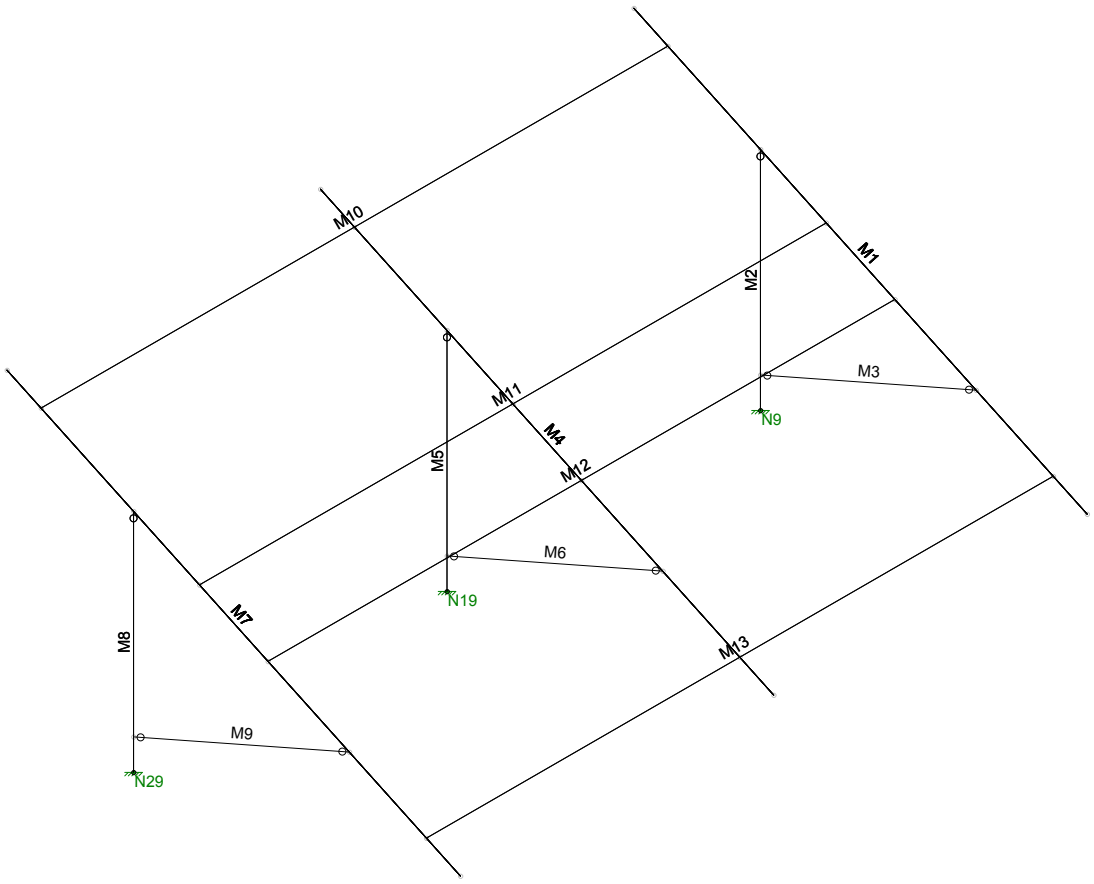


Schletter, Inc.		25° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

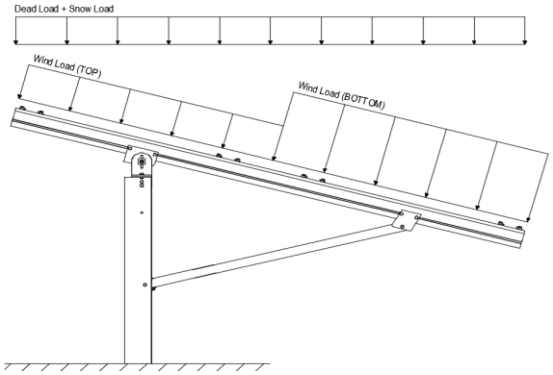
1.2 Construction

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	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 7-05 - 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 =	18.56 psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00	
C_s =	0.82	
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

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

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

2.4 Seismic Loads - N/A

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.8W
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

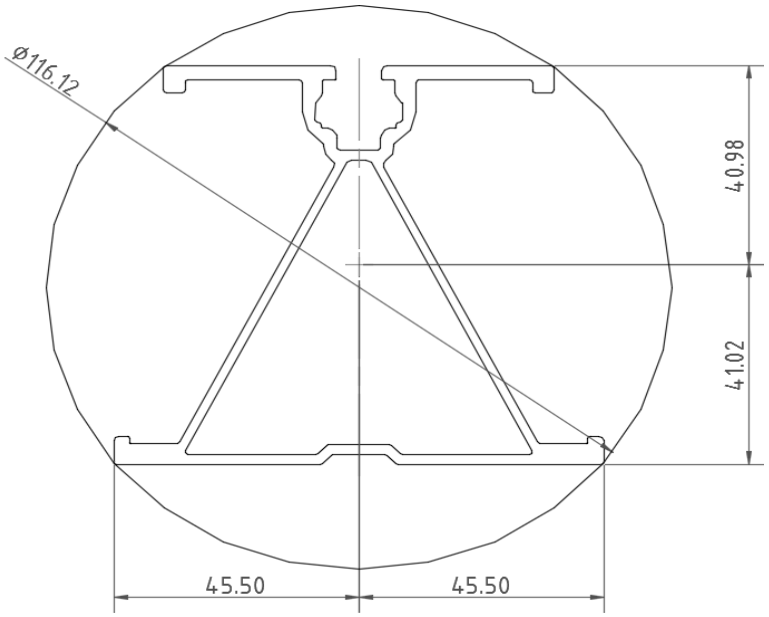
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	96	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 =	1.573	k-ft
M_z =	0.043	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	60%	

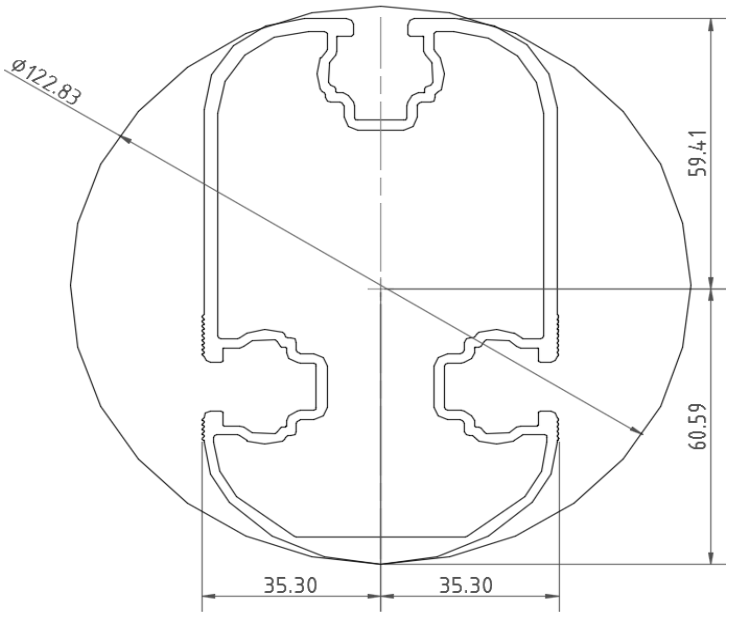


DETAIL VIEW

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 =	4.420	k-ft
M_z =	0.000	k-ft
P_n =	0.013	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	88%	

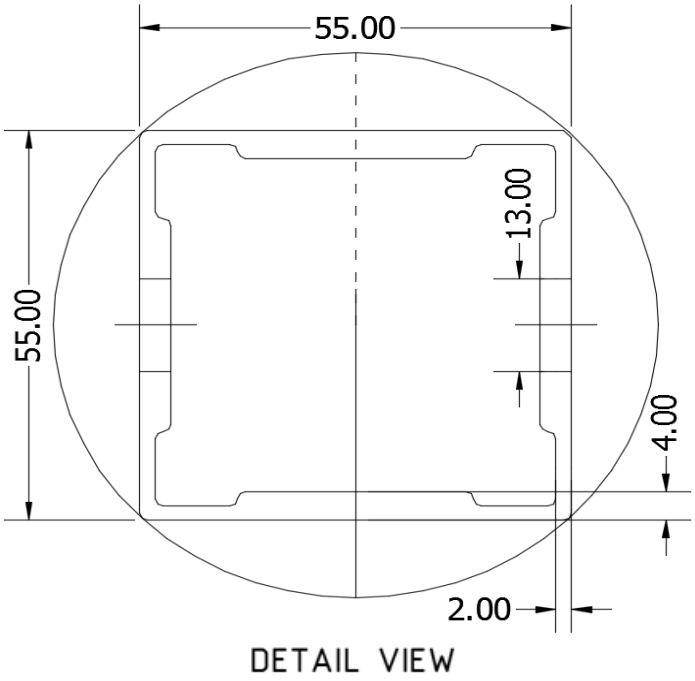


DETAIL VIEW

4.3 Strut Design

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

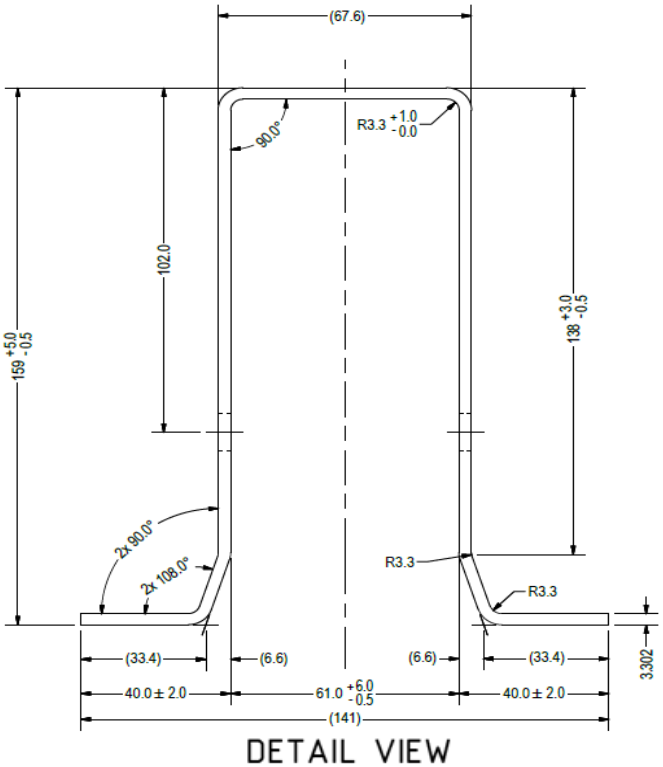
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.005	k-ft
M_z =	0.000	k-ft
P_n =	4.832	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	36%	



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 =	9.806	k-ft
M_z =	0.000	k-ft
P_r =	-5.332	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	61%	



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 =	6.90	k
Maximum Lateral Load =	3.34	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 =	1.00	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

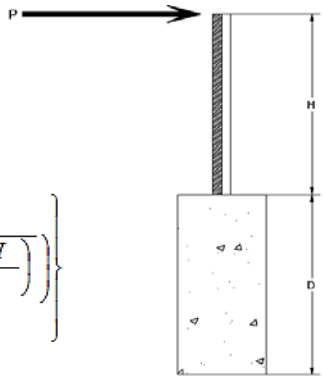
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.00	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 =	5.40	
Required Footing Depth, D =	8.79	ft

2nd Trial @ D_2 =	6.02	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.20	ksf
Constant 2.34P/(S_1B), A =	2.92	
Required Footing Depth, D =	5.72	ft

3rd Trial @ D_3 =	5.87	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 =	2.99	
Required Footing Depth, D =	5.82	ft

4th Trial @ D_4 =	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 =	3.00	
Required Footing Depth, D =	5.84	ft

5th Trial @ D_5 =	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 =	3.01	
Required Footing Depth, D =	6.00	ft

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

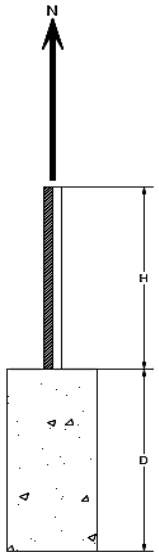
5.4 Uplifting Force Resistance

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 =	3.31	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 =	2.17	k
Required Concrete Volume, V =	14.99	ft^3
Required Footing Depth, D =	5.00	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	7.16
2	0.4	0.2	118.10	7.05
3	0.6	0.2	118.10	6.95
4	0.8	0.2	118.10	6.85
5	1	0.2	118.10	6.74
6	1.2	0.2	118.10	6.64
7	1.4	0.2	118.10	6.54
8	1.6	0.2	118.10	6.43
9	1.8	0.2	118.10	6.33
10	2	0.2	118.10	6.22
11	2.2	0.2	118.10	6.12
12	2.4	0.2	118.10	6.02
13	2.6	0.2	118.10	5.91
14	2.8	0.2	118.10	5.81
15	3	0.2	118.10	5.71
16	3.2	0.2	118.10	5.60
17	3.4	0.2	118.10	5.50
18	3.6	0.2	118.10	5.39
19	3.8	0.2	118.10	5.29
20	4	0.2	118.10	5.19
21	4.2	0.2	118.10	5.08
22	4.4	0.2	118.10	4.98
23	4.6	0.2	118.10	4.88
24	4.8	0.2	118.10	4.77
25	0	0.0	0.00	4.77
26	0	0.0	0.00	4.77
27	0	0.0	0.00	4.77
28	0	0.0	0.00	4.77
29	0	0.0	0.00	4.77
30	0	0.0	0.00	4.77
31	0	0.0	0.00	4.77
32	0	0.0	0.00	4.77
33	0	0.0	0.00	4.77
34	0	0.0	0.00	4.77
Max	4.8	Sum	1.13	

A 2ft diameter x 5ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.97	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

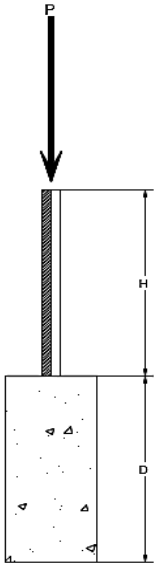
Weight of Concrete

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 =	6.70	k
Utilization =	67%	

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



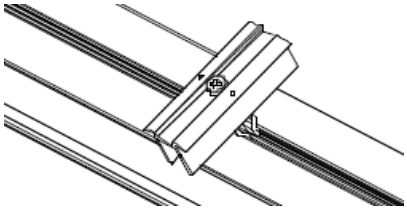
6. DESIGN OF JOINTS AND CONNECTIONS

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.

