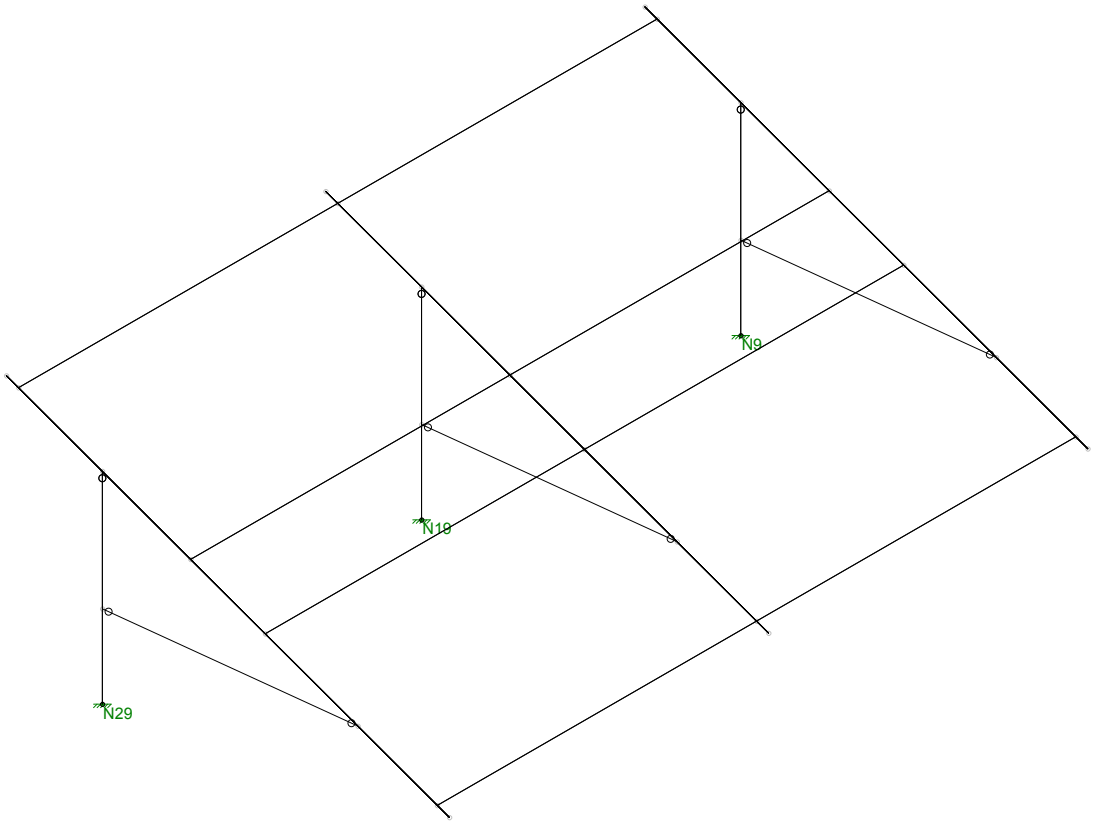


Schletter, Inc.		20° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

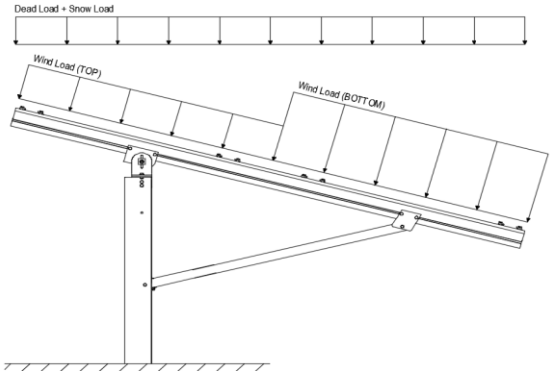
1.2 Construction

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

PV modules are required to meet the following specifications:

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

Modules Per Row =	2
Module Tilt =	20°
Maximum Height Above Grade =	3 ft



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	20.62	psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00		
C_s =	0.91		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	130	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	26.53	psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.05	*(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.*
$Cf+_{BOTTOM}$ =	1.65		
$Cf-_{TOP}$ =	-2.12	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1		

2.4 Seismic Loads

S_S =	2.50	R =	1.25
S_{DS} =	1.67	C_S =	0.8
S_1 =	1.00	ρ =	1.3
S_{D1} =	1.00	Ω =	1.25
T_a =	0.07	C_d =	1.25

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
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 + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W [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

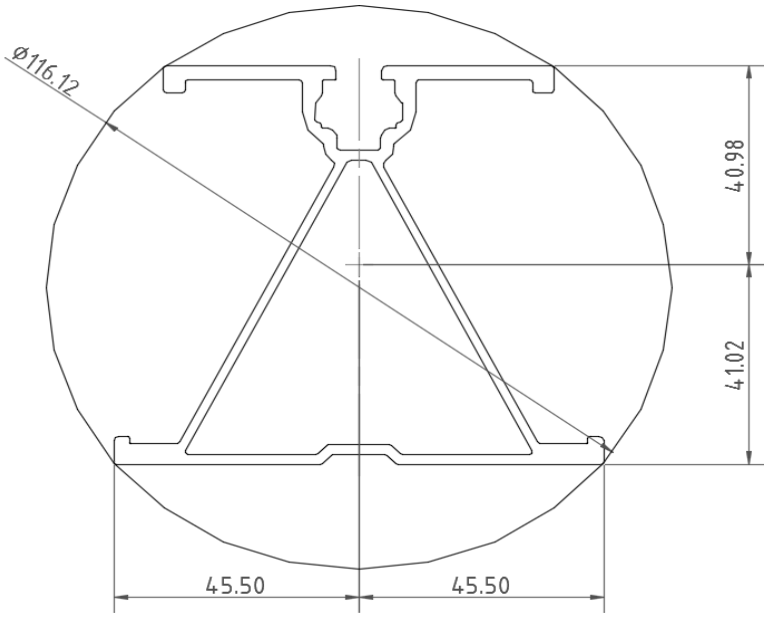
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	0.976	k-ft
M_z =	0.186	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	51%	

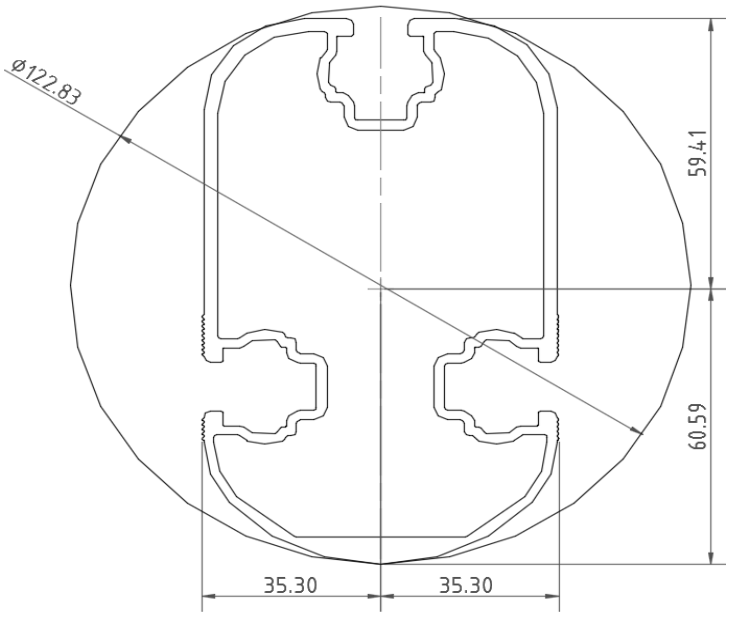


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.107	k-ft
M_z =	0.000	k-ft
P_n =	6.432	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	73%	

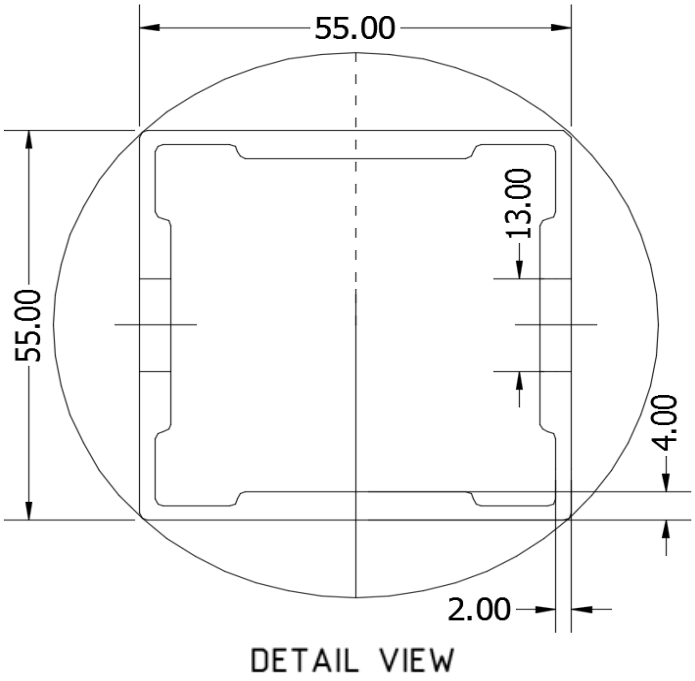


DETAIL VIEW

4.3 Strut Design

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

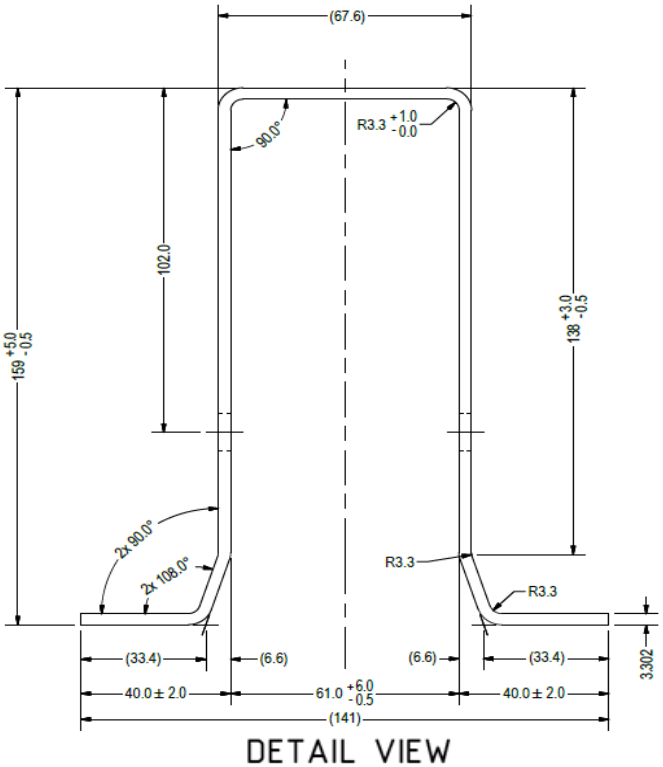
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.008	k-ft
M_z =	0.000	k-ft
P_n =	6.847	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	73%	



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 =	72.67	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 =	15.698	k-ft
M_z =	0.000	k-ft
P_r =	5.750	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.013	k
Utilization =	99%	



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 =	5.42	k
Maximum Lateral Load =	2.50	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)

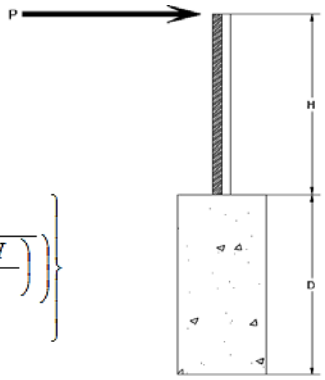
Lateral Force @ Top of Pole, P =	1.64	k
Height of Pole Above Grade, H =	5.06	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft
Lateral Bearing @ Bottom =	S_3	
Lateral Bearing @ D/3 =	S_1	
Required Depth =	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 =	1.64	k
Height of Pole Above Grade, H =	5.06	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	4th Trial @ D_4 =	7.17	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf	Lateral Soil Bearing @ D/3, S_1 =	0.48	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf	Lateral Soil Bearing @ D, S_3 =	1.43	ksf
Constant 2.34P/(S_1B), A =	8.87		Constant 2.34P/(S_1B), A =	4.02	
Required Footing Depth, D =	12.71	ft	Required Footing Depth, D =	7.13	ft
2nd Trial @ D_2 =	7.98	ft	5th Trial @ D_5 =	7.15	ft
Lateral Soil Bearing @ D/3, S_1 =	0.53	ksf	Lateral Soil Bearing @ D/3, S_1 =	0.48	ksf
Lateral Soil Bearing @ D, S_3 =	1.60	ksf	Lateral Soil Bearing @ D, S_3 =	1.43	ksf
Constant 2.34P/(S_1B), A =	3.61		Constant 2.34P/(S_1B), A =	4.03	
Required Footing Depth, D =	6.62	ft	Required Footing Depth, D =	7.25	ft
3rd Trial @ D_3 =	7.30	ft			
Lateral Soil Bearing @ D/3, S_1 =	0.49	ksf			
Lateral Soil Bearing @ D, S_3 =	1.46	ksf			
Constant 2.34P/(S_1B), A =	3.95				
Required Footing Depth, D =	7.04	ft			

A 2ft diameter x 7.25ft deep footing unrestrained at ground level is required for the racking structure.

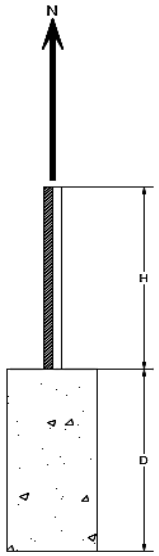
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.48	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	1.63	k
Required Concrete Volume, V =	11.25	ft^3
Required Footing Depth, D =	3.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.34
2	0.4	0.2	118.10	5.24
3	0.6	0.2	118.10	5.14
4	0.8	0.2	118.10	5.03
5	1	0.2	118.10	4.93
6	1.2	0.2	118.10	4.83
7	1.4	0.2	118.10	4.72
8	1.6	0.2	118.10	4.62
9	1.8	0.2	118.10	4.51
10	2	0.2	118.10	4.41
11	2.2	0.2	118.10	4.31
12	2.4	0.2	118.10	4.20
13	2.6	0.2	118.10	4.10
14	2.8	0.2	118.10	4.00
15	3	0.2	118.10	3.89
16	3.2	0.2	118.10	3.79
17	3.4	0.2	118.10	3.69
18	3.6	0.2	118.10	3.58
19	0	0.0	0.00	3.58
20	0	0.0	0.00	3.58
21	0	0.0	0.00	3.58
22	0	0.0	0.00	3.58
23	0	0.0	0.00	3.58
24	0	0.0	0.00	3.58
25	0	0.0	0.00	3.58
26	0	0.0	0.00	3.58
27	0	0.0	0.00	3.58
28	0	0.0	0.00	3.58
29	0	0.0	0.00	3.58
30	0	0.0	0.00	3.58
31	0	0.0	0.00	3.58
32	0	0.0	0.00	3.58
33	0	0.0	0.00	3.58
34	0	0.0	0.00	3.58
Max	3.6	Sum	0.85	

A 2ft diameter x 3.75ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	7.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.72	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	26.70	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

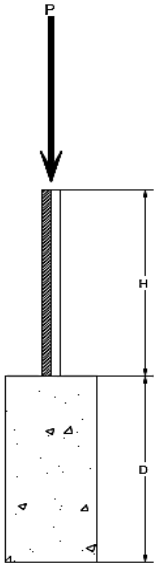
Weight of Concrete

Footing Volume	22.78	ft^3
Weight	3.30	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	4.01	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.62	k
Applied Force =	7.02	k
Utilization =	60%	

A 2ft diameter footing passes at a depth of 7.25ft.



