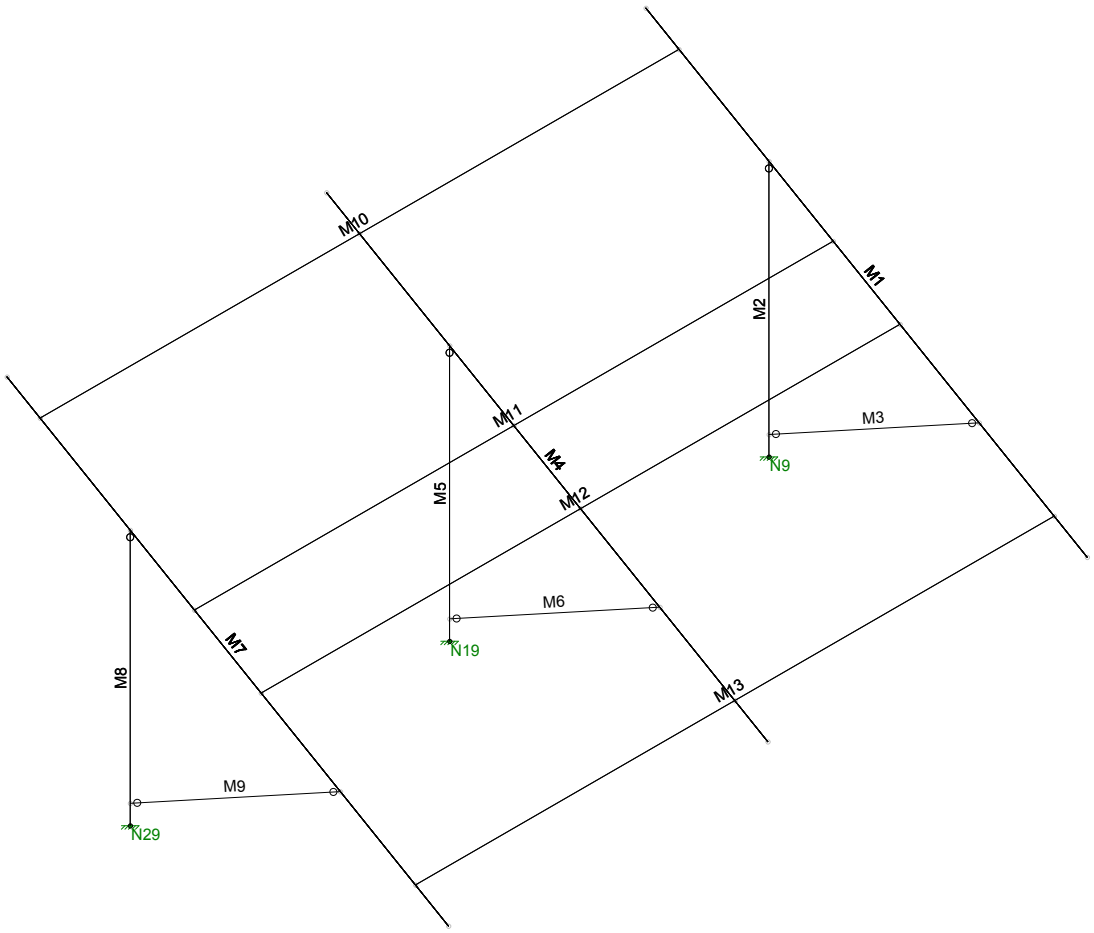


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

1.1 Project Description

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

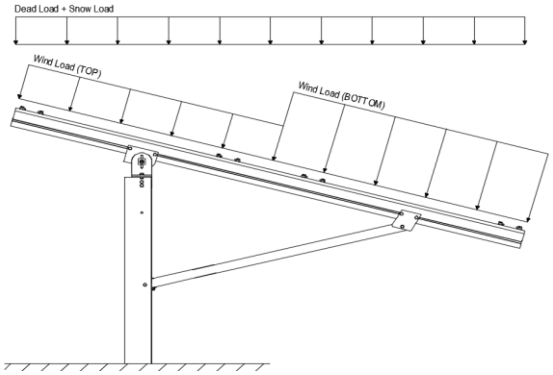
1.2 Construction

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

PV modules are required to meet the following specifications:

	Maximum		Minimum	
Height =	1700	mm	1550	mm
Width =	1050	mm	970	mm
Dead Load =	3.00	psf	1.75	psf

Modules Per Row =	2
Module Tilt =	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 7-05 - Chapter 6, Wind Loads
- ASCE 7-05 - Chapter 7, Snow Loads
- ASCE 7-05 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2003, 2006, 2009
- Aluminum Design Manual, Eighth Edition, 2005

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	16.49	psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.73		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	120	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z = 22.61 psf *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

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 + 0.8W
1.2D + 1.6W + 0.5S
0.9D + 1.6W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

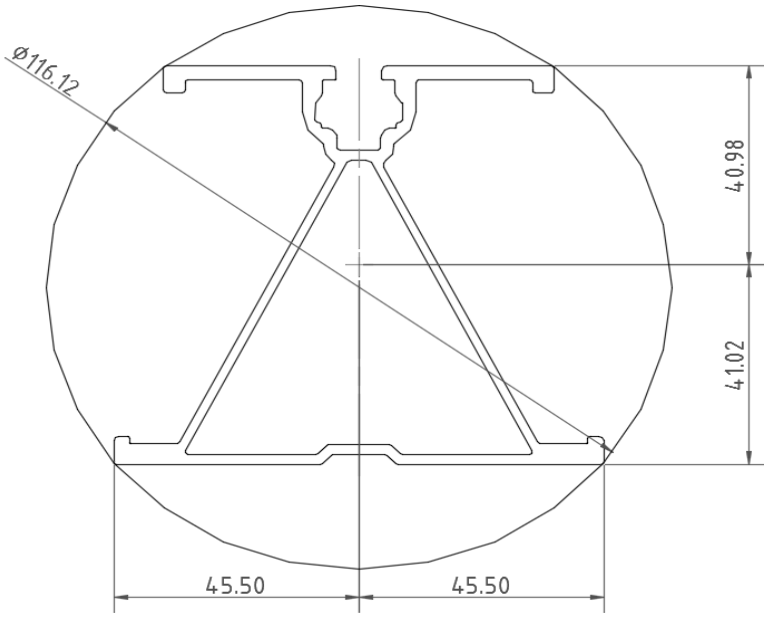
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	90	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 =	1.429	k-ft
M_z =	0.108	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	61%	

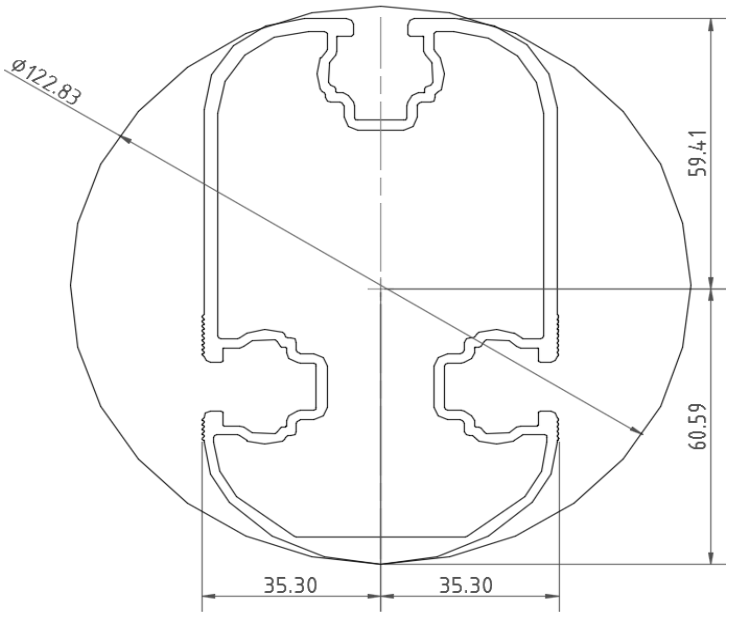


DETAIL VIEW

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 =	4.262	k-ft
M_z =	0.000	k-ft
P_n =	0.012	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	85%	

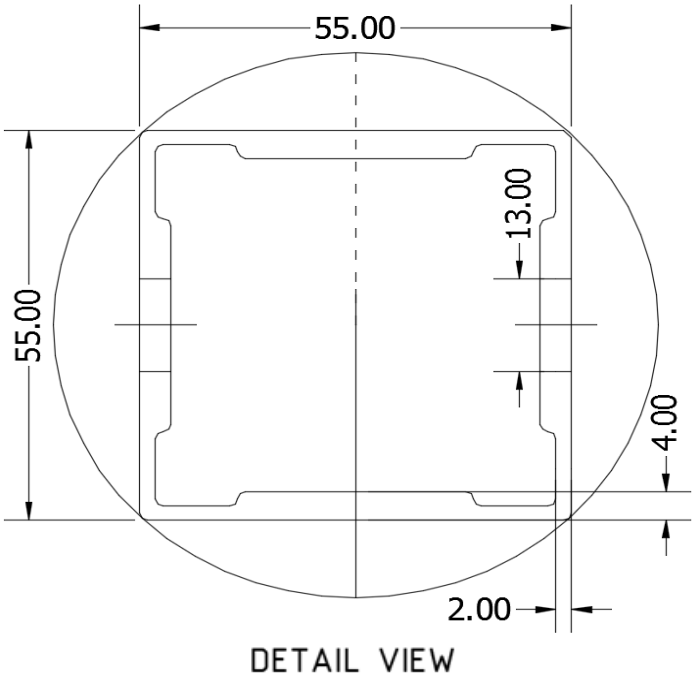


DETAIL VIEW

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).

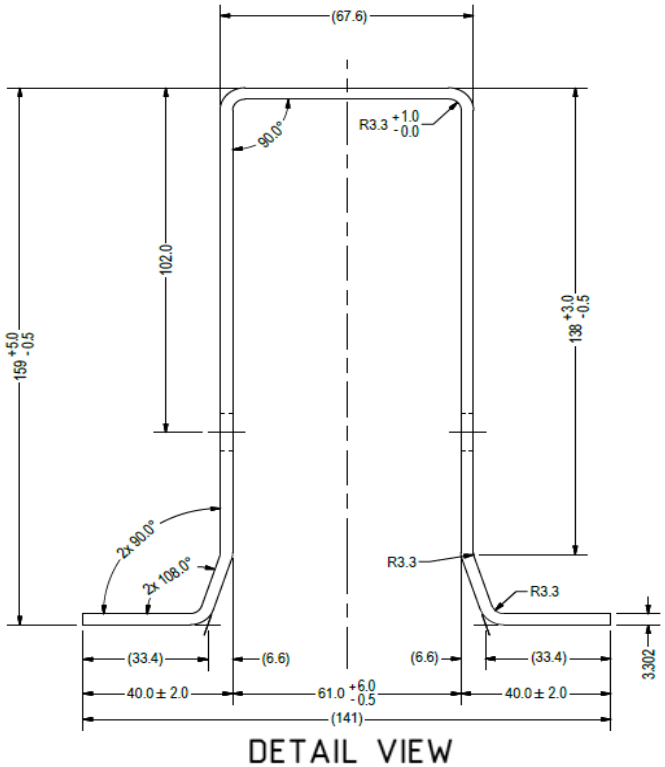
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	4.247	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	32%	



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 =	12.928	k-ft
M_z =	0.000	k-ft
P_r =	-5.138	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	79%	



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 =	6.64	k
Maximum Lateral Load =	3.76	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 =	0.86	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

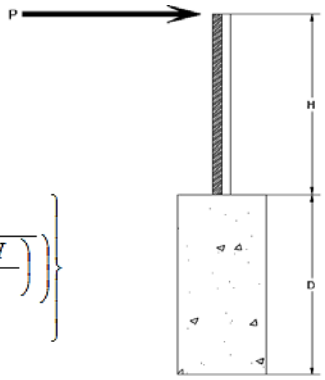
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	0.86	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 =	4.66	
Required Footing Depth, D =	8.57	ft

2nd Trial @ D_2 =	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 =	2.56	
Required Footing Depth, D =	5.76	ft

3rd Trial @ D_3 =	5.84	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.17	ksf
Constant 2.34P/(S_1B), A =	2.59	
Required Footing Depth, D =	5.81	ft

4th Trial @ D_4 =	5.82	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.16	ksf
Constant 2.34P/(S_1B), A =	2.60	
Required Footing Depth, D =	5.82	ft

5th Trial @ D_5 =	5.82	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.16	ksf
Constant 2.34P/(S_1B), A =	2.60	
Required Footing Depth, D =	6.00	ft

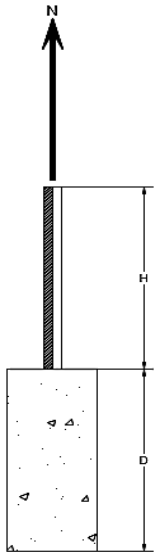
A 2ft diameter x 6ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.18	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	6.88
2	0.4	0.2	118.10	6.78
3	0.6	0.2	118.10	6.67
4	0.8	0.2	118.10	6.57
5	1	0.2	118.10	6.47
6	1.2	0.2	118.10	6.36
7	1.4	0.2	118.10	6.26
8	1.6	0.2	118.10	6.16
9	1.8	0.2	118.10	6.05
10	2	0.2	118.10	5.95
11	2.2	0.2	118.10	5.84
12	2.4	0.2	118.10	5.74
13	2.6	0.2	118.10	5.64
14	2.8	0.2	118.10	5.53
15	3	0.2	118.10	5.43
16	3.2	0.2	118.10	5.33
17	3.4	0.2	118.10	5.22
18	3.6	0.2	118.10	5.12
19	3.8	0.2	118.10	5.01
20	4	0.2	118.10	4.91
21	4.2	0.2	118.10	4.81
22	4.4	0.2	118.10	4.70
23	4.6	0.2	118.10	4.60
24	4.8	0.2	118.10	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	4.8	Sum	1.13	

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 =	3.61	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

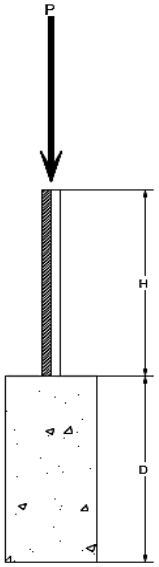
Weight of Concrete

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 =	6.34	k
Utilization =	63%	

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



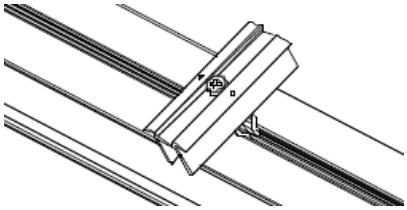
6. DESIGN OF JOINTS AND CONNECTIONS

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.

