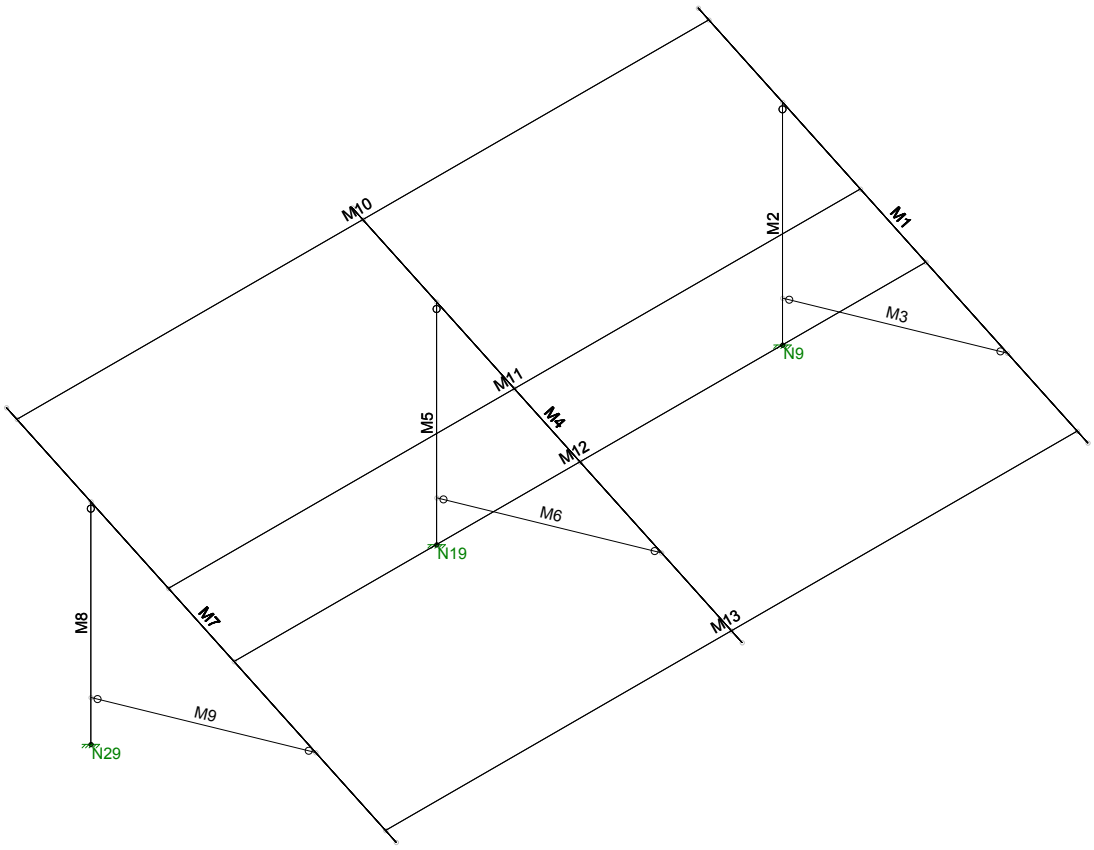


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

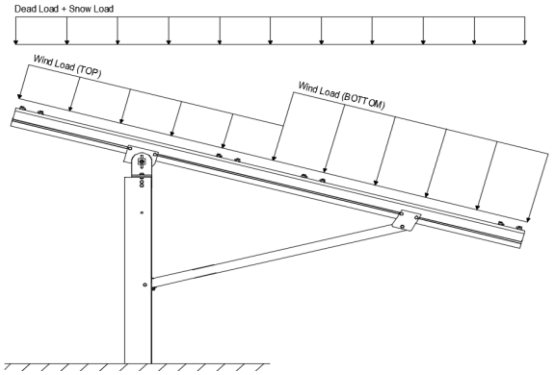
1.2 Construction

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 =	2000 mm	Height =	1900 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 =	110 mph	Exposure Category = C
Height <	15 ft	Importance Category = II
Peak Velocity Pressure, q_z =	19.00 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

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 =	0.08	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]	*(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)*
0.56D + 1.3E [R]	
1.54D + 1.25E + 0.2S [O]	
0.56D + 1.25E [O]	

Allowable Stress Design, ASD

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

1.0D + 1.0S	
1.0D + 1.0W	
1.0D + 0.75L + 0.75W + 0.75S	
0.6D + 1.0W [M]	*(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)*
1.238D + 0.875E [O]	
1.1785D + 0.65625E + 0.75S [O]	
0.362D + 0.875E [O]	

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

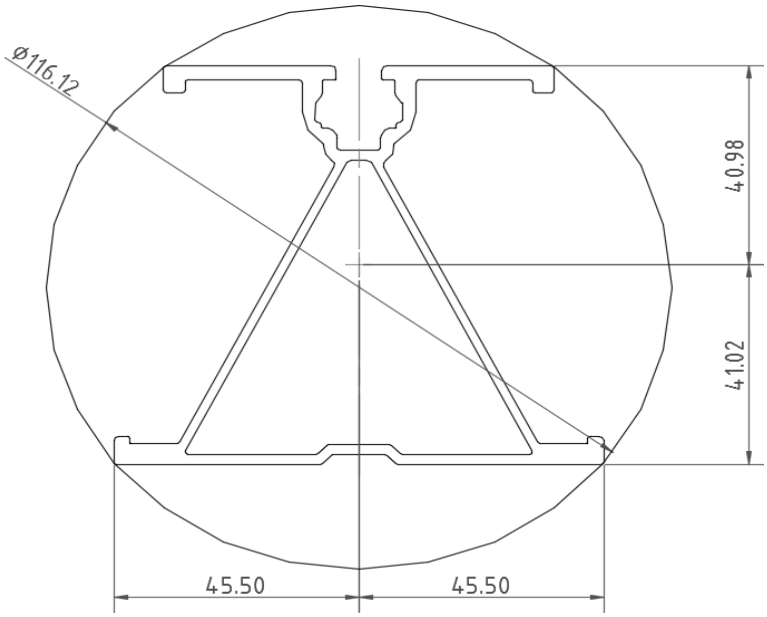
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	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 =	1.433	k-ft
M_z =	0.152	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	65%	

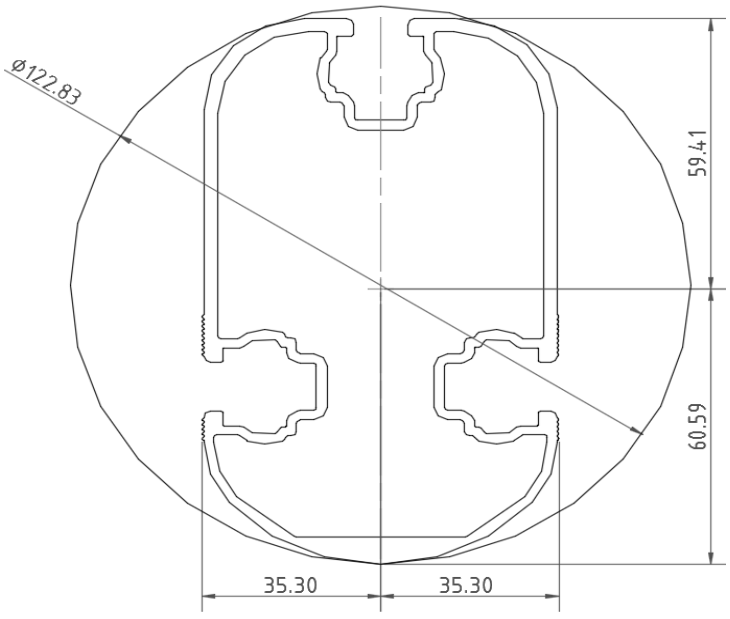


DETAIL VIEW

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 =	4.216	k-ft
M_z =	0.000	k-ft
P_n =	2.004	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	88%	

