	2	-69.847	1	-.01	1	-.105	1	-.918	2
201		6	max	17.493	3	133.029	3	4.477	3	0	3	-.005	12	.338	3
202			min	-46.957	1	-243.241	2	-38.797	2	-.01	1	-.152	1	-.771	2
203		7	max	17.493	3	209.888	3	18.926	9	0	3	-.002	12	.176	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	-46.957	1	-418.284	2	-22.351	2	-.01	1	-.16	1	-.458	2
205		8	max	17.493	3	286.747	3	52.167	1	0	3	.006	3	.02	2
206			min	-46.957	1	-593.326	2	-12.209	10	-.01	1	-.13	1	-.058	3
207		9	max	17.493	3	363.605	3	92.839	1	0	3	.016	3	.663	2
208			min	-46.957	1	-768.368	2	-7.68	10	-.01	1	-.114	2	-.366	3
209		10	max	17.493	3	440.464	3	133.511	1	0	12	.078	9	1.471	2
210			min	-46.957	1	-943.411	2	-98.582	9	-.01	1	-.096	2	-.745	3
211		11	max	17.493	3	768.368	2	7.68	10	.01	1	.016	3	.663	2
212			min	-46.957	1	-363.605	3	-92.839	1	0	3	-.114	2	-.366	3
213		12	max	17.493	3	593.326	2	12.209	10	.01	1	.006	3	.02	2
214			min	-46.957	1	-286.747	3	-52.167	1	0	3	-.13	1	-.058	3
215		13	max	17.493	3	418.284	2	22.351	2	.01	1	-.002	12	.176	3
216			min	-46.957	1	-209.888	3	-18.926	9	0	3	-.16	1	-.458	2
217		14	max	17.493	3	243.241	2	38.797	2	.01	1	-.005	12	.338	3
218			min	-46.957	1	-133.029	3	-4.477	3	0	3	-.152	1	-.771	2
219		15	max	17.493	3	68.199	2	69.847	1	.01	1	-.003	10	.427	3
220			min	-46.957	1	-56.17	3	-1.978	3	0	3	-.105	1	-.918	2
221		16	max	17.493	3	20.689	3	110.519	1	.01	1	.03	2	.444	3
222			min	-46.957	1	-106.844	2	.522	3	0	3	-.029	9	-.899	2
223		17	max	17.493	3	97.548	3	151.191	1	.01	1	.106	2	.388	3
224			min	-46.957	1	-281.886	2	2.355	12	0	3	-.01	3	-.716	2
225		18	max	17.493	3	174.407	3	191.862	1	.01	1	.266	1	.26	3
226			min	-46.957	1	-456.928	2	4.021	12	0	3	-.006	3	-.367	2
227		19	max	17.493	3	251.266	3	232.534	1	.01	1	.466	1	.147	2
228			min	-46.957	1	-631.971	2	5.688	12	0	3	0	3	.002	15
229	M13	1	max	5.129	3	683.826	2	-6.12	12	.008	3	.373	1	.208	2
230			min	-154.353	1	-279.117	3	-216.146	1	-.026	2	.005	12	-.048	3
231		2	max	5.129	3	508.784	2	-4.454	12	.008	3	.188	1	.179	3
232			min	-154.353	1	-202.258	3	-175.474	1	-.026	2	-.001	3	-.356	2
233		3	max	5.129	3	333.742	2	-2.787	12	.008	3	.063	2	.334	3
234			min	-154.353	1	-125.399	3	-134.803	1	-.026	2	-.006	3	-.753	2
235		4	max	5.129	3	158.699	2	-1.121	12	.008	3	.009	10	.416	3
236			min	-154.353	1	-48.541	3	-94.131	1	-.026	2	-.067	1	-.986	2
237		5	max	5.129	3	28.318	3	1.166	3	.008	3	-.006	15	.426	3
238			min	-154.353	1	-16.343	2	-53.46	1	-.026	2	-.137	1	-1.053	2
239		6	max	5.129	3	105.177	3	3.666	3	.008	3	-.005	12	.363	3
240			min	-154.353	1	-191.386	2	-27.682	2	-.026	2	-.168	1	-.955	2
241		7	max	5.129	3	182.036	3	27.883	1	.008	3	-.002	12	.227	3
242			min	-154.353	1	-366.428	2	-11.903	10	-.026	2	-.161	1	-.692	2
243		8	max	5.129	3	258.895	3	68.555	1	.008	3	.005	3	.019	3
244			min	-154.353	1	-541.47	2	-7.374	10	-.026	2	-.115	1	-.278	1
245		9	max	5.129	3	335.754	3	109.227	1	.008	3	.014	3	.331	2
246			min	-154.353	1	-716.513	2	-2.845	10	-.026	2	-.094	2	-.262	3
247		10	max	5.129	3	891.555	2	13.665	3	0	15	.103	9	1.09	2
248			min	-154.353	1	17.52	15	-149.898	1	-.026	2	-.066	2	-.616	3
249		11	max	5.129	3	716.513	2	2.845	10	.026	2	.014	3	.331	2
250			min	-154.353	1	-335.754	3	-109.227	1	-.008	3	-.094	2	-.262	3
251		12	max	5.129	3	541.47	2	7.374	10	.026	2	.005	3	.019	3
252			min	-154.353	1	-258.895	3	-68.555	1	-.008	3	-.115	1	-.278	1
253		13	max	5.129	3	366.428	2	11.903	10	.026	2	-.002	12	.227	3
254			min	-154.353	1	-182.036	3	-27.883	1	-.008	3	-.161	1	-.692	2
255		14	max	5.129	3	191.386	2	27.682	2	.026	2	-.005	12	.363	3
256			min	-154.353	1	-105.177	3	-3.666	3	-.008	3	-.168	1	-.955	2
257		15	max	5.129	3	16.343	2	53.46	1	.026	2	-.006	15	.426	3
258			min	-154.353	1	-28.318	3	-1.166	3	-.008	3	-.137	1	-1.053	2
259		16	max	5.129	3	48.541	3	94.131	1	.026	2	.009	10	.416	3
260			min	-154.353	1	-158.699	2	1.121	12	-.008	3	-.067	1	-.986	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	5.129	3	125.399	3	134.803	1	.026	2	.063	2	.334	3
262			min	-154.353	1	-333.742	2	2.787	12	-.008	3	-.006	3	-.753	2
263		18	max	5.129	3	202.258	3	175.474	1	.026	2	.188	1	.179	3
264			min	-154.353	1	-508.784	2	4.454	12	-.008	3	-.001	3	-.356	2
265		19	max	5.129	3	279.117	3	216.146	1	.026	2	.373	1	.208	2
266			min	-154.353	1	-683.826	2	6.12	12	-.008	3	.005	12	-.048	3
267	M2	1	max	2394.804	1	811.418	3	148.469	1	.002	3	.203	3	7.846	1
268			min	-1584.64	3	-509.039	2	-151.683	3	-.005	2	-.239	1	.272	15
269		2	max	2391.882	1	811.418	3	148.469	1	.002	3	.154	3	7.872	1
270			min	-1586.831	3	-509.039	2	-151.683	3	-.005	2	-.191	1	.27	15
271		3	max	2388.96	1	811.418	3	148.469	1	.002	3	.105	3	7.898	1
272			min	-1589.022	3	-509.039	2	-151.683	3	-.005	2	-.144	1	.267	15
273		4	max	2386.039	1	811.418	3	148.469	1	.002	3	.057	3	7.924	1
274			min	-1591.214	3	-509.039	2	-151.683	3	-.005	2	-.096	1	.264	12
275		5	max	1887.181	1	1703.587	1	111.61	1	.002	2	.029	3	7.653	1
276			min	-1380.061	3	40.501	12	-137.944	3	0	3	-.097	1	.182	12
277		6	max	1884.259	1	1703.587	1	111.61	1	.002	2	-.002	15	7.106	1
278			min	-1382.253	3	40.501	12	-137.944	3	0	3	-.061	1	.169	12
279		7	max	1881.338	1	1703.587	1	111.61	1	.002	2	.001	10	6.559	1
280			min	-1384.444	3	40.501	12	-137.944	3	0	3	-.06	3	.156	12
281		8	max	1878.416	1	1703.587	1	111.61	1	.002	2	.028	2	6.013	1
282			min	-1386.635	3	40.501	12	-137.944	3	0	3	-.104	3	.143	12
283		9	max	1875.494	1	1703.587	1	111.61	1	.002	2	.062	2	5.466	1
284			min	-1388.827	3	40.501	12	-137.944	3	0	3	-.148	3	.13	12
285		10	max	1872.573	1	1703.587	1	111.61	1	.002	2	.095	2	4.92	1
286			min	-1391.018	3	40.501	12	-137.944	3	0	3	-.192	3	.117	12
287		11	max	1869.651	1	1703.587	1	111.61	1	.002	2	.128	2	4.373	1
288			min	-1393.209	3	40.501	12	-137.944	3	0	3	-.237	3	.104	12
289		12	max	1866.729	1	1703.587	1	111.61	1	.002	2	.162	2	3.826	1