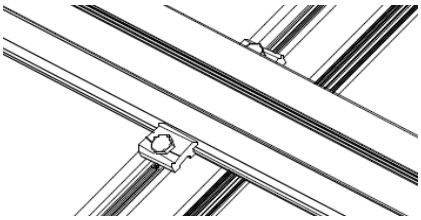
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.749 k
Allowable Uplift	=	1.214 k
Utilization	=	62%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.140 k
Allowable Uplift	=	2.180 k
Utilization	=	98%

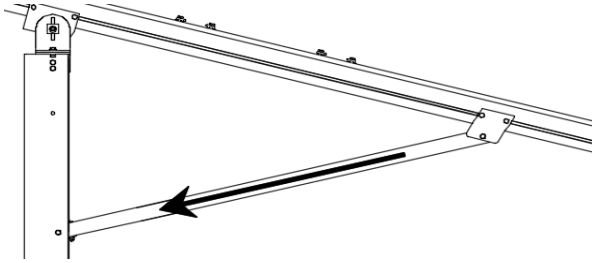


6.2 Strut Connections

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

Maximum Axial Load	=	4.832 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	54%

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

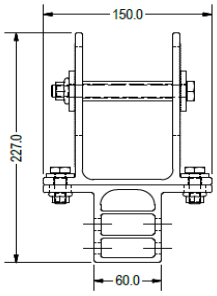


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

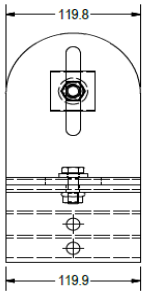
6.3 Girder to Post Connection

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.

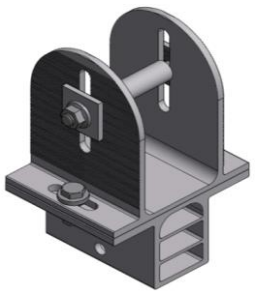
Maximum Tensile Load	=	4.525 k
Allowable Load	=	5.649 k
Utilization	=	80%



FRONT VIEW



SIDE VIEW



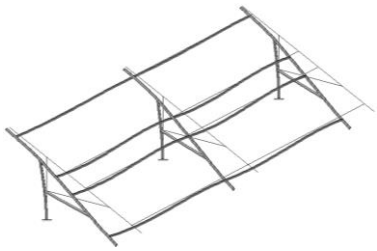
7. SEISMIC DESIGN

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:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	96 in	L_b =	96
J =	0.432	J =	0.432
	265.581		168.894
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	28.0 ksi	φF_L=	29.1
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm⁴	Iy =	446476 mm⁴
	2.155 in⁴		1.073 in⁴
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in³	Sy =	0.599 in³
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 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 =	-5.33	k	(LRFD Factored Load)
Mr (Strong) =	9.81	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 =	0.104	<	0.2	
Utilization =	0.61	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.104	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 61%

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	-69.356	-69.356	0	0
2	M11	y	-69.356	-69.356	0	0
3	M12	y	-107.187	-107.187	0	0
4	M13	y	-107.187	-107.187	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	138.712	138.712	0	0
2	M11	y	138.712	138.712	0	0
3	M12	y	63.051	63.051	0	0
4	M13	y	63.051	63.051	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	641.406	2	2257.847	2	176.193	2	.208	2	.003	3	4.571	1
2		min	-918.355	3	-1764.575	3	-208.394	3	-.267	3	-.007	2	.165	15
3	N19	max	2537.236	2	6190.082	2	0	1	0	2	0	3	8.036	1
4		min	-2529.048	3	-5299.167	3	0	3	0	12	0	15	.263	15
5	N29	max	641.406	2	2257.847	2	208.394	3	.267	3	.007	2	4.571	1
6		min	-918.355	3	-1764.575	3	-176.193	2	-.208	2	-.003	3	.165	15
7	Totals:	max	3820.047	2	10705.777	2	0	1						
8		min	-4365.759	3	-8828.317	3	0	12						

