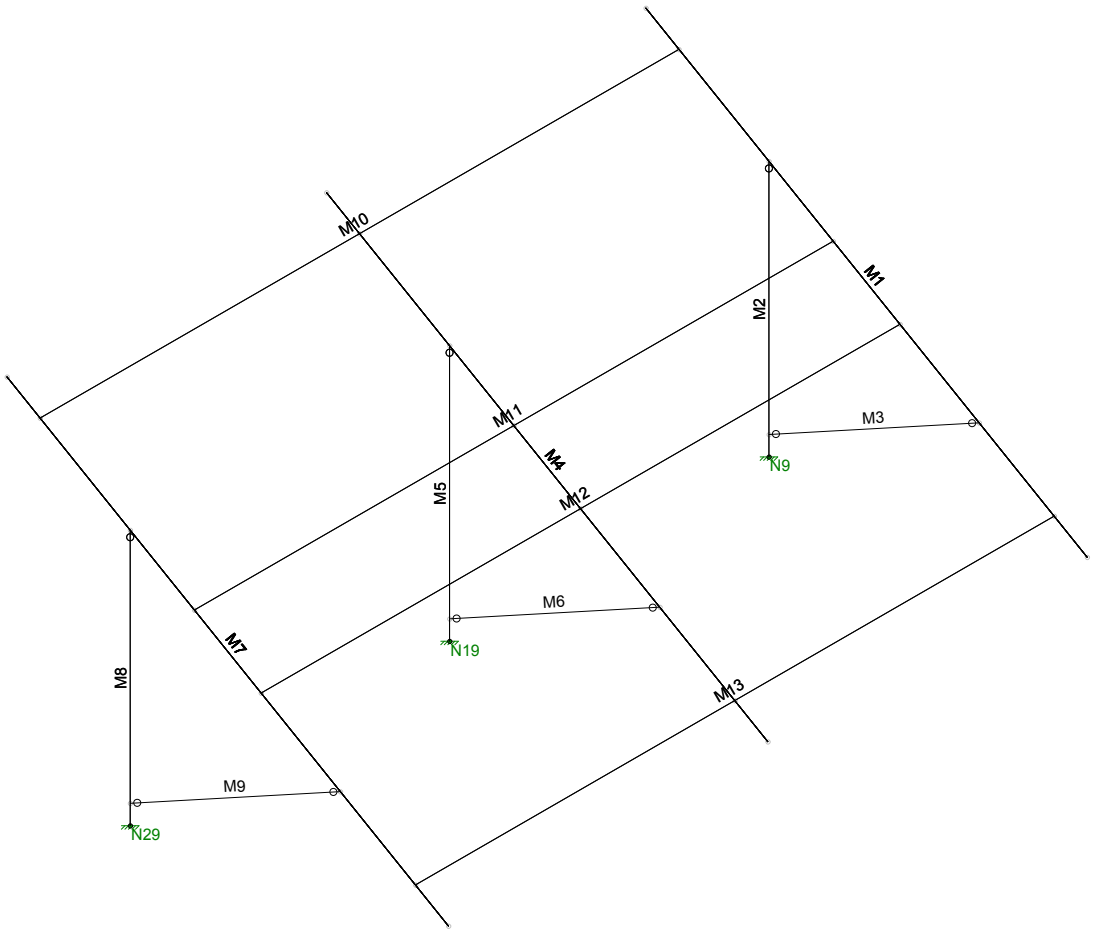


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

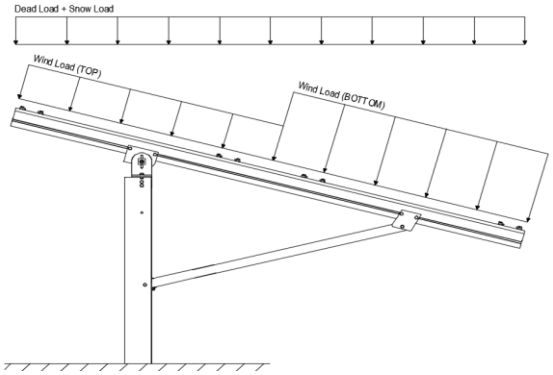
1.2 Construction

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 =	1700	mm	1550	mm
Width =	1050	mm	970	mm
Dead Load =	3.00	psf	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 =	140	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z = 30.77 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	*(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

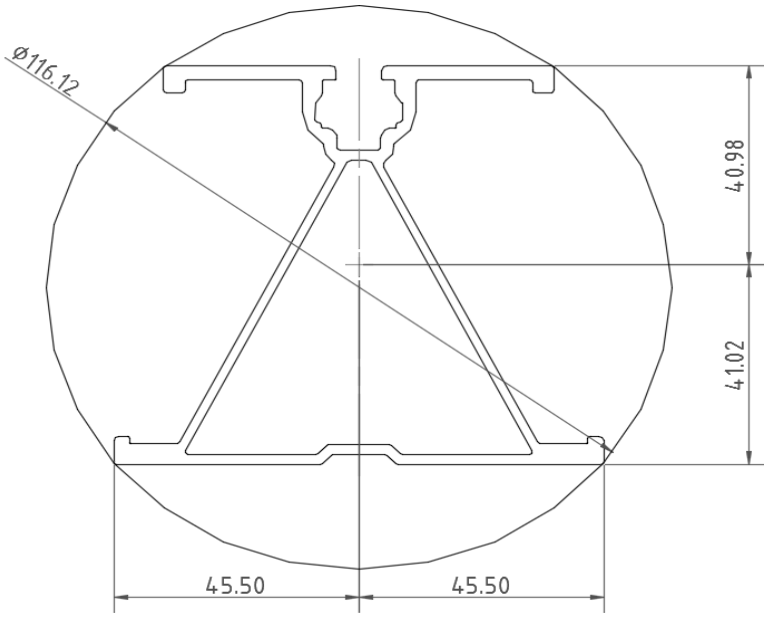
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	108	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 =	1.723	k-ft
M_z =	0.093	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	70%	

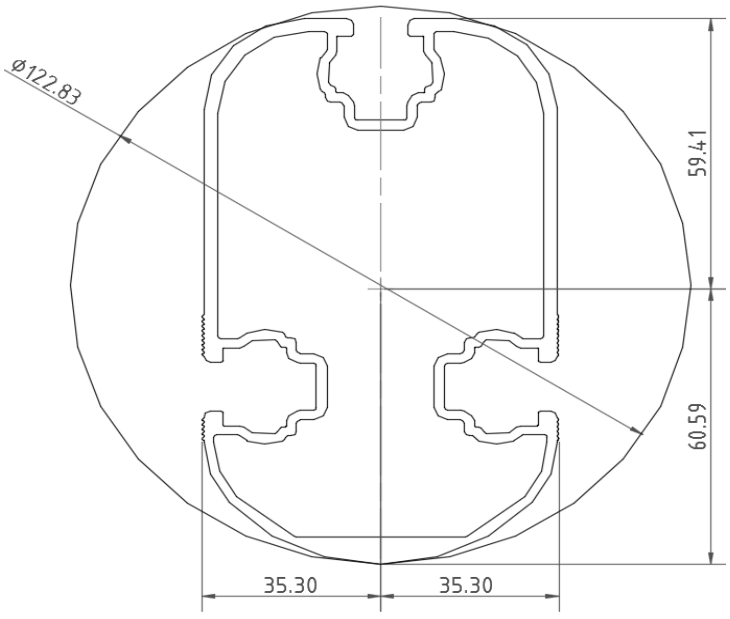


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.412	k-ft
M_z =	0.000	k-ft
P_n =	0.002	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	88%	

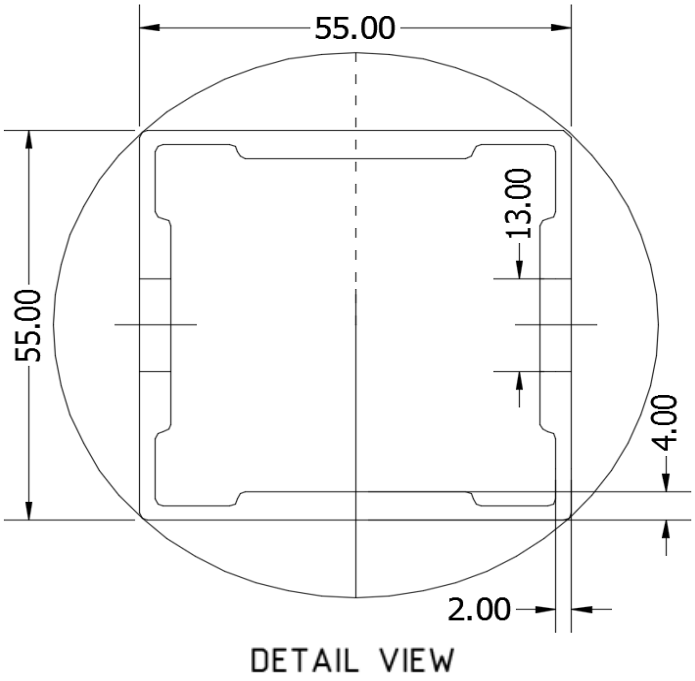


DETAIL VIEW

4.3 Strut Design

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

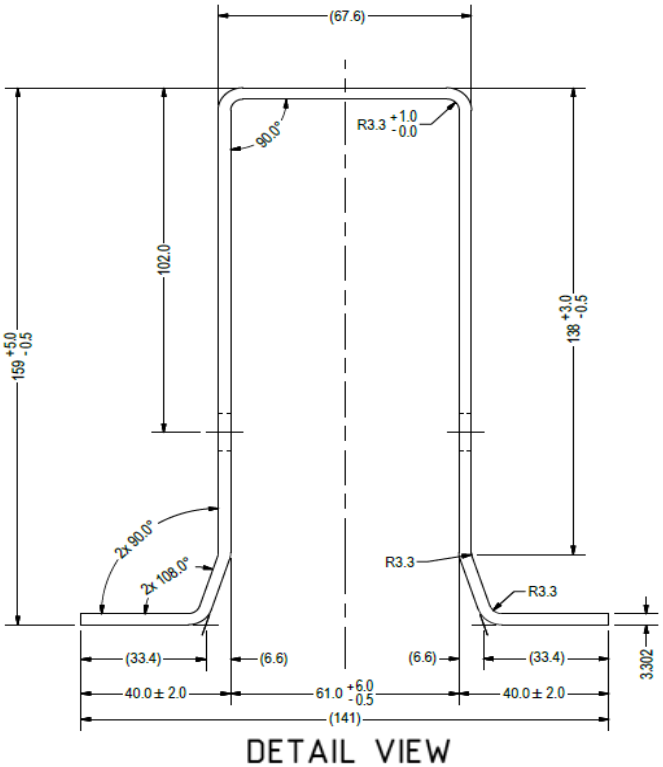
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	4.452	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	33%	



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 =	79.31	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 =	13.883	k-ft
M_z =	0.000	k-ft
P_r =	-5.200	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	84%	



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 =	6.72	k
Maximum Lateral Load =	3.89	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 =	0.89	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

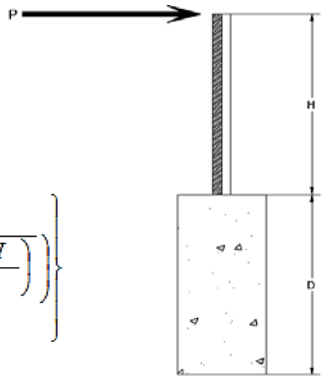
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	0.89	k
Height of Pole Above Grade, H =	6.61	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 =	4.83	
Required Footing Depth, D =	8.79	ft

2nd Trial @ D_2 =	6.02	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.20	ksf
Constant 2.34P/(S_1B), A =	2.61	
Required Footing Depth, D =	5.83	ft

3rd Trial @ D_3 =	5.92	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.18	ksf
Constant 2.34P/(S_1B), A =	2.65	
Required Footing Depth, D =	5.89	ft

4th Trial @ D_4 =	5.91	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.18	ksf
Constant 2.34P/(S_1B), A =	2.66	
Required Footing Depth, D =	5.90	ft

5th Trial @ D_5 =	5.90	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.18	ksf
Constant 2.34P/(S_1B), A =	2.66	
Required Footing Depth, D =	6.00	ft

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

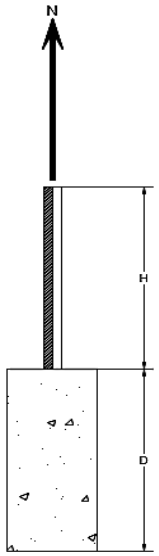
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.08	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	2.00	k
Required Concrete Volume, V =	13.76	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.66
2	0.4	0.2	118.10	6.56
3	0.6	0.2	118.10	6.45
4	0.8	0.2	118.10	6.35
5	1	0.2	118.10	6.25
6	1.2	0.2	118.10	6.14
7	1.4	0.2	118.10	6.04
8	1.6	0.2	118.10	5.94
9	1.8	0.2	118.10	5.83
10	2	0.2	118.10	5.73
11	2.2	0.2	118.10	5.62
12	2.4	0.2	118.10	5.52
13	2.6	0.2	118.10	5.42
14	2.8	0.2	118.10	5.31
15	3	0.2	118.10	5.21
16	3.2	0.2	118.10	5.11
17	3.4	0.2	118.10	5.00
18	3.6	0.2	118.10	4.90
19	3.8	0.2	118.10	4.79
20	4	0.2	118.10	4.69
21	4.2	0.2	118.10	4.59
22	4.4	0.2	118.10	4.48
23	4.6	0.2	118.10	4.38
24	0	0.0	0.00	4.38
25	0	0.0	0.00	4.38
26	0	0.0	0.00	4.38
27	0	0.0	0.00	4.38
28	0	0.0	0.00	4.38
29	0	0.0	0.00	4.38
30	0	0.0	0.00	4.38
31	0	0.0	0.00	4.38
32	0	0.0	0.00	4.38
33	0	0.0	0.00	4.38
34	0	0.0	0.00	4.38
Max	4.6	Sum	1.09	

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



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.85	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	18.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

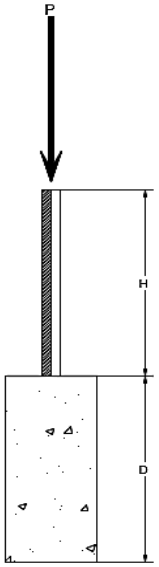
Weight of Concrete

Footing Volume	18.85	ft^3
Weight	2.73	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.83	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.05	k
Applied Force =	6.58	k
Utilization =	65%	

