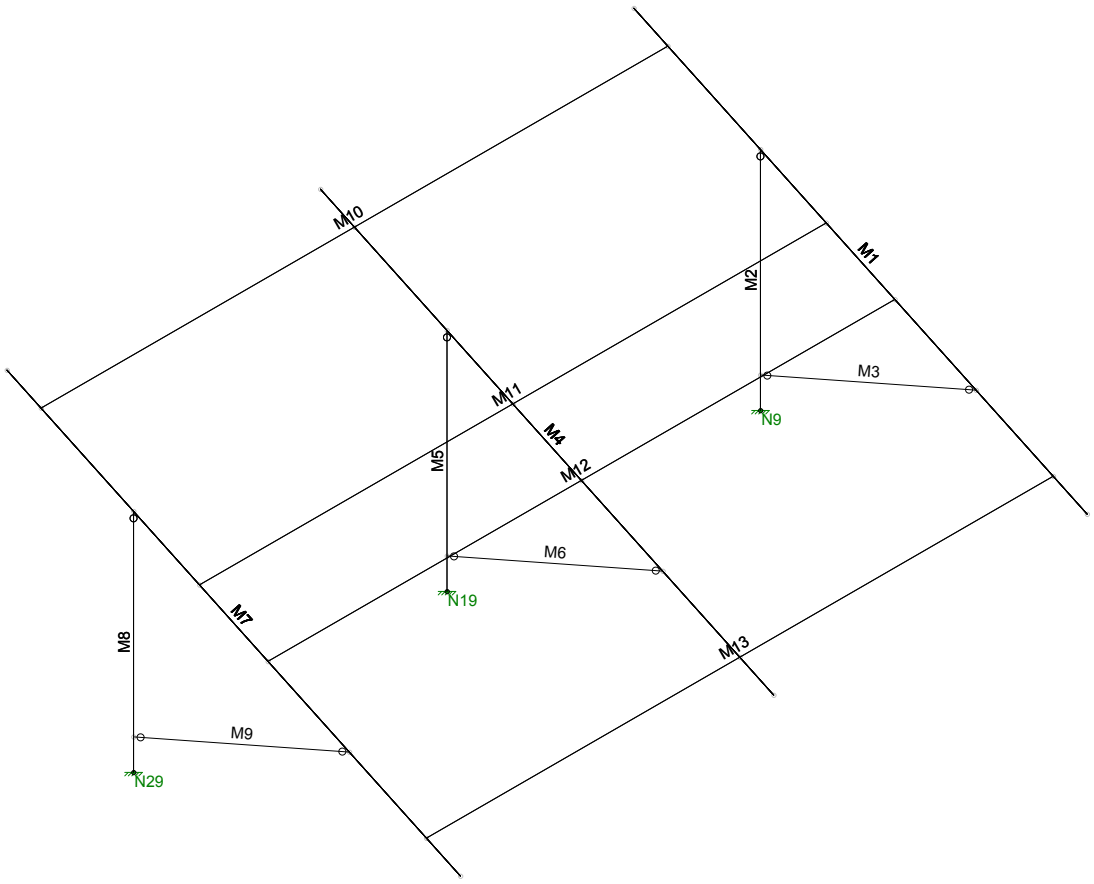


Schletter, Inc.		25° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

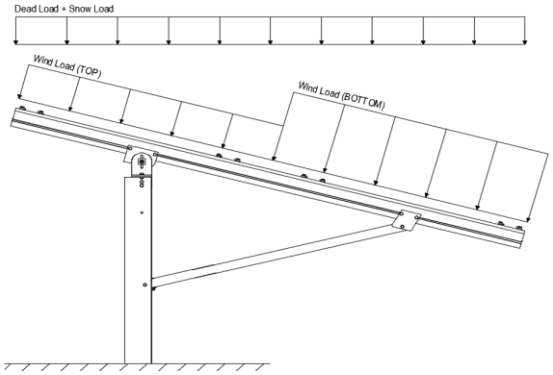
1.2 Construction

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 =	1700 mm	Height =	1550 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)*	*Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.*
$Cf+_{BOTTOM}$ =	1.7		
$Cf-_{TOP}$ =	-2.2	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1		

2.4 Seismic Loads - N/A

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W		
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

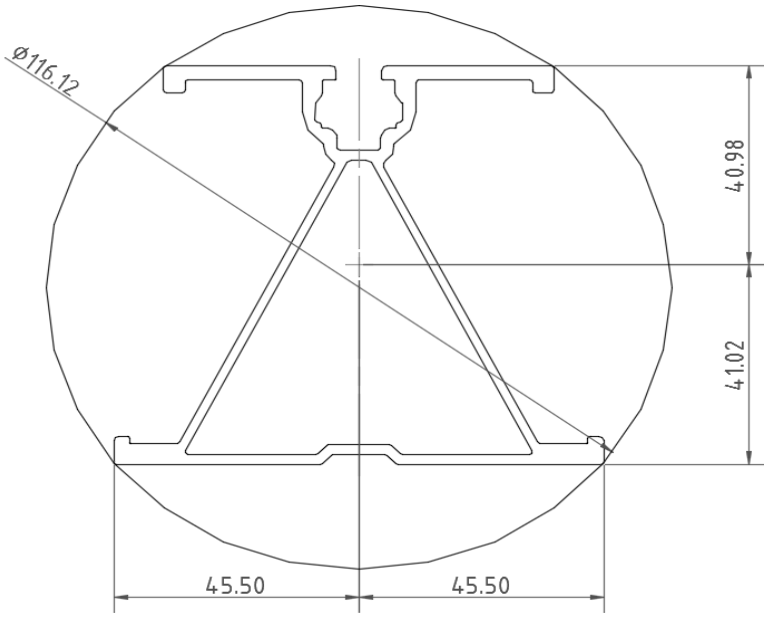
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	132	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 =	1.993	k-ft
M_z =	0.276	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	96%	

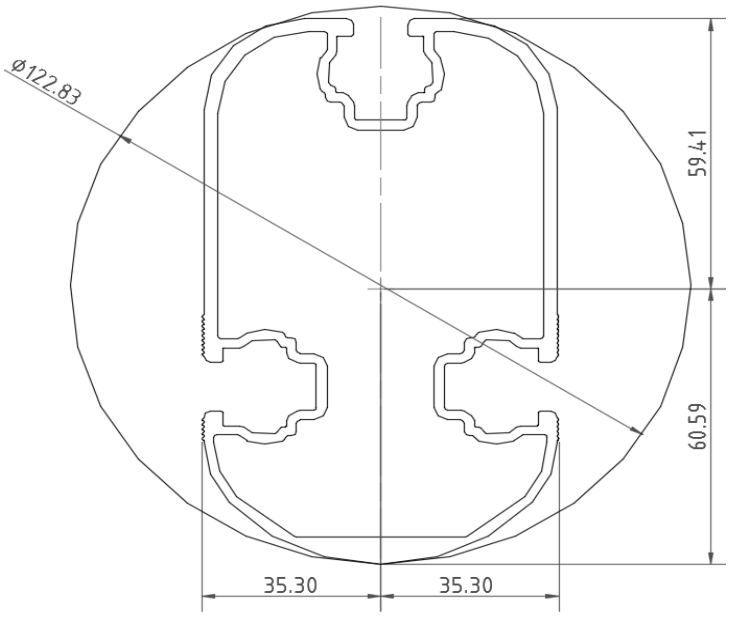


DETAIL VIEW

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 =	4.498	k-ft
M_z =	0.000	k-ft
P_n =	0.025	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	90%	

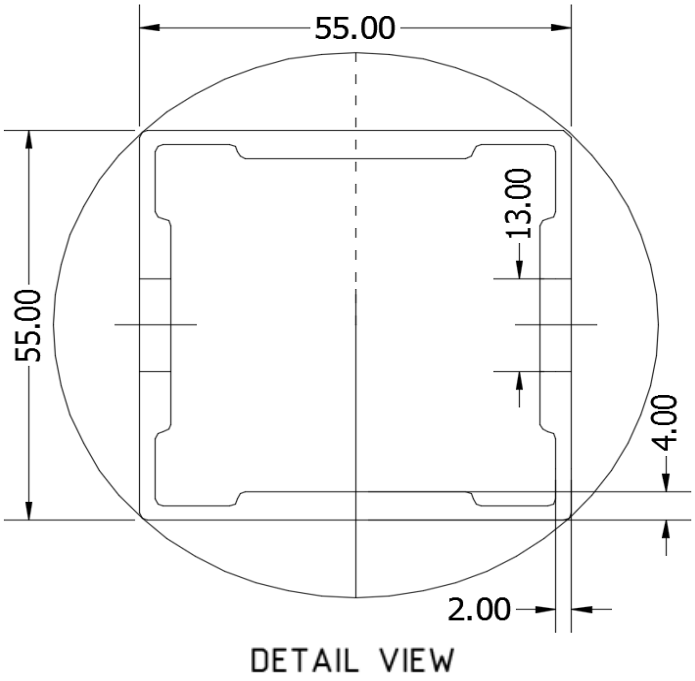


DETAIL VIEW

4.3 Strut Design

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

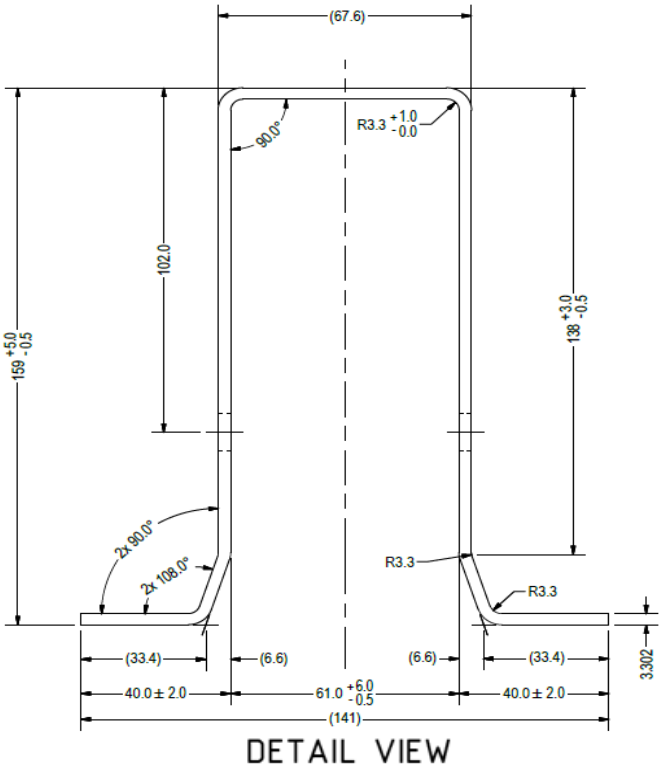
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.421	k-ft
P_n =	5.189	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	69%	



4.4 Post Design

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

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	72.60	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	12.027	k-ft
M_z =	0.000	k-ft
P_r =	6.904	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	82%	



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 =	6.84	k
Maximum Lateral Load =	3.33	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)

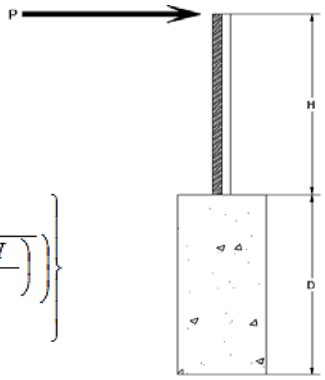
Lateral Force @ Top of Pole, P =	1.33	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft
Lateral Bearing @ Bottom =	S_3	
Lateral Bearing @ D/3 =	S_1	
Required Depth =	D	

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.33	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf	
Lateral Soil Bearing @ D, S_3 =	0.65	ksf	
Constant 2.34P/(S_1B), A =	7.16		
Required Footing Depth, D =	10.81	ft	
2nd Trial @ D_2 =	7.03	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.47	ksf	
Lateral Soil Bearing @ D, S_3 =	1.41	ksf	
Constant 2.34P/(S_1B), A =	3.31		
Required Footing Depth, D =	6.23	ft	
3rd Trial @ D_3 =	6.63	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf	
Lateral Soil Bearing @ D, S_3 =	1.33	ksf	
Constant 2.34P/(S_1B), A =	3.51		
Required Footing Depth, D =	6.49	ft	
4th Trial @ D_4 =	6.56	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf	
Lateral Soil Bearing @ D, S_3 =	1.31	ksf	
Constant 2.34P/(S_1B), A =	3.55		
Required Footing Depth, D =	6.54	ft	
5th Trial @ D_5 =	6.55	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf	
Lateral Soil Bearing @ D, S_3 =	1.31	ksf	
Constant 2.34P/(S_1B), A =	3.55		
Required Footing Depth, D =	6.75	ft	

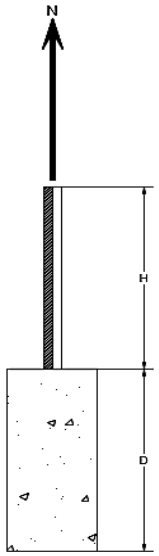
A 2ft diameter x 6.75ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.14	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 =	2.05	k
Required Concrete Volume, V =	14.13	ft^3
Required Footing Depth, D =	4.50	ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.78
2	0.4	0.2	118.10	6.68
3	0.6	0.2	118.10	6.57
4	0.8	0.2	118.10	6.47
5	1	0.2	118.10	6.37
6	1.2	0.2	118.10	6.26
7	1.4	0.2	118.10	6.16
8	1.6	0.2	118.10	6.05
9	1.8	0.2	118.10	5.95
10	2	0.2	118.10	5.85
11	2.2	0.2	118.10	5.74
12	2.4	0.2	118.10	5.64
13	2.6	0.2	118.10	5.54
14	2.8	0.2	118.10	5.43
15	3	0.2	118.10	5.33
16	3.2	0.2	118.10	5.22
17	3.4	0.2	118.10	5.12
18	3.6	0.2	118.10	5.02
19	3.8	0.2	118.10	4.91
20	4	0.2	118.10	4.81
21	4.2	0.2	118.10	4.71
22	4.4	0.2	118.10	4.60
23	4.6	0.2	118.10	4.50
24	0	0.0	0.00	4.50
25	0	0.0	0.00	4.50
26	0	0.0	0.00	4.50
27	0	0.0	0.00	4.50
28	0	0.0	0.00	4.50
29	0	0.0	0.00	4.50
30	0	0.0	0.00	4.50
31	0	0.0	0.00	4.50
32	0	0.0	0.00	4.50
33	0	0.0	0.00	4.50
34	0	0.0	0.00	4.50
Max	4.6	Sum	1.09	