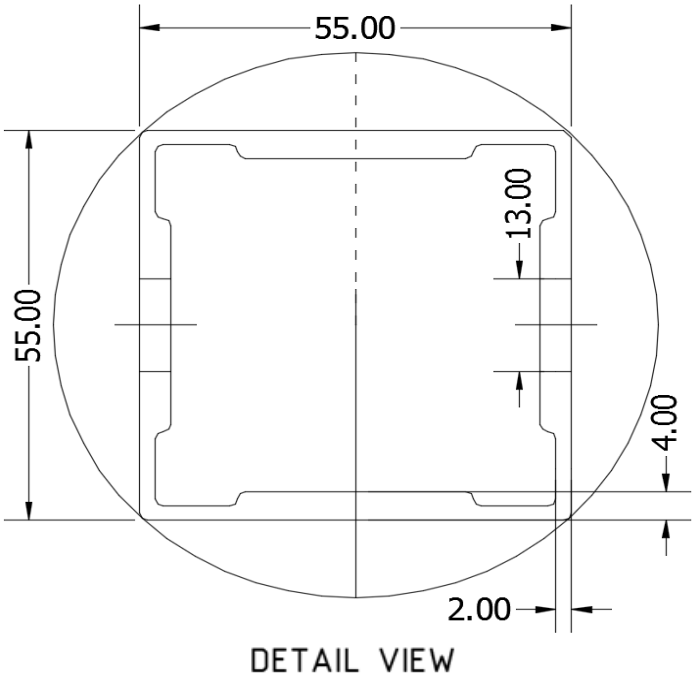


DETAIL VIEW

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).

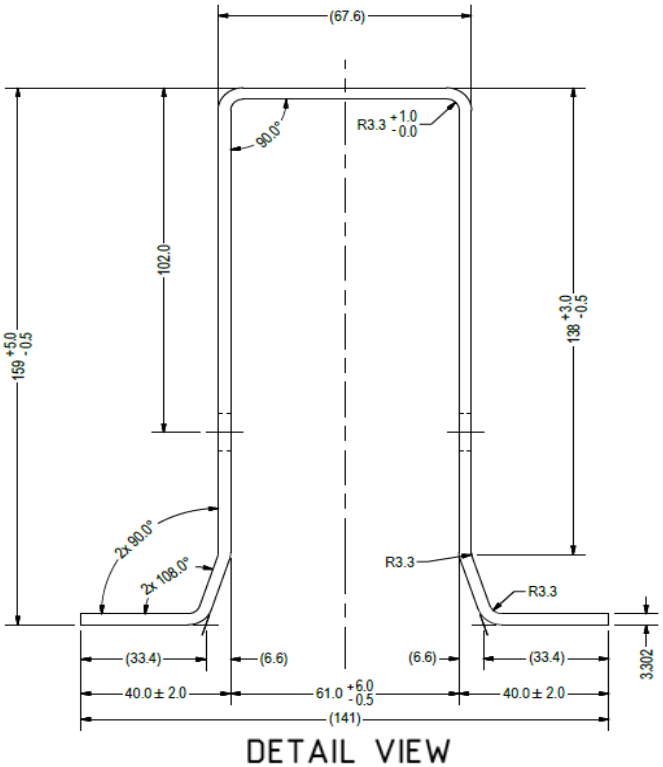
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.671	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	61%	



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 =	81.31	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	13.606	k-ft
M_z =	0.000	k-ft
P_r =	6.051	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	k
Utilization =	92%	



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 =	6.74	k
Maximum Lateral Load =	3.53	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 =	1.35	k
Height of Pole Above Grade, H =	5.78	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

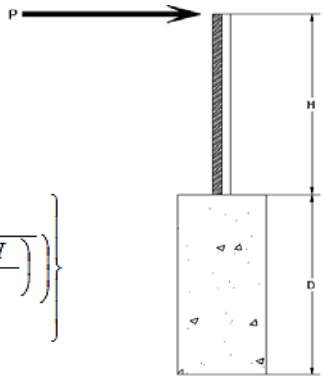
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.35	k
Height of Pole Above Grade, H =	5.78	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf
Constant 2.34P/(S_1B), A =	7.27	
Required Footing Depth, D =	11.32	ft

2nd Trial @ D_2 =	7.28	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 =	3.24	
Required Footing Depth, D =	6.42	ft

3rd Trial @ D_3 =	6.85	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.37	ksf
Constant 2.34P/(S_1B), A =	3.45	
Required Footing Depth, D =	6.69	ft

4th Trial @ D_4 =	6.77	ft
Lateral Soil Bearing @ D/3, S_1 =	0.45	ksf
Lateral Soil Bearing @ D, S_3 =	1.35	ksf
Constant 2.34P/(S_1B), A =	3.49	
Required Footing Depth, D =	6.75	ft

5th Trial @ D_5 =	6.76	ft
Lateral Soil Bearing @ D/3, S_1 =	0.45	ksf
Lateral Soil Bearing @ D, S_3 =	1.35	ksf
Constant 2.34P/(S_1B), A =	3.50	
Required Footing Depth, D =	7.00	ft

A 2ft diameter x 7ft deep footing unrestrained at ground level is required for the racking structure.

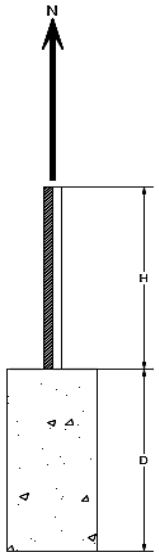
5.4 Uplifting Force Resistance

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 =	3.23	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 =	2.09	k
Required Concrete Volume, V =	14.45	ft^3
Required Footing Depth, D =	4.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.98
2	0.4	0.2	118.10	6.88
3	0.6	0.2	118.10	6.78
4	0.8	0.2	118.10	6.67
5	1	0.2	118.10	6.57
6	1.2	0.2	118.10	6.46
7	1.4	0.2	118.10	6.36
8	1.6	0.2	118.10	6.26
9	1.8	0.2	118.10	6.15
10	2	0.2	118.10	6.05
11	2.2	0.2	118.10	5.95
12	2.4	0.2	118.10	5.84
13	2.6	0.2	118.10	5.74
14	2.8	0.2	118.10	5.64
15	3	0.2	118.10	5.53
16	3.2	0.2	118.10	5.43
17	3.4	0.2	118.10	5.32
18	3.6	0.2	118.10	5.22
19	3.8	0.2	118.10	5.12
20	4	0.2	118.10	5.01
21	4.2	0.2	118.10	4.91
22	4.4	0.2	118.10	4.81
23	4.6	0.2	118.10	4.70
24	4.8	0.2	118.10	4.60
25	0	0.0	0.00	4.60
26	0	0.0	0.00	4.60
27	0	0.0	0.00	4.60
28	0	0.0	0.00	4.60
29	0	0.0	0.00	4.60
30	0	0.0	0.00	4.60
31	0	0.0	0.00	4.60
32	0	0.0	0.00	4.60
33	0	0.0	0.00	4.60
34	0	0.0	0.00	4.60
Max	4.8	Sum	1.13	

A 2ft diameter x 4.75ft 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 =	7.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.17	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	25.13	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

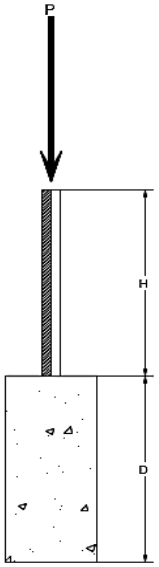
Weight of Concrete

Footing Volume	21.99	ft^3
Weight	3.19	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.77	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.31	k
Applied Force =	7.36	k
Utilization =	65%	

A 2ft diameter footing passes at a depth of 7ft.