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	-.001	3	0	1	0	1	0	1	0	1
3		2	max	-.221	15	-.473	15	0	5	0	1	0	15	0	4
4			min	-.939	4	-2.011	4	0	1	0	1	0	1	0	15
5		3	max	-6.824	15	304.877	3	-2.77	12	.058	3	.2	1	.304	2
6			min	-166.442	1	-690.324	2	-123.541	1	-.199	2	.007	15	-.132	3
7		4	max	-7.044	15	303.7	3	-2.77	12	.058	3	.124	1	.732	2
8			min	-167.174	1	-691.892	2	-123.541	1	-.199	2	.005	15	-.321	3
9		5	max	-7.265	15	302.524	3	-2.77	12	.058	3	.047	1	1.162	2
10			min	-167.905	1	-693.46	2	-123.541	1	-.199	2	0	10	-.509	3
11		6	max	394.973	3	593.773	2	16.18	3	.01	2	.085	2	1.12	2
12			min	-1226.356	2	-169.563	3	-163.221	1	-.032	3	-.032	3	-.524	3
13		7	max	394.425	3	592.205	2	16.18	3	.01	2	.005	10	.752	2
14			min	-1227.087	2	-170.739	3	-163.221	1	-.032	3	-.023	1	-.418	3
15		8	max	393.876	3	590.637	2	16.18	3	.01	2	-.004	15	.385	2
16			min	-1227.819	2	-171.915	3	-163.221	1	-.032	3	-.125	1	-.312	3
17		9	max	379.008	3	99.393	3	16.865	3	-.002	15	.078	1	.17	2
18			min	-1317.36	2	-56.862	2	-179.727	1	-.146	2	.003	15	-.266	3
19		10	max	378.459	3	98.217	3	16.865	3	-.002	15	.04	3	.206	2
20			min	-1318.092	2	-58.43	2	-179.727	1	-.146	2	-.037	2	-.327	3
21		11	max	377.911	3	97.041	3	16.865	3	-.002	15	.051	3	.243	2
22			min	-1318.823	2	-59.999	2	-179.727	1	-.146	2	-.145	1	-.388	3
23		12	max	359.051	3	810.568	3	72.081	2	.266	3	.113	1	.463	2
24			min	-1445.423	1	-506.178	2	-217.786	3	-.231	2	.004	15	-.73	3
25		13	max	358.502	3	809.392	3	72.081	2	.266	3	.127	1	.777	2
26			min	-1446.154	1	-507.746	2	-217.786	3	-.231	2	-.115	3	-1.233	3
27		14	max	168.441	1	474.043	2	-3.579	15	.173	2	.041	3	1.08	2
28			min	7.494	15	-743.237	3	-98.156	1	-.355	3	-.031	1	-1.713	3
29		15	max	167.71	1	472.475	2	-3.579	15	.173	2	.023	3	.786	2
30			min	7.274	15	-744.414	3	-98.156	1	-.355	3	-.092	1	-1.252	3
31		16	max	166.978	1	470.906	2	-3.579	15	.173	2	.005	3	.493	2
32			min	7.053	15	-745.59	3	-98.156	1	-.355	3	-.152	1	-.789	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
33		17	max	166.247	1	469.338	2	-3.579	15	.173	2	-.007	15	.201	2
34			min	6.832	15	-746.766	3	-98.156	1	-.355	3	-.213	1	-.326	3
35		18	max	.939	4	2.013	4	0	1	0	1	0	15	0	4
36			min	.221	15	.473	15	0	5	0	1	0	1	0	15
37		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
38			min	0	1	-.005	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.014	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	-2.01	4	0	1	0	1	0	1	0	15
43		3	max	-6.696	12	919.403	3	0	1	0	1	0	1	.715	2
44			min	-259.004	1	-1880.565	2	0	1	0	1	0	1	-.353	3
45		4	max	-7.061	12	918.227	3	0	1	0	1	0	1	1.882	2
46			min	-259.736	1	-1882.134	2	0	1	0	1	0	1	-.923	3
47		5	max	-7.427	12	917.051	3	0	1	0	1	0	1	3.051	2
48			min	-260.467	1	-1883.702	2	0	1	0	1	0	1	-1.492	3
49		6	max	1430.107	3	1750.5	2	0	1	0	1	0	1	2.886	2
50			min	-3299.907	2	-719.291	3	0	1	0	1	0	1	-1.461	3
51		7	max	1429.559	3	1748.932	2	0	1	0	1	0	1	1.8	2
52			min	-3300.639	2	-720.467	3	0	1	0	1	0	1	-1.014	3
53		8	max	1429.01	3	1747.363	2	0	1	0	1	0	1	.716	2
54			min	-3301.37	2	-721.643	3	0	1	0	1	0	1	-.567	3
55		9	max	1420.867	3	262.621	3	0	1	0	1	0	1	.084	1
56			min	-3363.136	2	-233.929	2	0	1	0	1	0	1	-.339	3
57		10	max	1420.318	3	261.445	3	0	1	0	1	0	1	.221	1
58			min	-3363.867	2	-235.498	2	0	1	0	1	0	1	-.502	3
59		11	max	1419.77	3	260.269	3	0	1	0	1	0	1	.359	1
60			min	-3364.598	2	-237.066	2	0	1	0	1	0	1	-.664	3
61		12	max	1419.609	3	2292.553	3	0	1	0	1	0	1	1.051	2
62			min	-3434.587	2	-1653.001	2	0	1	0	1	0	1	-1.634	3
63		13	max	1419.061	3	2291.377	3	0	1	0	1	0	1	2.078	2
64			min	-3435.318	2	-1654.57	2	0	1	0	1	0	1	-3.056	3
65		14	max	261.589	1	1363.761	2	0	1	0	1	0	1	3.064	2
66			min	8.648	12	-1969.847	3	0	1	0	1	0	1	-4.42	3
67		15	max	260.858	1	1362.193	2	0	1	0	1	0	1	2.218	2
68			min	8.283	12	-1971.023	3	0	1	0	1	0	1	-3.197	3
69		16	max	260.127	1	1360.624	2	0	1	0	1	0	1	1.373	2
70			min	7.917	12	-1972.199	3	0	1	0	1	0	1	-1.973	3
71		17	max	259.395	1	1359.056	2	0	1	0	1	0	1	.529	2
72			min	7.551	12	-1973.375	3	0	1	0	1	0	1	-.749	3
73		18	max	.939	4	2.013	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	.005	2	0	1	0	1	0	1	0	1
76			min	0	1	-.011	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	-.001	3	0	5	0	1	0	1	0	1
79		2	max	-.221	15	-.473	15	0	1	0	1	0	1	0	4
80			min	-.939	4	-2.011	4	0	5	0	1	0	15	0	15
81		3	max	-6.824	15	304.877	3	123.541	1	.199	2	-.007	15	.304	2
82			min	-166.442	1	-690.324	2	2.77	12	-.058	3	-.2	1	-.132	3
83		4	max	-7.044	15	303.7	3	123.541	1	.199	2	-.005	15	.732	2
84			min	-167.174	1	-691.892	2	2.77	12	-.058	3	-.124	1	-.321	3
85		5	max	-7.265	15	302.524	3	123.541	1	.199	2	0	10	1.162	2
86			min	-167.905	1	-693.46	2	2.77	12	-.058	3	-.047	1	-.509	3
87		6	max	394.973	3	593.773	2	163.221	1	.032	3	.032	3	1.12	2
88			min	-1226.356	2	-169.563	3	-16.18	3	-.01	2	-.085	2	-.524	3
89		7	max	394.425	3	592.205	2	163.221	1	.032	3	.023	1	.752	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	-1227.087	2	-170.739	3	-16.18	3	-.01	2	-.005	10	-.418	3
91		8	max	393.876	3	590.637	2	163.221	1	.032	3	.125	1	.385	2
92			min	-1227.819	2	-171.915	3	-16.18	3	-.01	2	.004	15	-.312	3
93		9	max	379.008	3	99.393	3	179.727	1	.146	2	-.003	15	.17	2
94			min	-1317.36	2	-56.862	2	-16.865	3	.002	15	-.078	1	-.266	3
95		10	max	378.459	3	98.217	3	179.727	1	.146	2	.037	2	.206	2
96			min	-1318.092	2	-58.43	2	-16.865	3	.002	15	-.04	3	-.327	3
97		11	max	377.911	3	97.041	3	179.727	1	.146	2	.145	1	.243	2
98			min	-1318.823	2	-59.999	2	-16.865	3	.002	15	-.051	3	-.388	3
99		12	max	359.051	3	810.568	3	217.786	3	.231	2	-.004	15	.463	2
100			min	-1445.423	1	-506.178	2	-72.081	2	-.266	3	-.113	1	-.73	3
101		13	max	358.502	3	809.392	3	217.786	3	.231	2	.115	3	.777	2
102			min	-1446.154	1	-507.746	2	-72.081	2	-.266	3	-.127	1	-1.233	3
103		14	max	168.441	1	474.043	2	98.156	1	.355	3	.031	1	1.08	2
104			min	7.494	15	-743.237	3	3.579	15	-.173	2	-.041	3	-1.713	3
105		15	max	167.71	1	472.475	2	98.156	1	.355	3	.092	1	.786	2
106			min	7.274	15	-744.414	3	3.579	15	-.173	2	-.023	3	-1.252	3
107		16	max	166.978	1	470.906	2	98.156	1	.355	3	.152	1	.493	2
108			min	7.053	15	-745.59	3	3.579	15	-.173	2	-.005	3	-.789	3
109		17	max	166.247	1	469.338	2	98.156	1	.355	3	.213	1	.201	2
110			min	6.832	15	-746.766	3	3.579	15	-.173	2	.007	15	-.326	3
111		18	max	.939	4	2.013	4	0	5	0	1	0	1	0	4
112			min	.221	15	.473	15	0	1	0	1	0	15	0	15
113		19	max	0	1	.002	2	0	5	0	1	0	1	0	1
114			min	0	1	-.005	3	0	1	0	1	0	1	0	1
115	M10	1	max	98.159	1	466.038	2	-6.391	15	.011	2	.253	1	.173	2
116			min	3.579	15	-749.077	3	-164.99	1	-.025	3	.009	15	-.355	3
117		2	max	98.159	1	338.965	2	-5.049	15	.011	2	.121	1	.226	3
118			min	3.579	15	-556.115	3	-132.351	1	-.025	3	.004	15	-.184	2
119		3	max	98.159	1	211.892	2	-3.707	15	.011	2	.037	2	.634	3
120			min	3.579	15	-363.153	3	-99.712	1	-.025	3	0	9	-.429	2
121		4	max	98.159	1	84.819	2	-2.365	15	.011	2	.005	10	.871	3
122			min	3.579	15	-170.19	3	-67.073	1	-.025	3	-.056	1	-.561	2
123		5	max	98.159	1	22.772	3	-1.022	15	.011	2	-.004	15	.937	3
124			min	3.579	15	-42.254	2	-34.434	1	-.025	3	-.101	1	-.58	2
125		6	max	98.159	1	215.734	3	5.008	9	.011	2	-.005	15	.831	3
126			min	3.579	15	-169.327	2	-15.524	2	-.025	3	-.118	1	-.486	2
127		7	max	98.159	1	408.696	3	30.844	1	.011	2	-.004	15	.553	3
128			min	3.579	15	-296.4	2	-6.866	10	-.025	3	-.105	1	-.279	2
129		8	max	98.159	1	601.659	3	63.483	1	.011	2	-.002	15	.104	3
130			min	3.579	15	-423.472	2	-3.158	10	-.025	3	-.063	1	.001	15
131		9	max	98.159	1	794.621	3	96.122	1	.011	2	.026	9	.474	2
132			min	3.579	15	-550.545	2	.55	10	-.025	3	-.046	2	-.517	3
133		10	max	98.159	1	-15.416	15	128.761	1	0	15	.108	1	1.02	2
134			min	3.579	15	-987.583	3	-4.941	3	-.025	3	-.031	10	-1.309	3
135		11	max	98.159	1	550.545	2	-.55	10	.025	3	.026	9	.474	2
136			min	3.579	15	-794.621	3	-96.122	1	-.011	2	-.046	2	-.517	3
137		12	max	98.159	1	423.472	2	3.158	10	.025	3	-.002	15	.104	3
138			min	3.579	15	-601.659	3	-63.483	1	-.011	2	-.063	1	.001	15
139		13	max	98.159	1	296.4	2	6.866	10	.025	3	-.004	15	.553	3
140			min	3.579	15	-408.696	3	-30.844	1	-.011	2	-.105	1	-.279	2
141		14	max	98.159	1	169.327	2	15.524	2	.025	3	-.005	15	.831	3
142			min	3.579	15	-215.734	3	-5.008	9	-.011	2	-.118	1	-.486	2
143		15	max	98.159	1	42.254	2	34.434	1	.025	3	-.004	15	.937	3
144			min	3.579	15	-22.772	3	1.022	15	-.011	2	-.101	1	-.58	2
145		16	max	98.159	1	170.19	3	67.073	1	.025	3	.005	10	.871	3
146			min	3.579	15	-84.819	2	2.365	15	-.011	2	-.056	1	-.561	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	98.159	1	363.153	3	99.712	1	.025	3	.037	2	.634	3
148			min	3.579	15	-211.892	2	3.707	15	-.011	2	0	9	-.429	2
149		18	max	98.159	1	556.115	3	132.351	1	.025	3	.121	1	.226	3
150			min	3.579	15	-338.965	2	5.049	15	-.011	2	.004	15	-.184	2
151		19	max	98.159	1	749.077	3	164.99	1	.025	3	.253	1	.173	2
152			min	3.579	15	-466.038	2	6.391	15	-.011	2	.009	15	-.355	3
153	M11	1	max	201.194	1	442.349	2	-6.666	15	0	15	.29	1	.101	1
154			min	-234.56	3	-715.806	3	-171.986	1	-.006	1	.01	15	-.36	3
155		2	max	201.194	1	315.276	2	-5.324	15	0	15	.152	1	.191	3
156			min	-234.56	3	-522.844	3	-139.347	1	-.006	1	.005	15	-.251	2
157		3	max	201.194	1	188.203	2	-3.982	15	0	15	.048	2	.57	3
158			min	-234.56	3	-329.882	3	-106.708	1	-.006	1	0	15	-.475	2
159		4	max	201.194	1	61.13	2	-2.639	15	0	15	.012	3	.777	3
160			min	-234.56	3	-136.919	3	-74.069	1	-.006	1	-.038	1	-.586	2
161		5	max	201.194	1	56.043	3	-1.297	15	0	15	.002	3	.813	3
162			min	-234.56	3	-65.943	2	-41.43	1	-.006	1	-.089	1	-.583	2
163		6	max	201.194	1	249.005	3	.631	9	0	15	-.004	12	.678	3