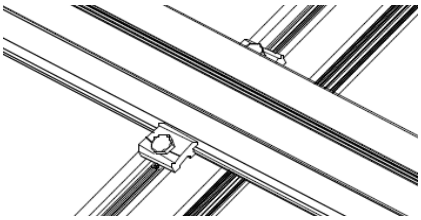
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.784 k
Allowable Uplift	=	1.214 k
Utilization	=	65%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.104 k
Allowable Uplift	=	2.180 k
Utilization	=	97%

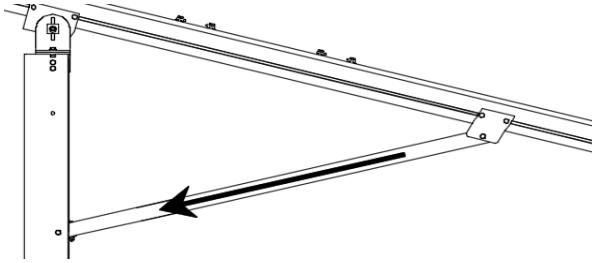


6.2 Strut Connections

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

Maximum Axial Load	=	4.247 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	48%

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

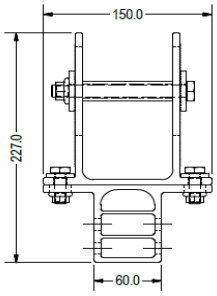


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

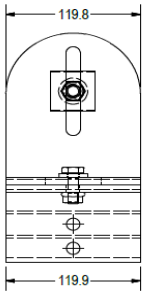
6.3 Girder to Post Connection

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.

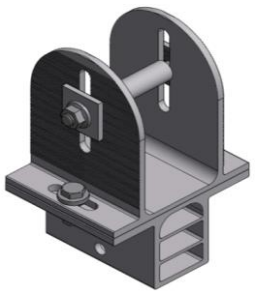
Maximum Tensile Load	=	4.439 k
Allowable Load	=	5.649 k
Utilization	=	79%



FRONT VIEW



SIDE VIEW



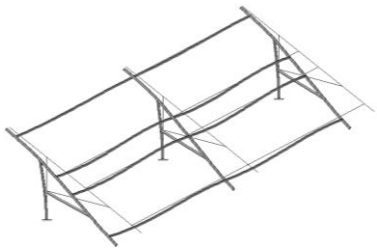
7. SEISMIC DESIGN

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 = 90 in

J = 0.432

248.982

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

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= 28.2 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 = 90

J = 0.432

158.338

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.3

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

$\varphi F_L St$= 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

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 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 =	79.31 in	
Pr =	-5.14 k	(LRFD Factored Load)
Mr (Strong) =	12.93 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 =	0.1195 <	0.2	
Utilization =	0.79 <	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65 k-ft

Flange Local Buckling:

Mn =	14.39 k-ft

Pr/Pc =	0.120 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 79%

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	-72.509	-72.509	0	0
2	M11	y	-72.509	-72.509	0	0
3	M12	y	-116.645	-116.645	0	0
4	M13	y	-116.645	-116.645	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	145.018	145.018	0	0
2	M11	y	145.018	145.018	0	0
3	M12	y	69.356	69.356	0	0
4	M13	y	69.356	69.356	0	0

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												

Load Combinations (Continued)