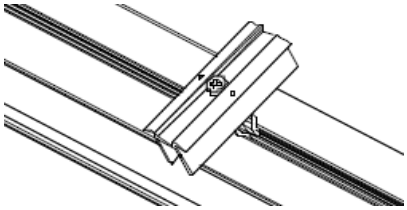
6. DESIGN OF JOINTS AND CONNECTIONS

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.

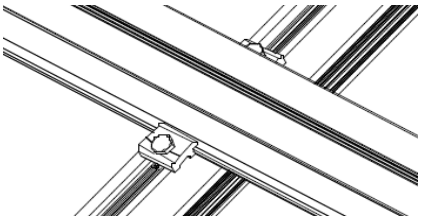
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.738 k
Allowable Uplift	=	1.214 k
Utilization	=	61%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.100 k
Allowable Uplift	=	2.180 k
Utilization	=	96%

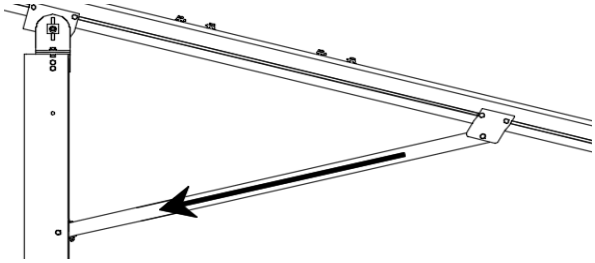


6.2 Strut Connections

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

Maximum Axial Load	=	5.671 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	64%

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

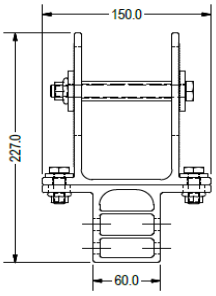


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

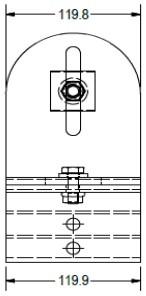
6.3 Girder to Post Connection

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.

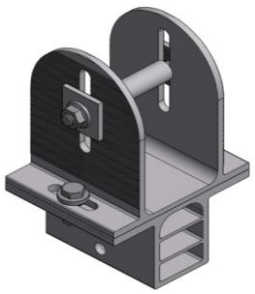
Maximum Tensile Load	=	4.329 k
Allowable Load	=	5.649 k
Utilization	=	77%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

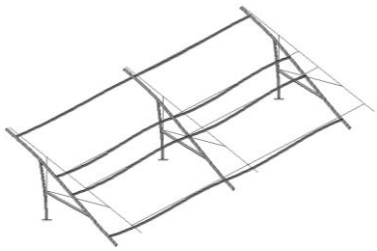
7.1 Seismic Drift

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}	=	74.39 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.488 in
Max Drift, Δ_{MAX}	=	0.859 in

0.859 ≤ 1.488, 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 =	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 = 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)

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

φF_L = 33.25 ksi

φF_L = 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 =	81.31	in	
Pr =	6.05	k	(LRFD Factored Load)
Mr (Strong) =	13.61	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	116.99			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	18.34	ksi		
Fe =	20.91	ksi		
Pn =	40.9	k		

Torsional/Flexural Torsional Buckling:

Fcr =	13.8471	ksi
Fey =	53.3447	ksi
Fez =	17.7356	ksi
Pn =	30.879	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.2177	≥	0.2	
Utilization =	0.92	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.218	≥	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 92%

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	-55.176	-55.176	0	0
2	M11	Y	-55.176	-55.176	0	0
3	M12	Y	-55.176	-55.176	0	0
4	M13	Y	-55.176	-55.176	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	-68.563	-68.563	0	0
2	M11	y	-68.563	-68.563	0	0
3	M12	y	-105.961	-105.961	0	0
4	M13	y	-105.961	-105.961	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	137.126	137.126	0	0
2	M11	y	137.126	137.126	0	0
3	M12	y	62.33	62.33	0	0
4	M13	y	62.33	62.33	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 + 0.8W	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												
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	550.788	2	2381.806	1	135.917	2	.219	1	.008	5	7.803	1
2		min	-874.174	3	-1730.754	3	-324.682	5	-1.468	5	-.005	2	.769	12
3	N19	max	2674.784	2	6259.491	2	0	3	0	1	.008	4	12.369	1
4		min	-2567.493	3	-5179.152	3	-342.855	5	-1.525	4	0	1	.39	15
5	N29	max	550.788	2	2381.806	1	151.557	3	.203	3	.009	4	7.803	1
6		min	-874.174	3	-1730.754	3	-354.149	4	-1.535	4	-.002	3	-.453	5
7	Totals:	max	3776.36	2	11020.692	2	0	3						
8		min	-4315.84	3	-8640.659	3	-1002.38	5						