164			min	-234.56	3	-193.016	2	-18.798	2	-.006	1	-.112	1	-.468	2
165		7	max	201.194	1	441.967	3	23.848	1	0	15	-.004	15	.371	3
166			min	-234.56	3	-320.089	2	-7.941	10	-.006	1	-.105	1	-.24	2
167		8	max	201.194	1	634.93	3	56.487	1	0	15	-.002	15	.101	2
168			min	-234.56	3	-447.162	2	-4.233	10	-.006	1	-.069	1	-.108	3
169		9	max	201.194	1	827.892	3	89.126	1	0	15	.018	9	.555	2
170			min	-234.56	3	-574.234	2	-2.1	3	-.006	1	-.052	2	-.758	3
171		10	max	201.194	1	1020.854	3	34.237	2	0	15	.089	1	1.122	2
172			min	-234.56	3	-701.307	2	-121.765	1	-.006	1	-.034	10	-1.58	3
173		11	max	201.194	1	574.234	2	2.1	3	.006	1	.018	9	.555	2
174			min	-234.56	3	-827.892	3	-89.126	1	0	15	-.052	2	-.758	3
175		12	max	201.194	1	447.162	2	4.233	10	.006	1	-.002	15	.101	2
176			min	-234.56	3	-634.93	3	-56.487	1	0	15	-.069	1	-.108	3
177		13	max	201.194	1	320.089	2	7.941	10	.006	1	-.004	15	.371	3
178			min	-234.56	3	-441.967	3	-23.848	1	0	15	-.105	1	-.24	2
179		14	max	201.194	1	193.016	2	18.798	2	.006	1	-.004	12	.678	3
180			min	-234.56	3	-249.005	3	-.631	9	0	15	-.112	1	-.468	2
181		15	max	201.194	1	65.943	2	41.43	1	.006	1	.002	3	.813	3
182			min	-234.56	3	-56.043	3	1.297	15	0	15	-.089	1	-.583	2
183		16	max	201.194	1	136.919	3	74.069	1	.006	1	.012	3	.777	3
184			min	-234.56	3	-61.13	2	2.639	15	0	15	-.038	1	-.586	2
185		17	max	201.194	1	329.882	3	106.708	1	.006	1	.048	2	.57	3
186			min	-234.56	3	-188.203	2	3.982	15	0	15	0	15	-.475	2
187		18	max	201.194	1	522.844	3	139.347	1	.006	1	.152	1	.191	3
188			min	-234.56	3	-315.276	2	5.324	15	0	15	.005	15	-.251	2
189		19	max	201.194	1	715.806	3	171.986	1	.006	1	.29	1	.101	1
190			min	-234.56	3	-442.349	2	6.666	15	0	15	.01	15	-.36	3
191	M12	1	max	17.981	2	643.815	2	-6.743	15	0	3	.308	1	.156	2
192			min	-20.429	9	-273.172	3	-175.361	1	-.006	1	.011	15	.002	15
193		2	max	17.981	2	462.938	2	-5.401	15	0	3	.166	1	.266	3
194			min	-20.429	9	-187.817	3	-142.722	1	-.006	1	.005	15	-.336	2
195		3	max	17.981	2	282.061	2	-4.059	15	0	3	.061	2	.395	3
196			min	-20.429	9	-102.461	3	-110.083	1	-.006	1	.001	15	-.667	2
197		4	max	17.981	2	101.184	2	-2.717	15	0	3	.013	10	.448	3
198			min	-20.429	9	-17.106	3	-77.444	1	-.006	1	-.029	1	-.838	2
199		5	max	17.981	2	68.25	3	-1.375	15	0	3	-.003	12	.426	3
200			min	-20.429	9	-79.693	2	-44.805	1	-.006	1	-.084	1	-.847	2
201		6	max	17.981	2	153.605	3	-.032	15	0	3	-.004	15	.327	3
202			min	-20.429	9	-260.57	2	-22.555	2	-.006	1	-.109	1	-.696	2
203		7	max	17.981	2	238.961	3	20.729	9	0	3	-.004	15	.153	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	-20.429	9	-441.447	2	-10.026	10	-.006	1	-.105	1	-.384	2
205		8	max	17.981	2	324.316	3	53.112	1	0	3	-.002	15	.089	2
206			min	-20.429	9	-622.324	2	-6.318	10	-.006	1	-.073	1	-.098	3
207		9	max	17.981	2	409.672	3	85.751	1	0	3	.016	9	.722	2
208			min	-20.429	9	-803.201	2	-2.611	10	-.006	1	-.059	2	-.424	3
209		10	max	17.981	2	984.078	2	3.797	3	0	3	.081	9	1.517	2
210			min	-20.429	9	-561.443	10	-118.39	1	-.006	1	-.04	10	-.826	3
211		11	max	17.981	2	803.201	2	2.611	10	.006	1	.016	9	.722	2
212			min	-20.429	9	-409.672	3	-85.751	1	0	3	-.059	2	-.424	3
213		12	max	17.981	2	622.324	2	6.318	10	.006	1	-.002	15	.089	2
214			min	-20.429	9	-324.316	3	-53.112	1	0	3	-.073	1	-.098	3
215		13	max	17.981	2	441.447	2	10.026	10	.006	1	-.004	15	.153	3
216			min	-20.429	9	-238.961	3	-20.729	9	0	3	-.105	1	-.384	2
217		14	max	17.981	2	260.57	2	22.555	2	.006	1	-.004	15	.327	3
218			min	-20.429	9	-153.605	3	.032	15	0	3	-.109	1	-.696	2
219		15	max	17.981	2	79.693	2	44.805	1	.006	1	-.003	12	.426	3
220			min	-20.429	9	-68.25	3	1.375	15	0	3	-.084	1	-.847	2
221		16	max	17.981	2	17.106	3	77.444	1	.006	1	.013	10	.448	3
222			min	-20.429	9	-101.184	2	2.717	15	0	3	-.029	1	-.838	2
223		17	max	17.981	2	102.461	3	110.083	1	.006	1	.061	2	.395	3
224			min	-20.429	9	-282.061	2	4.059	15	0	3	.001	15	-.667	2
225		18	max	17.981	2	187.817	3	142.722	1	.006	1	.166	1	.266	3
226			min	-20.429	9	-462.938	2	5.401	15	0	3	.005	15	-.336	2
227		19	max	17.981	2	273.172	3	175.361	1	.006	1	.308	1	.156	2
228			min	-20.429	9	-643.815	2	6.743	15	0	3	.011	15	.002	15
229	M13	1	max	-2.77	12	687.673	2	-6.382	15	.01	3	.25	1	.199	2
230			min	-123.459	1	-307.273	3	-164.714	1	-.024	2	.009	15	-.058	3
231		2	max	-2.77	12	506.796	2	-5.04	15	.01	3	.119	1	.177	3
232			min	-123.459	1	-221.917	3	-132.075	1	-.024	2	.004	15	-.331	2
233		3	max	-2.77	12	325.919	2	-3.698	15	.01	3	.035	2	.336	3
234			min	-123.459	1	-136.562	3	-99.436	1	-.024	2	-.002	9	-.702	2
235		4	max	-2.77	12	145.042	2	-2.356	15	.01	3	.004	10	.42	3
236			min	-123.459	1	-51.206	3	-66.797	1	-.024	2	-.058	1	-.911	2
237		5	max	-2.77	12	34.15	3	-1.013	15	.01	3	-.004	12	.427	3
238			min	-123.459	1	-35.834	2	-34.158	1	-.024	2	-.103	1	-.959	2
239		6	max	-2.77	12	119.505	3	5.149	9	.01	3	-.005	15	.359	3
240			min	-123.459	1	-216.711	2	-15.31	2	-.024	2	-.119	1	-.847	2
241		7	max	-2.77	12	204.861	3	31.12	1	.01	3	-.004	15	.215	3
242			min	-123.459	1	-397.588	2	-6.76	10	-.024	2	-.106	1	-.574	2
243		8	max	-2.77	12	290.216	3	63.759	1	.01	3	-.002	15	-.004	15
244			min	-123.459	1	-578.465	2	-3.052	10	-.024	2	-.064	1	-.14	2
245		9	max	-2.77	12	375.572	3	96.398	1	.01	3	.026	9	.454	2
246			min	-123.459	1	-759.342	2	.656	10	-.024	2	-.047	2	-.301	3
247		10	max	-2.77	12	940.219	2	4.267	3	.01	3	.108	1	1.21	2
248			min	-123.459	1	14.681	15	-129.037	1	-.024	2	-.032	10	-.673	3
249		11	max	-2.77	12	759.342	2	-.656	10	.024	2	.026	9	.454	2
250			min	-123.459	1	-375.572	3	-96.398	1	-.01	3	-.047	2	-.301	3
251		12	max	-2.77	12	578.465	2	3.052	10	.024	2	-.002	15	-.004	15
252			min	-123.459	1	-290.216	3	-63.759	1	-.01	3	-.064	1	-.14	2
253		13	max	-2.77	12	397.588	2	6.76	10	.024	2	-.004	15	.215	3
254			min	-123.459	1	-204.861	3	-31.12	1	-.01	3	-.106	1	-.574	2
255		14	max	-2.77	12	216.711	2	15.31	2	.024	2	-.005	15	.359	3
256			min	-123.459	1	-119.505	3	-5.149	9	-.01	3	-.119	1	-.847	2
257		15	max	-2.77	12	35.834	2	34.158	1	.024	2	-.004	12	.427	3
258			min	-123.459	1	-34.15	3	1.013	15	-.01	3	-.103	1	-.959	2
259		16	max	-2.77	12	51.206	3	66.797	1	.024	2	.004	10	.42	3
260			min	-123.459	1	-145.042	2	2.356	15	-.01	3	-.058	1	-.911	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	-2.77	12	136.562	3	99.436	1	.024	2	.035	2	.336	3
262			min	-123.459	1	-325.919	2	3.698	15	-.01	3	-.002	9	-.702	2
263		18	max	-2.77	12	221.917	3	132.075	1	.024	2	.119	1	.177	3
264			min	-123.459	1	-506.796	2	5.04	15	-.01	3	.004	15	-.331	2
265		19	max	-2.77	12	307.273	3	164.714	1	.024	2	.25	1	.199	2
266			min	-123.459	1	-687.673	2	6.382	15	-.01	3	.009	15	-.058	3
267	M2	1	max	2257.847	2	917.761	3	176.359	2	.003	3	.267	3	4.571	1
268			min	-1764.575	3	-640.124	2	-208.226	3	-.007	2	-.208	2	.165	15
269		2	max	2255.293	2	917.761	3	176.359	2	.003	3	.209	3	4.628	1
270			min	-1766.491	3	-640.124	2	-208.226	3	-.007	2	-.16	1	.163	15
271		3	max	2252.738	2	917.761	3	176.359	2	.003	3	.151	3	4.685	1
272			min	-1768.407	3	-640.124	2	-208.226	3	-.007	2	-.115	1	.161	15
273		4	max	1562.328	2	1079.591	1	128.835	2	.001	2	.11	3	4.544	1
274			min	-1523.101	3	36.789	15	-188.582	3	0	3	-.101	1	.155	15
275		5	max	1559.773	2	1079.591	1	128.835	2	.001	2	.057	3	4.241	1
276			min	-1525.017	3	36.789	15	-188.582	3	0	3	-.067	1	.145	15
277		6	max	1557.218	2	1079.591	1	128.835	2	.001	2	.004	3	3.938	1
278			min	-1526.934	3	36.789	15	-188.582	3	0	3	-.034	1	.134	15
279		7	max	1554.663	2	1079.591	1	128.835	2	.001	2	.012	2	3.635	1
280			min	-1528.85	3	36.789	15	-188.582	3	0	3	-.049	3	.124	15
281		8	max	1552.108	2	1079.591	1	128.835	2	.001	2	.048	2	3.332	1
282			min	-1530.766	3	36.789	15	-188.582	3	0	3	-.102	3	.114	15
283		9	max	1549.554	2	1079.591	1	128.835	2	.001	2	.084	2	3.029	1
284			min	-1532.682	3	36.789	15	-188.582	3	0	3	-.155	3	.103	15
285		10	max	1546.999	2	1079.591	1	128.835	2	.001	2	.12	2	2.726	1
286			min	-1534.598	3	36.789	15	-188.582	3	0	3	-.208	3	.093	15
287		11	max	1544.444	2	1079.591	1	128.835	2	.001	2	.157	2	2.423	1
288			min	-1536.514	3	36.789	15	-188.582	3	0	3	-.261	3	.083	15
289		12	max	1541.889	2	1079.591	1	128.835	2	.001	2	.193	2	2.12	1
290			min	-1538.431	3	36.789	15	-188.582	3	0	3	-.314	3	.072	15
291		13	max	1539.334	2	1079.591	1	128.835	2	.001	2	.229	2	1.817	1
292			min	-1540.347	3	36.789	15	-188.582	3	0	3	-.367	3	.062	15
293		14	max	1536.779	2	1079.591	1	128.835	2	.001	2	.265	2	1.515	1
294			min	-1542.263	3	36.789	15	-188.582	3	0	3	-.42	3	.052	15
295		15	max	1534.224	2	1079.591	1	128.835	2	.001	2	.301	2	1.212	1
296			min	-1544.179	3	36.789	15	-188.582	3	0	3	-.473	3	.041	15
297		16	max	1531.669	2	1079.591	1	128.835	2	.001	2	.337	2	.909	1
298			min	-1546.095	3	36.789	15	-188.582	3	0	3	-.525	3	.031	15
299		17	max	1529.114	2	1079.591	1	128.835	2	.001	2	.374	2	.606	1
300			min	-1548.011	3	36.789	15	-188.582	3	0	3	-.578	3	.021	15
301		18	max	1526.56	2	1079.591	1	128.835	2	.001	2	.41	2	.303	1
302			min	-1549.928	3	36.789	15	-188.582	3	0	3	-.631	3	.01	15
303		19	max	1524.005	2	1079.591	1	128.835	2	.001	2	.446	2	0	1
304			min	-1551.844	3	36.789	15	-188.582	3	0	3	-.684	3	0	1
305	M5	1	max	6190.082	2	2525.681	3	0	1	0	1	0	1	8.036	1
306			min	-5299.167	3	-2530.836	2	0	1	0	1	0	1	.263	15
307		2	max	6187.528	2	2525.681	3	0	1	0	1	0	1	8.454	1
308			min	-5301.083	3	-2530.836	2	0	1	0	1	0	1	.266	15
309		3	max	6184.973	2	2525.681	3	0	1	0	1	0	1	8.873	1
310			min	-5302.999	3	-2530.836	2	0	1	0	1	0	1	.269	15
311		4	max	4275.291	2	2076.586	1	0	1	0	1	0	1	8.74	1
312			min	-4435.74	3	62.079	15	0	1	0	1	0	1	.261	15
313		5	max	4272.736	2	2076.586	1	0	1	0	1	0	1	8.157	1
314			min	-4437.657	3	62.079	15	0	1	0	1	0	1	.244	15