5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.55	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	23.56	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

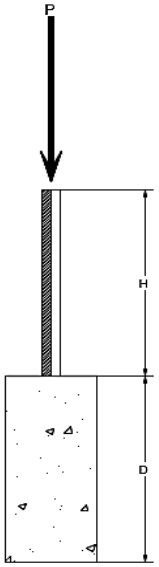
Weight of Concrete

Footing Volume	21.21	ft^3
Weight	3.07	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.53	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.00	k
Applied Force =	7.63	k
Utilization =	69%	

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



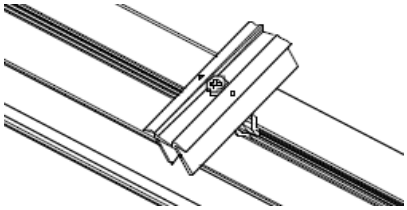
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

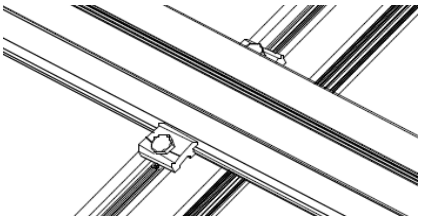
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.546 k
Allowable Uplift	=	1.214 k
Utilization	=	45%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.129 k
Allowable Uplift	=	2.180 k
Utilization	=	98%

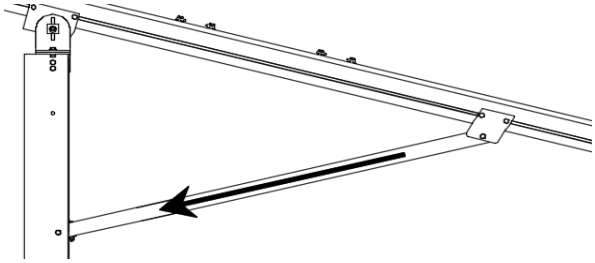


6.2 Strut Connections

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	=	5.189 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	58%

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

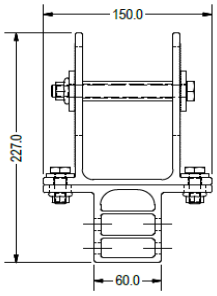


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

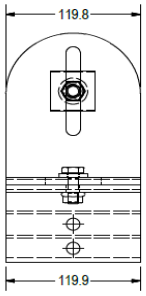
6.3 Girder to Post Connection

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.

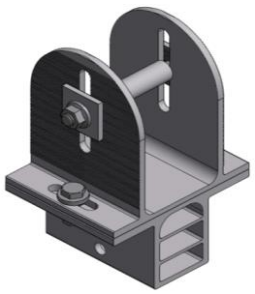
Maximum Tensile Load	=	4.531 k
Allowable Load	=	5.649 k
Utilization	=	80%



FRONT VIEW



SIDE VIEW



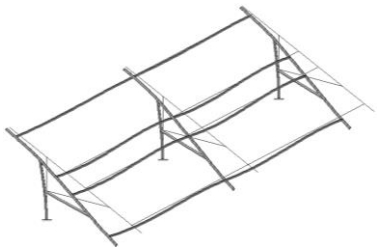
7. SEISMIC DESIGN

7.1 Seismic Drift - N/A

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

Mean Height, h_{sx}	=	70.15 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.403 in
Max Drift, Δ_{MAX}	=	0 in
N/A		

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



APPENDIX A

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

Purlin = **S1.5**

Strong Axis:

3.4.14

L_b = 132 in

J = 0.432

365.174

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

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= 27.1 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 = 132

J = 0.432

232.229

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

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= 28.4

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:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

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

φF_L = 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = φyFcy

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	72.60	in	
Pr =	6.90	k	(LRFD Factored Load)
Mr (Strong) =	12.03	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

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

Torsional/Flexural Torsional Buckling:

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

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.2015	≥	0.2	
Utilization =	0.82	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.201	≥	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 82%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

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

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-81.397	-81.397	0	0
2	M11	y	-81.397	-81.397	0	0
3	M12	y	-125.796	-125.796	0	0
4	M13	y	-125.796	-125.796	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	162.794	162.794	0	0
2	M11	y	162.794	162.794	0	0
3	M12	y	73.997	73.997	0	0
4	M13	y	73.997	73.997	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...
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	676.514	2	2552.821	1	319.808	1	.401	1	.006	3	5.416	1
2		min	-919.515	3	-1760.371	3	-331.301	3	-.416	3	-.012	2	.204	15
3	N19	max	2499.769	2	6926.171	1	0	3	0	3	0	1	11.183	1
4		min	-2564.148	3	-5259.209	3	0	1	0	2	0	15	.376	15
5	N29	max	676.514	2	2552.821	1	331.301	3	.416	3	.012	2	5.416	1
6		min	-919.515	3	-1760.371	3	-319.808	1	-.401	1	-.006	3	.204	15
7	Totals:	max	3852.796	2	12031.814	1	0	3						
8		min	-4403.177	3	-8779.951	3	0	2						