290			min	-1395.401	3	40.501	12	-137.944	3	0	3	-.281	3	.091	12
291		13	max	1863.807	1	1703.587	1	111.61	1	.002	2	.195	2	3.28	1
292			min	-1397.592	3	40.501	12	-137.944	3	0	3	-.325	3	.078	12
293		14	max	1860.886	1	1703.587	1	111.61	1	.002	2	.228	2	2.733	1
294			min	-1399.783	3	40.501	12	-137.944	3	0	3	-.37	3	.065	12
295		15	max	1857.964	1	1703.587	1	111.61	1	.002	2	.262	2	2.186	1
296			min	-1401.974	3	40.501	12	-137.944	3	0	3	-.414	3	.052	12
297		16	max	1855.042	1	1703.587	1	111.61	1	.002	2	.297	1	1.64	1
298			min	-1404.166	3	40.501	12	-137.944	3	0	3	-.458	3	.039	12
299		17	max	1852.12	1	1703.587	1	111.61	1	.002	2	.333	1	1.093	1
300			min	-1406.357	3	40.501	12	-137.944	3	0	3	-.502	3	.026	12
301		18	max	1849.199	1	1703.587	1	111.61	1	.002	2	.368	1	.547	1
302			min	-1408.548	3	40.501	12	-137.944	3	0	3	-.547	3	.013	12
303		19	max	1846.277	1	1703.587	1	111.61	1	.002	2	.404	1	0	1
304			min	-1410.74	3	40.501	12	-137.944	3	0	3	-.591	3	0	1
305	M5	1	max	6180.243	1	2377.094	3	0	1	0	1	0	1	13.014	1
306			min	-4775.243	3	-2460.388	2	0	1	0	1	0	1	.421	15
307		2	max	6177.321	1	2377.094	3	0	1	0	1	0	1	13.514	1
308			min	-4777.434	3	-2460.388	2	0	1	0	1	0	1	.426	15
309		3	max	6174.4	1	2377.094	3	0	1	0	1	0	1	14.014	1
310			min	-4779.626	3	-2460.388	2	0	1	0	1	0	1	.432	15
311		4	max	6171.478	1	2377.094	3	0	1	0	1	0	1	14.514	1
312			min	-4781.817	3	-2460.388	2	0	1	0	1	0	1	.015	3
313		5	max	4914.315	1	3166.945	1	0	1	0	1	0	1	14.226	1
314			min	-4080.202	3	-75.459	3	0	1	0	1	0	1	-.339	3
315		6	max	4911.393	1	3166.945	1	0	1	0	1	0	1	13.21	1
316			min	-4082.393	3	-75.459	3	0	1	0	1	0	1	-.315	3
317		7	max	4908.471	1	3166.945	1	0	1	0	1	0	1	12.194	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	-4084.585	3	-75.459	3	0	1	0	1	0	1	-.291	3
319		8	max	4905.549	1	3166.945	1	0	1	0	1	0	1	11.178	1
320			min	-4086.776	3	-75.459	3	0	1	0	1	0	1	-.266	3
321		9	max	4902.628	1	3166.945	1	0	1	0	1	0	1	10.162	1
322			min	-4088.967	3	-75.459	3	0	1	0	1	0	1	-.242	3
323		10	max	4899.706	1	3166.945	1	0	1	0	1	0	1	9.145	1
324			min	-4091.159	3	-75.459	3	0	1	0	1	0	1	-.218	3
325		11	max	4896.784	1	3166.945	1	0	1	0	1	0	1	8.129	1
326			min	-4093.35	3	-75.459	3	0	1	0	1	0	1	-.194	3
327		12	max	4893.863	1	3166.945	1	0	1	0	1	0	1	7.113	1
328			min	-4095.541	3	-75.459	3	0	1	0	1	0	1	-.169	3
329		13	max	4890.941	1	3166.945	1	0	1	0	1	0	1	6.097	1
330			min	-4097.733	3	-75.459	3	0	1	0	1	0	1	-.145	3
331		14	max	4888.019	1	3166.945	1	0	1	0	1	0	1	5.081	1
332			min	-4099.924	3	-75.459	3	0	1	0	1	0	1	-.121	3
333		15	max	4885.097	1	3166.945	1	0	1	0	1	0	1	4.065	1
334			min	-4102.115	3	-75.459	3	0	1	0	1	0	1	-.097	3
335		16	max	4882.176	1	3166.945	1	0	1	0	1	0	1	3.048	1
336			min	-4104.306	3	-75.459	3	0	1	0	1	0	1	-.073	3
337		17	max	4879.254	1	3166.945	1	0	1	0	1	0	1	2.032	1
338			min	-4106.498	3	-75.459	3	0	1	0	1	0	1	-.048	3
339		18	max	4876.332	1	3166.945	1	0	1	0	1	0	1	1.016	1
340			min	-4108.689	3	-75.459	3	0	1	0	1	0	1	-.024	3
341		19	max	4873.41	1	3166.945	1	0	1	0	1	0	1	0	1
342			min	-4110.88	3	-75.459	3	0	1	0	1	0	1	0	1
343	M8	1	max	2394.804	1	811.418	3	151.683	3	.005	2	.239	1	7.846	1
344			min	-1584.64	3	-509.039	2	-148.469	1	-.002	3	-.203	3	.272	15
345		2	max	2391.882	1	811.418	3	151.683	3	.005	2	.191	1	7.872	1
346			min	-1586.831	3	-509.039	2	-148.469	1	-.002	3	-.154	3	.27	15
347		3	max	2388.96	1	811.418	3	151.683	3	.005	2	.144	1	7.898	1
348			min	-1589.022	3	-509.039	2	-148.469	1	-.002	3	-.105	3	.267	15
349		4	max	2386.039	1	811.418	3	151.683	3	.005	2	.096	1	7.924	1
350			min	-1591.214	3	-509.039	2	-148.469	1	-.002	3	-.057	3	.264	12
351		5	max	1887.181	1	1703.587	1	137.944	3	0	3	.097	1	7.653	1
352			min	-1380.061	3	40.501	12	-111.61	1	-.002	2	-.029	3	.182	12
353		6	max	1884.259	1	1703.587	1	137.944	3	0	3	.061	1	7.106	1
354			min	-1382.253	3	40.501	12	-111.61	1	-.002	2	.002	15	.169	12
355		7	max	1881.338	1	1703.587	1	137.944	3	0	3	.06	3	6.559	1
356			min	-1384.444	3	40.501	12	-111.61	1	-.002	2	-.001	10	.156	12
357		8	max	1878.416	1	1703.587	1	137.944	3	0	3	.104	3	6.013	1
358			min	-1386.635	3	40.501	12	-111.61	1	-.002	2	-.028	2	.143	12
359		9	max	1875.494	1	1703.587	1	137.944	3	0	3	.148	3	5.466	1
360			min	-1388.827	3	40.501	12	-111.61	1	-.002	2	-.062	2	.13	12
361		10	max	1872.573	1	1703.587	1	137.944	3	0	3	.192	3	4.92	1
362			min	-1391.018	3	40.501	12	-111.61	1	-.002	2	-.095	2	.117	12
363		11	max	1869.651	1	1703.587	1	137.944	3	0	3	.237	3	4.373	1
364			min	-1393.209	3	40.501	12	-111.61	1	-.002	2	-.128	2	.104	12
365		12	max	1866.729	1	1703.587	1	137.944	3	0	3	.281	3	3.826	1
366			min	-1395.401	3	40.501	12	-111.61	1	-.002	2	-.162	2	.091	12
367		13	max	1863.807	1	1703.587	1	137.944	3	0	3	.325	3	3.28	1
368			min	-1397.592	3	40.501	12	-111.61	1	-.002	2	-.195	2	.078	12
369		14	max	1860.886	1	1703.587	1	137.944	3	0	3	.37	3	2.733	1
370			min	-1399.783	3	40.501	12	-111.61	1	-.002	2	-.228	2	.065	12
371		15	max	1857.964	1	1703.587	1	137.944	3	0	3	.414	3	2.186	1
372			min	-1401.974	3	40.501	12	-111.61	1	-.002	2	-.262	2	.052	12
373		16	max	1855.042	1	1703.587	1	137.944	3	0	3	.458	3	1.64	1
374			min	-1404.166	3	40.501	12	-111.61	1	-.002	2	-.297	1	.039	12

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
375		17	max	1852.12	1	1703.587	1	137.944	3	0	3	.502	3	1.093	1
376			min	-1406.357	3	40.501	12	-111.61	1	-.002	2	-.333	1	.026	12
377		18	max	1849.199	1	1703.587	1	137.944	3	0	3	.547	3	.547	1
378			min	-1408.548	3	40.501	12	-111.61	1	-.002	2	-.368	1	.013	12
379		19	max	1846.277	1	1703.587	1	137.944	3	0	3	.591	3	0	1
380			min	-1410.74	3	40.501	12	-111.61	1	-.002	2	-.404	1	0	1
381	M3	1	max	2026.637	2	5.879	4	37.742	2	.019	3	.006	2	0	1
382			min	-783.809	3	1.382	15	-14.32	3	-.046	2	-.002	3	0	1
383		2	max	2026.49	2	5.226	4	37.742	2	.019	3	.02	2	0	15