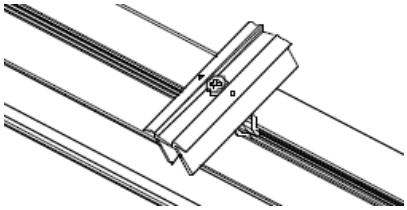
6. DESIGN OF JOINTS AND CONNECTIONS

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.

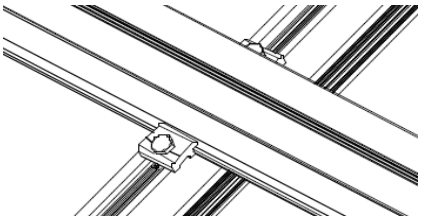
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.618 k
Allowable Uplift	=	1.214 k
Utilization	=	51%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.639 k
Allowable Uplift	=	2.180 k
Utilization	=	75%

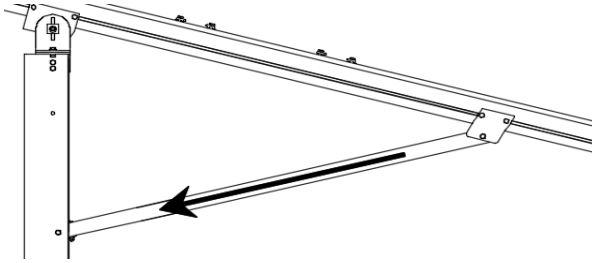


6.2 Strut Connections

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	=	6.847 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	77%

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

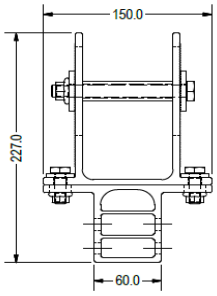


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

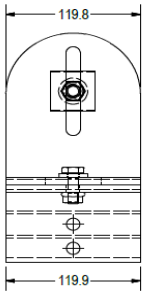
6.3 Girder to Post Connection

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.

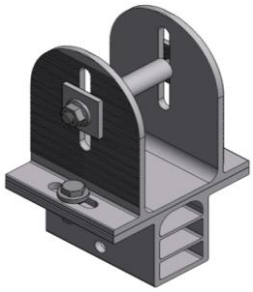
Maximum Tensile Load	=	3.398 k
Allowable Load	=	5.649 k
Utilization	=	60%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

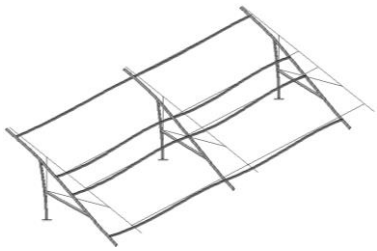
7.1 Seismic Drift

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}	=	57.36 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.147 in
Max Drift, Δ_{MAX}	=	0.611 in

0.611 ≤ 1.147, OK.

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 =	90 in	L_b =	90
J =	0.432	J =	0.432
	248.982		158.338
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	28.2 ksi	φF_L=	29.3
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 81.7717 in
J = 1.98
105.231

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 81.7717
J = 1.98
114.202

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L = φb[Bt-Dt*√(Rb/t)]

φF_L = 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L St$ = 30.1 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

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

$\varphi F_L Wk$ = 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φyFcy

φF_L = 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L = φc[Bt-Dt*√(Rb/t)]

φF_L = 30.80 ksi

φF_L = 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 74.8031 in

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$S2 = C_t$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 74.8031

J = 0.942

116.737

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 29.9

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

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

φF_L = 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = φyFcy

φF_L = 33.25 ksi

φF_L = 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	72.67	in	
Pr =	5.75	k	(LRFD Factored Load)
Mr (Strong) =	15.70	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	104.56			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	22.96	ksi		
Fe =	26.18	ksi		
Pn =	51.204	k		

Torsional/Flexural Torsional Buckling:

Fcr =	17.0464	ksi
Fey =	66.785	ksi
Fez =	21.7259	ksi
Pn =	38.0134	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1681	<	0.2	
Utilization =	0.99	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.168	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 99%

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			.8			8		

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-63.565	-63.565	0	0
2	M11	Y	-63.565	-63.565	0	0
3	M12	Y	-63.565	-63.565	0	0
4	M13	Y	-63.565	-63.565	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	-91.409	-91.409	0	0
2	M11	y	-91.409	-91.409	0	0
3	M12	y	-143.642	-143.642	0	0
4	M13	y	-143.642	-143.642	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	184.558	184.558	0	0
2	M11	y	184.558	184.558	0	0
3	M12	y	87.056	87.056	0	0
4	M13	y	87.056	87.056	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Z	7.874	7.874	0	0
2	M11	Z	7.874	7.874	0	0
3	M12	Z	7.874	7.874	0	0
4	M13	Z	7.874	7.874	0	0
5	M10	Z	0	0	0	0
6	M11	Z	0	0	0	0
7	M12	Z	0	0	0	0
8	M13	Z	0	0	0	0

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.5W	Yes	Y		1	1.2	3	1.6	4	.5														
2	LRFD 1.2D + 1.0W + 0.5S	Yes	Y		1	1.2	3	.5	4	1														
3	LRFD 0.9D + 1.0W	Yes	Y		2	.9					5	1												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 0.6W	Yes	Y		1	1			4	.6														
11	ASD 1.0D + 0.75L + 0.45W + 0....	Yes	Y		1	1	3	.75	4	.45														
12	ASD 0.6D + 0.6W	Yes	Y		2	.6					5	.6												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	273.063	2	2350.668	1	139.493	1	.216	1	.003	5	8.758	1
2		min	-528.363	3	-1457.317	3	-303.828	5	-1.245	5	-.002	1	-.695	3
3	N19	max	1865.639	2	5796.576	1	0	12	0	3	.003	4	13.468	1
4		min	-1730.197	3	-4167.458	3	-320.165	5	-1.292	4	0	1	-.622	3
5	N29	max	273.063	2	2350.668	1	118.226	3	.132	3	.004	4	8.758	1
6		min	-528.363	3	-1457.317	3	-335.155	4	-1.308	4	0	3	-.695	3
7	Totals:	max	2411.765	2	10497.913	1	0	10						
8		min	-2786.924	3	-7082.091	3	-938.168	4						

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	.003	1	0	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	4.896	3	269.869	3	20.265	3	.057	3	.284	1	.247	2
4			min	-195.318	1	-659.467	2	-139.344	1	-.189	1	-.03	3	-.1	3
5		3	max	4.427	3	268.58	3	20.265	3	.057	3	.193	1	.681	2
6			min	-195.944	1	-661.186	2	-139.344	1	-.189	1	-.017	3	-.277	3
7		4	max	3.957	3	267.29	3	20.265	3	.057	3	.101	1	1.115	2
8			min	-196.57	1	-662.905	2	-139.344	1	-.189	1	-.004	3	-.453	3
9		5	max	1024.313	3	607.123	2	30.866	3	.003	3	.139	1	1.317	2
10			min	-2782.103	1	-231.988	3	-165.636	1	-.054	2	-.039	3	-.536	3
11		6	max	1023.844	3	605.404	2	30.866	3	.003	3	.034	2	.919	2
12			min	-2782.728	1	-233.277	3	-165.636	1	-.054	2	-.019	3	-.384	3
13		7	max	1023.375	3	603.685	2	30.866	3	.003	3	.001	3	.522	2
14			min	-2783.354	1	-234.567	3	-165.636	1	-.054	2	-.079	1	-.23	3
15		8	max	1022.906	3	601.966	2	30.866	3	.003	3	.022	3	.128	1
16			min	-2783.98	1	-235.856	3	-165.636	1	-.054	2	-.188	1	-.076	3
17		9	max	1030.411	3	20.302	1	50.504	3	.013	5	.106	1	-.001	12
18			min	-2996.675	1	-5.107	3	-219.671	1	-.161	2	-.002	3	-.057	2
19		10	max	1029.942	3	18.582	1	50.504	3	.013	5	.031	3	.001	3
20			min	-2997.301	1	-6.396	3	-219.671	1	-.161	2	-.038	1	-.067	2
21		11	max	1029.473	3	16.863	1	50.504	3	.013	5	.064	3	.006	3
22			min	-2997.927	1	-7.685	3	-219.671	1	-.161	2	-.182	1	-.076	2
23		12	max	1032.926	3	537.535	3	2.921	10	.169	3	.139	4	.079	1
24			min	-3204.222	1	-446.994	1	-190.089	4	-.218	1	.015	12	-.169	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
25		13	max	1032.457	3	536.245	3	2.921	10	.169	3	.114	1	.372	1
26			min	-3204.848	1	-448.714	1	-191.675	4	-.218	1	-.03	3	-.522	3
27		14	max	1031.988	3	534.956	3	2.921	10	.169	3	.098	1	.667	1
28			min	-3205.473	1	-450.433	1	-193.26	4	-.218	1	-.126	5	-.873	3
29		15	max	1031.518	3	533.666	3	2.921	10	.169	3	.081	1	.963	1
30			min	-3206.099	1	-452.152	1	-194.846	4	-.218	1	-.249	5	-1.224	3
31		16	max	196.806	1	445.28	1	64.739	5	.103	1	.008	3	.733	1
32			min	-5.967	3	-556.821	3	-136.777	1	-.217	3	-.191	4	-.934	3
33		17	max	196.18	1	443.561	1	63.153	5	.103	1	.024	3	.441	1
34			min	-6.436	3	-558.111	3	-136.777	1	-.217	3	-.205	1	-.568	3
35		18	max	195.555	1	441.841	1	61.567	5	.103	1	.04	3	.151	1
36			min	-6.906	3	-559.4	3	-136.777	1	-.217	3	-.295	1	-.201	3
37		19	max	0	1	0	15	0	1	0	1	0	1	0	1
38			min	0	1	0	1	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.006	1	0	4	0	1	0	1	0	1
40			min	0	1	-.002	3	0	1	0	1	0	1	0	1
41		2	max	19.64	10	673.493	3	0	1	.02	4	.235	4	.441	2
42			min	-202.87	1	-1475.805	2	-89.201	5	0	1	0	1	-.205	3
43		3	max	19.119	10	672.204	3	0	1	.02	4	.177	4	1.409	2
44			min	-203.496	1	-1477.525	2	-90.787	5	0	1	0	1	-.647	3
45		4	max	18.597	10	670.914	3	0	1	.02	4	.117	4	2.38	2
46			min	-204.122	1	-1479.244	2	-92.372	5	0	1	0	1	-1.088	3
47		5	max	2804.303	3	1502.384	2	0	1	0	1	.033	4	2.803	2
48			min	-6250.636	2	-716.067	3	-94.365	4	-.008	4	0	1	-1.273	3
49		6	max	2803.834	3	1500.664	2	0	1	0	1	0	1	1.817	2
50			min	-6251.262	2	-717.356	3	-95.951	4	-.008	4	-.03	5	-.803	3
51		7	max	2803.365	3	1498.945	2	0	1	0	1	0	1	.833	2
52			min	-6251.888	2	-718.646	3	-97.536	4	-.008	4	-.093	4	-.331	3
53		8	max	2802.895	3	1497.226	2	0	1	0	1	0	1	.141	3
54			min	-6252.514	2	-719.935	3	-99.122	4	-.008	4	-.158	4	-.174	1
55		9	max	2754.347	3	31.54	3	0	1	.011	4	.157	4	.366	3
56			min	-6342.249	1	-137.963	2	-219.111	4	0	1	0	1	-.614	1
57		10	max	2753.878	3	30.25	3	0	1	.011	4	.013	5	.346	3
58			min	-6342.875	1	-139.682	2	-220.697	4	0	1	0	1	-.524	1
59		11	max	2753.408	3	28.961	3	0	1	.011	4	0	1	.326	3
60			min	-6343.501	1	-141.401	2	-222.282	4	0	1	-.133	4	-.433	1
61		12	max	2712.964	3	1606.029	3	0	1	.1	4	.172	5	.065	1
62			min	-6524.417	1	-1530.709	1	-215.466	5	0	1	0	1	-.181	3
63		13	max	2712.494	3	1604.74	3	0	1	.1	4	.03	5	1.07	1
64			min	-6525.043	1	-1532.428	1	-217.052	5	0	1	0	1	-1.234	3
65		14	max	2712.025	3	1603.45	3	0	1	.1	4	0	1	2.077	1
66			min	-6525.668	1	-1534.147	1	-218.637	5	0	1	-.113	4	-2.287	3
67		15	max	2711.556	3	1602.161	3	0	1	.1	4	0	1	3.084	1
68			min	-6526.294	1	-1535.866	1	-220.223	5	0	1	-.257	5	-3.339	3
69		16	max	203.649	1	1431.367	1	49.218	5	0	1	0	1	2.349	1
70			min	-18.979	10	-1555.356	3	0	1	-.093	4	-.174	5	-2.536	3
71		17	max	203.023	1	1429.648	1	47.632	5	0	1	0	1	1.41	1
72			min	-19.5	10	-1556.646	3	0	1	-.093	4	-.142	4	-1.515	3
73		18	max	202.397	1	1427.928	1	46.047	5	0	1	0	1	.472	1
74			min	-20.022	10	-1557.935	3	0	1	-.093	4	-.112	4	-.493	3
75		19	max	0	1	0	5	0	1	0	1	0	1	0	1
76			min	0	1	-.002	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.003	1	0	4	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	27.645	5	269.869	3	139.344	1	.189	1	.122	5	.247	2
80			min	-195.318	1	-659.467	2	-40.255	5	-.057	3	-.284	1	-.1	3
81		3	max	27.353	5	268.58	3	139.344	1	.189	1	.095	5	.681	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
82			min	-195.944	1	-661.186	2	-41.84	5	-.057	3	-.193	1	-.277	3
83		4	max	27.061	5	267.29	3	139.344	1	.189	1	.067	5	1.115	2
84			min	-196.57	1	-662.905	2	-43.426	5	-.057	3	-.101	1	-.453	3
85		5	max	1024.313	3	607.123	2	165.636	1	.054	2	.039	3	1.317	2
86			min	-2782.103	1	-231.988	3	-42.871	5	-.004	5	-.139	1	-.536	3
87		6	max	1023.844	3	605.404	2	165.636	1	.054	2	.019	3	.919	2
88			min	-2782.728	1	-233.277	3	-44.456	5	-.004	5	-.034	2	-.384	3
89		7	max	1023.375	3	603.685	2	165.636	1	.054	2	.079	1	.522	2
90			min	-2783.354	1	-234.567	3	-46.042	5	-.004	5	-.049	5	-.23	3
91		8	max	1022.906	3	601.966	2	165.636	1	.054	2	.188	1	.128	1
92			min	-2783.98	1	-235.856	3	-47.627	5	-.004	5	-.08	5	-.076	3
93		9	max	1030.411	3	20.302	1	219.671	1	.161	2	.075	5	-.001	12
94			min	-2996.675	1	-5.107	3	-75.632	5	.014	15	-.106	1	-.057	2
95		10	max	1029.942	3	18.582	1	219.671	1	.161	2	.038	1	.001	3
96			min	-2997.301	1	-6.396	3	-77.218	5	.014	15	-.031	3	-.067	2
97		11	max	1029.473	3	16.863	1	219.671	1	.161	2	.182	1	.006	3
98			min	-2997.927	1	-7.685	3	-78.803	5	.014	15	-.064	3	-.076	2
99		12	max	1032.926	3	537.535	3	83.548	3	.218	1	.105	5	.079	1
100			min	-3204.222	1	-446.994	1	-180.833	5	-.169	3	-.131	1	-.169	3
101		13	max	1032.457	3	536.245	3	83.548	3	.218	1	.03	3	.372	1
102			min	-3204.848	1	-448.714	1	-182.419	5	-.169	3	-.114	1	-.522	3
103		14	max	1031.988	3	534.956	3	83.548	3	.218	1	.085	3	.667	1
104			min	-3205.473	1	-450.433	1	-184.004	5	-.169	3	-.15	4	-.873	3
105		15	max	1031.518	3	533.666	3	83.548	3	.218	1	.14	3	.963	1
106			min	-3206.099	1	-452.152	1	-185.59	5	-.169	3	-.268	4	-1.224	3
107		16	max	196.806	1	445.28	1	136.777	1	.217	3	.116	1	.733	1
108			min	-5.967	3	-556.821	3	-24.505	3	-.103	1	-.161	5	-.934	3
109		17	max	196.18	1	443.561	1	136.777	1	.217	3	.205	1	.441	1
110			min	-6.436	3	-558.111	3	-24.505	3	-.103	1	-.111	5	-.568	3
111		18	max	195.555	1	441.841	1	136.777	1	.217	3	.295	1	.151	1
112			min	-6.906	3	-559.4	3	-24.505	3	-.103	1	-.062	5	-.201	3
113		19	max	0	1	0	5	0	3	0	1	0	1	0	1
114			min	0	1	0	1	0	4	0	1	0	1	0	1
115	M10	1	max	136.802	1	441.388	1	7.352	3	.003	1	.341	1	.103	1
116			min	-24.507	3	-560.675	3	-195.487	1	-.014	3	-.048	3	-.217	3
117		2	max	136.802	1	312.996	1	9.137	3	.003	1	.192	1	.188	3
118			min	-24.507	3	-411.781	3	-162.619	1	-.014	3	-.042	3	-.211	1
119		3	max	136.802	1	184.604	1	10.922	3	.003	1	.084	2	.469	3
120			min	-24.507	3	-262.887	3	-129.751	1	-.014	3	-.033	3	-.418	1
121		4	max	136.802	1	56.212	1	12.707	3	.003	1	.022	2	.626	3
122			min	-24.507	3	-113.993	3	-96.882	1	-.014	3	-.033	14	-.519	1
123		5	max	136.802	1	34.901	3	14.492	3	.003	1	-.005	10	.659	3
124			min	-24.507	3	-72.18	1	-64.014	1	-.014	3	-.091	1	-.512	1
125		6	max	136.802	1	183.796	3	16.277	3	.003	1	0	3	.568	3
126			min	-24.507	3	-200.572	1	-42.188	2	-.014	3	-.131	1	-.398	1
127		7	max	136.802	1	332.69	3	18.864	4	.003	1	.015	3	.353	3
128			min	-24.507	3	-328.964	1	-29.248	2	-.014	3	-.143	1	-.178	1
129		8	max	136.802	1	481.584	3	35.243	14	.003	1	.031	3	.15	1
130			min	-24.507	3	-457.356	1	-16.821	10	-.014	3	-.128	1	-.014	5
131		9	max	136.802	1	630.478	3	67.459	1	.003	1	.048	3	.585	1
132			min	-24.507	3	-585.748	1	-13.587	10	-.014	3	-.127	2	-.45	3
133		10	max	136.802	1	714.14	1	10.353	10	.014	3	.067	3	1.126	1
134			min	-24.507	3	-779.372	3	-100.327	1	-.002	4	-.125	2	-1.037	3
135		11	max	136.802	1	585.748	1	13.587	10	.014	3	.048	3	.585	1
136			min	-24.507	3	-630.478	3	-67.459	1	-.003	1	-.127	2	-.45	3
137		12	max	136.802	1	457.356	1	16.821	10	.014	3	.031	3	.15	1
138			min	-24.507	3	-481.584	3	-34.856	9	-.003	1	-.128	1	.008	12