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	.004	2	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	-5.582	12	304.658	3	6.353	3	.051	3	.302	1	.271	2
4			min	-210.82	1	-726.862	2	-145.661	1	-.209	2	.003	12	-.111	3
5		3	max	-5.968	12	303.414	3	6.353	3	.051	3	.207	1	.748	2
6			min	-211.594	1	-728.52	2	-145.661	1	-.209	2	.006	12	-.311	3
7		4	max	-6.355	12	302.17	3	6.353	3	.051	3	.111	1	1.227	2
8			min	-212.367	1	-730.178	2	-145.661	1	-.209	2	.008	12	-.51	3
9		5	max	636.215	3	672.696	2	20.663	3	-.005	9	.151	1	1.448	2
10			min	-1744.974	2	-265.714	3	-178.559	1	-.025	3	-.039	3	-.603	3
11		6	max	635.635	3	671.038	2	20.663	3	-.005	9	.045	2	1.008	2
12			min	-1745.747	2	-266.958	3	-178.559	1	-.025	3	-.029	5	-.429	3
13		7	max	635.055	3	669.38	2	20.663	3	-.005	9	-.008	12	.568	2
14			min	-1746.521	2	-268.201	3	-178.559	1	-.025	3	-.084	4	-.253	3
15		8	max	634.475	3	667.721	2	20.663	3	-.005	9	.001	3	.129	2
16			min	-1747.294	2	-269.445	3	-178.559	1	-.025	3	-.201	1	-.077	3
17		9	max	627.4	3	5.423	1	38.764	3	.017	5	.109	1	.008	3
18			min	-1872.048	2	-.948	10	-226.402	1	-.155	2	.011	12	-.075	2
19		10	max	626.82	3	3.895	9	38.764	3	.017	5	.043	3	.006	3
20			min	-1872.821	2	-2.329	10	-226.402	1	-.155	2	-.04	2	-.074	2
21		11	max	626.24	3	2.513	9	38.764	3	.017	5	.068	3	.006	3
22			min	-1873.595	2	-3.751	2	-226.402	1	-.155	2	-.188	1	-.072	2
23		12	max	614.327	3	695.991	3	12.344	10	.211	3	.146	1	.093	1
24			min	-2081.198	1	-460.974	2	-201.08	4	-.207	2	.036	10	-.22	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	613.747	3	694.748	3	12.344	10	.211	3	.126	1	.395	1
26			min	-2081.971	1	-462.632	2	-202.665	4	-.207	2	-.034	3	-.676	3
27		14	max	613.168	3	693.504	3	12.344	10	.211	3	.106	1	.698	1
28			min	-2082.744	1	-464.29	2	-204.251	4	-.207	2	-.154	5	-1.131	3
29		15	max	612.588	3	692.261	3	12.344	10	.211	3	.106	2	1.002	2
30			min	-2083.517	1	-465.948	2	-205.837	4	-.207	2	-.282	5	-1.586	3
31		16	max	212.628	1	461.465	2	67.475	5	.13	2	.017	3	.762	2
32			min	4.979	12	-721.069	3	-131.152	1	-.322	3	-.192	4	-1.211	3
33		17	max	211.854	1	459.807	2	65.89	5	.13	2	.014	3	.46	2
34			min	4.593	12	-722.312	3	-131.152	1	-.322	3	-.23	1	-.737	3
35		18	max	211.081	1	458.149	2	64.304	5	.13	2	.012	3	.159	1
36			min	4.206	12	-723.556	3	-131.152	1	-.322	3	-.316	1	-.263	3
37		19	max	0	1	0	15	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.007	2	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	6.915	10	891.457	3	0	1	.032	4	.253	4	.566	2
42			min	-269.703	1	-1855.443	2	-94.857	5	0	1	0	1	-.279	3
43		3	max	6.271	10	890.213	3	0	1	.032	4	.191	4	1.784	2
44			min	-270.476	1	-1857.101	2	-96.443	5	0	1	0	1	-.864	3
45		4	max	5.626	10	888.969	3	0	1	.032	4	.127	4	3.003	2
46			min	-271.25	1	-1858.76	2	-98.029	5	0	1	0	1	-1.448	3
47		5	max	2058.805	3	1863.512	2	0	1	0	1	.021	4	3.539	2
48			min	-4396.263	2	-935.469	3	-94.759	4	-.018	4	0	1	-1.696	3
49		6	max	2058.225	3	1861.854	2	0	1	0	1	0	1	2.317	2
50			min	-4397.036	2	-936.713	3	-96.345	4	-.018	4	-.042	5	-1.081	3
51		7	max	2057.645	3	1860.195	2	0	1	0	1	0	1	1.096	2
52			min	-4397.809	2	-937.956	3	-97.93	4	-.018	4	-.106	4	-.466	3
53		8	max	2057.065	3	1858.537	2	0	1	0	1	0	1	.15	3
54			min	-4398.582	2	-939.2	3	-99.516	4	-.018	4	-.17	4	-.136	1
55		9	max	2027.129	3	16.378	3	0	1	.013	4	.149	4	.443	3
56			min	-4430.014	2	-125.988	2	-220.818	4	0	1	0	1	-.691	2
57		10	max	2026.549	3	15.134	3	0	1	.013	4	.005	5	.433	3
58			min	-4430.787	2	-127.647	2	-222.404	4	0	1	0	1	-.608	2
59		11	max	2025.969	3	13.891	3	0	1	.013	4	0	1	.423	3
60			min	-4431.56	2	-129.305	2	-223.989	4	0	1	-.143	4	-.523	2
61		12	max	2005.707	3	2031.562	3	0	1	.128	4	.15	5	.041	1
62			min	-4474.031	2	-1576.041	2	-222.061	5	0	1	0	1	-.221	3
63		13	max	2005.127	3	2030.318	3	0	1	.128	4	.003	5	1.062	1
64			min	-4474.804	2	-1577.699	2	-223.646	5	0	1	0	1	-1.554	3
65		14	max	2004.547	3	2029.075	3	0	1	.128	4	0	1	2.084	1
66			min	-4475.577	2	-1579.357	2	-225.232	5	0	1	-.144	4	-2.885	3
67		15	max	2003.967	3	2027.831	3	0	1	.128	4	0	1	3.107	1
68			min	-4476.35	2	-1581.015	2	-226.818	5	0	1	-.292	4	-4.216	3
69		16	max	270.728	1	1445.429	1	54.107	5	0	1	0	1	2.366	1
70			min	-6.467	10	-1967.108	3	0	1	-.122	4	-.161	5	-3.201	3
71		17	max	269.955	1	1443.771	1	52.521	5	0	1	0	1	1.418	1
72			min	-7.112	10	-1968.351	3	0	1	-.122	4	-.126	5	-1.91	3
73		18	max	269.182	1	1442.112	1	50.935	5	0	1	0	1	.471	1
74			min	-7.756	10	-1969.595	3	0	1	-.122	4	-.093	4	-.618	3
75		19	max	0	1	0	2	0	1	0	1	0	1	0	1
76			min	0	1	-.004	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.004	2	.001	4	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	25.425	5	304.658	3	145.661	1	.209	2	.128	5	.271	2
80			min	-210.82	1	-726.862	2	-42.135	5	-.051	3	-.302	1	-.111	3
81		3	max	25.065	5	303.414	3	145.661	1	.209	2	.1	5	.748	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	-211.594	1	-728.52	2	-43.721	5	-.051	3	-.207	1	-.311	3
83		4	max	24.704	5	302.17	3	145.661	1	.209	2	.071	5	1.227	2
84			min	-212.367	1	-730.178	2	-45.306	5	-.051	3	-.111	1	-.51	3
85		5	max	636.215	3	672.696	2	178.559	1	.025	3	.039	3	1.448	2
86			min	-1744.974	2	-265.714	3	-39.473	5	-.015	5	-.151	1	-.603	3
87		6	max	635.635	3	671.038	2	178.559	1	.025	3	.026	3	1.008	2
88			min	-1745.747	2	-266.958	3	-41.058	5	-.015	5	-.045	2	-.429	3
89		7	max	635.055	3	669.38	2	178.559	1	.025	3	.084	1	.568	2
90			min	-1746.521	2	-268.201	3	-42.644	5	-.015	5	-.059	5	-.253	3
91		8	max	634.475	3	667.721	2	178.559	1	.025	3	.201	1	.129	2
92			min	-1747.294	2	-269.445	3	-44.229	5	-.015	5	-.087	5	-.077	3
93		9	max	627.4	3	5.423	1	226.402	1	.155	2	.067	5	.008	3
94			min	-1872.048	2	-.948	10	-76.962	5	.016	15	-.109	1	-.075	2
95		10	max	626.82	3	3.895	9	226.402	1	.155	2	.04	2	.006	3