384			min	-783.919	3	1.228	15	-14.32	3	-.046	2	-.008	3	-.002	4
385		3	max	2026.344	2	4.572	4	37.742	2	.019	3	.033	2	0	15
386			min	-784.029	3	1.075	15	-14.32	3	-.046	2	-.013	3	-.004	4
387		4	max	2026.197	2	3.919	4	37.742	2	.019	3	.046	2	-.001	15
388			min	-784.139	3	.921	15	-14.32	3	-.046	2	-.018	3	-.005	4
389		5	max	2026.051	2	3.266	4	37.742	2	.019	3	.06	2	-.002	15
390			min	-784.249	3	.768	15	-14.32	3	-.046	2	-.023	3	-.007	4
391		6	max	2025.904	2	2.613	4	37.742	2	.019	3	.073	2	-.002	15
392			min	-784.359	3	.614	15	-14.32	3	-.046	2	-.028	3	-.008	4
393		7	max	2025.757	2	1.96	4	37.742	2	.019	3	.087	2	-.002	15
394			min	-784.469	3	.461	15	-14.32	3	-.046	2	-.033	3	-.008	4
395		8	max	2025.611	2	1.306	4	37.742	2	.019	3	.1	2	-.002	15
396			min	-784.579	3	.307	15	-14.32	3	-.046	2	-.038	3	-.009	4
397		9	max	2025.464	2	.653	4	37.742	2	.019	3	.114	2	-.002	15
398			min	-784.689	3	.154	15	-14.32	3	-.046	2	-.043	3	-.009	4
399		10	max	2025.317	2	0	1	37.742	2	.019	3	.127	2	-.002	15
400			min	-784.799	3	0	1	-14.32	3	-.046	2	-.048	3	-.009	4
401		11	max	2025.171	2	-.154	15	37.742	2	.019	3	.141	2	-.002	15
402			min	-784.909	3	-.653	4	-14.32	3	-.046	2	-.054	3	-.009	4
403		12	max	2025.024	2	-.307	15	37.742	2	.019	3	.154	2	-.002	15
404			min	-785.019	3	-1.306	4	-14.32	3	-.046	2	-.059	3	-.009	4
405		13	max	2024.878	2	-.461	15	37.742	2	.019	3	.168	2	-.002	15
406			min	-785.129	3	-1.96	4	-14.32	3	-.046	2	-.064	3	-.008	4
407		14	max	2024.731	2	-.614	15	37.742	2	.019	3	.181	2	-.002	15
408			min	-785.239	3	-2.613	4	-14.32	3	-.046	2	-.069	3	-.008	4
409		15	max	2024.584	2	-.768	15	37.742	2	.019	3	.195	2	-.002	15
410			min	-785.349	3	-3.266	4	-14.32	3	-.046	2	-.074	3	-.007	4
411		16	max	2024.438	2	-.921	15	37.742	2	.019	3	.208	2	-.001	15
412			min	-785.459	3	-3.919	4	-14.32	3	-.046	2	-.079	3	-.005	4
413		17	max	2024.291	2	-1.075	15	37.742	2	.019	3	.222	2	0	15
414			min	-785.568	3	-4.572	4	-14.32	3	-.046	2	-.084	3	-.004	4
415		18	max	2024.145	2	-1.228	15	37.742	2	.019	3	.235	2	0	15
416			min	-785.678	3	-5.226	4	-14.32	3	-.046	2	-.089	3	-.002	4
417		19	max	2023.998	2	-1.382	15	37.742	2	.019	3	.249	2	0	1
418			min	-785.788	3	-5.879	4	-14.32	3	-.046	2	-.095	3	0	1
419	M6	1	max	5429.964	2	5.879	4	0	1	0	1	0	1	0	1
420			min	-2552.67	3	1.382	15	0	1	0	1	0	1	0	1
421		2	max	5429.817	2	5.226	4	0	1	0	1	0	1	0	15
422			min	-2552.78	3	1.228	15	0	1	0	1	0	1	-.002	4
423		3	max	5429.671	2	4.572	4	0	1	0	1	0	1	0	15
424			min	-2552.89	3	1.075	15	0	1	0	1	0	1	-.004	4
425		4	max	5429.524	2	3.919	4	0	1	0	1	0	1	-.001	15
426			min	-2552.999	3	.921	15	0	1	0	1	0	1	-.005	4
427		5	max	5429.377	2	3.266	4	0	1	0	1	0	1	-.002	15
428			min	-2553.109	3	.768	15	0	1	0	1	0	1	-.007	4
429		6	max	5429.231	2	2.613	4	0	1	0	1	0	1	-.002	15
430			min	-2553.219	3	.614	15	0	1	0	1	0	1	-.008	4
431		7	max	5429.084	2	1.96	4	0	1	0	1	0	1	-.002	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
432			min	-2553.329	3	.461	15	0	1	0	1	0	1	-.008	4
433		8	max	5428.937	2	1.306	4	0	1	0	1	0	1	-.002	15
434			min	-2553.439	3	.307	15	0	1	0	1	0	1	-.009	4
435		9	max	5428.791	2	.653	4	0	1	0	1	0	1	-.002	15
436			min	-2553.549	3	.154	15	0	1	0	1	0	1	-.009	4
437		10	max	5428.644	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2553.659	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	5428.498	2	-.154	15	0	1	0	1	0	1	-.002	15
440			min	-2553.769	3	-.653	4	0	1	0	1	0	1	-.009	4
441		12	max	5428.351	2	-.307	15	0	1	0	1	0	1	-.002	15
442			min	-2553.879	3	-1.306	4	0	1	0	1	0	1	-.009	4
443		13	max	5428.204	2	-.461	15	0	1	0	1	0	1	-.002	15
444			min	-2553.989	3	-1.96	4	0	1	0	1	0	1	-.008	4
445		14	max	5428.058	2	-.614	15	0	1	0	1	0	1	-.002	15
446			min	-2554.099	3	-2.613	4	0	1	0	1	0	1	-.008	4
447		15	max	5427.911	2	-.768	15	0	1	0	1	0	1	-.002	15
448			min	-2554.209	3	-3.266	4	0	1	0	1	0	1	-.007	4
449		16	max	5427.765	2	-.921	15	0	1	0	1	0	1	-.001	15
450			min	-2554.319	3	-3.919	4	0	1	0	1	0	1	-.005	4
451		17	max	5427.618	2	-1.075	15	0	1	0	1	0	1	0	15
452			min	-2554.429	3	-4.572	4	0	1	0	1	0	1	-.004	4
453		18	max	5427.471	2	-1.228	15	0	1	0	1	0	1	0	15
454			min	-2554.539	3	-5.226	4	0	1	0	1	0	1	-.002	4
455		19	max	5427.325	2	-1.382	15	0	1	0	1	0	1	0	1
456			min	-2554.649	3	-5.879	4	0	1	0	1	0	1	0	1
457	M9	1	max	2026.637	2	5.879	4	14.32	3	.046	2	.002	3	0	1
458			min	-783.809	3	1.382	15	-37.742	2	-.019	3	-.006	2	0	1
459		2	max	2026.49	2	5.226	4	14.32	3	.046	2	.008	3	0	15
460			min	-783.919	3	1.228	15	-37.742	2	-.019	3	-.02	2	-.002	4
461		3	max	2026.344	2	4.572	4	14.32	3	.046	2	.013	3	0	15
462			min	-784.029	3	1.075	15	-37.742	2	-.019	3	-.033	2	-.004	4
463		4	max	2026.197	2	3.919	4	14.32	3	.046	2	.018	3	-.001	15
464			min	-784.139	3	.921	15	-37.742	2	-.019	3	-.046	2	-.005	4
465		5	max	2026.051	2	3.266	4	14.32	3	.046	2	.023	3	-.002	15
466			min	-784.249	3	.768	15	-37.742	2	-.019	3	-.06	2	-.007	4
467		6	max	2025.904	2	2.613	4	14.32	3	.046	2	.028	3	-.002	15
468			min	-784.359	3	.614	15	-37.742	2	-.019	3	-.073	2	-.008	4
469		7	max	2025.757	2	1.96	4	14.32	3	.046	2	.033	3	-.002	15
470			min	-784.469	3	.461	15	-37.742	2	-.019	3	-.087	2	-.008	4
471		8	max	2025.611	2	1.306	4	14.32	3	.046	2	.038	3	-.002	15
472			min	-784.579	3	.307	15	-37.742	2	-.019	3	-.1	2	-.009	4
473		9	max	2025.464	2	.653	4	14.32	3	.046	2	.043	3	-.002	15
474			min	-784.689	3	.154	15	-37.742	2	-.019	3	-.114	2	-.009	4
475		10	max	2025.317	2	0	1	14.32	3	.046	2	.048	3	-.002	15
476			min	-784.799	3	0	1	-37.742	2	-.019	3	-.127	2	-.009	4
477		11	max	2025.171	2	-.154	15	14.32	3	.046	2	.054	3	-.002	15
478			min	-784.909	3	-.653	4	-37.742	2	-.019	3	-.141	2	-.009	4
479		12	max	2025.024	2	-.307	15	14.32	3	.046	2	.059	3	-.002	15
480			min	-785.019	3	-1.306	4	-37.742	2	-.019	3	-.154	2	-.009	4