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	136.802	1	328.964	1	29.248	2	.014	3	.015	3	.353	3
140			min	-24.507	3	-332.69	3	-18.062	3	-.003	1	-.143	1	-.178	1
141		14	max	136.802	1	200.572	1	42.188	2	.014	3	0	3	.568	3
142			min	-24.507	3	-183.796	3	-16.277	3	-.003	1	-.131	1	-.398	1
143		15	max	136.802	1	72.18	1	64.014	1	.014	3	.002	5	.659	3
144			min	-24.507	3	-34.901	3	-14.492	3	-.003	1	-.091	1	-.512	1
145		16	max	136.802	1	113.993	3	96.882	1	.014	3	.022	2	.626	3
146			min	-30.533	5	-56.212	1	-12.707	3	-.003	1	-.029	9	-.519	1
147		17	max	136.802	1	262.887	3	129.751	1	.014	3	.084	2	.469	3
148			min	-40.366	5	-184.604	1	-10.922	3	-.003	1	-.033	3	-.418	1
149		18	max	136.802	1	411.781	3	162.619	1	.014	3	.192	1	.188	3
150			min	-50.2	5	-312.996	1	-9.137	3	-.003	1	-.042	3	-.211	1
151		19	max	136.802	1	560.675	3	195.487	1	.014	3	.341	1	.103	1
152			min	-60.034	5	-441.388	1	-7.352	3	-.003	1	-.048	3	-.217	3
153	M11	1	max	193.905	1	462.797	1	50.621	5	.007	3	.395	1	.086	4
154			min	-133.791	3	-547.869	3	-206.472	1	-.018	1	-.215	5	-.203	3
155		2	max	193.905	1	334.405	1	52.432	5	.007	3	.237	1	.191	3
156			min	-133.791	3	-398.974	3	-173.603	1	-.018	1	-.172	5	-.259	1
157		3	max	193.905	1	206.013	1	54.243	5	.007	3	.106	2	.462	3
158			min	-133.791	3	-250.08	3	-140.735	1	-.018	1	-.128	5	-.484	1
159		4	max	193.905	1	77.621	1	56.054	5	.007	3	.038	2	.608	3
160			min	-133.791	3	-101.186	3	-107.867	1	-.018	1	-.087	4	-.602	1
161		5	max	193.905	1	47.708	3	57.865	5	.007	3	0	10	.631	3
162			min	-133.791	3	-50.771	1	-74.998	1	-.018	1	-.074	1	-.613	1
163		6	max	193.905	1	196.602	3	59.676	5	.007	3	.015	5	.529	3
164			min	-133.791	3	-179.163	1	-49.108	2	-.018	1	-.123	1	-.518	1
165		7	max	193.905	1	345.497	3	64.135	4	.007	3	.065	5	.303	3
166			min	-133.791	3	-307.555	1	-36.169	2	-.018	1	-.144	1	-.315	1
167		8	max	193.905	1	494.391	3	72.739	4	.007	3	.117	5	0	9
168			min	-133.791	3	-435.947	1	-23.23	2	-.018	1	-.138	1	-.047	3
169		9	max	193.905	1	643.285	3	81.343	4	.007	3	.171	5	.412	1
170			min	-133.791	3	-564.339	1	-16.395	10	-.018	1	-.14	2	-.521	3
171		10	max	193.905	1	692.731	1	54.735	5	.018	1	.234	4	.936	1
172			min	-133.791	3	-792.179	3	-89.343	1	-.007	14	-.143	2	-1.119	3
173		11	max	193.905	1	564.339	1	56.546	5	.018	1	.043	3	.412	1
174			min	-133.791	3	-643.285	3	-56.475	1	-.007	3	-.184	4	-.521	3
175		12	max	193.905	1	435.947	1	58.357	5	.018	1	.028	3	.019	4
176			min	-133.791	3	-494.391	3	-28.817	9	-.007	3	-.147	4	-.047	3
177		13	max	193.905	1	307.555	1	60.168	5	.018	1	.016	3	.303	3
178			min	-133.791	3	-345.497	3	-14.506	3	-.007	3	-.144	1	-.315	1
179		14	max	193.905	1	179.163	1	66.602	4	.018	1	.004	3	.529	3
180			min	-133.791	3	-196.602	3	-12.721	3	-.007	3	-.123	1	-.518	1
181		15	max	193.905	1	50.771	1	75.205	4	.018	1	.025	5	.631	3
182			min	-133.791	3	-47.708	3	-10.936	3	-.007	3	-.074	1	-.613	1
183		16	max	193.905	1	101.186	3	107.867	1	.018	1	.079	5	.608	3
184			min	-133.791	3	-77.621	1	-9.151	3	-.007	3	-.014	9	-.602	1
185		17	max	193.905	1	250.08	3	140.735	1	.018	1	.149	4	.462	3
186			min	-133.791	3	-206.013	1	-7.366	3	-.007	3	-.021	3	-.484	1
187		18	max	193.905	1	398.974	3	173.603	1	.018	1	.237	1	.191	3
188			min	-133.791	3	-334.405	1	-5.581	3	-.007	3	-.026	3	-.259	1
189		19	max	193.905	1	547.869	3	206.472	1	.018	1	.395	1	.073	1
190			min	-133.791	3	-462.797	1	-3.796	3	-.007	3	-.03	3	-.203	3
191	M12	1	max	26.203	5	581.556	2	45.977	5	.004	3	.421	1	.107	2
192			min	-52.022	1	-232.757	3	-211.852	1	-.014	1	-.196	5	.017	15
193		2	max	19.806	3	426.303	2	47.788	5	.004	3	.258	1	.203	3
194			min	-52.022	1	-165.114	3	-178.984	1	-.014	1	-.157	5	-.315	1
195		3	max	19.806	3	271.051	2	49.599	5	.004	3	.123	1	.313	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
196			min	-52.022	1	-97.472	3	-146.116	1	-.014	1	-.116	5	-.603	2
197		4	max	19.806	3	115.798	2	51.411	5	.004	3	.049	2	.366	3
198			min	-52.022	1	-29.829	3	-113.247	1	-.014	1	-.077	4	-.764	2
199		5	max	19.806	3	37.813	3	53.222	5	.004	3	.003	10	.363	3
200			min	-52.022	1	-39.455	2	-80.379	1	-.014	1	-.066	1	-.796	2
201		6	max	19.806	3	105.456	3	55.033	5	.004	3	.015	5	.303	3
202			min	-52.022	1	-194.707	2	-54.014	2	-.014	1	-.119	1	-.698	2
203		7	max	19.806	3	173.098	3	58.83	4	.004	3	.061	5	.187	3
204			min	-52.022	1	-349.96	2	-41.075	2	-.014	1	-.145	1	-.472	2
205		8	max	19.806	3	240.741	3	67.433	4	.004	3	.109	5	.014	3
206			min	-53.076	4	-505.213	2	-28.135	2	-.014	1	-.144	1	-.127	1
207		9	max	19.806	3	308.383	3	76.037	4	.004	3	.159	5	.371	2
208			min	-62.909	4	-660.465	2	-18.836	10	-.014	1	-.149	2	-.214	3
209		10	max	19.806	3	815.718	2	85.213	14	.014	1	.217	4	.986	2
210			min	-72.743	4	-376.026	3	-83.963	1	-.005	14	-.156	2	-.5	3
211		11	max	46.013	5	660.465	2	52.334	5	.014	1	.05	3	.371	2
212			min	-52.022	1	-308.383	3	-51.094	1	-.004	3	-.175	4	-.214	3
213		12	max	36.179	5	505.213	2	54.145	5	.014	1	.032	3	.014	3
214			min	-52.022	1	-240.741	3	-26.444	9	-.004	3	-.144	1	-.127	1
215		13	max	26.346	5	349.96	2	55.956	5	.014	1	.016	3	.187	3
216			min	-52.022	1	-173.098	3	-18.704	3	-.004	3	-.145	1	-.472	2
217		14	max	19.806	3	194.707	2	63.238	4	.014	1	.001	3	.303	3
218			min	-52.022	1	-105.456	3	-16.919	3	-.004	3	-.119	1	-.698	2
219		15	max	19.806	3	39.455	2	80.379	1	.014	1	.022	5	.363	3
220			min	-52.022	1	-37.813	3	-15.134	3	-.004	3	-.066	1	-.796	2
221		16	max	19.806	3	29.829	3	113.247	1	.014	1	.073	5	.366	3
222			min	-52.022	1	-115.798	2	-13.349	3	-.004	3	-.024	3	-.764	2
223		17	max	19.806	3	97.472	3	146.116	1	.014	1	.141	4	.313	3
224			min	-52.022	1	-271.051	2	-11.564	3	-.004	3	-.034	3	-.603	2
225		18	max	19.806	3	165.114	3	178.984	1	.014	1	.258	1	.203	3
226			min	-52.022	1	-426.303	2	-9.779	3	-.004	3	-.043	3	-.315	1
227		19	max	19.806	3	232.757	3	211.852	1	.014	1	.421	1	.107	2
228			min	-52.022	1	-581.556	2	-7.994	3	-.004	3	-.051	3	-.021	5
229	M13	1	max	38.555	5	658.604	2	27.94	5	.01	3	.331	1	.189	1
230			min	-139.192	1	-271.211	3	-194.103	1	-.027	2	-.135	5	-.057	3
231		2	max	28.721	5	503.352	2	29.751	5	.01	3	.183	1	.141	3
232			min	-139.192	1	-203.569	3	-161.234	1	-.027	2	-.111	5	-.296	2
233		3	max	20.265	3	348.099	2	31.562	5	.01	3	.078	2	.283	3
234			min	-139.192	1	-135.926	3	-128.366	1	-.027	2	-.086	5	-.651	2
235		4	max	20.265	3	194.017	1	33.374	5	.01	3	.016	2	.368	3
236			min	-139.192	1	-68.284	3	-95.498	1	-.027	2	-.069	4	-.876	2
237		5	max	20.265	3	43.861	1	35.185	5	.01	3	-.005	12	.397	3
238			min	-139.192	1	-.641	3	-62.629	1	-.027	2	-.097	1	-.972	2
239		6	max	20.265	3	67.001	3	36.996	5	.01	3	.004	3	.369	3
240			min	-139.192	1	-117.659	2	-41.323	2	-.027	2	-.135	1	-.939	2
241		7	max	20.265	3	134.644	3	43.522	4	.01	3	.032	5	.285	3
242			min	-139.192	1	-272.911	2	-28.384	2	-.027	2	-.147	1	-.781	1
243		8	max	20.265	3	202.286	3	52.126	4	.01	3	.065	5	.144	3
244			min	-139.192	1	-428.164	2	-16.458	10	-.027	2	-.13	1	-.505	1
245		9	max	20.265	3	269.929	3	68.844	1	.01	3	.099	5	-.007	15
246			min	-139.192	1	-583.417	2	-13.224	10	-.027	2	-.129	2	-.103	1
247		10	max	20.265	3	337.571	3	101.712	1	.027	2	.149	4	.488	2
248			min	-139.192	1	-738.669	2	-9.99	10	-.01	3	-.126	2	-.305	3
249		11	max	27.889	5	583.417	2	32.741	5	.027	2	.047	3	.002	5
250			min	-139.192	1	-269.929	3	-68.844	1	-.01	3	-.129	2	-.103	1
251		12	max	20.265	3	428.164	2	34.552	5	.027	2	.031	3	.144	3
252			min	-139.192	1	-202.286	3	-35.976	1	-.01	3	-.13	1	-.505	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
253		13	max	20.265	3	272.911	2	36.363	5	.027	2	.017	3	.285	3
254			min	-139.192	1	-134.644	3	-16.095	3	-.01	3	-.147	1	-.781	1
255		14	max	20.265	3	117.659	2	41.323	2	.027	2	.004	3	.369	3
256			min	-139.192	1	-67.001	3	-14.31	3	-.01	3	-.135	1	-.939	2
257		15	max	20.265	3	2.286	5	62.629	1	.027	2	.019	5	.397	3
258			min	-139.192	1	-43.861	1	-12.525	3	-.01	3	-.097	1	-.972	2
259		16	max	20.265	3	68.284	3	95.498	1	.027	2	.053	5	.368	3
260			min	-139.192	1	-194.017	1	-10.74	3	-.01	3	-.032	9	-.876	2
261		17	max	20.265	3	135.926	3	128.366	1	.027	2	.095	4	.283	3
262			min	-139.192	1	-348.099	2	-8.955	3	-.01	3	-.025	3	-.651	2
263		18	max	20.265	3	203.569	3	161.234	1	.027	2	.183	1	.141	3
264			min	-139.192	1	-503.352	2	-7.17	3	-.01	3	-.032	3	-.296	2
265		19	max	20.265	3	271.211	3	194.103	1	.027	2	.331	1	.189	1
266			min	-139.192	1	-658.604	2	-5.386	3	-.01	3	-.037	3	-.057	3
267	M2	1	max	2350.668	1	529.061	3	139.839	1	.003	5	1.245	5	8.758	1
268			min	-1457.317	3	-265.512	2	-304.006	5	-.002	1	-.216	1	-.695	3
269		2	max	2348.111	1	529.061	3	139.839	1	.003	5	1.16	5	8.746	1
270			min	-1459.235	3	-265.512	2	-301.789	5	-.002	1	-.176	1	-.844	3
271		3	max	2345.553	1	529.061	3	139.839	1	.003	5	1.076	5	8.733	1
272			min	-1461.153	3	-265.512	2	-299.573	5	-.002	1	-.137	1	-.992	3
273		4	max	2342.996	1	529.061	3	139.839	1	.003	5	.992	5	8.72	1
274			min	-1463.071	3	-265.512	2	-297.356	5	-.002	1	-.098	1	-1.141	3
275		5	max	2340.439	1	529.061	3	139.839	1	.003	5	.91	4	8.707	1
276			min	-1464.989	3	-265.512	2	-295.14	5	-.002	1	-.059	1	-1.289	3
277		6	max	2337.881	1	529.061	3	139.839	1	.003	5	.833	4	8.695	1