315		6	max	4270.181	2	2076.586	1	0	1	0	1	0	1	7.574	1
316			min	-4439.573	3	62.079	15	0	1	0	1	0	1	.226	15
317		7	max	4267.627	2	2076.586	1	0	1	0	1	0	1	6.992	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	-4441.489	3	62.079	15	0	1	0	1	0	1	.209	15
319		8	max	4265.072	2	2076.586	1	0	1	0	1	0	1	6.409	1
320			min	-4443.405	3	62.079	15	0	1	0	1	0	1	.192	15
321		9	max	4262.517	2	2076.586	1	0	1	0	1	0	1	5.826	1
322			min	-4445.321	3	62.079	15	0	1	0	1	0	1	.174	15
323		10	max	4259.962	2	2076.586	1	0	1	0	1	0	1	5.244	1
324			min	-4447.237	3	62.079	15	0	1	0	1	0	1	.157	15
325		11	max	4257.407	2	2076.586	1	0	1	0	1	0	1	4.661	1
326			min	-4449.154	3	62.079	15	0	1	0	1	0	1	.139	15
327		12	max	4254.852	2	2076.586	1	0	1	0	1	0	1	4.078	1
328			min	-4451.07	3	62.079	15	0	1	0	1	0	1	.122	15
329		13	max	4252.297	2	2076.586	1	0	1	0	1	0	1	3.496	1
330			min	-4452.986	3	62.079	15	0	1	0	1	0	1	.105	15
331		14	max	4249.742	2	2076.586	1	0	1	0	1	0	1	2.913	1
332			min	-4454.902	3	62.079	15	0	1	0	1	0	1	.087	15
333		15	max	4247.187	2	2076.586	1	0	1	0	1	0	1	2.331	1
334			min	-4456.818	3	62.079	15	0	1	0	1	0	1	.07	15
335		16	max	4244.633	2	2076.586	1	0	1	0	1	0	1	1.748	1
336			min	-4458.734	3	62.079	15	0	1	0	1	0	1	.052	15
337		17	max	4242.078	2	2076.586	1	0	1	0	1	0	1	1.165	1
338			min	-4460.651	3	62.079	15	0	1	0	1	0	1	.035	15
339		18	max	4239.523	2	2076.586	1	0	1	0	1	0	1	.583	1
340			min	-4462.567	3	62.079	15	0	1	0	1	0	1	.017	15
341		19	max	4236.968	2	2076.586	1	0	1	0	1	0	1	0	1
342			min	-4464.483	3	62.079	15	0	1	0	1	0	1	0	1
343	M8	1	max	2257.847	2	917.761	3	208.226	3	.007	2	.208	2	4.571	1
344			min	-1764.575	3	-640.124	2	-176.359	2	-.003	3	-.267	3	.165	15
345		2	max	2255.293	2	917.761	3	208.226	3	.007	2	.16	1	4.628	1
346			min	-1766.491	3	-640.124	2	-176.359	2	-.003	3	-.209	3	.163	15
347		3	max	2252.738	2	917.761	3	208.226	3	.007	2	.115	1	4.685	1
348			min	-1768.407	3	-640.124	2	-176.359	2	-.003	3	-.151	3	.161	15
349		4	max	1562.328	2	1079.591	1	188.582	3	0	3	.101	1	4.544	1
350			min	-1523.101	3	36.789	15	-128.835	2	-.001	2	-.11	3	.155	15
351		5	max	1559.773	2	1079.591	1	188.582	3	0	3	.067	1	4.241	1
352			min	-1525.017	3	36.789	15	-128.835	2	-.001	2	-.057	3	.145	15
353		6	max	1557.218	2	1079.591	1	188.582	3	0	3	.034	1	3.938	1
354			min	-1526.934	3	36.789	15	-128.835	2	-.001	2	-.004	3	.134	15
355		7	max	1554.663	2	1079.591	1	188.582	3	0	3	.049	3	3.635	1
356			min	-1528.85	3	36.789	15	-128.835	2	-.001	2	-.012	2	.124	15
357		8	max	1552.108	2	1079.591	1	188.582	3	0	3	.102	3	3.332	1
358			min	-1530.766	3	36.789	15	-128.835	2	-.001	2	-.048	2	.114	15
359		9	max	1549.554	2	1079.591	1	188.582	3	0	3	.155	3	3.029	1
360			min	-1532.682	3	36.789	15	-128.835	2	-.001	2	-.084	2	.103	15
361		10	max	1546.999	2	1079.591	1	188.582	3	0	3	.208	3	2.726	1
362			min	-1534.598	3	36.789	15	-128.835	2	-.001	2	-.12	2	.093	15
363		11	max	1544.444	2	1079.591	1	188.582	3	0	3	.261	3	2.423	1
364			min	-1536.514	3	36.789	15	-128.835	2	-.001	2	-.157	2	.083	15
365		12	max	1541.889	2	1079.591	1	188.582	3	0	3	.314	3	2.12	1
366			min	-1538.431	3	36.789	15	-128.835	2	-.001	2	-.193	2	.072	15
367		13	max	1539.334	2	1079.591	1	188.582	3	0	3	.367	3	1.817	1
368			min	-1540.347	3	36.789	15	-128.835	2	-.001	2	-.229	2	.062	15
369		14	max	1536.779	2	1079.591	1	188.582	3	0	3	.42	3	1.515	1
370			min	-1542.263	3	36.789	15	-128.835	2	-.001	2	-.265	2	.052	15
371		15	max	1534.224	2	1079.591	1	188.582	3	0	3	.473	3	1.212	1
372			min	-1544.179	3	36.789	15	-128.835	2	-.001	2	-.301	2	.041	15
373		16	max	1531.669	2	1079.591	1	188.582	3	0	3	.525	3	.909	1
374			min	-1546.095	3	36.789	15	-128.835	2	-.001	2	-.337	2	.031	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
375		17	max	1529.114	2	1079.591	1	188.582	3	0	3	.578	3	.606	1
376			min	-1548.011	3	36.789	15	-128.835	2	-.001	2	-.374	2	.021	15
377		18	max	1526.56	2	1079.591	1	188.582	3	0	3	.631	3	.303	1
378			min	-1549.928	3	36.789	15	-128.835	2	-.001	2	-.41	2	.01	15
379		19	max	1524.005	2	1079.591	1	188.582	3	0	3	.684	3	0	1
380			min	-1551.844	3	36.789	15	-128.835	2	-.001	2	-.446	2	0	1
381	M3	1	max	1719.536	2	4.588	4	47.041	2	.015	3	.004	2	0	1
382			min	-623.246	3	1.079	15	-20.098	3	-.031	2	-.002	3	0	1
383		2	max	1719.361	2	4.078	4	47.041	2	.015	3	.018	2	0	15
384			min	-623.377	3	.959	15	-20.098	3	-.031	2	-.008	3	-.001	4
385		3	max	1719.187	2	3.569	4	47.041	2	.015	3	.031	2	0	15
386			min	-623.508	3	.839	15	-20.098	3	-.031	2	-.014	3	-.002	4
387		4	max	1719.013	2	3.059	4	47.041	2	.015	3	.045	2	0	15
388			min	-623.639	3	.719	15	-20.098	3	-.031	2	-.02	3	-.003	4
389		5	max	1718.838	2	2.549	4	47.041	2	.015	3	.059	2	0	15
390			min	-623.769	3	.599	15	-20.098	3	-.031	2	-.026	3	-.004	4
391		6	max	1718.664	2	2.039	4	47.041	2	.015	3	.073	2	-.001	15
392			min	-623.9	3	.479	15	-20.098	3	-.031	2	-.032	3	-.005	4
393		7	max	1718.49	2	1.529	4	47.041	2	.015	3	.086	2	-.001	15
394			min	-624.031	3	.36	15	-20.098	3	-.031	2	-.037	3	-.005	4
395		8	max	1718.315	2	1.02	4	47.041	2	.015	3	.1	2	-.001	15
396			min	-624.162	3	.24	15	-20.098	3	-.031	2	-.043	3	-.006	4
397		9	max	1718.141	2	.51	4	47.041	2	.015	3	.114	2	-.001	15
398			min	-624.293	3	.12	15	-20.098	3	-.031	2	-.049	3	-.006	4
399		10	max	1717.966	2	0	1	47.041	2	.015	3	.128	2	-.001	15
400			min	-624.423	3	0	1	-20.098	3	-.031	2	-.055	3	-.006	4
401		11	max	1717.792	2	-.12	15	47.041	2	.015	3	.141	2	-.001	15
402			min	-624.554	3	-.51	4	-20.098	3	-.031	2	-.061	3	-.006	4
403		12	max	1717.618	2	-.24	15	47.041	2	.015	3	.155	2	-.001	15
404			min	-624.685	3	-1.02	4	-20.098	3	-.031	2	-.067	3	-.006	4
405		13	max	1717.443	2	-.36	15	47.041	2	.015	3	.169	2	-.001	15
406			min	-624.816	3	-1.529	4	-20.098	3	-.031	2	-.073	3	-.005	4
407		14	max	1717.269	2	-.479	15	47.041	2	.015	3	.183	2	-.001	15
408			min	-624.947	3	-2.039	4	-20.098	3	-.031	2	-.079	3	-.005	4
409		15	max	1717.094	2	-.599	15	47.041	2	.015	3	.197	2	0	15
410			min	-625.077	3	-2.549	4	-20.098	3	-.031	2	-.084	3	-.004	4
411		16	max	1716.92	2	-.719	15	47.041	2	.015	3	.21	2	0	15
412			min	-625.208	3	-3.059	4	-20.098	3	-.031	2	-.09	3	-.003	4
413		17	max	1716.746	2	-.839	15	47.041	2	.015	3	.224	2	0	15
414			min	-625.339	3	-3.569	4	-20.098	3	-.031	2	-.096	3	-.002	4
415		18	max	1716.571	2	-.959	15	47.041	2	.015	3	.238	2	0	15
416			min	-625.47	3	-4.078	4	-20.098	3	-.031	2	-.102	3	-.001	4
417		19	max	1716.397	2	-1.079	15	47.041	2	.015	3	.252	2	0	1
418			min	-625.6	3	-4.588	4	-20.098	3	-.031	2	-.108	3	0	1
419	M6	1	max	4831.956	2	4.588	4	0	1	0	1	0	1	0	1
420			min	-2179.242	3	1.079	15	0	1	0	1	0	1	0	1
421		2	max	4831.782	2	4.078	4	0	1	0	1	0	1	0	15
422			min	-2179.373	3	.959	15	0	1	0	1	0	1	-.001	4
423		3	max	4831.607	2	3.569	4	0	1	0	1	0	1	0	15
424			min	-2179.503	3	.839	15	0	1	0	1	0	1	-.002	4
425		4	max	4831.433	2	3.059	4	0	1	0	1	0	1	0	15
426			min	-2179.634	3	.719	15	0	1	0	1	0	1	-.003	4
427		5	max	4831.258	2	2.549	4	0	1	0	1	0	1	0	15
428			min	-2179.765	3	.599	15	0	1	0	1	0	1	-.004	4
429		6	max	4831.084	2	2.039	4	0	1	0	1	0	1	-.001	15
430			min	-2179.896	3	.479	15	0	1	0	1	0	1	-.005	4
431		7	max	4830.91	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	-2180.027	3	.36	15	0	1	0	1	0	1	-.005	4
433		8	max	4830.735	2	1.02	4	0	1	0	1	0	1	-.001	15
434			min	-2180.157	3	.24	15	0	1	0	1	0	1	-.006	4
435		9	max	4830.561	2	.51	4	0	1	0	1	0	1	-.001	15
436			min	-2180.288	3	.12	15	0	1	0	1	0	1	-.006	4
437		10	max	4830.386	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2180.419	3	0	1	0	1	0	1	0	1	-.006	4
439		11	max	4830.212	2	-.12	15	0	1	0	1	0	1	-.001	15
440			min	-2180.55	3	-.51	4	0	1	0	1	0	1	-.006	4
441		12	max	4830.038	2	-.24	15	0	1	0	1	0	1	-.001	15
442			min	-2180.681	3	-1.02	4	0	1	0	1	0	1	-.006	4
443		13	max	4829.863	2	-.36	15	0	1	0	1	0	1	-.001	15
444			min	-2180.811	3	-1.529	4	0	1	0	1	0	1	-.005	4
445		14	max	4829.689	2	-.479	15	0	1	0	1	0	1	-.001	15
446			min	-2180.942	3	-2.039	4	0	1	0	1	0	1	-.005	4
447		15	max	4829.515	2	-.599	15	0	1	0	1	0	1	0	15
448			min	-2181.073	3	-2.549	4	0	1	0	1	0	1	-.004	4
449		16	max	4829.34	2	-.719	15	0	1	0	1	0	1	0	15
450			min	-2181.204	3	-3.059	4	0	1	0	1	0	1	-.003	4
451		17	max	4829.166	2	-.839	15	0	1	0	1	0	1	0	15
452			min	-2181.335	3	-3.569	4	0	1	0	1	0	1	-.002	4
453		18	max	4828.991	2	-.959	15	0	1	0	1	0	1	0	15
454			min	-2181.465	3	-4.078	4	0	1	0	1	0	1	-.001	4
455		19	max	4828.817	2	-1.079	15	0	1	0	1	0	1	0	1
456			min	-2181.596	3	-4.588	4	0	1	0	1	0	1	0	1
457	M9	1	max	1719.536	2	4.588	4	20.098	3	.031	2	.002	3	0	1
458			min	-623.246	3	1.079	15	-47.041	2	-.015	3	-.004	2	0	1
459		2	max	1719.361	2	4.078	4	20.098	3	.031	2	.008	3	0	15
460			min	-623.377	3	.959	15	-47.041	2	-.015	3	-.018	2	-.001	4
461		3	max	1719.187	2	3.569	4	20.098	3	.031	2	.014	3	0	15
462			min	-623.508	3	.839	15	-47.041	2	-.015	3	-.031	2	-.002	4
463		4	max	1719.013	2	3.059	4	20.098	3	.031	2	.02	3	0	15
464			min	-623.639	3	.719	15	-47.041	2	-.015	3	-.045	2	-.003	4
465		5	max	1718.838	2	2.549	4	20.098	3	.031	2	.026	3	0	15
466			min	-623.769	3	.599	15	-47.041	2	-.015	3	-.059	2	-.004	4
467		6	max	1718.664	2	2.039	4	20.098	3	.031	2	.032	3	-.001	15
468			min	-623.9	3	.479	15	-47.041	2	-.015	3	-.073	2	-.005	4
469		7	max	1718.49	2	1.529	4	20.098	3	.031	2	.037	3	-.001	15
470			min	-624.031	3	.36	15	-47.041	2	-.015	3	-.086	2	-.005	4
471		8	max	1718.315	2	1.02	4	20.098	3	.031	2	.043	3	-.001	15
472			min	-624.162	3	.24	15	-47.041	2	-.015	3	-.1	2	-.006	4
473		9	max	1718.141	2	.51	4	20.098	3	.031	2	.049	3	-.001	15
474			min	-624.293	3	.12	15	-47.041	2	-.015	3	-.114	2	-.006	4
475		10	max	1717.966	2	0	1	20.098	3	.031	2	.055	3	-.001	15