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	824.032	2	2110.807	2	148.253	2	.195	2	.005	3	3.765	3
2		min	-1129.575	3	-1649.775	3	-187.449	3	-.281	3	-.01	2	.155	15
3	N19	max	2891.631	2	5817.139	2	0	2	0	3	0	3	6.753	3
4		min	-2885.827	3	-5087.756	3	0	3	0	15	0	15	.225	15
5	N29	max	824.032	2	2110.807	2	187.449	3	.281	3	.01	2	3.765	3
6		min	-1129.575	3	-1649.775	3	-148.253	2	-.195	2	-.005	3	.155	15
7	Totals:	max	4539.696	2	10038.753	2	0	2						
8		min	-5144.976	3	-8387.307	3	0	3						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	2	0	5	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-.261	15	-.452	15	0	5	0	1	0	15	0	4
4			min	-1.11	4	-1.922	4	0	1	0	1	0	1	0	15
5		3	max	-7.48	15	310.489	3	-3.881	15	.049	3	.164	1	.295	2
6			min	-154.301	1	-673.378	2	-94.9	1	-.178	2	.007	15	-.133	3
7		4	max	-7.741	15	309.365	3	-3.881	15	.049	3	.105	1	.713	2
8			min	-155.166	1	-674.877	2	-94.9	1	-.178	2	.005	15	-.326	3
9		5	max	-8.002	15	308.241	3	-3.881	15	.049	3	.046	1	1.132	2
10			min	-156.031	1	-676.375	2	-94.9	1	-.178	2	.002	15	-.517	3
11		6	max	259.476	3	575.335	2	-4.615	15	.023	2	.066	2	1.093	2
12			min	-843.988	2	-172.698	3	-128.97	1	-.04	3	-.024	3	-.532	3
13		7	max	258.827	3	573.837	2	-4.615	15	.023	2	.005	10	.736	2
14			min	-844.854	2	-173.822	3	-128.97	1	-.04	3	-.028	3	-.425	3
15		8	max	258.179	3	572.338	2	-4.615	15	.023	2	-.004	15	.38	2
16			min	-845.719	2	-174.946	3	-128.97	1	-.04	3	-.103	1	-.317	3
17		9	max	227.515	3	108.062	3	-6.149	15	-.001	15	.066	1	.17	2
18			min	-924.887	2	-61.21	2	-146.152	1	-.118	2	.003	15	-.269	3
19		10	max	226.866	3	106.938	3	-6.149	15	-.001	15	.036	3	.209	2
20			min	-925.752	2	-62.709	2	-146.152	1	-.118	2	-.031	2	-.336	3
21		11	max	226.217	3	105.814	3	-6.149	15	-.001	15	.025	3	.248	2
22			min	-926.617	2	-64.207	2	-146.152	1	-.118	2	-.116	1	-.402	3
23		12	max	191.35	3	807.46	3	76.405	2	.231	3	.097	1	.456	2
24			min	-1057.409	1	-479.867	2	-234.516	3	-.181	2	.004	15	-.742	3
25		13	max	190.701	3	806.336	3	76.405	2	.231	3	.107	1	.754	2
26			min	-1058.274	1	-481.365	2	-234.516	3	-.181	2	-.112	3	-1.243	3
27		14	max	156.575	1	455.664	2	-3.361	15	.164	2	.076	3	1.04	2
28			min	8.261	15	-746.269	3	-70.382	1	-.345	3	-.05	2	-1.722	3
29		15	max	155.71	1	454.166	2	-3.361	15	.164	2	.035	3	.758	2
30			min	8	15	-747.393	3	-70.382	1	-.345	3	-.087	1	-1.258	3
31		16	max	154.844	1	452.667	2	-3.361	15	.164	2	-.004	12	.477	2
32			min	7.739	15	-748.517	3	-70.382	1	-.345	3	-.131	1	-.794	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	153.979	1	451.168	2	-3.361	15	.164	2	-.007	15	.196	2
34			min	7.478	15	-749.641	3	-70.382	1	-.345	3	-.175	1	-.329	3
35		18	max	1.11	4	1.923	4	0	1	0	1	0	15	0	4
36			min	.261	15	.452	15	0	5	0	1	0	1	0	15
37		19	max	0	1	.003	2	0	1	0	1	0	1	0	1
38			min	0	1	-.007	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.015	2	0	1	0	1	0	1	0	1
40			min	0	1	-.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	-1.921	4	0	1	0	1	0	1	0	15
43		3	max	13.765	3	967.202	3	0	1	0	1	0	1	.715	2
44			min	-263.453	1	-1870.728	2	0	1	0	1	0	1	-.374	3
45		4	max	13.116	3	966.078	3	0	1	0	1	0	1	1.876	2
46			min	-264.318	1	-1872.227	2	0	1	0	1	0	1	-.974	3
47		5	max	12.467	3	964.954	3	0	1	0	1	0	1	3.039	2
48			min	-265.183	1	-1873.725	2	0	1	0	1	0	1	-1.573	3
49		6	max	1080.005	3	1755.572	2	0	1	0	1	0	1	2.87	2
50			min	-2320.824	2	-780.83	3	0	1	0	1	0	1	-1.532	3
51		7	max	1079.356	3	1754.074	2	0	1	0	1	0	1	1.781	2
52			min	-2321.689	2	-781.954	3	0	1	0	1	0	1	-1.047	3
53		8	max	1078.707	3	1752.575	2	0	1	0	1	0	1	.693	2
54			min	-2322.554	2	-783.078	3	0	1	0	1	0	1	-.561	3
55		9	max	1097.896	3	238.208	3	0	1	0	1	0	1	.055	1
56			min	-2405.03	2	-207.71	2	0	1	0	1	0	1	-.309	3
57		10	max	1097.247	3	237.084	3	0	1	0	1	0	1	.169	1
58			min	-2405.895	2	-209.209	2	0	1	0	1	0	1	-.456	3
59		11	max	1096.598	3	235.96	3	0	1	0	1	0	1	.298	2
60			min	-2406.76	2	-210.707	2	0	1	0	1	0	1	-.603	3
61		12	max	1124.196	3	2232.799	3	0	1	0	1	0	1	.953	2
62			min	-2496.553	2	-1547.66	2	0	1	0	1	0	1	-1.548	3
63		13	max	1123.547	3	2231.675	3	0	1	0	1	0	1	1.914	2
64			min	-2497.418	2	-1549.159	2	0	1	0	1	0	1	-2.933	3
65		14	max	266.692	1	1265.579	2	0	1	0	1	0	1	2.837	2
66			min	-12.041	3	-1901.842	3	0	1	0	1	0	1	-4.262	3
67		15	max	265.827	1	1264.08	2	0	1	0	1	0	1	2.052	2
68			min	-12.69	3	-1902.966	3	0	1	0	1	0	1	-3.081	3
69		16	max	264.961	1	1262.582	2	0	1	0	1	0	1	1.268	2
70			min	-13.339	3	-1904.09	3	0	1	0	1	0	1	-1.9	3
71		17	max	264.096	1	1261.083	2	0	1	0	1	0	1	.485	2
72			min	-13.988	3	-1905.214	3	0	1	0	1	0	1	-.718	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	-.014	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	0	1	0	1	0	1	0	1
78			min	0	1	0	3	0	5	0	1	0	1	0	1
79		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	4
80			min	-1.11	4	-1.922	4	0	5	0	1	0	15	0	15
81		3	max	-7.48	15	310.489	3	94.9	1	.178	2	-.007	15	.295	2
82			min	-154.301	1	-673.378	2	3.881	15	-.049	3	-.164	1	-.133	3
83		4	max	-7.741	15	309.365	3	94.9	1	.178	2	-.005	15	.713	2
84			min	-155.166	1	-674.877	2	3.881	15	-.049	3	-.105	1	-.326	3
85		5	max	-8.002	15	308.241	3	94.9	1	.178	2	-.002	15	1.132	2
86			min	-156.031	1	-676.375	2	3.881	15	-.049	3	-.046	1	-.517	3
87		6	max	259.476	3	575.335	2	128.97	1	.04	3	.024	3	1.093	2
88			min	-843.988	2	-172.698	3	4.615	15	-.023	2	-.066	2	-.532	3
89		7	max	258.827	3	573.837	2	128.97	1	.04	3	.028	3	.736	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	-844.854	2	-173.822	3	4.615	15	-.023	2	-.005	10	-.425	3
91		8	max	258.179	3	572.338	2	128.97	1	.04	3	.103	1	.38	2
92			min	-845.719	2	-174.946	3	4.615	15	-.023	2	.004	15	-.317	3
93		9	max	227.515	3	108.062	3	146.152	1	.118	2	-.003	15	.17	2
94			min	-924.887	2	-61.21	2	6.149	15	.001	15	-.066	1	-.269	3
95		10	max	226.866	3	106.938	3	146.152	1	.118	2	.031	2	.209	2
96			min	-925.752	2	-62.709	2	6.149	15	.001	15	-.036	3	-.336	3
97		11	max	226.217	3	105.814	3	146.152	1	.118	2	.116	1	.248	2
98			min	-926.617	2	-64.207	2	6.149	15	.001	15	-.025	3	-.402	3
99		12	max	191.35	3	807.46	3	234.516	3	.181	2	-.004	15	.456	2
100			min	-1057.409	1	-479.867	2	-76.405	2	-.231	3	-.097	1	-.742	3
101		13	max	190.701	3	806.336	3	234.516	3	.181	2	.112	3	.754	2
102			min	-1058.274	1	-481.365	2	-76.405	2	-.231	3	-.107	1	-1.243	3
103		14	max	156.575	1	455.664	2	70.382	1	.345	3	.05	2	1.04	2
104			min	8.261	15	-746.269	3	3.361	15	-.164	2	-.076	3	-1.722	3
105		15	max	155.71	1	454.166	2	70.382	1	.345	3	.087	1	.758	2
106			min	8	15	-747.393	3	3.361	15	-.164	2	-.035	3	-1.258	3
107		16	max	154.844	1	452.667	2	70.382	1	.345	3	.131	1	.477	2
108			min	7.739	15	-748.517	3	3.361	15	-.164	2	.004	12	-.794	3
109		17	max	153.979	1	451.168	2	70.382	1	.345	3	.175	1	.196	2
110			min	7.478	15	-749.641	3	3.361	15	-.164	2	.007	15	-.329	3
111		18	max	1.11	4	1.923	4	0	5	0	1	0	1	0	4
112			min	.261	15	.452	15	0	1	0	1	0	15	0	15
113		19	max	0	1	.003	2	0	5	0	1	0	1	0	1
114			min	0	1	-.007	3	0	1	0	1	0	1	0	1
115	M10	1	max	70.39	1	447.92	2	-6.957	15	.013	2	.203	1	.164	2
116			min	3.361	15	-751.849	3	-152.344	1	-.026	3	.009	15	-.345	3
117		2	max	70.39	1	328.319	2	-5.468	15	.013	2	.089	1	.203	3
118			min	3.361	15	-562.359	3	-120.852	1	-.026	3	.004	15	-.159	2
119		3	max	70.39	1	208.718	2	-3.979	15	.013	2	.031	3	.592	3
120			min	3.361	15	-372.869	3	-89.359	1	-.026	3	-.005	9	-.383	2
121		4	max	70.39	1	89.117	2	-2.49	15	.013	2	.013	3	.824	3
122			min	3.361	15	-183.379	3	-57.867	1	-.026	3	-.06	1	-.507	2
123		5	max	70.39	1	6.111	3	-1.002	15	.013	2	-.003	12	.898	3
124			min	3.361	15	-30.611	1	-26.375	1	-.026	3	-.095	1	-.532	2
125		6	max	70.39	1	195.601	3	6.717	9	.013	2	-.005	15	.814	3
126			min	3.361	15	-150.085	2	-16.665	3	-.026	3	-.104	1	-.456	2
127		7	max	70.39	1	385.091	3	36.61	1	.013	2	-.004	15	.572	3
128			min	3.361	15	-269.686	2	-14.432	3	-.026	3	-.086	1	-.281	2
129		8	max	70.39	1	574.581	3	68.103	1	.013	2	-.001	15	.172	3
130			min	3.361	15	-389.287	2	-12.199	3	-.026	3	-.043	1	-.007	10
131		9	max	70.39	1	764.071	3	99.595	1	.013	2	.028	9	.367	2
132			min	3.361	15	-508.888	2	-9.966	3	-.026	3	-.052	3	-.386	3
133		10	max	70.39	1	-13.803	15	131.087	1	0	15	.123	1	.841	2
134			min	3.361	15	-953.561	3	4.556	12	-.026	3	-.059	3	-1.101	3
135		11	max	70.39	1	508.888	2	9.966	3	.026	3	.028	9	.367	2
136			min	3.361	15	-764.071	3	-99.595	1	-.013	2	-.052	3	-.386	3
137		12	max	70.39	1	389.287	2	12.199	3	.026	3	-.001	15	.172	3
138			min	3.361	15	-574.581	3	-68.103	1	-.013	2	-.043	1	-.007	10
139		13	max	70.39	1	269.686	2	14.432	3	.026	3	-.004	15	.572	3
140			min	3.361	15	-385.091	3	-36.61	1	-.013	2	-.086	1	-.281	2
141		14	max	70.39	1	150.085	2	16.665	3	.026	3	-.005	15	.814	3
142			min	3.361	15	-195.601	3	-6.717	9	-.013	2	-.104	1	-.456	2
143		15	max	70.39	1	30.611	1	26.375	1	.026	3	-.003	12	.898	3
144			min	3.361	15	-6.111	3	1.002	15	-.013	2	-.095	1	-.532	2
145		16	max	70.39	1	183.379	3	57.867	1	.026	3	.013	3	.824	3
146			min	3.361	15	-89.117	2	2.49	15	-.013	2	-.06	1	-.507	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	70.39	1	372.869	3	89.359	1	.026	3	.031	3	.592	3
148			min	3.361	15	-208.718	2	3.979	15	-.013	2	-.005	9	-.383	2
149		18	max	70.39	1	562.359	3	120.852	1	.026	3	.089	1	.203	3
150			min	3.361	15	-328.319	2	5.468	15	-.013	2	.004	15	-.159	2
151		19	max	70.39	1	751.849	3	152.344	1	.026	3	.203	1	.164	2
152			min	3.361	15	-447.92	2	6.957	15	-.013	2	.009	15	-.345	3
153	M11	1	max	162.158	2	412.463	2	-7.294	15	0	15	.239	1	.067	1
154			min	-217.393	3	-703.25	3	-159.519	1	-.004	1	.01	15	-.323	3
155		2	max	162.158	2	292.861	2	-5.805	15	0	15	.119	1	.184	3
156			min	-217.393	3	-513.759	3	-128.027	1	-.004	1	.005	15	-.231	2
157		3	max	162.158	2	173.26	2	-4.316	15	0	15	.052	3	.533	3