96			min	-1872.821	2	-2.329	10	-78.548	5	.016	15	-.043	3	-.074	2
97		11	max	626.24	3	2.513	9	226.402	1	.155	2	.188	1	.006	3
98			min	-1873.595	2	-3.751	2	-80.133	5	.016	15	-.068	3	-.072	2
99		12	max	614.327	3	695.991	3	141.117	3	.207	2	.083	5	.093	1
100			min	-2081.198	1	-460.974	2	-186.349	5	-.211	3	-.146	1	-.22	3
101		13	max	613.747	3	694.748	3	141.117	3	.207	2	.034	3	.395	1
102			min	-2081.971	1	-462.632	2	-187.934	5	-.211	3	-.126	1	-.676	3
103		14	max	613.168	3	693.504	3	141.117	3	.207	2	.127	3	.698	1
104			min	-2082.744	1	-464.29	2	-189.52	5	-.211	3	-.18	4	-1.131	3
105		15	max	612.588	3	692.261	3	141.117	3	.207	2	.22	3	1.002	2
106			min	-2083.517	1	-465.948	2	-191.106	5	-.211	3	-.299	4	-1.586	3
107		16	max	212.628	1	461.465	2	131.152	1	.322	3	.144	1	.762	2
108			min	1.94	15	-721.069	3	2.474	12	-.13	2	-.153	5	-1.211	3
109		17	max	211.854	1	459.807	2	131.152	1	.322	3	.23	1	.46	2
110			min	1.707	15	-722.312	3	2.474	12	-.13	2	-.1	5	-.737	3
111		18	max	211.081	1	458.149	2	131.152	1	.322	3	.316	1	.159	1
112			min	1.473	15	-723.556	3	2.474	12	-.13	2	-.048	5	-.263	3
113		19	max	0	1	0	5	0	12	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	131.197	1	456.897	1	-1.248	15	.006	1	.36	1	.13	2
116			min	2.475	12	-724.748	3	-210.832	1	-.021	3	-.022	5	-.322	3
117		2	max	131.197	1	326.051	1	.295	15	.006	1	.19	1	.237	3
118			min	2.475	12	-534.77	3	-172.553	1	-.021	3	-.023	5	-.218	1
119		3	max	131.197	1	195.317	2	2.441	5	.006	1	.077	2	.628	3
120			min	2.475	12	-344.791	3	-134.273	1	-.021	3	-.022	5	-.45	1
121		4	max	131.197	1	64.611	2	4.828	5	.006	1	.016	10	.85	3
122			min	2.475	12	-154.813	3	-95.994	1	-.021	3	-.049	1	-.565	1
123		5	max	131.197	1	35.166	3	7.215	5	.006	1	-.008	12	.903	3
124			min	2.475	12	-66.486	1	-57.715	1	-.021	3	-.117	1	-.564	1
125		6	max	131.197	1	225.144	3	9.602	5	.006	1	-.003	15	.788	3
126			min	2.475	12	-197.332	1	-35.299	2	-.021	3	-.151	1	-.447	2
127		7	max	131.197	1	415.122	3	24.623	14	.006	1	.004	5	.503	3
128			min	2.475	12	-328.177	1	-19.82	2	-.021	3	-.152	1	-.214	2
129		8	max	131.197	1	605.101	3	57.122	1	.006	1	.016	5	.137	1
130			min	1.909	15	-459.023	1	-12.807	10	-.021	3	-.118	1	-.02	5
131		9	max	131.197	1	795.079	3	95.401	1	.006	1	.032	4	.603	1
132			min	-7.262	5	-589.869	1	-8.544	10	-.021	3	-.111	2	-.573	3
133		10	max	131.197	1	985.057	3	15.844	3	.021	3	.087	14	1.185	1
134			min	2.475	12	31.45	15	-133.681	1	-.003	14	-.095	2	-1.364	3
135		11	max	131.197	1	589.869	1	8.544	10	.021	3	.018	3	.603	1
136			min	2.475	12	-795.079	3	-95.401	1	-.006	1	-.111	2	-.573	3
137		12	max	131.197	1	459.023	1	12.807	10	.021	3	.007	3	.137	1
138			min	2.475	12	-605.101	3	-57.122	1	-.006	1	-.118	1	.02	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
139		13	max	131.197	1	328.177	1	19.82	2	.021	3	-.001	12	.503	3
140			min	-.099	15	-415.122	3	-23.839	9	-.006	1	-.152	1	-.214	2
141		14	max	131.197	1	197.332	1	35.299	2	.021	3	-.006	12	.788	3
142			min	-10.317	5	-225.144	3	-6.434	3	-.006	1	-.151	1	-.447	2
143		15	max	131.197	1	66.486	1	57.715	1	.021	3	-.001	15	.903	3
144			min	-20.807	5	-35.166	3	-4.081	3	-.006	1	-.117	1	-.564	1
145		16	max	131.197	1	154.813	3	95.994	1	.021	3	.016	10	.85	3
146			min	-31.296	5	-64.611	2	-1.728	3	-.006	1	-.049	1	-.565	1
147		17	max	131.197	1	344.791	3	134.273	1	.021	3	.077	2	.628	3
148			min	-41.785	5	-195.317	2	.624	3	-.006	1	-.016	3	-.45	1
149		18	max	131.197	1	534.77	3	172.553	1	.021	3	.19	1	.237	3
150			min	-52.275	5	-326.051	1	2.251	12	-.006	1	-.014	3	-.218	1
151		19	max	131.197	1	724.748	3	210.832	1	.021	3	.36	1	.13	2
152			min	-62.764	5	-456.897	1	3.819	12	-.006	1	-.011	3	-.322	3
153	M11	1	max	195.675	1	459.725	1	42.977	5	.004	3	.419	1	.107	4
154			min	-179.648	3	-697.733	3	-222.013	1	-.013	1	-.205	5	-.296	3
155		2	max	195.675	1	328.879	1	45.364	5	.004	3	.239	1	.24	3
156			min	-179.648	3	-507.755	3	-183.734	1	-.013	1	-.166	5	-.295	2
157		3	max	195.675	1	198.034	1	47.751	5	.004	3	.099	2	.607	3
158			min	-179.648	3	-317.777	3	-145.455	1	-.013	1	-.125	5	-.525	2
159		4	max	195.675	1	67.188	1	50.138	5	.004	3	.028	2	.805	3
160			min	-179.648	3	-127.798	3	-107.176	1	-.013	1	-.091	4	-.639	2
161		5	max	195.675	1	62.18	3	52.525	5	.004	3	-.001	12	.834	3
162			min	-179.648	3	-67.704	2	-68.897	1	-.013	1	-.098	1	-.637	2
163		6	max	195.675	1	252.159	3	54.912	5	.004	3	.012	5	.694	3
164			min	-179.648	3	-198.411	2	-41.721	2	-.013	1	-.142	1	-.519	2
165		7	max	195.675	1	442.137	3	63.354	4	.004	3	.062	5	.385	3
166			min	-179.648	3	-329.117	2	-26.242	2	-.013	1	-.152	1	-.284	2
167		8	max	195.675	1	632.115	3	74.064	4	.004	3	.114	5	.066	2
168			min	-179.648	3	-459.824	2	-15.335	10	-.013	1	-.128	1	-.092	3
169		9	max	195.675	1	822.094	3	84.774	4	.004	3	.168	5	.533	2
170			min	-179.648	3	-590.53	2	-11.073	10	-.013	1	-.124	2	-.738	3
171		10	max	195.675	1	249.991	14	122.499	1	.013	1	.247	4	1.116	2
172			min	-179.648	3	-1012.072	3	-47.735	14	-.005	14	-.112	2	-1.553	3
173		11	max	195.675	1	590.53	2	49.151	5	.013	1	.008	3	.533	2
174			min	-179.648	3	-822.094	3	-84.22	1	-.004	3	-.172	4	-.738	3
175		12	max	195.675	1	459.824	2	51.538	5	.013	1	.002	3	.066	2
176			min	-179.648	3	-632.115	3	-45.941	1	-.004	3	-.143	4	-.092	3
177		13	max	195.675	1	329.117	2	53.925	5	.013	1	0	12	.385	3
178			min	-179.648	3	-442.137	3	-17.367	9	-.004	3	-.152	1	-.284	2
179		14	max	195.675	1	198.411	2	59.049	4	.013	1	-.002	12	.694	3
180			min	-179.648	3	-252.159	3	-.396	3	-.004	3	-.142	1	-.519	2
181		15	max	195.675	1	67.704	2	69.759	4	.013	1	.022	5	.834	3
182			min	-179.648	3	-62.18	3	1.345	12	-.004	3	-.098	1	-.637	2
183		16	max	195.675	1	127.798	3	107.176	1	.013	1	.076	5	.805	3
184			min	-179.648	3	-67.188	1	2.913	12	-.004	3	-.028	9	-.639	2
185		17	max	195.675	1	317.777	3	145.455	1	.013	1	.143	4	.607	3