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	.007	1	0	15	0	1	0	1	0	1
2			min	0	1	-.001	3	-.001	1	0	1	0	1	0	1
3		2	max	-.221	15	-.473	15	0	15	0	1	0	15	0	4
4			min	-.939	4	-2.011	4	-.001	1	0	1	0	1	0	15
5		3	max	-8.852	15	296.301	3	1.115	3	.076	3	.312	1	.31	2
6			min	-211.378	1	-711.298	2	-197.277	1	-.28	2	.012	15	-.127	3
7		4	max	-9.072	15	295.125	3	1.115	3	.076	3	.19	1	.752	2
8			min	-212.11	1	-712.866	2	-197.277	1	-.28	2	.008	15	-.31	3
9		5	max	-9.293	15	293.948	3	1.115	3	.076	3	.067	1	1.194	2
10			min	-212.841	1	-714.434	2	-197.277	1	-.28	2	-.009	10	-.493	3
11		6	max	395.545	3	630.299	2	36.144	3	.07	2	.141	1	1.144	2
12			min	-1288.292	2	-180.062	3	-269.951	1	-.082	3	-.055	3	-.502	3
13		7	max	394.996	3	628.731	2	36.144	3	.07	2	.017	2	.754	2
14			min	-1289.023	2	-181.238	3	-269.951	1	-.082	3	-.033	3	-.39	3
15		8	max	394.448	3	627.162	2	36.144	3	.07	2	-.007	12	.364	2
16			min	-1289.755	2	-182.414	3	-269.951	1	-.082	3	-.194	1	-.277	3
17		9	max	378.81	3	91.802	3	30.824	3	-.003	15	.099	1	.151	1
18			min	-1502.272	1	-71.251	2	-270.229	1	-.238	2	-.001	10	-.225	3
19		10	max	378.262	3	90.625	3	30.824	3	-.003	15	.066	3	.195	1
20			min	-1503.003	1	-72.82	2	-270.229	1	-.238	2	-.068	1	-.282	3
21		11	max	377.713	3	89.449	3	30.824	3	-.003	15	.085	3	.239	1
22			min	-1503.734	1	-74.388	2	-270.229	1	-.238	2	-.236	1	-.337	3
23		12	max	358.612	3	819.855	3	170.548	2	.47	3	.177	1	.501	1
24			min	-1718.887	1	-603.708	1	-336.05	3	-.452	2	.007	15	-.681	3
25		13	max	358.063	3	818.679	3	170.548	2	.47	3	.238	1	.876	1
26			min	-1719.618	1	-605.276	1	-336.05	3	-.452	2	-.189	3	-1.189	3
27		14	max	213.591	1	544.434	1	-5.956	15	.318	1	.062	3	1.236	1
28			min	9.537	15	-728.879	3	-149.178	1	-.511	3	-.061	1	-1.676	3
29		15	max	212.86	1	542.866	1	-5.956	15	.318	1	.038	3	.899	1
30			min	9.316	15	-730.055	3	-149.178	1	-.511	3	-.154	1	-1.223	3
31		16	max	212.128	1	541.298	1	-5.956	15	.318	1	.013	3	.563	1
32			min	9.095	15	-731.231	3	-149.178	1	-.511	3	-.246	1	-.77	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	211.397	1	539.73	1	-5.956	15	.318	1	-.008	12	.227	1
34			min	8.875	15	-732.407	3	-149.178	1	-.511	3	-.339	1	-.316	3
35		18	max	.939	4	2.013	4	.001	1	0	1	0	15	0	4
36			min	.221	15	.473	15	0	15	0	1	0	1	0	15
37		19	max	0	1	.002	2	.001	1	0	1	0	1	0	1
38			min	0	1	-.005	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.017	2	0	1	0	1	0	1	0	1
40			min	0	1	-.004	3	0	1	0	1	0	1	0	1
41		2	max	-.221	15	-.473	15	0	1	0	1	0	1	0	4
42			min	-.939	4	-2.009	4	0	1	0	1	0	1	0	15
43		3	max	-14.336	12	921.141	3	0	1	0	1	0	1	.788	2
44			min	-389.446	1	-2051.428	2	0	1	0	1	0	1	-.357	3
45		4	max	-14.702	12	919.965	3	0	1	0	1	0	1	2.062	2
46			min	-390.177	1	-2052.997	2	0	1	0	1	0	1	-.929	3
47		5	max	-15.067	12	918.789	3	0	1	0	1	0	1	3.337	2
48			min	-390.908	1	-2054.565	2	0	1	0	1	0	1	-1.499	3
49		6	max	1388.99	3	1864.819	2	0	1	0	1	0	1	3.174	2
50			min	-3625.542	2	-682.775	3	0	1	0	1	0	1	-1.482	3
51		7	max	1388.442	3	1863.25	2	0	1	0	1	0	1	2.017	2
52			min	-3626.274	2	-683.952	3	0	1	0	1	0	1	-1.058	3
53		8	max	1387.893	3	1861.682	2	0	1	0	1	0	1	.861	2
54			min	-3627.005	2	-685.128	3	0	1	0	1	0	1	-.633	3
55		9	max	1367.699	3	277.782	3	0	1	0	1	0	1	.193	1
56			min	-3852.345	1	-251.985	1	0	1	0	1	0	1	-.424	3
57		10	max	1367.151	3	276.606	3	0	1	0	1	0	1	.35	1
58			min	-3853.076	1	-253.553	1	0	1	0	1	0	1	-.596	3
59		11	max	1366.602	3	275.43	3	0	1	0	1	0	1	.508	1
60			min	-3853.807	1	-255.121	1	0	1	0	1	0	1	-.767	3
61		12	max	1353.336	3	2275.189	3	0	1	0	1	0	1	1.283	1
62			min	-4233.51	1	-1843.874	1	0	1	0	1	0	1	-1.734	3
63		13	max	1352.788	3	2274.013	3	0	1	0	1	0	1	2.428	1
64			min	-4234.241	1	-1845.442	1	0	1	0	1	0	1	-3.146	3
65		14	max	391.602	1	1565.76	1	0	1	0	1	0	1	3.527	1
66			min	16.587	12	-2000.211	3	0	1	0	1	0	1	-4.498	3
67		15	max	390.871	1	1564.192	1	0	1	0	1	0	1	2.556	1
68			min	16.222	12	-2001.387	3	0	1	0	1	0	1	-3.256	3
69		16	max	390.139	1	1562.623	1	0	1	0	1	0	1	1.585	1
70			min	15.856	12	-2002.564	3	0	1	0	1	0	1	-2.014	3
71		17	max	389.408	1	1561.055	1	0	1	0	1	0	1	.616	1
72			min	15.49	12	-2003.74	3	0	1	0	1	0	1	-.771	3
73		18	max	.939	4	2.014	4	0	1	0	1	0	1	0	4
74			min	.221	15	.473	15	0	1	0	1	0	1	0	15
75		19	max	0	1	.006	2	0	1	0	1	0	1	0	1
76			min	0	1	-.012	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.007	1	.001	1	0	1	0	1	0	1
78			min	0	1	-.001	3	0	15	0	1	0	1	0	1
79		2	max	-.221	15	-.473	15	.001	1	0	1	0	1	0	4
80			min	-.939	4	-2.011	4	0	15	0	1	0	15	0	15
81		3	max	-8.852	15	296.301	3	197.277	1	.28	2	-.012	15	.31	2
82			min	-211.378	1	-711.298	2	-1.115	3	-.076	3	-.312	1	-.127	3
83		4	max	-9.072	15	295.125	3	197.277	1	.28	2	-.008	15	.752	2
84			min	-212.11	1	-712.866	2	-1.115	3	-.076	3	-.19	1	-.31	3
85		5	max	-9.293	15	293.948	3	197.277	1	.28	2	.009	10	1.194	2
86			min	-212.841	1	-714.434	2	-1.115	3	-.076	3	-.067	1	-.493	3
87		6	max	395.545	3	630.299	2	269.951	1	.082	3	.055	3	1.144	2
88			min	-1288.292	2	-180.062	3	-36.144	3	-.07	2	-.141	1	-.502	3
89		7	max	394.996	3	628.731	2	269.951	1	.082	3	.033	3	.754	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	-1289.023	2	-181.238	3	-36.144	3	-.07	2	-.017	2	-.39	3
91		8	max	394.448	3	627.162	2	269.951	1	.082	3	.194	1	.364	2
92			min	-1289.755	2	-182.414	3	-36.144	3	-.07	2	.007	12	-.277	3
93		9	max	378.81	3	91.802	3	270.229	1	.238	2	.001	10	.151	1
94			min	-1502.272	1	-71.251	2	-30.824	3	.003	15	-.099	1	-.225	3
95		10	max	378.262	3	90.625	3	270.229	1	.238	2	.068	1	.195	1
96			min	-1503.003	1	-72.82	2	-30.824	3	.003	15	-.066	3	-.282	3
97		11	max	377.713	3	89.449	3	270.229	1	.238	2	.236	1	.239	1
98			min	-1503.734	1	-74.388	2	-30.824	3	.003	15	-.085	3	-.337	3
99		12	max	358.612	3	819.855	3	336.05	3	.452	2	-.007	15	.501	1
100			min	-1718.887	1	-603.708	1	-170.548	2	-.47	3	-.177	1	-.681	3
101		13	max	358.063	3	818.679	3	336.05	3	.452	2	.189	3	.876	1
102			min	-1719.618	1	-605.276	1	-170.548	2	-.47	3	-.238	1	-1.189	3
103		14	max	213.591	1	544.434	1	149.178	1	.511	3	.061	1	1.236	1
104			min	9.537	15	-728.879	3	5.956	15	-.318	1	-.062	3	-1.676	3
105		15	max	212.86	1	542.866	1	149.178	1	.511	3	.154	1	.899	1
106			min	9.316	15	-730.055	3	5.956	15	-.318	1	-.038	3	-1.223	3
107		16	max	212.128	1	541.298	1	149.178	1	.511	3	.246	1	.563	1
108			min	9.095	15	-731.231	3	5.956	15	-.318	1	-.013	3	-.77	3
109		17	max	211.397	1	539.73	1	149.178	1	.511	3	.339	1	.227	1
110			min	8.875	15	-732.407	3	5.956	15	-.318	1	.008	12	-.316	3
111		18	max	.939	4	2.013	4	0	15	0	1	0	1	0	4
112			min	.221	15	.473	15	-.001	1	0	1	0	15	0	15
113		19	max	0	1	.002	2	0	15	0	1	0	1	0	1
114			min	0	1	-.005	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	149.164	1	536.271	1	-8.434	15	.008	1	.399	1	.318	1
116			min	5.956	15	-734.73	3	-210.286	1	-.02	3	.015	15	-.511	3
117		2	max	149.164	1	390.286	1	-6.588	15	.008	1	.17	1	.269	3
118			min	5.956	15	-541.695	3	-165.408	1	-.02	3	.006	15	-.249	1
119		3	max	149.164	1	244.301	1	-4.743	15	.008	1	.021	2	.814	3
120			min	5.956	15	-348.661	3	-120.529	1	-.02	3	-.013	9	-.637	1
121		4	max	149.164	1	98.316	1	-2.897	15	.008	1	-.005	10	1.122	3
122			min	5.956	15	-155.626	3	-75.651	1	-.02	3	-.125	1	-.846	1
123		5	max	149.164	1	37.408	3	-1.052	15	.008	1	-.008	15	1.194	3
124			min	5.956	15	-47.669	1	-30.772	1	-.02	3	-.19	1	-.877	1
125		6	max	149.164	1	230.443	3	14.106	1	.008	1	-.008	15	1.03	3
126			min	5.956	15	-193.654	1	-3.605	10	-.02	3	-.2	1	-.729	1
127		7	max	149.164	1	423.477	3	58.985	1	.008	1	-.006	15	.631	3
128			min	5.956	15	-339.639	1	1.494	10	-.02	3	-.156	1	-.403	1
129		8	max	149.164	1	616.512	3	103.864	1	.008	1	-.002	15	.101	1
130			min	5.956	15	-485.624	1	3.682	12	-.02	3	-.056	1	-.005	3
131		9	max	149.164	1	809.546	3	148.742	1	.008	1	.098	1	.784	1
132			min	5.956	15	-631.609	1	5.527	12	-.02	3	-.012	10	-.876	3
133		10	max	149.164	1	1002.581	3	193.621	1	0	15	.307	1	1.645	1
134			min	5.956	15	-777.594	1	7.372	12	-.02	3	.006	10	-1.984	3
135		11	max	149.164	1	631.609	1	-5.527	12	.02	3	.098	1	.784	1
136			min	5.956	15	-809.546	3	-148.742	1	-.008	1	-.012	10	-.876	3
137		12	max	149.164	1	485.624	1	-3.682	12	.02	3	-.002	15	.101	1
138			min	5.956	15	-616.512	3	-103.864	1	-.008	1	-.056	1	-.005	3
139		13	max	149.164	1	339.639	1	-1.494	10	.02	3	-.006	15	.631	3
140			min	5.956	15	-423.477	3	-58.985	1	-.008	1	-.156	1	-.403	1
141		14	max	149.164	1	193.654	1	3.605	10	.02	3	-.008	15	1.03	3
142			min	5.956	15	-230.443	3	-14.106	1	-.008	1	-.2	1	-.729	1
143		15	max	149.164	1	47.669	1	30.772	1	.02	3	-.008	15	1.194	3
144			min	5.956	15	-37.408	3	1.052	15	-.008	1	-.19	1	-.877	1
145		16	max	149.164	1	155.626	3	75.651	1	.02	3	-.005	10	1.122	3
146			min	5.956	15	-98.316	1	2.897	15	-.008	1	-.125	1	-.846	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
147		17	max	149.164	1	348.661	3	120.529	1	.02	3	.021	2	.814	3
148			min	5.956	15	-244.301	1	4.743	15	-.008	1	-.013	9	-.637	1
149		18	max	149.164	1	541.695	3	165.408	1	.02	3	.17	1	.269	3
150			min	5.956	15	-390.286	1	6.588	15	-.008	1	.006	15	-.249	1
151		19	max	149.164	1	734.73	3	210.286	1	.02	3	.399	1	.318	1
152			min	5.956	15	-536.271	1	8.434	15	-.008	1	.015	15	-.511	3
153	M11	1	max	366.845	1	527.522	1	-8.662	15	0	15	.436	1	.268	1
154			min	-366.75	3	-732.65	3	-215.293	1	-.006	1	.017	15	-.606	3
155		2	max	366.845	1	381.537	1	-6.816	15	0	15	.2	1	.172	3
156			min	-366.75	3	-539.615	3	-170.415	1	-.006	1	.007	15	-.307	2
157		3	max	366.845	1	235.552	1	-4.971	15	0	15	.026	2	.713	3
158			min	-366.75	3	-346.581	3	-125.536	1	-.006	1	0	15	-.665	1
159		4	max	366.845	1	89.567	1	-3.125	15	0	15	.008	3	1.019	3
160			min	-366.75	3	-153.546	3	-80.658	1	-.006	1	-.107	1	-.864	1
161		5	max	366.845	1	39.488	3	-1.279	15	0	15	-.002	12	1.088	3
162			min	-366.75	3	-58.976	2	-35.779	1	-.006	1	-.178	1	-.884	1