481		13	max	2024.878	2	-.461	15	14.32	3	.046	2	.064	3	-.002	15
482			min	-785.129	3	-1.96	4	-37.742	2	-.019	3	-.168	2	-.008	4
483		14	max	2024.731	2	-.614	15	14.32	3	.046	2	.069	3	-.002	15
484			min	-785.239	3	-2.613	4	-37.742	2	-.019	3	-.181	2	-.008	4
485		15	max	2024.584	2	-.768	15	14.32	3	.046	2	.074	3	-.002	15
486			min	-785.349	3	-3.266	4	-37.742	2	-.019	3	-.195	2	-.007	4
487		16	max	2024.438	2	-.921	15	14.32	3	.046	2	.079	3	-.001	15
488			min	-785.459	3	-3.919	4	-37.742	2	-.019	3	-.208	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	2024.291	2	-1.075	15	14.32	3	.046	2	.084	3	0	15
490			min	-785.568	3	-4.572	4	-37.742	2	-.019	3	-.222	2	-.004	4
491		18	max	2024.145	2	-1.228	15	14.32	3	.046	2	.089	3	0	15
492			min	-785.678	3	-5.226	4	-37.742	2	-.019	3	-.235	2	-.002	4
493		19	max	2023.998	2	-1.382	15	14.32	3	.046	2	.095	3	0	1
494			min	-785.788	3	-5.879	4	-37.742	2	-.019	3	-.249	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	-.017	15	.082	3	.013	1	8.888e-3	3	NC	3	NC	1
2			min	-.523	1	-1.094	1	0	3	-2.624e-2	2	97.361	1	NC	1
3		2	max	-.017	15	.051	3	0	3	8.575e-3	3	7781.522	12	NC	2
4			min	-.523	1	-.946	1	-.009	1	-2.49e-2	2	108.327	1	6724.991	1
5		3	max	-.017	15	.021	3	0	3	7.962e-3	3	3985.846	12	NC	3
6			min	-.523	1	-.802	1	-.021	1	-2.225e-2	2	121.725	1	4561.63	1
7		4	max	-.017	15	-.004	3	.001	3	7.349e-3	3	4029.186	15	NC	3
8			min	-.522	1	-.668	1	-.023	1	-1.961e-2	2	137.57	1	4393.759	1
9		5	max	-.017	15	-.015	12	.002	3	7.007e-3	3	4472.584	15	NC	3
10			min	-.522	1	-.551	1	-.021	1	-1.768e-2	2	155.288	1	4979.988	1
11		6	max	-.017	15	-.015	15	.003	3	7.364e-3	3	4943.805	15	NC	3
12			min	-.522	1	-.453	1	-.013	1	-1.755e-2	2	174.013	1	7159.152	1
13		7	max	-.017	15	-.013	15	.002	3	7.721e-3	3	5459.853	15	NC	1
14			min	-.521	1	-.368	1	-.005	1	-1.743e-2	2	194.263	1	NC	1
15		8	max	-.017	15	-.01	15	0	1	8.078e-3	3	6053.772	15	NC	1
16			min	-.52	1	-.29	1	0	10	-1.73e-2	2	217.327	1	NC	1
17		9	max	-.017	15	-.008	15	0	10	8.821e-3	3	6787.593	15	NC	1
18			min	-.52	1	-.214	1	0	3	-1.622e-2	2	245.967	1	NC	1
19		10	max	-.017	15	-.005	15	.001	1	9.927e-3	3	7746.186	15	NC	1
20			min	-.519	1	-.137	1	-.001	3	-1.422e-2	2	284.006	1	NC	1
21		11	max	-.017	15	-.002	15	.001	1	1.103e-2	3	9049.724	15	NC	1
22			min	-.518	1	-.059	1	0	3	-1.222e-2	2	336.818	1	NC	1
23		12	max	-.017	15	.021	1	.004	3	1.027e-2	3	NC	15	NC	1
24			min	-.517	1	-.032	3	-.005	1	-9.952e-3	1	415.232	1	NC	1
25		13	max	-.017	15	.099	1	.01	3	7.521e-3	3	NC	15	NC	1
26			min	-.516	1	-.029	3	-.007	1	-7.146e-3	1	538.697	1	NC	1
27		14	max	-.017	15	.171	1	.015	3	4.772e-3	3	NC	5	NC	1
28			min	-.516	1	-.017	3	-.006	2	-4.339e-3	1	741.933	1	8732.508	3
29		15	max	-.017	15	.232	1	.015	3	2.023e-3	3	NC	5	NC	1
30			min	-.515	1	.008	15	-.001	10	-1.533e-3	1	1091.237	1	8818.902	3
31		16	max	-.017	15	.278	1	.012	1	5.378e-3	3	NC	5	NC	2
32			min	-.515	1	.01	15	0	15	-2.908e-3	1	1683.471	1	7293.995	1
33		17	max	-.017	15	.311	1	.015	1	9.449e-3	3	NC	5	NC	2
34			min	-.515	1	.011	15	0	15	-4.774e-3	1	2803.879	1	6056.67	1
35		18	max	-.017	15	.338	1	.008	1	1.352e-2	3	NC	4	NC	2
36			min	-.515	1	.012	15	0	15	-6.639e-3	1	1111.357	3	8086.247	1
37		19	max	-.017	15	.362	1	0	15	1.56e-2	3	NC	1	NC	1
38			min	-.515	1	.013	15	-.011	1	-7.591e-3	1	675.915	3	NC	1
39	M4	1	max	-.008	12	.287	3	0	1	0	1	NC	3	NC	1
40			min	-.952	1	-2.085	1	0	1	0	1	54.811	1	NC	1
41		2	max	-.008	12	.206	3	0	1	0	1	2961.078	12	NC	1
42			min	-.952	1	-1.793	1	0	1	0	1	61.794	1	NC	1
43		3	max	-.008	12	.128	3	0	1	0	1	2343.533	15	NC	1
44			min	-.951	1	-1.507	1	0	1	0	1	70.57	1	NC	1
45		4	max	-.008	12	.063	3	0	1	0	1	2648.171	15	NC	1
46			min	-.951	1	-1.245	1	0	1	0	1	81.152	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
47		5	max	-.008	12	.019	3	0	1	0	1	2985.062	15	NC	1
48			min	-.951	1	-1.024	1	0	1	0	1	92.951	1	NC	1
49		6	max	-.009	12	0	3	0	1	0	1	3334.282	15	NC	1
50			min	-.949	1	-.849	1	0	1	0	1	104.994	1	NC	1
51		7	max	-.009	12	-.004	3	0	1	0	1	3709.099	15	NC	1
52			min	-.948	1	-.704	1	0	1	0	1	117.594	1	NC	1
53		8	max	-.009	12	-.001	3	0	1	0	1	4142.023	15	NC	1
54			min	-.946	1	-.574	1	0	1	0	1	131.866	1	NC	1
55		9	max	-.01	12	0	3	0	1	0	1	4702.317	15	NC	1
56			min	-.944	1	-.441	1	0	1	0	1	150.472	1	NC	1
57		10	max	-.01	12	-.004	12	0	1	0	1	5492.028	15	NC	1
58			min	-.943	1	-.298	1	0	1	0	1	177.36	1	NC	1
59		11	max	-.011	12	-.004	15	0	1	0	1	6668.841	15	NC	1
60			min	-.941	1	-.147	1	0	1	0	1	218.694	1	NC	1
61		12	max	-.011	12	.012	1	0	1	0	1	8592.97	15	NC	1
62			min	-.939	1	-.036	3	0	1	0	1	289.584	1	NC	1
63		13	max	-.012	12	.17	1	0	1	0	1	NC	15	NC	1
64			min	-.937	1	-.051	3	0	1	0	1	418.72	3	NC	1
65		14	max	-.012	12	.311	1	0	1	0	1	NC	5	NC	1
66			min	-.935	1	-.044	3	0	1	0	1	427.674	3	NC	1
67		15	max	-.013	12	.42	1	0	1	0	1	NC	5	NC	1
68			min	-.934	1	.004	12	0	1	0	1	501.055	3	NC	1
69		16	max	-.013	12	.481	1	0	1	0	1	NC	2	NC	1
70			min	-.933	1	.015	15	0	1	0	1	810.761	3	NC	1
71		17	max	-.013	12	.505	1	0	1	0	1	NC	1	NC	1
72			min	-.934	1	.016	15	0	1	0	1	6928.631	3	NC	1
73		18	max	-.013	12	.506	1	0	1	0	1	NC	1	NC	1
74			min	-.934	1	.016	15	0	1	0	1	878.677	3	NC	1
75		19	max	-.013	12	.638	3	0	1	0	1	NC	1	NC	1
76			min	-.934	1	.017	15	0	1	0	1	403.326	3	NC	1
77	M7	1	max	-.017	15	.082	3	0	3	2.624e-2	2	NC	3	NC	1
78			min	-.523	1	-1.094	1	-.013	1	-8.888e-3	3	97.361	1	NC	1
79		2	max	-.017	15	.051	3	.009	1	2.49e-2	2	7781.522	12	NC	2
80			min	-.523	1	-.946	1	0	3	-8.575e-3	3	108.327	1	6724.991	1
81		3	max	-.017	15	.021	3	.021	1	2.225e-2	2	3985.846	12	NC	3
82			min	-.523	1	-.802	1	0	3	-7.962e-3	3	121.725	1	4561.63	1
83		4	max	-.017	15	-.004	3	.023	1	1.961e-2	2	4029.186	15	NC	3
84			min	-.522	1	-.668	1	-.001	3	-7.349e-3	3	137.57	1	4393.759	1
85		5	max	-.017	15	-.015	12	.021	1	1.768e-2	2	4472.584	15	NC	3
86			min	-.522	1	-.551	1	-.002	3	-7.007e-3	3	155.288	1	4979.988	1