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



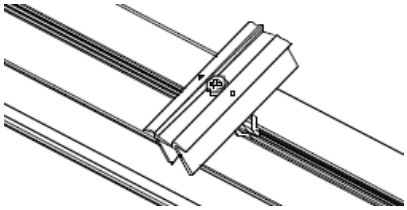
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

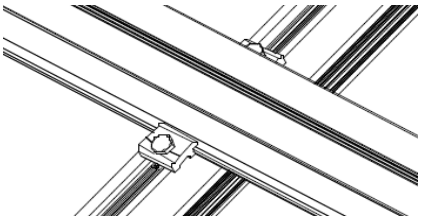
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.665 k
Allowable Uplift	=	1.214 k
Utilization	=	55%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.135 k
Allowable Uplift	=	2.180 k
Utilization	=	98%

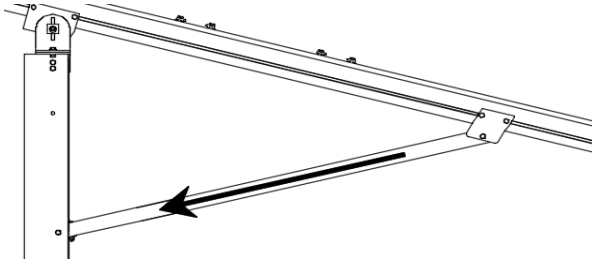


6.2 Strut Connections

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	=	4.452 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	50%

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

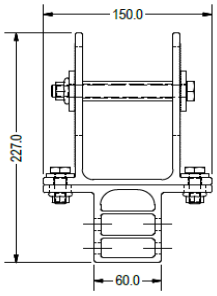


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

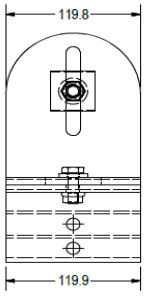
6.3 Girder to Post Connection

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

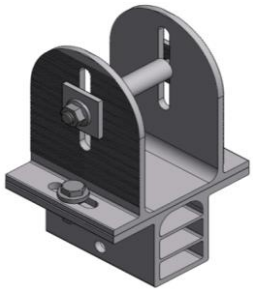
Maximum Tensile Load	=	4.516 k
Allowable Load	=	5.649 k
Utilization	=	80%



FRONT VIEW



SIDE VIEW



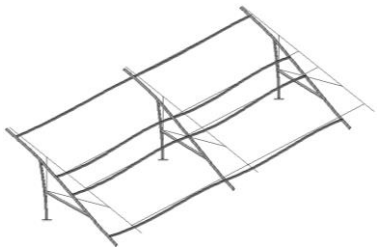
7. SEISMIC DESIGN

7.1 Seismic Drift - N/A

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

Mean Height, h_{sx}	=	74.11 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.482 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:

3.4.14

L_b = 108 in

J = 0.432

298.779

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

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= 27.7 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

$\varphi F_L St$= 25.1 ksi

Ix = 897074 mm^4

2.155 in^4

y = 41.015 mm

Sx = 1.335 in^3

$M_{max}St$ = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 108

J = 0.432

190.005

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

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= 28.9

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

$M_{max}Wk$ = 1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 30.3

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= φb[Bt-Dt*√(Rb/t)]

φF_L= 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L St$= 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

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

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:	Weak Axis:
3.4.14	**3.4.14**
L_b = 61 in	L_b = 61
J = 0.942	J = 0.942
95.1963	95.1963
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$
S1 = 0.51461	S1 = 0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$	$S2 = \left(\frac{C_c}{1.6}\right)^2$
S2 = 1701.56	S2 = 1701.56
φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L= 30.2 ksi	φF_L= 30.2
3.4.16	**3.4.16**
b/t = 24.5	b/t = 24.5
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$
S1 = 12.2	S1 = 12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$	$S2 = \frac{k_1 Bp}{1.6Dp}$
S2 = 46.7	S2 = 46.7
φF_L= φb[Bp-1.6Dp*b/t]	φF_L= φb[Bp-1.6Dp*b/t]
φF_L= 28.2 ksi	φF_L= 28.2 ksi
3.4.16.1 Not Used	**3.4.16.1**
Rb/t = 0.0	N/A for Weak Direction
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$	
S1 = 1.1	
$S2 = C_t$	
S2 = 141.0	
φF_L= 1.17φyFcy	
φF_L= 38.9 ksi	
3.4.18	**3.4.18**
h/t = 24.5	h/t = 24.5
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$
S1 = 36.9	S1 = 36.9
m = 0.65	m = 0.65
C_0 = 27.5	C_0 = 27.5
Cc = 27.5	Cc = 27.5
$S2 = \frac{k_1 Bbr}{mDbr}$	$S2 = \frac{k_1 Bbr}{mDbr}$
S2 = 77.3	S2 = 77.3
φF_L= 1.3φyFcy	φF_L= 1.3φyFcy
φF_L= 43.2 ksi	φF_L= 43.2 ksi
φF_LSt= 28.2 ksi	φF_LWk= 28.2 ksi
Ix = 279836 mm^4	Iy = 279836 mm^4
0.672 in^4	0.672 in^4
y = 27.5 mm	x = 27.5 mm
Sx = 0.621 in^3	Sy = 0.621 in^3
M_{max}St = 1.460 k-ft	M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

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

φF_L = 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

$\varphi F_L = \varphi c[Bp-1.6Dp*b/t]$

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

$\varphi F_L = \varphi c[Bp-1.6Dp*b/t]$

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

$\varphi F_L = \varphi yFcy$

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	79.31	in	
Pr =	-5.20	k	(LRFD Factored Load)
Mr (Strong) =	13.88	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	114.11			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	19.28	ksi		
Fe =	21.98	ksi		
Pn =	42.988	k		

Torsional/Flexural Torsional Buckling:

Fcr =	14.4957	ksi
Fey =	56.0686	ksi
Fez =	18.5443	ksi
Pn =	32.3254	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.121	<	0.2	
Utilization =	0.84	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.121	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 84%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-39.836	-39.836	0	0
2	M11	Y	-39.836	-39.836	0	0
3	M12	Y	-39.836	-39.836	0	0
4	M13	Y	-39.836	-39.836	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	-98.692	-98.692	0	0
2	M11	y	-98.692	-98.692	0	0
3	M12	y	-158.766	-158.766	0	0
4	M13	y	-158.766	-158.766	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	197.385	197.385	0	0
2	M11	y	197.385	197.385	0	0
3	M12	y	94.402	94.402	0	0
4	M13	y	94.402	94.402	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	846.844	2	2212.99	2	206.472	2	.271	2	.007	3	3.7	3
2		min	-1131.414	3	-1678.683	3	-244.803	3	-.363	3	-.014	2	.175	15
3	N19	max	2940.555	2	6157.662	2	0	2	0	2	0	1	7.289	3
4		min	-2989.339	3	-5151.295	3	0	3	0	3	0	15	.276	15
5	N29	max	846.844	2	2212.99	2	244.803	3	.363	3	.014	2	3.7	3
6		min	-1131.414	3	-1678.683	3	-206.472	2	-.271	2	-.007	3	.175	15
7	Totals:	max	4634.244	2	10583.643	2	0	9						
8		min	-5252.166	3	-8508.661	3	0	1						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	2	0	15	0	1	0	1	0	1
2			min	0	1	0	3	-.001	1	0	1	0	1	0	1
3		2	max	-.261	15	-.452	15	0	15	0	1	0	15	0	4
4			min	-1.11	4	-1.922	4	-.001	1	0	1	0	1	0	15
5		3	max	-8.7	15	312.175	3	-5.335	15	.06	3	.218	1	.3	2
6			min	-178.795	1	-690.078	2	-126.493	1	-.219	2	.01	15	-.133	3
7		4	max	-8.961	15	311.051	3	-5.335	15	.06	3	.14	1	.729	2
8			min	-179.66	1	-691.577	2	-126.493	1	-.219	2	.006	15	-.326	3
9		5	max	-9.222	15	309.927	3	-5.335	15	.06	3	.061	1	1.159	2
10			min	-180.526	1	-693.075	2	-126.493	1	-.219	2	0	10	-.519	3
11		6	max	270.689	3	602.446	2	4.228	3	.053	2	.09	2	1.113	2
12			min	-878.977	2	-185.162	3	-174.774	1	-.066	3	-.034	3	-.53	3
13		7	max	270.04	3	600.948	2	4.228	3	.053	2	.009	10	.74	2
14			min	-879.842	2	-186.286	3	-174.774	1	-.066	3	-.032	3	-.415	3
15		8	max	269.391	3	599.449	2	4.228	3	.053	2	-.006	15	.368	2
16			min	-880.707	2	-187.41	3	-174.774	1	-.066	3	-.136	1	-.299	3
17		9	max	242.272	3	102.801	3	-5.189	12	-.002	15	.079	1	.148	2
18			min	-991.091	1	-67.695	2	-187.49	1	-.161	2	.001	10	-.245	3
19		10	max	241.623	3	101.677	3	-5.189	12	-.002	15	.048	3	.191	2
20			min	-991.956	1	-69.193	2	-187.49	1	-.161	2	-.043	2	-.308	3
21		11	max	240.975	3	100.553	3	-5.189	12	-.002	15	.043	3	.234	2
22			min	-992.821	1	-70.692	2	-187.49	1	-.161	2	-.153	1	-.371	3
23		12	max	209.896	3	822.119	3	116.096	2	.327	3	.129	1	.457	2
24			min	-1176.803	1	-515.426	2	-292.286	3	-.272	2	.006	15	-.716	3
25		13	max	209.247	3	820.995	3	116.096	2	.327	3	.153	1	.778	2
26			min	-1177.669	1	-516.924	2	-292.286	3	-.272	2	-.153	3	-1.226	3
27		14	max	181.208	1	476.144	2	-4.505	15	.216	2	.098	3	1.085	2
28			min	9.487	15	-743.331	3	-90.961	1	-.419	3	-.07	2	-1.713	3
29		15	max	180.342	1	474.645	2	-4.505	15	.216	2	.051	3	.79	2
30			min	9.226	15	-744.455	3	-90.961	1	-.419	3	-.121	1	-1.252	3
31		16	max	179.477	1	473.147	2	-4.505	15	.216	2	.005	3	.496	2
32			min	8.965	15	-745.579	3	-90.961	1	-.419	3	-.178	1	-.789	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
33		17	max	178.612	1	471.648	2	-4.505	15	.216	2	-.01	15	.203	2
34			min	8.704	15	-746.703	3	-90.961	1	-.419	3	-.234	1	-.326	3
35		18	max	1.11	4	1.923	4	.001	1	0	1	0	15	0	4
36			min	.261	15	.452	15	0	15	0	1	0	1	0	15
37		19	max	0	1	.003	2	.001	1	0	1	0	1	0	1
38			min	0	1	-.007	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.016	2	0	1	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	4
42			min	-1.11	4	-1.92	4	0	1	0	1	0	1	0	15
43		3	max	.486	3	984.532	3	0	1	0	1	0	1	.76	2
44			min	-327.83	1	-1977.01	2	0	1	0	1	0	1	-.384	3
45		4	max	-.163	3	983.408	3	0	1	0	1	0	1	1.987	2
46			min	-328.695	1	-1978.509	2	0	1	0	1	0	1	-.994	3
47		5	max	-.812	3	982.284	3	0	1	0	1	0	1	3.216	2
48			min	-329.56	1	-1980.007	2	0	1	0	1	0	1	-1.604	3
49		6	max	1071.019	3	1825.535	2	0	1	0	1	0	1	3.048	2
50			min	-2462.37	2	-768.628	3	0	1	0	1	0	1	-1.572	3
51		7	max	1070.37	3	1824.036	2	0	1	0	1	0	1	1.916	2
52			min	-2463.235	2	-769.752	3	0	1	0	1	0	1	-1.094	3
53		8	max	1069.721	3	1822.538	2	0	1	0	1	0	1	.784	2
54			min	-2464.1	2	-770.876	3	0	1	0	1	0	1	-.616	3
55		9	max	1073.784	3	256.512	3	0	1	0	1	0	1	.115	1
56			min	-2579.423	2	-212.81	2	0	1	0	1	0	1	-.373	3
57		10	max	1073.135	3	255.389	3	0	1	0	1	0	1	.238	1
58			min	-2580.289	2	-214.309	2	0	1	0	1	0	1	-.532	3
59		11	max	1072.486	3	254.265	3	0	1	0	1	0	1	.369	2
60			min	-2581.154	2	-215.808	2	0	1	0	1	0	1	-.69	3
61		12	max	1084.468	3	2269.541	3	0	1	0	1	0	1	1.051	2
62			min	-2752.664	1	-1615.032	2	0	1	0	1	0	1	-1.654	3
63		13	max	1083.819	3	2268.417	3	0	1	0	1	0	1	2.054	2
64			min	-2753.529	1	-1616.531	2	0	1	0	1	0	1	-3.062	3
65		14	max	330.792	1	1343.839	2	0	1	0	1	0	1	3.017	2
66			min	1.813	3	-1966.593	3	0	1	0	1	0	1	-4.412	3
67		15	max	329.926	1	1342.341	2	0	1	0	1	0	1	2.184	2
68			min	1.164	3	-1967.717	3	0	1	0	1	0	1	-3.191	3
69		16	max	329.061	1	1340.842	2	0	1	0	1	0	1	1.351	2
70			min	.515	3	-1968.841	3	0	1	0	1	0	1	-1.97	3
71		17	max	328.196	1	1339.343	2	0	1	0	1	0	1	.519	2
72			min	-.134	3	-1969.965	3	0	1	0	1	0	1	-.747	3
73		18	max	1.11	4	1.924	4	0	1	0	1	0	1	0	4
74			min	.261	15	.452	15	0	1	0	1	0	1	0	15
75		19	max	0	1	.008	2	0	1	0	1	0	1	0	1
76			min	0	1	-.015	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	.001	1	0	1	0	1	0	1
78			min	0	1	0	3	0	15	0	1	0	1	0	1
79		2	max	-.261	15	-.452	15	.001	1	0	1	0	1	0	4
80			min	-1.11	4	-1.922	4	0	15	0	1	0	15	0	15
81		3	max	-8.7	15	312.175	3	126.493	1	.219	2	-.01	15	.3	2
82			min	-178.795	1	-690.078	2	5.335	15	-.06	3	-.218	1	-.133	3
83		4	max	-8.961	15	311.051	3	126.493	1	.219	2	-.006	15	.729	2
84			min	-179.66	1	-691.577	2	5.335	15	-.06	3	-.14	1	-.326	3
85		5	max	-9.222	15	309.927	3	126.493	1	.219	2	0	10	1.159	2
86			min	-180.526	1	-693.075	2	5.335	15	-.06	3	-.061	1	-.519	3
87		6	max	270.689	3	602.446	2	174.774	1	.066	3	.034	3	1.113	2
88			min	-878.977	2	-185.162	3	-4.228	3	-.053	2	-.09	2	-.53	3
89		7	max	270.04	3	600.948	2	174.774	1	.066	3	.032	3	.74	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	-879.842	2	-186.286	3	-4.228	3	-.053	2	-.009	10	-.415	3
91		8	max	269.391	3	599.449	2	174.774	1	.066	3	.136	1	.368	2
92			min	-880.707	2	-187.41	3	-4.228	3	-.053	2	.006	15	-.299	3
93		9	max	242.272	3	102.801	3	187.49	1	.161	2	-.001	10	.148	2
94			min	-991.091	1	-67.695	2	5.189	12	.002	15	-.079	1	-.245	3
95		10	max	241.623	3	101.677	3	187.49	1	.161	2	.043	2	.191	2
96			min	-991.956	1	-69.193	2	5.189	12	.002	15	-.048	3	-.308	3
97		11	max	240.975	3	100.553	3	187.49	1	.161	2	.153	1	.234	2
98			min	-992.821	1	-70.692	2	5.189	12	.002	15	-.043	3	-.371	3
99		12	max	209.896	3	822.119	3	292.286	3	.272	2	-.006	15	.457	2
100			min	-1176.803	1	-515.426	2	-116.096	2	-.327	3	-.129	1	-.716	3
101		13	max	209.247	3	820.995	3	292.286	3	.272	2	.153	3	.778	2
102			min	-1177.669	1	-516.924	2	-116.096	2	-.327	3	-.153	1	-1.226	3
103		14	max	181.208	1	476.144	2	90.961	1	.419	3	.07	2	1.085	2
104			min	9.487	15	-743.331	3	4.505	15	-.216	2	-.098	3	-1.713	3
105		15	max	180.342	1	474.645	2	90.961	1	.419	3	.121	1	.79	2
106			min	9.226	15	-744.455	3	4.505	15	-.216	2	-.051	3	-1.252	3
107		16	max	179.477	1	473.147	2	90.961	1	.419	3	.178	1	.496	2
108			min	8.965	15	-745.579	3	4.505	15	-.216	2	-.005	3	-.789	3
109		17	max	178.612	1	471.648	2	90.961	1	.419	3	.234	1	.203	2
110			min	8.704	15	-746.703	3	4.505	15	-.216	2	.01	15	-.326	3
111		18	max	1.11	4	1.923	4	0	15	0	1	0	1	0	4
112			min	.261	15	.452	15	-.001	1	0	1	0	15	0	15
113		19	max	0	1	.003	2	0	15	0	1	0	1	0	1
114			min	0	1	-.007	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	90.97	1	468.362	2	-8.182	15	.012	2	.271	1	.216	2
116			min	4.505	15	-748.983	3	-177.023	1	-.025	3	.012	15	-.419	3
117		2	max	90.97	1	342.164	2	-6.396	15	.012	2	.113	1	.234	3
118			min	4.505	15	-556.239	3	-139.232	1	-.025	3	.005	15	-.189	2
119		3	max	90.97	1	215.965	2	-4.609	15	.012	2	.027	3	.694	3
120			min	4.505	15	-363.495	3	-101.442	1	-.025	3	-.011	9	-.469	2
121		4	max	90.97	1	89.766	2	-2.823	15	.012	2	.009	3	.961	3
122			min	4.505	15	-170.75	3	-63.651	1	-.025	3	-.09	1	-.621	2
123		5	max	90.97	1	21.994	3	-1.036	15	.012	2	-.005	12	1.035	3
124			min	4.505	15	-37.042	1	-25.861	1	-.025	3	-.135	1	-.648	2
125		6	max	90.97	1	214.738	3	11.93	1	.012	2	-.007	15	.917	3
126			min	4.505	15	-162.631	2	-11.539	3	-.025	3	-.142	1	-.549	2
127		7	max	90.97	1	407.482	3	49.72	1	.012	2	-.005	15	.606	3
128			min	4.505	15	-288.83	2	-8.86	3	-.025	3	-.111	1	-.323	2
129		8	max	90.97	1	600.226	3	87.511	1	.012	2	-.001	15	.102	3
130			min	4.505	15	-415.028	2	-6.181	3	-.025	3	-.042	1	.002	15
131		9	max	90.97	1	792.971	3	125.301	1	.012	2	.064	1	.507	2
132			min	4.505	15	-541.227	2	-3.501	3	-.025	3	-.042	3	-.595	3
133		10	max	90.97	1	985.715	3	163.092	1	.012	2	.208	1	1.112	2
134			min	4.505	15	-667.425	2	-.822	3	-.025	3	-.044	3	-1.484	3
135		11	max	90.97	1	541.227	2	3.501	3	.025	3	.064	1	.507	2
136			min	4.505	15	-792.971	3	-125.301	1	-.012	2	-.042	3	-.595	3
137		12	max	90.97	1	415.028	2	6.181	3	.025	3	-.001	15	.102	3
138			min	4.505	15	-600.226	3	-87.511	1	-.012	2	-.042	1	.002	15
139		13	max	90.97	1	288.83	2	8.86	3	.025	3	-.005	15	.606	3
140			min	4.505	15	-407.482	3	-49.72	1	-.012	2	-.111	1	-.323	2
141		14	max	90.97	1	162.631	2	11.539	3	.025	3	-.007	15	.917	3
142			min	4.505	15	-214.738	3	-11.93	1	-.012	2	-.142	1	-.549	2
143		15	max	90.97	1	37.042	1	25.861	1	.025	3	-.005	12	1.035	3
144			min	4.505	15	-21.994	3	1.036	15	-.012	2	-.135	1	-.648	2
145		16	max	90.97	1	170.75	3	63.651	1	.025	3	.009	3	.961	3
146			min	4.505	15	-89.766	2	2.823	15	-.012	2	-.09	1	-.621	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	90.97	1	363.495	3	101.442	1	.025	3	.027	3	.694	3
148			min	4.505	15	-215.965	2	4.609	15	-.012	2	-.011	9	-.469	2
149		18	max	90.97	1	556.239	3	139.232	1	.025	3	.113	1	.234	3
150			min	4.505	15	-342.164	2	6.396	15	-.012	2	.005	15	-.189	2
151		19	max	90.97	1	748.983	3	177.023	1	.025	3	.271	1	.216	2
152			min	4.505	15	-468.362	2	8.182	15	-.012	2	.012	15	-.419	3
153	M11	1	max	225.334	1	441.462	2	-8.5	15	0	15	.309	1	.123	1
154			min	-285.364	3	-723.225	3	-183.469	1	-.004	3	.014	15	-.441	3
155		2	max	225.334	1	315.264	2	-6.713	15	0	15	.145	1	.186	3
156			min	-285.364	3	-530.481	3	-145.678	1	-.004	3	.006	15	-.267	2