278			min	-1466.907	3	-265.512	2	-292.923	5	-.002	1	-.034	3	-1.438	3
279		7	max	2335.324	1	529.061	3	139.839	1	.003	5	.756	4	8.682	1
280			min	-1468.825	3	-265.512	2	-290.707	5	-.002	1	-.067	3	-1.587	3
281		8	max	2332.766	1	529.061	3	139.839	1	.003	5	.68	4	8.669	1
282			min	-1470.743	3	-265.512	2	-288.49	5	-.002	1	-.101	3	-1.735	3
283		9	max	2072.594	1	2902.068	1	111.188	1	.002	1	.607	4	8.151	1
284			min	-1357.894	3	-599.622	3	-278.249	5	0	3	-.106	3	-1.684	3
285		10	max	2070.036	1	2902.068	1	111.188	1	.002	1	.533	4	7.336	1
286			min	-1359.812	3	-599.622	3	-276.032	5	0	3	-.136	3	-1.516	3
287		11	max	2067.479	1	2902.068	1	111.188	1	.002	1	.459	4	6.521	1
288			min	-1361.73	3	-599.622	3	-273.816	5	0	3	-.167	3	-1.347	3
289		12	max	2064.921	1	2902.068	1	111.188	1	.002	1	.386	4	5.706	1
290			min	-1363.648	3	-599.622	3	-271.599	5	0	3	-.197	3	-1.179	3
291		13	max	2062.364	1	2902.068	1	111.188	1	.002	1	.313	4	4.89	1
292			min	-1365.566	3	-599.622	3	-269.383	5	0	3	-.228	3	-1.01	3
293		14	max	2059.806	1	2902.068	1	111.188	1	.002	1	.241	4	4.075	1
294			min	-1367.484	3	-599.622	3	-267.166	5	0	3	-.258	3	-.842	3
295		15	max	2057.249	1	2902.068	1	111.188	1	.002	1	.216	1	3.26	1
296			min	-1369.403	3	-599.622	3	-264.95	5	0	3	-.288	3	-.674	3
297		16	max	2054.691	1	2902.068	1	111.188	1	.002	1	.248	1	2.445	1
298			min	-1371.321	3	-599.622	3	-262.733	5	0	3	-.319	3	-.505	3
299		17	max	2052.134	1	2902.068	1	111.188	1	.002	1	.279	1	1.63	1
300			min	-1373.239	3	-599.622	3	-260.517	5	0	3	-.349	3	-.337	3
301		18	max	2049.576	1	2902.068	1	111.188	1	.002	1	.31	1	.815	1
302			min	-1375.157	3	-599.622	3	-258.3	5	0	3	-.379	3	-.168	3
303		19	max	2047.019	1	2902.068	1	111.188	1	.002	1	.341	1	0	1
304			min	-1377.075	3	-599.622	3	-256.084	5	0	3	-.41	3	0	1
305	M5	1	max	5796.576	1	1733.471	3	0	1	.003	4	1.292	4	13.468	1
306			min	-4167.458	3	-1834.629	2	-320.483	5	0	1	0	1	-.622	3
307		2	max	5794.019	1	1733.471	3	0	1	.003	4	1.203	4	13.816	1
308			min	-4169.376	3	-1834.629	2	-318.267	5	0	1	0	1	-1.109	3
309		3	max	5791.461	1	1733.471	3	0	1	.003	4	1.114	4	14.164	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
310			min	-4171.294	3	-1834.629	2	-316.05	5	0	1	0	1	-1.596	3
311		4	max	5788.904	1	1733.471	3	0	1	.003	4	1.025	4	14.512	1
312			min	-4173.212	3	-1834.629	2	-313.834	5	0	1	0	1	-2.083	3
313		5	max	5786.346	1	1733.471	3	0	1	.003	4	.938	4	14.86	1
314			min	-4175.13	3	-1834.629	2	-311.617	5	0	1	0	1	-2.57	3
315		6	max	5783.789	1	1733.471	3	0	1	.003	4	.851	4	15.208	1
316			min	-4177.048	3	-1834.629	2	-309.401	5	0	1	0	1	-3.057	3
317		7	max	5781.231	1	1733.471	3	0	1	.003	4	.764	4	15.556	1
318			min	-4178.966	3	-1834.629	2	-307.184	5	0	1	0	1	-3.543	3
319		8	max	5778.674	1	1733.471	3	0	1	.003	4	.679	4	15.904	1
320			min	-4180.884	3	-1834.629	2	-304.968	5	0	1	0	1	-4.03	3
321		9	max	5257.334	1	5370.077	1	0	1	0	1	.608	4	15.082	1
322			min	-3846.838	3	-1410.275	3	-300.62	4	0	4	0	1	-3.961	3
323		10	max	5254.776	1	5370.077	1	0	1	0	1	.524	4	13.574	1
324			min	-3848.756	3	-1410.275	3	-298.404	4	0	4	0	1	-3.565	3
325		11	max	5252.219	1	5370.077	1	0	1	0	1	.441	4	12.066	1
326			min	-3850.674	3	-1410.275	3	-296.187	4	0	4	0	1	-3.169	3
327		12	max	5249.662	1	5370.077	1	0	1	0	1	.358	4	10.558	1
328			min	-3852.592	3	-1410.275	3	-293.971	4	0	4	0	1	-2.773	3
329		13	max	5247.104	1	5370.077	1	0	1	0	1	.275	4	9.049	1
330			min	-3854.51	3	-1410.275	3	-291.754	4	0	4	0	1	-2.377	3
331		14	max	5244.547	1	5370.077	1	0	1	0	1	.194	4	7.541	1
332			min	-3856.428	3	-1410.275	3	-289.538	4	0	4	0	1	-1.98	3
333		15	max	5241.989	1	5370.077	1	0	1	0	1	.113	4	6.033	1
334			min	-3858.347	3	-1410.275	3	-287.321	4	0	4	0	1	-1.584	3
335		16	max	5239.432	1	5370.077	1	0	1	0	1	.032	4	4.525	1
336			min	-3860.265	3	-1410.275	3	-285.105	4	0	4	0	1	-1.188	3
337		17	max	5236.874	1	5370.077	1	0	1	0	1	0	1	3.016	1
338			min	-3862.183	3	-1410.275	3	-282.888	4	0	4	-.048	5	-.792	3
339		18	max	5234.317	1	5370.077	1	0	1	0	1	0	1	1.508	1
340			min	-3864.101	3	-1410.275	3	-280.672	4	0	4	-.127	4	-.396	3
341		19	max	5231.759	1	5370.077	1	0	1	0	1	0	1	0	1
342			min	-3866.019	3	-1410.275	3	-278.455	4	0	4	-.205	4	0	1
343	M8	1	max	2350.668	1	529.061	3	118.131	3	.004	4	1.308	4	8.758	1
344			min	-1457.317	3	-265.512	2	-335.783	4	0	3	-.132	3	-.695	3
345		2	max	2348.111	1	529.061	3	118.131	3	.004	4	1.214	4	8.746	1
346			min	-1459.235	3	-265.512	2	-333.566	4	0	3	-.099	3	-.844	3
347		3	max	2345.553	1	529.061	3	118.131	3	.004	4	1.121	4	8.733	1
348			min	-1461.153	3	-265.512	2	-331.35	4	0	3	-.065	3	-.992	3
349		4	max	2342.996	1	529.061	3	118.131	3	.004	4	1.028	4	8.72	1
350			min	-1463.071	3	-265.512	2	-329.133	4	0	3	-.032	3	-1.141	3
351		5	max	2340.439	1	529.061	3	118.131	3	.004	4	.936	4	8.707	1
352			min	-1464.989	3	-265.512	2	-326.917	4	0	3	0	12	-1.289	3
353		6	max	2337.881	1	529.061	3	118.131	3	.004	4	.844	4	8.695	1
354			min	-1466.907	3	-265.512	2	-324.7	4	0	3	-.003	10	-1.438	3
355		7	max	2335.324	1	529.061	3	118.131	3	.004	4	.754	4	8.682	1
356			min	-1468.825	3	-265.512	2	-322.484	4	0	3	-.034	2	-1.587	3
357		8	max	2332.766	1	529.061	3	118.131	3	.004	4	.663	4	8.669	1
358			min	-1470.743	3	-265.512	2	-320.268	4	0	3	-.068	2	-1.735	3
359		9	max	2072.594	1	2902.068	1	108.167	3	0	3	.599	4	8.151	1
360			min	-1357.894	3	-599.622	3	-307.497	4	-.002	1	-.034	2	-1.684	3
361		10	max	2070.036	1	2902.068	1	108.167	3	0	3	.513	4	7.336	1
362			min	-1359.812	3	-599.622	3	-305.281	4	-.002	1	-.061	2	-1.516	3
363		11	max	2067.479	1	2902.068	1	108.167	3	0	3	.432	5	6.521	1
364			min	-1361.73	3	-599.622	3	-303.064	4	-.002	1	-.092	1	-1.347	3
365		12	max	2064.921	1	2902.068	1	108.167	3	0	3	.353	5	5.706	1
366			min	-1363.648	3	-599.622	3	-300.848	4	-.002	1	-.123	1	-1.179	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
367		13	max	2062.364	1	2902.068	1	108.167	3	0	3	.275	5	4.89	1
368			min	-1365.566	3	-599.622	3	-298.631	4	-.002	1	-.154	1	-1.01	3
369		14	max	2059.806	1	2902.068	1	108.167	3	0	3	.258	3	4.075	1
370			min	-1367.484	3	-599.622	3	-296.415	4	-.002	1	-.185	1	-.842	3
371		15	max	2057.249	1	2902.068	1	108.167	3	0	3	.288	3	3.26	1
372			min	-1369.403	3	-599.622	3	-294.198	4	-.002	1	-.216	1	-.674	3
373		16	max	2054.691	1	2902.068	1	108.167	3	0	3	.319	3	2.445	1
374			min	-1371.321	3	-599.622	3	-291.982	4	-.002	1	-.248	1	-.505	3
375		17	max	2052.134	1	2902.068	1	108.167	3	0	3	.349	3	1.63	1
376			min	-1373.239	3	-599.622	3	-289.765	4	-.002	1	-.279	1	-.337	3
377		18	max	2049.576	1	2902.068	1	108.167	3	0	3	.379	3	.815	1
378			min	-1375.157	3	-599.622	3	-287.549	4	-.002	1	-.31	1	-.168	3
379		19	max	2047.019	1	2902.068	1	108.167	3	0	3	.41	3	0	1
380			min	-1377.075	3	-599.622	3	-285.332	4	-.002	1	-.341	1	0	1
381	M3	1	max	2923.568	2	6.095	4	27.41	1	.026	3	.003	4	0	1
382			min	-1136.528	3	1.433	15	-10.553	3	-.064	1	-.001	3	0	1
383		2	max	2923.514	2	5.418	4	27.41	1	.026	3	.013	1	0	15
384			min	-1136.568	3	1.274	15	-10.553	3	-.064	1	-.005	3	-.002	4
385		3	max	2923.46	2	4.741	4	27.41	1	.026	3	.023	1	0	15
386			min	-1136.608	3	1.114	15	-10.553	3	-.064	1	-.009	3	-.004	4
387		4	max	2923.406	2	4.064	4	27.41	1	.026	3	.032	1	-.001	15
388			min	-1136.649	3	.955	15	-10.553	3	-.064	1	-.012	3	-.005	4
389		5	max	2923.352	2	3.386	4	27.41	1	.026	3	.042	1	-.002	15
390			min	-1136.689	3	.796	15	-10.553	3	-.064	1	-.016	3	-.007	4
391		6	max	2923.298	2	2.709	4	27.41	1	.026	3	.052	1	-.002	15
392			min	-1136.73	3	.637	15	-10.553	3	-.064	1	-.02	3	-.008	4
393		7	max	2923.244	2	2.032	4	27.41	1	.026	3	.062	1	-.002	15
394			min	-1136.77	3	.478	15	-10.553	3	-.064	1	-.024	3	-.009	4
395		8	max	2923.19	2	1.355	4	27.41	1	.026	3	.072	1	-.002	15
396			min	-1136.811	3	.318	15	-10.553	3	-.064	1	-.028	3	-.009	4
397		9	max	2923.136	2	.677	4	27.41	1	.026	3	.081	1	-.002	15
398			min	-1136.851	3	.159	15	-10.553	3	-.064	1	-.031	3	-.01	4
399		10	max	2923.082	2	0	1	27.41	1	.026	3	.091	1	-.002	15
400			min	-1136.892	3	0	1	-10.553	3	-.064	1	-.035	3	-.01	4
401		11	max	2923.028	2	-.159	15	27.41	1	.026	3	.101	1	-.002	15
402			min	-1136.932	3	-.677	6	-10.553	3	-.064	1	-.039	3	-.01	4
403		12	max	2922.974	2	-.318	15	27.41	1	.026	3	.111	1	-.002	15
404			min	-1136.973	3	-1.355	6	-10.553	3	-.064	1	-.043	3	-.009	4
405		13	max	2922.92	2	-.478	15	27.41	1	.026	3	.121	1	-.002	15
406			min	-1137.013	3	-2.032	6	-10.553	3	-.064	1	-.046	3	-.009	4
407		14	max	2922.866	2	-.637	15	27.41	1	.026	3	.13	1	-.002	15
408			min	-1137.054	3	-2.709	6	-10.553	3	-.064	1	-.05	3	-.008	4
409		15	max	2922.812	2	-.796	15	27.41	1	.026	3	.14	1	-.002	15
410			min	-1137.094	3	-3.386	6	-10.553	3	-.064	1	-.054	3	-.007	4
411		16	max	2922.758	2	-.955	15	27.41	1	.026	3	.15	1	-.001	15
412			min	-1137.135	3	-4.064	6	-10.553	3	-.064	1	-.058	3	-.005	4
413		17	max	2922.704	2	-1.114	15	27.41	1	.026	3	.16	1	0	15
414			min	-1137.175	3	-4.741	6	-10.553	3	-.064	1	-.061	3	-.004	4
415		18	max	2922.65	2	-1.274	15	27.41	1	.026	3	.17	1	0	15
416			min	-1137.216	3	-5.418	6	-10.553	3	-.064	1	-.065	3	-.002	4
417		19	max	2922.597	2	-1.433	15	27.41	1	.026	3	.179	1	0	1