158			min	-217.393	3	-324.269	3	-96.534	1	-.004	1	0	15	-.425	2
159		4	max	162.158	2	53.659	2	-2.828	15	0	15	.028	3	.724	3
160			min	-217.393	3	-134.779	3	-65.042	1	-.004	1	-.042	1	-.52	2
161		5	max	162.158	2	54.711	3	-1.339	15	0	15	.007	3	.758	3
162			min	-217.393	3	-65.942	2	-33.549	1	-.004	1	-.083	1	-.515	2
163		6	max	162.158	2	244.201	3	2.017	9	0	15	-.004	15	.633	3
164			min	-217.393	3	-185.543	2	-22.76	3	-.004	1	-.098	1	-.41	2
165		7	max	162.158	2	433.691	3	29.435	1	0	15	-.004	15	.351	3
166			min	-217.393	3	-305.144	2	-20.527	3	-.004	1	-.086	1	-.206	2
167		8	max	162.158	2	623.181	3	60.928	1	0	15	-.002	15	.099	2
168			min	-217.393	3	-424.745	2	-18.295	3	-.004	1	-.049	1	-.09	3
169		9	max	162.158	2	812.671	3	92.42	1	0	15	.021	9	.502	2
170			min	-217.393	3	-544.346	2	-16.062	3	-.004	1	-.062	3	-.688	3
171		10	max	162.158	2	1002.161	3	123.913	1	0	15	.105	1	1.006	2
172			min	-217.393	3	-663.947	2	-70.884	14	-.004	1	-.074	3	-1.444	3
173		11	max	162.158	2	544.346	2	16.062	3	.004	1	.021	9	.502	2
174			min	-217.393	3	-812.671	3	-92.42	1	0	15	-.062	3	-.688	3
175		12	max	162.158	2	424.745	2	18.295	3	.004	1	-.002	15	.099	2
176			min	-217.393	3	-623.181	3	-60.928	1	0	15	-.049	1	-.09	3
177		13	max	162.158	2	305.144	2	20.527	3	.004	1	-.004	15	.351	3
178			min	-217.393	3	-433.691	3	-29.435	1	0	15	-.086	1	-.206	2
179		14	max	162.158	2	185.543	2	22.76	3	.004	1	-.004	15	.633	3
180			min	-217.393	3	-244.201	3	-2.017	9	0	15	-.098	1	-.41	2
181		15	max	162.158	2	65.942	2	33.549	1	.004	1	.007	3	.758	3
182			min	-217.393	3	-54.711	3	1.339	15	0	15	-.083	1	-.515	2
183		16	max	162.158	2	134.779	3	65.042	1	.004	1	.028	3	.724	3
184			min	-217.393	3	-53.659	2	2.828	15	0	15	-.042	1	-.52	2
185		17	max	162.158	2	324.269	3	96.534	1	.004	1	.052	3	.533	3
186			min	-217.393	3	-173.26	2	4.316	15	0	15	0	15	-.425	2
187		18	max	162.158	2	513.759	3	128.027	1	.004	1	.119	1	.184	3
188			min	-217.393	3	-292.861	2	5.805	15	0	15	.005	15	-.231	2
189		19	max	162.158	2	703.25	3	159.519	1	.004	1	.239	1	.067	1
190			min	-217.393	3	-412.463	2	7.294	15	0	15	.01	15	-.323	3
191	M12	1	max	17.706	2	630.543	2	-7.359	15	0	15	.253	1	.141	2
192			min	-21.371	9	-284.514	3	-162.357	1	-.004	1	.011	15	.001	15
193		2	max	17.706	2	452.094	2	-5.87	15	0	15	.13	1	.252	3
194			min	-21.371	9	-195.907	3	-130.864	1	-.004	1	.005	15	-.31	2
195		3	max	17.706	2	273.645	2	-4.382	15	0	15	.039	3	.378	3
196			min	-21.371	9	-107.299	3	-99.372	1	-.004	1	0	15	-.613	2
197		4	max	17.706	2	95.196	2	-2.893	15	0	15	.019	3	.43	3
198			min	-21.371	9	-18.692	3	-67.88	1	-.004	1	-.035	1	-.767	2
199		5	max	17.706	2	69.915	3	-1.404	15	0	15	0	3	.409	3
200			min	-21.371	9	-83.253	2	-36.387	1	-.004	1	-.079	1	-.772	2
201		6	max	17.706	2	158.523	3	1.107	9	0	15	-.004	15	.314	3
202			min	-21.371	9	-261.702	2	-18.837	3	-.004	1	-.096	1	-.628	2
203		7	max	17.706	2	247.13	3	26.598	1	0	15	-.004	15	.145	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	-21.371	9	-440.151	2	-16.604	3	-.004	1	-.087	1	-.335	2
205		8	max	17.706	2	335.737	3	58.09	1	0	15	-.002	15	.106	2
206			min	-21.371	9	-618.6	2	-14.371	3	-.004	1	-.051	1	-.098	3
207		9	max	17.706	2	424.345	3	89.582	1	0	15	.019	9	.696	2
208			min	-21.371	9	-797.049	2	-12.138	3	-.004	1	-.055	3	-.415	3
209		10	max	17.706	2	725.04	1	40.784	2	0	15	.098	1	1.434	2
210			min	-21.371	9	-975.498	2	-121.075	1	-.004	1	-.064	3	-.805	3
211		11	max	17.706	2	797.049	2	12.138	3	.004	1	.019	9	.696	2
212			min	-21.371	9	-424.345	3	-89.582	1	0	15	-.055	3	-.415	3
213		12	max	17.706	2	618.6	2	14.371	3	.004	1	-.002	15	.106	2
214			min	-21.371	9	-335.737	3	-58.09	1	0	15	-.051	1	-.098	3
215		13	max	17.706	2	440.151	2	16.604	3	.004	1	-.004	15	.145	3
216			min	-21.371	9	-247.13	3	-26.598	1	0	15	-.087	1	-.335	2
217		14	max	17.706	2	261.702	2	18.837	3	.004	1	-.004	15	.314	3
218			min	-21.371	9	-158.523	3	-1.107	9	0	15	-.096	1	-.628	2
219		15	max	17.706	2	83.253	2	36.387	1	.004	1	0	3	.409	3
220			min	-21.371	9	-69.915	3	1.404	15	0	15	-.079	1	-.772	2
221		16	max	17.706	2	18.692	3	67.88	1	.004	1	.019	3	.43	3
222			min	-21.371	9	-95.196	2	2.893	15	0	15	-.035	1	-.767	2
223		17	max	17.706	2	107.299	3	99.372	1	.004	1	.039	3	.378	3
224			min	-21.371	9	-273.645	2	4.382	15	0	15	0	15	-.613	2
225		18	max	17.706	2	195.907	3	130.864	1	.004	1	.13	1	.252	3
226			min	-21.371	9	-452.094	2	5.87	15	0	15	.005	15	-.31	2
227		19	max	17.706	2	284.514	3	162.357	1	.004	1	.253	1	.141	2
228			min	-21.371	9	-630.543	2	7.359	15	0	15	.011	15	.001	15
229	M13	1	max	-3.881	15	670.866	2	-6.957	15	.008	3	.203	1	.178	2
230			min	-94.838	1	-312.768	3	-152.437	1	-.021	2	.009	15	-.049	3
231		2	max	-3.881	15	492.417	2	-5.469	15	.008	3	.089	1	.174	3
232			min	-94.838	1	-224.161	3	-120.945	1	-.021	2	.004	15	-.307	2
233		3	max	-3.881	15	313.968	2	-3.98	15	.008	3	.031	3	.324	3
234			min	-94.838	1	-135.553	3	-89.453	1	-.021	2	-.005	9	-.643	2
235		4	max	-3.881	15	135.519	2	-2.491	15	.008	3	.013	3	.4	3
236			min	-94.838	1	-46.946	3	-57.96	1	-.021	2	-.06	1	-.83	2
237		5	max	-3.881	15	41.661	3	-1.002	15	.008	3	-.002	12	.402	3
238			min	-94.838	1	-42.93	2	-26.468	1	-.021	2	-.096	1	-.869	2
239		6	max	-3.881	15	130.269	3	6.704	9	.008	3	-.005	15	.331	3
240			min	-94.838	1	-221.379	2	-16.428	3	-.021	2	-.104	1	-.759	2
241		7	max	-3.881	15	218.876	3	36.517	1	.008	3	-.004	15	.185	3
242			min	-94.838	1	-399.828	2	-14.195	3	-.021	2	-.087	1	-.5	2
243		8	max	-3.881	15	307.483	3	68.009	1	.008	3	-.001	15	-.003	15
244			min	-94.838	1	-578.277	2	-11.962	3	-.021	2	-.044	1	-.093	1
245		9	max	-3.881	15	396.091	3	99.502	1	.008	3	.028	9	.464	2
246			min	-94.838	1	-756.726	2	-9.729	3	-.021	2	-.051	3	-.327	3
247		10	max	-3.881	15	935.175	2	-4.409	12	0	15	.122	1	1.169	2
248			min	-94.838	1	13.172	15	-130.994	1	-.021	2	-.058	3	-.694	3
249		11	max	-3.881	15	756.726	2	9.729	3	.021	2	.028	9	.464	2
250			min	-94.838	1	-396.091	3	-99.502	1	-.008	3	-.051	3	-.327	3
251		12	max	-3.881	15	578.277	2	11.962	3	.021	2	-.001	15	-.003	15
252			min	-94.838	1	-307.483	3	-68.009	1	-.008	3	-.044	1	-.093	1
253		13	max	-3.881	15	399.828	2	14.195	3	.021	2	-.004	15	.185	3
254			min	-94.838	1	-218.876	3	-36.517	1	-.008	3	-.087	1	-.5	2
255		14	max	-3.881	15	221.379	2	16.428	3	.021	2	-.005	15	.331	3
256			min	-94.838	1	-130.269	3	-6.704	9	-.008	3	-.104	1	-.759	2
257		15	max	-3.881	15	42.93	2	26.468	1	.021	2	-.002	12	.402	3
258			min	-94.838	1	-41.661	3	1.002	15	-.008	3	-.096	1	-.869	2
259		16	max	-3.881	15	46.946	3	57.96	1	.021	2	.013	3	.4	3
260			min	-94.838	1	-135.519	2	2.491	15	-.008	3	-.06	1	-.83	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
261		17	max	-3.881	15	135.553	3	89.453	1	.021	2	.031	3	.324	3
262			min	-94.838	1	-313.968	2	3.98	15	-.008	3	-.005	9	-.643	2
263		18	max	-3.881	15	224.161	3	120.945	1	.021	2	.089	1	.174	3
264			min	-94.838	1	-492.417	2	5.469	15	-.008	3	.004	15	-.307	2
265		19	max	-3.881	15	312.768	3	152.437	1	.021	2	.203	1	.178	2
266			min	-94.838	1	-670.866	2	6.957	15	-.008	3	.009	15	-.049	3
267	M2	1	max	2110.807	2	1128.925	3	148.355	2	.005	3	.281	3	3.765	3
268			min	-1649.775	3	-823.655	2	-187.334	3	-.01	2	-.195	2	.155	15
269		2	max	2107.969	2	1128.925	3	148.355	2	.005	3	.222	3	3.413	3
270			min	-1651.903	3	-823.655	2	-187.334	3	-.01	2	-.149	2	.153	15
271		3	max	1398.387	2	655.733	1	104.155	2	.001	2	.174	3	3.269	1
272			min	-1389.747	3	29.427	15	-168.201	3	0	3	-.122	2	.147	15
273		4	max	1395.55	2	655.733	1	104.155	2	.001	2	.121	3	3.065	1
274			min	-1391.876	3	29.427	15	-168.201	3	0	3	-.089	2	.138	15
275		5	max	1392.712	2	655.733	1	104.155	2	.001	2	.069	3	2.861	1
276			min	-1394.004	3	29.427	15	-168.201	3	0	3	-.057	1	.128	15
277		6	max	1389.875	2	655.733	1	104.155	2	.001	2	.016	3	2.656	1
278			min	-1396.132	3	29.427	15	-168.201	3	0	3	-.03	1	.119	15
279		7	max	1387.037	2	655.733	1	104.155	2	.001	2	.008	2	2.452	1
280			min	-1398.26	3	29.427	15	-168.201	3	0	3	-.036	3	.11	15
281		8	max	1384.2	2	655.733	1	104.155	2	.001	2	.041	2	2.248	1
282			min	-1400.388	3	29.427	15	-168.201	3	0	3	-.088	3	.101	15
283		9	max	1381.363	2	655.733	1	104.155	2	.001	2	.073	2	2.043	1
284			min	-1402.516	3	29.427	15	-168.201	3	0	3	-.141	3	.092	15
285		10	max	1378.525	2	655.733	1	104.155	2	.001	2	.105	2	1.839	1
286			min	-1404.644	3	29.427	15	-168.201	3	0	3	-.193	3	.083	15
287		11	max	1375.688	2	655.733	1	104.155	2	.001	2	.138	2	1.635	1
288			min	-1406.772	3	29.427	15	-168.201	3	0	3	-.246	3	.073	15
289		12	max	1372.85	2	655.733	1	104.155	2	.001	2	.17	2	1.43	1
290			min	-1408.9	3	29.427	15	-168.201	3	0	3	-.298	3	.064	15
291		13	max	1370.013	2	655.733	1	104.155	2	.001	2	.203	2	1.226	1
292			min	-1411.028	3	29.427	15	-168.201	3	0	3	-.35	3	.055	15
293		14	max	1367.175	2	655.733	1	104.155	2	.001	2	.235	2	1.022	1
294			min	-1413.156	3	29.427	15	-168.201	3	0	3	-.403	3	.046	15
295		15	max	1364.338	2	655.733	1	104.155	2	.001	2	.268	2	.817	1
296			min	-1415.284	3	29.427	15	-168.201	3	0	3	-.455	3	.037	15
297		16	max	1361.5	2	655.733	1	104.155	2	.001	2	.3	2	.613	1
298			min	-1417.412	3	29.427	15	-168.201	3	0	3	-.508	3	.028	15
299		17	max	1358.663	2	655.733	1	104.155	2	.001	2	.333	2	.409	1
300			min	-1419.541	3	29.427	15	-168.201	3	0	3	-.56	3	.018	15
301		18	max	1355.826	2	655.733	1	104.155	2	.001	2	.365	2	.204	1
302			min	-1421.669	3	29.427	15	-168.201	3	0	3	-.613	3	.009	15
303		19	max	1352.988	2	655.733	1	104.155	2	.001	2	.398	2	0	1
304			min	-1423.797	3	29.427	15	-168.201	3	0	3	-.665	3	0	1
305	M5	1	max	5817.139	2	2882.122	3	0	1	0	1	0	1	6.753	3
306			min	-5087.756	3	-2890.277	2	0	1	0	1	0	1	.225	15
307		2	max	5814.302	2	2882.122	3	0	1	0	1	0	1	5.855	3