157		3	max	225.334	1	189.065	2	-4.927	15	0	15	.048	3	.62	3
158			min	-285.364	3	-337.736	3	-107.888	1	-.004	3	0	15	-.519	2
159		4	max	225.334	1	62.866	2	-3.14	15	0	15	.024	3	.861	3
160			min	-285.364	3	-144.992	3	-70.097	1	-.004	3	-.071	1	-.645	2
161		5	max	225.334	1	47.752	3	-1.354	15	0	15	.004	3	.91	3
162			min	-285.364	3	-63.332	2	-32.307	1	-.004	3	-.122	1	-.645	2
163		6	max	225.334	1	240.496	3	5.944	9	0	15	-.006	15	.766	3
164			min	-285.364	3	-189.531	2	-16.632	3	-.004	3	-.136	1	-.519	2
165		7	max	225.334	1	433.24	3	43.274	1	0	15	-.005	15	.429	3
166			min	-285.364	3	-315.729	2	-13.952	3	-.004	3	-.111	1	-.266	2
167		8	max	225.334	1	625.985	3	81.064	1	0	15	-.002	15	.113	2
168			min	-285.364	3	-441.928	2	-11.273	3	-.004	3	-.049	1	-.1	3
169		9	max	225.334	1	818.729	3	118.855	1	0	15	.051	1	.618	2
170			min	-285.364	3	-568.127	2	-8.594	3	-.004	3	-.052	3	-.823	3
171		10	max	225.334	1	1011.473	3	156.645	1	.004	1	.189	1	1.249	2
172			min	-285.364	3	-694.325	2	-5.914	3	-.004	3	-.059	3	-1.738	3
173		11	max	225.334	1	568.127	2	8.594	3	.004	3	.051	1	.618	2
174			min	-285.364	3	-818.729	3	-118.855	1	0	15	-.052	3	-.823	3
175		12	max	225.334	1	441.928	2	11.273	3	.004	3	-.002	15	.113	2
176			min	-285.364	3	-625.985	3	-81.064	1	0	15	-.049	1	-.1	3
177		13	max	225.334	1	315.729	2	13.952	3	.004	3	-.005	15	.429	3
178			min	-285.364	3	-433.24	3	-43.274	1	0	15	-.111	1	-.266	2
179		14	max	225.334	1	189.531	2	16.632	3	.004	3	-.006	15	.766	3
180			min	-285.364	3	-240.496	3	-5.944	9	0	15	-.136	1	-.519	2
181		15	max	225.334	1	63.332	2	32.307	1	.004	3	.004	3	.91	3
182			min	-285.364	3	-47.752	3	1.354	15	0	15	-.122	1	-.645	2
183		16	max	225.334	1	144.992	3	70.097	1	.004	3	.024	3	.861	3
184			min	-285.364	3	-62.866	2	3.14	15	0	15	-.071	1	-.645	2
185		17	max	225.334	1	337.736	3	107.888	1	.004	3	.048	3	.62	3
186			min	-285.364	3	-189.065	2	4.927	15	0	15	0	15	-.519	2
187		18	max	225.334	1	530.481	3	145.678	1	.004	3	.145	1	.186	3
188			min	-285.364	3	-315.264	2	6.713	15	0	15	.006	15	-.267	2
189		19	max	225.334	1	723.225	3	183.469	1	.004	3	.309	1	.123	1
190			min	-285.364	3	-441.462	2	8.5	15	0	15	.014	15	-.441	3
191	M12	1	max	31.605	2	664.159	2	-8.571	15	0	15	.326	1	.214	2
192			min	-23.32	9	-291.721	3	-186.327	1	-.004	1	.014	15	.003	15
193		2	max	31.605	2	477.886	2	-6.785	15	0	15	.159	1	.295	3
194			min	-23.32	9	-201.96	3	-148.537	1	-.004	1	.007	15	-.357	2
195		3	max	31.605	2	291.613	2	-4.998	15	0	15	.034	3	.452	3
196			min	-23.32	9	-112.199	3	-110.746	1	-.004	1	0	15	-.742	2
197		4	max	31.605	2	105.341	2	-3.212	15	0	15	.014	3	.519	3
198			min	-23.32	9	-22.438	3	-72.956	1	-.004	1	-.063	1	-.94	2
199		5	max	31.605	2	67.323	3	-1.425	15	0	15	-.002	12	.497	3
200			min	-23.32	9	-80.932	2	-35.165	1	-.004	1	-.117	1	-.952	2
201		6	max	31.605	2	157.085	3	4.951	9	0	15	-.006	15	.384	3
202			min	-23.32	9	-267.205	2	-13.058	3	-.004	1	-.133	1	-.778	2
203		7	max	31.605	2	246.846	3	40.415	1	0	15	-.005	15	.182	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	-23.32	9	-453.477	2	-10.378	3	-.004	1	-.111	1	-.418	2
205		8	max	31.605	2	336.607	3	78.206	1	0	15	-.002	15	.129	2
206			min	-23.32	9	-639.75	2	-7.699	3	-.004	1	-.052	1	-.109	3
207		9	max	31.605	2	426.368	3	115.996	1	0	15	.045	1	.861	2
208			min	-23.32	9	-826.023	2	-5.02	3	-.004	1	-.045	3	-.491	3
209		10	max	31.605	2	516.129	3	153.787	1	0	15	.18	1	1.781	2
210			min	-23.32	9	-1012.295	2	-2.34	3	-.004	1	-.048	3	-.962	3
211		11	max	31.605	2	826.023	2	5.02	3	.004	1	.045	1	.861	2
212			min	-23.32	9	-426.368	3	-115.996	1	0	15	-.045	3	-.491	3
213		12	max	31.605	2	639.75	2	7.699	3	.004	1	-.002	15	.129	2
214			min	-23.32	9	-336.607	3	-78.206	1	0	15	-.052	1	-.109	3
215		13	max	31.605	2	453.477	2	10.378	3	.004	1	-.005	15	.182	3
216			min	-23.32	9	-246.846	3	-40.415	1	0	15	-.111	1	-.418	2
217		14	max	31.605	2	267.205	2	13.058	3	.004	1	-.006	15	.384	3
218			min	-23.32	9	-157.085	3	-4.951	9	0	15	-.133	1	-.778	2
219		15	max	31.605	2	80.932	2	35.165	1	.004	1	-.002	12	.497	3
220			min	-23.32	9	-67.323	3	1.425	15	0	15	-.117	1	-.952	2
221		16	max	31.605	2	22.438	3	72.956	1	.004	1	.014	3	.519	3
222			min	-23.32	9	-105.341	2	3.212	15	0	15	-.063	1	-.94	2
223		17	max	31.605	2	112.199	3	110.746	1	.004	1	.034	3	.452	3
224			min	-23.32	9	-291.613	2	4.998	15	0	15	0	15	-.742	2
225		18	max	31.605	2	201.96	3	148.537	1	.004	1	.159	1	.295	3
226			min	-23.32	9	-477.886	2	6.785	15	0	15	.007	15	-.357	2
227		19	max	31.605	2	291.721	3	186.327	1	.004	1	.326	1	.214	2
228			min	-23.32	9	-664.159	2	8.571	15	0	15	.014	15	.003	15
229	M13	1	max	-5.335	15	687.608	2	-8.177	15	.007	3	.269	1	.219	2
230			min	-126.394	1	-314.455	3	-176.863	1	-.02	2	.012	15	-.06	3
231		2	max	-5.335	15	501.336	2	-6.391	15	.007	3	.111	1	.209	3
232			min	-126.394	1	-224.694	3	-139.073	1	-.02	2	.005	15	-.376	2
233		3	max	-5.335	15	315.063	2	-4.604	15	.007	3	.028	3	.389	3
234			min	-126.394	1	-134.932	3	-101.282	1	-.02	2	-.011	9	-.784	2
235		4	max	-5.335	15	128.79	2	-2.818	15	.007	3	.01	3	.479	3
236			min	-126.394	1	-45.171	3	-63.492	1	-.02	2	-.091	1	-1.006	2
237		5	max	-5.335	15	44.59	3	-1.031	15	.007	3	-.004	12	.479	3
238			min	-126.394	1	-57.482	2	-25.701	1	-.02	2	-.136	1	-1.041	2
239		6	max	-5.335	15	134.351	3	12.089	1	.007	3	-.007	15	.39	3
240			min	-126.394	1	-243.755	2	-11.577	3	-.02	2	-.143	1	-.891	2
241		7	max	-5.335	15	224.112	3	49.88	1	.007	3	-.005	15	.211	3
242			min	-126.394	1	-430.028	2	-8.898	3	-.02	2	-.112	1	-.554	2
243		8	max	-5.335	15	313.874	3	87.67	1	.007	3	-.002	15	-.002	15
244			min	-126.394	1	-616.3	2	-6.219	3	-.02	2	-.043	1	-.058	3
245		9	max	-5.335	15	403.635	3	125.461	1	.007	3	.064	1	.679	2
246			min	-126.394	1	-802.573	2	-3.539	3	-.02	2	-.042	3	-.417	3
247		10	max	-5.335	15	493.396	3	163.251	1	.007	3	.208	1	1.575	2
248			min	-126.394	1	-988.845	2	-.86	3	-.02	2	-.044	3	-.866	3
249		11	max	-5.335	15	802.573	2	3.539	3	.02	2	.064	1	.679	2
250			min	-126.394	1	-403.635	3	-125.461	1	-.007	3	-.042	3	-.417	3
251		12	max	-5.335	15	616.3	2	6.219	3	.02	2	-.002	15	-.002	15
252			min	-126.394	1	-313.874	3	-87.67	1	-.007	3	-.043	1	-.058	3
253		13	max	-5.335	15	430.028	2	8.898	3	.02	2	-.005	15	.211	3
254			min	-126.394	1	-224.112	3	-49.88	1	-.007	3	-.112	1	-.554	2
255		14	max	-5.335	15	243.755	2	11.577	3	.02	2	-.007	15	.39	3
256			min	-126.394	1	-134.351	3	-12.089	1	-.007	3	-.143	1	-.891	2
257		15	max	-5.335	15	57.482	2	25.701	1	.02	2	-.004	12	.479	3
258			min	-126.394	1	-44.59	3	1.031	15	-.007	3	-.136	1	-1.041	2
259		16	max	-5.335	15	45.171	3	63.492	1	.02	2	.01	3	.479	3
260			min	-126.394	1	-128.79	2	2.818	15	-.007	3	-.091	1	-1.006	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	-5.335	15	134.932	3	101.282	1	.02	2	.028	3	.389	3
262			min	-126.394	1	-315.063	2	4.604	15	-.007	3	-.011	9	-.784	2
263		18	max	-5.335	15	224.694	3	139.073	1	.02	2	.111	1	.209	3
264			min	-126.394	1	-501.336	2	6.391	15	-.007	3	.005	15	-.376	2
265		19	max	-5.335	15	314.455	3	176.863	1	.02	2	.269	1	.219	2
266			min	-126.394	1	-687.608	2	8.177	15	-.007	3	.012	15	-.06	3
267	M2	1	max	2212.99	2	1130.763	3	206.622	2	.007	3	.363	3	3.7	3
268			min	-1678.683	3	-846.427	2	-244.651	3	-.014	2	-.271	2	.175	15
269		2	max	2210.153	2	1130.763	3	206.622	2	.007	3	.287	3	3.762	1
270			min	-1680.811	3	-846.427	2	-244.651	3	-.014	2	-.207	2	.173	15
271		3	max	1505.563	1	732.599	1	146.541	2	.001	2	.225	3	3.653	1
272			min	-1410.723	3	33.291	15	-217.566	3	0	3	-.168	2	.166	15
273		4	max	1502.726	1	732.599	1	146.541	2	.001	2	.157	3	3.424	1
274			min	-1412.852	3	33.291	15	-217.566	3	0	3	-.123	2	.156	15
275		5	max	1499.888	1	732.599	1	146.541	2	.001	2	.089	3	3.196	1
276			min	-1414.98	3	33.291	15	-217.566	3	0	3	-.081	1	.145	15
277		6	max	1497.051	1	732.599	1	146.541	2	.001	2	.021	3	2.968	1
278			min	-1417.108	3	33.291	15	-217.566	3	0	3	-.041	1	.135	15
279		7	max	1494.214	1	732.599	1	146.541	2	.001	2	.014	2	2.739	1
280			min	-1419.236	3	33.291	15	-217.566	3	0	3	-.047	3	.124	15
281		8	max	1491.376	1	732.599	1	146.541	2	.001	2	.06	2	2.511	1
282			min	-1421.364	3	33.291	15	-217.566	3	0	3	-.114	3	.114	15
283		9	max	1488.539	1	732.599	1	146.541	2	.001	2	.106	2	2.283	1
284			min	-1423.492	3	33.291	15	-217.566	3	0	3	-.182	3	.104	15
285		10	max	1485.701	1	732.599	1	146.541	2	.001	2	.151	2	2.055	1
286			min	-1425.62	3	33.291	15	-217.566	3	0	3	-.25	3	.093	15
287		11	max	1482.864	1	732.599	1	146.541	2	.001	2	.197	2	1.826	1
288			min	-1427.748	3	33.291	15	-217.566	3	0	3	-.318	3	.083	15
289		12	max	1480.026	1	732.599	1	146.541	2	.001	2	.243	2	1.598	1
290			min	-1429.876	3	33.291	15	-217.566	3	0	3	-.386	3	.073	15
291		13	max	1477.189	1	732.599	1	146.541	2	.001	2	.288	2	1.37	1
292			min	-1432.004	3	33.291	15	-217.566	3	0	3	-.453	3	.062	15
293		14	max	1474.351	1	732.599	1	146.541	2	.001	2	.334	2	1.141	1
294			min	-1434.132	3	33.291	15	-217.566	3	0	3	-.521	3	.052	15
295		15	max	1471.514	1	732.599	1	146.541	2	.001	2	.38	2	.913	1
296			min	-1436.26	3	33.291	15	-217.566	3	0	3	-.589	3	.041	15
297		16	max	1468.677	1	732.599	1	146.541	2	.001	2	.425	2	.685	1
298			min	-1438.388	3	33.291	15	-217.566	3	0	3	-.657	3	.031	15
299		17	max	1465.839	1	732.599	1	146.541	2	.001	2	.471	2	.457	1
300			min	-1440.517	3	33.291	15	-217.566	3	0	3	-.725	3	.021	15
301		18	max	1463.002	1	732.599	1	146.541	2	.001	2	.517	2	.228	1
302			min	-1442.645	3	33.291	15	-217.566	3	0	3	-.792	3	.01	15
303		19	max	1460.164	1	732.599	1	146.541	2	.001	2	.562	2	0	1
304			min	-1444.773	3	33.291	15	-217.566	3	0	3	-.86	3	0	1
305	M5	1	max	6157.662	2	2985.308	3	0	1	0	1	0	1	7.289	3
306			min	-5151.295	3	-2938.721	2	0	1	0	1	0	1	.276	15
307		2	max	6154.825	2	2985.308	3	0	1	0	1	0	1	6.773	1
308			min	-5153.423	3	-2938.721	2	0	1	0	1	0	1	.28	15
309		3	max	4030.165	2	1343.548	1	0	1	0	1	0	1	6.699	1
310			min	-4183.932	3	54.333	15	0	1	0	1	0	1	.271	15
311		4	max	4027.328	2	1343.548	1	0	1	0	1	0	1	6.28	1
312			min	-4186.06	3	54.333	15	0	1	0	1	0	1	.254	15
313		5	max	4024.49	2	1343.548	1	0	1	0	1	0	1	5.861	1
314			min	-4188.188	3	54.333	15	0	1	0	1	0	1	.237	15
315		6	max	4021.653	2	1343.548	1	0	1	0	1	0	1	5.443	1
316			min	-4190.316	3	54.333	15	0	1	0	1	0	1	.22	15
317		7	max	4018.815	2	1343.548	1	0	1	0	1	0	1	5.024	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	-4192.444	3	54.333	15	0	1	0	1	0	1	.203	15
319		8	max	4015.978	2	1343.548	1	0	1	0	1	0	1	4.605	1
320			min	-4194.572	3	54.333	15	0	1	0	1	0	1	.186	15