418			min	-1137.256	3	-6.095	6	-10.553	3	-.064	1	-.069	3	0	1
419	M6	1	max	6847.103	2	6.095	6	0	1	.015	4	.003	4	0	1
420			min	-3174.574	3	1.433	15	-9.576	4	0	1	0	1	0	1
421		2	max	6847.049	2	5.418	6	0	1	.015	4	0	1	0	15
422			min	-3174.614	3	1.274	15	-9.116	4	0	1	0	4	-.002	6
423		3	max	6846.995	2	4.741	6	0	1	.015	4	0	1	0	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
424			min	-3174.655	3	1.114	15	-8.656	4	0	1	-.004	4	-.004	6
425		4	max	6846.941	2	4.064	6	0	1	.015	4	0	1	-.001	15
426			min	-3174.695	3	.955	15	-8.197	4	0	1	-.007	4	-.005	6
427		5	max	6846.888	2	3.386	6	0	1	.015	4	0	1	-.002	15
428			min	-3174.736	3	.796	15	-7.737	4	0	1	-.01	4	-.007	6
429		6	max	6846.834	2	2.709	6	0	1	.015	4	0	1	-.002	15
430			min	-3174.776	3	.637	15	-7.277	4	0	1	-.012	4	-.008	6
431		7	max	6846.78	2	2.032	6	0	1	.015	4	0	1	-.002	15
432			min	-3174.817	3	.478	15	-6.817	4	0	1	-.015	4	-.009	6
433		8	max	6846.726	2	1.355	6	0	1	.015	4	0	1	-.002	15
434			min	-3174.857	3	.318	15	-6.358	4	0	1	-.017	4	-.009	6
435		9	max	6846.672	2	.677	6	0	1	.015	4	0	1	-.002	15
436			min	-3174.898	3	.159	15	-5.898	4	0	1	-.02	4	-.01	6
437		10	max	6846.618	2	0	1	0	1	.015	4	0	1	-.002	15
438			min	-3174.938	3	0	1	-5.438	4	0	1	-.022	4	-.01	6
439		11	max	6846.564	2	-.159	15	0	1	.015	4	0	1	-.002	15
440			min	-3174.979	3	-.677	4	-4.978	4	0	1	-.023	4	-.01	6
441		12	max	6846.51	2	-.318	15	0	1	.015	4	0	1	-.002	15
442			min	-3175.019	3	-1.355	4	-4.519	4	0	1	-.025	4	-.009	6
443		13	max	6846.456	2	-.478	15	0	1	.015	4	0	1	-.002	15
444			min	-3175.06	3	-2.032	4	-4.059	4	0	1	-.027	4	-.009	6
445		14	max	6846.402	2	-.637	15	0	1	.015	4	0	1	-.002	15
446			min	-3175.1	3	-2.709	4	-3.599	4	0	1	-.028	4	-.008	6
447		15	max	6846.348	2	-.796	15	0	1	.015	4	0	1	-.002	15
448			min	-3175.141	3	-3.386	4	-3.139	4	0	1	-.029	4	-.007	6
449		16	max	6846.294	2	-.955	15	0	1	.015	4	0	1	-.001	15
450			min	-3175.181	3	-4.064	4	-2.68	4	0	1	-.03	4	-.005	6
451		17	max	6846.24	2	-1.114	15	0	1	.015	4	0	1	0	15
452			min	-3175.222	3	-4.741	4	-2.22	4	0	1	-.031	4	-.004	6
453		18	max	6846.186	2	-1.274	15	0	1	.015	4	0	1	0	15
454			min	-3175.262	3	-5.418	4	-1.76	4	0	1	-.032	4	-.002	6
455		19	max	6846.132	2	-1.433	15	0	1	.015	4	0	1	0	1
456			min	-3175.303	3	-6.095	4	-1.3	4	0	1	-.032	4	0	1
457	M9	1	max	2923.568	2	6.095	4	10.553	3	.064	1	.003	5	0	1
458			min	-1136.528	3	1.433	15	-27.41	1	-.026	3	-.003	2	0	1
459		2	max	2923.514	2	5.418	4	10.553	3	.064	1	.005	3	0	15
460			min	-1136.568	3	1.274	15	-27.41	1	-.026	3	-.013	1	-.002	4
461		3	max	2923.46	2	4.741	4	10.553	3	.064	1	.009	3	0	15
462			min	-1136.608	3	1.114	15	-27.41	1	-.026	3	-.023	1	-.004	4
463		4	max	2923.406	2	4.064	4	10.553	3	.064	1	.012	3	-.001	15
464			min	-1136.649	3	.955	15	-27.41	1	-.026	3	-.032	1	-.005	4
465		5	max	2923.352	2	3.386	4	10.553	3	.064	1	.016	3	-.002	15
466			min	-1136.689	3	.796	15	-27.41	1	-.026	3	-.042	1	-.007	4
467		6	max	2923.298	2	2.709	4	10.553	3	.064	1	.02	3	-.002	15
468			min	-1136.73	3	.637	15	-27.41	1	-.026	3	-.052	1	-.008	4
469		7	max	2923.244	2	2.032	4	10.553	3	.064	1	.024	3	-.002	15
470			min	-1136.77	3	.478	15	-27.41	1	-.026	3	-.062	1	-.009	4
471		8	max	2923.19	2	1.355	4	10.553	3	.064	1	.028	3	-.002	15
472			min	-1136.811	3	.318	15	-27.41	1	-.026	3	-.072	1	-.009	4
473		9	max	2923.136	2	.677	4	10.553	3	.064	1	.031	3	-.002	15
474			min	-1136.851	3	.159	15	-27.41	1	-.026	3	-.081	1	-.01	4
475		10	max	2923.082	2	0	1	10.553	3	.064	1	.035	3	-.002	15
476			min	-1136.892	3	0	1	-27.41	1	-.026	3	-.091	1	-.01	4
477		11	max	2923.028	2	-.159	15	10.553	3	.064	1	.039	3	-.002	15
478			min	-1136.932	3	-.677	6	-27.41	1	-.026	3	-.101	1	-.01	4
479		12	max	2922.974	2	-.318	15	10.553	3	.064	1	.043	3	-.002	15
480			min	-1136.973	3	-1.355	6	-27.41	1	-.026	3	-.111	1	-.009	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
481		13	max	2922.92	2	-.478	15	10.553	3	.064	1	.046	3	-.002	15
482			min	-1137.013	3	-2.032	6	-27.41	1	-.026	3	-.121	1	-.009	4
483		14	max	2922.866	2	-.637	15	10.553	3	.064	1	.05	3	-.002	15
484			min	-1137.054	3	-2.709	6	-27.41	1	-.026	3	-.13	1	-.008	4
485		15	max	2922.812	2	-.796	15	10.553	3	.064	1	.054	3	-.002	15
486			min	-1137.094	3	-3.386	6	-27.41	1	-.026	3	-.14	1	-.007	4
487		16	max	2922.758	2	-.955	15	10.553	3	.064	1	.058	3	-.001	15
488			min	-1137.135	3	-4.064	6	-27.41	1	-.026	3	-.15	1	-.005	4
489		17	max	2922.704	2	-1.114	15	10.553	3	.064	1	.061	3	0	15
490			min	-1137.175	3	-4.741	6	-27.41	1	-.026	3	-.16	1	-.004	4
491		18	max	2922.65	2	-1.274	15	10.553	3	.064	1	.065	3	0	15
492			min	-1137.216	3	-5.418	6	-27.41	1	-.026	3	-.17	1	-.002	4
493		19	max	2922.597	2	-1.433	15	10.553	3	.064	1	.069	3	0	1
494			min	-1137.256	3	-6.095	6	-27.41	1	-.026	3	-.179	1	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	.083	3	.342	3	.011	1	9.895e-3	3	1123.923	12	NC	1
2			min	-.52	1	-1.503	1	-.631	4	-2.67e-2	1	74.068	1	254.106	5
3		2	max	.083	3	.29	3	0	3	9.527e-3	3	1486.589	12	NC	2
4			min	-.52	1	-1.328	1	-.609	4	-2.547e-2	1	81.51	1	264.942	4
5		3	max	.083	3	.24	3	.002	3	8.807e-3	3	2166.004	12	NC	3
6			min	-.52	1	-1.157	1	-.58	4	-2.307e-2	1	90.413	1	279.894	4
7		4	max	.083	3	.194	3	.003	3	8.087e-3	3	3722.347	12	NC	3
8			min	-.52	1	-.996	1	-.546	4	-2.066e-2	1	100.757	1	300.303	4
9		5	max	.083	3	.154	3	.003	3	7.558e-3	3	9474.248	12	NC	3
10			min	-.52	1	-.853	1	-.508	4	-1.874e-2	1	112.226	1	326.771	4
11		6	max	.083	3	.124	3	.003	3	7.517e-3	3	NC	3	NC	2
12			min	-.519	1	-.729	1	-.468	4	-1.806e-2	1	124.411	1	359.86	4
13		7	max	.082	3	.099	3	.002	3	7.477e-3	3	7962.414	12	NC	1
14			min	-.518	1	-.619	1	-.428	4	-1.739e-2	1	137.678	1	399.75	4
15		8	max	.082	3	.077	3	0	1	7.437e-3	3	4677.201	12	NC	1
16			min	-.516	1	-.517	1	-.392	4	-1.671e-2	1	152.794	1	444.891	5
17		9	max	.081	3	.057	3	0	10	7.643e-3	3	3362.535	12	NC	1
18			min	-.515	1	-.417	1	-.359	4	-1.543e-2	1	171.262	1	496.289	5
19		10	max	.081	3	.037	3	.001	1	8.083e-3	3	2623.397	12	NC	1
20			min	-.514	1	-.316	1	-.323	4	-1.359e-2	1	195.08	1	566.308	5
21		11	max	.081	3	.017	3	.001	1	8.522e-3	3	2479.839	15	NC	1
22			min	-.513	1	-.214	1	-.287	4	-1.175e-2	1	226.955	1	662.053	5
23		12	max	.08	3	-.003	12	.003	3	7.708e-3	3	2836.971	15	NC	1
24			min	-.512	1	-.111	1	-.252	4	-9.456e-3	1	271.957	1	794.521	5
25		13	max	.08	3	-.001	15	.007	3	5.563e-3	3	3316.675	15	NC	1
26			min	-.51	1	-.022	3	-.213	4	-6.682e-3	1	338.387	1	1017.073	5
27		14	max	.079	3	.088	1	.01	3	3.417e-3	3	3991.987	15	NC	1
28			min	-.509	1	-.032	3	-.174	4	-4.052e-3	4	439.756	1	1410.381	5
29		15	max	.079	3	.174	1	.01	3	1.272e-3	3	5007.478	15	NC	1
30			min	-.508	1	-.029	3	-.139	4	-4.663e-3	4	600.373	1	2125.145	5
31		16	max	.079	3	.246	1	.009	1	3.517e-3	3	6695.837	15	NC	2
32			min	-.508	1	-.007	3	-.112	4	-4.104e-3	4	861.48	1	3417.442	5
33		17	max	.079	3	.306	1	.012	1	6.278e-3	3	NC	15	NC	2
34			min	-.508	1	.019	12	-.094	5	-3.407e-3	4	1357.536	1	6125.064	5
35		18	max	.079	3	.359	1	.006	1	9.038e-3	3	NC	5	NC	2
36			min	-.508	1	.034	15	-.081	4	-4.653e-3	1	2772.958	1	9736.09	1
37		19	max	.079	3	.41	1	0	12	1.045e-2	3	NC	1	NC	1
38			min	-.508	1	.041	15	-.074	4	-5.325e-3	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
39	M4	1	max	.173	3	.72	3	0	1	8.106e-4	4	1711.46	15	NC	1
40			min	-.902	1	-2.684	1	-.63	4	0	1	43.865	1	254.508	4
41		2	max	.173	3	.616	3	0	1	6.831e-4	4	1883.026	15	NC	1
42			min	-.902	1	-2.372	1	-.61	4	0	1	48.557	1	263.763	4
43		3	max	.173	3	.515	3	0	1	4.341e-4	5	2088.749	15	NC	1
44			min	-.902	1	-2.066	1	-.582	4	0	1	54.246	1	278.102	4
45		4	max	.173	3	.424	3	0	1	1.862e-4	5	2527.725	12	NC	1
46			min	-.902	1	-1.781	1	-.548	4	0	1	60.898	1	298.474	4
47		5	max	.173	3	.35	3	0	1	3.479e-5	5	NC	12	NC	1
48			min	-.901	1	-1.531	1	-.508	4	0	1	68.215	1	325.503	4
49		6	max	.172	3	.296	3	0	1	1.313e-4	5	7266.526	12	NC	1
50			min	-.899	1	-1.323	1	-.467	4	0	1	75.805	1	359.325	4
51		7	max	.171	3	.254	3	0	1	2.278e-4	5	3221.673	12	NC	1
52			min	-.896	1	-1.141	1	-.427	4	0	1	83.955	1	399.644	4
53		8	max	.17	3	.218	3	0	1	3.247e-4	4	3514.88	15	NC	1
54			min	-.894	1	-.972	1	-.391	4	0	1	93.33	1	444.875	4
55		9	max	.169	3	.179	3	0	1	3.004e-4	4	3961.393	15	NC	1
56			min	-.891	1	-.799	1	-.359	4	0	1	105.315	1	494.488	4
57		10	max	.168	3	.135	3	0	1	1.615e-4	5	4574.202	15	NC	1
58			min	-.889	1	-.616	1	-.323	4	0	1	121.867	1	566.111	4
59		11	max	.166	3	.084	3	0	1	2.317e-5	5	5454.826	15	NC	1
60			min	-.886	1	-.425	1	-.286	4	0	1	145.797	1	663.504	4
61		12	max	.165	3	.029	3	0	1	0	1	6816.756	15	NC	1
62			min	-.883	1	-.227	1	-.253	4	-6.673e-4	4	183.112	1	787.03	4
63		13	max	.164	3	0	15	0	1	0	1	9078.844	15	NC	1
64			min	-.881	1	-.036	2	-.215	4	-1.939e-3	4	245.826	1	997.76	4
65		14	max	.163	3	.151	1	0	1	0	1	NC	15	NC	1
66			min	-.878	1	-.059	3	-.176	4	-3.211e-3	4	358.224	1	1378.576	4
67		15	max	.162	3	.3	1	0	1	0	1	NC	5	NC	1
68			min	-.876	1	-.058	3	-.141	4	-4.482e-3	4	372.371	3	2081.376	4
69		16	max	.162	3	.402	1	0	1	0	1	NC	5	NC	1
70			min	-.875	1	-.006	3	-.115	4	-3.557e-3	4	431.243	3	3377.596	4
71		17	max	.162	3	.467	1	0	1	0	1	NC	5	NC	1
72			min	-.875	1	.012	15	-.096	4	-2.373e-3	4	597.718	3	6207.83	4