476			min	-624.423	3	0	1	-47.041	2	-.015	3	-.128	2	-.006	4
477		11	max	1717.792	2	-.12	15	20.098	3	.031	2	.061	3	-.001	15
478			min	-624.554	3	-.51	4	-47.041	2	-.015	3	-.141	2	-.006	4
479		12	max	1717.618	2	-.24	15	20.098	3	.031	2	.067	3	-.001	15
480			min	-624.685	3	-1.02	4	-47.041	2	-.015	3	-.155	2	-.006	4
481		13	max	1717.443	2	-.36	15	20.098	3	.031	2	.073	3	-.001	15
482			min	-624.816	3	-1.529	4	-47.041	2	-.015	3	-.169	2	-.005	4
483		14	max	1717.269	2	-.479	15	20.098	3	.031	2	.079	3	-.001	15
484			min	-624.947	3	-2.039	4	-47.041	2	-.015	3	-.183	2	-.005	4
485		15	max	1717.094	2	-.599	15	20.098	3	.031	2	.084	3	0	15
486			min	-625.077	3	-2.549	4	-47.041	2	-.015	3	-.197	2	-.004	4
487		16	max	1716.92	2	-.719	15	20.098	3	.031	2	.09	3	0	15
488			min	-625.208	3	-3.059	4	-47.041	2	-.015	3	-.21	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	1716.746	2	-.839	15	20.098	3	.031	2	.096	3	0	15
490			min	-625.339	3	-3.569	4	-47.041	2	-.015	3	-.224	2	-.002	4
491		18	max	1716.571	2	-.959	15	20.098	3	.031	2	.102	3	0	15
492			min	-625.47	3	-4.078	4	-47.041	2	-.015	3	-.238	2	-.001	4
493		19	max	1716.397	2	-1.079	15	20.098	3	.031	2	.108	3	0	1
494			min	-625.6	3	-4.588	4	-47.041	2	-.015	3	-.252	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	.05	3	.019	1	7.753e-3	3	NC	3	NC	3
2			min	-.229	1	-.576	1	0	15	-2.014e-2	2	216.583	1	3748.714	1
3		2	max	-.008	15	.023	3	.006	1	7.753e-3	3	8008.57	12	NC	3
4			min	-.229	1	-.487	1	0	15	-2.014e-2	2	253.122	1	5952.718	1
5		3	max	-.008	15	-.004	12	0	15	7.295e-3	3	8652.808	15	NC	1
6			min	-.229	1	-.397	1	-.006	1	-1.858e-2	2	304.55	1	NC	1
7		4	max	-.008	15	-.01	15	0	15	6.594e-3	3	NC	15	NC	1
8			min	-.228	1	-.311	1	-.011	1	-1.618e-2	2	378.683	1	NC	1
9		5	max	-.008	15	-.008	15	0	12	5.892e-3	3	NC	15	NC	1
10			min	-.228	1	-.233	1	-.011	1	-1.377e-2	2	485.498	1	NC	1
11		6	max	-.008	15	-.006	15	.001	3	5.836e-3	3	NC	15	NC	1
12			min	-.228	1	-.169	1	-.009	1	-1.286e-2	2	633.236	1	NC	1
13		7	max	-.008	15	-.004	15	.001	3	6.227e-3	3	NC	5	NC	1
14			min	-.228	1	-.117	1	-.004	2	-1.298e-2	2	836.136	1	NC	1
15		8	max	-.008	15	-.003	15	0	3	6.618e-3	3	NC	5	NC	2
16			min	-.227	1	-.075	1	0	2	-1.31e-2	2	1101.609	3	7982.428	1
17		9	max	-.008	15	-.002	15	0	15	7.277e-3	3	NC	2	NC	2
18			min	-.227	1	-.068	3	0	3	-1.255e-2	2	1135.209	3	7968.83	1
19		10	max	-.008	15	.007	2	0	2	8.407e-3	3	NC	5	NC	2
20			min	-.226	1	-.061	3	0	3	-1.079e-2	2	1209.025	3	7709.112	1
21		11	max	-.008	15	.036	2	0	3	9.537e-3	3	NC	1	NC	2
22			min	-.226	1	-.049	3	0	2	-9.037e-3	2	1352.19	3	8003.486	1
23		12	max	-.008	15	.064	1	.004	3	7.902e-3	3	NC	4	NC	1
24			min	-.225	1	-.032	3	-.004	1	-6.625e-3	2	1630.226	3	NC	1
25		13	max	-.008	15	.088	1	.008	3	4.702e-3	3	NC	4	NC	1
26			min	-.225	1	-.005	3	-.005	2	-3.839e-3	2	1444.285	2	NC	1
27		14	max	-.008	15	.103	1	.008	3	1.666e-3	3	NC	3	NC	2
28			min	-.224	1	.004	15	-.002	2	-1.161e-3	2	1326.769	2	7882.526	1
29		15	max	-.008	15	.106	3	.006	1	5.935e-3	3	NC	4	NC	2
30			min	-.224	1	.004	15	0	15	-3.248e-3	2	1416.06	2	5893.352	1
31		16	max	-.008	15	.19	3	.008	1	1.02e-2	3	NC	4	NC	3
32			min	-.224	1	.004	15	0	15	-5.334e-3	2	958.165	3	5319.54	1
33		17	max	-.008	15	.285	3	.005	1	1.447e-2	3	NC	4	NC	2
34			min	-.224	1	.004	15	0	15	-7.42e-3	2	569.924	3	6042.795	1
35		18	max	-.008	15	.385	3	0	15	1.726e-2	3	NC	4	NC	1
36			min	-.225	1	-.001	10	-.005	1	-8.781e-3	2	400.404	3	NC	1
37		19	max	-.008	15	.484	3	0	15	1.726e-2	3	NC	1	NC	1
38			min	-.225	1	-.017	10	-.017	1	-8.781e-3	2	308.703	3	NC	1
39	M4	1	max	-.013	15	.228	3	0	1	0	1	NC	3	NC	1
40			min	-.436	1	-1.277	2	0	1	0	1	118.396	1	NC	1
41		2	max	-.013	15	.151	3	0	1	0	1	4886.026	15	NC	1
42			min	-.436	1	-1.059	2	0	1	0	1	142.963	1	NC	1
43		3	max	-.013	15	.073	3	0	1	0	1	5904.135	15	NC	1
44			min	-.436	1	-.839	2	0	1	0	1	180.519	1	NC	1
45		4	max	-.013	15	0	3	0	1	0	1	7395.405	15	NC	1
46			min	-.435	1	-.629	2	0	1	0	1	241.541	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	-.013	15	0	1	0	1	9594.983	15	NC	1
48			min	-.435	1	-.461	1	0	1	0	1	345.325	1	NC	1
49		6	max	-.013	15	-.01	15	0	1	0	1	NC	15	NC	1
50			min	-.435	1	-.329	1	0	1	0	1	411.811	3	NC	1
51		7	max	-.013	15	-.007	15	0	1	0	1	NC	5	NC	1
52			min	-.434	1	-.229	1	0	1	0	1	390.236	3	NC	1
53		8	max	-.013	15	-.005	15	0	1	0	1	NC	5	NC	1
54			min	-.433	1	-.15	1	0	1	0	1	385.788	3	NC	1
55		9	max	-.013	15	-.003	15	0	1	0	1	NC	1	NC	1
56			min	-.431	1	-.116	3	0	1	0	1	389.813	3	NC	1
57		10	max	-.013	15	.002	10	0	1	0	1	NC	4	NC	1
58			min	-.43	1	-.108	3	0	1	0	1	399.116	3	NC	1
59		11	max	-.013	15	.062	2	0	1	0	1	NC	4	NC	1
60			min	-.429	1	-.093	3	0	1	0	1	417.725	3	NC	1
61		12	max	-.013	15	.122	1	0	1	0	1	NC	5	NC	1
62			min	-.428	1	-.07	3	0	1	0	1	450.88	3	NC	1
63		13	max	-.013	15	.172	1	0	1	0	1	NC	5	NC	1
64			min	-.427	1	-.024	3	0	1	0	1	429.048	2	NC	1
65		14	max	-.013	15	.194	1	0	1	0	1	NC	5	NC	1
66			min	-.425	1	.006	15	0	1	0	1	409.907	2	NC	1
67		15	max	-.013	15	.212	3	0	1	0	1	NC	5	NC	1
68			min	-.425	1	.006	15	0	1	0	1	446.423	2	NC	1
69		16	max	-.013	15	.404	3	0	1	0	1	NC	5	NC	1
70			min	-.426	1	.005	15	0	1	0	1	552.053	2	NC	1
71		17	max	-.013	15	.623	3	0	1	0	1	NC	5	NC	1
72			min	-.426	1	-.002	10	0	1	0	1	339.304	3	NC	1
73		18	max	-.013	15	.852	3	0	1	0	1	NC	4	NC	1
74			min	-.426	1	-.067	2	0	1	0	1	214.784	3	NC	1
75		19	max	-.013	15	1.08	3	0	1	0	1	NC	1	NC	1
76			min	-.426	1	-.15	2	0	1	0	1	157.247	3	NC	1
77	M7	1	max	-.008	15	.05	3	0	15	2.014e-2	2	NC	3	NC	3
78			min	-.229	1	-.576	1	-.019	1	-7.753e-3	3	216.583	1	3748.714	1
79		2	max	-.008	15	.023	3	0	15	2.014e-2	2	8008.57	12	NC	3
80			min	-.229	1	-.487	1	-.006	1	-7.753e-3	3	253.122	1	5952.718	1
81		3	max	-.008	15	-.004	12	.006	1	1.858e-2	2	8652.808	15	NC	1
82			min	-.229	1	-.397	1	0	15	-7.295e-3	3	304.55	1	NC	1
83		4	max	-.008	15	-.01	15	.011	1	1.618e-2	2	NC	15	NC	1
84			min	-.228	1	-.311	1	0	15	-6.594e-3	3	378.683	1	NC	1
85		5	max	-.008	15	-.008	15	.011	1	1.377e-2	2	NC	15	NC	1
86			min	-.228	1	-.233	1	0	12	-5.892e-3	3	485.498	1	NC	1
87		6	max	-.008	15	-.006	15	.009	1	1.286e-2	2	NC	15	NC	1
88			min	-.228	1	-.169	1	-.001	3	-5.836e-3	3	633.236	1	NC	1
89		7	max	-.008	15	-.004	15	.004	2	1.298e-2	2	NC	5	NC	1
90			min	-.228	1	-.117	1	-.001	3	-6.227e-3	3	836.136	1	NC	1
91		8	max	-.008	15	-.003	15	0	2	1.31e-2	2	NC	5	NC	2
92			min	-.227	1	-.075	1	0	3	-6.618e-3	3	1101.609	3	7982.428	1
93		9	max	-.008	15	-.002	15	0	3	1.255e-2	2	NC	2	NC	2
94			min	-.227	1	-.068	3	0	15	-7.277e-3	3	1135.209	3	7968.83	1
95		10	max	-.008	15	.007	2	0	3	1.079e-2	2	NC	5	NC	2
96			min	-.226	1	-.061	3	0	2	-8.407e-3	3	1209.025	3	7709.112	1
97		11	max	-.008	15	.036	2	0	2	9.037e-3	2	NC	1	NC	2
98			min	-.226	1	-.049	3	0	3	-9.537e-3	3	1352.19	3	8003.486	1
99		12	max	-.008	15	.064	1	.004	1	6.625e-3	2	NC	4	NC	1
100			min	-.225	1	-.032	3	-.004	3	-7.902e-3	3	1630.226	3	NC	1
101		13	max	-.008	15	.088	1	.005	2	3.839e-3	2	NC	4	NC	1
102			min	-.225	1	-.005	3	-.008	3	-4.702e-3	3	1444.285	2	NC	1
103		14	max	-.008	15	.103	1	.002	2	1.161e-3	2	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	-.224	1	.004	15	-.008	3	-1.666e-3	3	1326.769	2	7882.526	1
105		15	max	-.008	15	.106	3	0	15	3.248e-3	2	NC	4	NC	2
106			min	-.224	1	.004	15	-.006	1	-5.935e-3	3	1416.06	2	5893.352	1
107		16	max	-.008	15	.19	3	0	15	5.334e-3	2	NC	4	NC	3
108			min	-.224	1	.004	15	-.008	1	-1.02e-2	3	958.165	3	5319.54	1
109		17	max	-.008	15	.285	3	0	15	7.42e-3	2	NC	4	NC	2
110			min	-.224	1	.004	15	-.005	1	-1.447e-2	3	569.924	3	6042.795	1
111		18	max	-.008	15	.385	3	.005	1	8.781e-3	2	NC	4	NC	1
112			min	-.225	1	-.001	10	0	15	-1.726e-2	3	400.404	3	NC	1
113		19	max	-.008	15	.484	3	.017	1	8.781e-3	2	NC	1	NC	1
114			min	-.225	1	-.017	10	0	15	-1.726e-2	3	308.703	3	NC	1
115	M10	1	max	0	1	.35	3	.225	1	1.335e-2	3	NC	1	NC	1
116			min	0	15	.003	15	.008	15	-3.575e-3	2	NC	1	NC	1
117		2	max	0	1	.539	3	.255	1	1.528e-2	3	NC	4	NC	2
118			min	0	15	-.072	2	.009	15	-4.415e-3	2	1019.105	3	6336.695	1
119		3	max	0	1	.714	3	.301	1	1.72e-2	3	NC	5	NC	3
120			min	0	15	-.156	2	.01	15	-5.256e-3	2	528.113	3	2521.68	1
121		4	max	0	1	.85	3	.349	1	1.912e-2	3	NC	5	NC	5
122			min	0	15	-.213	2	.012	15	-6.097e-3	2	384.11	3	1541.845	1
123		5	max	0	1	.933	3	.391	1	2.105e-2	3	NC	5	NC	5
124			min	0	15	-.236	2	.013	15	-6.937e-3	2	329.652	3	1155.791	1
125		6	max	0	1	.957	3	.42	1	2.297e-2	3	NC	5	NC	5
126			min	0	15	-.223	2	.014	15	-7.778e-3	2	316.217	3	983.417	1
127		7	max	0	1	.931	3	.434	1	2.49e-2	3	NC	5	NC	5
128			min	0	15	-.18	2	.014	15	-8.619e-3	2	330.614	3	914.937	1
129		8	max	0	1	.871	3	.436	1	2.682e-2	3	NC	4	NC	5
130			min	0	15	-.121	2	.014	15	-9.46e-3	2	368.864	3	907.436	1
131		9	max	0	1	.805	3	.43	1	2.874e-2	3	NC	4	NC	5
132			min	0	15	-.064	2	.013	15	-1.03e-2	2	422.287	3	933.293	1
133		10	max	0	1	.772	3	.426	1	3.067e-2	3	NC	4	NC	5
134			min	0	1	-.038	2	.013	15	-1.114e-2	2	454.869	3	954.269	1
135		11	max	0	15	.805	3	.43	1	2.874e-2	3	NC	4	NC	5
136			min	0	1	-.064	2	.013	15	-1.03e-2	2	422.287	3	933.293	1
137		12	max	0	15	.871	3	.436	1	2.682e-2	3	NC	4	NC	5
138			min	0	1	-.121	2	.014	15	-9.46e-3	2	368.864	3	907.436	1
139		13	max	0	15	.931	3	.434	1	2.49e-2	3	NC	5	NC	5
140			min	0	1	-.18	2	.014	15	-8.619e-3	2	330.614	3	914.937	1
141		14	max	0	15	.957	3	.42	1	2.297e-2	3	NC	5	NC	5
142			min	0	1	-.223	2	.014	15	-7.778e-3	2	316.217	3	983.417	1
143		15	max	0	15	.933	3	.391	1	2.105e-2	3	NC	5	NC	5
144			min	0	1	-.236	2	.013	15	-6.937e-3	2	329.652	3	1155.791	1
145		16	max	0	15	.85	3	.349	1	1.912e-2	3	NC	5	NC	5
146			min	0	1	-.213	2	.012	15	-6.097e-3	2	384.11	3	1541.845	1
147		17	max	0	15	.714	3	.301	1	1.72e-2	3	NC	5	NC	3
148			min	0	1	-.156	2	.01	15	-5.256e-3	2	528.113	3	2521.68	1