321		9	max	4013.14	2	1343.548	1	0	1	0	1	0	1	4.187	1
322			min	-4196.7	3	54.333	15	0	1	0	1	0	1	.169	15
323		10	max	4010.303	2	1343.548	1	0	1	0	1	0	1	3.768	1
324			min	-4198.828	3	54.333	15	0	1	0	1	0	1	.152	15
325		11	max	4007.466	2	1343.548	1	0	1	0	1	0	1	3.349	1
326			min	-4200.956	3	54.333	15	0	1	0	1	0	1	.135	15
327		12	max	4004.628	2	1343.548	1	0	1	0	1	0	1	2.931	1
328			min	-4203.084	3	54.333	15	0	1	0	1	0	1	.119	15
329		13	max	4001.791	2	1343.548	1	0	1	0	1	0	1	2.512	1
330			min	-4205.213	3	54.333	15	0	1	0	1	0	1	.102	15
331		14	max	3998.953	2	1343.548	1	0	1	0	1	0	1	2.093	1
332			min	-4207.341	3	54.333	15	0	1	0	1	0	1	.085	15
333		15	max	3996.116	2	1343.548	1	0	1	0	1	0	1	1.675	1
334			min	-4209.469	3	54.333	15	0	1	0	1	0	1	.068	15
335		16	max	3993.278	2	1343.548	1	0	1	0	1	0	1	1.256	1
336			min	-4211.597	3	54.333	15	0	1	0	1	0	1	.051	15
337		17	max	3990.441	2	1343.548	1	0	1	0	1	0	1	.837	1
338			min	-4213.725	3	54.333	15	0	1	0	1	0	1	.034	15
339		18	max	3987.603	2	1343.548	1	0	1	0	1	0	1	.419	1
340			min	-4215.853	3	54.333	15	0	1	0	1	0	1	.017	15
341		19	max	3984.766	2	1343.548	1	0	1	0	1	0	1	0	1
342			min	-4217.981	3	54.333	15	0	1	0	1	0	1	0	1
343	M8	1	max	2212.99	2	1130.763	3	244.651	3	.014	2	.271	2	3.7	3
344			min	-1678.683	3	-846.427	2	-206.622	2	-.007	3	-.363	3	.175	15
345		2	max	2210.153	2	1130.763	3	244.651	3	.014	2	.207	2	3.762	1
346			min	-1680.811	3	-846.427	2	-206.622	2	-.007	3	-.287	3	.173	15
347		3	max	1505.563	1	732.599	1	217.566	3	0	3	.168	2	3.653	1
348			min	-1410.723	3	33.291	15	-146.541	2	-.001	2	-.225	3	.166	15
349		4	max	1502.726	1	732.599	1	217.566	3	0	3	.123	2	3.424	1
350			min	-1412.852	3	33.291	15	-146.541	2	-.001	2	-.157	3	.156	15
351		5	max	1499.888	1	732.599	1	217.566	3	0	3	.081	1	3.196	1
352			min	-1414.98	3	33.291	15	-146.541	2	-.001	2	-.089	3	.145	15
353		6	max	1497.051	1	732.599	1	217.566	3	0	3	.041	1	2.968	1
354			min	-1417.108	3	33.291	15	-146.541	2	-.001	2	-.021	3	.135	15
355		7	max	1494.214	1	732.599	1	217.566	3	0	3	.047	3	2.739	1
356			min	-1419.236	3	33.291	15	-146.541	2	-.001	2	-.014	2	.124	15
357		8	max	1491.376	1	732.599	1	217.566	3	0	3	.114	3	2.511	1
358			min	-1421.364	3	33.291	15	-146.541	2	-.001	2	-.06	2	.114	15
359		9	max	1488.539	1	732.599	1	217.566	3	0	3	.182	3	2.283	1
360			min	-1423.492	3	33.291	15	-146.541	2	-.001	2	-.106	2	.104	15
361		10	max	1485.701	1	732.599	1	217.566	3	0	3	.25	3	2.055	1
362			min	-1425.62	3	33.291	15	-146.541	2	-.001	2	-.151	2	.093	15
363		11	max	1482.864	1	732.599	1	217.566	3	0	3	.318	3	1.826	1
364			min	-1427.748	3	33.291	15	-146.541	2	-.001	2	-.197	2	.083	15
365		12	max	1480.026	1	732.599	1	217.566	3	0	3	.386	3	1.598	1
366			min	-1429.876	3	33.291	15	-146.541	2	-.001	2	-.243	2	.073	15
367		13	max	1477.189	1	732.599	1	217.566	3	0	3	.453	3	1.37	1
368			min	-1432.004	3	33.291	15	-146.541	2	-.001	2	-.288	2	.062	15
369		14	max	1474.351	1	732.599	1	217.566	3	0	3	.521	3	1.141	1
370			min	-1434.132	3	33.291	15	-146.541	2	-.001	2	-.334	2	.052	15
371		15	max	1471.514	1	732.599	1	217.566	3	0	3	.589	3	.913	1
372			min	-1436.26	3	33.291	15	-146.541	2	-.001	2	-.38	2	.041	15
373		16	max	1468.677	1	732.599	1	217.566	3	0	3	.657	3	.685	1
374			min	-1438.388	3	33.291	15	-146.541	2	-.001	2	-.425	2	.031	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	1465.839	1	732.599	1	217.566	3	0	3	.725	3	.457	1
376			min	-1440.517	3	33.291	15	-146.541	2	-.001	2	-.471	2	.021	15
377		18	max	1463.002	1	732.599	1	217.566	3	0	3	.792	3	.228	1
378			min	-1442.645	3	33.291	15	-146.541	2	-.001	2	-.517	2	.01	15
379		19	max	1460.164	1	732.599	1	217.566	3	0	3	.86	3	0	1
380			min	-1444.773	3	33.291	15	-146.541	2	-.001	2	-.562	2	0	1
381	M3	1	max	1522.151	2	4.384	4	59.654	2	.011	3	.003	3	0	1
382			min	-574.316	3	1.031	15	-27.468	3	-.02	2	-.007	2	0	1
383		2	max	1521.943	2	3.897	4	59.654	2	.011	3	.011	2	0	15
384			min	-574.472	3	.916	15	-27.468	3	-.02	2	-.005	3	-.001	4
385		3	max	1521.735	2	3.41	4	59.654	2	.011	3	.028	2	0	15
386			min	-574.628	3	.802	15	-27.468	3	-.02	2	-.013	3	-.002	4
387		4	max	1521.527	2	2.923	4	59.654	2	.011	3	.045	2	0	15
388			min	-574.784	3	.687	15	-27.468	3	-.02	2	-.021	3	-.003	4
389		5	max	1521.319	2	2.436	4	59.654	2	.011	3	.063	2	0	15
390			min	-574.94	3	.573	15	-27.468	3	-.02	2	-.029	3	-.004	4
391		6	max	1521.111	2	1.949	4	59.654	2	.011	3	.08	2	-.001	15
392			min	-575.096	3	.458	15	-27.468	3	-.02	2	-.037	3	-.005	4
393		7	max	1520.903	2	1.461	4	59.654	2	.011	3	.098	2	-.001	15
394			min	-575.252	3	.344	15	-27.468	3	-.02	2	-.045	3	-.005	4
395		8	max	1520.695	2	.974	4	59.654	2	.011	3	.115	2	-.001	15
396			min	-575.408	3	.229	15	-27.468	3	-.02	2	-.053	3	-.005	4
397		9	max	1520.487	2	.487	4	59.654	2	.011	3	.132	2	-.001	15
398			min	-575.564	3	.115	15	-27.468	3	-.02	2	-.061	3	-.006	4
399		10	max	1520.279	2	0	1	59.654	2	.011	3	.15	2	-.001	15
400			min	-575.72	3	0	1	-27.468	3	-.02	2	-.07	3	-.006	4
401		11	max	1520.071	2	-.115	15	59.654	2	.011	3	.167	2	-.001	15
402			min	-575.876	3	-.487	4	-27.468	3	-.02	2	-.078	3	-.006	4
403		12	max	1519.863	2	-.229	15	59.654	2	.011	3	.185	2	-.001	15
404			min	-576.032	3	-.974	4	-27.468	3	-.02	2	-.086	3	-.005	4
405		13	max	1519.654	2	-.344	15	59.654	2	.011	3	.202	2	-.001	15
406			min	-576.189	3	-1.461	4	-27.468	3	-.02	2	-.094	3	-.005	4
407		14	max	1519.446	2	-.458	15	59.654	2	.011	3	.219	2	-.001	15
408			min	-576.345	3	-1.949	4	-27.468	3	-.02	2	-.102	3	-.005	4
409		15	max	1519.238	2	-.573	15	59.654	2	.011	3	.237	2	0	15
410			min	-576.501	3	-2.436	4	-27.468	3	-.02	2	-.11	3	-.004	4
411		16	max	1519.03	2	-.687	15	59.654	2	.011	3	.254	2	0	15
412			min	-576.657	3	-2.923	4	-27.468	3	-.02	2	-.118	3	-.003	4
413		17	max	1518.822	2	-.802	15	59.654	2	.011	3	.272	2	0	15
414			min	-576.813	3	-3.41	4	-27.468	3	-.02	2	-.126	3	-.002	4
415		18	max	1518.614	2	-.916	15	59.654	2	.011	3	.289	2	0	15
416			min	-576.969	3	-3.897	4	-27.468	3	-.02	2	-.134	3	-.001	4
417		19	max	1518.406	2	-1.031	15	59.654	2	.011	3	.307	2	0	1
418			min	-577.125	3	-4.384	4	-27.468	3	-.02	2	-.142	3	0	1
419	M6	1	max	4451.912	2	4.384	4	0	1	0	1	0	1	0	1
420			min	-2047.846	3	1.031	15	0	1	0	1	0	1	0	1
421		2	max	4451.704	2	3.897	4	0	1	0	1	0	1	0	15
422			min	-2048.002	3	.916	15	0	1	0	1	0	1	-.001	4
423		3	max	4451.496	2	3.41	4	0	1	0	1	0	1	0	15
424			min	-2048.158	3	.802	15	0	1	0	1	0	1	-.002	4
425		4	max	4451.288	2	2.923	4	0	1	0	1	0	1	0	15
426			min	-2048.314	3	.687	15	0	1	0	1	0	1	-.003	4
427		5	max	4451.08	2	2.436	4	0	1	0	1	0	1	0	15
428			min	-2048.47	3	.573	15	0	1	0	1	0	1	-.004	4
429		6	max	4450.872	2	1.949	4	0	1	0	1	0	1	-.001	15
430			min	-2048.626	3	.458	15	0	1	0	1	0	1	-.005	4
431		7	max	4450.664	2	1.461	4	0	1	0	1	0	1	-.001	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
432			min	-2048.782	3	.344	15	0	1	0	1	0	1	-.005	4
433		8	max	4450.456	2	.974	4	0	1	0	1	0	1	-.001	15
434			min	-2048.939	3	.229	15	0	1	0	1	0	1	-.005	4
435		9	max	4450.248	2	.487	4	0	1	0	1	0	1	-.001	15
436			min	-2049.095	3	.115	15	0	1	0	1	0	1	-.006	4
437		10	max	4450.04	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2049.251	3	0	1	0	1	0	1	0	1	-.006	4
439		11	max	4449.832	2	-.115	15	0	1	0	1	0	1	-.001	15
440			min	-2049.407	3	-.487	4	0	1	0	1	0	1	-.006	4
441		12	max	4449.624	2	-.229	15	0	1	0	1	0	1	-.001	15
442			min	-2049.563	3	-.974	4	0	1	0	1	0	1	-.005	4
443		13	max	4449.415	2	-.344	15	0	1	0	1	0	1	-.001	15
444			min	-2049.719	3	-1.461	4	0	1	0	1	0	1	-.005	4
445		14	max	4449.207	2	-.458	15	0	1	0	1	0	1	-.001	15
446			min	-2049.875	3	-1.949	4	0	1	0	1	0	1	-.005	4
447		15	max	4448.999	2	-.573	15	0	1	0	1	0	1	0	15
448			min	-2050.031	3	-2.436	4	0	1	0	1	0	1	-.004	4
449		16	max	4448.791	2	-.687	15	0	1	0	1	0	1	0	15
450			min	-2050.187	3	-2.923	4	0	1	0	1	0	1	-.003	4
451		17	max	4448.583	2	-.802	15	0	1	0	1	0	1	0	15
452			min	-2050.343	3	-3.41	4	0	1	0	1	0	1	-.002	4
453		18	max	4448.375	2	-.916	15	0	1	0	1	0	1	0	15
454			min	-2050.499	3	-3.897	4	0	1	0	1	0	1	-.001	4
455		19	max	4448.167	2	-1.031	15	0	1	0	1	0	1	0	1
456			min	-2050.655	3	-4.384	4	0	1	0	1	0	1	0	1
457	M9	1	max	1522.151	2	4.384	4	27.468	3	.02	2	.007	2	0	1
458			min	-574.316	3	1.031	15	-59.654	2	-.011	3	-.003	3	0	1
459		2	max	1521.943	2	3.897	4	27.468	3	.02	2	.005	3	0	15
460			min	-574.472	3	.916	15	-59.654	2	-.011	3	-.011	2	-.001	4
461		3	max	1521.735	2	3.41	4	27.468	3	.02	2	.013	3	0	15
462			min	-574.628	3	.802	15	-59.654	2	-.011	3	-.028	2	-.002	4
463		4	max	1521.527	2	2.923	4	27.468	3	.02	2	.021	3	0	15
464			min	-574.784	3	.687	15	-59.654	2	-.011	3	-.045	2	-.003	4
465		5	max	1521.319	2	2.436	4	27.468	3	.02	2	.029	3	0	15
466			min	-574.94	3	.573	15	-59.654	2	-.011	3	-.063	2	-.004	4
467		6	max	1521.111	2	1.949	4	27.468	3	.02	2	.037	3	-.001	15
468			min	-575.096	3	.458	15	-59.654	2	-.011	3	-.08	2	-.005	4
469		7	max	1520.903	2	1.461	4	27.468	3	.02	2	.045	3	-.001	15
470			min	-575.252	3	.344	15	-59.654	2	-.011	3	-.098	2	-.005	4
471		8	max	1520.695	2	.974	4	27.468	3	.02	2	.053	3	-.001	15
472			min	-575.408	3	.229	15	-59.654	2	-.011	3	-.115	2	-.005	4
473		9	max	1520.487	2	.487	4	27.468	3	.02	2	.061	3	-.001	15
474			min	-575.564	3	.115	15	-59.654	2	-.011	3	-.132	2	-.006	4
475		10	max	1520.279	2	0	1	27.468	3	.02	2	.07	3	-.001	15
476			min	-575.72	3	0	1	-59.654	2	-.011	3	-.15	2	-.006	4
477		11	max	1520.071	2	-.115	15	27.468	3	.02	2	.078	3	-.001	15
478			min	-575.876	3	-.487	4	-59.654	2	-.011	3	-.167	2	-.006	4
479		12	max	1519.863	2	-.229	15	27.468	3	.02	2	.086	3	-.001	15
480			min	-576.032	3	-.974	4	-59.654	2	-.011	3	-.185	2	-.005	4
481		13	max	1519.654	2	-.344	15	27.468	3	.02	2	.094	3	-.001	15
482			min	-576.189	3	-1.461	4	-59.654	2	-.011	3	-.202	2	-.005	4
483		14	max	1519.446	2	-.458	15	27.468	3	.02	2	.102	3	-.001	15
484			min	-576.345	3	-1.949	4	-59.654	2	-.011	3	-.219	2	-.005	4
485		15	max	1519.238	2	-.573	15	27.468	3	.02	2	.11	3	0	15
486			min	-576.501	3	-2.436	4	-59.654	2	-.011	3	-.237	2	-.004	4
487		16	max	1519.03	2	-.687	15	27.468	3	.02	2	.118	3	0	15
488			min	-576.657	3	-2.923	4	-59.654	2	-.011	3	-.254	2	-.003	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
489		17	max	1518.822	2	-.802	15	27.468	3	.02	2	.126	3	0	15
490			min	-576.813	3	-3.41	4	-59.654	2	-.011	3	-.272	2	-.002	4
491		18	max	1518.614	2	-.916	15	27.468	3	.02	2	.134	3	0	15
492			min	-576.969	3	-3.897	4	-59.654	2	-.011	3	-.289	2	-.001	4
493		19	max	1518.406	2	-1.031	15	27.468	3	.02	2	.142	3	0	1
494			min	-577.125	3	-4.384	4	-59.654	2	-.011	3	-.307	2	0	1