73		18	max	.162	3	.51	1	0	1	0	1	NC	4	NC	1
74			min	-.876	1	.014	15	-.082	4	-1.19e-3	4	1160.357	3	NC	1
75		19	max	.162	3	.547	1	0	1	0	1	NC	1	NC	1
76			min	-.876	1	.015	15	-.073	4	-5.86e-4	4	NC	1	NC	1
77	M7	1	max	.083	3	.342	3	.001	3	2.67e-2	1	NC	5	NC	1
78			min	-.52	1	-1.503	1	-.635	4	-9.895e-3	3	74.068	1	250.575	4
79		2	max	.083	3	.29	3	.008	1	2.547e-2	1	NC	5	NC	2
80			min	-.52	1	-1.328	1	-.605	4	-9.527e-3	3	81.51	1	264.626	4
81		3	max	.083	3	.24	3	.018	1	2.307e-2	1	NC	5	NC	3
82			min	-.52	1	-1.157	1	-.573	4	-8.807e-3	3	90.413	1	281.805	4
83		4	max	.083	3	.194	3	.02	1	2.066e-2	1	NC	5	NC	3
84			min	-.52	1	-.996	1	-.538	4	-8.087e-3	3	100.757	1	302.991	4
85		5	max	.083	3	.154	3	.018	1	1.874e-2	1	NC	5	NC	3
86			min	-.52	1	-.853	1	-.501	4	-7.558e-3	3	112.226	1	329.074	4
87		6	max	.083	3	.124	3	.011	1	1.806e-2	1	NC	3	NC	2
88			min	-.519	1	-.729	1	-.463	4	-7.517e-3	3	124.411	1	360.132	4
89		7	max	.082	3	.099	3	.004	1	1.739e-2	1	NC	5	NC	1
90			min	-.518	1	-.619	1	-.427	4	-7.477e-3	3	137.678	1	396.647	4
91		8	max	.082	3	.077	3	0	10	1.671e-2	1	NC	5	NC	1
92			min	-.516	1	-.517	1	-.392	4	-7.437e-3	3	152.794	1	439.431	4
93		9	max	.081	3	.057	3	0	3	1.543e-2	1	NC	5	NC	1
94			min	-.515	1	-.417	1	-.359	4	-7.643e-3	3	171.262	1	490.3	4
95		10	max	.081	3	.037	3	.001	3	1.359e-2	1	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.514	1	-.316	1	-.324	4	-8.083e-3	3	195.08	1	558.17	4
97		11	max	.081	3	.017	3	0	3	1.175e-2	1	NC	5	NC	1
98			min	-.513	1	-.214	1	-.287	4	-8.522e-3	3	226.955	1	651.476	4
99		12	max	.08	3	.003	5	.004	1	9.456e-3	1	NC	5	NC	1
100			min	-.512	1	-.111	1	-.25	4	-7.708e-3	3	271.957	1	785.808	4
101		13	max	.08	3	0	5	.007	1	6.682e-3	1	NC	5	NC	1
102			min	-.51	1	-.022	3	-.21	4	-5.563e-3	3	338.387	1	1007.589	4
103		14	max	.079	3	.088	1	.005	2	3.907e-3	1	NC	5	NC	1
104			min	-.509	1	-.032	3	-.172	4	-3.417e-3	3	439.756	1	1385.517	4
105		15	max	.079	3	.174	1	0	10	1.133e-3	1	NC	7	NC	1
106			min	-.508	1	-.029	3	-.14	4	-4.364e-3	5	600.373	1	2026.376	4
107		16	max	.079	3	.246	1	-.002	10	2.02e-3	1	NC	4	NC	2
108			min	-.508	1	-.008	5	-.116	4	-3.59e-3	5	861.48	1	3051.653	4
109		17	max	.079	3	.306	1	-.002	12	3.336e-3	1	NC	4	NC	2
110			min	-.508	1	-.013	5	-.099	4	-6.278e-3	3	1357.536	1	4939.19	4
111		18	max	.079	3	.359	1	0	12	4.653e-3	1	NC	4	NC	2
112			min	-.508	1	-.019	5	-.084	4	-9.038e-3	3	2772.958	1	9736.09	1
113		19	max	.079	3	.41	1	.01	1	5.325e-3	1	NC	1	NC	1
114			min	-.508	1	-.024	5	-.07	4	-1.045e-2	3	3985.415	5	NC	1
115	M10	1	max	0	1	.385	1	.508	1	6.509e-3	1	NC	1	NC	1
116			min	-.077	4	-.021	5	-.079	3	-7.074e-4	5	NC	1	NC	1
117		2	max	0	1	.333	1	.546	1	7.16e-3	3	NC	4	NC	3
118			min	-.077	4	-.013	5	-.081	3	-6.048e-4	5	1695.004	3	4696.666	1
119		3	max	0	1	.303	3	.606	1	8.195e-3	3	NC	4	NC	3
120			min	-.077	4	-.007	5	-.087	3	-5.022e-4	5	888.536	3	1834.111	1
121		4	max	0	1	.374	3	.674	1	9.23e-3	3	NC	4	NC	5
122			min	-.077	4	-.003	5	-.097	3	-3.996e-4	5	657.735	3	1084.623	1
123		5	max	0	1	.411	3	.739	1	1.027e-2	3	NC	4	NC	5
124			min	-.077	4	0	15	-.11	3	-2.97e-4	5	579.152	3	778.152	1
125		6	max	0	1	.413	3	.795	1	1.13e-2	3	NC	4	NC	5
126			min	-.077	4	.002	15	-.124	3	-1.944e-4	5	576.624	3	627.615	1
127		7	max	0	1	.383	3	.836	1	1.234e-2	3	NC	1	NC	5
128			min	-.077	4	.004	15	-.138	3	-9.185e-5	5	636.545	3	548.757	1
129		8	max	0	1	.444	1	.862	1	1.337e-2	3	NC	4	NC	5
130			min	-.077	4	.007	15	-.15	3	9.147e-7	15	767.581	3	509.048	1
131		9	max	0	1	.503	1	.873	1	1.441e-2	3	NC	4	NC	5
132			min	-.077	4	.011	15	-.159	3	7.019e-5	15	967.549	3	492.829	1
133		10	max	0	1	.529	1	.876	1	1.544e-2	3	NC	5	NC	5
134			min	-.077	4	.014	15	-.162	3	1.395e-4	15	1104.876	3	489.62	1
135		11	max	0	3	.503	1	.873	1	1.441e-2	3	NC	4	NC	15
136			min	-.077	4	.017	15	-.159	3	2.232e-4	15	967.549	3	492.829	1
137		12	max	0	3	.444	1	.862	1	1.337e-2	3	NC	4	NC	15
138			min	-.077	4	.017	15	-.15	3	3.069e-4	15	767.581	3	509.048	1
139		13	max	0	3	.383	3	.836	1	1.234e-2	3	NC	1	NC	5
140			min	-.077	4	.017	15	-.138	3	3.906e-4	15	636.545	3	548.757	1
141		14	max	0	3	.413	3	.795	1	1.13e-2	3	NC	5	NC	5
142			min	-.077	4	.016	15	-.124	3	4.743e-4	15	576.624	3	627.615	1
143		15	max	0	3	.411	3	.739	1	1.027e-2	3	NC	5	NC	5
144			min	-.077	4	.017	15	-.11	3	5.58e-4	15	579.152	3	778.152	1
145		16	max	0	3	.374	3	.674	1	9.23e-3	3	NC	5	NC	5
146			min	-.077	4	.019	15	-.097	3	6.417e-4	15	657.735	3	1084.623	1
147		17	max	0	3	.303	3	.606	1	8.195e-3	3	NC	5	NC	3
148			min	-.077	4	.023	15	-.087	3	7.253e-4	15	888.536	3	1834.111	1
149		18	max	0	3	.333	1	.546	1	7.16e-3	3	NC	4	NC	3
150			min	-.077	4	.029	15	-.081	3	8.09e-4	15	1695.004	3	4696.666	1
151		19	max	0	3	.385	1	.508	1	6.509e-3	1	NC	1	NC	1
152			min	-.077	4	.038	15	-.079	3	8.927e-4	15	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
153	M11	1	max	.001	1	.006	3	.512	1	1.311e-2	1	NC	1	NC	1
154			min	-.269	4	-.161	1	-.08	3	-2.588e-3	3	NC	1	NC	1
155		2	max	.001	1	.095	3	.541	1	1.444e-2	1	NC	4	NC	3
156			min	-.269	4	-.268	1	-.086	3	-3.079e-3	3	1690.169	1	5260.681	4
157		3	max	.001	1	.174	3	.596	1	1.577e-2	1	NC	5	NC	3
158			min	-.269	4	-.36	1	-.095	3	-3.571e-3	3	903.517	1	2157.143	1
159		4	max	0	1	.228	3	.663	1	1.711e-2	1	NC	5	NC	12
160			min	-.269	4	-.427	1	-.106	3	-4.062e-3	3	677.3	1	1197.366	1
161		5	max	0	1	.249	3	.73	1	1.844e-2	1	NC	5	NC	15
162			min	-.269	4	-.461	1	-.119	3	-4.553e-3	3	600.793	1	826.87	1
163		6	max	0	1	.236	3	.789	1	1.977e-2	1	NC	5	NC	5
164			min	-.269	4	-.461	1	-.132	3	-5.045e-3	3	599.731	1	649.626	1
165		7	max	0	1	.194	3	.835	1	2.11e-2	1	NC	5	NC	5
166			min	-.269	4	-.434	1	-.144	3	-5.536e-3	3	660.232	1	557.089	1
167		8	max	0	1	.137	3	.866	1	2.243e-2	1	NC	5	NC	5
168			min	-.269	4	-.389	1	-.155	3	-6.027e-3	3	788.537	1	509.347	1
169		9	max	0	1	.082	3	.881	1	2.376e-2	1	NC	5	NC	5
170			min	-.269	4	-.345	1	-.163	3	-6.519e-3	3	977.599	1	488.331	1
171		10	max	0	1	.057	3	.885	1	2.509e-2	1	NC	5	NC	5
172			min	-.269	4	-.324	1	-.166	3	-7.01e-3	3	1103.206	1	483.316	1
173		11	max	0	3	.082	3	.881	1	2.376e-2	1	NC	5	7211.802	15
174			min	-.269	4	-.345	1	-.163	3	-6.519e-3	3	977.599	1	488.331	1
175		12	max	0	3	.137	3	.866	1	2.243e-2	1	NC	5	6383.273	15
176			min	-.269	4	-.389	1	-.155	3	-6.027e-3	3	788.537	1	509.347	1
177		13	max	0	3	.194	3	.835	1	2.11e-2	1	NC	5	8187.421	15
178			min	-.269	4	-.434	1	-.144	3	-5.536e-3	3	660.232	1	557.089	1
179		14	max	0	3	.236	3	.789	1	1.977e-2	1	NC	5	NC	5
180			min	-.269	4	-.461	1	-.132	3	-5.045e-3	3	599.731	1	649.626	1
181		15	max	0	3	.249	3	.73	1	1.844e-2	1	NC	15	NC	5
182			min	-.269	4	-.461	1	-.119	3	-4.553e-3	3	600.793	1	826.87	1
183		16	max	0	3	.228	3	.663	1	1.711e-2	1	NC	15	NC	4
184			min	-.269	4	-.427	1	-.106	3	-4.062e-3	3	677.3	1	1197.366	1
185		17	max	0	3	.174	3	.596	1	1.577e-2	1	NC	5	NC	3
186			min	-.269	4	-.36	1	-.095	3	-3.571e-3	3	903.517	1	2157.143	1
187		18	max	0	3	.095	3	.541	1	1.444e-2	1	NC	5	NC	3
188			min	-.269	4	-.268	1	-.086	3	-3.079e-3	3	1690.169	1	6315.892	1
189		19	max	0	3	.006	3	.512	1	1.311e-2	1	NC	1	NC	1
190			min	-.269	4	-.161	1	-.08	3	-2.588e-3	3	NC	1	NC	1
191	M12	1	max	0	3	.068	3	.516	1	1.273e-2	1	NC	1	NC	1
192			min	-.376	4	-.469	1	-.082	3	-2.579e-3	3	NC	1	NC	1
193		2	max	0	3	.139	3	.54	1	1.376e-2	1	NC	5	NC	2
194			min	-.376	4	-.631	1	-.084	3	-2.842e-3	3	1110.532	1	5852.731	4
195		3	max	0	3	.199	3	.593	1	1.479e-2	1	NC	5	NC	3
196			min	-.376	4	-.776	1	-.091	3	-3.106e-3	3	585.582	1	2339.752	1
197		4	max	0	3	.243	3	.66	1	1.581e-2	1	NC	5	NC	12
198			min	-.376	4	-.889	1	-.101	3	-3.369e-3	3	428.168	1	1253.126	1
199		5	max	0	3	.266	3	.728	1	1.684e-2	1	NC	5	NC	15
200			min	-.376	4	-.961	1	-.115	3	-3.632e-3	3	365.485	1	848.202	1
201		6	max	0	3	.27	3	.79	1	1.787e-2	1	NC	5	NC	5
202			min	-.376	4	-.991	1	-.129	3	-3.896e-3	3	344.846	1	657.614	1
203		7	max	0	3	.257	3	.838	1	1.89e-2	1	NC	5	NC	5
204			min	-.376	4	-.983	1	-.144	3	-4.159e-3	3	350.197	1	558.574	1
205		8	max	0	3	.234	3	.871	1	1.992e-2	1	NC	5	NC	5
206			min	-.376	4	-.95	1	-.157	3	-4.422e-3	3	374.497	1	507.122	1
207		9	max	0	3	.211	3	.888	1	2.095e-2	1	NC	5	NC	5
208			min	-.376	4	-.91	1	-.166	3	-4.686e-3	3	408.273	1	483.915	1
209		10	max	0	1	.2	3	.892	1	2.198e-2	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
210			min	-.376	4	-.889	1	-.169	3	-4.949e-3	3	427.988	1	478.07	1
211		11	max	0	1	.211	3	.888	1	2.095e-2	1	NC	5	7424.808	15
212			min	-.376	4	-.91	1	-.166	3	-4.686e-3	3	408.273	1	483.915	1
213		12	max	0	1	.234	3	.871	1	1.992e-2	1	NC	15	6548.092	15
214			min	-.376	4	-.95	1	-.157	3	-4.422e-3	3	374.497	1	507.122	1
215		13	max	0	1	.257	3	.838	1	1.89e-2	1	NC	15	8245.079	15
216			min	-.376	4	-.983	1	-.144	3	-4.159e-3	3	350.197	1	558.574	1
217		14	max	0	1	.27	3	.79	1	1.787e-2	1	NC	15	NC	5
218			min	-.376	4	-.991	1	-.129	3	-3.896e-3	3	344.846	1	657.614	1
219		15	max	0	1	.266	3	.728	1	1.684e-2	1	NC	15	NC	5
220			min	-.376	4	-.961	1	-.115	3	-3.632e-3	3	365.485	1	848.202	1
221		16	max	0	1	.243	3	.66	1	1.581e-2	1	NC	15	NC	4
222			min	-.376	4	-.889	1	-.101	3	-3.369e-3	3	428.168	1	1253.126	1
223		17	max	0	1	.199	3	.593	1	1.479e-2	1	NC	5	NC	3
224			min	-.376	4	-.776	1	-.091	3	-3.106e-3	3	585.582	1	2339.752	1