163		6	max	366.845	1	232.523	3	9.099	1	0	15	-.007	12	.922	3
164			min	-366.75	3	-202.403	1	-4.547	3	-.006	1	-.194	1	-.726	1
165		7	max	366.845	1	425.557	3	53.978	1	0	15	-.006	15	.52	3
166			min	-366.75	3	-348.388	1	-1.779	3	-.006	1	-.156	1	-.389	1
167		8	max	366.845	1	618.592	3	98.857	1	0	15	-.002	15	.126	1
168			min	-366.75	3	-494.373	1	.989	3	-.006	1	-.062	1	-.118	3
169		9	max	366.845	1	811.626	3	143.735	1	0	15	.086	1	.819	1
170			min	-366.75	3	-640.358	1	2.838	12	-.006	1	-.012	10	-.992	3
171		10	max	366.845	1	1004.661	3	188.614	1	0	15	.289	1	1.691	1
172			min	-366.75	3	-786.343	1	4.684	12	-.006	1	-.005	3	-2.102	3
173		11	max	366.845	1	640.358	1	-2.838	12	.006	1	.086	1	.819	1
174			min	-366.75	3	-811.626	3	-143.735	1	0	15	-.012	10	-.992	3
175		12	max	366.845	1	494.373	1	-.989	3	.006	1	-.002	15	.126	1
176			min	-366.75	3	-618.592	3	-98.857	1	0	15	-.062	1	-.118	3
177		13	max	366.845	1	348.388	1	1.779	3	.006	1	-.006	15	.52	3
178			min	-366.75	3	-425.557	3	-53.978	1	0	15	-.156	1	-.389	1
179		14	max	366.845	1	202.403	1	4.547	3	.006	1	-.007	12	.922	3
180			min	-366.75	3	-232.523	3	-9.099	1	0	15	-.194	1	-.726	1
181		15	max	366.845	1	58.976	2	35.779	1	.006	1	-.002	12	1.088	3
182			min	-366.75	3	-39.488	3	1.279	15	0	15	-.178	1	-.884	1
183		16	max	366.845	1	153.546	3	80.658	1	.006	1	.008	3	1.019	3
184			min	-366.75	3	-89.567	1	3.125	15	0	15	-.107	1	-.864	1
185		17	max	366.845	1	346.581	3	125.536	1	.006	1	.026	2	.713	3
186			min	-366.75	3	-235.552	1	4.971	15	0	15	0	15	-.665	1
187		18	max	366.845	1	539.615	3	170.415	1	.006	1	.2	1	.172	3
188			min	-366.75	3	-381.537	1	6.816	15	0	15	.007	15	-.307	2
189		19	max	366.845	1	732.65	3	215.293	1	.006	1	.436	1	.268	1
190			min	-366.75	3	-527.522	1	8.662	15	0	15	.017	15	-.606	3
191	M12	1	max	50.646	2	694.817	2	-8.752	15	0	3	.461	1	.308	2
192			min	-20.138	9	-276.001	3	-218.77	1	-.007	1	.018	15	.005	15
193		2	max	50.646	2	501.971	2	-6.906	15	0	3	.221	1	.34	3
194			min	-20.138	9	-191.496	3	-173.892	1	-.007	1	.008	15	-.423	2
195		3	max	50.646	2	309.125	2	-5.061	15	0	3	.043	2	.522	3
196			min	-20.138	9	-106.991	3	-129.013	1	-.007	1	0	15	-.919	2
197		4	max	50.646	2	116.278	2	-3.215	15	0	3	0	10	.601	3
198			min	-20.138	9	-22.486	3	-84.134	1	-.007	1	-.094	1	-1.179	2
199		5	max	50.646	2	62.019	3	-1.37	15	0	3	-.007	12	.577	3
200			min	-20.138	9	-76.568	2	-39.256	1	-.007	1	-.17	1	-1.203	2
201		6	max	50.646	2	146.524	3	7.481	9	0	3	-.008	15	.449	3
202			min	-20.138	9	-269.414	2	-6.674	2	-.007	1	-.19	1	-.992	2
203		7	max	50.646	2	231.028	3	50.501	1	0	3	-.006	15	.219	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
204			min	-20.138	9	-462.261	2	-.244	10	-.007	1	-.156	1	-.545	2
205		8	max	50.646	2	315.533	3	95.38	1	0	3	-.002	15	.138	2
206			min	-20.138	9	-655.107	2	2.964	12	-.007	1	-.067	1	-.115	3
207		9	max	50.646	2	400.038	3	140.258	1	0	3	.077	1	1.057	2
208			min	-20.138	9	-847.954	2	4.81	12	-.007	1	-.016	10	-.553	3
209		10	max	50.646	2	484.543	3	185.137	1	0	3	.276	1	2.211	2
210			min	-20.138	9	-1040.8	2	6.655	12	-.007	1	0	10	-1.093	3
211		11	max	50.646	2	847.954	2	-4.81	12	.007	1	.077	1	1.057	2
212			min	-20.138	9	-400.038	3	-140.258	1	0	3	-.016	10	-.553	3
213		12	max	50.646	2	655.107	2	-2.964	12	.007	1	-.002	15	.138	2
214			min	-20.138	9	-315.533	3	-95.38	1	0	3	-.067	1	-.115	3
215		13	max	50.646	2	462.261	2	.244	10	.007	1	-.006	15	.219	3
216			min	-20.138	9	-231.028	3	-50.501	1	0	3	-.156	1	-.545	2
217		14	max	50.646	2	269.414	2	6.674	2	.007	1	-.008	15	.449	3
218			min	-20.138	9	-146.524	3	-7.481	9	0	3	-.19	1	-.992	2
219		15	max	50.646	2	76.568	2	39.256	1	.007	1	-.007	12	.577	3
220			min	-20.138	9	-62.019	3	1.37	15	0	3	-.17	1	-1.203	2
221		16	max	50.646	2	22.486	3	84.134	1	.007	1	0	10	.601	3
222			min	-20.138	9	-116.278	2	3.215	15	0	3	-.094	1	-1.179	2
223		17	max	50.646	2	106.991	3	129.013	1	.007	1	.043	2	.522	3
224			min	-20.138	9	-309.125	2	5.061	15	0	3	0	15	-.919	2
225		18	max	50.646	2	191.496	3	173.892	1	.007	1	.221	1	.34	3
226			min	-20.138	9	-501.971	2	6.906	15	0	3	.008	15	-.423	2
227		19	max	50.646	2	276.001	3	218.77	1	.007	1	.461	1	.308	2
228			min	-20.138	9	-694.817	2	8.752	15	0	3	.018	15	.005	15
229	M13	1	max	1.114	3	708.667	2	-8.41	15	.007	3	.392	1	.28	2
230			min	-197.101	1	-298.7	3	-209.439	1	-.021	2	.015	15	-.076	3
231		2	max	1.114	3	515.82	2	-6.564	15	.007	3	.164	1	.237	3
232			min	-197.101	1	-214.195	3	-164.561	1	-.021	2	.006	15	-.469	2
233		3	max	1.114	3	322.974	2	-4.719	15	.007	3	.016	2	.447	3
234			min	-197.101	1	-129.691	3	-119.682	1	-.021	2	-.015	9	-.981	2
235		4	max	1.114	3	130.128	2	-2.873	15	.007	3	-.003	12	.554	3
236			min	-197.101	1	-45.186	3	-74.804	1	-.021	2	-.129	1	-1.258	2
237		5	max	1.114	3	39.319	3	-1.028	15	.007	3	-.007	12	.558	3
238			min	-197.101	1	-62.719	2	-29.925	1	-.021	2	-.193	1	-1.299	2
239		6	max	1.114	3	123.824	3	14.954	1	.007	3	-.008	15	.458	3
240			min	-197.101	1	-255.565	2	-3.213	10	-.021	2	-.202	1	-1.105	2
241		7	max	1.114	3	208.329	3	59.832	1	.007	3	-.006	15	.255	3
242			min	-197.101	1	-448.412	2	1.266	12	-.021	2	-.156	1	-.675	2
243		8	max	1.114	3	292.834	3	104.711	1	.007	3	-.002	15	0	10
244			min	-197.101	1	-641.258	2	3.112	12	-.021	2	-.056	1	-.051	3
245		9	max	1.114	3	377.339	3	149.589	1	.007	3	.099	1	.893	2
246			min	-197.101	1	-834.104	2	4.957	12	-.021	2	-.011	10	-.461	3
247		10	max	1.114	3	461.843	3	194.468	1	0	15	.31	1	2.03	2
248			min	-197.101	1	-1026.951	2	6.802	12	-.021	2	.006	12	-.973	3
249		11	max	1.114	3	834.104	2	-4.957	12	.021	2	.099	1	.893	2
250			min	-197.101	1	-377.339	3	-149.589	1	-.007	3	-.011	10	-.461	3
251		12	max	1.114	3	641.258	2	-3.112	12	.021	2	-.002	15	0	10
252			min	-197.101	1	-292.834	3	-104.711	1	-.007	3	-.056	1	-.051	3
253		13	max	1.114	3	448.412	2	-1.266	12	.021	2	-.006	15	.255	3
254			min	-197.101	1	-208.329	3	-59.832	1	-.007	3	-.156	1	-.675	2
255		14	max	1.114	3	255.565	2	3.213	10	.021	2	-.008	15	.458	3
256			min	-197.101	1	-123.824	3	-14.954	1	-.007	3	-.202	1	-1.105	2
257		15	max	1.114	3	62.719	2	29.925	1	.021	2	-.007	12	.558	3
258			min	-197.101	1	-39.319	3	1.028	15	-.007	3	-.193	1	-1.299	2
259		16	max	1.114	3	45.186	3	74.804	1	.021	2	-.003	12	.554	3
260			min	-197.101	1	-130.128	2	2.873	15	-.007	3	-.129	1	-1.258	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
261		17	max	1.114	3	129.691	3	119.682	1	.021	2	.016	2	.447	3
262			min	-197.101	1	-322.974	2	4.719	15	-.007	3	-.015	9	-.981	2
263		18	max	1.114	3	214.195	3	164.561	1	.021	2	.164	1	.237	3
264			min	-197.101	1	-515.82	2	6.564	15	-.007	3	.006	15	-.469	2
265		19	max	1.114	3	298.7	3	209.439	1	.021	2	.392	1	.28	2
266			min	-197.101	1	-708.667	2	8.41	15	-.007	3	.015	15	-.076	3
267	M2	1	max	2552.821	1	918.923	3	320.172	1	.006	3	.416	3	5.416	1
268			min	-1760.371	3	-675.085	2	-331.041	3	-.012	2	-.401	1	.204	15
269		2	max	2550.267	1	918.923	3	320.172	1	.006	3	.323	3	5.474	1
270			min	-1762.287	3	-675.085	2	-331.041	3	-.012	2	-.312	1	.202	15
271		3	max	2547.712	1	918.923	3	320.172	1	.006	3	.23	3	5.533	1
272			min	-1764.203	3	-675.085	2	-331.041	3	-.012	2	-.222	1	.2	15
273		4	max	1904.476	1	1273.911	1	245.898	1	.002	2	.167	3	5.361	1
274			min	-1517.911	3	45.748	15	-296.743	3	-.001	3	-.189	1	.193	15
275		5	max	1901.921	1	1273.911	1	245.898	1	.002	2	.084	3	5.004	1
276			min	-1519.827	3	45.748	15	-296.743	3	-.001	3	-.12	1	.18	15
277		6	max	1899.366	1	1273.911	1	245.898	1	.002	2	0	3	4.647	1
278			min	-1521.743	3	45.748	15	-296.743	3	-.001	3	-.051	1	.167	15
279		7	max	1896.811	1	1273.911	1	245.898	1	.002	2	.037	2	4.289	1
280			min	-1523.659	3	45.748	15	-296.743	3	-.001	3	-.083	3	.154	15
281		8	max	1894.256	1	1273.911	1	245.898	1	.002	2	.103	2	3.932	1
282			min	-1525.575	3	45.748	15	-296.743	3	-.001	3	-.166	3	.141	15
283		9	max	1891.701	1	1273.911	1	245.898	1	.002	2	.17	2	3.574	1
284			min	-1527.492	3	45.748	15	-296.743	3	-.001	3	-.249	3	.128	15
285		10	max	1889.146	1	1273.911	1	245.898	1	.002	2	.236	2	3.217	1
286			min	-1529.408	3	45.748	15	-296.743	3	-.001	3	-.332	3	.116	15
287		11	max	1886.591	1	1273.911	1	245.898	1	.002	2	.303	2	2.859	1
288			min	-1531.324	3	45.748	15	-296.743	3	-.001	3	-.416	3	.103	15
289		12	max	1884.037	1	1273.911	1	245.898	1	.002	2	.369	2	2.502	1
290			min	-1533.24	3	45.748	15	-296.743	3	-.001	3	-.499	3	.09	15
291		13	max	1881.482	1	1273.911	1	245.898	1	.002	2	.436	2	2.145	1
292			min	-1535.156	3	45.748	15	-296.743	3	-.001	3	-.582	3	.077	15
293		14	max	1878.927	1	1273.911	1	245.898	1	.002	2	.502	2	1.787	1
294			min	-1537.072	3	45.748	15	-296.743	3	-.001	3	-.666	3	.064	15
295		15	max	1876.372	1	1273.911	1	245.898	1	.002	2	.57	1	1.43	1
296			min	-1538.989	3	45.748	15	-296.743	3	-.001	3	-.749	3	.051	15
297		16	max	1873.817	1	1273.911	1	245.898	1	.002	2	.639	1	1.072	1
298			min	-1540.905	3	45.748	15	-296.743	3	-.001	3	-.832	3	.039	15
299		17	max	1871.262	1	1273.911	1	245.898	1	.002	2	.708	1	.715	1
300			min	-1542.821	3	45.748	15	-296.743	3	-.001	3	-.915	3	.026	15
301		18	max	1868.707	1	1273.911	1	245.898	1	.002	2	.777	1	.357	1
302			min	-1544.737	3	45.748	15	-296.743	3	-.001	3	-.999	3	.013	15
303		19	max	1866.152	1	1273.911	1	245.898	1	.002	2	.846	1	0	1
304			min	-1546.653	3	45.748	15	-296.743	3	-.001	3	-1.082	3	0	1
305	M5	1	max	6926.171	1	2560.517	3	0	1	0	1	0	1	11.183	1
306			min	-5259.209	3	-2490.91	2	0	1	0	1	0	1	.376	15
307		2	max	6923.616	1	2560.517	3	0	1	0	1	0	1	11.603	1
308			min	-5261.125	3	-2490.91	2	0	1	0	1	0	1	.379	15
309		3	max	6921.061	1	2560.517	3	0	1	0	1	0	1	12.022	1
310			min	-5263.042	3	-2490.91	2	0	1	0	1	0	1	.383	15
311		4	max	5113.928	1	2798.295	1	0	1	0	1	0	1	11.777	1
312			min	-4414.667	3	88.166	15	0	1	0	1	0	1	.371	15
313		5	max	5111.373	1	2798.295	1	0	1	0	1	0	1	10.992	1