87		6	max	-.017	15	-.015	15	.013	1	1.755e-2	2	4943.805	15	NC	3
88			min	-.522	1	-.453	1	-.003	3	-7.364e-3	3	174.013	1	7159.152	1
89		7	max	-.017	15	-.013	15	.005	1	1.743e-2	2	5459.853	15	NC	1
90			min	-.521	1	-.368	1	-.002	3	-7.721e-3	3	194.263	1	NC	1
91		8	max	-.017	15	-.01	15	0	10	1.73e-2	2	6053.772	15	NC	1
92			min	-.52	1	-.29	1	0	1	-8.078e-3	3	217.327	1	NC	1
93		9	max	-.017	15	-.008	15	0	3	1.622e-2	2	6787.593	15	NC	1
94			min	-.52	1	-.214	1	0	10	-8.821e-3	3	245.967	1	NC	1
95		10	max	-.017	15	-.005	15	.001	3	1.422e-2	2	7746.186	15	NC	1
96			min	-.519	1	-.137	1	-.001	1	-9.927e-3	3	284.006	1	NC	1
97		11	max	-.017	15	-.002	15	0	3	1.222e-2	2	9049.724	15	NC	1
98			min	-.518	1	-.059	1	-.001	1	-1.103e-2	3	336.818	1	NC	1
99		12	max	-.017	15	.021	1	.005	1	9.952e-3	1	NC	15	NC	1
100			min	-.517	1	-.032	3	-.004	3	-1.027e-2	3	415.232	1	NC	1
101		13	max	-.017	15	.099	1	.007	1	7.146e-3	1	NC	15	NC	1
102			min	-.516	1	-.029	3	-.01	3	-7.521e-3	3	538.697	1	NC	1
103		14	max	-.017	15	.171	1	.006	2	4.339e-3	1	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
104			min	-.516	1	-.017	3	-.015	3	-4.772e-3	3	741.933	1	8732.508	3
105		15	max	-.017	15	.232	1	.001	10	1.533e-3	1	NC	5	NC	1
106			min	-.515	1	.008	15	-.015	3	-2.023e-3	3	1091.237	1	8818.902	3
107		16	max	-.017	15	.278	1	0	15	2.908e-3	1	NC	5	NC	2
108			min	-.515	1	.01	15	-.012	1	-5.378e-3	3	1683.471	1	7293.995	1
109		17	max	-.017	15	.311	1	0	15	4.774e-3	1	NC	5	NC	2
110			min	-.515	1	.011	15	-.015	1	-9.449e-3	3	2803.879	1	6056.67	1
111		18	max	-.017	15	.338	1	0	15	6.639e-3	1	NC	4	NC	2
112			min	-.515	1	.012	15	-.008	1	-1.352e-2	3	1111.357	3	8086.247	1
113		19	max	-.017	15	.362	1	.011	1	7.591e-3	1	NC	1	NC	1
114			min	-.515	1	.013	15	0	15	-1.56e-2	3	675.915	3	NC	1
115	M10	1	max	.001	1	.35	1	.515	1	1.041e-2	3	NC	1	NC	1
116			min	0	12	.013	15	.017	15	1.477e-4	15	NC	1	NC	1
117		2	max	0	1	.432	3	.568	1	1.193e-2	3	NC	4	NC	3
118			min	0	12	.01	15	.019	15	1.36e-4	15	1128.117	3	3867.849	1
119		3	max	0	1	.598	3	.649	1	1.344e-2	3	NC	5	NC	3
120			min	0	12	.009	15	.022	15	1.242e-4	15	588.658	3	1523.362	1
121		4	max	0	1	.722	3	.737	1	1.496e-2	3	NC	5	NC	3
122			min	0	12	.008	15	.025	15	1.125e-4	15	433.894	3	916.971	1
123		5	max	0	1	.788	3	.818	1	1.648e-2	3	NC	5	NC	3
124			min	0	12	.008	15	.025	12	-3.422e-5	10	380.313	3	673.638	1
125		6	max	0	1	.793	3	.88	1	1.799e-2	3	NC	5	NC	3
126			min	0	12	.009	15	.023	12	-2.346e-4	10	376.563	3	559.085	1
127		7	max	0	1	.746	3	.919	1	1.951e-2	3	NC	4	NC	3
128			min	0	12	.011	15	.02	12	-4.391e-4	2	412.63	3	504.998	1
129		8	max	0	1	.666	3	.936	1	2.103e-2	3	NC	4	NC	3
130			min	0	12	.013	15	.017	12	-8.229e-4	2	492.416	3	484.694	1
131		9	max	0	1	.584	3	.937	1	2.254e-2	3	NC	4	NC	3
132			min	0	12	.016	15	.014	12	-1.207e-3	2	612.431	3	483.506	1
133		10	max	0	1	.546	3	.934	1	2.406e-2	3	NC	5	NC	3
134			min	0	1	.017	15	.013	12	-1.59e-3	2	693.312	3	487.106	1
135		11	max	0	12	.584	3	.937	1	2.254e-2	3	NC	4	NC	3
136			min	0	1	.016	15	.014	12	-1.207e-3	2	612.431	3	483.506	1
137		12	max	0	12	.666	3	.936	1	2.103e-2	3	NC	4	NC	3
138			min	0	1	.013	15	.017	12	-8.229e-4	2	492.416	3	484.694	1
139		13	max	0	12	.746	3	.919	1	1.951e-2	3	NC	4	NC	3
140			min	0	1	.011	15	.02	12	-4.391e-4	2	412.63	3	504.998	1
141		14	max	0	12	.793	3	.88	1	1.799e-2	3	NC	5	NC	3
142			min	0	1	.009	15	.023	12	-2.346e-4	10	376.563	3	559.085	1
143		15	max	0	12	.788	3	.818	1	1.648e-2	3	NC	5	NC	3
144			min	0	1	.008	15	.025	12	-3.422e-5	10	380.313	3	673.638	1
145		16	max	0	12	.722	3	.737	1	1.496e-2	3	NC	5	NC	3
146			min	0	1	.008	15	.025	15	1.125e-4	15	433.894	3	916.971	1
147		17	max	0	12	.598	3	.649	1	1.344e-2	3	NC	5	NC	3
148			min	0	1	.009	15	.022	15	1.242e-4	15	588.658	3	1523.362	1
149		18	max	0	12	.432	3	.568	1	1.193e-2	3	NC	4	NC	3
150			min	0	1	.01	15	.019	15	1.36e-4	15	1128.117	3	3867.849	1
151		19	max	0	12	.35	1	.515	1	1.041e-2	3	NC	1	NC	1
152			min	-.001	1	.013	15	.017	15	1.477e-4	15	NC	1	NC	1
153	M11	1	max	.002	1	0	15	.518	1	1.008e-2	1	NC	1	NC	1
154			min	-.001	3	-.032	3	.017	15	4.832e-5	3	NC	1	NC	1
155		2	max	.002	1	.103	3	.556	1	1.119e-2	1	NC	5	NC	3
156			min	-.001	3	-.144	1	.017	12	-2.057e-4	3	1509.224	3	5279.32	1
157		3	max	.001	1	.223	3	.63	1	1.23e-2	1	NC	5	NC	3
158			min	-.001	3	-.251	1	.016	12	-4.598e-4	3	798.719	3	1812.179	1
159		4	max	.001	1	.303	3	.717	1	1.341e-2	1	NC	5	NC	3
160			min	0	3	-.321	1	.016	12	-7.138e-4	3	608.758	3	1023.28	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	.328	3	.8	1	1.453e-2	1	NC	5	NC	3
162			min	0	3	-.344	1	.016	12	-9.678e-4	3	566.053	3	723.315	1
163		6	max	0	1	.297	3	.867	1	1.564e-2	1	NC	5	NC	3
164			min	0	3	-.321	1	.015	12	-1.222e-3	3	619.857	3	584.371	1
165		7	max	0	1	.218	3	.912	1	1.675e-2	1	NC	5	NC	3
166			min	0	3	-.259	1	.014	12	-1.476e-3	3	813.227	3	517.121	1
167		8	max	0	1	.115	3	.935	1	1.786e-2	1	NC	5	NC	3
168			min	0	3	-.177	1	.013	12	-1.73e-3	3	1282.279	1	488.445	1
169		9	max	0	1	.018	3	.941	1	1.897e-2	1	NC	4	NC	3
170			min	0	3	-.101	1	.012	12	-1.984e-3	3	2406.65	2	481.749	1
171		10	max	0	1	-.002	15	.94	1	2.008e-2	1	NC	3	NC	3
172			min	0	1	-.066	1	.011	12	-2.238e-3	3	3970.237	2	483.122	1
173		11	max	0	3	.018	3	.941	1	1.897e-2	1	NC	4	NC	3
174			min	0	1	-.101	1	.012	12	-1.984e-3	3	2406.65	2	481.749	1
175		12	max	0	3	.115	3	.935	1	1.786e-2	1	NC	5	NC	3
176			min	0	1	-.177	1	.013	12	-1.73e-3	3	1282.279	1	488.445	1
177		13	max	0	3	.218	3	.912	1	1.675e-2	1	NC	5	NC	3
178			min	0	1	-.259	1	.014	12	-1.476e-3	3	813.227	3	517.121	1
179		14	max	0	3	.297	3	.867	1	1.564e-2	1	NC	5	NC	3
180			min	0	1	-.321	1	.015	12	-1.222e-3	3	619.857	3	584.371	1
181		15	max	0	3	.328	3	.8	1	1.453e-2	1	NC	5	NC	3
182			min	0	1	-.344	1	.016	12	-9.678e-4	3	566.053	3	723.315	1
183		16	max	0	3	.303	3	.717	1	1.341e-2	1	NC	5	NC	3