186			min	-179.648	3	-198.034	1	4.482	12	-.004	3	.004	12	-.525	2
187		18	max	195.675	1	507.755	3	183.734	1	.013	1	.239	1	.24	3
188			min	-179.648	3	-328.879	1	6.05	12	-.004	3	.008	12	-.295	2
189		19	max	195.675	1	697.733	3	222.013	1	.013	1	.419	1	.076	1
190			min	-179.648	3	-459.725	1	7.619	12	-.004	3	.015	12	-.296	3
191	M12	1	max	30.944	5	665.094	2	40.752	5	0	3	.444	1	.14	2
192			min	-46.558	1	-274.234	3	-226.678	1	-.009	1	-.195	5	.026	15
193		2	max	20.454	5	481.199	2	43.139	5	0	3	.259	1	.266	3
194			min	-46.558	1	-190.632	3	-188.399	1	-.009	1	-.157	5	-.369	2
195		3	max	18.189	3	297.304	2	45.526	5	0	3	.116	2	.398	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	-46.558	1	-107.03	3	-150.12	1	-.009	1	-.118	5	-.715	2
197		4	max	18.189	3	113.409	2	47.913	5	0	3	.04	2	.456	3
198			min	-46.558	1	-23.428	3	-111.84	1	-.009	1	-.085	4	-.898	2
199		5	max	18.189	3	60.174	3	50.3	5	0	3	0	10	.44	3
200			min	-46.558	1	-70.485	2	-73.561	1	-.009	1	-.09	1	-.917	2
201		6	max	18.189	3	143.775	3	52.687	5	0	3	.013	5	.349	3
202			min	-46.558	1	-254.38	2	-46.535	2	-.009	1	-.138	1	-.772	2
203		7	max	18.189	3	227.377	3	60.617	4	0	3	.061	5	.184	3
204			min	-46.558	1	-438.275	2	-31.056	2	-.009	1	-.153	1	-.465	2
205		8	max	18.189	3	310.979	3	71.327	4	0	3	.111	5	.007	10
206			min	-53.432	4	-622.17	2	-17.944	10	-.009	1	-.133	1	-.055	3
207		9	max	18.189	3	394.581	3	82.037	4	0	3	.163	5	.641	2
208			min	-63.922	4	-806.065	2	-13.682	10	-.009	1	-.133	2	-.368	3
209		10	max	18.189	3	-13.561	15	117.834	1	0	3	.239	4	1.44	2
210			min	-74.411	4	-989.959	2	-14.682	3	-.009	1	-.126	2	-.756	3
211		11	max	45.739	5	806.065	2	47.304	5	.009	1	.017	3	.641	2
212			min	-46.558	1	-394.581	3	-79.555	1	0	5	-.169	4	-.368	3
213		12	max	35.249	5	622.17	2	49.691	5	.009	1	.007	3	.007	10
214			min	-46.558	1	-310.979	3	-41.276	1	0	5	-.141	4	-.055	3
215		13	max	24.76	5	438.275	2	52.078	5	.009	1	0	3	.184	3
216			min	-46.558	1	-227.377	3	-15.516	9	0	5	-.153	1	-.465	2
217		14	max	18.189	3	254.38	2	57.924	4	.009	1	-.004	12	.349	3
218			min	-46.558	1	-143.775	3	-5.272	3	0	5	-.138	1	-.772	2
219		15	max	18.189	3	70.485	2	73.561	1	.009	1	.02	5	.44	3
220			min	-46.558	1	-60.174	3	-2.919	3	0	5	-.09	1	-.917	2
221		16	max	18.189	3	23.428	3	111.84	1	.009	1	.072	5	.456	3
222			min	-46.558	1	-113.409	2	-.566	3	0	5	-.023	9	-.898	2
223		17	max	18.189	3	107.03	3	150.12	1	.009	1	.14	4	.398	3
224			min	-46.558	1	-297.304	2	1.441	12	0	5	-.011	3	-.715	2
225		18	max	18.189	3	190.632	3	188.399	1	.009	1	.259	1	.266	3
226			min	-46.558	1	-481.199	2	3.01	12	0	5	-.009	3	-.369	2
227		19	max	18.189	3	274.234	3	226.678	1	.009	1	.444	1	.14	2
228			min	-49.061	4	-665.094	2	4.578	12	0	5	-.004	3	-.032	5
229	M13	1	max	40.431	5	726.172	2	25.791	5	.009	3	.351	1	.209	2
230			min	-145.482	1	-305.947	3	-209.452	1	-.028	2	-.142	5	-.051	3
231		2	max	29.942	5	542.278	2	28.178	5	.009	3	.182	1	.184	3
232			min	-145.482	1	-222.345	3	-171.172	1	-.028	2	-.118	5	-.355	2
233		3	max	19.452	5	358.383	2	30.565	5	.009	3	.071	2	.344	3
234			min	-145.482	1	-138.743	3	-132.893	1	-.028	2	-.092	5	-.755	2
235		4	max	8.963	5	174.488	2	32.952	5	.009	3	.013	10	.431	3
236			min	-145.482	1	-55.141	3	-94.614	1	-.028	2	-.08	4	-.992	2
237		5	max	6.352	3	28.46	3	35.339	5	.009	3	-.005	12	.443	3
238			min	-145.482	1	-9.407	2	-56.335	1	-.028	2	-.121	1	-1.066	2
239		6	max	6.352	3	112.062	3	37.74	4	.009	3	0	15	.38	3
240			min	-145.482	1	-193.301	2	-34.115	2	-.028	2	-.154	1	-.976	2
241		7	max	6.352	3	195.664	3	48.45	4	.009	3	.033	5	.243	3
242			min	-145.482	1	-377.196	2	-18.636	2	-.028	2	-.154	1	-.722	2
243		8	max	6.352	3	279.266	3	59.97	14	.009	3	.07	5	.032	3
244			min	-145.482	1	-561.091	2	-12.2	10	-.028	2	-.119	1	-.305	2
245		9	max	6.352	3	362.868	3	96.781	1	.009	3	.112	4	.276	2
246			min	-145.482	1	-744.986	2	-7.937	10	-.028	2	-.111	2	-.253	3
247		10	max	6.352	3	928.881	2	101.112	14	-.001	15	.178	4	1.019	2
248			min	-145.482	1	-446.47	3	-135.061	1	-.028	2	-.094	2	-.613	3
249		11	max	28.898	5	744.986	2	30.636	5	.028	2	.016	3	.276	2
250			min	-145.482	1	-362.868	3	-96.781	1	-.009	3	-.111	2	-.253	3
251		12	max	18.409	5	561.091	2	33.023	5	.028	2	.007	3	.032	3
252			min	-145.482	1	-279.266	3	-58.502	1	-.009	3	-.119	1	-.305	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
253		13	max	7.92	5	377.196	2	35.41	5	.028	2	0	3	.243	3
254			min	-145.482	1	-195.664	3	-24.489	9	-.009	3	-.154	1	-.722	2
255		14	max	6.352	3	193.301	2	38.082	4	.028	2	-.004	12	.38	3
256			min	-145.482	1	-112.062	3	-4.23	3	-.009	3	-.154	1	-.976	2
257		15	max	6.352	3	9.407	2	56.335	1	.028	2	.018	5	.443	3
258			min	-145.482	1	-28.46	3	-1.878	3	-.009	3	-.121	1	-1.066	2
259		16	max	6.352	3	55.141	3	94.614	1	.028	2	.055	5	.431	3
260			min	-145.482	1	-174.488	2	.475	3	-.009	3	-.054	1	-.992	2
261		17	max	6.352	3	138.743	3	132.893	1	.028	2	.097	4	.344	3
262			min	-145.482	1	-358.383	2	2.058	12	-.009	3	-.007	3	-.755	2
263		18	max	6.352	3	222.345	3	171.172	1	.028	2	.182	1	.184	3
264			min	-145.482	1	-542.278	2	3.626	12	-.009	3	-.003	3	-.355	2
265		19	max	6.352	3	305.947	3	209.452	1	.028	2	.351	1	.209	2
266			min	-145.482	1	-726.172	2	5.194	12	-.009	3	.002	12	-.051	3
267	M2	1	max	2381.806	1	873.728	3	136.15	2	.008	5	1.468	5	7.803	1
268			min	-1730.754	3	-546.798	2	-324.816	5	-.005	2	-.219	1	.769	12
269		2	max	2378.884	1	873.728	3	136.15	2	.008	5	1.364	5	7.836	1
270			min	-1732.945	3	-546.798	2	-322.283	5	-.005	2	-.175	1	.594	12
271		3	max	2375.962	1	873.728	3	136.15	2	.008	5	1.261	5	7.869	1
272			min	-1735.136	3	-546.798	2	-319.751	5	-.005	2	-.132	1	.418	12
273		4	max	2373.041	1	873.728	3	136.15	2	.008	5	1.159	4	7.903	1
274			min	-1737.328	3	-546.798	2	-317.219	5	-.005	2	-.089	1	.243	12