314			min	-4416.583	3	88.166	15	0	1	0	1	0	1	.346	15
315		6	max	5108.818	1	2798.295	1	0	1	0	1	0	1	10.207	1
316			min	-4418.499	3	88.166	15	0	1	0	1	0	1	.322	15
317		7	max	5106.263	1	2798.295	1	0	1	0	1	0	1	9.422	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	-4420.416	3	88.166	15	0	1	0	1	0	1	.297	15
319		8	max	5103.709	1	2798.295	1	0	1	0	1	0	1	8.637	1
320			min	-4422.332	3	88.166	15	0	1	0	1	0	1	.272	15
321		9	max	5101.154	1	2798.295	1	0	1	0	1	0	1	7.851	1
322			min	-4424.248	3	88.166	15	0	1	0	1	0	1	.247	15
323		10	max	5098.599	1	2798.295	1	0	1	0	1	0	1	7.066	1
324			min	-4426.164	3	88.166	15	0	1	0	1	0	1	.223	15
325		11	max	5096.044	1	2798.295	1	0	1	0	1	0	1	6.281	1
326			min	-4428.08	3	88.166	15	0	1	0	1	0	1	.198	15
327		12	max	5093.489	1	2798.295	1	0	1	0	1	0	1	5.496	1
328			min	-4429.996	3	88.166	15	0	1	0	1	0	1	.173	15
329		13	max	5090.934	1	2798.295	1	0	1	0	1	0	1	4.711	1
330			min	-4431.913	3	88.166	15	0	1	0	1	0	1	.148	15
331		14	max	5088.379	1	2798.295	1	0	1	0	1	0	1	3.926	1
332			min	-4433.829	3	88.166	15	0	1	0	1	0	1	.124	15
333		15	max	5085.824	1	2798.295	1	0	1	0	1	0	1	3.141	1
334			min	-4435.745	3	88.166	15	0	1	0	1	0	1	.099	15
335		16	max	5083.269	1	2798.295	1	0	1	0	1	0	1	2.355	1
336			min	-4437.661	3	88.166	15	0	1	0	1	0	1	.074	15
337		17	max	5080.715	1	2798.295	1	0	1	0	1	0	1	1.57	1
338			min	-4439.577	3	88.166	15	0	1	0	1	0	1	.049	15
339		18	max	5078.16	1	2798.295	1	0	1	0	1	0	1	.785	1
340			min	-4441.493	3	88.166	15	0	1	0	1	0	1	.025	15
341		19	max	5075.605	1	2798.295	1	0	1	0	1	0	1	0	1
342			min	-4443.41	3	88.166	15	0	1	0	1	0	1	0	1
343	M8	1	max	2552.821	1	918.923	3	331.041	3	.012	2	.401	1	5.416	1
344			min	-1760.371	3	-675.085	2	-320.172	1	-.006	3	-.416	3	.204	15
345		2	max	2550.267	1	918.923	3	331.041	3	.012	2	.312	1	5.474	1
346			min	-1762.287	3	-675.085	2	-320.172	1	-.006	3	-.323	3	.202	15
347		3	max	2547.712	1	918.923	3	331.041	3	.012	2	.222	1	5.533	1
348			min	-1764.203	3	-675.085	2	-320.172	1	-.006	3	-.23	3	.2	15
349		4	max	1904.476	1	1273.911	1	296.743	3	.001	3	.189	1	5.361	1
350			min	-1517.911	3	45.748	15	-245.898	1	-.002	2	-.167	3	.193	15
351		5	max	1901.921	1	1273.911	1	296.743	3	.001	3	.12	1	5.004	1
352			min	-1519.827	3	45.748	15	-245.898	1	-.002	2	-.084	3	.18	15
353		6	max	1899.366	1	1273.911	1	296.743	3	.001	3	.051	1	4.647	1
354			min	-1521.743	3	45.748	15	-245.898	1	-.002	2	0	3	.167	15
355		7	max	1896.811	1	1273.911	1	296.743	3	.001	3	.083	3	4.289	1
356			min	-1523.659	3	45.748	15	-245.898	1	-.002	2	-.037	2	.154	15
357		8	max	1894.256	1	1273.911	1	296.743	3	.001	3	.166	3	3.932	1
358			min	-1525.575	3	45.748	15	-245.898	1	-.002	2	-.103	2	.141	15
359		9	max	1891.701	1	1273.911	1	296.743	3	.001	3	.249	3	3.574	1
360			min	-1527.492	3	45.748	15	-245.898	1	-.002	2	-.17	2	.128	15
361		10	max	1889.146	1	1273.911	1	296.743	3	.001	3	.332	3	3.217	1
362			min	-1529.408	3	45.748	15	-245.898	1	-.002	2	-.236	2	.116	15
363		11	max	1886.591	1	1273.911	1	296.743	3	.001	3	.416	3	2.859	1
364			min	-1531.324	3	45.748	15	-245.898	1	-.002	2	-.303	2	.103	15
365		12	max	1884.037	1	1273.911	1	296.743	3	.001	3	.499	3	2.502	1
366			min	-1533.24	3	45.748	15	-245.898	1	-.002	2	-.369	2	.09	15
367		13	max	1881.482	1	1273.911	1	296.743	3	.001	3	.582	3	2.145	1
368			min	-1535.156	3	45.748	15	-245.898	1	-.002	2	-.436	2	.077	15
369		14	max	1878.927	1	1273.911	1	296.743	3	.001	3	.666	3	1.787	1
370			min	-1537.072	3	45.748	15	-245.898	1	-.002	2	-.502	2	.064	15
371		15	max	1876.372	1	1273.911	1	296.743	3	.001	3	.749	3	1.43	1
372			min	-1538.989	3	45.748	15	-245.898	1	-.002	2	-.57	1	.051	15
373		16	max	1873.817	1	1273.911	1	296.743	3	.001	3	.832	3	1.072	1
374			min	-1540.905	3	45.748	15	-245.898	1	-.002	2	-.639	1	.039	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	1871.262	1	1273.911	1	296.743	3	.001	3	.915	3	.715	1
376			min	-1542.821	3	45.748	15	-245.898	1	-.002	2	-.708	1	.026	15
377		18	max	1868.707	1	1273.911	1	296.743	3	.001	3	.999	3	.357	1
378			min	-1544.737	3	45.748	15	-245.898	1	-.002	2	-.777	1	.013	15
379		19	max	1866.152	1	1273.911	1	296.743	3	.001	3	1.082	3	0	1
380			min	-1546.653	3	45.748	15	-245.898	1	-.002	2	-.846	1	0	1
381	M3	1	max	1796.146	2	4.588	4	78.355	2	.025	3	.007	2	0	1
382			min	-625.701	3	1.079	15	-35.037	3	-.052	2	-.004	3	0	1
383		2	max	1795.971	2	4.078	4	78.355	2	.025	3	.03	2	0	15
384			min	-625.832	3	.959	15	-35.037	3	-.052	2	-.014	3	-.001	4
385		3	max	1795.797	2	3.569	4	78.355	2	.025	3	.053	2	0	15
386			min	-625.962	3	.839	15	-35.037	3	-.052	2	-.024	3	-.002	4
387		4	max	1795.623	2	3.059	4	78.355	2	.025	3	.075	2	0	15
388			min	-626.093	3	.719	15	-35.037	3	-.052	2	-.034	3	-.003	4
389		5	max	1795.448	2	2.549	4	78.355	2	.025	3	.098	2	0	15
390			min	-626.224	3	.599	15	-35.037	3	-.052	2	-.045	3	-.004	4
391		6	max	1795.274	2	2.039	4	78.355	2	.025	3	.121	2	-.001	15
392			min	-626.355	3	.479	15	-35.037	3	-.052	2	-.055	3	-.005	4
393		7	max	1795.099	2	1.529	4	78.355	2	.025	3	.144	2	-.001	15
394			min	-626.486	3	.36	15	-35.037	3	-.052	2	-.065	3	-.005	4
395		8	max	1794.925	2	1.02	4	78.355	2	.025	3	.167	2	-.001	15
396			min	-626.616	3	.24	15	-35.037	3	-.052	2	-.075	3	-.006	4
397		9	max	1794.751	2	.51	4	78.355	2	.025	3	.19	2	-.001	15
398			min	-626.747	3	.12	15	-35.037	3	-.052	2	-.086	3	-.006	4
399		10	max	1794.576	2	0	1	78.355	2	.025	3	.213	2	-.001	15
400			min	-626.878	3	0	1	-35.037	3	-.052	2	-.096	3	-.006	4
401		11	max	1794.402	2	-.12	15	78.355	2	.025	3	.236	2	-.001	15
402			min	-627.009	3	-.51	4	-35.037	3	-.052	2	-.106	3	-.006	4
403		12	max	1794.227	2	-.24	15	78.355	2	.025	3	.259	2	-.001	15
404			min	-627.14	3	-1.02	4	-35.037	3	-.052	2	-.116	3	-.006	4
405		13	max	1794.053	2	-.36	15	78.355	2	.025	3	.282	2	-.001	15
406			min	-627.27	3	-1.529	4	-35.037	3	-.052	2	-.127	3	-.005	4
407		14	max	1793.879	2	-.479	15	78.355	2	.025	3	.305	2	-.001	15
408			min	-627.401	3	-2.039	4	-35.037	3	-.052	2	-.137	3	-.005	4
409		15	max	1793.704	2	-.599	15	78.355	2	.025	3	.328	2	0	15
410			min	-627.532	3	-2.549	4	-35.037	3	-.052	2	-.147	3	-.004	4
411		16	max	1793.53	2	-.719	15	78.355	2	.025	3	.35	2	0	15
412			min	-627.663	3	-3.059	4	-35.037	3	-.052	2	-.157	3	-.003	4
413		17	max	1793.356	2	-.839	15	78.355	2	.025	3	.373	2	0	15
414			min	-627.793	3	-3.569	4	-35.037	3	-.052	2	-.167	3	-.002	4
415		18	max	1793.181	2	-.959	15	78.355	2	.025	3	.396	2	0	15
416			min	-627.924	3	-4.078	4	-35.037	3	-.052	2	-.178	3	-.001	4
417		19	max	1793.007	2	-1.079	15	78.355	2	.025	3	.419	2	0	1
418			min	-628.055	3	-4.588	4	-35.037	3	-.052	2	-.188	3	0	1
419	M6	1	max	5208.589	2	4.588	4	0	1	0	1	0	1	0	1
420			min	-2133.656	3	1.079	15	0	1	0	1	0	1	0	1
421		2	max	5208.415	2	4.078	4	0	1	0	1	0	1	0	15
422			min	-2133.786	3	.959	15	0	1	0	1	0	1	-.001	4
423		3	max	5208.24	2	3.569	4	0	1	0	1	0	1	0	15
424			min	-2133.917	3	.839	15	0	1	0	1	0	1	-.002	4
425		4	max	5208.066	2	3.059	4	0	1	0	1	0	1	0	15
426			min	-2134.048	3	.719	15	0	1	0	1	0	1	-.003	4
427		5	max	5207.892	2	2.549	4	0	1	0	1	0	1	0	15
428			min	-2134.179	3	.599	15	0	1	0	1	0	1	-.004	4
429		6	max	5207.717	2	2.039	4	0	1	0	1	0	1	-.001	15
430			min	-2134.31	3	.479	15	0	1	0	1	0	1	-.005	4
431		7	max	5207.543	2	1.529	4	0	1	0	1	0	1	-.001	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
432			min	-2134.44	3	.36	15	0	1	0	1	0	1	-.005	4
433		8	max	5207.369	2	1.02	4	0	1	0	1	0	1	-.001	15
434			min	-2134.571	3	.24	15	0	1	0	1	0	1	-.006	4
435		9	max	5207.194	2	.51	4	0	1	0	1	0	1	-.001	15
436			min	-2134.702	3	.12	15	0	1	0	1	0	1	-.006	4
437		10	max	5207.02	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2134.833	3	0	1	0	1	0	1	0	1	-.006	4
439		11	max	5206.845	2	-.12	15	0	1	0	1	0	1	-.001	15
440			min	-2134.963	3	-.51	4	0	1	0	1	0	1	-.006	4
441		12	max	5206.671	2	-.24	15	0	1	0	1	0	1	-.001	15
442			min	-2135.094	3	-1.02	4	0	1	0	1	0	1	-.006	4
443		13	max	5206.497	2	-.36	15	0	1	0	1	0	1	-.001	15
444			min	-2135.225	3	-1.529	4	0	1	0	1	0	1	-.005	4
445		14	max	5206.322	2	-.479	15	0	1	0	1	0	1	-.001	15
446			min	-2135.356	3	-2.039	4	0	1	0	1	0	1	-.005	4
447		15	max	5206.148	2	-.599	15	0	1	0	1	0	1	0	15
448			min	-2135.487	3	-2.549	4	0	1	0	1	0	1	-.004	4
449		16	max	5205.973	2	-.719	15	0	1	0	1	0	1	0	15
450			min	-2135.617	3	-3.059	4	0	1	0	1	0	1	-.003	4
451		17	max	5205.799	2	-.839	15	0	1	0	1	0	1	0	15
452			min	-2135.748	3	-3.569	4	0	1	0	1	0	1	-.002	4
453		18	max	5205.625	2	-.959	15	0	1	0	1	0	1	0	15
454			min	-2135.879	3	-4.078	4	0	1	0	1	0	1	-.001	4
455		19	max	5205.45	2	-1.079	15	0	1	0	1	0	1	0	1
456			min	-2136.01	3	-4.588	4	0	1	0	1	0	1	0	1
457	M9	1	max	1796.146	2	4.588	4	35.037	3	.052	2	.004	3	0	1
458			min	-625.701	3	1.079	15	-78.355	2	-.025	3	-.007	2	0	1
459		2	max	1795.971	2	4.078	4	35.037	3	.052	2	.014	3	0	15
460			min	-625.832	3	.959	15	-78.355	2	-.025	3	-.03	2	-.001	4
461		3	max	1795.797	2	3.569	4	35.037	3	.052	2	.024	3	0	15
462			min	-625.962	3	.839	15	-78.355	2	-.025	3	-.053	2	-.002	4
463		4	max	1795.623	2	3.059	4	35.037	3	.052	2	.034	3	0	15
464			min	-626.093	3	.719	15	-78.355	2	-.025	3	-.075	2	-.003	4
465		5	max	1795.448	2	2.549	4	35.037	3	.052	2	.045	3	0	15
466			min	-626.224	3	.599	15	-78.355	2	-.025	3	-.098	2	-.004	4
467		6	max	1795.274	2	2.039	4	35.037	3	.052	2	.055	3	-.001	15
468			min	-626.355	3	.479	15	-78.355	2	-.025	3	-.121	2	-.005	4
469		7	max	1795.099	2	1.529	4	35.037	3	.052	2	.065	3	-.001	15
470			min	-626.486	3	.36	15	-78.355	2	-.025	3	-.144	2	-.005	4
471		8	max	1794.925	2	1.02	4	35.037	3	.052	2	.075	3	-.001	15
472			min	-626.616	3	.24	15	-78.355	2	-.025	3	-.167	2	-.006	4
473		9	max	1794.751	2	.51	4	35.037	3	.052	2	.086	3	-.001	15
474			min	-626.747	3	.12	15	-78.355	2	-.025	3	-.19	2	-.006	4
475		10	max	1794.576	2	0	1	35.037	3	.052	2	.096	3	-.001	15
476			min	-626.878	3	0	1	-78.355	2	-.025	3	-.213	2	-.006	4