149		18	max	0	15	.539	3	.255	1	1.528e-2	3	NC	4	NC	2
150			min	0	1	-.072	2	.009	15	-4.415e-3	2	1019.105	3	6336.695	1
151		19	max	0	15	.35	3	.225	1	1.335e-2	3	NC	1	NC	1
152			min	0	1	.003	15	.008	15	-3.575e-3	2	NC	1	NC	1
153	M11	1	max	.002	1	.045	2	.226	1	4.14e-3	1	NC	1	NC	1
154			min	-.002	3	-.044	3	.008	15	1.467e-4	15	NC	1	NC	1
155		2	max	.001	1	.067	3	.248	1	4.624e-3	1	NC	4	NC	2
156			min	-.002	3	-.043	2	.009	15	1.589e-4	15	1732.573	3	8612.167	1
157		3	max	.001	1	.167	3	.29	1	5.107e-3	1	NC	5	NC	3
158			min	-.001	3	-.116	2	.01	15	1.712e-4	15	911.824	3	2999.72	1
159		4	max	.001	1	.232	3	.337	1	5.591e-3	1	NC	5	NC	3
160			min	-.001	3	-.16	2	.011	15	1.834e-4	15	696.954	3	1724.162	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
161		5	max	0	1	.249	3	.38	1	6.074e-3	1	NC	5	NC	3
162			min	0	3	-.168	2	.013	15	1.957e-4	15	656.27	3	1244.9	1
163		6	max	0	1	.216	3	.412	1	6.558e-3	1	NC	5	NC	5
164			min	0	3	-.139	2	.014	15	2.079e-4	15	739.75	3	1031.419	1
165		7	max	0	1	.141	3	.43	1	7.041e-3	1	NC	4	NC	5
166			min	0	3	-.082	2	.014	15	2.202e-4	15	1038.181	3	939.737	1
167		8	max	0	1	.044	3	.435	1	7.525e-3	1	NC	4	NC	5
168			min	0	3	-.011	2	.014	15	2.324e-4	15	2181.989	3	916.223	1
169		9	max	0	1	.055	1	.432	1	8.008e-3	1	NC	1	NC	5
170			min	0	3	-.045	3	.013	15	2.447e-4	15	NC	1	930.323	1
171		10	max	0	1	.083	2	.429	1	8.492e-3	1	NC	4	NC	5
172			min	0	1	-.086	3	.013	15	2.57e-4	15	4558.574	3	946.102	1
173		11	max	0	3	.055	1	.432	1	8.008e-3	1	NC	1	NC	5
174			min	0	1	-.045	3	.013	15	2.447e-4	15	NC	1	930.323	1
175		12	max	0	3	.044	3	.435	1	7.525e-3	1	NC	4	NC	5
176			min	0	1	-.011	2	.014	15	2.324e-4	15	2181.989	3	916.223	1
177		13	max	0	3	.141	3	.43	1	7.041e-3	1	NC	4	NC	5
178			min	0	1	-.082	2	.014	15	2.202e-4	15	1038.181	3	939.737	1
179		14	max	0	3	.216	3	.412	1	6.558e-3	1	NC	5	NC	5
180			min	0	1	-.139	2	.014	15	2.079e-4	15	739.75	3	1031.419	1
181		15	max	0	3	.249	3	.38	1	6.074e-3	1	NC	5	NC	3
182			min	0	1	-.168	2	.013	15	1.957e-4	15	656.27	3	1244.9	1
183		16	max	.001	3	.232	3	.337	1	5.591e-3	1	NC	5	NC	3
184			min	-.001	1	-.16	2	.011	15	1.834e-4	15	696.954	3	1724.162	1
185		17	max	.001	3	.167	3	.29	1	5.107e-3	1	NC	5	NC	3
186			min	-.001	1	-.116	2	.01	15	1.712e-4	15	911.824	3	2999.72	1
187		18	max	.002	3	.067	3	.248	1	4.624e-3	1	NC	4	NC	2
188			min	-.001	1	-.043	2	.009	15	1.589e-4	15	1732.573	3	8612.167	1
189		19	max	.002	3	.045	2	.226	1	4.14e-3	1	NC	1	NC	1
190			min	-.002	1	-.044	3	.008	15	1.467e-4	15	NC	1	NC	1
191	M12	1	max	0	2	-.002	15	.227	1	5.12e-3	1	NC	1	NC	1
192			min	0	9	-.07	3	.008	15	1.741e-4	15	NC	1	NC	1
193		2	max	0	2	0	12	.246	1	5.619e-3	1	NC	4	NC	1
194			min	0	9	-.176	2	.008	15	1.872e-4	15	1376.243	2	NC	1
195		3	max	0	2	.051	3	.286	1	6.118e-3	1	NC	5	NC	3
196			min	0	9	-.295	2	.01	15	2.004e-4	15	741.953	2	3278.83	1
197		4	max	0	2	.08	3	.333	1	6.617e-3	1	NC	5	NC	3
198			min	0	9	-.373	2	.011	15	2.135e-4	15	569.668	2	1818.591	1
199		5	max	0	2	.08	3	.376	1	7.116e-3	1	NC	5	NC	5
200			min	0	9	-.4	2	.013	15	2.266e-4	15	528.03	2	1286.838	1
201		6	max	0	2	.054	3	.41	1	7.615e-3	1	NC	5	NC	5
202			min	0	9	-.374	2	.013	15	2.398e-4	15	568.199	2	1051.522	1
203		7	max	0	2	.008	3	.43	1	8.114e-3	1	NC	5	NC	5
204			min	0	9	-.306	2	.014	15	2.529e-4	15	712.688	2	947.892	1
205		8	max	0	2	-.005	15	.437	1	8.613e-3	1	NC	5	NC	5
206			min	0	9	-.214	2	.014	15	2.661e-4	15	1080.734	2	916.227	1
207		9	max	0	2	-.004	15	.435	1	9.112e-3	1	NC	4	NC	5
208			min	0	9	-.136	1	.013	15	2.792e-4	15	2079.787	2	924.351	1
209		10	max	0	1	-.003	15	.432	1	9.611e-3	1	NC	4	NC	5
210			min	0	1	-.118	3	.013	15	2.923e-4	15	3515.61	1	937.476	1
211		11	max	0	9	-.004	15	.435	1	9.112e-3	1	NC	4	NC	5
212			min	0	2	-.136	1	.013	15	2.792e-4	15	2079.787	2	924.351	1
213		12	max	0	9	-.005	15	.437	1	8.613e-3	1	NC	5	NC	5
214			min	0	2	-.214	2	.014	15	2.661e-4	15	1080.734	2	916.227	1
215		13	max	0	9	.008	3	.43	1	8.114e-3	1	NC	5	NC	5
216			min	0	2	-.306	2	.014	15	2.529e-4	15	712.688	2	947.892	1
217		14	max	0	9	.054	3	.41	1	7.615e-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	-.374	2	.013	15	2.398e-4	15	568.199	2	1051.522	1
219		15	max	0	9	.08	3	.376	1	7.116e-3	1	NC	5	NC	5
220			min	0	2	-.4	2	.013	15	2.266e-4	15	528.03	2	1286.838	1
221		16	max	0	9	.08	3	.333	1	6.617e-3	1	NC	5	NC	3
222			min	0	2	-.373	2	.011	15	2.135e-4	15	569.668	2	1818.591	1
223		17	max	0	9	.051	3	.286	1	6.118e-3	1	NC	5	NC	3
224			min	0	2	-.295	2	.01	15	2.004e-4	15	741.953	2	3278.83	1
225		18	max	0	9	0	12	.246	1	5.619e-3	1	NC	4	NC	1
226			min	0	2	-.176	2	.008	15	1.872e-4	15	1376.243	2	NC	1
227		19	max	0	9	-.002	15	.227	1	5.12e-3	1	NC	1	NC	1
228			min	0	2	-.07	3	.008	15	1.741e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.013	3	.229	1	1.282e-2	2	NC	1	NC	1
230			min	0	1	-.456	1	.008	15	-3.644e-3	3	NC	1	NC	1
231		2	max	0	12	.095	3	.26	1	1.466e-2	2	NC	5	NC	3
232			min	0	1	-.661	2	.009	15	-4.388e-3	3	893.662	2	6026.604	1
233		3	max	0	12	.166	3	.308	1	1.65e-2	2	NC	5	NC	3
234			min	0	1	-.856	2	.011	15	-5.131e-3	3	468.577	2	2431.662	1
235		4	max	0	12	.216	3	.357	1	1.834e-2	2	NC	5	NC	3
236			min	0	1	-1.007	2	.012	15	-5.875e-3	3	341.935	2	1496.075	1
237		5	max	0	12	.241	3	.399	1	2.017e-2	2	NC	5	NC	5
238			min	0	1	-1.103	2	.013	15	-6.618e-3	3	292.237	2	1124.891	1
239		6	max	0	12	.239	3	.429	1	2.201e-2	2	NC	15	NC	5
240			min	0	1	-1.139	2	.014	15	-7.362e-3	3	276.986	2	958.333	1
241		7	max	0	12	.215	3	.444	1	2.385e-2	2	NC	15	NC	5
242			min	0	1	-1.123	2	.014	15	-8.105e-3	3	283.572	2	891.646	1
243		8	max	0	12	.178	3	.446	1	2.569e-2	2	NC	15	NC	5
244			min	0	1	-1.072	2	.014	15	-8.849e-3	3	306.798	2	883.597	1
245		9	max	0	12	.141	3	.44	1	2.753e-2	2	NC	5	NC	5
246			min	0	1	-1.012	2	.013	15	-9.593e-3	3	338.861	2	907.61	1
247		10	max	0	1	.124	3	.436	1	2.937e-2	2	NC	5	NC	5
248			min	0	1	-.983	2	.013	15	-1.034e-2	3	357.734	2	927.299	1
249		11	max	0	1	.141	3	.44	1	2.753e-2	2	NC	5	NC	5
250			min	0	12	-1.012	2	.013	15	-9.593e-3	3	338.861	2	907.61	1
251		12	max	0	1	.178	3	.446	1	2.569e-2	2	NC	15	NC	5
252			min	0	12	-1.072	2	.014	15	-8.849e-3	3	306.798	2	883.597	1
253		13	max	0	1	.215	3	.444	1	2.385e-2	2	NC	15	NC	5
254			min	0	12	-1.123	2	.014	15	-8.105e-3	3	283.572	2	891.646	1
255		14	max	0	1	.239	3	.429	1	2.201e-2	2	NC	15	NC	5
256			min	0	12	-1.139	2	.014	15	-7.362e-3	3	276.986	2	958.333	1
257		15	max	0	1	.241	3	.399	1	2.017e-2	2	NC	5	NC	5
258			min	0	12	-1.103	2	.013	15	-6.618e-3	3	292.237	2	1124.891	1
259		16	max	0	1	.216	3	.357	1	1.834e-2	2	NC	5	NC	3
260			min	0	12	-1.007	2	.012	15	-5.875e-3	3	341.935	2	1496.075	1
261		17	max	0	1	.166	3	.308	1	1.65e-2	2	NC	5	NC	3
262			min	0	12	-.856	2	.011	15	-5.131e-3	3	468.577	2	2431.662	1
263		18	max	0	1	.095	3	.26	1	1.466e-2	2	NC	5	NC	3
264			min	0	12	-.661	2	.009	15	-4.388e-3	3	893.662	2	6026.604	1
265		19	max	0	1	.013	3	.229	1	1.282e-2	2	NC	1	NC	1
266			min	0	12	-.456	1	.008	15	-3.644e-3	3	NC	1	NC	1
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	3	2.068e-3	2	NC	1	NC	1
270			min	0	2	0	1	0	2	-8.927e-4	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	4.135e-3	2	NC	1	NC	1
272			min	0	2	-.004	1	0	2	-1.785e-3	3	NC	1	NC	1
273		4	max	0	3	0	15	.001	3	4.843e-3	2	NC	3	NC	1
274			min	0	2	-.009	1	0	1	-2.068e-3	3	6776.346	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	.002	3	4.446e-3	2	NC	4	NC	1
276			min	0	2	-.016	1	-.001	1	-1.856e-3	3	3786.677	1	NC	1
277		6	max	0	3	0	15	.003	3	4.049e-3	2	NC	4	NC	1
278			min	0	2	-.025	1	-.002	1	-1.644e-3	3	2434.684	1	NC	1
279		7	max	0	3	-.001	15	.003	3	3.652e-3	2	NC	5	NC	1
280			min	0	2	-.035	1	-.003	1	-1.432e-3	3	1708.839	1	9937.584	3
281		8	max	0	3	-.002	15	.004	3	3.255e-3	2	NC	5	NC	1
282			min	0	2	-.048	1	-.003	1	-1.22e-3	3	1273.342	1	8351.41	3
283		9	max	0	3	-.002	15	.005	3	2.858e-3	2	NC	5	NC	1
284			min	0	2	-.061	1	-.004	1	-1.008e-3	3	991.057	1	7298.028	3
285		10	max	0	3	-.003	15	.005	3	2.46e-3	2	NC	5	NC	1
286			min	0	2	-.076	1	-.004	1	-7.955e-4	3	797.338	1	6599.707	3
287		11	max	0	3	-.003	15	.005	3	2.063e-3	2	NC	5	NC	1
288			min	0	2	-.092	1	-.005	1	-5.834e-4	3	658.477	1	6162.338	3
289		12	max	0	3	-.004	15	.005	3	1.666e-3	2	NC	5	NC	1
290			min	0	2	-.109	1	-.005	1	-3.712e-4	3	555.478	1	5939.988	3
291		13	max	0	3	-.004	15	.005	3	1.269e-3	2	NC	15	NC	1
292			min	-.001	2	-.127	1	-.005	1	-1.591e-4	3	476.91	1	5924.199	3
293		14	max	.001	3	-.005	15	.004	3	8.722e-4	2	NC	15	NC	1
294			min	-.001	2	-.146	1	-.005	1	3.531e-6	15	415.583	1	6147.187	3
295		15	max	.001	3	-.006	15	.002	3	4.752e-4	2	NC	15	NC	1
296			min	-.001	2	-.165	1	-.005	1	-6.877e-5	9	366.779	1	6711.529	3
297		16	max	.001	3	-.006	15	0	3	4.773e-4	3	9499.584	15	NC	1
298			min	-.001	2	-.185	1	-.004	1	-1.975e-4	1	327.312	1	7884.711	3
299		17	max	.001	3	-.007	15	0	15	6.895e-4	3	8564.157	15	NC	1
300			min	-.001	2	-.205	1	-.003	1	-5.487e-4	1	294.955	1	NC	1
301		18	max	.001	3	-.008	15	0	10	9.016e-4	3	7787.579	15	NC	1
302			min	-.001	2	-.226	1	-.005	3	-9.e-4	1	268.111	1	NC	1
303		19	max	.001	3	-.008	15	.002	2	1.114e-3	3	7136.398	15	NC	1
304			min	-.002	2	-.247	1	-.009	3	-1.251e-3	1	245.616	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	1	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	2	NC	1
310			min	0	2	-.007	1	0	1	0	1	9009.788	1	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	0	2	-.016	1	0	1	0	1	3794.917	1	NC	1
313		5	max	.001	3	0	15	0	1	0	1	NC	5	NC	1
314			min	-.001	2	-.029	1	0	1	0	1	2078.725	1	NC	1
315		6	max	.001	3	-.001	15	0	1	0	1	NC	5	NC	1
316			min	-.001	2	-.046	1	0	1	0	1	1321.732	1	NC	1
317		7	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
318			min	-.002	2	-.066	1	0	1	0	1	921.147	1	NC	1