308			min	-5089.885	3	-2890.277	2	0	1	0	1	0	1	.229	15
309		3	max	3784.624	2	1103.711	1	0	1	0	1	0	1	5.503	1
310			min	-4122.64	3	44.364	15	0	1	0	1	0	1	.221	15
311		4	max	3781.786	2	1103.711	1	0	1	0	1	0	1	5.159	1
312			min	-4124.768	3	44.364	15	0	1	0	1	0	1	.207	15
313		5	max	3778.949	2	1103.711	1	0	1	0	1	0	1	4.815	1
314			min	-4126.896	3	44.364	15	0	1	0	1	0	1	.194	15
315		6	max	3776.111	2	1103.711	1	0	1	0	1	0	1	4.471	1
316			min	-4129.024	3	44.364	15	0	1	0	1	0	1	.18	15
317		7	max	3773.274	2	1103.711	1	0	1	0	1	0	1	4.127	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	-4131.152	3	44.364	15	0	1	0	1	0	1	.166	15
319		8	max	3770.437	2	1103.711	1	0	1	0	1	0	1	3.783	1
320			min	-4133.28	3	44.364	15	0	1	0	1	0	1	.152	15
321		9	max	3767.599	2	1103.711	1	0	1	0	1	0	1	3.439	1
322			min	-4135.409	3	44.364	15	0	1	0	1	0	1	.138	15
323		10	max	3764.762	2	1103.711	1	0	1	0	1	0	1	3.095	1
324			min	-4137.537	3	44.364	15	0	1	0	1	0	1	.124	15
325		11	max	3761.924	2	1103.711	1	0	1	0	1	0	1	2.751	1
326			min	-4139.665	3	44.364	15	0	1	0	1	0	1	.111	15
327		12	max	3759.087	2	1103.711	1	0	1	0	1	0	1	2.407	1
328			min	-4141.793	3	44.364	15	0	1	0	1	0	1	.097	15
329		13	max	3756.249	2	1103.711	1	0	1	0	1	0	1	2.064	1
330			min	-4143.921	3	44.364	15	0	1	0	1	0	1	.083	15
331		14	max	3753.412	2	1103.711	1	0	1	0	1	0	1	1.72	1
332			min	-4146.049	3	44.364	15	0	1	0	1	0	1	.069	15
333		15	max	3750.575	2	1103.711	1	0	1	0	1	0	1	1.376	1
334			min	-4148.177	3	44.364	15	0	1	0	1	0	1	.055	15
335		16	max	3747.737	2	1103.711	1	0	1	0	1	0	1	1.032	1
336			min	-4150.305	3	44.364	15	0	1	0	1	0	1	.041	15
337		17	max	3744.9	2	1103.711	1	0	1	0	1	0	1	.688	1
338			min	-4152.433	3	44.364	15	0	1	0	1	0	1	.028	15
339		18	max	3742.062	2	1103.711	1	0	1	0	1	0	1	.344	1
340			min	-4154.561	3	44.364	15	0	1	0	1	0	1	.014	15
341		19	max	3739.225	2	1103.711	1	0	1	0	1	0	1	0	1
342			min	-4156.689	3	44.364	15	0	1	0	1	0	1	0	1
343	M8	1	max	2110.807	2	1128.925	3	187.334	3	.01	2	.195	2	3.765	3
344			min	-1649.775	3	-823.655	2	-148.355	2	-.005	3	-.281	3	.155	15
345		2	max	2107.969	2	1128.925	3	187.334	3	.01	2	.149	2	3.413	3
346			min	-1651.903	3	-823.655	2	-148.355	2	-.005	3	-.222	3	.153	15
347		3	max	1398.387	2	655.733	1	168.201	3	0	3	.122	2	3.269	1
348			min	-1389.747	3	29.427	15	-104.155	2	-.001	2	-.174	3	.147	15
349		4	max	1395.55	2	655.733	1	168.201	3	0	3	.089	2	3.065	1
350			min	-1391.876	3	29.427	15	-104.155	2	-.001	2	-.121	3	.138	15
351		5	max	1392.712	2	655.733	1	168.201	3	0	3	.057	1	2.861	1
352			min	-1394.004	3	29.427	15	-104.155	2	-.001	2	-.069	3	.128	15
353		6	max	1389.875	2	655.733	1	168.201	3	0	3	.03	1	2.656	1
354			min	-1396.132	3	29.427	15	-104.155	2	-.001	2	-.016	3	.119	15
355		7	max	1387.037	2	655.733	1	168.201	3	0	3	.036	3	2.452	1
356			min	-1398.26	3	29.427	15	-104.155	2	-.001	2	-.008	2	.11	15
357		8	max	1384.2	2	655.733	1	168.201	3	0	3	.088	3	2.248	1
358			min	-1400.388	3	29.427	15	-104.155	2	-.001	2	-.041	2	.101	15
359		9	max	1381.363	2	655.733	1	168.201	3	0	3	.141	3	2.043	1
360			min	-1402.516	3	29.427	15	-104.155	2	-.001	2	-.073	2	.092	15
361		10	max	1378.525	2	655.733	1	168.201	3	0	3	.193	3	1.839	1
362			min	-1404.644	3	29.427	15	-104.155	2	-.001	2	-.105	2	.083	15
363		11	max	1375.688	2	655.733	1	168.201	3	0	3	.246	3	1.635	1
364			min	-1406.772	3	29.427	15	-104.155	2	-.001	2	-.138	2	.073	15
365		12	max	1372.85	2	655.733	1	168.201	3	0	3	.298	3	1.43	1
366			min	-1408.9	3	29.427	15	-104.155	2	-.001	2	-.17	2	.064	15
367		13	max	1370.013	2	655.733	1	168.201	3	0	3	.35	3	1.226	1
368			min	-1411.028	3	29.427	15	-104.155	2	-.001	2	-.203	2	.055	15
369		14	max	1367.175	2	655.733	1	168.201	3	0	3	.403	3	1.022	1
370			min	-1413.156	3	29.427	15	-104.155	2	-.001	2	-.235	2	.046	15
371		15	max	1364.338	2	655.733	1	168.201	3	0	3	.455	3	.817	1
372			min	-1415.284	3	29.427	15	-104.155	2	-.001	2	-.268	2	.037	15
373		16	max	1361.5	2	655.733	1	168.201	3	0	3	.508	3	.613	1
374			min	-1417.412	3	29.427	15	-104.155	2	-.001	2	-.3	2	.028	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	1358.663	2	655.733	1	168.201	3	0	3	.56	3	.409	1
376			min	-1419.541	3	29.427	15	-104.155	2	-.001	2	-.333	2	.018	15
377		18	max	1355.826	2	655.733	1	168.201	3	0	3	.613	3	.204	1
378			min	-1421.669	3	29.427	15	-104.155	2	-.001	2	-.365	2	.009	15
379		19	max	1352.988	2	655.733	1	168.201	3	0	3	.665	3	0	1
380			min	-1423.797	3	29.427	15	-104.155	2	-.001	2	-.398	2	0	1
381	M3	1	max	1470.843	2	4.384	4	43.906	2	.008	3	.002	3	0	1
382			min	-557.787	3	1.031	15	-19.419	3	-.015	2	-.005	2	0	1
383		2	max	1470.635	2	3.897	4	43.906	2	.008	3	.008	2	0	15
384			min	-557.944	3	.916	15	-19.419	3	-.015	2	-.004	3	-.001	4
385		3	max	1470.427	2	3.41	4	43.906	2	.008	3	.021	2	0	15
386			min	-558.1	3	.802	15	-19.419	3	-.015	2	-.01	3	-.002	4
387		4	max	1470.219	2	2.923	4	43.906	2	.008	3	.033	2	0	15
388			min	-558.256	3	.687	15	-19.419	3	-.015	2	-.015	3	-.003	4
389		5	max	1470.011	2	2.436	4	43.906	2	.008	3	.046	2	0	15
390			min	-558.412	3	.573	15	-19.419	3	-.015	2	-.021	3	-.004	4
391		6	max	1469.803	2	1.949	4	43.906	2	.008	3	.059	2	-.001	15
392			min	-558.568	3	.458	15	-19.419	3	-.015	2	-.027	3	-.005	4
393		7	max	1469.595	2	1.461	4	43.906	2	.008	3	.072	2	-.001	15
394			min	-558.724	3	.344	15	-19.419	3	-.015	2	-.032	3	-.005	4
395		8	max	1469.387	2	.974	4	43.906	2	.008	3	.085	2	-.001	15
396			min	-558.88	3	.229	15	-19.419	3	-.015	2	-.038	3	-.005	4
397		9	max	1469.179	2	.487	4	43.906	2	.008	3	.097	2	-.001	15
398			min	-559.036	3	.115	15	-19.419	3	-.015	2	-.044	3	-.006	4
399		10	max	1468.971	2	0	1	43.906	2	.008	3	.11	2	-.001	15
400			min	-559.192	3	0	1	-19.419	3	-.015	2	-.049	3	-.006	4
401		11	max	1468.763	2	-.115	15	43.906	2	.008	3	.123	2	-.001	15
402			min	-559.348	3	-.487	4	-19.419	3	-.015	2	-.055	3	-.006	4
403		12	max	1468.555	2	-.229	15	43.906	2	.008	3	.136	2	-.001	15
404			min	-559.504	3	-.974	4	-19.419	3	-.015	2	-.061	3	-.005	4
405		13	max	1468.346	2	-.344	15	43.906	2	.008	3	.149	2	-.001	15
406			min	-559.66	3	-1.461	4	-19.419	3	-.015	2	-.066	3	-.005	4
407		14	max	1468.138	2	-.458	15	43.906	2	.008	3	.162	2	-.001	15
408			min	-559.816	3	-1.949	4	-19.419	3	-.015	2	-.072	3	-.005	4
409		15	max	1467.93	2	-.573	15	43.906	2	.008	3	.174	2	0	15
410			min	-559.972	3	-2.436	4	-19.419	3	-.015	2	-.078	3	-.004	4
411		16	max	1467.722	2	-.687	15	43.906	2	.008	3	.187	2	0	15
412			min	-560.128	3	-2.923	4	-19.419	3	-.015	2	-.083	3	-.003	4
413		17	max	1467.514	2	-.802	15	43.906	2	.008	3	.2	2	0	15
414			min	-560.284	3	-3.41	4	-19.419	3	-.015	2	-.089	3	-.002	4
415		18	max	1467.306	2	-.916	15	43.906	2	.008	3	.213	2	0	15
416			min	-560.44	3	-3.897	4	-19.419	3	-.015	2	-.095	3	-.001	4
417		19	max	1467.098	2	-1.031	15	43.906	2	.008	3	.226	2	0	1
418			min	-560.596	3	-4.384	4	-19.419	3	-.015	2	-.1	3	0	1
419	M6	1	max	4246.708	2	4.384	4	0	1	0	1	0	1	0	1
420			min	-2041.281	3	1.031	15	0	1	0	1	0	1	0	1
421		2	max	4246.5	2	3.897	4	0	1	0	1	0	1	0	15
422			min	-2041.438	3	.916	15	0	1	0	1	0	1	-.001	4
423		3	max	4246.292	2	3.41	4	0	1	0	1	0	1	0	15
424			min	-2041.594	3	.802	15	0	1	0	1	0	1	-.002	4
425		4	max	4246.084	2	2.923	4	0	1	0	1	0	1	0	15
426			min	-2041.75	3	.687	15	0	1	0	1	0	1	-.003	4
427		5	max	4245.876	2	2.436	4	0	1	0	1	0	1	0	15
428			min	-2041.906	3	.573	15	0	1	0	1	0	1	-.004	4
429		6	max	4245.668	2	1.949	4	0	1	0	1	0	1	-.001	15
430			min	-2042.062	3	.458	15	0	1	0	1	0	1	-.005	4
431		7	max	4245.46	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	-2042.218	3	.344	15	0	1	0	1	0	1	-.005	4
433		8	max	4245.252	2	.974	4	0	1	0	1	0	1	-.001	15
434			min	-2042.374	3	.229	15	0	1	0	1	0	1	-.005	4
435		9	max	4245.044	2	.487	4	0	1	0	1	0	1	-.001	15
436			min	-2042.53	3	.115	15	0	1	0	1	0	1	-.006	4
437		10	max	4244.835	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2042.686	3	0	1	0	1	0	1	0	1	-.006	4
439		11	max	4244.627	2	-.115	15	0	1	0	1	0	1	-.001	15
440			min	-2042.842	3	-.487	4	0	1	0	1	0	1	-.006	4
441		12	max	4244.419	2	-.229	15	0	1	0	1	0	1	-.001	15
442			min	-2042.998	3	-.974	4	0	1	0	1	0	1	-.005	4
443		13	max	4244.211	2	-.344	15	0	1	0	1	0	1	-.001	15
444			min	-2043.154	3	-1.461	4	0	1	0	1	0	1	-.005	4
445		14	max	4244.003	2	-.458	15	0	1	0	1	0	1	-.001	15
446			min	-2043.31	3	-1.949	4	0	1	0	1	0	1	-.005	4
447		15	max	4243.795	2	-.573	15	0	1	0	1	0	1	0	15
448			min	-2043.466	3	-2.436	4	0	1	0	1	0	1	-.004	4
449		16	max	4243.587	2	-.687	15	0	1	0	1	0	1	0	15
450			min	-2043.622	3	-2.923	4	0	1	0	1	0	1	-.003	4
451		17	max	4243.379	2	-.802	15	0	1	0	1	0	1	0	15
452			min	-2043.778	3	-3.41	4	0	1	0	1	0	1	-.002	4
453		18	max	4243.171	2	-.916	15	0	1	0	1	0	1	0	15
454			min	-2043.934	3	-3.897	4	0	1	0	1	0	1	-.001	4
455		19	max	4242.963	2	-1.031	15	0	1	0	1	0	1	0	1
456			min	-2044.09	3	-4.384	4	0	1	0	1	0	1	0	1
457	M9	1	max	1470.843	2	4.384	4	19.419	3	.015	2	.005	2	0	1
458			min	-557.787	3	1.031	15	-43.906	2	-.008	3	-.002	3	0	1
459		2	max	1470.635	2	3.897	4	19.419	3	.015	2	.004	3	0	15
460			min	-557.944	3	.916	15	-43.906	2	-.008	3	-.008	2	-.001	4
461		3	max	1470.427	2	3.41	4	19.419	3	.015	2	.01	3	0	15
462			min	-558.1	3	.802	15	-43.906	2	-.008	3	-.021	2	-.002	4
463		4	max	1470.219	2	2.923	4	19.419	3	.015	2	.015	3	0	15
464			min	-558.256	3	.687	15	-43.906	2	-.008	3	-.033	2	-.003	4
465		5	max	1470.011	2	2.436	4	19.419	3	.015	2	.021	3	0	15
466			min	-558.412	3	.573	15	-43.906	2	-.008	3	-.046	2	-.004	4
467		6	max	1469.803	2	1.949	4	19.419	3	.015	2	.027	3	-.001	15
468			min	-558.568	3	.458	15	-43.906	2	-.008	3	-.059	2	-.005	4
469		7	max	1469.595	2	1.461	4	19.419	3	.015	2	.032	3	-.001	15
470			min	-558.724	3	.344	15	-43.906	2	-.008	3	-.072	2	-.005	4
471		8	max	1469.387	2	.974	4	19.419	3	.015	2	.038	3	-.001	15