477		11	max	1794.402	2	-.12	15	35.037	3	.052	2	.106	3	-.001	15
478			min	-627.009	3	-.51	4	-78.355	2	-.025	3	-.236	2	-.006	4
479		12	max	1794.227	2	-.24	15	35.037	3	.052	2	.116	3	-.001	15
480			min	-627.14	3	-1.02	4	-78.355	2	-.025	3	-.259	2	-.006	4
481		13	max	1794.053	2	-.36	15	35.037	3	.052	2	.127	3	-.001	15
482			min	-627.27	3	-1.529	4	-78.355	2	-.025	3	-.282	2	-.005	4
483		14	max	1793.879	2	-.479	15	35.037	3	.052	2	.137	3	-.001	15
484			min	-627.401	3	-2.039	4	-78.355	2	-.025	3	-.305	2	-.005	4
485		15	max	1793.704	2	-.599	15	35.037	3	.052	2	.147	3	0	15
486			min	-627.532	3	-2.549	4	-78.355	2	-.025	3	-.328	2	-.004	4
487		16	max	1793.53	2	-.719	15	35.037	3	.052	2	.157	3	0	15
488			min	-627.663	3	-3.059	4	-78.355	2	-.025	3	-.35	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	1793.356	2	-.839	15	35.037	3	.052	2	.167	3	0	15
490			min	-627.793	3	-3.569	4	-78.355	2	-.025	3	-.373	2	-.002	4
491		18	max	1793.181	2	-.959	15	35.037	3	.052	2	.178	3	0	15
492			min	-627.924	3	-4.078	4	-78.355	2	-.025	3	-.396	2	-.001	4
493		19	max	1793.007	2	-1.079	15	35.037	3	.052	2	.188	3	0	1
494			min	-628.055	3	-4.588	4	-78.355	2	-.025	3	-.419	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	-.01	15	.04	3	.03	1	1.254e-2	3	NC	3	NC	3
2			min	-.27	1	-.666	1	.001	15	-3.171e-2	2	187.346	1	2356.223	1
3		2	max	-.01	15	.015	3	.009	1	1.254e-2	3	9290.018	12	NC	3
4			min	-.27	1	-.564	1	0	15	-3.171e-2	2	218.502	1	3738.733	1
5		3	max	-.01	15	-.008	12	0	15	1.194e-2	3	7079.401	15	NC	2
6			min	-.27	1	-.462	1	-.009	1	-2.952e-2	2	262.141	1	7557.814	1
7		4	max	-.01	15	-.012	15	0	15	1.102e-2	3	8397.714	15	NC	1
8			min	-.27	1	-.363	1	-.016	1	-2.615e-2	2	324.644	1	NC	1
9		5	max	-.01	15	-.01	15	0	3	1.011e-2	3	NC	15	NC	1
10			min	-.27	1	-.274	1	-.017	1	-2.278e-2	2	413.917	1	NC	1
11		6	max	-.01	15	-.007	15	.002	3	1.031e-2	3	NC	15	NC	1
12			min	-.269	1	-.2	1	-.014	1	-2.19e-2	2	536.003	1	NC	1
13		7	max	-.01	15	-.005	15	.002	3	1.13e-2	3	NC	15	NC	2
14			min	-.269	1	-.141	1	-.007	1	-2.274e-2	2	701.611	1	6945.133	1
15		8	max	-.01	15	-.004	15	0	3	1.228e-2	3	NC	5	NC	2
16			min	-.268	1	-.092	1	-.002	2	-2.358e-2	2	946.634	1	5223.379	1
17		9	max	-.01	15	-.002	15	0	15	1.35e-2	3	NC	2	NC	2
18			min	-.268	1	-.063	3	0	3	-2.308e-2	2	1305.345	3	5126.359	1
19		10	max	-.01	15	.004	2	0	1	1.513e-2	3	NC	5	NC	2
20			min	-.267	1	-.055	3	0	3	-2.021e-2	2	1407.602	3	4996.757	1
21		11	max	-.01	15	.036	1	.002	3	1.676e-2	3	NC	5	NC	2
22			min	-.267	1	-.044	3	-.001	2	-1.734e-2	2	1598.168	3	5350.421	1
23		12	max	-.01	15	.073	1	.008	3	1.374e-2	3	NC	4	NC	2
24			min	-.266	1	-.028	3	-.008	1	-1.291e-2	1	1697.07	2	7399.178	1
25		13	max	-.01	15	.104	1	.015	3	8.073e-3	3	NC	4	NC	2
26			min	-.265	1	-.003	3	-.01	2	-7.494e-3	1	1344.195	2	8145.134	1
27		14	max	-.01	15	.122	1	.014	3	2.67e-3	3	NC	3	NC	2
28			min	-.265	1	.004	15	-.007	2	-2.279e-3	1	1231.082	2	5746.728	1
29		15	max	-.01	15	.123	1	.009	3	8.818e-3	3	NC	4	NC	2
30			min	-.265	1	.005	15	0	10	-6.101e-3	1	1312.282	2	4001.81	1
31		16	max	-.01	15	.184	3	.012	1	1.496e-2	3	NC	4	NC	3
32			min	-.265	1	.005	15	0	15	-9.924e-3	1	932.374	3	3513.333	1
33		17	max	-.01	15	.275	3	.008	1	2.111e-2	3	NC	4	NC	3
34			min	-.265	1	.004	15	0	15	-1.375e-2	1	569.143	3	3944.915	1
35		18	max	-.01	15	.371	3	0	15	2.512e-2	3	NC	4	NC	2
36			min	-.265	1	-.004	10	-.008	1	-1.624e-2	1	404.467	3	7251.703	1
37		19	max	-.01	15	.467	3	-.001	15	2.512e-2	3	NC	1	NC	1
38			min	-.265	1	-.02	10	-.026	1	-1.624e-2	1	313.805	3	NC	1
39	M4	1	max	-.019	15	.22	3	0	1	0	1	NC	3	NC	1
40			min	-.589	1	-1.568	1	0	1	0	1	87.43	1	NC	1
41		2	max	-.019	15	.141	3	0	1	0	1	3379.532	15	NC	1
42			min	-.589	1	-1.319	1	0	1	0	1	104.381	1	NC	1
43		3	max	-.019	15	.063	3	0	1	0	1	4072.785	15	NC	1
44			min	-.589	1	-1.07	1	0	1	0	1	129.561	1	NC	1
45		4	max	-.019	15	-.01	12	0	1	0	1	5081.788	15	NC	1
46			min	-.589	1	-.829	1	0	1	0	1	168.78	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	-.019	15	-.019	15	0	1	0	1	6558.024	15	NC	1
48			min	-.589	1	-.614	1	0	1	0	1	231.455	1	NC	1
49		6	max	-.019	15	-.014	15	0	1	0	1	8649.801	15	NC	1
50			min	-.588	1	-.441	1	0	1	0	1	329.993	1	NC	1
51		7	max	-.019	15	-.01	15	0	1	0	1	NC	15	NC	1
52			min	-.586	1	-.309	1	0	1	0	1	382.088	3	NC	1
53		8	max	-.019	15	-.007	15	0	1	0	1	NC	5	NC	1
54			min	-.585	1	-.201	1	0	1	0	1	377.538	3	NC	1
55		9	max	-.019	15	-.003	15	0	1	0	1	NC	5	NC	1
56			min	-.584	1	-.131	3	0	1	0	1	382.103	3	NC	1
57		10	max	-.019	15	.004	10	0	1	0	1	NC	4	NC	1
58			min	-.582	1	-.121	3	0	1	0	1	393.127	3	NC	1
59		11	max	-.018	15	.081	1	0	1	0	1	NC	4	NC	1
60			min	-.581	1	-.103	3	0	1	0	1	415.138	3	NC	1
61		12	max	-.018	15	.164	1	0	1	0	1	NC	5	NC	1
62			min	-.579	1	-.075	3	0	1	0	1	454.782	3	NC	1
63		13	max	-.018	15	.231	1	0	1	0	1	NC	5	NC	1
64			min	-.578	1	-.024	3	0	1	0	1	423.786	2	NC	1
65		14	max	-.018	15	.263	1	0	1	0	1	NC	5	NC	1
66			min	-.576	1	.008	15	0	1	0	1	398.533	2	NC	1
67		15	max	-.018	15	.248	1	0	1	0	1	NC	3	NC	1
68			min	-.576	1	.008	15	0	1	0	1	430.586	2	NC	1
69		16	max	-.018	15	.428	3	0	1	0	1	NC	5	NC	1
70			min	-.576	1	.007	15	0	1	0	1	530.304	2	NC	1
71		17	max	-.018	15	.657	3	0	1	0	1	NC	5	NC	1
72			min	-.576	1	.005	15	0	1	0	1	306.218	3	NC	1
73		18	max	-.018	15	.896	3	0	1	0	1	NC	4	NC	1
74			min	-.577	1	-.034	2	0	1	0	1	198.082	3	NC	1
75		19	max	-.018	15	1.135	3	0	1	0	1	NC	1	NC	1
76			min	-.577	1	-.121	2	0	1	0	1	146.492	3	NC	1
77	M7	1	max	-.01	15	.04	3	-.001	15	3.171e-2	2	NC	3	NC	3
78			min	-.27	1	-.666	1	-.03	1	-1.254e-2	3	187.346	1	2356.223	1
79		2	max	-.01	15	.015	3	0	15	3.171e-2	2	9290.018	12	NC	3
80			min	-.27	1	-.564	1	-.009	1	-1.254e-2	3	218.502	1	3738.733	1
81		3	max	-.01	15	-.008	12	.009	1	2.952e-2	2	7079.401	15	NC	2
82			min	-.27	1	-.462	1	0	15	-1.194e-2	3	262.141	1	7557.814	1
83		4	max	-.01	15	-.012	15	.016	1	2.615e-2	2	8397.714	15	NC	1
84			min	-.27	1	-.363	1	0	15	-1.102e-2	3	324.644	1	NC	1
85		5	max	-.01	15	-.01	15	.017	1	2.278e-2	2	NC	15	NC	1
86			min	-.27	1	-.274	1	0	3	-1.011e-2	3	413.917	1	NC	1
87		6	max	-.01	15	-.007	15	.014	1	2.19e-2	2	NC	15	NC	1
88			min	-.269	1	-.2	1	-.002	3	-1.031e-2	3	536.003	1	NC	1
89		7	max	-.01	15	-.005	15	.007	1	2.274e-2	2	NC	15	NC	2
90			min	-.269	1	-.141	1	-.002	3	-1.13e-2	3	701.611	1	6945.133	1
91		8	max	-.01	15	-.004	15	.002	2	2.358e-2	2	NC	5	NC	2
92			min	-.268	1	-.092	1	0	3	-1.228e-2	3	946.634	1	5223.379	1
93		9	max	-.01	15	-.002	15	0	3	2.308e-2	2	NC	2	NC	2
94			min	-.268	1	-.063	3	0	15	-1.35e-2	3	1305.345	3	5126.359	1
95		10	max	-.01	15	.004	2	0	3	2.021e-2	2	NC	5	NC	2
96			min	-.267	1	-.055	3	0	1	-1.513e-2	3	1407.602	3	4996.757	1
97		11	max	-.01	15	.036	1	.001	2	1.734e-2	2	NC	5	NC	2
98			min	-.267	1	-.044	3	-.002	3	-1.676e-2	3	1598.168	3	5350.421	1
99		12	max	-.01	15	.073	1	.008	1	1.291e-2	1	NC	4	NC	2
100			min	-.266	1	-.028	3	-.008	3	-1.374e-2	3	1697.07	2	7399.178	1
101		13	max	-.01	15	.104	1	.01	2	7.494e-3	1	NC	4	NC	2
102			min	-.265	1	-.003	3	-.015	3	-8.073e-3	3	1344.195	2	8145.134	1
103		14	max	-.01	15	.122	1	.007	2	2.279e-3	1	NC	3	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
104			min	-.265	1	.004	15	-.014	3	-2.67e-3	3	1231.082	2	5746.728	1
105		15	max	-.01	15	.123	1	0	10	6.101e-3	1	NC	4	NC	2
106			min	-.265	1	.005	15	-.009	3	-8.818e-3	3	1312.282	2	4001.81	1
107		16	max	-.01	15	.184	3	0	15	9.924e-3	1	NC	4	NC	3
108			min	-.265	1	.005	15	-.012	1	-1.496e-2	3	932.374	3	3513.333	1
109		17	max	-.01	15	.275	3	0	15	1.375e-2	1	NC	4	NC	3
110			min	-.265	1	.004	15	-.008	1	-2.111e-2	3	569.143	3	3944.915	1
111		18	max	-.01	15	.371	3	.008	1	1.624e-2	1	NC	4	NC	2
112			min	-.265	1	-.004	10	0	15	-2.512e-2	3	404.467	3	7251.703	1
113		19	max	-.01	15	.467	3	.026	1	1.624e-2	1	NC	1	NC	1
114			min	-.265	1	-.02	10	.001	15	-2.512e-2	3	313.805	3	NC	1
115	M10	1	max	.002	1	.338	3	.265	1	1.286e-2	3	NC	1	NC	1
116			min	0	15	.002	10	.01	15	-3.857e-3	2	NC	1	NC	1
117		2	max	.001	1	.72	3	.339	1	1.499e-2	3	NC	5	NC	3
118			min	0	15	-.213	2	.012	15	-4.719e-3	2	691.644	3	3553.04	1
119		3	max	.001	1	1.072	3	.455	1	1.711e-2	3	NC	5	NC	3
120			min	0	15	-.422	2	.017	15	-5.581e-3	2	359.775	3	1388.974	1
121		4	max	.001	1	1.33	3	.571	1	1.924e-2	3	NC	5	NC	5
122			min	0	15	-.56	2	.021	15	-6.444e-3	2	266.189	3	863.659	1
123		5	max	0	1	1.457	3	.658	1	2.137e-2	3	NC	15	NC	5
124			min	0	15	-.606	2	.024	15	-7.306e-3	2	235.899	3	672.491	1
125		6	max	0	1	1.445	3	.7	1	2.349e-2	3	NC	5	NC	5
126			min	0	15	-.554	2	.025	15	-8.168e-3	2	238.425	3	606.535	1
127		7	max	0	1	1.314	3	.696	1	2.562e-2	3	NC	5	NC	5
128			min	0	15	-.421	2	.024	15	-9.03e-3	2	270.6	3	612.078	1
129		8	max	0	1	1.109	3	.657	1	2.775e-2	3	NC	5	NC	5
130			min	0	15	-.244	2	.022	15	-9.893e-3	2	342.179	3	674.528	1
131		9	max	0	1	.908	3	.604	1	2.988e-2	3	NC	4	NC	5
132			min	0	15	-.08	2	.02	15	-1.075e-2	2	462.87	3	778.383	1
133		10	max	0	1	.813	3	.577	1	3.2e-2	3	NC	1	NC	5
134			min	0	1	-.018	10	.018	15	-1.162e-2	2	555.319	3	847.712	1
135		11	max	0	15	.908	3	.604	1	2.988e-2	3	NC	4	NC	5
136			min	0	1	-.08	2	.02	15	-1.075e-2	2	462.87	3	778.383	1
137		12	max	0	15	1.109	3	.657	1	2.775e-2	3	NC	5	NC	5
138			min	0	1	-.244	2	.022	15	-9.893e-3	2	342.179	3	674.528	1
139		13	max	0	15	1.314	3	.696	1	2.562e-2	3	NC	5	NC	5
140			min	0	1	-.421	2	.024	15	-9.03e-3	2	270.6	3	612.078	1
141		14	max	0	15	1.445	3	.7	1	2.349e-2	3	NC	5	NC	5
142			min	0	1	-.554	2	.025	15	-8.168e-3	2	238.425	3	606.535	1
143		15	max	0	15	1.457	3	.658	1	2.137e-2	3	NC	15	NC	5
144			min	0	1	-.606	2	.024	15	-7.306e-3	2	235.899	3	672.491	1
145		16	max	0	15	1.33	3	.571	1	1.924e-2	3	NC	5	NC	5
146			min	-.001	1	-.56	2	.021	15	-6.444e-3	2	266.189	3	863.659	1
147		17	max	0	15	1.072	3	.455	1	1.711e-2	3	NC	5	NC	3
148			min	-.001	1	-.422	2	.017	15	-5.581e-3	2	359.775	3	1388.974	1
149		18	max	0	15	.72	3	.339	1	1.499e-2	3	NC	5	NC	3