184			min	-.001	1	-.321	1	.016	12	-7.138e-4	3	608.758	3	1023.28	1
185		17	max	.001	3	.223	3	.63	1	1.23e-2	1	NC	5	NC	3
186			min	-.001	1	-.251	1	.016	12	-4.598e-4	3	798.719	3	1812.179	1
187		18	max	.001	3	.103	3	.556	1	1.119e-2	1	NC	5	NC	3
188			min	-.002	1	-.144	1	.017	12	-2.057e-4	3	1509.224	3	5279.32	1
189		19	max	.001	3	0	15	.518	1	1.008e-2	1	NC	1	NC	1
190			min	-.002	1	-.032	3	.017	15	4.832e-5	3	NC	1	NC	1
191	M12	1	max	0	3	-.009	15	.52	1	9.668e-3	1	NC	1	NC	1
192			min	0	1	-.254	1	.017	15	1.114e-4	12	NC	1	NC	1
193		2	max	0	3	.054	3	.553	1	1.047e-2	1	NC	5	NC	3
194			min	0	1	-.436	1	.019	15	1.095e-4	12	1053.037	2	6226.456	1
195		3	max	0	3	.125	3	.624	1	1.128e-2	1	NC	5	NC	3
196			min	0	1	-.594	1	.021	15	1.076e-4	12	562.828	2	1965.581	1
197		4	max	0	3	.168	3	.71	1	1.208e-2	1	NC	5	NC	3
198			min	0	1	-.707	1	.021	12	1.01e-4	3	423.681	2	1073.526	1
199		5	max	0	3	.181	3	.794	1	1.289e-2	1	NC	5	NC	3
200			min	0	1	-.763	1	.02	12	9.372e-5	3	379.288	2	744.764	1
201		6	max	0	3	.164	3	.863	1	1.37e-2	1	NC	5	NC	3
202			min	0	1	-.76	1	.019	12	8.645e-5	3	384.738	2	594.188	1
203		7	max	0	3	.123	3	.912	1	1.45e-2	1	NC	5	NC	3
204			min	0	1	-.709	1	.016	12	7.918e-5	3	434.926	2	520.918	1
205		8	max	0	3	.07	3	.938	1	1.531e-2	1	NC	5	NC	3
206			min	0	1	-.628	1	.013	12	7.19e-5	3	541.967	2	488.508	1
207		9	max	0	3	.022	3	.946	1	1.611e-2	1	NC	5	NC	3
208			min	0	1	-.548	1	.011	12	6.463e-5	3	691.961	1	479.383	1
209		10	max	0	1	0	3	.945	1	1.692e-2	1	NC	5	NC	3
210			min	0	1	-.511	1	.01	12	5.736e-5	3	793.107	1	479.774	1
211		11	max	0	1	.022	3	.946	1	1.611e-2	1	NC	5	NC	3
212			min	0	3	-.548	1	.011	12	6.463e-5	3	691.961	1	479.383	1
213		12	max	0	1	.07	3	.938	1	1.531e-2	1	NC	5	NC	3
214			min	0	3	-.628	1	.013	12	7.19e-5	3	541.967	2	488.508	1
215		13	max	0	1	.123	3	.912	1	1.45e-2	1	NC	5	NC	3
216			min	0	3	-.709	1	.016	12	7.918e-5	3	434.926	2	520.918	1
217		14	max	0	1	.164	3	.863	1	1.37e-2	1	NC	5	NC	3

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
218			min	0	3	-.76	1	.019	12	8.645e-5	3	384.738	2	594.188	1
219		15	max	0	1	.181	3	.794	1	1.289e-2	1	NC	5	NC	3
220			min	0	3	-.763	1	.02	12	9.372e-5	3	379.288	2	744.764	1
221		16	max	0	1	.168	3	.71	1	1.208e-2	1	NC	5	NC	3
222			min	0	3	-.707	1	.021	12	1.01e-4	3	423.681	2	1073.526	1
223		17	max	0	1	.125	3	.624	1	1.128e-2	1	NC	5	NC	3
224			min	0	3	-.594	1	.021	15	1.076e-4	12	562.828	2	1965.581	1
225		18	max	0	1	.054	3	.553	1	1.047e-2	1	NC	5	NC	3
226			min	0	3	-.436	1	.019	15	1.095e-4	12	1053.037	2	6226.456	1
227		19	max	0	1	-.009	15	.52	1	9.668e-3	1	NC	1	NC	1
228			min	0	3	-.254	1	.017	15	1.114e-4	12	NC	1	NC	1
229	M13	1	max	0	3	.067	3	.523	1	1.87e-2	1	NC	1	NC	1
230			min	-.001	1	-1.022	1	.017	15	-3.948e-3	3	NC	1	NC	1
231		2	max	0	3	.166	3	.58	1	2.073e-2	1	NC	5	NC	3
232			min	-.001	1	-1.304	1	.019	12	-4.651e-3	3	685.95	2	3575.299	1
233		3	max	0	3	.253	3	.664	1	2.277e-2	1	NC	5	NC	3
234			min	0	1	-1.564	1	.019	12	-5.354e-3	3	357.518	2	1444.055	1
235		4	max	0	3	.317	3	.754	1	2.481e-2	1	NC	15	NC	3
236			min	0	1	-1.777	1	.019	12	-6.057e-3	3	257.756	2	880.094	1
237		5	max	0	3	.352	3	.836	1	2.684e-2	1	9366.018	15	NC	3
238			min	0	1	-1.928	1	.018	12	-6.759e-3	3	216.222	2	651.224	1
239		6	max	0	3	.357	3	.898	1	2.888e-2	1	8511.34	15	NC	3
240			min	0	1	-2.011	1	.016	12	-7.462e-3	3	199.622	2	542.922	1
241		7	max	0	3	.337	3	.938	1	3.097e-2	2	8250.301	15	NC	3
242			min	0	1	-2.033	1	.014	12	-8.165e-3	3	197.339	2	491.792	1
243		8	max	0	3	.302	3	.954	1	3.314e-2	2	8359.13	15	NC	3
244			min	0	1	-2.009	1	.011	12	-8.868e-3	3	204.492	2	472.808	1
245		9	max	0	3	.265	3	.955	1	3.53e-2	2	8649.254	15	NC	3
246			min	0	1	-1.966	1	.009	12	-9.571e-3	3	215.955	1	472.018	1
247		10	max	0	1	.247	3	.952	1	3.747e-2	2	8835.305	15	NC	3
248			min	0	1	-1.942	1	.008	12	-1.027e-2	3	221.682	1	475.617	1
249		11	max	0	1	.265	3	.955	1	3.53e-2	2	8649.254	15	NC	3
250			min	0	3	-1.966	1	.009	12	-9.571e-3	3	215.955	1	472.018	1
251		12	max	0	1	.302	3	.954	1	3.314e-2	2	8359.13	15	NC	3
252			min	0	3	-2.009	1	.011	12	-8.868e-3	3	204.492	2	472.808	1
253		13	max	0	1	.337	3	.938	1	3.097e-2	2	8250.301	15	NC	3
254			min	0	3	-2.033	1	.014	12	-8.165e-3	3	197.339	2	491.792	1
255		14	max	0	1	.357	3	.898	1	2.888e-2	1	8511.34	15	NC	3
256			min	0	3	-2.011	1	.016	12	-7.462e-3	3	199.622	2	542.922	1
257		15	max	0	1	.352	3	.836	1	2.684e-2	1	9366.018	15	NC	3
258			min	0	3	-1.928	1	.018	12	-6.759e-3	3	216.222	2	651.224	1
259		16	max	0	1	.317	3	.754	1	2.481e-2	1	NC	15	NC	3
260			min	0	3	-1.777	1	.019	12	-6.057e-3	3	257.756	2	880.094	1
261		17	max	0	1	.253	3	.664	1	2.277e-2	1	NC	5	NC	3
262			min	0	3	-1.564	1	.019	12	-5.354e-3	3	357.518	2	1444.055	1
263		18	max	.001	1	.166	3	.58	1	2.073e-2	1	NC	5	NC	3
264			min	0	3	-1.304	1	.019	12	-4.651e-3	3	685.95	2	3575.299	1
265		19	max	.001	1	.067	3	.523	1	1.87e-2	1	NC	1	NC	1
266			min	0	3	-1.022	1	.017	15	-3.948e-3	3	NC	1	NC	1
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	3	1.689e-3	2	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-6.494e-4	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	3.378e-3	2	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-1.299e-3	3	7881.199	1	NC	1
273		4	max	0	3	0	15	.001	3	5.067e-3	2	NC	3	NC	1
274			min	0	1	-.02	1	-.001	1	-1.948e-3	3	3495.652	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	5.618e-3	2	NC	3	NC	1
276			min	0	1	-.035	1	-.002	1	-2.132e-3	3	1955.206	1	NC	1
277		6	max	0	3	-.002	15	.002	3	5.117e-3	2	NC	3	NC	1
278			min	0	1	-.055	1	-.003	1	-1.885e-3	3	1249.211	1	NC	1
279		7	max	0	3	-.003	15	.003	3	4.616e-3	2	NC	5	NC	1
280			min	0	1	-.079	1	-.004	1	-1.638e-3	3	871.85	1	NC	1
281		8	max	0	3	-.004	15	.003	3	4.115e-3	2	NC	5	NC	1
282			min	0	1	-.107	1	-.005	1	-1.39e-3	3	646.626	1	NC	1
283		9	max	0	3	-.005	15	.004	3	3.614e-3	2	NC	15	NC	1