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	-.009	15	-.017	15	.021	1	8.503e-3	3	NC	3	NC	3
2			min	-.207	1	-.461	1	0	15	-2.146e-2	2	272.869	1	3339.988	1
3		2	max	-.009	15	-.014	15	.006	1	8.503e-3	3	NC	12	NC	2
4			min	-.207	1	-.382	1	0	15	-2.146e-2	2	325.605	1	5255.126	1
5		3	max	-.009	15	-.011	15	0	15	8.029e-3	3	8125.572	15	NC	1
6			min	-.207	1	-.302	1	-.006	1	-1.974e-2	2	403.715	1	NC	1
7		4	max	-.009	15	-.009	15	0	15	7.302e-3	3	9571.805	15	NC	1
8			min	-.206	1	-.225	1	-.012	1	-1.711e-2	2	524.67	1	NC	1
9		5	max	-.009	15	-.007	15	0	15	6.575e-3	3	NC	10	NC	1
10			min	-.206	1	-.157	1	-.012	1	-1.447e-2	2	717.312	1	NC	1
11		6	max	-.009	15	-.005	15	0	3	6.75e-3	3	NC	15	NC	1
12			min	-.206	1	-.101	1	-.01	1	-1.378e-2	2	1021.945	1	NC	1
13		7	max	-.009	15	-.003	15	.001	3	7.548e-3	3	NC	5	NC	2
14			min	-.206	1	-.092	3	-.005	2	-1.442e-2	2	1393.593	9	8984.973	1
15		8	max	-.009	15	.002	10	0	3	8.346e-3	3	NC	5	NC	2
16			min	-.206	1	-.08	3	-.001	2	-1.506e-2	2	1676.235	2	7023.498	1
17		9	max	-.009	15	.02	2	0	15	9.352e-3	3	NC	5	NC	2
18			min	-.205	1	-.063	3	0	3	-1.478e-2	2	1318.709	2	7000.912	1
19		10	max	-.009	15	.04	2	0	2	1.073e-2	3	NC	1	NC	2
20			min	-.205	1	-.043	3	0	3	-1.284e-2	2	1103.528	2	6818.108	1
21		11	max	-.009	15	.064	1	.001	3	1.21e-2	3	NC	5	NC	2
22			min	-.204	1	-.019	3	0	2	-1.091e-2	2	966.809	2	7113.587	1
23		12	max	-.009	15	.088	1	.005	3	1.008e-2	3	NC	4	NC	2
24			min	-.204	1	.004	15	-.004	1	-8.123e-3	2	877.851	2	9021.302	1
25		13	max	-.009	15	.107	1	.01	3	6.15e-3	3	NC	4	NC	2
26			min	-.204	1	.005	15	-.006	2	-4.851e-3	2	834.902	2	9093.965	1
27		14	max	-.009	15	.115	1	.009	3	2.414e-3	3	NC	4	NC	2
28			min	-.203	1	.005	15	-.003	2	-1.708e-3	2	850.432	2	6667.944	1
29		15	max	-.009	15	.183	3	.008	1	7.453e-3	3	NC	4	NC	2
30			min	-.203	1	.006	15	0	15	-4.306e-3	2	580.806	3	4977.351	1
31		16	max	-.009	15	.279	3	.01	1	1.249e-2	3	NC	4	NC	3
32			min	-.203	1	.006	15	0	15	-6.904e-3	2	410.032	3	4558.489	1
33		17	max	-.009	15	.386	3	.006	1	1.753e-2	3	NC	4	NC	2
34			min	-.203	1	-.015	10	0	15	-9.503e-3	2	308.892	3	5255.755	1
35		18	max	-.009	15	.497	3	0	15	2.082e-2	3	NC	4	NC	2
36			min	-.203	1	-.044	2	-.006	1	-1.12e-2	2	245.831	3	9735.158	1
37		19	max	-.009	15	.608	3	0	15	2.082e-2	3	NC	1	NC	1
38			min	-.203	1	-.082	2	-.019	1	-1.12e-2	2	204.193	3	NC	1
39	M4	1	max	-.015	15	.034	3	0	1	0	1	NC	3	NC	1
40			min	-.379	1	-1.024	2	0	1	0	1	152.887	1	NC	1
41		2	max	-.015	15	-.018	12	0	1	0	1	4757.695	15	NC	1
42			min	-.379	1	-.82	2	0	1	0	1	192.725	1	NC	1
43		3	max	-.015	15	-.021	15	0	1	0	1	5802.136	15	NC	1
44			min	-.379	1	-.632	1	0	1	0	1	260.894	1	NC	1
45		4	max	-.015	15	-.016	15	0	1	0	1	7365.508	15	NC	1
46			min	-.378	1	-.458	1	0	1	0	1	394.596	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	-.015	15	-.011	15	0	1	0	1	9742.274	15	NC	1
48			min	-.378	1	-.305	1	0	1	0	1	662.154	3	NC	1
49		6	max	-.015	15	-.008	15	0	1	0	1	NC	11	NC	1
50			min	-.378	1	-.187	1	0	1	0	1	616.152	3	NC	1
51		7	max	-.015	15	-.005	15	0	1	0	1	NC	5	NC	1
52			min	-.377	1	-.176	3	0	1	0	1	559.46	2	NC	1
53		8	max	-.015	15	.002	10	0	1	0	1	NC	5	NC	1
54			min	-.376	1	-.154	3	0	1	0	1	461.239	2	NC	1
55		9	max	-.015	15	.035	2	0	1	0	1	NC	5	NC	1
56			min	-.375	1	-.123	3	0	1	0	1	404.471	2	NC	1
57		10	max	-.015	15	.074	2	0	1	0	1	NC	4	NC	1
58			min	-.374	1	-.088	3	0	1	0	1	360.996	2	NC	1
59		11	max	-.015	15	.122	1	0	1	0	1	NC	4	NC	1
60			min	-.373	1	-.045	3	0	1	0	1	328.562	2	NC	1
61		12	max	-.015	15	.169	1	0	1	0	1	NC	5	NC	1
62			min	-.372	1	.005	12	0	1	0	1	304.694	2	NC	1
63		13	max	-.015	15	.202	1	0	1	0	1	NC	5	NC	1
64			min	-.371	1	.008	15	0	1	0	1	292.829	2	NC	1
65		14	max	-.015	15	.209	1	0	1	0	1	NC	5	NC	1
66			min	-.37	1	.009	15	0	1	0	1	299.816	2	NC	1
67		15	max	-.015	15	.373	3	0	1	0	1	NC	5	NC	1
68			min	-.371	1	.008	15	0	1	0	1	338.744	2	NC	1
69		16	max	-.015	15	.594	3	0	1	0	1	NC	5	NC	1
70			min	-.371	1	-.008	10	0	1	0	1	239.607	3	NC	1
71		17	max	-.015	15	.841	3	0	1	0	1	NC	5	NC	1
72			min	-.371	1	-.083	2	0	1	0	1	166.111	3	NC	1
73		18	max	-.015	15	1.099	3	0	1	0	1	NC	4	NC	1
74			min	-.371	1	-.19	2	0	1	0	1	125.947	3	NC	1
75		19	max	-.015	15	1.355	3	0	1	0	1	NC	1	NC	1
76			min	-.371	1	-.297	2	0	1	0	1	101.476	3	NC	1
77	M7	1	max	-.009	15	-.017	15	0	15	2.146e-2	2	NC	3	NC	3
78			min	-.207	1	-.461	1	-.021	1	-8.503e-3	3	272.869	1	3339.988	1
79		2	max	-.009	15	-.014	15	0	15	2.146e-2	2	NC	12	NC	2
80			min	-.207	1	-.382	1	-.006	1	-8.503e-3	3	325.605	1	5255.126	1
81		3	max	-.009	15	-.011	15	.006	1	1.974e-2	2	8125.572	15	NC	1
82			min	-.207	1	-.302	1	0	15	-8.029e-3	3	403.715	1	NC	1
83		4	max	-.009	15	-.009	15	.012	1	1.711e-2	2	9571.805	15	NC	1
84			min	-.206	1	-.225	1	0	15	-7.302e-3	3	524.67	1	NC	1
85		5	max	-.009	15	-.007	15	.012	1	1.447e-2	2	NC	10	NC	1
86			min	-.206	1	-.157	1	0	15	-6.575e-3	3	717.312	1	NC	1
87		6	max	-.009	15	-.005	15	.01	1	1.378e-2	2	NC	15	NC	1
88			min	-.206	1	-.101	1	0	3	-6.75e-3	3	1021.945	1	NC	1
89		7	max	-.009	15	-.003	15	.005	2	1.442e-2	2	NC	5	NC	2
90			min	-.206	1	-.092	3	-.001	3	-7.548e-3	3	1393.593	9	8984.973	1
91		8	max	-.009	15	.002	10	.001	2	1.506e-2	2	NC	5	NC	2
92			min	-.206	1	-.08	3	0	3	-8.346e-3	3	1676.235	2	7023.498	1
93		9	max	-.009	15	.02	2	0	3	1.478e-2	2	NC	5	NC	2
94			min	-.205	1	-.063	3	0	15	-9.352e-3	3	1318.709	2	7000.912	1
95		10	max	-.009	15	.04	2	0	3	1.284e-2	2	NC	1	NC	2
96			min	-.205	1	-.043	3	0	2	-1.073e-2	3	1103.528	2	6818.108	1
97		11	max	-.009	15	.064	1	0	2	1.091e-2	2	NC	5	NC	2
98			min	-.204	1	-.019	3	-.001	3	-1.21e-2	3	966.809	2	7113.587	1
99		12	max	-.009	15	.088	1	.004	1	8.123e-3	2	NC	4	NC	2
100			min	-.204	1	.004	15	-.005	3	-1.008e-2	3	877.851	2	9021.302	1
101		13	max	-.009	15	.107	1	.006	2	4.851e-3	2	NC	4	NC	2
102			min	-.204	1	.005	15	-.01	3	-6.15e-3	3	834.902	2	9093.965	1
103		14	max	-.009	15	.115	1	.003	2	1.708e-3	2	NC	4	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
104			min	-.203	1	.005	15	-.009	3	-2.414e-3	3	850.432	2	6667.944	1
105		15	max	-.009	15	.183	3	0	15	4.306e-3	2	NC	4	NC	2
106			min	-.203	1	.006	15	-.008	1	-7.453e-3	3	580.806	3	4977.351	1
107		16	max	-.009	15	.279	3	0	15	6.904e-3	2	NC	4	NC	3
108			min	-.203	1	.006	15	-.01	1	-1.249e-2	3	410.032	3	4558.489	1
109		17	max	-.009	15	.386	3	0	15	9.503e-3	2	NC	4	NC	2
110			min	-.203	1	-.015	10	-.006	1	-1.753e-2	3	308.892	3	5255.755	1
111		18	max	-.009	15	.497	3	.006	1	1.12e-2	2	NC	4	NC	2
112			min	-.203	1	-.044	2	0	15	-2.082e-2	3	245.831	3	9735.158	1
113		19	max	-.009	15	.608	3	.019	1	1.12e-2	2	NC	1	NC	1
114			min	-.203	1	-.082	2	0	15	-2.082e-2	3	204.193	3	NC	1
115	M10	1	max	0	1	.458	3	.203	1	1.493e-2	3	NC	1	NC	1
116			min	0	15	-.031	2	.009	15	-5.101e-3	2	NC	1	NC	1
117		2	max	0	1	.715	3	.243	1	1.71e-2	3	NC	4	NC	2
118			min	0	15	-.167	2	.011	15	-6.126e-3	2	840.946	3	5488.526	1
119		3	max	0	1	.955	3	.301	1	1.927e-2	3	NC	5	NC	5
120			min	0	15	-.29	2	.014	15	-7.151e-3	2	435.123	3	2222.124	1
121		4	max	0	1	1.141	3	.358	1	2.144e-2	3	NC	5	NC	5
122			min	0	15	-.376	2	.016	15	-8.176e-3	2	316.632	3	1399.319	1
123		5	max	0	1	1.251	3	.401	1	2.361e-2	3	NC	5	NC	5
124			min	0	15	-.414	2	.018	15	-9.201e-3	2	272.396	3	1092.773	1
125		6	max	0	1	1.281	3	.423	1	2.578e-2	3	NC	5	NC	5
126			min	0	15	-.402	2	.018	15	-1.023e-2	2	262.499	3	981.941	1
127		7	max	0	1	1.24	3	.424	1	2.795e-2	3	NC	5	NC	5
128			min	0	15	-.346	2	.018	15	-1.125e-2	2	276.477	3	981.011	1
129		8	max	0	1	1.151	3	.407	1	3.012e-2	3	NC	5	NC	5
130			min	0	15	-.266	2	.017	15	-1.228e-2	2	311.755	3	1062.979	1
131		9	max	0	1	1.056	3	.383	1	3.23e-2	3	NC	4	NC	5
132			min	0	15	-.189	2	.016	15	-1.33e-2	2	361.434	3	1200.148	1
133		10	max	0	1	1.009	3	.371	1	3.447e-2	3	NC	4	NC	5
134			min	0	1	-.153	2	.015	15	-1.433e-2	2	392.126	3	1289.756	1
135		11	max	0	15	1.056	3	.383	1	3.23e-2	3	NC	4	NC	5
136			min	0	1	-.189	2	.016	15	-1.33e-2	2	361.434	3	1200.148	1
137		12	max	0	15	1.151	3	.407	1	3.012e-2	3	NC	5	NC	5
138			min	0	1	-.266	2	.017	15	-1.228e-2	2	311.755	3	1062.979	1
139		13	max	0	15	1.24	3	.424	1	2.795e-2	3	NC	5	NC	5
140			min	0	1	-.346	2	.018	15	-1.125e-2	2	276.477	3	981.011	1
141		14	max	0	15	1.281	3	.423	1	2.578e-2	3	NC	5	NC	5
142			min	0	1	-.402	2	.018	15	-1.023e-2	2	262.499	3	981.941	1
143		15	max	0	15	1.251	3	.401	1	2.361e-2	3	NC	5	NC	5
144			min	0	1	-.414	2	.018	15	-9.201e-3	2	272.396	3	1092.773	1
145		16	max	0	15	1.141	3	.358	1	2.144e-2	3	NC	5	NC	5
146			min	0	1	-.376	2	.016	15	-8.176e-3	2	316.632	3	1399.319	1
147		17	max	0	15	.955	3	.301	1	1.927e-2	3	NC	5	NC	5
148			min	0	1	-.29	2	.014	15	-7.151e-3	2	435.123	3	2222.124	1
149		18	max	0	15	.715	3	.243	1	1.71e-2	3	NC	4	NC	2
150			min	0	1	-.167	2	.011	15	-6.126e-3	2	840.946	3	5488.526	1
151		19	max	0	15	.458	3	.203	1	1.493e-2	3	NC	1	NC	1
152			min	0	1	-.031	2	.009	15	-5.101e-3	2	NC	1	NC	1
153	M11	1	max	.002	1	.073	1	.204	1	3.821e-3	3	NC	1	NC	1
154			min	-.002	3	-.009	3	.009	15	1.574e-4	15	NC	1	NC	1
155		2	max	.002	1	.15	3	.233	1	4.157e-3	3	NC	4	NC	2
156			min	-.002	3	-.059	2	.011	15	1.691e-4	15	1355.548	3	7535.983	1
157		3	max	.001	1	.296	3	.285	1	4.494e-3	3	NC	5	NC	3
158			min	-.002	3	-.16	2	.013	15	1.807e-4	15	707.725	3	2669.01	1
159		4	max	.001	1	.394	3	.341	1	4.831e-3	3	NC	5	NC	5
160			min	-.002	3	-.22	2	.015	15	1.924e-4	15	535.813	3	1581.448	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
161		5	max	.001	1	.425	3	.386	1	5.168e-3	3	NC	5	NC	5