150			min	-.001	1	-.213	2	.012	15	-4.719e-3	2	691.644	3	3553.04	1
151		19	max	0	15	.338	3	.265	1	1.286e-2	3	NC	1	NC	1
152			min	-.002	1	.002	10	.01	15	-3.857e-3	2	NC	1	NC	1
153	M11	1	max	.004	1	.05	1	.267	1	5.018e-3	1	NC	1	NC	1
154			min	-.004	3	-.039	3	.01	15	1.847e-4	15	NC	1	NC	1
155		2	max	.003	1	.235	3	.326	1	5.714e-3	1	NC	5	NC	3
156			min	-.003	3	-.196	2	.012	15	2.041e-4	15	965.309	3	4458.339	1
157		3	max	.003	1	.49	3	.434	1	6.409e-3	1	NC	5	NC	3
158			min	-.003	3	-.405	1	.016	15	2.234e-4	15	499.084	3	1579.62	1
159		4	max	.003	1	.663	3	.547	1	7.104e-3	1	NC	5	NC	3
160			min	-.003	3	-.539	1	.02	15	2.428e-4	15	375.936	3	940.629	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
161		5	max	.002	1	.718	3	.636	1	7.799e-3	1	NC	5	NC	3
162			min	-.002	3	-.573	1	.023	15	2.621e-4	15	348.704	3	713.892	1
163		6	max	.002	1	.646	3	.684	1	8.495e-3	1	NC	5	NC	5
164			min	-.002	3	-.504	1	.024	15	2.814e-4	15	385.27	3	632.179	1
165		7	max	.001	1	.468	3	.687	1	9.19e-3	1	NC	5	NC	5
166			min	-.001	3	-.35	1	.024	15	3.008e-4	15	521.34	3	628.307	1
167		8	max	0	1	.229	3	.653	1	9.885e-3	1	NC	5	NC	5
168			min	0	3	-.153	2	.022	15	3.201e-4	15	984.262	3	682.689	1
169		9	max	0	1	.029	1	.606	1	1.058e-2	1	NC	1	NC	5
170			min	0	3	.001	15	.02	15	3.395e-4	15	5692.509	3	777.754	1
171		10	max	0	1	.112	1	.58	1	1.128e-2	1	NC	4	NC	5
172			min	0	1	-.094	3	.018	15	3.588e-4	15	4262.004	1	841.606	1
173		11	max	0	3	.029	1	.606	1	1.058e-2	1	NC	1	NC	5
174			min	0	1	.001	15	.02	15	3.395e-4	15	5692.509	3	777.754	1
175		12	max	0	3	.229	3	.653	1	9.885e-3	1	NC	5	NC	5
176			min	0	1	-.153	2	.022	15	3.201e-4	15	984.262	3	682.689	1
177		13	max	.001	3	.468	3	.687	1	9.19e-3	1	NC	5	NC	5
178			min	-.001	1	-.35	1	.024	15	3.008e-4	15	521.34	3	628.307	1
179		14	max	.002	3	.646	3	.684	1	8.495e-3	1	NC	5	NC	5
180			min	-.002	1	-.504	1	.024	15	2.814e-4	15	385.27	3	632.179	1
181		15	max	.002	3	.718	3	.636	1	7.799e-3	1	NC	5	NC	3
182			min	-.002	1	-.573	1	.023	15	2.621e-4	15	348.704	3	713.892	1
183		16	max	.003	3	.663	3	.547	1	7.104e-3	1	NC	5	NC	3
184			min	-.003	1	-.539	1	.02	15	2.428e-4	15	375.936	3	940.629	1
185		17	max	.003	3	.49	3	.434	1	6.409e-3	1	NC	5	NC	3
186			min	-.003	1	-.405	1	.016	15	2.234e-4	15	499.084	3	1579.62	1
187		18	max	.003	3	.235	3	.326	1	5.714e-3	1	NC	5	NC	3
188			min	-.003	1	-.196	2	.012	15	2.041e-4	15	965.309	3	4458.339	1
189		19	max	.004	3	.05	1	.267	1	5.018e-3	1	NC	1	NC	1
190			min	-.004	1	-.039	3	.01	15	1.847e-4	15	NC	1	NC	1
191	M12	1	max	0	2	-.003	15	.268	1	6.004e-3	1	NC	1	NC	1
192			min	0	9	-.065	3	.01	15	2.157e-4	15	NC	1	NC	1
193		2	max	0	2	.115	3	.317	1	6.787e-3	1	NC	5	NC	2
194			min	0	9	-.397	2	.012	15	2.381e-4	15	741.988	2	5396.469	1
195		3	max	0	2	.255	3	.42	1	7.569e-3	1	NC	5	NC	3
196			min	0	9	-.705	2	.015	15	2.604e-4	15	397.744	2	1742.071	1
197		4	max	0	2	.335	3	.532	1	8.352e-3	1	NC	15	NC	5
198			min	0	9	-.906	2	.02	15	2.827e-4	15	305.177	2	1000.842	1
199		5	max	0	2	.344	3	.623	1	9.135e-3	1	NC	15	NC	5
200			min	0	9	-.97	2	.023	15	3.051e-4	15	284.187	2	744.507	1
201		6	max	0	2	.286	3	.674	1	9.917e-3	1	NC	15	NC	5
202			min	0	9	-.893	2	.024	15	3.274e-4	15	309.659	2	650.18	1
203		7	max	0	2	.176	3	.681	1	1.07e-2	1	NC	5	NC	5
204			min	0	9	-.702	2	.024	15	3.497e-4	15	399.463	2	638.894	1
205		8	max	0	2	.041	3	.652	1	1.148e-2	1	NC	5	NC	5
206			min	0	9	-.448	1	.022	15	3.72e-4	15	648.673	2	686.99	1
207		9	max	0	2	-.007	15	.609	1	1.227e-2	1	NC	3	NC	5
208			min	0	9	-.236	1	.02	15	3.944e-4	15	1525.492	1	775.355	1
209		10	max	0	1	-.005	15	.584	1	1.305e-2	1	NC	4	NC	5
210			min	0	1	-.139	1	.019	15	4.167e-4	15	3471.214	1	835.112	1
211		11	max	0	9	-.007	15	.609	1	1.227e-2	1	NC	3	NC	5
212			min	0	2	-.236	1	.02	15	3.944e-4	15	1525.492	1	775.355	1
213		12	max	0	9	.041	3	.652	1	1.148e-2	1	NC	5	NC	5
214			min	0	2	-.448	1	.022	15	3.72e-4	15	648.673	2	686.99	1
215		13	max	0	9	.176	3	.681	1	1.07e-2	1	NC	5	NC	5
216			min	0	2	-.702	2	.024	15	3.497e-4	15	399.463	2	638.894	1
217		14	max	0	9	.286	3	.674	1	9.917e-3	1	NC	15	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
218			min	0	2	-.893	2	.024	15	3.274e-4	15	309.659	2	650.18	1
219		15	max	0	9	.344	3	.623	1	9.135e-3	1	NC	15	NC	5
220			min	0	2	-.97	2	.023	15	3.051e-4	15	284.187	2	744.507	1
221		16	max	0	9	.335	3	.532	1	8.352e-3	1	NC	15	NC	5
222			min	0	2	-.906	2	.02	15	2.827e-4	15	305.177	2	1000.842	1
223		17	max	0	9	.255	3	.42	1	7.569e-3	1	NC	5	NC	3
224			min	0	2	-.705	2	.015	15	2.604e-4	15	397.744	2	1742.071	1
225		18	max	0	9	.115	3	.317	1	6.787e-3	1	NC	5	NC	2
226			min	0	2	-.397	2	.012	15	2.381e-4	15	741.988	2	5396.469	1
227		19	max	0	9	-.003	15	.268	1	6.004e-3	1	NC	1	NC	1
228			min	0	2	-.065	3	.01	15	2.157e-4	15	NC	1	NC	1
229	M13	1	max	0	3	.007	3	.27	1	1.37e-2	1	NC	1	NC	1
230			min	-.002	1	-.528	1	.01	15	-3.314e-3	3	NC	1	NC	1
231		2	max	0	3	.188	3	.348	1	1.589e-2	1	NC	5	NC	3
232			min	-.002	1	-.959	1	.013	15	-4.115e-3	3	567.414	2	3361.629	1
233		3	max	0	3	.342	3	.467	1	1.808e-2	1	NC	15	NC	3
234			min	-.002	1	-1.342	1	.017	15	-4.916e-3	3	300.916	2	1339.365	1
235		4	max	0	3	.445	3	.584	1	2.028e-2	1	NC	15	NC	5
236			min	-.001	1	-1.633	2	.021	15	-5.717e-3	3	224.606	2	839.827	1
237		5	max	0	3	.482	3	.672	1	2.247e-2	1	8856.796	15	NC	5
238			min	-.001	1	-1.784	2	.024	15	-6.518e-3	3	198.996	2	656.798	1
239		6	max	0	3	.455	3	.715	1	2.466e-2	1	8693.438	15	NC	5
240			min	0	1	-1.784	2	.025	15	-7.319e-3	3	199.06	2	593.707	1
241		7	max	0	3	.374	3	.71	1	2.685e-2	1	9359.643	15	NC	5
242			min	0	1	-1.676	1	.025	15	-8.12e-3	3	220.518	2	599.577	1
243		8	max	0	3	.264	3	.67	1	2.905e-2	1	NC	15	NC	5
244			min	0	1	-1.498	1	.023	15	-8.921e-3	3	266.533	2	660.367	1
245		9	max	0	3	.161	3	.617	1	3.127e-2	2	NC	15	NC	5
246			min	0	1	-1.318	1	.02	15	-9.721e-3	3	334.14	1	760.772	1
247		10	max	0	1	.114	3	.589	1	3.354e-2	2	NC	15	NC	5
248			min	0	1	-1.233	1	.019	15	-1.052e-2	3	374.679	1	827.481	1
249		11	max	0	1	.161	3	.617	1	3.127e-2	2	NC	15	NC	5
250			min	0	3	-1.318	1	.02	15	-9.721e-3	3	334.14	1	760.772	1
251		12	max	0	1	.264	3	.67	1	2.905e-2	1	NC	15	NC	5
252			min	0	3	-1.498	1	.023	15	-8.921e-3	3	266.533	2	660.367	1
253		13	max	0	1	.374	3	.71	1	2.685e-2	1	9359.643	15	NC	5
254			min	0	3	-1.676	1	.025	15	-8.12e-3	3	220.518	2	599.577	1
255		14	max	0	1	.455	3	.715	1	2.466e-2	1	8693.438	15	NC	5
256			min	0	3	-1.784	2	.025	15	-7.319e-3	3	199.06	2	593.707	1
257		15	max	.001	1	.482	3	.672	1	2.247e-2	1	8856.796	15	NC	5
258			min	0	3	-1.784	2	.024	15	-6.518e-3	3	198.996	2	656.798	1
259		16	max	.001	1	.445	3	.584	1	2.028e-2	1	NC	15	NC	5
260			min	0	3	-1.633	2	.021	15	-5.717e-3	3	224.606	2	839.827	1
261		17	max	.002	1	.342	3	.467	1	1.808e-2	1	NC	15	NC	3
262			min	0	3	-1.342	1	.017	15	-4.916e-3	3	300.916	2	1339.365	1
263		18	max	.002	1	.188	3	.348	1	1.589e-2	1	NC	5	NC	3
264			min	0	3	-.959	1	.013	15	-4.115e-3	3	567.414	2	3361.629	1
265		19	max	.002	1	.007	3	.27	1	1.37e-2	1	NC	1	NC	1
266			min	0	3	-.528	1	.01	15	-3.314e-3	3	NC	1	NC	1
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	3	3.461e-3	2	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-1.558e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	6.922e-3	2	NC	1	NC	1
272			min	0	1	-.005	1	0	1	-3.115e-3	3	NC	1	NC	1
273		4	max	0	3	0	15	.002	3	8.105e-3	2	NC	3	NC	1
274			min	0	1	-.011	1	-.002	1	-3.613e-3	3	5722.95	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	7.438e-3	2	NC	4	NC	1
276			min	0	1	-.019	1	-.003	1	-3.25e-3	3	3200.904	1	NC	1
277		6	max	0	3	-.001	15	.004	3	6.771e-3	2	NC	5	NC	1
278			min	0	1	-.029	1	-.004	1	-2.887e-3	3	2059.104	1	7691.408	3
279		7	max	0	3	-.002	15	.005	3	6.104e-3	2	NC	5	NC	4
280			min	0	1	-.042	1	-.005	1	-2.524e-3	3	1445.702	1	6180.284	3
281		8	max	0	3	-.002	15	.006	3	5.437e-3	2	NC	5	NC	4
282			min	0	1	-.056	1	-.006	1	-2.162e-3	3	1077.509	1	5205.337	3
283		9	max	0	3	-.003	15	.007	3	4.77e-3	2	NC	5	NC	4
284			min	0	1	-.072	1	-.007	1	-1.799e-3	3	838.777	1	4556.981	3
285		10	max	0	3	-.003	15	.007	3	4.103e-3	2	NC	5	NC	4
286			min	0	1	-.09	1	-.008	1	-1.436e-3	3	674.91	1	4127.11	3
287		11	max	0	3	-.004	15	.008	3	3.436e-3	2	NC	15	NC	4
288			min	-.001	1	-.109	1	-.009	1	-1.073e-3	3	557.426	1	3858.467	3
289		12	max	0	3	-.005	15	.007	3	2.769e-3	2	NC	15	NC	4
290			min	-.001	1	-.129	1	-.009	1	-7.105e-4	3	470.27	1	3723.257	3
291		13	max	0	3	-.005	15	.007	3	2.102e-3	2	NC	15	NC	4
292			min	-.001	1	-.15	1	-.009	1	-3.477e-4	3	403.781	1	3716.824	3
293		14	max	.001	3	-.006	15	.005	3	1.435e-3	2	9694.24	15	NC	4
294			min	-.001	1	-.172	1	-.009	1	9.229e-6	15	351.876	1	3859.868	3
295		15	max	.001	3	-.007	15	.003	3	7.685e-4	2	8560.743	15	NC	4
296			min	-.001	1	-.195	1	-.008	1	-1.123e-4	9	310.568	1	4217.245	3
297		16	max	.001	3	-.008	15	0	3	7.407e-4	3	7643.287	15	NC	4
298			min	-.002	1	-.219	1	-.006	1	-4.023e-4	1	277.16	1	4957.574	3
299		17	max	.001	3	-.009	15	0	10	1.104e-3	3	6890.51	15	NC	4
300			min	-.002	1	-.243	1	-.004	1	-1.053e-3	1	249.768	1	6605.876	3
301		18	max	.001	3	-.01	15	.003	2	1.466e-3	3	6265.586	15	NC	1
302			min	-.002	1	-.267	1	-.008	3	-1.703e-3	1	227.043	1	NC	1
303		19	max	.001	3	-.011	15	.007	2	1.829e-3	3	5741.587	15	NC	1
304			min	-.002	1	-.291	1	-.014	3	-2.353e-3	1	207.998	1	NC	1
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	1	0	1	NC	1	NC	1
308			min	0	1	-.002	1	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	3	NC	1
310			min	0	1	-.009	1	0	1	0	1	6429.614	1	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	-.001	1	-.022	1	0	1	0	1	2742.467	1	NC	1
313		5	max	.001	3	-.001	15	0	1	0	1	NC	5	NC	1
314			min	-.001	1	-.04	1	0	1	0	1	1513.148	1	NC	1
315		6	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
316			min	-.002	1	-.063	1	0	1	0	1	965.975	1	NC	1
317		7	max	.001	3	-.003	15	0	1	0	1	NC	5	NC	1
318			min	-.002	1	-.09	1	0	1	0	1	674.915	1	NC	1