472			min	-558.88	3	.229	15	-43.906	2	-.008	3	-.085	2	-.005	4
473		9	max	1469.179	2	.487	4	19.419	3	.015	2	.044	3	-.001	15
474			min	-559.036	3	.115	15	-43.906	2	-.008	3	-.097	2	-.006	4
475		10	max	1468.971	2	0	1	19.419	3	.015	2	.049	3	-.001	15
476			min	-559.192	3	0	1	-43.906	2	-.008	3	-.11	2	-.006	4
477		11	max	1468.763	2	-.115	15	19.419	3	.015	2	.055	3	-.001	15
478			min	-559.348	3	-.487	4	-43.906	2	-.008	3	-.123	2	-.006	4
479		12	max	1468.555	2	-.229	15	19.419	3	.015	2	.061	3	-.001	15
480			min	-559.504	3	-.974	4	-43.906	2	-.008	3	-.136	2	-.005	4
481		13	max	1468.346	2	-.344	15	19.419	3	.015	2	.066	3	-.001	15
482			min	-559.66	3	-1.461	4	-43.906	2	-.008	3	-.149	2	-.005	4
483		14	max	1468.138	2	-.458	15	19.419	3	.015	2	.072	3	-.001	15
484			min	-559.816	3	-1.949	4	-43.906	2	-.008	3	-.162	2	-.005	4
485		15	max	1467.93	2	-.573	15	19.419	3	.015	2	.078	3	0	15
486			min	-559.972	3	-2.436	4	-43.906	2	-.008	3	-.174	2	-.004	4
487		16	max	1467.722	2	-.687	15	19.419	3	.015	2	.083	3	0	15
488			min	-560.128	3	-2.923	4	-43.906	2	-.008	3	-.187	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	1467.514	2	-.802	15	19.419	3	.015	2	.089	3	0	15
490			min	-560.284	3	-3.41	4	-43.906	2	-.008	3	-.2	2	-.002	4
491		18	max	1467.306	2	-.916	15	19.419	3	.015	2	.095	3	0	15
492			min	-560.44	3	-3.897	4	-43.906	2	-.008	3	-.213	2	-.001	4
493		19	max	1467.098	2	-1.031	15	19.419	3	.015	2	.1	3	0	1
494			min	-560.596	3	-4.384	4	-43.906	2	-.008	3	-.226	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	-.008	15	-.015	15	.015	1	6.281e-3	3	NC	3	NC	3
2			min	-.185	1	-.424	1	0	15	-1.639e-2	2	302.05	1	4499.195	1
3		2	max	-.008	15	-.012	15	.004	1	6.281e-3	3	NC	12	NC	2
4			min	-.185	1	-.35	1	0	15	-1.639e-2	2	362.356	1	7096.7	1
5		3	max	-.008	15	-.01	15	0	15	5.893e-3	3	9135.069	15	NC	1
6			min	-.185	1	-.276	1	-.005	1	-1.5e-2	2	452.868	1	NC	1
7		4	max	-.008	15	-.008	15	0	15	5.298e-3	3	NC	15	NC	1
8			min	-.185	1	-.205	1	-.009	1	-1.286e-2	2	595.843	1	NC	1
9		5	max	-.008	15	-.006	15	0	15	4.703e-3	3	NC	10	NC	1
10			min	-.185	1	-.141	1	-.009	1	-1.072e-2	2	830.734	1	NC	1
11		6	max	-.008	15	-.004	15	0	3	4.747e-3	3	NC	5	NC	1
12			min	-.184	1	-.101	3	-.007	1	-1.001e-2	2	1220.743	1	NC	1
13		7	max	-.008	15	-.003	15	0	3	5.233e-3	3	NC	5	NC	1
14			min	-.184	1	-.095	3	-.003	2	-1.028e-2	2	1594.878	9	NC	1
15		8	max	-.008	15	.004	10	0	3	5.719e-3	3	NC	5	NC	2
16			min	-.184	1	-.083	3	0	2	-1.056e-2	2	1564.241	2	9338.465	1
17		9	max	-.008	15	.022	2	0	15	6.429e-3	3	NC	1	NC	2
18			min	-.184	1	-.066	3	0	3	-1.022e-2	2	1255.562	2	9382.307	1
19		10	max	-.008	15	.041	2	0	2	7.534e-3	3	NC	3	NC	2
20			min	-.183	1	-.046	3	0	3	-8.798e-3	2	1066.748	2	9101.435	1
21		11	max	-.008	15	.06	1	0	3	8.64e-3	3	NC	5	NC	2
22			min	-.183	1	-.022	3	0	2	-7.378e-3	2	946.204	2	9388.805	1
23		12	max	-.008	15	.081	1	.004	3	7.26e-3	3	NC	4	NC	1
24			min	-.183	1	.003	15	-.003	2	-5.476e-3	2	868.45	2	NC	1
25		13	max	-.008	15	.097	1	.008	3	4.475e-3	3	NC	4	NC	1
26			min	-.182	1	.004	15	-.004	2	-3.301e-3	2	833.332	2	NC	1
27		14	max	-.008	15	.106	3	.007	3	1.843e-3	3	NC	4	NC	2
28			min	-.182	1	.005	15	-.001	2	-1.217e-3	2	854.318	2	8659.165	1
29		15	max	-.008	15	.187	3	.006	1	5.994e-3	3	NC	4	NC	2
30			min	-.182	1	.005	15	0	15	-3.193e-3	2	570.348	3	6587.21	1
31		16	max	-.008	15	.285	3	.008	1	1.015e-2	3	NC	4	NC	2
32			min	-.182	1	.005	10	0	15	-5.169e-3	2	402.437	3	6069.255	1
33		17	max	-.008	15	.394	3	.005	1	1.43e-2	3	NC	4	NC	2
34			min	-.182	1	-.017	10	0	15	-7.145e-3	2	303.181	3	7008.843	1
35		18	max	-.008	15	.507	3	0	15	1.7e-2	3	NC	4	NC	1
36			min	-.182	1	-.047	2	-.004	1	-8.433e-3	2	241.309	3	NC	1
37		19	max	-.008	15	.62	3	0	15	1.7e-2	3	NC	1	NC	1
38			min	-.182	1	-.085	2	-.014	1	-8.433e-3	2	200.448	3	NC	1
39	M4	1	max	-.013	15	.048	3	0	1	0	1	NC	3	NC	1
40			min	-.311	1	-.93	2	0	1	0	1	185.552	1	NC	1
41		2	max	-.013	15	-.008	3	0	1	0	1	5878.694	15	NC	1
42			min	-.311	1	-.744	2	0	1	0	1	237.178	1	NC	1
43		3	max	-.013	15	-.017	15	0	1	0	1	7177.741	15	NC	1
44			min	-.311	1	-.556	2	0	1	0	1	328.975	1	NC	1
45		4	max	-.013	15	-.013	15	0	1	0	1	9249.254	10	NC	1
46			min	-.311	1	-.386	1	0	1	0	1	522.365	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	-.013	15	-.009	15	0	1	0	1	NC	15	NC	1
48			min	-.311	1	-.254	1	0	1	0	1	669.959	3	NC	1
49		6	max	-.013	15	-.006	15	0	1	0	1	NC	5	NC	1
50			min	-.31	1	-.168	3	0	1	0	1	622.585	3	NC	1
51		7	max	-.012	15	-.004	15	0	1	0	1	NC	5	NC	1
52			min	-.31	1	-.161	3	0	1	0	1	542.149	2	NC	1
53		8	max	-.012	15	.002	10	0	1	0	1	NC	5	NC	1
54			min	-.309	1	-.14	3	0	1	0	1	461.104	2	NC	1
55		9	max	-.012	15	.029	2	0	1	0	1	NC	4	NC	1
56			min	-.308	1	-.112	3	0	1	0	1	412.232	2	NC	1
57		10	max	-.012	15	.064	2	0	1	0	1	NC	4	NC	1
58			min	-.307	1	-.079	3	0	1	0	1	372.738	2	NC	1
59		11	max	-.012	15	.1	1	0	1	0	1	NC	4	NC	1
60			min	-.306	1	-.04	3	0	1	0	1	342.172	2	NC	1
61		12	max	-.012	15	.139	1	0	1	0	1	NC	5	NC	1
62			min	-.306	1	.005	12	0	1	0	1	319.056	2	NC	1
63		13	max	-.012	15	.167	1	0	1	0	1	NC	5	NC	1
64			min	-.305	1	.006	15	0	1	0	1	307.64	2	NC	1
65		14	max	-.012	15	.182	3	0	1	0	1	NC	5	NC	1
66			min	-.304	1	.007	15	0	1	0	1	315.577	2	NC	1
67		15	max	-.012	15	.347	3	0	1	0	1	NC	5	NC	1
68			min	-.304	1	.007	15	0	1	0	1	356.95	2	NC	1
69		16	max	-.012	15	.556	3	0	1	0	1	NC	5	NC	1
70			min	-.304	1	-.014	10	0	1	0	1	263.925	3	NC	1
71		17	max	-.012	15	.79	3	0	1	0	1	NC	5	NC	1
72			min	-.304	1	-.093	2	0	1	0	1	180.548	3	NC	1
73		18	max	-.012	15	1.034	3	0	1	0	1	NC	4	NC	1
74			min	-.304	1	-.195	2	0	1	0	1	135.893	3	NC	1
75		19	max	-.012	15	1.278	3	0	1	0	1	NC	1	NC	1
76			min	-.304	1	-.296	2	0	1	0	1	109.007	3	NC	1
77	M7	1	max	-.008	15	-.015	15	0	15	1.639e-2	2	NC	3	NC	3
78			min	-.185	1	-.424	1	-.015	1	-6.281e-3	3	302.05	1	4499.195	1
79		2	max	-.008	15	-.012	15	0	15	1.639e-2	2	NC	12	NC	2
80			min	-.185	1	-.35	1	-.004	1	-6.281e-3	3	362.356	1	7096.7	1
81		3	max	-.008	15	-.01	15	.005	1	1.5e-2	2	9135.069	15	NC	1
82			min	-.185	1	-.276	1	0	15	-5.893e-3	3	452.868	1	NC	1
83		4	max	-.008	15	-.008	15	.009	1	1.286e-2	2	NC	15	NC	1
84			min	-.185	1	-.205	1	0	15	-5.298e-3	3	595.843	1	NC	1
85		5	max	-.008	15	-.006	15	.009	1	1.072e-2	2	NC	10	NC	1
86			min	-.185	1	-.141	1	0	15	-4.703e-3	3	830.734	1	NC	1
87		6	max	-.008	15	-.004	15	.007	1	1.001e-2	2	NC	5	NC	1
88			min	-.184	1	-.101	3	0	3	-4.747e-3	3	1220.743	1	NC	1
89		7	max	-.008	15	-.003	15	.003	2	1.028e-2	2	NC	5	NC	1
90			min	-.184	1	-.095	3	0	3	-5.233e-3	3	1594.878	9	NC	1
91		8	max	-.008	15	.004	10	0	2	1.056e-2	2	NC	5	NC	2
92			min	-.184	1	-.083	3	0	3	-5.719e-3	3	1564.241	2	9338.465	1
93		9	max	-.008	15	.022	2	0	3	1.022e-2	2	NC	1	NC	2
94			min	-.184	1	-.066	3	0	15	-6.429e-3	3	1255.562	2	9382.307	1
95		10	max	-.008	15	.041	2	0	3	8.798e-3	2	NC	3	NC	2
96			min	-.183	1	-.046	3	0	2	-7.534e-3	3	1066.748	2	9101.435	1
97		11	max	-.008	15	.06	1	0	2	7.378e-3	2	NC	5	NC	2
98			min	-.183	1	-.022	3	0	3	-8.64e-3	3	946.204	2	9388.805	1
99		12	max	-.008	15	.081	1	.003	2	5.476e-3	2	NC	4	NC	1
100			min	-.183	1	.003	15	-.004	3	-7.26e-3	3	868.45	2	NC	1
101		13	max	-.008	15	.097	1	.004	2	3.301e-3	2	NC	4	NC	1
102			min	-.182	1	.004	15	-.008	3	-4.475e-3	3	833.332	2	NC	1
103		14	max	-.008	15	.106	3	.001	2	1.217e-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	-.182	1	.005	15	-.007	3	-1.843e-3	3	854.318	2	8659.165	1
105		15	max	-.008	15	.187	3	0	15	3.193e-3	2	NC	4	NC	2
106			min	-.182	1	.005	15	-.006	1	-5.994e-3	3	570.348	3	6587.21	1
107		16	max	-.008	15	.285	3	0	15	5.169e-3	2	NC	4	NC	2
108			min	-.182	1	.005	10	-.008	1	-1.015e-2	3	402.437	3	6069.255	1
109		17	max	-.008	15	.394	3	0	15	7.145e-3	2	NC	4	NC	2
110			min	-.182	1	-.017	10	-.005	1	-1.43e-2	3	303.181	3	7008.843	1
111		18	max	-.008	15	.507	3	.004	1	8.433e-3	2	NC	4	NC	1
112			min	-.182	1	-.047	2	0	15	-1.7e-2	3	241.309	3	NC	1
113		19	max	-.008	15	.62	3	.014	1	8.433e-3	2	NC	1	NC	1
114			min	-.182	1	-.085	2	0	15	-1.7e-2	3	200.448	3	NC	1
115	M10	1	max	0	1	.468	3	.182	1	1.521e-2	3	NC	1	NC	1
116			min	0	15	-.034	2	.008	15	-5.048e-3	2	NC	1	NC	1
117		2	max	0	1	.642	3	.205	1	1.715e-2	3	NC	4	NC	2
118			min	0	15	-.119	2	.009	15	-5.996e-3	2	1034.877	3	7857.388	1
119		3	max	0	1	.805	3	.238	1	1.909e-2	3	NC	5	NC	4
120			min	0	15	-.196	2	.011	15	-6.945e-3	2	533.461	3	3217.6	1
121		4	max	0	1	.937	3	.271	1	2.103e-2	3	NC	5	NC	5
122			min	0	15	-.253	2	.012	15	-7.893e-3	2	383.81	3	2013.348	1
123		5	max	0	1	1.023	3	.298	1	2.297e-2	3	NC	5	NC	5
124			min	0	15	-.282	2	.013	15	-8.841e-3	2	323.828	3	1545.081	1
125		6	max	0	1	1.062	3	.315	1	2.491e-2	3	NC	5	NC	5
126			min	0	15	-.282	2	.014	15	-9.789e-3	2	303.053	3	1349.912	1
127		7	max	0	1	1.056	3	.321	1	2.685e-2	3	NC	5	NC	5
128			min	0	15	-.258	2	.014	15	-1.074e-2	2	306.161	3	1295.407	1
129		8	max	0	1	1.019	3	.317	1	2.879e-2	3	NC	4	NC	5
130			min	0	15	-.218	2	.013	15	-1.169e-2	2	326.622	3	1330.818	1
131		9	max	0	1	.973	3	.309	1	3.073e-2	3	NC	4	NC	5
132			min	0	15	-.179	2	.013	15	-1.263e-2	2	356.082	3	1416.416	1
133		10	max	0	1	.95	3	.304	1	3.267e-2	3	NC	4	NC	5
134			min	0	1	-.16	2	.012	15	-1.358e-2	2	373.536	3	1465.348	3
135		11	max	0	15	.973	3	.309	1	3.073e-2	3	NC	4	NC	5
136			min	0	1	-.179	2	.013	15	-1.263e-2	2	356.082	3	1416.416	1
137		12	max	0	15	1.019	3	.317	1	2.879e-2	3	NC	4	NC	5
138			min	0	1	-.218	2	.013	15	-1.169e-2	2	326.622	3	1330.818	1
139		13	max	0	15	1.056	3	.321	1	2.685e-2	3	NC	5	NC	5
140			min	0	1	-.258	2	.014	15	-1.074e-2	2	306.161	3	1295.407	1
141		14	max	0	15	1.062	3	.315	1	2.491e-2	3	NC	5	NC	5
142			min	0	1	-.282	2	.014	15	-9.789e-3	2	303.053	3	1349.912	1
143		15	max	0	15	1.023	3	.298	1	2.297e-2	3	NC	5	NC	5
144			min	0	1	-.282	2	.013	15	-8.841e-3	2	323.828	3	1545.081	1
145		16	max	0	15	.937	3	.271	1	2.103e-2	3	NC	5	NC	5