225		18	max	0	1	.139	3	.54	1	1.376e-2	1	NC	5	NC	2
226			min	-.376	4	-.631	1	-.084	3	-2.842e-3	3	1110.532	1	7339.872	5
227		19	max	0	1	.068	3	.516	1	1.273e-2	1	NC	1	NC	1
228			min	-.376	4	-.469	1	-.082	3	-2.579e-3	3	NC	1	NC	1
229	M13	1	max	0	3	.317	3	.52	1	2.217e-2	1	NC	1	NC	1
230			min	-.621	4	-1.418	1	-.083	3	-6.602e-3	3	NC	1	NC	1
231		2	max	0	3	.415	3	.563	1	2.41e-2	1	NC	5	NC	3
232			min	-.621	4	-1.685	1	-.088	3	-7.332e-3	3	672.83	1	4221.728	1
233		3	max	0	3	.506	3	.626	1	2.604e-2	1	NC	5	NC	3
234			min	-.621	4	-1.938	1	-.097	3	-8.063e-3	3	346.218	1	1701.692	1
235		4	max	0	3	.582	3	.696	1	2.797e-2	1	NC	15	NC	12
236			min	-.621	4	-2.155	1	-.109	3	-8.794e-3	3	243.943	1	1022.377	1
237		5	max	0	3	.638	3	.764	1	2.991e-2	1	9899.615	15	NC	15
238			min	-.621	4	-2.327	1	-.122	3	-9.525e-3	3	198	1	740.26	1
239		6	max	0	3	.672	3	.82	1	3.184e-2	1	8444.374	15	NC	5
240			min	-.621	4	-2.446	1	-.136	3	-1.026e-2	3	175.083	1	600.452	1
241		7	max	0	3	.686	3	.862	1	3.378e-2	1	7671.025	15	NC	5
242			min	-.621	4	-2.514	1	-.15	3	-1.099e-2	3	164.19	1	526.86	1
243		8	max	0	3	.684	3	.888	1	3.571e-2	1	7293.92	15	NC	5
244			min	-.621	4	-2.54	1	-.162	3	-1.172e-2	3	160.423	1	489.735	1
245		9	max	0	3	.675	3	.9	1	3.765e-2	1	7156.522	15	NC	5
246			min	-.621	4	-2.538	1	-.17	3	-1.245e-2	3	160.637	1	474.59	1
247		10	max	0	1	.669	3	.902	1	3.958e-2	1	7134.241	15	NC	5
248			min	-.621	4	-2.532	1	-.173	3	-1.318e-2	3	161.589	1	471.613	1
249		11	max	0	1	.675	3	.9	1	3.765e-2	1	7048.011	15	NC	15
250			min	-.621	4	-2.538	1	-.17	3	-1.245e-2	3	160.637	1	474.59	1
251		12	max	0	1	.684	3	.888	1	3.571e-2	1	6942.115	15	NC	15
252			min	-.621	4	-2.54	1	-.162	3	-1.172e-2	3	160.423	1	489.735	1
253		13	max	0	1	.686	3	.862	1	3.378e-2	1	6974.179	15	NC	15
254			min	-.621	4	-2.514	1	-.15	3	-1.099e-2	3	164.19	1	526.86	1
255		14	max	0	1	.672	3	.82	1	3.184e-2	1	7275.806	15	NC	5
256			min	-.621	4	-2.446	1	-.136	3	-1.026e-2	3	175.083	1	600.452	1
257		15	max	0	1	.638	3	.764	1	2.991e-2	1	8026.909	15	NC	5
258			min	-.621	4	-2.327	1	-.122	3	-9.525e-3	3	198	1	740.26	1
259		16	max	0	1	.582	3	.696	1	2.797e-2	1	9616.363	15	NC	4
260			min	-.621	4	-2.155	1	-.109	3	-8.794e-3	3	243.943	1	1022.377	1
261		17	max	0	1	.506	3	.626	1	2.604e-2	1	NC	15	NC	3
262			min	-.621	4	-1.938	1	-.097	3	-8.063e-3	3	346.218	1	1701.692	1
263		18	max	0	1	.415	3	.563	1	2.41e-2	1	NC	5	NC	3
264			min	-.621	4	-1.685	1	-.088	3	-7.332e-3	3	672.83	1	4221.728	1
265		19	max	0	1	.317	3	.52	1	2.217e-2	1	NC	1	NC	1
266			min	-.621	4	-1.418	1	-.083	3	-6.602e-3	3	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
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	3	0	5	5.319e-4	1	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-9.256e-4	5	NC	1	NC	1
271		3	max	0	3	0	3	.003	5	1.064e-3	1	NC	3	NC	1
272			min	0	1	-.008	1	0	1	-1.851e-3	5	8052.242	1	NC	1
273		4	max	0	3	.001	3	.006	5	1.596e-3	1	NC	3	NC	1
274			min	0	1	-.017	1	0	1	-2.777e-3	5	3583.309	1	NC	1
275		5	max	0	3	.003	3	.01	5	2.128e-3	1	NC	3	NC	1
276			min	0	1	-.03	1	-.002	1	-3.702e-3	5	2017.379	1	6044.507	5
277		6	max	0	3	.005	3	.015	5	2.66e-3	1	NC	3	NC	1
278			min	0	1	-.047	1	-.002	1	-4.628e-3	5	1292.013	1	3978.109	5
279		7	max	0	3	.007	3	.021	5	3.192e-3	1	NC	12	NC	1
280			min	0	1	-.068	1	-.003	1	-5.554e-3	5	897.746	1	2839.535	5
281		8	max	0	3	.01	3	.028	5	3.724e-3	1	NC	12	NC	1
282			min	0	1	-.092	1	-.003	1	-6.479e-3	5	659.943	1	2144.382	5
283		9	max	0	3	.015	3	.036	5	3.628e-3	2	7233.786	12	NC	1
284			min	0	1	-.12	1	-.004	1	-6.71e-3	5	504.574	1	1687.999	5
285		10	max	0	3	.019	3	.044	5	3.166e-3	2	5415.899	12	NC	1
286			min	-.001	1	-.152	1	-.005	1	-6.533e-3	5	398.656	1	1371.502	5
287		11	max	0	3	.025	3	.053	5	2.704e-3	2	4213.205	12	NC	1
288			min	-.001	1	-.187	1	-.005	1	-6.357e-3	5	323.942	1	1142.698	5
289		12	max	0	3	.031	3	.062	5	2.242e-3	2	3420.696	15	NC	1
290			min	-.001	1	-.225	1	-.005	1	-6.18e-3	5	269.419	1	971.814	5
291		13	max	0	3	.037	3	.072	5	1.78e-3	2	2933.19	15	NC	1
292			min	-.001	1	-.266	1	-.006	1	-6.003e-3	5	228.478	1	840.763	5
293		14	max	0	3	.044	3	.082	4	1.318e-3	2	2552.927	15	NC	1
294			min	-.002	1	-.308	1	-.006	1	-5.826e-3	5	196.983	1	737.314	4
295		15	max	.001	3	.052	3	.093	4	8.556e-4	2	2250.663	15	NC	1
296			min	-.002	1	-.352	1	-.006	1	-5.649e-3	5	172.26	1	654.474	4
297		16	max	.001	3	.06	3	.103	4	3.935e-4	2	2006.485	15	NC	1
298			min	-.002	1	-.398	1	-.005	1	-5.506e-3	4	152.511	1	587.31	4
299		17	max	.001	3	.067	3	.114	4	3.368e-4	3	1806.527	15	NC	1
300			min	-.002	1	-.444	1	-.005	1	-5.393e-3	4	136.502	1	532.144	4
301		18	max	.001	3	.075	3	.125	4	5.565e-4	3	1640.836	15	NC	1
302			min	-.002	1	-.492	1	-.007	3	-5.28e-3	4	123.358	1	486.327	4
303		19	max	.001	3	.084	3	.135	4	7.762e-4	3	1502.163	15	NC	1
304			min	-.002	1	-.539	1	-.009	3	-5.167e-3	4	112.45	1	447.918	4
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	12	0	4	0	1	NC	1	NC	1
308			min	0	1	-.003	1	0	1	-9.543e-4	4	NC	1	NC	1
309		3	max	0	3	0	3	.003	4	0	1	NC	3	NC	1
310			min	0	1	-.011	1	0	1	-1.909e-3	4	5302.141	1	NC	1
311		4	max	0	3	.001	3	.006	4	0	1	NC	3	NC	1
312			min	0	1	-.026	1	0	1	-2.863e-3	4	2314.284	1	NC	1
313		5	max	0	3	.003	3	.01	4	0	1	NC	3	NC	1
314			min	-.001	1	-.047	1	0	1	-3.817e-3	4	1284.785	1	5832.373	4
315		6	max	.001	3	.007	3	.016	4	0	1	NC	5	NC	1
316			min	-.002	1	-.075	1	0	1	-4.771e-3	4	813.119	1	3840.189	4
317		7	max	.001	3	.011	3	.022	4	0	1	NC	5	NC	1
318			min	-.002	1	-.109	1	0	1	-5.726e-3	4	558.938	1	2742.326	4
319		8	max	.002	3	.017	3	.029	4	0	1	NC	15	NC	1
320			min	-.002	1	-.149	1	0	1	-6.68e-3	4	406.748	1	2071.943	4
321		9	max	.002	3	.025	3	.037	4	0	1	NC	15	NC	1
322			min	-.002	1	-.197	1	0	1	-6.916e-3	4	307.751	1	1631.721	4
323		10	max	.002	3	.035	3	.046	4	0	1	8912.535	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
324			min	-.003	1	-.252	1	0	1	-6.731e-3	4	240.832	1	1326.359	4
325		11	max	.002	3	.046	3	.055	4	0	1	7213.931	15	NC	1
326			min	-.003	1	-.313	1	0	1	-6.545e-3	4	194.124	1	1105.627	4
327		12	max	.002	3	.059	3	.064	4	0	1	5980.054	15	NC	1
328			min	-.003	1	-.378	1	0	1	-6.36e-3	4	160.362	1	940.822	4
329		13	max	.003	3	.072	3	.074	4	0	1	5057.287	15	NC	1
330			min	-.003	1	-.449	1	0	1	-6.174e-3	4	135.224	1	814.488	4
331		14	max	.003	3	.087	3	.085	4	0	1	4350.002	15	NC	1
332			min	-.004	1	-.523	1	0	1	-5.989e-3	4	116.029	1	715.521	4
333		15	max	.003	3	.103	3	.095	4	0	1	3796.53	15	NC	1
334			min	-.004	1	-.6	1	0	1	-5.804e-3	4	101.058	1	636.585	4
335		16	max	.003	3	.119	3	.106	4	0	1	3355.644	15	NC	1
336			min	-.004	1	-.68	1	0	1	-5.618e-3	4	89.167	1	572.668	4
337		17	max	.003	3	.136	3	.117	4	0	1	2999.136	15	NC	1
338			min	-.005	1	-.762	1	0	1	-5.433e-3	4	79.577	1	520.258	4
339		18	max	.004	3	.154	3	.127	4	0	1	2707.088	15	NC	1
340			min	-.005	1	-.846	1	0	1	-5.247e-3	4	71.739	1	476.83	4
341		19	max	.004	3	.171	3	.138	4	0	1	2465.215	15	NC	1
342			min	-.005	1	-.93	1	0	1	-5.062e-3	4	65.261	1	440.533	4
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	5	0	4	2.116e-4	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-1.037e-3	4	NC	1	NC	1
347		3	max	0	3	0	3	.003	4	4.232e-4	3	NC	3	NC	1
348			min	0	1	-.008	1	0	3	-2.073e-3	4	8052.242	1	NC	1
349		4	max	0	3	.001	3	.006	4	6.348e-4	3	NC	3	NC	1
350			min	0	1	-.017	1	0	3	-3.11e-3	4	3583.309	1	9958.263	4
351		5	max	0	3	.003	3	.01	4	8.464e-4	3	NC	3	NC	1
352			min	0	1	-.03	1	0	3	-4.146e-3	4	2017.379	1	5778.298	4
353		6	max	0	3	.005	3	.016	4	1.058e-3	3	NC	3	NC	1
354			min	0	1	-.047	1	-.001	3	-5.183e-3	4	1292.013	1	3809.123	4
355		7	max	0	3	.007	3	.022	4	1.27e-3	3	NC	5	NC	1
356			min	0	1	-.068	1	-.001	3	-6.219e-3	4	897.746	1	2723.449	4
357		8	max	0	3	.01	3	.029	4	1.481e-3	3	NC	5	NC	1
358			min	0	1	-.092	1	-.002	3	-7.256e-3	4	659.943	1	2060.268	4
359		9	max	0	3	.015	3	.037	4	1.421e-3	3	NC	5	NC	1
360			min	0	1	-.12	1	-.002	3	-7.463e-3	4	504.574	1	1624.602	4
361		10	max	0	3	.019	3	.046	4	1.201e-3	3	NC	5	NC	1
362			min	-.001	1	-.152	1	-.002	3	-7.183e-3	4	398.656	1	1322.065	4
363		11	max	0	3	.025	3	.055	4	9.816e-4	3	NC	5	NC	1
364			min	-.001	1	-.187	1	-.001	3	-6.903e-3	4	323.942	1	1103.179	4
365		12	max	0	3	.031	3	.065	4	7.618e-4	3	NC	7	NC	1
366			min	-.001	1	-.225	1	-.001	3	-6.624e-3	4	269.419	1	939.648	4
367		13	max	0	3	.037	3	.075	4	5.421e-4	3	NC	15	NC	1
368			min	-.001	1	-.266	1	0	3	-6.344e-3	4	228.478	1	814.239	4
369		14	max	0	3	.044	3	.085	4	3.224e-4	3	NC	15	NC	1
370			min	-.002	1	-.308	1	0	12	-6.064e-3	4	196.983	1	715.974	4
371		15	max	.001	3	.052	3	.095	4	1.027e-4	3	9119.19	15	NC	1
372			min	-.002	1	-.352	1	0	12	-5.784e-3	4	172.26	1	637.595	4
373		16	max	.001	3	.06	3	.106	4	9.06e-7	9	8280.999	15	NC	1
374			min	-.002	1	-.398	1	.001	10	-5.505e-3	4	152.511	1	574.138	4
375		17	max	.001	3	.067	3	.116	4	2.917e-4	1	7576.926	15	NC	1
376			min	-.002	1	-.444	1	0	10	-5.26e-3	5	136.502	1	522.122	4
377		18	max	.001	3	.075	3	.127	4	7.798e-4	1	6979.222	15	NC	1
378			min	-.002	1	-.492	1	0	10	-5.048e-3	5	123.358	1	479.046	4
379		19	max	.001	3	.084	3	.137	4	1.268e-3	1	6467.225	15	NC	1
380			min	-.002	1	-.539	1	0	10	-4.836e-3	5	112.45	1	443.075	4