319		8	max	.002	3	-.003	15	0	1	0	1	NC	5	NC	1
320			min	-.002	2	-.089	1	0	1	0	1	683.051	1	NC	1
321		9	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
322			min	-.002	2	-.114	1	0	1	0	1	529.737	1	NC	1
323		10	max	.002	3	-.004	15	0	1	0	1	NC	15	NC	1
324			min	-.002	2	-.143	1	0	1	0	1	425.041	1	NC	1
325		11	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
326			min	-.002	2	-.173	1	0	1	0	1	350.276	1	NC	1
327		12	max	.003	3	-.006	15	0	1	0	1	9661.2	15	NC	1
328			min	-.003	2	-.205	1	0	1	0	1	294.987	1	NC	1
329		13	max	.003	3	-.007	15	0	1	0	1	8294.639	15	NC	1
330			min	-.003	2	-.24	1	0	1	0	1	252.915	1	NC	1
331		14	max	.003	3	-.008	15	0	1	0	1	7227.965	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	-.275	1	0	1	0	1	220.142	1	NC	1
333		15	max	.003	3	-.01	15	0	1	0	1	6379.118	15	NC	1
334			min	-.003	2	-.312	1	0	1	0	1	194.106	1	NC	1
335		16	max	.004	3	-.011	15	0	1	0	1	5692.676	15	NC	1
336			min	-.004	2	-.35	1	0	1	0	1	173.082	1	NC	1
337		17	max	.004	3	-.012	15	0	1	0	1	5129.885	15	NC	1
338			min	-.004	2	-.389	1	0	1	0	1	155.866	1	NC	1
339		18	max	.004	3	-.013	15	0	1	0	1	4663.001	15	NC	1
340			min	-.004	2	-.428	1	0	1	0	1	141.601	1	NC	1
341		19	max	.004	3	-.014	15	0	1	0	1	4271.756	15	NC	1
342			min	-.004	2	-.467	1	0	1	0	1	129.658	1	NC	1
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	15	0	2	8.927e-4	3	NC	1	NC	1
346			min	0	2	0	1	0	3	-2.068e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	2	1.785e-3	3	NC	1	NC	1
348			min	0	2	-.004	1	0	3	-4.135e-3	2	NC	1	NC	1
349		4	max	0	3	0	15	0	1	2.068e-3	3	NC	3	NC	1
350			min	0	2	-.009	1	-.001	3	-4.843e-3	2	6776.346	1	NC	1
351		5	max	0	3	0	15	.001	1	1.856e-3	3	NC	4	NC	1
352			min	0	2	-.016	1	-.002	3	-4.446e-3	2	3786.677	1	NC	1
353		6	max	0	3	0	15	.002	1	1.644e-3	3	NC	4	NC	1
354			min	0	2	-.025	1	-.003	3	-4.049e-3	2	2434.684	1	NC	1
355		7	max	0	3	-.001	15	.003	1	1.432e-3	3	NC	5	NC	1
356			min	0	2	-.035	1	-.003	3	-3.652e-3	2	1708.839	1	9937.584	3
357		8	max	0	3	-.002	15	.003	1	1.22e-3	3	NC	5	NC	1
358			min	0	2	-.048	1	-.004	3	-3.255e-3	2	1273.342	1	8351.41	3
359		9	max	0	3	-.002	15	.004	1	1.008e-3	3	NC	5	NC	1
360			min	0	2	-.061	1	-.005	3	-2.858e-3	2	991.057	1	7298.028	3
361		10	max	0	3	-.003	15	.004	1	7.955e-4	3	NC	5	NC	1
362			min	0	2	-.076	1	-.005	3	-2.46e-3	2	797.338	1	6599.707	3
363		11	max	0	3	-.003	15	.005	1	5.834e-4	3	NC	5	NC	1
364			min	0	2	-.092	1	-.005	3	-2.063e-3	2	658.477	1	6162.338	3
365		12	max	0	3	-.004	15	.005	1	3.712e-4	3	NC	5	NC	1
366			min	0	2	-.109	1	-.005	3	-1.666e-3	2	555.478	1	5939.988	3
367		13	max	0	3	-.004	15	.005	1	1.591e-4	3	NC	15	NC	1
368			min	-.001	2	-.127	1	-.005	3	-1.269e-3	2	476.91	1	5924.199	3
369		14	max	.001	3	-.005	15	.005	1	-3.531e-6	15	NC	15	NC	1
370			min	-.001	2	-.146	1	-.004	3	-8.722e-4	2	415.583	1	6147.187	3
371		15	max	.001	3	-.006	15	.005	1	6.877e-5	9	NC	15	NC	1
372			min	-.001	2	-.165	1	-.002	3	-4.752e-4	2	366.779	1	6711.529	3
373		16	max	.001	3	-.006	15	.004	1	1.975e-4	1	9499.584	15	NC	1
374			min	-.001	2	-.185	1	0	3	-4.773e-4	3	327.312	1	7884.711	3
375		17	max	.001	3	-.007	15	.003	1	5.487e-4	1	8564.157	15	NC	1
376			min	-.001	2	-.205	1	0	15	-6.895e-4	3	294.955	1	NC	1
377		18	max	.001	3	-.008	15	.005	3	9.e-4	1	7787.579	15	NC	1
378			min	-.001	2	-.226	1	0	10	-9.016e-4	3	268.111	1	NC	1
379		19	max	.001	3	-.008	15	.009	3	1.251e-3	1	7136.398	15	NC	1
380			min	-.002	2	-.247	1	-.002	2	-1.114e-3	3	245.616	1	NC	1
381	M3	1	max	.005	1	0	15	0	3	1.928e-3	2	NC	1	NC	1
382			min	0	15	-.003	1	0	2	-7.365e-4	3	NC	1	NC	1
383		2	max	.005	1	0	15	.008	3	2.292e-3	2	NC	1	NC	4
384			min	0	15	-.02	1	-.017	2	-9.094e-4	3	NC	1	3749.114	2
385		3	max	.004	1	-.002	15	.015	3	2.656e-3	2	NC	1	NC	4
386			min	0	15	-.038	1	-.033	2	-1.082e-3	3	NC	1	1896.204	2
387		4	max	.004	1	-.002	15	.022	3	3.019e-3	2	NC	1	NC	4
388			min	0	15	-.055	1	-.048	2	-1.255e-3	3	NC	1	1286.708	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	.028	3	3.383e-3	2	NC	1	NC	5
390			min	0	15	-.072	1	-.063	2	-1.428e-3	3	NC	1	988.717	2
391		6	max	.004	3	-.004	15	.034	3	3.747e-3	2	NC	1	NC	5
392			min	0	15	-.09	1	-.076	2	-1.601e-3	3	NC	1	816.107	2
393		7	max	.004	3	-.004	15	.039	3	4.111e-3	2	NC	1	NC	5
394			min	0	10	-.107	1	-.087	2	-1.774e-3	3	NC	1	707.118	2
395		8	max	.004	3	-.005	15	.043	3	4.474e-3	2	NC	1	NC	5
396			min	0	10	-.124	1	-.097	2	-1.946e-3	3	NC	1	635.626	2
397		9	max	.004	3	-.006	15	.046	3	4.838e-3	2	NC	1	NC	5
398			min	0	10	-.141	1	-.104	2	-2.119e-3	3	NC	1	589.007	2
399		10	max	.005	3	-.006	15	.049	3	5.202e-3	2	NC	1	NC	5
400			min	-.001	2	-.158	1	-.109	2	-2.292e-3	3	NC	1	560.849	2
401		11	max	.005	3	-.007	15	.05	3	5.566e-3	2	NC	1	NC	5
402			min	-.002	2	-.175	1	-.111	2	-2.465e-3	3	NC	1	548.178	2
403		12	max	.005	3	-.007	15	.049	3	5.929e-3	2	NC	1	NC	5
404			min	-.002	2	-.192	1	-.11	2	-2.638e-3	3	NC	1	550.458	2
405		13	max	.005	3	-.008	15	.048	3	6.293e-3	2	NC	1	NC	5
406			min	-.003	2	-.208	1	-.106	2	-2.811e-3	3	NC	1	569.604	2
407		14	max	.005	3	-.008	15	.044	3	6.657e-3	2	NC	1	NC	5
408			min	-.003	2	-.225	1	-.098	2	-2.983e-3	3	NC	1	611.138	2
409		15	max	.006	3	-.009	15	.039	3	7.021e-3	2	NC	1	NC	5
410			min	-.004	2	-.241	1	-.086	2	-3.156e-3	3	NC	1	687.764	2
411		16	max	.006	3	-.009	15	.033	3	7.384e-3	2	NC	1	NC	5
412			min	-.005	2	-.258	1	-.07	2	-3.329e-3	3	NC	1	830.602	2
413		17	max	.006	3	-.01	15	.024	3	7.748e-3	2	NC	1	NC	5
414			min	-.005	2	-.274	1	-.049	2	-3.502e-3	3	NC	1	1134.521	2
415		18	max	.006	3	-.01	15	.013	3	8.112e-3	2	NC	1	NC	4
416			min	-.006	2	-.291	1	-.023	2	-3.675e-3	3	NC	1	2076.004	2
417		19	max	.006	3	-.01	15	.01	1	8.476e-3	2	NC	1	NC	1
418			min	-.006	2	-.307	1	0	3	-3.848e-3	3	NC	1	NC	1
419	M6	1	max	.009	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.005	1	0	1	0	1	NC	1	NC	1
421		2	max	.008	1	-.001	15	0	1	0	1	NC	1	NC	1
422			min	0	15	-.038	1	0	1	0	1	NC	1	NC	1
423		3	max	.007	3	-.002	15	0	1	0	1	NC	1	NC	1
424			min	0	15	-.071	1	0	1	0	1	NC	1	NC	1
425		4	max	.007	3	-.004	15	0	1	0	1	NC	1	NC	1
426			min	0	15	-.104	1	0	1	0	1	NC	1	NC	1
427		5	max	.008	3	-.005	15	0	1	0	1	NC	1	NC	1
428			min	0	10	-.138	1	0	1	0	1	NC	1	NC	1
429		6	max	.009	3	-.006	15	0	1	0	1	NC	1	NC	1
430			min	0	10	-.171	1	0	1	0	1	NC	1	NC	1
431		7	max	.009	3	-.007	15	0	1	0	1	NC	1	NC	1
432			min	-.002	2	-.204	1	0	1	0	1	NC	1	NC	1
433		8	max	.01	3	-.008	15	0	1	0	1	NC	1	NC	1
434			min	-.004	2	-.236	1	0	1	0	1	NC	1	NC	1
435		9	max	.011	3	-.009	15	0	1	0	1	NC	1	NC	1
436			min	-.006	2	-.269	1	0	1	0	1	NC	1	NC	1
437		10	max	.012	3	-.01	15	0	1	0	1	NC	1	NC	1
438			min	-.007	2	-.302	1	0	1	0	1	NC	1	NC	1
439		11	max	.012	3	-.011	15	0	1	0	1	NC	1	NC	1
440			min	-.009	2	-.334	1	0	1	0	1	NC	1	NC	1
441		12	max	.013	3	-.012	15	0	1	0	1	NC	1	NC	1
442			min	-.01	2	-.367	1	0	1	0	1	NC	1	NC	1
443		13	max	.014	3	-.013	15	0	1	0	1	NC	1	NC	1
444			min	-.012	2	-.399	1	0	1	0	1	NC	1	NC	1
445		14	max	.015	3	-.014	15	0	1	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
446			min	-.014	2	-.432	1	0	1	0	1	NC	1	NC	1
447		15	max	.015	3	-.014	15	0	1	0	1	NC	1	NC	1
448			min	-.015	2	-.464	1	0	1	0	1	NC	1	NC	1
449		16	max	.016	3	-.015	15	0	1	0	1	NC	1	NC	1
450			min	-.017	2	-.496	1	0	1	0	1	NC	1	NC	1
451		17	max	.017	3	-.016	15	0	1	0	1	NC	1	NC	1
452			min	-.019	2	-.528	1	0	1	0	1	NC	1	NC	1
453		18	max	.018	3	-.017	15	0	1	0	1	NC	1	NC	1
454			min	-.02	2	-.56	1	0	1	0	1	NC	1	NC	1
455		19	max	.018	3	-.018	15	0	1	0	1	NC	1	NC	1
456			min	-.022	2	-.592	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.005	1	0	15	0	2	7.365e-4	3	NC	1	NC	1
458			min	0	15	-.003	1	0	3	-1.928e-3	2	NC	1	NC	1
459		2	max	.005	1	0	15	.017	2	9.094e-4	3	NC	1	NC	4
460			min	0	15	-.02	1	-.008	3	-2.292e-3	2	NC	1	3749.114	2
461		3	max	.004	1	-.002	15	.033	2	1.082e-3	3	NC	1	NC	4
462			min	0	15	-.038	1	-.015	3	-2.656e-3	2	NC	1	1896.204	2
463		4	max	.004	1	-.002	15	.048	2	1.255e-3	3	NC	1	NC	4
464			min	0	15	-.055	1	-.022	3	-3.019e-3	2	NC	1	1286.708	2
465		5	max	.003	3	-.003	15	.063	2	1.428e-3	3	NC	1	NC	5
466			min	0	15	-.072	1	-.028	3	-3.383e-3	2	NC	1	988.717	2
467		6	max	.004	3	-.004	15	.076	2	1.601e-3	3	NC	1	NC	5
468			min	0	15	-.09	1	-.034	3	-3.747e-3	2	NC	1	816.107	2
469		7	max	.004	3	-.004	15	.087	2	1.774e-3	3	NC	1	NC	5
470			min	0	10	-.107	1	-.039	3	-4.111e-3	2	NC	1	707.118	2
471		8	max	.004	3	-.005	15	.097	2	1.946e-3	3	NC	1	NC	5
472			min	0	10	-.124	1	-.043	3	-4.474e-3	2	NC	1	635.626	2
473		9	max	.004	3	-.006	15	.104	2	2.119e-3	3	NC	1	NC	5
474			min	0	10	-.141	1	-.046	3	-4.838e-3	2	NC	1	589.007	2
475		10	max	.005	3	-.006	15	.109	2	2.292e-3	3	NC	1	NC	5
476			min	-.001	2	-.158	1	-.049	3	-5.202e-3	2	NC	1	560.849	2
477		11	max	.005	3	-.007	15	.111	2	2.465e-3	3	NC	1	NC	5
478			min	-.002	2	-.175	1	-.05	3	-5.566e-3	2	NC	1	548.178	2
479		12	max	.005	3	-.007	15	.11	2	2.638e-3	3	NC	1	NC	5
480			min	-.002	2	-.192	1	-.049	3	-5.929e-3	2	NC	1	550.458	2
481		13	max	.005	3	-.008	15	.106	2	2.811e-3	3	NC	1	NC	5
482			min	-.003	2	-.208	1	-.048	3	-6.293e-3	2	NC	1	569.604	2
483		14	max	.005	3	-.008	15	.098	2	2.983e-3	3	NC	1	NC	5
484			min	-.003	2	-.225	1	-.044	3	-6.657e-3	2	NC	1	611.138	2
485		15	max	.006	3	-.009	15	.086	2	3.156e-3	3	NC	1	NC	5
486			min	-.004	2	-.241	1	-.039	3	-7.021e-3	2	NC	1	687.764	2
487		16	max	.006	3	-.009	15	.07	2	3.329e-3	3	NC	1	NC	5
488			min	-.005	2	-.258	1	-.033	3	-7.384e-3	2	NC	1	830.602	2
489		17	max	.006	3	-.01	15	.049	2	3.502e-3	3	NC	1	NC	5
490			min	-.005	2	-.274	1	-.024	3	-7.748e-3	2	NC	1	1134.521	2
491		18	max	.006	3	-.01	15	.023	2	3.675e-3	3	NC	1	NC	4
492			min	-.006	2	-.291	1	-.013	3	-8.112e-3	2	NC	1	2076.004	2
493		19	max	.006	3	-.01	15	0	3	3.848e-3	3	NC	1	NC	1
494			min	-.006	2	-.307	1	-.01	1	-8.476e-3	2	NC	1	NC	1