146			min	0	1	-.253	2	.012	15	-7.893e-3	2	383.81	3	2013.348	1
147		17	max	0	15	.805	3	.238	1	1.909e-2	3	NC	5	NC	4
148			min	0	1	-.196	2	.011	15	-6.945e-3	2	533.461	3	3217.6	1
149		18	max	0	15	.642	3	.205	1	1.715e-2	3	NC	4	NC	2
150			min	0	1	-.119	2	.009	15	-5.996e-3	2	1034.877	3	7857.388	1
151		19	max	0	15	.468	3	.182	1	1.521e-2	3	NC	1	NC	1
152			min	0	1	-.034	2	.008	15	-5.048e-3	2	NC	1	NC	1
153	M11	1	max	.001	2	.068	1	.183	1	3.961e-3	3	NC	1	NC	1
154			min	-.002	3	-.011	3	.008	15	1.38e-4	15	NC	1	NC	1
155		2	max	.001	2	.083	3	.199	1	4.207e-3	3	NC	4	NC	1
156			min	-.001	3	-.005	10	.009	15	1.467e-4	15	1915.676	3	NC	1
157		3	max	0	2	.167	3	.228	1	4.454e-3	3	NC	4	NC	3
158			min	-.001	3	-.06	2	.01	15	1.555e-4	15	1008.33	3	3949.951	1
159		4	max	0	2	.223	3	.261	1	4.7e-3	3	NC	5	NC	5
160			min	-.001	3	-.092	2	.011	15	1.643e-4	15	767.879	3	2304.445	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
161		5	max	0	2	.24	3	.289	1	4.946e-3	3	NC	5	NC	5
162			min	0	3	-.096	2	.012	15	1.731e-4	15	716.794	3	1694.204	1
163		6	max	0	2	.215	3	.308	1	5.192e-3	3	NC	4	NC	5
164			min	0	3	-.072	2	.013	15	1.818e-4	15	793.677	3	1435.115	1
165		7	max	0	2	.157	3	.317	1	5.438e-3	3	NC	4	NC	5
166			min	0	3	-.025	2	.013	15	1.906e-4	15	1069.524	3	1343.185	1
167		8	max	0	2	.08	3	.316	1	5.684e-3	3	NC	1	NC	5
168			min	0	3	.002	15	.013	15	1.994e-4	15	1973.616	3	1350.735	1
169		9	max	0	2	.095	1	.31	1	5.93e-3	3	NC	4	NC	5
170			min	0	3	.004	15	.013	15	2.082e-4	15	6704.462	1	1413.455	1
171		10	max	0	1	.115	1	.306	1	6.176e-3	3	NC	3	NC	5
172			min	0	1	-.024	3	.012	15	2.169e-4	15	3851.099	1	1459.323	1
173		11	max	0	3	.095	1	.31	1	5.93e-3	3	NC	4	NC	5
174			min	0	2	.004	15	.013	15	2.082e-4	15	6704.462	1	1413.455	1
175		12	max	0	3	.08	3	.316	1	5.684e-3	3	NC	1	NC	5
176			min	0	2	.002	15	.013	15	1.994e-4	15	1973.616	3	1350.735	1
177		13	max	0	3	.157	3	.317	1	5.438e-3	3	NC	4	NC	5
178			min	0	2	-.025	2	.013	15	1.906e-4	15	1069.524	3	1343.185	1
179		14	max	0	3	.215	3	.308	1	5.192e-3	3	NC	4	NC	5
180			min	0	2	-.072	2	.013	15	1.818e-4	15	793.677	3	1435.115	1
181		15	max	0	3	.24	3	.289	1	4.946e-3	3	NC	5	NC	5
182			min	0	2	-.096	2	.012	15	1.731e-4	15	716.794	3	1694.204	1
183		16	max	.001	3	.223	3	.261	1	4.7e-3	3	NC	5	NC	5
184			min	0	2	-.092	2	.011	15	1.643e-4	15	767.879	3	2304.445	1
185		17	max	.001	3	.167	3	.228	1	4.454e-3	3	NC	4	NC	3
186			min	0	2	-.06	2	.01	15	1.555e-4	15	1008.33	3	3949.951	1
187		18	max	.001	3	.083	3	.199	1	4.207e-3	3	NC	4	NC	1
188			min	-.001	2	-.005	10	.009	15	1.467e-4	15	1915.676	3	NC	1
189		19	max	.002	3	.068	1	.183	1	3.961e-3	3	NC	1	NC	1
190			min	-.001	2	-.011	3	.008	15	1.38e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.015	2	.184	1	3.746e-3	1	NC	1	NC	1
192			min	0	9	-.073	3	.008	15	1.638e-4	15	NC	1	NC	1
193		2	max	0	2	-.002	15	.197	1	4.007e-3	1	NC	4	NC	1
194			min	0	9	-.092	2	.009	15	1.73e-4	15	1692.878	2	NC	1
195		3	max	0	2	.027	3	.226	1	4.267e-3	1	NC	5	NC	4
196			min	0	9	-.181	2	.01	15	1.822e-4	15	917.292	2	4306.769	1
197		4	max	0	2	.05	3	.258	1	4.528e-3	1	NC	5	NC	5
198			min	0	9	-.238	2	.011	15	1.914e-4	15	711.344	2	2429.059	1
199		5	max	0	2	.049	3	.287	1	4.789e-3	1	NC	5	NC	5
200			min	0	9	-.254	2	.012	15	2.006e-4	15	670.903	2	1751.641	1
201		6	max	0	2	.026	3	.307	1	5.049e-3	1	NC	5	NC	5
202			min	0	9	-.227	2	.013	15	2.098e-4	15	744.678	2	1463.913	1
203		7	max	0	2	-.003	15	.317	1	5.31e-3	1	NC	5	NC	5
204			min	0	9	-.166	2	.013	15	2.19e-4	15	993.253	2	1355.522	1
205		8	max	0	2	-.002	15	.317	1	5.571e-3	1	NC	3	NC	5
206			min	0	9	-.088	2	.013	15	2.282e-4	15	1748.706	2	1350.76	1
207		9	max	0	2	-.001	15	.312	1	5.831e-3	1	NC	4	NC	5
208			min	0	9	-.103	3	.013	15	2.374e-4	15	5777.135	2	1403.294	1
209		10	max	0	1	.016	2	.308	1	6.092e-3	1	NC	1	NC	5
210			min	0	1	-.122	3	.012	15	2.466e-4	15	3636.834	3	1444.189	1
211		11	max	0	9	-.001	15	.312	1	5.831e-3	1	NC	4	NC	5
212			min	0	2	-.103	3	.013	15	2.374e-4	15	5777.135	2	1403.294	1
213		12	max	0	9	-.002	15	.317	1	5.571e-3	1	NC	3	NC	5
214			min	0	2	-.088	2	.013	15	2.282e-4	15	1748.706	2	1350.76	1
215		13	max	0	9	-.003	15	.317	1	5.31e-3	1	NC	5	NC	5
216			min	0	2	-.166	2	.013	15	2.19e-4	15	993.253	2	1355.522	1
217		14	max	0	9	.026	3	.307	1	5.049e-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	-.227	2	.013	15	2.098e-4	15	744.678	2	1463.913	1
219		15	max	0	9	.049	3	.287	1	4.789e-3	1	NC	5	NC	5
220			min	0	2	-.254	2	.012	15	2.006e-4	15	670.903	2	1751.641	1
221		16	max	0	9	.05	3	.258	1	4.528e-3	1	NC	5	NC	5
222			min	0	2	-.238	2	.011	15	1.914e-4	15	711.344	2	2429.059	1
223		17	max	0	9	.027	3	.226	1	4.267e-3	1	NC	5	NC	4
224			min	0	2	-.181	2	.01	15	1.822e-4	15	917.292	2	4306.769	1
225		18	max	0	9	-.002	15	.197	1	4.007e-3	1	NC	4	NC	1
226			min	0	2	-.092	2	.009	15	1.73e-4	15	1692.878	2	NC	1
227		19	max	0	9	.015	2	.184	1	3.746e-3	1	NC	1	NC	1
228			min	0	2	-.073	3	.008	15	1.638e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.012	15	.185	1	1.094e-2	2	NC	1	NC	1
230			min	0	1	-.324	1	.008	15	-1.987e-3	3	NC	1	NC	1
231		2	max	0	15	-.006	12	.208	1	1.252e-2	2	NC	4	NC	2
232			min	0	1	-.476	2	.009	15	-2.596e-3	3	1099.209	2	7606.936	1
233		3	max	0	15	.046	3	.242	1	1.409e-2	2	NC	5	NC	4
234			min	0	1	-.623	2	.011	15	-3.205e-3	3	578.273	2	3136.199	1
235		4	max	0	15	.081	3	.276	1	1.566e-2	2	NC	5	NC	5
236			min	0	1	-.736	2	.012	15	-3.814e-3	3	424.492	2	1967.471	1
237		5	max	0	15	.094	3	.304	1	1.723e-2	2	NC	5	NC	5
238			min	0	1	-.804	2	.013	15	-4.423e-3	3	366.057	2	1510.796	1
239		6	max	0	15	.085	3	.321	1	1.88e-2	2	NC	5	NC	5
240			min	0	1	-.824	2	.014	15	-5.032e-3	3	351.412	2	1319.044	1
241		7	max	0	15	.059	3	.327	1	2.037e-2	2	NC	5	NC	5
242			min	0	1	-.804	2	.014	15	-5.641e-3	3	366.166	2	1263.524	1
243		8	max	0	15	.023	3	.324	1	2.195e-2	2	NC	5	NC	5
244			min	0	1	-.756	2	.013	15	-6.25e-3	3	405.338	2	1294.52	1
245		9	max	0	15	-.01	12	.316	1	2.352e-2	2	NC	5	NC	5
246			min	0	1	-.704	2	.013	15	-6.859e-3	3	458.996	2	1373.5	1
247		10	max	0	1	-.02	15	.311	1	2.509e-2	2	NC	5	NC	5
248			min	0	1	-.679	2	.013	15	-7.468e-3	3	491.142	2	1426.306	1
249		11	max	0	1	-.01	12	.316	1	2.352e-2	2	NC	5	NC	5
250			min	0	15	-.704	2	.013	15	-6.859e-3	3	458.996	2	1373.5	1
251		12	max	0	1	.023	3	.324	1	2.195e-2	2	NC	5	NC	5
252			min	0	15	-.756	2	.013	15	-6.25e-3	3	405.338	2	1294.52	1
253		13	max	0	1	.059	3	.327	1	2.037e-2	2	NC	5	NC	5
254			min	0	15	-.804	2	.014	15	-5.641e-3	3	366.166	2	1263.524	1
255		14	max	0	1	.085	3	.321	1	1.88e-2	2	NC	5	NC	5
256			min	0	15	-.824	2	.014	15	-5.032e-3	3	351.412	2	1319.044	1
257		15	max	0	1	.094	3	.304	1	1.723e-2	2	NC	5	NC	5
258			min	0	15	-.804	2	.013	15	-4.423e-3	3	366.057	2	1510.796	1
259		16	max	0	1	.081	3	.276	1	1.566e-2	2	NC	5	NC	5
260			min	0	15	-.736	2	.012	15	-3.814e-3	3	424.492	2	1967.471	1
261		17	max	0	1	.046	3	.242	1	1.409e-2	2	NC	5	NC	4
262			min	0	15	-.623	2	.011	15	-3.205e-3	3	578.273	2	3136.199	1
263		18	max	0	1	-.006	12	.208	1	1.252e-2	2	NC	4	NC	2
264			min	0	15	-.476	2	.009	15	-2.596e-3	3	1099.209	2	7606.936	1
265		19	max	0	1	-.012	15	.185	1	1.094e-2	2	NC	1	NC	1
266			min	0	15	-.324	1	.008	15	-1.987e-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	3.216e-3	2	NC	1	NC	1
270			min	0	2	-.001	3	0	2	-1.457e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	4.176e-3	2	NC	1	NC	1
272			min	0	2	-.004	3	0	2	-1.861e-3	3	NC	1	NC	1
273		4	max	0	3	0	15	.001	3	3.842e-3	2	NC	2	NC	1
274			min	0	2	-.009	3	0	2	-1.661e-3	3	7850.392	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
275		5	max	0	3	0	15	.002	3	3.508e-3	2	NC	4	NC	1
276			min	0	2	-.015	3	-.002	2	-1.461e-3	3	4584.377	3	NC	1
277		6	max	0	3	0	15	.003	3	3.174e-3	2	NC	4	NC	1
278			min	0	2	-.022	3	-.002	2	-1.261e-3	3	3024.881	3	NC	1
279		7	max	0	3	-.001	15	.004	3	2.841e-3	2	NC	5	NC	1
280			min	0	2	-.031	3	-.003	2	-1.061e-3	3	2159.066	3	9885.914	3
281		8	max	0	3	-.002	15	.005	3	2.507e-3	2	NC	5	NC	1
282			min	0	2	-.041	3	-.004	2	-8.609e-4	3	1627.449	3	8225.589	3
283		9	max	0	3	-.002	15	.006	3	2.173e-3	2	NC	5	NC	1
284			min	0	2	-.053	3	-.004	2	-6.609e-4	3	1277.59	3	7130.788	3
285		10	max	0	3	-.003	15	.007	3	1.839e-3	2	NC	5	NC	1
286			min	0	2	-.065	1	-.005	2	-4.609e-4	3	1034.312	1	6406.916	3
287		11	max	0	3	-.004	15	.007	3	1.505e-3	2	NC	5	NC	1
288			min	0	2	-.079	1	-.005	2	-2.609e-4	3	856.085	1	5949.541	3
289		12	max	0	3	-.004	15	.007	3	1.172e-3	2	NC	5	NC	1
290			min	0	2	-.093	1	-.006	2	-6.086e-5	3	723.474	1	5708.114	3
291		13	max	0	3	-.005	15	.007	3	8.378e-4	2	NC	15	NC	1
292			min	-.001	2	-.108	1	-.006	1	9.929e-7	15	622.04	1	5671.124	3
293		14	max	.001	3	-.006	15	.006	3	5.04e-4	2	NC	15	NC	1
294			min	-.001	2	-.124	1	-.006	1	-7.407e-5	9	542.716	1	5864.147	3
295		15	max	.001	3	-.006	15	.005	3	5.392e-4	3	NC	15	NC	1
296			min	-.001	2	-.14	1	-.005	1	-1.62e-4	9	479.47	1	6384.136	3
297		16	max	.001	3	-.007	15	.003	3	7.392e-4	3	9477.666	15	NC	1
298			min	-.001	2	-.157	1	-.005	1	-3.823e-4	1	428.25	1	7479.151	3
299		17	max	.001	3	-.008	15	0	3	9.392e-4	3	8549.413	15	NC	1
300			min	-.001	2	-.174	1	-.004	1	-6.549e-4	1	386.198	1	9935.857	3
301		18	max	.001	3	-.009	15	0	10	1.139e-3	3	7778.025	15	NC	1
302			min	-.001	2	-.192	1	-.003	3	-9.275e-4	1	351.268	1	NC	1
303		19	max	.001	3	-.009	15	.002	2	1.339e-3	3	7130.665	15	NC	1
304			min	-.001	2	-.209	1	-.007	3	-1.2e-3	1	321.967	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	1	NC	1
310			min	0	2	-.007	3	0	1	0	1	9312.917	3	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	0	2	-.015	3	0	1	0	1	4483.708	3	NC	1
313		5	max	.001	3	0	15	0	1	0	1	NC	4	NC	1
314			min	-.001	2	-.025	3	0	1	0	1	2645.739	3	NC	1
315		6	max	.001	3	-.001	15	0	1	0	1	NC	5	NC	1
316			min	-.001	2	-.038	3	0	1	0	1	1756.139	3	NC	1