275		5	max	1869.089	1	1699.68	1	100.718	1	.002	2	1.063	5	7.635	1
276			min	-1505.717	3	34.025	12	-301.732	5	0	3	-.091	1	.153	12
277		6	max	1866.167	1	1699.68	1	100.718	1	.002	2	.97	4	7.09	1
278			min	-1507.909	3	34.025	12	-299.2	5	0	3	-.058	1	.142	12
279		7	max	1863.246	1	1699.68	1	100.718	1	.002	2	.878	4	6.544	1
280			min	-1510.1	3	34.025	12	-296.667	5	0	3	-.058	3	.131	12
281		8	max	1860.324	1	1699.68	1	100.718	1	.002	2	.786	4	5.999	1
282			min	-1512.291	3	34.025	12	-294.135	5	0	3	-.103	3	.12	12
283		9	max	1857.402	1	1699.68	1	100.718	1	.002	2	.695	4	5.454	1
284			min	-1514.483	3	34.025	12	-291.603	5	0	3	-.147	3	.109	12
285		10	max	1854.48	1	1699.68	1	100.718	1	.002	2	.605	4	4.908	1
286			min	-1516.674	3	34.025	12	-289.071	5	0	3	-.191	3	.098	12
287		11	max	1851.559	1	1699.68	1	100.718	1	.002	2	.516	4	4.363	1
288			min	-1518.865	3	34.025	12	-286.539	5	0	3	-.235	3	.087	12
289		12	max	1848.637	1	1699.68	1	100.718	1	.002	2	.428	4	3.818	1
290			min	-1521.057	3	34.025	12	-284.007	5	0	3	-.279	3	.076	12
291		13	max	1845.715	1	1699.68	1	100.718	1	.002	2	.341	4	3.272	1
292			min	-1523.248	3	34.025	12	-281.474	5	0	3	-.323	3	.066	12
293		14	max	1842.793	1	1699.68	1	100.718	1	.002	2	.254	4	2.727	1
294			min	-1525.439	3	34.025	12	-278.942	5	0	3	-.368	3	.055	12
295		15	max	1839.872	1	1699.68	1	100.718	1	.002	2	.245	2	2.181	1
296			min	-1527.63	3	34.025	12	-276.41	5	0	3	-.412	3	.044	12
297		16	max	1836.95	1	1699.68	1	100.718	1	.002	2	.277	2	1.636	1
298			min	-1529.822	3	34.025	12	-273.878	5	0	3	-.456	3	.033	12
299		17	max	1834.028	1	1699.68	1	100.718	1	.002	2	.309	2	1.091	1
300			min	-1532.013	3	34.025	12	-271.346	5	0	3	-.5	3	.022	12
301		18	max	1831.107	1	1699.68	1	100.718	1	.002	2	.34	2	.545	1
302			min	-1534.204	3	34.025	12	-268.814	5	0	3	-.544	3	.011	12
303		19	max	1828.185	1	1699.68	1	100.718	1	.002	2	.372	2	0	1
304			min	-1536.396	3	34.025	12	-266.281	5	0	3	-.589	3	0	1
305	M5	1	max	6259.491	2	2565.046	3	0	1	.008	4	1.525	4	12.369	1
306			min	-5179.152	3	-2657.369	2	-343.099	5	0	1	0	1	.39	15
307		2	max	6256.569	2	2565.046	3	0	1	.008	4	1.416	4	12.899	1
308			min	-5181.343	3	-2657.369	2	-340.567	5	0	1	0	1	.396	15
309		3	max	6253.647	2	2565.046	3	0	1	.008	4	1.307	4	13.43	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	-5183.535	3	-2657.369	2	-338.035	5	0	1	0	1	.401	15
311		4	max	6250.725	2	2565.046	3	0	1	.008	4	1.2	4	13.96	1
312			min	-5185.726	3	-2657.369	2	-335.503	5	0	1	0	1	-.059	3
313		5	max	4827.661	1	3051.113	1	0	1	0	1	1.101	4	13.706	1
314			min	-4423.087	3	-97.547	3	-324.081	4	0	4	0	1	-.438	3
315		6	max	4824.739	1	3051.113	1	0	1	0	1	.998	4	12.727	1
316			min	-4425.278	3	-97.547	3	-321.549	4	0	4	0	1	-.407	3
317		7	max	4821.818	1	3051.113	1	0	1	0	1	.895	4	11.748	1
318			min	-4427.47	3	-97.547	3	-319.017	4	0	4	0	1	-.376	3
319		8	max	4818.896	1	3051.113	1	0	1	0	1	.793	4	10.769	1
320			min	-4429.661	3	-97.547	3	-316.485	4	0	4	0	1	-.344	3
321		9	max	4815.974	1	3051.113	1	0	1	0	1	.692	4	9.79	1
322			min	-4431.852	3	-97.547	3	-313.953	4	0	4	0	1	-.313	3
323		10	max	4813.052	1	3051.113	1	0	1	0	1	.592	4	8.811	1
324			min	-4434.044	3	-97.547	3	-311.421	4	0	4	0	1	-.282	3
325		11	max	4810.131	1	3051.113	1	0	1	0	1	.492	4	7.832	1
326			min	-4436.235	3	-97.547	3	-308.888	4	0	4	0	1	-.25	3
327		12	max	4807.209	1	3051.113	1	0	1	0	1	.393	4	6.853	1
328			min	-4438.426	3	-97.547	3	-306.356	4	0	4	0	1	-.219	3
329		13	max	4804.287	1	3051.113	1	0	1	0	1	.295	4	5.874	1
330			min	-4440.617	3	-97.547	3	-303.824	4	0	4	0	1	-.188	3
331		14	max	4801.366	1	3051.113	1	0	1	0	1	.198	4	4.895	1
332			min	-4442.809	3	-97.547	3	-301.292	4	0	4	0	1	-.156	3
333		15	max	4798.444	1	3051.113	1	0	1	0	1	.102	4	3.916	1
334			min	-4445	3	-97.547	3	-298.76	4	0	4	0	1	-.125	3
335		16	max	4795.522	1	3051.113	1	0	1	0	1	.007	4	2.937	1
336			min	-4447.191	3	-97.547	3	-296.228	4	0	4	0	1	-.094	3
337		17	max	4792.6	1	3051.113	1	0	1	0	1	0	1	1.958	1
338			min	-4449.383	3	-97.547	3	-293.695	4	0	4	-.088	4	-.063	3
339		18	max	4789.679	1	3051.113	1	0	1	0	1	0	1	.979	1
340			min	-4451.574	3	-97.547	3	-291.163	4	0	4	-.182	4	-.031	3
341		19	max	4786.757	1	3051.113	1	0	1	0	1	0	1	0	1
342			min	-4453.765	3	-97.547	3	-288.631	4	0	4	-.275	4	0	1
343	M8	1	max	2381.806	1	873.728	3	151.382	3	.009	4	1.535	4	7.803	1
344			min	-1730.754	3	-546.798	2	-354.603	4	-.002	3	-.203	3	-.453	5
345		2	max	2378.884	1	873.728	3	151.382	3	.009	4	1.422	4	7.836	1
346			min	-1732.945	3	-546.798	2	-352.071	4	-.002	3	-.155	3	-.405	5
347		3	max	2375.962	1	873.728	3	151.382	3	.009	4	1.309	4	7.869	1
348			min	-1735.136	3	-546.798	2	-349.539	4	-.002	3	-.106	3	-.356	5
349		4	max	2373.041	1	873.728	3	151.382	3	.009	4	1.198	4	7.903	1
350			min	-1737.328	3	-546.798	2	-347.006	4	-.002	3	-.058	3	-.308	5
351		5	max	1869.089	1	1699.68	1	137.71	3	0	3	1.101	4	7.635	1
352			min	-1505.717	3	-61.177	5	-327.538	4	-.002	2	-.03	3	-.275	5
353		6	max	1866.167	1	1699.68	1	137.71	3	0	3	.996	4	7.09	1
354			min	-1507.909	3	-61.177	5	-325.006	4	-.002	2	.009	12	-.255	5
355		7	max	1863.246	1	1699.68	1	137.71	3	0	3	.892	4	6.544	1
356			min	-1510.1	3	-61.177	5	-322.474	4	-.002	2	0	10	-.236	5
357		8	max	1860.324	1	1699.68	1	137.71	3	0	3	.789	4	5.999	1
358			min	-1512.291	3	-61.177	5	-319.942	4	-.002	2	-.024	2	-.216	5
359		9	max	1857.402	1	1699.68	1	137.71	3	0	3	.687	4	5.454	1
360			min	-1514.483	3	-61.177	5	-317.41	4	-.002	2	-.056	2	-.196	5
361		10	max	1854.48	1	1699.68	1	137.71	3	0	3	.586	4	4.908	1
362			min	-1516.674	3	-61.177	5	-314.878	4	-.002	2	-.087	2	-.177	5
363		11	max	1851.559	1	1699.68	1	137.71	3	0	3	.49	5	4.363	1
364			min	-1518.865	3	-61.177	5	-312.345	4	-.002	2	-.119	2	-.157	5
365		12	max	1848.637	1	1699.68	1	137.71	3	0	3	.396	5	3.818	1
366			min	-1521.057	3	-61.177	5	-309.813	4	-.002	2	-.151	2	-.137	5