319		8	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
320			min	-.002	1	-.121	1	0	1	0	1	501.334	1	NC	1
321		9	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
322			min	-.002	1	-.156	1	0	1	0	1	389.299	1	NC	1
323		10	max	.002	3	-.006	15	0	1	0	1	9746.053	15	NC	1
324			min	-.003	1	-.194	1	0	1	0	1	312.658	1	NC	1
325		11	max	.002	3	-.008	15	0	1	0	1	8049.916	15	NC	1
326			min	-.003	1	-.235	1	0	1	0	1	257.854	1	NC	1
327		12	max	.003	3	-.009	15	0	1	0	1	6791.543	15	NC	1
328			min	-.003	1	-.279	1	0	1	0	1	217.282	1	NC	1
329		13	max	.003	3	-.01	15	0	1	0	1	5831.5	15	NC	1
330			min	-.003	1	-.325	1	0	1	0	1	186.384	1	NC	1
331		14	max	.003	3	-.012	15	0	1	0	1	5082.019	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
332			min	-.004	1	-.373	1	0	1	0	1	162.297	1	NC	1
333		15	max	.003	3	-.014	15	0	1	0	1	4485.514	15	NC	1
334			min	-.004	1	-.423	1	0	1	0	1	143.15	1	NC	1
335		16	max	.004	3	-.015	15	0	1	0	1	4003.081	15	NC	1
336			min	-.004	1	-.475	1	0	1	0	1	127.681	1	NC	1
337		17	max	.004	3	-.017	15	0	1	0	1	3607.512	15	NC	1
338			min	-.004	1	-.527	1	0	1	0	1	115.008	1	NC	1
339		18	max	.004	3	-.018	15	0	1	0	1	3279.325	15	NC	1
340			min	-.005	1	-.58	1	0	1	0	1	104.503	1	NC	1
341		19	max	.004	3	-.02	15	0	1	0	1	3004.287	15	NC	1
342			min	-.005	1	-.633	1	0	1	0	1	95.705	1	NC	1
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	15	0	1	1.558e-3	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-3.461e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	3.115e-3	3	NC	1	NC	1
348			min	0	1	-.005	1	0	3	-6.922e-3	2	NC	1	NC	1
349		4	max	0	3	0	15	.002	1	3.613e-3	3	NC	3	NC	1
350			min	0	1	-.011	1	-.002	3	-8.105e-3	2	5722.95	1	NC	1
351		5	max	0	3	0	15	.003	1	3.25e-3	3	NC	4	NC	1
352			min	0	1	-.019	1	-.003	3	-7.438e-3	2	3200.904	1	NC	1
353		6	max	0	3	-.001	15	.004	1	2.887e-3	3	NC	5	NC	1
354			min	0	1	-.029	1	-.004	3	-6.771e-3	2	2059.104	1	7691.408	3
355		7	max	0	3	-.002	15	.005	1	2.524e-3	3	NC	5	NC	4
356			min	0	1	-.042	1	-.005	3	-6.104e-3	2	1445.702	1	6180.284	3
357		8	max	0	3	-.002	15	.006	1	2.162e-3	3	NC	5	NC	4
358			min	0	1	-.056	1	-.006	3	-5.437e-3	2	1077.509	1	5205.337	3
359		9	max	0	3	-.003	15	.007	1	1.799e-3	3	NC	5	NC	4
360			min	0	1	-.072	1	-.007	3	-4.77e-3	2	838.777	1	4556.981	3
361		10	max	0	3	-.003	15	.008	1	1.436e-3	3	NC	5	NC	4
362			min	0	1	-.09	1	-.007	3	-4.103e-3	2	674.91	1	4127.11	3
363		11	max	0	3	-.004	15	.009	1	1.073e-3	3	NC	15	NC	4
364			min	-.001	1	-.109	1	-.008	3	-3.436e-3	2	557.426	1	3858.467	3
365		12	max	0	3	-.005	15	.009	1	7.105e-4	3	NC	15	NC	4
366			min	-.001	1	-.129	1	-.007	3	-2.769e-3	2	470.27	1	3723.257	3
367		13	max	0	3	-.005	15	.009	1	3.477e-4	3	NC	15	NC	4
368			min	-.001	1	-.15	1	-.007	3	-2.102e-3	2	403.781	1	3716.824	3
369		14	max	.001	3	-.006	15	.009	1	-9.229e-6	15	9694.24	15	NC	4
370			min	-.001	1	-.172	1	-.005	3	-1.435e-3	2	351.876	1	3859.868	3
371		15	max	.001	3	-.007	15	.008	1	1.123e-4	9	8560.743	15	NC	4
372			min	-.001	1	-.195	1	-.003	3	-7.685e-4	2	310.568	1	4217.245	3
373		16	max	.001	3	-.008	15	.006	1	4.023e-4	1	7643.287	15	NC	4
374			min	-.002	1	-.219	1	0	3	-7.407e-4	3	277.16	1	4957.574	3
375		17	max	.001	3	-.009	15	.004	1	1.053e-3	1	6890.51	15	NC	4
376			min	-.002	1	-.243	1	0	10	-1.104e-3	3	249.768	1	6605.876	3
377		18	max	.001	3	-.01	15	.008	3	1.703e-3	1	6265.586	15	NC	1
378			min	-.002	1	-.267	1	-.003	2	-1.466e-3	3	227.043	1	NC	1
379		19	max	.001	3	-.011	15	.014	3	2.353e-3	1	5741.587	15	NC	1
380			min	-.002	1	-.291	1	-.007	2	-1.829e-3	3	207.998	1	NC	1
381	M3	1	max	.006	1	0	15	.001	3	3.22e-3	2	NC	1	NC	1
382			min	0	15	-.003	1	-.001	1	-1.314e-3	3	NC	1	NC	1
383		2	max	.006	1	-.001	15	.014	3	3.834e-3	2	NC	1	NC	4
384			min	0	15	-.024	1	-.028	2	-1.611e-3	3	NC	1	2247.27	2
385		3	max	.005	1	-.002	15	.026	3	4.449e-3	2	NC	1	NC	5
386			min	0	15	-.044	1	-.055	2	-1.907e-3	3	NC	1	1136.695	2
387		4	max	.005	1	-.003	15	.038	3	5.063e-3	2	NC	1	NC	5
388			min	0	15	-.065	1	-.081	2	-2.204e-3	3	NC	1	771.38	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
389		5	max	.004	1	-.004	15	.049	3	5.678e-3	2	NC	1	NC	5
390			min	0	15	-.085	1	-.105	2	-2.501e-3	3	NC	1	592.772	2
391		6	max	.004	3	-.004	15	.059	3	6.292e-3	2	NC	1	NC	5
392			min	0	15	-.105	1	-.127	2	-2.798e-3	3	NC	1	489.313	2
393		7	max	.004	3	-.005	15	.068	3	6.907e-3	2	NC	1	NC	5
394			min	0	10	-.126	1	-.146	2	-3.095e-3	3	NC	1	423.989	2
395		8	max	.004	3	-.006	15	.075	3	7.522e-3	2	NC	1	NC	5
396			min	0	10	-.146	1	-.162	2	-3.392e-3	3	NC	1	381.141	2
397		9	max	.004	3	-.007	15	.081	3	8.136e-3	2	NC	1	NC	5
398			min	0	10	-.166	1	-.174	2	-3.688e-3	3	NC	1	353.202	2
399		10	max	.005	3	-.008	15	.085	3	8.751e-3	2	NC	1	NC	15
400			min	-.001	2	-.186	1	-.183	2	-3.985e-3	3	NC	1	336.331	2
401		11	max	.005	3	-.008	15	.086	3	9.365e-3	2	NC	1	NC	15
402			min	-.002	2	-.206	1	-.186	2	-4.282e-3	3	NC	1	328.746	2
403		12	max	.005	3	-.009	15	.086	3	9.98e-3	2	NC	1	NC	15
404			min	-.002	2	-.226	1	-.185	2	-4.579e-3	3	NC	1	330.124	2
405		13	max	.005	3	-.01	15	.083	3	1.059e-2	2	NC	1	NC	15
406			min	-.003	2	-.245	1	-.178	2	-4.876e-3	3	NC	1	341.618	2
407		14	max	.005	3	-.01	15	.077	3	1.121e-2	2	NC	1	NC	5
408			min	-.004	2	-.265	1	-.165	2	-5.172e-3	3	NC	1	366.54	2
409		15	max	.006	3	-.011	15	.068	3	1.182e-2	2	NC	1	NC	5
410			min	-.004	2	-.285	1	-.145	2	-5.469e-3	3	NC	1	412.51	2
411		16	max	.006	3	-.011	15	.056	3	1.244e-2	2	NC	1	NC	5
412			min	-.005	2	-.304	1	-.118	2	-5.766e-3	3	NC	1	498.195	2
413		17	max	.006	3	-.012	15	.041	3	1.305e-2	2	NC	1	NC	5
414			min	-.005	2	-.323	1	-.083	2	-6.063e-3	3	NC	1	680.504	2
415		18	max	.006	3	-.012	15	.022	3	1.367e-2	2	NC	1	NC	5
416			min	-.006	2	-.343	1	-.04	2	-6.36e-3	3	NC	1	1245.252	2
417		19	max	.006	3	-.013	15	.017	1	1.428e-2	2	NC	1	NC	1
418			min	-.007	2	-.362	1	0	3	-6.657e-3	3	NC	1	NC	1
419	M6	1	max	.013	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.007	1	0	1	0	1	NC	1	NC	1
421		2	max	.011	1	-.002	15	0	1	0	1	NC	1	NC	1
422			min	0	15	-.051	1	0	1	0	1	NC	1	NC	1
423		3	max	.01	1	-.003	15	0	1	0	1	NC	1	NC	1
424			min	0	15	-.096	1	0	1	0	1	NC	1	NC	1
425		4	max	.008	1	-.005	15	0	1	0	1	NC	1	NC	1
426			min	0	15	-.14	1	0	1	0	1	NC	1	NC	1
427		5	max	.008	3	-.006	15	0	1	0	1	NC	1	NC	1
428			min	0	15	-.184	1	0	1	0	1	NC	1	NC	1
429		6	max	.009	3	-.008	15	0	1	0	1	NC	1	NC	1
430			min	0	10	-.229	1	0	1	0	1	NC	1	NC	1
431		7	max	.01	3	-.009	15	0	1	0	1	NC	1	NC	1
432			min	-.001	10	-.273	1	0	1	0	1	NC	1	NC	1
433		8	max	.011	3	-.011	15	0	1	0	1	NC	1	NC	1
434			min	-.003	2	-.317	1	0	1	0	1	NC	1	NC	1
435		9	max	.011	3	-.012	15	0	1	0	1	NC	1	NC	1
436			min	-.005	2	-.361	1	0	1	0	1	NC	1	NC	1
437		10	max	.012	3	-.014	15	0	1	0	1	NC	1	NC	1
438			min	-.006	2	-.405	1	0	1	0	1	NC	1	NC	1
439		11	max	.013	3	-.015	15	0	1	0	1	NC	1	NC	1
440			min	-.008	2	-.449	1	0	1	0	1	NC	1	NC	1
441		12	max	.013	3	-.016	15	0	1	0	1	NC	1	NC	1
442			min	-.01	2	-.493	1	0	1	0	1	NC	1	NC	1
443		13	max	.014	3	-.018	15	0	1	0	1	NC	1	NC	1
444			min	-.012	2	-.536	1	0	1	0	1	NC	1	NC	1
445		14	max	.015	3	-.019	15	0	1	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
446			min	-.013	2	-.58	1	0	1	0	1	NC	1	NC	1
447		15	max	.016	3	-.02	15	0	1	0	1	NC	1	NC	1
448			min	-.015	2	-.623	1	0	1	0	1	NC	1	NC	1
449		16	max	.016	3	-.021	15	0	1	0	1	NC	1	NC	1
450			min	-.017	2	-.667	1	0	1	0	1	NC	1	NC	1
451		17	max	.017	3	-.023	15	0	1	0	1	NC	1	NC	1
452			min	-.019	2	-.71	1	0	1	0	1	NC	1	NC	1
453		18	max	.018	3	-.024	15	0	1	0	1	NC	1	NC	1
454			min	-.02	2	-.754	1	0	1	0	1	NC	1	NC	1
455		19	max	.018	3	-.025	15	0	1	0	1	NC	1	NC	1
456			min	-.022	2	-.797	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.006	1	0	15	.001	1	1.314e-3	3	NC	1	NC	1
458			min	0	15	-.003	1	-.001	3	-3.22e-3	2	NC	1	NC	1
459		2	max	.006	1	-.001	15	.028	2	1.611e-3	3	NC	1	NC	4
460			min	0	15	-.024	1	-.014	3	-3.834e-3	2	NC	1	2247.27	2
461		3	max	.005	1	-.002	15	.055	2	1.907e-3	3	NC	1	NC	5
462			min	0	15	-.044	1	-.026	3	-4.449e-3	2	NC	1	1136.695	2
463		4	max	.005	1	-.003	15	.081	2	2.204e-3	3	NC	1	NC	5
464			min	0	15	-.065	1	-.038	3	-5.063e-3	2	NC	1	771.38	2
465		5	max	.004	1	-.004	15	.105	2	2.501e-3	3	NC	1	NC	5
466			min	0	15	-.085	1	-.049	3	-5.678e-3	2	NC	1	592.772	2
467		6	max	.004	3	-.004	15	.127	2	2.798e-3	3	NC	1	NC	5
468			min	0	15	-.105	1	-.059	3	-6.292e-3	2	NC	1	489.313	2
469		7	max	.004	3	-.005	15	.146	2	3.095e-3	3	NC	1	NC	5
470			min	0	10	-.126	1	-.068	3	-6.907e-3	2	NC	1	423.989	2
471		8	max	.004	3	-.006	15	.162	2	3.392e-3	3	NC	1	NC	5
472			min	0	10	-.146	1	-.075	3	-7.522e-3	2	NC	1	381.141	2
473		9	max	.004	3	-.007	15	.174	2	3.688e-3	3	NC	1	NC	5
474			min	0	10	-.166	1	-.081	3	-8.136e-3	2	NC	1	353.202	2
475		10	max	.005	3	-.008	15	.183	2	3.985e-3	3	NC	1	NC	15
476			min	-.001	2	-.186	1	-.085	3	-8.751e-3	2	NC	1	336.331	2
477		11	max	.005	3	-.008	15	.186	2	4.282e-3	3	NC	1	NC	15
478			min	-.002	2	-.206	1	-.086	3	-9.365e-3	2	NC	1	328.746	2
479		12	max	.005	3	-.009	15	.185	2	4.579e-3	3	NC	1	NC	15
480			min	-.002	2	-.226	1	-.086	3	-9.98e-3	2	NC	1	330.124	2
481		13	max	.005	3	-.01	15	.178	2	4.876e-3	3	NC	1	NC	15
482			min	-.003	2	-.245	1	-.083	3	-1.059e-2	2	NC	1	341.618	2
483		14	max	.005	3	-.01	15	.165	2	5.172e-3	3	NC	1	NC	5
484			min	-.004	2	-.265	1	-.077	3	-1.121e-2	2	NC	1	366.54	2
485		15	max	.006	3	-.011	15	.145	2	5.469e-3	3	NC	1	NC	5
486			min	-.004	2	-.285	1	-.068	3	-1.182e-2	2	NC	1	412.51	2
487		16	max	.006	3	-.011	15	.118	2	5.766e-3	3	NC	1	NC	5
488			min	-.005	2	-.304	1	-.056	3	-1.244e-2	2	NC	1	498.195	2
489		17	max	.006	3	-.012	15	.083	2	6.063e-3	3	NC	1	NC	5
490			min	-.005	2	-.323	1	-.041	3	-1.305e-2	2	NC	1	680.504	2
491		18	max	.006	3	-.012	15	.04	2	6.36e-3	3	NC	1	NC	5
492			min	-.006	2	-.343	1	-.022	3	-1.367e-2	2	NC	1	1245.252	2
493		19	max	.006	3	-.013	15	0	3	6.657e-3	3	NC	1	NC	1
494			min	-.007	2	-.362	1	-.017	1	-1.428e-2	2	NC	1	NC	1