284			min	0	1	-.138	1	-.006	1	-1.143e-3	3	501.348	1	NC	1
285		10	max	0	3	-.006	15	.004	3	3.113e-3	2	NC	15	NC	1
286			min	-.001	1	-.172	1	-.007	1	-8.961e-4	3	402.067	1	NC	1
287		11	max	0	3	-.007	15	.004	3	2.611e-3	2	9836.181	15	NC	1
288			min	-.001	1	-.209	1	-.008	1	-6.489e-4	3	331.189	1	NC	1
289		12	max	0	3	-.008	15	.004	3	2.11e-3	2	8288.828	15	NC	1
290			min	-.001	1	-.249	1	-.009	1	-4.018e-4	3	278.781	1	NC	1
291		13	max	.001	3	-.01	15	.003	3	1.609e-3	2	7109.96	15	NC	1
292			min	-.001	1	-.29	1	-.009	1	-1.546e-4	3	238.915	1	NC	1
293		14	max	.001	3	-.011	15	.001	3	1.108e-3	2	6190.804	15	NC	1
294			min	-.002	1	-.333	1	-.009	1	1.108e-5	15	207.872	1	NC	1
295		15	max	.001	3	-.013	15	0	12	6.072e-4	2	5460.081	15	NC	1
296			min	-.002	1	-.378	1	-.009	1	-1.892e-5	9	183.219	1	NC	1
297		16	max	.001	3	-.014	15	0	15	5.869e-4	3	4869.735	15	NC	1
298			min	-.002	1	-.424	1	-.009	1	-2.187e-4	9	163.322	1	NC	1
299		17	max	.001	3	-.016	15	0	15	8.341e-4	3	4386.13	15	NC	1
300			min	-.002	1	-.471	1	-.008	1	-7.087e-4	1	147.036	1	NC	1
301		18	max	.001	3	-.017	15	0	10	1.081e-3	3	3985.244	15	NC	1
302			min	-.002	1	-.519	1	-.01	3	-1.204e-3	1	133.546	1	7157.937	3
303		19	max	.002	3	-.019	15	.001	10	1.328e-3	3	3649.545	15	NC	1
304			min	-.002	1	-.567	1	-.014	3	-1.7e-3	1	122.256	1	4868.993	3
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	1	0	1	NC	1	NC	1
308			min	0	1	-.003	1	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	3	NC	1
310			min	0	1	-.014	1	0	1	0	1	4783.679	1	NC	1
311		4	max	0	3	-.001	15	0	1	0	1	NC	3	NC	1
312			min	-.001	1	-.033	1	0	1	0	1	2076.333	1	NC	1
313		5	max	.001	3	-.002	15	0	1	0	1	NC	3	NC	1
314			min	-.001	1	-.061	1	0	1	0	1	1140.187	1	NC	1
315		6	max	.001	3	-.003	15	0	1	0	1	NC	3	NC	1
316			min	-.002	1	-.096	1	0	1	0	1	718.25	1	NC	1
317		7	max	.002	3	-.004	15	0	1	0	1	NC	3	NC	1
318			min	-.002	1	-.14	1	0	1	0	1	496.46	1	NC	1
319		8	max	.002	3	-.006	15	0	1	0	1	NC	3	NC	1
320			min	-.002	1	-.19	1	0	1	0	1	365.655	1	NC	1
321		9	max	.002	3	-.008	15	0	1	0	1	NC	3	NC	1
322			min	-.003	1	-.246	1	0	1	0	1	282.026	1	NC	1
323		10	max	.002	3	-.009	12	0	1	0	1	NC	3	NC	1
324			min	-.003	1	-.308	1	0	1	0	1	225.263	1	NC	1
325		11	max	.003	3	-.01	12	0	1	0	1	NC	3	NC	1
326			min	-.003	1	-.375	1	0	1	0	1	184.958	1	NC	1
327		12	max	.003	3	-.011	12	0	1	0	1	NC	3	NC	1
328			min	-.003	1	-.446	1	0	1	0	1	155.287	1	NC	1
329		13	max	.003	3	-.012	12	0	1	0	1	NC	3	NC	1
330			min	-.004	1	-.522	1	0	1	0	1	132.797	1	NC	1
331		14	max	.003	3	-.012	12	0	1	0	1	NC	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
332			min	-.004	1	-.601	1	0	1	0	1	115.338	1	NC	1
333		15	max	.004	3	-.013	12	0	1	0	1	NC	3	NC	1
334			min	-.004	1	-.683	1	0	1	0	1	101.509	1	NC	1
335		16	max	.004	3	-.013	12	0	1	0	1	NC	3	NC	1
336			min	-.005	1	-.767	1	0	1	0	1	90.372	1	NC	1
337		17	max	.004	3	-.014	12	0	1	0	1	NC	3	NC	1
338			min	-.005	1	-.853	1	0	1	0	1	81.275	1	NC	1
339		18	max	.004	3	-.015	12	0	1	0	1	NC	3	NC	1
340			min	-.005	1	-.94	1	0	1	0	1	73.752	1	NC	1
341		19	max	.005	3	-.015	12	0	1	0	1	NC	3	NC	1
342			min	-.006	1	-1.027	1	0	1	0	1	67.466	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	6.494e-4	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-1.689e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	1.299e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-3.378e-3	2	7881.199	1	NC	1
349		4	max	0	3	0	15	.001	1	1.948e-3	3	NC	3	NC	1
350			min	0	1	-.02	1	-.001	3	-5.067e-3	2	3495.652	1	NC	1
351		5	max	0	3	-.001	15	.002	1	2.132e-3	3	NC	3	NC	1
352			min	0	1	-.035	1	-.002	3	-5.618e-3	2	1955.206	1	NC	1
353		6	max	0	3	-.002	15	.003	1	1.885e-3	3	NC	3	NC	1
354			min	0	1	-.055	1	-.002	3	-5.117e-3	2	1249.211	1	NC	1
355		7	max	0	3	-.003	15	.004	1	1.638e-3	3	NC	5	NC	1
356			min	0	1	-.079	1	-.003	3	-4.616e-3	2	871.85	1	NC	1
357		8	max	0	3	-.004	15	.005	1	1.39e-3	3	NC	5	NC	1
358			min	0	1	-.107	1	-.003	3	-4.115e-3	2	646.626	1	NC	1
359		9	max	0	3	-.005	15	.006	1	1.143e-3	3	NC	15	NC	1
360			min	0	1	-.138	1	-.004	3	-3.614e-3	2	501.348	1	NC	1
361		10	max	0	3	-.006	15	.007	1	8.961e-4	3	NC	15	NC	1
362			min	-.001	1	-.172	1	-.004	3	-3.113e-3	2	402.067	1	NC	1
363		11	max	0	3	-.007	15	.008	1	6.489e-4	3	9836.181	15	NC	1
364			min	-.001	1	-.209	1	-.004	3	-2.611e-3	2	331.189	1	NC	1
365		12	max	0	3	-.008	15	.009	1	4.018e-4	3	8288.828	15	NC	1
366			min	-.001	1	-.249	1	-.004	3	-2.11e-3	2	278.781	1	NC	1
367		13	max	.001	3	-.01	15	.009	1	1.546e-4	3	7109.96	15	NC	1
368			min	-.001	1	-.29	1	-.003	3	-1.609e-3	2	238.915	1	NC	1
369		14	max	.001	3	-.011	15	.009	1	-1.108e-5	15	6190.804	15	NC	1
370			min	-.002	1	-.333	1	-.001	3	-1.108e-3	2	207.872	1	NC	1
371		15	max	.001	3	-.013	15	.009	1	1.892e-5	9	5460.081	15	NC	1
372			min	-.002	1	-.378	1	0	12	-6.072e-4	2	183.219	1	NC	1
373		16	max	.001	3	-.014	15	.009	1	2.187e-4	9	4869.735	15	NC	1
374			min	-.002	1	-.424	1	0	15	-5.869e-4	3	163.322	1	NC	1
375		17	max	.001	3	-.016	15	.008	1	7.087e-4	1	4386.13	15	NC	1
376			min	-.002	1	-.471	1	0	15	-8.341e-4	3	147.036	1	NC	1
377		18	max	.001	3	-.017	15	.01	3	1.204e-3	1	3985.244	15	NC	1
378			min	-.002	1	-.519	1	0	10	-1.081e-3	3	133.546	1	7157.937	3
379		19	max	.002	3	-.019	15	.014	3	1.7e-3	1	3649.545	15	NC	1
380			min	-.002	1	-.567	1	-.001	10	-1.328e-3	3	122.256	1	4868.993	3
381	M3	1	max	.026	1	0	15	.001	3	1.476e-3	2	NC	1	NC	1
382			min	0	15	-.008	1	-.002	1	-4.8e-4	3	NC	1	NC	1
383		2	max	.025	1	-.002	15	.011	3	2.134e-3	2	NC	1	NC	4
384			min	0	15	-.052	1	-.026	2	-7.494e-4	3	NC	1	3058.725	2
385		3	max	.024	1	-.004	15	.02	3	2.792e-3	2	NC	1	NC	5
386			min	0	15	-.097	1	-.049	2	-1.019e-3	3	NC	1	1548.821	2
387		4	max	.023	1	-.006	15	.029	3	3.45e-3	2	NC	1	NC	5
388			min	0	15	-.141	1	-.072	2	-1.288e-3	3	NC	1	1052.095	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	.022	1	-.008	15	.037	3	4.108e-3	2	NC	1	NC	5