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
381	M3	1	max	.101	1	.002	3	.031	5	1.573e-3	4	NC	1	NC	1
382			min	-.012	3	-.011	1	-.004	1	-1.362e-4	3	NC	1	NC	1
383		2	max	.1	1	.011	3	.061	5	1.535e-3	4	NC	1	NC	3
384			min	-.011	3	-.069	1	-.02	1	-5.088e-4	3	8561.965	3	4295.118	1
385		3	max	.099	1	.02	3	.091	5	2.131e-3	2	NC	1	NC	4
386			min	-.011	3	-.127	1	-.037	1	-8.815e-4	3	4271.8	3	2172.552	1
387		4	max	.098	1	.029	3	.121	5	3.052e-3	2	NC	1	NC	4
388			min	-.01	3	-.185	1	-.052	1	-1.254e-3	3	2838.162	3	1474.348	1
389		5	max	.097	1	.038	3	.151	5	3.973e-3	2	NC	1	NC	4
390			min	-.01	3	-.243	1	-.067	1	-1.627e-3	3	2118.98	3	1132.985	1
391		6	max	.095	1	.048	3	.181	5	4.894e-3	2	NC	1	NC	4
392			min	-.009	3	-.3	1	-.08	1	-1.999e-3	3	1685.842	3	935.251	1
393		7	max	.094	1	.057	3	.21	5	5.815e-3	2	NC	1	NC	4
394			min	-.009	3	-.358	1	-.092	1	-2.372e-3	3	1395.948	3	810.401	1
395		8	max	.093	1	.067	3	.239	5	6.736e-3	2	NC	5	NC	4
396			min	-.008	3	-.415	1	-.101	1	-2.745e-3	3	1188.092	3	728.508	1
397		9	max	.092	1	.077	3	.267	5	7.657e-3	2	NC	5	NC	4
398			min	-.008	3	-.471	1	-.108	1	-3.117e-3	3	1031.668	3	675.113	1
399		10	max	.091	1	.087	3	.295	5	8.578e-3	2	NC	5	NC	6
400			min	-.007	3	-.528	1	-.113	1	-3.49e-3	3	909.667	3	642.871	1
401		11	max	.089	1	.097	3	.322	5	9.499e-3	2	NC	5	NC	6
402			min	-.007	3	-.584	1	-.114	1	-3.863e-3	3	811.876	3	628.376	1
403		12	max	.088	1	.107	3	.348	5	1.042e-2	2	NC	5	NC	4
404			min	-.007	3	-.641	1	-.112	2	-4.235e-3	3	731.793	3	598.234	14
405		13	max	.087	1	.118	3	.374	5	1.134e-2	1	NC	1	NC	4
406			min	-.006	3	-.696	1	-.107	2	-4.608e-3	3	665.074	3	536.029	14
407		14	max	.086	1	.129	3	.399	5	1.227e-2	1	NC	1	NC	4
408			min	-.006	3	-.752	1	-.099	2	-4.981e-3	3	608.71	3	482.937	14
409		15	max	.085	1	.14	3	.423	5	1.319e-2	1	NC	1	NC	4
410			min	-.005	3	-.808	1	-.086	2	-5.353e-3	3	560.545	3	437.075	14
411		16	max	.084	1	.151	3	.447	5	1.412e-2	1	NC	1	NC	4
412			min	-.005	3	-.863	1	-.068	2	-5.726e-3	3	518.994	3	397.062	14
413		17	max	.082	1	.162	3	.469	5	1.505e-2	1	NC	1	NC	4
414			min	-.004	3	-.918	1	-.046	2	-6.098e-3	3	482.866	3	361.861	14
415		18	max	.081	1	.173	3	.493	4	1.597e-2	1	NC	1	NC	4
416			min	-.004	3	-.973	1	-.019	2	-6.471e-3	3	451.247	3	330.679	14
417		19	max	.08	1	.184	3	.519	4	1.69e-2	1	NC	1	NC	1
418			min	-.003	3	-1.028	1	-.003	3	-6.844e-3	3	423.425	3	302.894	14
419	M6	1	max	.165	1	.004	3	.032	4	1.577e-3	4	NC	1	NC	1
420			min	-.019	3	-.019	1	0	1	0	1	NC	1	NC	1
421		2	max	.162	1	.025	3	.063	4	1.366e-3	4	NC	1	NC	1
422			min	-.018	3	-.121	1	0	1	0	1	3625.507	3	NC	1
423		3	max	.159	1	.046	3	.094	4	1.155e-3	4	NC	1	NC	1
424			min	-.017	3	-.223	1	0	1	0	1	1811.105	3	9731.733	4
425		4	max	.157	1	.068	3	.125	4	9.434e-4	4	NC	1	NC	1
426			min	-.015	3	-.325	1	0	1	0	1	1205.656	3	6564.345	4
427		5	max	.154	1	.089	3	.156	4	7.321e-4	4	NC	1	NC	1
428			min	-.014	3	-.427	1	0	1	0	1	902.497	3	5024.995	4
429		6	max	.151	1	.111	3	.186	4	5.207e-4	4	NC	1	NC	1
430			min	-.013	3	-.528	1	0	1	0	1	720.298	3	4139.809	4
431		7	max	.149	1	.133	3	.216	4	3.094e-4	4	NC	1	NC	1
432			min	-.011	3	-.63	1	0	1	0	1	598.614	3	3586.002	4
433		8	max	.146	1	.155	3	.246	4	9.809e-5	4	NC	5	NC	1
434			min	-.01	3	-.731	1	0	1	0	1	511.54	3	3227.282	4
435		9	max	.143	1	.177	3	.275	4	0	1	NC	5	NC	1
436			min	-.009	3	-.832	1	0	1	-1.245e-4	5	446.124	3	2998.029	4
437		10	max	.14	1	.199	3	.303	4	0	1	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	-.007	3	-.933	1	0	1	-3.339e-4	5	395.17	3	2865.154	4
439		11	max	.138	1	.222	3	.33	4	0	1	NC	5	NC	1
440			min	-.006	3	-1.033	1	0	1	-5.434e-4	5	354.359	3	2813.649	4
441		12	max	.135	1	.244	3	.357	4	0	1	NC	5	NC	1
442			min	-.005	3	-1.133	1	0	1	-7.528e-4	5	320.943	3	2841.437	4
443		13	max	.132	1	.267	3	.383	4	0	1	NC	1	NC	1
444			min	-.003	3	-1.233	1	0	1	-9.623e-4	5	293.09	3	2959.646	4
445		14	max	.13	1	.29	3	.408	4	0	1	NC	1	NC	1
446			min	-.002	3	-1.333	1	0	1	-1.172e-3	5	269.529	3	3199.028	4
447		15	max	.127	1	.313	3	.433	4	0	1	NC	1	NC	1
448			min	0	3	-1.433	1	0	1	-1.381e-3	4	249.354	3	3629.664	4
449		16	max	.124	1	.337	3	.456	4	0	1	NC	1	NC	1
450			min	0	3	-1.532	1	0	1	-1.593e-3	4	231.899	3	4422.659	4
451		17	max	.122	1	.36	3	.478	4	0	1	NC	1	NC	1
452			min	.001	12	-1.631	1	0	1	-1.804e-3	4	216.665	3	6099.103	4
453		18	max	.119	1	.384	3	.499	4	0	1	NC	1	NC	1
454			min	.002	12	-1.73	1	0	1	-2.015e-3	4	203.27	3	NC	1
455		19	max	.116	1	.407	3	.52	4	0	1	NC	1	NC	1
456			min	.003	12	-1.829	1	0	1	-2.227e-3	4	191.417	3	NC	1
457	M9	1	max	.101	1	.002	3	.032	4	1.515e-3	4	NC	1	NC	1
458			min	-.012	3	-.011	1	-.002	3	-2.896e-4	2	NC	1	NC	1
459		2	max	.1	1	.011	3	.066	4	1.293e-3	5	NC	1	NC	3
460			min	-.011	3	-.069	1	-.008	3	-1.211e-3	2	8561.965	3	4295.118	1
461		3	max	.099	1	.02	3	.099	4	1.074e-3	5	NC	1	NC	15
462			min	-.011	3	-.127	1	-.015	3	-2.131e-3	2	4271.8	3	2172.552	1
463		4	max	.098	1	.029	3	.133	4	1.254e-3	3	NC	1	8384.225	15
464			min	-.01	3	-.185	1	-.021	3	-3.052e-3	2	2838.162	3	1474.348	1
465		5	max	.097	1	.038	3	.166	4	1.627e-3	3	NC	1	6418.834	15
466			min	-.01	3	-.243	1	-.027	3	-3.973e-3	2	2118.98	3	1132.985	1
467		6	max	.095	1	.048	3	.198	4	1.999e-3	3	NC	1	5287.506	15
468			min	-.009	3	-.3	1	-.032	3	-4.894e-3	2	1685.842	3	935.251	1
469		7	max	.094	1	.057	3	.23	4	2.372e-3	3	NC	1	4578.723	15
470			min	-.009	3	-.358	1	-.037	3	-5.815e-3	2	1395.948	3	810.401	1
471		8	max	.093	1	.067	3	.261	4	2.745e-3	3	NC	5	4118.671	15
472			min	-.008	3	-.415	1	-.04	3	-6.736e-3	2	1188.092	3	728.508	1
473		9	max	.092	1	.077	3	.29	4	3.117e-3	3	NC	5	3823.601	15
474			min	-.008	3	-.471	1	-.043	3	-7.657e-3	2	1031.668	3	675.113	1
475		10	max	.091	1	.087	3	.319	4	3.49e-3	3	NC	5	3651.221	15
476			min	-.007	3	-.528	1	-.045	3	-8.578e-3	2	909.667	3	642.871	1
477		11	max	.089	1	.097	3	.347	4	3.863e-3	3	NC	5	3582.24	15
478			min	-.007	3	-.584	1	-.046	3	-9.499e-3	2	811.876	3	628.376	1
479		12	max	.088	1	.107	3	.373	4	4.235e-3	3	NC	5	3613.787	15
480			min	-.007	3	-.641	1	-.046	3	-1.042e-2	2	731.793	3	631.016	1
481		13	max	.087	1	.118	3	.398	4	4.608e-3	3	NC	1	3759.691	15
482			min	-.006	3	-.696	1	-.044	3	-1.134e-2	1	665.074	3	652.99	1
483		14	max	.086	1	.129	3	.421	4	4.981e-3	3	NC	1	4058.53	15
484			min	-.006	3	-.752	1	-.04	3	-1.227e-2	1	608.71	3	700.63	1
485		15	max	.085	1	.14	3	.443	4	5.353e-3	3	NC	1	4598.41	15
486			min	-.005	3	-.808	1	-.035	3	-1.319e-2	1	560.545	3	788.505	1
487		16	max	.084	1	.151	3	.463	4	5.726e-3	3	NC	1	5594.597	15
488			min	-.005	3	-.863	1	-.029	3	-1.412e-2	1	518.994	3	952.296	1
489		17	max	.082	1	.162	3	.481	4	6.098e-3	3	NC	1	7702.82	15
490			min	-.004	5	-.918	1	-.02	3	-1.505e-2	1	482.866	3	1300.784	1
491		18	max	.081	1	.173	3	.497	4	6.471e-3	3	NC	1	NC	12
492			min	-.005	5	-.973	1	-.009	3	-1.597e-2	1	451.247	3	2380.311	1
493		19	max	.08	1	.184	3	.511	4	6.844e-3	3	NC	1	NC	1
494			min	-.005	5	-1.028	1	-.019	1	-1.69e-2	1	423.425	3	NC	1