317		7	max	.002	3	-.002	15	0	1	0	1	NC	5	NC	1
318			min	-.001	2	-.053	3	0	1	0	1	1258.277	3	NC	1
319		8	max	.002	3	-.003	15	0	1	0	1	NC	5	NC	1
320			min	-.002	2	-.071	3	0	1	0	1	950.979	3	NC	1
321		9	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
322			min	-.002	2	-.09	3	0	1	0	1	747.992	3	NC	1
323		10	max	.002	3	-.004	15	0	1	0	1	NC	15	NC	1
324			min	-.002	2	-.111	3	0	1	0	1	606.608	3	NC	1
325		11	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
326			min	-.002	2	-.134	3	0	1	0	1	504.147	3	NC	1
327		12	max	.003	3	-.006	15	0	1	0	1	NC	15	NC	1
328			min	-.003	2	-.157	3	0	1	0	1	427.451	3	NC	1
329		13	max	.003	3	-.007	15	0	1	0	1	9172.071	15	NC	1
330			min	-.003	2	-.183	3	0	1	0	1	368.501	3	NC	1
331		14	max	.003	3	-.008	15	0	1	0	1	8003.575	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	-.209	3	0	1	0	1	322.215	3	NC	1
333		15	max	.003	3	-.01	15	0	1	0	1	7071.717	15	NC	1
334			min	-.003	2	-.236	3	0	1	0	1	285.186	3	NC	1
335		16	max	.004	3	-.011	15	0	1	0	1	6316.915	15	NC	1
336			min	-.003	2	-.264	3	0	1	0	1	255.112	3	NC	1
337		17	max	.004	3	-.012	15	0	1	0	1	5697.097	15	NC	1
338			min	-.004	2	-.292	3	0	1	0	1	230.359	3	NC	1
339		18	max	.004	3	-.013	15	0	1	0	1	5182.194	15	NC	1
340			min	-.004	2	-.321	3	0	1	0	1	209.755	3	NC	1
341		19	max	.004	3	-.014	15	0	1	0	1	4750.206	15	NC	1
342			min	-.004	2	-.35	3	0	1	0	1	192.437	3	NC	1
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	15	0	2	1.457e-3	3	NC	1	NC	1
346			min	0	2	-.001	3	0	3	-3.216e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	2	1.861e-3	3	NC	1	NC	1
348			min	0	2	-.004	3	0	3	-4.176e-3	2	NC	1	NC	1
349		4	max	0	3	0	15	0	2	1.661e-3	3	NC	2	NC	1
350			min	0	2	-.009	3	-.001	3	-3.842e-3	2	7850.392	3	NC	1
351		5	max	0	3	0	15	.002	2	1.461e-3	3	NC	4	NC	1
352			min	0	2	-.015	3	-.002	3	-3.508e-3	2	4584.377	3	NC	1
353		6	max	0	3	0	15	.002	2	1.261e-3	3	NC	4	NC	1
354			min	0	2	-.022	3	-.003	3	-3.174e-3	2	3024.881	3	NC	1
355		7	max	0	3	-.001	15	.003	2	1.061e-3	3	NC	5	NC	1
356			min	0	2	-.031	3	-.004	3	-2.841e-3	2	2159.066	3	9885.914	3
357		8	max	0	3	-.002	15	.004	2	8.609e-4	3	NC	5	NC	1
358			min	0	2	-.041	3	-.005	3	-2.507e-3	2	1627.449	3	8225.589	3
359		9	max	0	3	-.002	15	.004	2	6.609e-4	3	NC	5	NC	1
360			min	0	2	-.053	3	-.006	3	-2.173e-3	2	1277.59	3	7130.788	3
361		10	max	0	3	-.003	15	.005	2	4.609e-4	3	NC	5	NC	1
362			min	0	2	-.065	1	-.007	3	-1.839e-3	2	1034.312	1	6406.916	3
363		11	max	0	3	-.004	15	.005	2	2.609e-4	3	NC	5	NC	1
364			min	0	2	-.079	1	-.007	3	-1.505e-3	2	856.085	1	5949.541	3
365		12	max	0	3	-.004	15	.006	2	6.086e-5	3	NC	5	NC	1
366			min	0	2	-.093	1	-.007	3	-1.172e-3	2	723.474	1	5708.114	3
367		13	max	0	3	-.005	15	.006	1	-9.929e-7	15	NC	15	NC	1
368			min	-.001	2	-.108	1	-.007	3	-8.378e-4	2	622.04	1	5671.124	3
369		14	max	.001	3	-.006	15	.006	1	7.407e-5	9	NC	15	NC	1
370			min	-.001	2	-.124	1	-.006	3	-5.04e-4	2	542.716	1	5864.147	3
371		15	max	.001	3	-.006	15	.005	1	1.62e-4	9	NC	15	NC	1
372			min	-.001	2	-.14	1	-.005	3	-5.392e-4	3	479.47	1	6384.136	3
373		16	max	.001	3	-.007	15	.005	1	3.823e-4	1	9477.666	15	NC	1
374			min	-.001	2	-.157	1	-.003	3	-7.392e-4	3	428.25	1	7479.151	3
375		17	max	.001	3	-.008	15	.004	1	6.549e-4	1	8549.413	15	NC	1
376			min	-.001	2	-.174	1	0	3	-9.392e-4	3	386.198	1	9935.857	3
377		18	max	.001	3	-.009	15	.003	3	9.275e-4	1	7778.025	15	NC	1
378			min	-.001	2	-.192	1	0	10	-1.139e-3	3	351.268	1	NC	1
379		19	max	.001	3	-.009	15	.007	3	1.2e-3	1	7130.665	15	NC	1
380			min	-.001	2	-.209	1	-.002	2	-1.339e-3	3	321.967	1	NC	1
381	M3	1	max	.002	3	0	15	0	3	2.039e-3	2	NC	1	NC	1
382			min	0	15	0	1	0	2	-8.523e-4	3	NC	1	NC	1
383		2	max	.002	3	0	15	.007	3	2.211e-3	2	NC	1	NC	3
384			min	0	10	-.014	1	-.014	2	-9.451e-4	3	NC	1	4495.271	2
385		3	max	.002	3	-.001	15	.013	3	2.383e-3	2	NC	1	NC	4
386			min	0	10	-.026	1	-.027	2	-1.038e-3	3	NC	1	2261.211	2
387		4	max	.002	3	-.002	15	.019	3	2.555e-3	2	NC	1	NC	4
388			min	0	2	-.039	1	-.04	2	-1.131e-3	3	NC	1	1526.838	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	.025	3	2.727e-3	2	NC	1	NC	4
390			min	-.001	2	-.052	1	-.053	2	-1.224e-3	3	NC	1	1167.989	2
391		6	max	.003	3	-.004	15	.03	3	2.899e-3	2	NC	1	NC	5
392			min	-.002	2	-.064	1	-.064	2	-1.317e-3	3	NC	1	960.148	2
393		7	max	.003	3	-.004	15	.035	3	3.072e-3	2	NC	1	NC	5
394			min	-.002	2	-.077	1	-.074	2	-1.41e-3	3	NC	1	828.814	2
395		8	max	.003	3	-.005	15	.039	3	3.244e-3	2	NC	1	NC	5
396			min	-.003	2	-.089	1	-.083	2	-1.502e-3	3	NC	1	742.457	2
397		9	max	.003	3	-.005	15	.042	3	3.416e-3	2	NC	1	NC	5
398			min	-.003	2	-.101	1	-.089	2	-1.595e-3	3	NC	1	685.822	2
399		10	max	.004	3	-.006	15	.044	3	3.588e-3	2	NC	1	NC	5
400			min	-.004	2	-.113	1	-.094	2	-1.688e-3	3	NC	1	651.12	2
401		11	max	.004	3	-.006	15	.045	3	3.76e-3	2	NC	1	NC	5
402			min	-.004	2	-.125	1	-.096	2	-1.781e-3	3	NC	1	634.677	2
403		12	max	.004	3	-.007	15	.045	3	3.932e-3	2	NC	1	NC	5
404			min	-.005	2	-.137	1	-.095	2	-1.874e-3	3	NC	1	635.701	2
405		13	max	.004	3	-.007	15	.044	3	4.104e-3	2	NC	1	NC	5
406			min	-.005	2	-.149	1	-.092	2	-1.967e-3	3	NC	1	656.256	2
407		14	max	.004	3	-.008	15	.041	3	4.276e-3	2	NC	1	NC	5
408			min	-.006	2	-.161	1	-.085	2	-2.06e-3	3	NC	1	702.551	2
409		15	max	.004	3	-.008	15	.036	3	4.448e-3	2	NC	1	NC	5
410			min	-.006	2	-.173	1	-.075	2	-2.153e-3	3	NC	1	789.001	2
411		16	max	.005	3	-.009	15	.03	3	4.62e-3	2	NC	1	NC	5
412			min	-.007	2	-.185	1	-.061	2	-2.245e-3	3	NC	1	951.01	2
413		17	max	.005	3	-.009	15	.023	3	4.792e-3	2	NC	1	NC	4
414			min	-.007	2	-.196	1	-.043	2	-2.338e-3	3	NC	1	1296.608	2
415		18	max	.005	3	-.009	15	.013	3	4.965e-3	2	NC	1	NC	4
416			min	-.008	2	-.208	1	-.021	2	-2.431e-3	3	NC	1	2368.504	2
417		19	max	.005	3	-.01	15	.008	1	5.137e-3	2	NC	1	NC	1
418			min	-.008	2	-.219	1	0	15	-2.524e-3	3	NC	1	NC	1
419	M6	1	max	.003	3	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.001	3	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	2	-.023	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	-.044	1	0	1	0	1	NC	1	NC	1
425		4	max	.006	3	-.003	15	0	1	0	1	NC	1	NC	1
426			min	-.003	2	-.065	1	0	1	0	1	NC	1	NC	1
427		5	max	.006	3	-.004	15	0	1	0	1	NC	1	NC	1
428			min	-.005	2	-.086	1	0	1	0	1	NC	1	NC	1
429		6	max	.007	3	-.005	15	0	1	0	1	NC	1	NC	1
430			min	-.006	2	-.107	1	0	1	0	1	NC	1	NC	1
431		7	max	.008	3	-.006	15	0	1	0	1	NC	1	NC	1
432			min	-.008	2	-.128	1	0	1	0	1	NC	1	NC	1
433		8	max	.008	3	-.007	15	0	1	0	1	NC	1	NC	1
434			min	-.009	2	-.149	1	0	1	0	1	NC	1	NC	1
435		9	max	.009	3	-.008	15	0	1	0	1	NC	1	NC	1
436			min	-.011	2	-.17	1	0	1	0	1	NC	1	NC	1
437		10	max	.01	3	-.008	15	0	1	0	1	NC	1	NC	1
438			min	-.012	2	-.191	1	0	1	0	1	NC	1	NC	1
439		11	max	.01	3	-.009	15	0	1	0	1	NC	1	NC	1
440			min	-.013	2	-.212	1	0	1	0	1	NC	1	NC	1
441		12	max	.011	3	-.01	15	0	1	0	1	NC	1	NC	1
442			min	-.015	2	-.232	1	0	1	0	1	NC	1	NC	1
443		13	max	.012	3	-.011	15	0	1	0	1	NC	1	NC	1
444			min	-.016	2	-.253	1	0	1	0	1	NC	1	NC	1
445		14	max	.012	3	-.011	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	-.273	1	0	1	0	1	NC	1	NC	1
447		15	max	.013	3	-.012	15	0	1	0	1	NC	1	NC	1
448			min	-.019	2	-.293	1	0	1	0	1	NC	1	NC	1
449		16	max	.014	3	-.013	15	0	1	0	1	NC	1	NC	1
450			min	-.021	2	-.313	1	0	1	0	1	NC	1	NC	1
451		17	max	.014	3	-.014	15	0	1	0	1	NC	1	NC	1
452			min	-.022	2	-.334	1	0	1	0	1	NC	1	NC	1
453		18	max	.015	3	-.014	15	0	1	0	1	NC	1	NC	1
454			min	-.023	2	-.354	1	0	1	0	1	NC	1	NC	1
455		19	max	.016	3	-.015	15	0	1	0	1	NC	1	NC	1
456			min	-.025	2	-.374	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.002	3	0	15	0	2	8.523e-4	3	NC	1	NC	1
458			min	0	15	0	1	0	3	-2.039e-3	2	NC	1	NC	1
459		2	max	.002	3	0	15	.014	2	9.451e-4	3	NC	1	NC	3
460			min	0	10	-.014	1	-.007	3	-2.211e-3	2	NC	1	4495.271	2
461		3	max	.002	3	-.001	15	.027	2	1.038e-3	3	NC	1	NC	4
462			min	0	10	-.026	1	-.013	3	-2.383e-3	2	NC	1	2261.211	2
463		4	max	.002	3	-.002	15	.04	2	1.131e-3	3	NC	1	NC	4
464			min	0	2	-.039	1	-.019	3	-2.555e-3	2	NC	1	1526.838	2
465		5	max	.003	3	-.003	15	.053	2	1.224e-3	3	NC	1	NC	4
466			min	-.001	2	-.052	1	-.025	3	-2.727e-3	2	NC	1	1167.989	2
467		6	max	.003	3	-.004	15	.064	2	1.317e-3	3	NC	1	NC	5
468			min	-.002	2	-.064	1	-.03	3	-2.899e-3	2	NC	1	960.148	2
469		7	max	.003	3	-.004	15	.074	2	1.41e-3	3	NC	1	NC	5
470			min	-.002	2	-.077	1	-.035	3	-3.072e-3	2	NC	1	828.814	2
471		8	max	.003	3	-.005	15	.083	2	1.502e-3	3	NC	1	NC	5
472			min	-.003	2	-.089	1	-.039	3	-3.244e-3	2	NC	1	742.457	2
473		9	max	.003	3	-.005	15	.089	2	1.595e-3	3	NC	1	NC	5
474			min	-.003	2	-.101	1	-.042	3	-3.416e-3	2	NC	1	685.822	2
475		10	max	.004	3	-.006	15	.094	2	1.688e-3	3	NC	1	NC	5
476			min	-.004	2	-.113	1	-.044	3	-3.588e-3	2	NC	1	651.12	2
477		11	max	.004	3	-.006	15	.096	2	1.781e-3	3	NC	1	NC	5
478			min	-.004	2	-.125	1	-.045	3	-3.76e-3	2	NC	1	634.677	2
479		12	max	.004	3	-.007	15	.095	2	1.874e-3	3	NC	1	NC	5
480			min	-.005	2	-.137	1	-.045	3	-3.932e-3	2	NC	1	635.701	2
481		13	max	.004	3	-.007	15	.092	2	1.967e-3	3	NC	1	NC	5
482			min	-.005	2	-.149	1	-.044	3	-4.104e-3	2	NC	1	656.256	2
483		14	max	.004	3	-.008	15	.085	2	2.06e-3	3	NC	1	NC	5
484			min	-.006	2	-.161	1	-.041	3	-4.276e-3	2	NC	1	702.551	2
485		15	max	.004	3	-.008	15	.075	2	2.153e-3	3	NC	1	NC	5
486			min	-.006	2	-.173	1	-.036	3	-4.448e-3	2	NC	1	789.001	2
487		16	max	.005	3	-.009	15	.061	2	2.245e-3	3	NC	1	NC	5
488			min	-.007	2	-.185	1	-.03	3	-4.62e-3	2	NC	1	951.01	2
489		17	max	.005	3	-.009	15	.043	2	2.338e-3	3	NC	1	NC	4
490			min	-.007	2	-.196	1	-.023	3	-4.792e-3	2	NC	1	1296.608	2
491		18	max	.005	3	-.009	15	.021	2	2.431e-3	3	NC	1	NC	4
492			min	-.008	2	-.208	1	-.013	3	-4.965e-3	2	NC	1	2368.504	2
493		19	max	.005	3	-.01	15	0	15	2.524e-3	3	NC	1	NC	1
494			min	-.008	2	-.219	1	-.008	1	-5.137e-3	2	NC	1	NC	1