162			min	-.001	3	-.23	2	.017	15	2.04e-4	15	497.743	3	1190.495	1
163		6	max	0	1	.384	3	.412	1	5.504e-3	3	NC	5	NC	5
164			min	-.001	3	-.19	2	.018	15	2.156e-4	15	548.439	3	1041.843	1
165		7	max	0	1	.285	3	.416	1	5.841e-3	3	NC	5	NC	5
166			min	0	3	-.11	2	.018	15	2.273e-4	15	734.143	3	1018.345	1
167		8	max	0	1	.152	3	.404	1	6.178e-3	3	NC	4	NC	5
168			min	0	3	-.009	2	.017	15	2.389e-4	15	1334.832	3	1081.754	1
169		9	max	0	1	.102	1	.384	1	6.515e-3	3	NC	2	NC	5
170			min	0	3	.004	15	.016	15	2.506e-4	15	5586.493	3	1200.409	1
171		10	max	0	1	.139	1	.373	1	6.852e-3	3	NC	3	NC	5
172			min	0	1	-.027	3	.015	15	2.622e-4	15	3265.23	1	1279.347	1
173		11	max	0	3	.102	1	.384	1	6.515e-3	3	NC	2	NC	5
174			min	0	1	.004	15	.016	15	2.506e-4	15	5586.493	3	1200.409	1
175		12	max	0	3	.152	3	.404	1	6.178e-3	3	NC	4	NC	5
176			min	0	1	-.009	2	.017	15	2.389e-4	15	1334.832	3	1081.754	1
177		13	max	0	3	.285	3	.416	1	5.841e-3	3	NC	5	NC	5
178			min	0	1	-.11	2	.018	15	2.273e-4	15	734.143	3	1018.345	1
179		14	max	.001	3	.384	3	.412	1	5.504e-3	3	NC	5	NC	5
180			min	0	1	-.19	2	.018	15	2.156e-4	15	548.439	3	1041.843	1
181		15	max	.001	3	.425	3	.386	1	5.168e-3	3	NC	5	NC	5
182			min	-.001	1	-.23	2	.017	15	2.04e-4	15	497.743	3	1190.495	1
183		16	max	.002	3	.394	3	.341	1	4.831e-3	3	NC	5	NC	5
184			min	-.001	1	-.22	2	.015	15	1.924e-4	15	535.813	3	1581.448	1
185		17	max	.002	3	.296	3	.285	1	4.494e-3	3	NC	5	NC	3
186			min	-.001	1	-.16	2	.013	15	1.807e-4	15	707.725	3	2669.01	1
187		18	max	.002	3	.15	3	.233	1	4.157e-3	3	NC	4	NC	2
188			min	-.002	1	-.059	2	.011	15	1.691e-4	15	1355.548	3	7535.983	1
189		19	max	.002	3	.073	1	.204	1	3.821e-3	3	NC	1	NC	1
190			min	-.002	1	-.009	3	.009	15	1.574e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.012	2	.205	1	4.144e-3	1	NC	1	NC	1
192			min	0	9	-.069	3	.009	15	1.847e-4	15	NC	1	NC	1
193		2	max	0	2	.031	3	.229	1	4.515e-3	1	NC	4	NC	2
194			min	0	9	-.173	2	.01	15	1.979e-4	15	1163.888	2	8959.28	1
195		3	max	0	2	.109	3	.279	1	4.885e-3	1	NC	5	NC	4
196			min	0	9	-.332	2	.013	15	2.111e-4	15	627.777	2	2916.334	1
197		4	max	0	2	.151	3	.335	1	5.256e-3	1	NC	5	NC	5
198			min	0	9	-.433	2	.015	15	2.242e-4	15	485.472	2	1671.849	1
199		5	max	0	2	.153	3	.38	1	5.626e-3	1	NC	5	NC	5
200			min	0	9	-.46	2	.017	15	2.374e-4	15	457.236	2	1235.263	1
201		6	max	0	2	.116	3	.408	1	5.997e-3	1	NC	5	NC	5
202			min	0	9	-.413	2	.018	15	2.506e-4	15	507.6	2	1067.008	1
203		7	max	0	2	.049	3	.415	1	6.367e-3	1	NC	5	NC	5
204			min	0	9	-.306	2	.018	15	2.638e-4	15	678.981	2	1031.886	1
205		8	max	0	2	-.004	15	.404	1	6.738e-3	1	NC	5	NC	5
206			min	0	9	-.167	2	.017	15	2.769e-4	15	1208.219	2	1085.627	1
207		9	max	0	2	-.002	15	.386	1	7.108e-3	1	NC	4	NC	5
208			min	0	9	-.103	3	.016	15	2.901e-4	15	4246.723	2	1194.651	1
209		10	max	0	1	.02	2	.376	1	7.479e-3	1	NC	1	NC	5
210			min	0	1	-.135	3	.015	15	3.033e-4	15	3309.258	3	1268.082	1
211		11	max	0	9	-.002	15	.386	1	7.108e-3	1	NC	4	NC	5
212			min	0	2	-.103	3	.016	15	2.901e-4	15	4246.723	2	1194.651	1
213		12	max	0	9	-.004	15	.404	1	6.738e-3	1	NC	5	NC	5
214			min	0	2	-.167	2	.017	15	2.769e-4	15	1208.219	2	1085.627	1
215		13	max	0	9	.049	3	.415	1	6.367e-3	1	NC	5	NC	5
216			min	0	2	-.306	2	.018	15	2.638e-4	15	678.981	2	1031.886	1
217		14	max	0	9	.116	3	.408	1	5.997e-3	1	NC	5	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
218			min	0	2	-.413	2	.018	15	2.506e-4	15	507.6	2	1067.008	1
219		15	max	0	9	.153	3	.38	1	5.626e-3	1	NC	5	NC	5
220			min	0	2	-.46	2	.017	15	2.374e-4	15	457.236	2	1235.263	1
221		16	max	0	9	.151	3	.335	1	5.256e-3	1	NC	5	NC	5
222			min	0	2	-.433	2	.015	15	2.242e-4	15	485.472	2	1671.849	1
223		17	max	0	9	.109	3	.279	1	4.885e-3	1	NC	5	NC	4
224			min	0	2	-.332	2	.013	15	2.111e-4	15	627.777	2	2916.334	1
225		18	max	0	9	.031	3	.229	1	4.515e-3	1	NC	4	NC	2
226			min	0	2	-.173	2	.01	15	1.979e-4	15	1163.888	2	8959.28	1
227		19	max	0	9	.012	2	.205	1	4.144e-3	1	NC	1	NC	1
228			min	0	2	-.069	3	.009	15	1.847e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.013	15	.207	1	1.114e-2	2	NC	1	NC	1
230			min	-.001	1	-.354	1	.009	15	-1.928e-3	3	NC	1	NC	1
231		2	max	0	15	.033	3	.247	1	1.294e-2	2	NC	5	NC	3
232			min	0	1	-.578	2	.011	15	-2.555e-3	3	839.224	2	5319.485	1
233		3	max	0	15	.117	3	.306	1	1.473e-2	2	NC	5	NC	5
234			min	0	1	-.806	2	.014	15	-3.181e-3	3	444.269	2	2171.657	1
235		4	max	0	15	.171	3	.364	1	1.653e-2	2	NC	5	NC	5
236			min	0	1	-.974	2	.016	15	-3.807e-3	3	330.254	2	1372.202	1
237		5	max	0	15	.188	3	.408	1	1.833e-2	2	NC	15	NC	5
238			min	0	1	-1.064	2	.018	15	-4.434e-3	3	290.588	2	1072.958	1
239		6	max	0	15	.167	3	.431	1	2.012e-2	2	NC	15	NC	5
240			min	0	1	-1.071	2	.019	15	-5.06e-3	3	287.541	2	964.041	1
241		7	max	0	15	.116	3	.431	1	2.192e-2	2	NC	15	NC	5
242			min	0	1	-1.01	2	.018	15	-5.686e-3	3	313.214	2	961.888	1
243		8	max	0	15	.049	3	.414	1	2.372e-2	2	NC	5	NC	5
244			min	0	1	-.906	2	.017	15	-6.313e-3	3	369.02	2	1039.672	1
245		9	max	0	15	-.012	12	.391	1	2.552e-2	2	NC	5	NC	5
246			min	0	1	-.8	2	.016	15	-6.939e-3	3	450.144	2	1169.963	1
247		10	max	0	1	-.024	15	.379	1	2.731e-2	2	NC	5	NC	5
248			min	0	1	-.75	1	.015	15	-7.565e-3	3	502.963	2	1254.791	1
249		11	max	0	1	-.012	12	.391	1	2.552e-2	2	NC	5	NC	5
250			min	0	15	-.8	2	.016	15	-6.939e-3	3	450.144	2	1169.963	1
251		12	max	0	1	.049	3	.414	1	2.372e-2	2	NC	5	NC	5
252			min	0	15	-.906	2	.017	15	-6.313e-3	3	369.02	2	1039.672	1
253		13	max	0	1	.116	3	.431	1	2.192e-2	2	NC	15	NC	5
254			min	0	15	-1.01	2	.018	15	-5.686e-3	3	313.214	2	961.888	1
255		14	max	0	1	.167	3	.431	1	2.012e-2	2	NC	15	NC	5
256			min	0	15	-1.071	2	.019	15	-5.06e-3	3	287.541	2	964.041	1
257		15	max	0	1	.188	3	.408	1	1.833e-2	2	NC	15	NC	5
258			min	0	15	-1.064	2	.018	15	-4.434e-3	3	290.588	2	1072.958	1
259		16	max	0	1	.171	3	.364	1	1.653e-2	2	NC	5	NC	5
260			min	0	15	-.974	2	.016	15	-3.807e-3	3	330.254	2	1372.202	1
261		17	max	0	1	.117	3	.306	1	1.473e-2	2	NC	5	NC	5
262			min	0	15	-.806	2	.014	15	-3.181e-3	3	444.269	2	2171.657	1
263		18	max	0	1	.033	3	.247	1	1.294e-2	2	NC	5	NC	3
264			min	0	15	-.578	2	.011	15	-2.555e-3	3	839.224	2	5319.485	1
265		19	max	.001	1	-.013	15	.207	1	1.114e-2	2	NC	1	NC	1
266			min	0	15	-.354	1	.009	15	-1.928e-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	4.376e-3	2	NC	1	NC	1
270			min	0	2	-.001	3	0	2	-2.05e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	5.682e-3	2	NC	1	NC	1
272			min	0	2	-.004	3	0	2	-2.621e-3	3	NC	1	NC	1
273		4	max	0	3	0	15	.002	3	5.227e-3	2	NC	2	NC	1
274			min	0	2	-.009	1	-.001	2	-2.345e-3	3	7522.569	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
275		5	max	0	3	0	15	.003	3	4.771e-3	2	NC	4	NC	1
276			min	0	2	-.016	1	-.002	2	-2.068e-3	3	4270.742	1	NC	1
277		6	max	0	3	-.001	15	.004	3	4.315e-3	2	NC	5	NC	1
278			min	0	2	-.024	1	-.003	2	-1.791e-3	3	2774.192	1	9660.307	3
279		7	max	0	3	-.002	15	.006	3	3.86e-3	2	NC	5	NC	1
280			min	0	2	-.034	1	-.004	2	-1.514e-3	3	1960.672	1	7641.693	3
281		8	max	0	3	-.002	15	.007	3	3.404e-3	2	NC	5	NC	1
282			min	0	2	-.046	1	-.005	2	-1.237e-3	3	1467.917	1	6358.42	3
283		9	max	0	3	-.003	15	.008	3	2.948e-3	2	NC	5	NC	1
284			min	0	1	-.059	1	-.006	2	-9.606e-4	3	1146.707	1	5512.224	3
285		10	max	0	3	-.003	15	.009	3	2.493e-3	2	NC	5	NC	1
286			min	0	1	-.073	1	-.007	2	-6.838e-4	3	925.145	1	4952.72	3
287		11	max	0	3	-.004	15	.009	3	2.037e-3	2	NC	5	NC	4
288			min	0	1	-.088	1	-.007	1	-4.07e-4	3	765.776	1	4599.203	3
289		12	max	0	3	-.005	15	.009	3	1.582e-3	2	NC	15	NC	4
290			min	0	1	-.104	1	-.008	1	-1.302e-4	3	647.186	1	4412.608	3
291		13	max	.001	3	-.006	15	.009	3	1.126e-3	2	NC	15	NC	4
292			min	-.001	1	-.121	1	-.008	1	2.355e-6	15	556.47	1	4384.044	3
293		14	max	.001	3	-.006	15	.008	3	6.704e-4	2	NC	15	NC	4
294			min	-.001	1	-.139	1	-.008	1	-1.011e-4	9	485.524	1	4533.286	3
295		15	max	.001	3	-.007	15	.006	3	7.001e-4	3	9377.231	15	NC	4
296			min	-.001	1	-.157	1	-.007	1	-2.351e-4	9	428.954	1	4935.289	3
297		16	max	.001	3	-.008	15	.004	3	9.769e-4	3	8378.286	15	NC	1
298			min	-.001	1	-.176	1	-.007	1	-5.638e-4	1	383.14	1	5781.822	3
299		17	max	.001	3	-.009	15	0	3	1.254e-3	3	7557.68	15	NC	1
300			min	-.001	1	-.195	1	-.005	1	-9.528e-4	1	345.523	1	7681.028	3
301		18	max	.001	3	-.01	15	0	10	1.53e-3	3	6875.753	15	NC	1
302			min	-.002	1	-.214	1	-.004	3	-1.342e-3	1	314.277	1	NC	1
303		19	max	.002	3	-.011	15	.003	2	1.807e-3	3	6303.472	15	NC	1
304			min	-.002	1	-.234	1	-.01	3	-1.731e-3	1	288.066	1	NC	1
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	1	0	1	NC	1	NC	1
308			min	0	2	-.002	3	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	2	NC	1
310			min	0	2	-.008	3	0	1	0	1	8626.339	3	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	0	2	-.016	3	0	1	0	1	4140.516	3	NC	1
313		5	max	.001	3	-.001	15	0	1	0	1	NC	5	NC	1
314			min	-.001	2	-.028	1	0	1	0	1	2397.811	1	NC	1
315		6	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
316			min	-.001	2	-.043	1	0	1	0	1	1547.59	1	NC	1
317		7	max	.002	3	-.003	15	0	1	0	1	NC	5	NC	1
318			min	-.002	2	-.062	1	0	1	0	1	1089.415	1	NC	1
319		8	max	.002	3	-.003	15	0	1	0	1	NC	5	NC	1
320			min	-.002	2	-.083	1	0	1	0	1	813.421	1	NC	1
321		9	max	.002	3	-.004	15	0	1	0	1	NC	15	NC	1
322			min	-.002	2	-.106	1	0	1	0	1	634.194	1	NC	1
323		10	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
324			min	-.002	2	-.132	1	0	1	0	1	510.911	1	NC	1
325		11	max	.003	3	-.007	15	0	1	0	1	NC	15	NC	1