390			min	0	15	-.185	1	-.093	2	-1.558e-3	3	NC	1	809.22	2
391		6	max	.022	1	-.009	15	.044	3	4.766e-3	2	NC	1	NC	5
392			min	0	15	-.229	1	-.112	2	-1.827e-3	3	9670.313	4	668.537	2
393		7	max	.021	1	-.011	15	.051	3	5.424e-3	2	NC	1	NC	5
394			min	0	15	-.273	1	-.129	2	-2.096e-3	3	8575.823	4	579.728	2
395		8	max	.02	1	-.013	15	.056	3	6.082e-3	2	NC	1	NC	5
396			min	0	15	-.316	1	-.143	2	-2.366e-3	3	7918.965	4	521.507	2
397		9	max	.019	1	-.014	12	.061	3	6.74e-3	2	NC	3	NC	5
398			min	0	15	-.36	1	-.153	2	-2.635e-3	3	7565.404	4	483.595	2
399		10	max	.019	1	-.015	12	.063	3	7.398e-3	2	NC	3	NC	5
400			min	0	15	-.403	1	-.16	2	-2.905e-3	3	7453.555	4	460.774	2
401		11	max	.018	1	-.017	12	.065	3	8.056e-3	2	NC	3	NC	5
402			min	0	15	-.446	1	-.163	2	-3.174e-3	3	7565.404	4	450.636	2
403		12	max	.017	1	-.018	12	.064	3	8.715e-3	2	NC	1	NC	5
404			min	0	15	-.488	1	-.161	2	-3.443e-3	3	7918.965	4	452.764	2
405		13	max	.016	1	-.018	12	.062	3	9.373e-3	2	NC	1	NC	5
406			min	0	15	-.531	1	-.154	2	-3.713e-3	3	8575.823	4	468.759	2
407		14	max	.016	1	-.019	12	.057	3	1.003e-2	2	NC	1	NC	5
408			min	0	15	-.573	1	-.142	2	-3.982e-3	3	9670.313	4	503.188	2
409		15	max	.015	1	-.02	12	.051	3	1.069e-2	2	NC	1	NC	5
410			min	0	15	-.615	1	-.124	2	-4.251e-3	3	NC	1	566.542	2
411		16	max	.014	1	-.021	12	.041	3	1.135e-2	2	NC	1	NC	5
412			min	0	15	-.657	1	-.1	2	-4.521e-3	3	NC	1	684.502	2
413		17	max	.013	1	-.021	12	.03	3	1.2e-2	2	NC	1	NC	5
414			min	0	15	-.698	1	-.069	2	-4.79e-3	3	NC	1	935.348	2
415		18	max	.013	1	-.022	12	.015	3	1.266e-2	2	NC	1	NC	4
416			min	0	15	-.74	1	-.03	2	-5.06e-3	3	NC	1	1712.213	2
417		19	max	.012	1	-.022	12	.022	1	1.332e-2	2	NC	1	NC	1
418			min	0	15	-.782	1	-.002	3	-5.329e-3	3	NC	1	NC	1
419	M6	1	max	.043	1	0	15	0	1	0	1	NC	1	NC	1
420			min	.001	15	-.014	1	0	1	0	1	NC	1	NC	1
421		2	max	.041	1	0	3	0	1	0	1	NC	1	NC	1
422			min	.001	15	-.094	1	0	1	0	1	NC	1	NC	1
423		3	max	.039	1	0	3	0	1	0	1	NC	1	NC	1
424			min	.001	15	-.175	1	0	1	0	1	NC	1	NC	1
425		4	max	.037	1	0	3	0	1	0	1	NC	1	NC	1
426			min	.001	15	-.255	1	0	1	0	1	NC	1	NC	1
427		5	max	.035	1	0	3	0	1	0	1	NC	1	NC	1
428			min	.001	15	-.336	1	0	1	0	1	NC	1	NC	1
429		6	max	.033	1	0	3	0	1	0	1	NC	1	NC	1
430			min	.001	15	-.416	1	0	1	0	1	9670.313	4	NC	1
431		7	max	.031	1	0	3	0	1	0	1	NC	1	NC	1
432			min	.001	15	-.496	1	0	1	0	1	8575.823	4	NC	1
433		8	max	.029	1	0	3	0	1	0	1	NC	1	NC	1
434			min	.001	15	-.576	1	0	1	0	1	7918.965	4	NC	1
435		9	max	.027	1	0	3	0	1	0	1	NC	3	NC	1
436			min	0	15	-.655	1	0	1	0	1	7565.404	4	NC	1
437		10	max	.025	1	.002	3	0	1	0	1	NC	3	NC	1
438			min	0	15	-.735	1	0	1	0	1	7453.555	4	NC	1
439		11	max	.023	1	.003	3	0	1	0	1	NC	3	NC	1
440			min	0	15	-.814	1	0	1	0	1	7565.404	4	NC	1
441		12	max	.021	1	.004	3	0	1	0	1	NC	1	NC	1
442			min	0	15	-.893	1	0	1	0	1	7918.965	4	NC	1
443		13	max	.019	1	.005	3	0	1	0	1	NC	1	NC	1
444			min	0	15	-.971	1	0	1	0	1	8575.823	4	NC	1
445		14	max	.02	3	.007	3	0	1	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
446			min	0	15	-1.05	1	0	1	0	1	9670.313	4	NC	1
447		15	max	.021	3	.009	3	0	1	0	1	NC	1	NC	1
448			min	0	10	-1.128	1	0	1	0	1	8218.4	3	NC	1
449		16	max	.022	3	.01	3	0	1	0	1	NC	1	NC	1
450			min	-.001	10	-1.206	1	0	1	0	1	6888.18	3	NC	1
451		17	max	.023	3	.012	3	0	1	0	1	NC	1	NC	1
452			min	-.002	10	-1.284	1	0	1	0	1	5883.732	3	NC	1
453		18	max	.024	3	.014	3	0	1	0	1	NC	1	NC	1
454			min	-.004	10	-1.362	1	0	1	0	1	5110.982	3	NC	1
455		19	max	.025	3	.016	3	0	1	0	1	NC	1	NC	1
456			min	-.005	2	-1.439	1	0	1	0	1	4507.817	3	NC	1
457	M9	1	max	.026	1	0	15	.002	1	4.8e-4	3	NC	1	NC	1
458			min	0	15	-.008	1	-.001	3	-1.476e-3	2	NC	1	NC	1
459		2	max	.025	1	-.002	15	.026	2	7.494e-4	3	NC	1	NC	4
460			min	0	15	-.052	1	-.011	3	-2.134e-3	2	NC	1	3058.725	2
461		3	max	.024	1	-.004	15	.049	2	1.019e-3	3	NC	1	NC	5
462			min	0	15	-.097	1	-.02	3	-2.792e-3	2	NC	1	1548.821	2
463		4	max	.023	1	-.006	15	.072	2	1.288e-3	3	NC	1	NC	5
464			min	0	15	-.141	1	-.029	3	-3.45e-3	2	NC	1	1052.095	2
465		5	max	.022	1	-.008	15	.093	2	1.558e-3	3	NC	1	NC	5
466			min	0	15	-.185	1	-.037	3	-4.108e-3	2	NC	1	809.22	2
467		6	max	.022	1	-.009	15	.112	2	1.827e-3	3	NC	1	NC	5
468			min	0	15	-.229	1	-.044	3	-4.766e-3	2	9670.313	4	668.537	2
469		7	max	.021	1	-.011	15	.129	2	2.096e-3	3	NC	1	NC	5
470			min	0	15	-.273	1	-.051	3	-5.424e-3	2	8575.823	4	579.728	2
471		8	max	.02	1	-.013	15	.143	2	2.366e-3	3	NC	1	NC	5
472			min	0	15	-.316	1	-.056	3	-6.082e-3	2	7918.965	4	521.507	2
473		9	max	.019	1	-.014	12	.153	2	2.635e-3	3	NC	3	NC	5
474			min	0	15	-.36	1	-.061	3	-6.74e-3	2	7565.404	4	483.595	2
475		10	max	.019	1	-.015	12	.16	2	2.905e-3	3	NC	3	NC	5
476			min	0	15	-.403	1	-.063	3	-7.398e-3	2	7453.555	4	460.774	2
477		11	max	.018	1	-.017	12	.163	2	3.174e-3	3	NC	3	NC	5
478			min	0	15	-.446	1	-.065	3	-8.056e-3	2	7565.404	4	450.636	2
479		12	max	.017	1	-.018	12	.161	2	3.443e-3	3	NC	1	NC	5
480			min	0	15	-.488	1	-.064	3	-8.715e-3	2	7918.965	4	452.764	2
481		13	max	.016	1	-.018	12	.154	2	3.713e-3	3	NC	1	NC	5
482			min	0	15	-.531	1	-.062	3	-9.373e-3	2	8575.823	4	468.759	2
483		14	max	.016	1	-.019	12	.142	2	3.982e-3	3	NC	1	NC	5
484			min	0	15	-.573	1	-.057	3	-1.003e-2	2	9670.313	4	503.188	2
485		15	max	.015	1	-.02	12	.124	2	4.251e-3	3	NC	1	NC	5
486			min	0	15	-.615	1	-.051	3	-1.069e-2	2	NC	1	566.542	2
487		16	max	.014	1	-.021	12	.1	2	4.521e-3	3	NC	1	NC	5
488			min	0	15	-.657	1	-.041	3	-1.135e-2	2	NC	1	684.502	2
489		17	max	.013	1	-.021	12	.069	2	4.79e-3	3	NC	1	NC	5
490			min	0	15	-.698	1	-.03	3	-1.2e-2	2	NC	1	935.348	2
491		18	max	.013	1	-.022	12	.03	2	5.06e-3	3	NC	1	NC	4
492			min	0	15	-.74	1	-.015	3	-1.266e-2	2	NC	1	1712.213	2
493		19	max	.012	1	-.022	12	.002	3	5.329e-3	3	NC	1	NC	1
494			min	0	15	-.782	1	-.022	1	-1.332e-2	2	NC	1	NC	1