326			min	-.002	2	-.159	1	0	1	0	1	422.421	1	NC	1
327		12	max	.003	3	-.008	15	0	1	0	1	8705.294	15	NC	1
328			min	-.003	2	-.189	1	0	1	0	1	356.683	1	NC	1
329		13	max	.003	3	-.009	15	0	1	0	1	7486.3	15	NC	1
330			min	-.003	2	-.22	1	0	1	0	1	306.464	1	NC	1
331		14	max	.003	3	-.01	15	0	1	0	1	6532.712	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
332			min	-.003	2	-.252	1	0	1	0	1	267.232	1	NC	1
333		15	max	.003	3	-.012	15	0	1	0	1	5772.214	15	NC	1
334			min	-.003	2	-.285	1	0	1	0	1	235.978	1	NC	1
335		16	max	.004	3	-.013	15	0	1	0	1	5156.195	15	NC	1
336			min	-.004	2	-.319	1	0	1	0	1	210.687	1	NC	1
337		17	max	.004	3	-.014	15	0	1	0	1	4650.328	15	NC	1
338			min	-.004	2	-.354	1	0	1	0	1	189.935	1	NC	1
339		18	max	.004	3	-.016	15	0	1	0	1	4230.079	15	NC	1
340			min	-.004	2	-.39	1	0	1	0	1	172.708	1	NC	1
341		19	max	.004	3	-.017	15	0	1	0	1	3877.496	15	NC	1
342			min	-.004	2	-.425	1	0	1	0	1	158.264	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	2.05e-3	3	NC	1	NC	1
346			min	0	2	-.001	3	0	3	-4.376e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	2	2.621e-3	3	NC	1	NC	1
348			min	0	2	-.004	3	0	3	-5.682e-3	2	NC	1	NC	1
349		4	max	0	3	0	15	.001	2	2.345e-3	3	NC	2	NC	1
350			min	0	2	-.009	1	-.002	3	-5.227e-3	2	7522.569	1	NC	1
351		5	max	0	3	0	15	.002	2	2.068e-3	3	NC	4	NC	1
352			min	0	2	-.016	1	-.003	3	-4.771e-3	2	4270.742	1	NC	1
353		6	max	0	3	-.001	15	.003	2	1.791e-3	3	NC	5	NC	1
354			min	0	2	-.024	1	-.004	3	-4.315e-3	2	2774.192	1	9660.307	3
355		7	max	0	3	-.002	15	.004	2	1.514e-3	3	NC	5	NC	1
356			min	0	2	-.034	1	-.006	3	-3.86e-3	2	1960.672	1	7641.693	3
357		8	max	0	3	-.002	15	.005	2	1.237e-3	3	NC	5	NC	1
358			min	0	2	-.046	1	-.007	3	-3.404e-3	2	1467.917	1	6358.42	3
359		9	max	0	3	-.003	15	.006	2	9.606e-4	3	NC	5	NC	1
360			min	0	1	-.059	1	-.008	3	-2.948e-3	2	1146.707	1	5512.224	3
361		10	max	0	3	-.003	15	.007	2	6.838e-4	3	NC	5	NC	1
362			min	0	1	-.073	1	-.009	3	-2.493e-3	2	925.145	1	4952.72	3
363		11	max	0	3	-.004	15	.007	1	4.07e-4	3	NC	5	NC	4
364			min	0	1	-.088	1	-.009	3	-2.037e-3	2	765.776	1	4599.203	3
365		12	max	0	3	-.005	15	.008	1	1.302e-4	3	NC	15	NC	4
366			min	0	1	-.104	1	-.009	3	-1.582e-3	2	647.186	1	4412.608	3
367		13	max	.001	3	-.006	15	.008	1	-2.355e-6	15	NC	15	NC	4
368			min	-.001	1	-.121	1	-.009	3	-1.126e-3	2	556.47	1	4384.044	3
369		14	max	.001	3	-.006	15	.008	1	1.011e-4	9	NC	15	NC	4
370			min	-.001	1	-.139	1	-.008	3	-6.704e-4	2	485.524	1	4533.286	3
371		15	max	.001	3	-.007	15	.007	1	2.351e-4	9	9377.231	15	NC	4
372			min	-.001	1	-.157	1	-.006	3	-7.001e-4	3	428.954	1	4935.289	3
373		16	max	.001	3	-.008	15	.007	1	5.638e-4	1	8378.286	15	NC	1
374			min	-.001	1	-.176	1	-.004	3	-9.769e-4	3	383.14	1	5781.822	3
375		17	max	.001	3	-.009	15	.005	1	9.528e-4	1	7557.68	15	NC	1
376			min	-.001	1	-.195	1	0	3	-1.254e-3	3	345.523	1	7681.028	3
377		18	max	.001	3	-.01	15	.004	3	1.342e-3	1	6875.753	15	NC	1
378			min	-.002	1	-.214	1	0	10	-1.53e-3	3	314.277	1	NC	1
379		19	max	.002	3	-.011	15	.01	3	1.731e-3	1	6303.472	15	NC	1
380			min	-.002	1	-.234	1	-.003	2	-1.807e-3	3	288.066	1	NC	1
381	M3	1	max	.002	3	0	15	0	3	2.773e-3	2	NC	1	NC	1
382			min	0	15	0	1	0	2	-1.211e-3	3	NC	1	NC	1
383		2	max	.002	3	0	15	.009	3	3.009e-3	2	NC	1	NC	4
384			min	0	10	-.015	1	-.019	2	-1.338e-3	3	NC	1	3306.653	2
385		3	max	.002	3	-.002	15	.018	3	3.245e-3	2	NC	1	NC	4
386			min	0	10	-.029	1	-.037	2	-1.465e-3	3	NC	1	1663.364	2
387		4	max	.002	3	-.002	15	.027	3	3.48e-3	2	NC	1	NC	5
388			min	0	2	-.043	1	-.055	2	-1.592e-3	3	NC	1	1123.184	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	.003	3	-.003	15	.035	3	3.716e-3	2	NC	1	NC	5
390			min	-.001	2	-.057	1	-.072	2	-1.72e-3	3	NC	1	859.227	2
391		6	max	.003	3	-.004	15	.042	3	3.952e-3	2	NC	1	NC	5
392			min	-.002	2	-.071	1	-.087	2	-1.847e-3	3	NC	1	706.345	2
393		7	max	.003	3	-.005	15	.048	3	4.188e-3	2	NC	1	NC	5
394			min	-.002	2	-.085	1	-.101	2	-1.974e-3	3	NC	1	609.74	2
395		8	max	.003	3	-.005	15	.054	3	4.424e-3	2	NC	1	NC	5
396			min	-.003	2	-.099	1	-.112	2	-2.101e-3	3	NC	1	546.22	2
397		9	max	.003	3	-.006	15	.058	3	4.66e-3	2	NC	1	NC	5
398			min	-.003	2	-.113	1	-.121	2	-2.229e-3	3	NC	1	504.563	2
399		10	max	.004	3	-.007	15	.061	3	4.896e-3	2	NC	1	NC	5
400			min	-.004	2	-.126	1	-.128	2	-2.356e-3	3	NC	1	479.04	2
401		11	max	.004	3	-.007	15	.063	3	5.131e-3	2	NC	1	NC	5
402			min	-.004	2	-.14	1	-.131	2	-2.483e-3	3	NC	1	466.949	2
403		12	max	.004	3	-.008	15	.063	3	5.367e-3	2	NC	1	NC	5
404			min	-.005	2	-.153	1	-.13	2	-2.61e-3	3	NC	1	467.709	2
405		13	max	.004	3	-.008	15	.061	3	5.603e-3	2	NC	1	NC	5
406			min	-.005	2	-.166	1	-.125	2	-2.738e-3	3	NC	1	482.839	2
407		14	max	.004	3	-.009	15	.057	3	5.839e-3	2	NC	1	NC	5
408			min	-.006	2	-.18	1	-.116	2	-2.865e-3	3	NC	1	516.907	2
409		15	max	.005	3	-.009	15	.051	3	6.075e-3	2	NC	1	NC	5
410			min	-.006	2	-.193	1	-.102	2	-2.992e-3	3	NC	1	580.519	2
411		16	max	.005	3	-.01	15	.042	3	6.311e-3	2	NC	1	NC	5
412			min	-.007	2	-.206	1	-.083	2	-3.119e-3	3	NC	1	699.727	2
413		17	max	.005	3	-.01	15	.031	3	6.546e-3	2	NC	1	NC	5
414			min	-.007	2	-.219	1	-.059	2	-3.246e-3	3	NC	1	954.018	2
415		18	max	.005	3	-.011	15	.017	3	6.782e-3	2	NC	1	NC	4
416			min	-.008	2	-.232	1	-.028	2	-3.374e-3	3	NC	1	1742.713	2
417		19	max	.005	3	-.011	15	.011	1	7.018e-3	2	NC	1	NC	1
418			min	-.008	2	-.245	1	0	12	-3.501e-3	3	NC	1	NC	1
419	M6	1	max	.004	3	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.002	1	0	1	0	1	NC	1	NC	1
421		2	max	.004	3	-.001	15	0	1	0	1	NC	1	NC	1
422			min	0	10	-.027	1	0	1	0	1	NC	1	NC	1
423		3	max	.005	3	-.002	15	0	1	0	1	NC	1	NC	1
424			min	-.002	2	-.053	1	0	1	0	1	NC	1	NC	1
425		4	max	.006	3	-.004	15	0	1	0	1	NC	1	NC	1
426			min	-.003	2	-.079	1	0	1	0	1	NC	1	NC	1
427		5	max	.006	3	-.005	15	0	1	0	1	NC	1	NC	1
428			min	-.005	2	-.104	1	0	1	0	1	NC	1	NC	1
429		6	max	.007	3	-.006	15	0	1	0	1	NC	1	NC	1
430			min	-.006	2	-.13	1	0	1	0	1	NC	1	NC	1
431		7	max	.008	3	-.007	15	0	1	0	1	NC	1	NC	1
432			min	-.008	2	-.155	1	0	1	0	1	NC	1	NC	1
433		8	max	.009	3	-.008	15	0	1	0	1	NC	1	NC	1
434			min	-.009	2	-.181	1	0	1	0	1	NC	1	NC	1
435		9	max	.009	3	-.009	15	0	1	0	1	NC	1	NC	1
436			min	-.011	2	-.206	1	0	1	0	1	NC	1	NC	1
437		10	max	.01	3	-.01	15	0	1	0	1	NC	1	NC	1
438			min	-.012	2	-.231	1	0	1	0	1	NC	1	NC	1
439		11	max	.011	3	-.011	15	0	1	0	1	NC	1	NC	1
440			min	-.014	2	-.256	1	0	1	0	1	NC	1	NC	1
441		12	max	.011	3	-.012	15	0	1	0	1	NC	1	NC	1
442			min	-.015	2	-.281	1	0	1	0	1	NC	1	NC	1
443		13	max	.012	3	-.013	15	0	1	0	1	NC	1	NC	1
444			min	-.017	2	-.306	1	0	1	0	1	NC	1	NC	1
445		14	max	.013	3	-.014	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	-.018	2	-.331	1	0	1	0	1	NC	1	NC	1
447		15	max	.013	3	-.015	15	0	1	0	1	NC	1	NC	1
448			min	-.02	2	-.355	1	0	1	0	1	NC	1	NC	1
449		16	max	.014	3	-.016	15	0	1	0	1	NC	1	NC	1
450			min	-.021	2	-.38	1	0	1	0	1	NC	1	NC	1
451		17	max	.015	3	-.016	15	0	1	0	1	NC	1	NC	1
452			min	-.023	2	-.405	1	0	1	0	1	NC	1	NC	1
453		18	max	.015	3	-.017	15	0	1	0	1	NC	1	NC	1
454			min	-.024	2	-.429	1	0	1	0	1	NC	1	NC	1
455		19	max	.016	3	-.018	15	0	1	0	1	NC	1	NC	1
456			min	-.026	2	-.454	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.002	3	0	15	0	2	1.211e-3	3	NC	1	NC	1
458			min	0	15	0	1	0	3	-2.773e-3	2	NC	1	NC	1
459		2	max	.002	3	0	15	.019	2	1.338e-3	3	NC	1	NC	4
460			min	0	10	-.015	1	-.009	3	-3.009e-3	2	NC	1	3306.653	2
461		3	max	.002	3	-.002	15	.037	2	1.465e-3	3	NC	1	NC	4
462			min	0	10	-.029	1	-.018	3	-3.245e-3	2	NC	1	1663.364	2
463		4	max	.002	3	-.002	15	.055	2	1.592e-3	3	NC	1	NC	5
464			min	0	2	-.043	1	-.027	3	-3.48e-3	2	NC	1	1123.184	2
465		5	max	.003	3	-.003	15	.072	2	1.72e-3	3	NC	1	NC	5
466			min	-.001	2	-.057	1	-.035	3	-3.716e-3	2	NC	1	859.227	2
467		6	max	.003	3	-.004	15	.087	2	1.847e-3	3	NC	1	NC	5
468			min	-.002	2	-.071	1	-.042	3	-3.952e-3	2	NC	1	706.345	2
469		7	max	.003	3	-.005	15	.101	2	1.974e-3	3	NC	1	NC	5
470			min	-.002	2	-.085	1	-.048	3	-4.188e-3	2	NC	1	609.74	2
471		8	max	.003	3	-.005	15	.112	2	2.101e-3	3	NC	1	NC	5
472			min	-.003	2	-.099	1	-.054	3	-4.424e-3	2	NC	1	546.22	2
473		9	max	.003	3	-.006	15	.121	2	2.229e-3	3	NC	1	NC	5
474			min	-.003	2	-.113	1	-.058	3	-4.66e-3	2	NC	1	504.563	2
475		10	max	.004	3	-.007	15	.128	2	2.356e-3	3	NC	1	NC	5
476			min	-.004	2	-.126	1	-.061	3	-4.896e-3	2	NC	1	479.04	2
477		11	max	.004	3	-.007	15	.131	2	2.483e-3	3	NC	1	NC	5
478			min	-.004	2	-.14	1	-.063	3	-5.131e-3	2	NC	1	466.949	2
479		12	max	.004	3	-.008	15	.13	2	2.61e-3	3	NC	1	NC	5
480			min	-.005	2	-.153	1	-.063	3	-5.367e-3	2	NC	1	467.709	2
481		13	max	.004	3	-.008	15	.125	2	2.738e-3	3	NC	1	NC	5
482			min	-.005	2	-.166	1	-.061	3	-5.603e-3	2	NC	1	482.839	2
483		14	max	.004	3	-.009	15	.116	2	2.865e-3	3	NC	1	NC	5
484			min	-.006	2	-.18	1	-.057	3	-5.839e-3	2	NC	1	516.907	2
485		15	max	.005	3	-.009	15	.102	2	2.992e-3	3	NC	1	NC	5
486			min	-.006	2	-.193	1	-.051	3	-6.075e-3	2	NC	1	580.519	2
487		16	max	.005	3	-.01	15	.083	2	3.119e-3	3	NC	1	NC	5
488			min	-.007	2	-.206	1	-.042	3	-6.311e-3	2	NC	1	699.727	2
489		17	max	.005	3	-.01	15	.059	2	3.246e-3	3	NC	1	NC	5
490			min	-.007	2	-.219	1	-.031	3	-6.546e-3	2	NC	1	954.018	2
491		18	max	.005	3	-.011	15	.028	2	3.374e-3	3	NC	1	NC	4
492			min	-.008	2	-.232	1	-.017	3	-6.782e-3	2	NC	1	1742.713	2
493		19	max	.005	3	-.011	15	0	12	3.501e-3	3	NC	1	NC	1
494			min	-.008	2	-.245	1	-.011	1	-7.018e-3	2	NC	1	NC	1