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	1845.715	1	1699.68	1	137.71	3	0	3	.323	3	3.272	1
368			min	-1523.248	3	-61.177	5	-307.281	4	-.002	2	-.182	2	-.118	5
369		14	max	1842.793	1	1699.68	1	137.71	3	0	3	.368	3	2.727	1
370			min	-1525.439	3	-61.177	5	-304.749	4	-.002	2	-.214	2	-.098	5
371		15	max	1839.872	1	1699.68	1	137.71	3	0	3	.412	3	2.181	1
372			min	-1527.63	3	-61.177	5	-302.217	4	-.002	2	-.245	2	-.079	5
373		16	max	1836.95	1	1699.68	1	137.71	3	0	3	.456	3	1.636	1
374			min	-1529.822	3	-61.177	5	-299.684	4	-.002	2	-.277	2	-.059	5
375		17	max	1834.028	1	1699.68	1	137.71	3	0	3	.5	3	1.091	1
376			min	-1532.013	3	-61.177	5	-297.152	4	-.002	2	-.309	2	-.039	5
377		18	max	1831.107	1	1699.68	1	137.71	3	0	3	.544	3	.545	1
378			min	-1534.204	3	-61.177	5	-294.62	4	-.002	2	-.34	2	-.02	5
379		19	max	1828.185	1	1699.68	1	137.71	3	0	3	.589	3	0	1
380			min	-1536.396	3	-61.177	5	-292.088	4	-.002	2	-.372	2	0	1
381	M3	1	max	2143.914	2	5.879	4	36.922	2	.019	3	.008	4	0	1
382			min	-857.689	3	1.382	15	-14.301	3	-.045	2	-.002	3	0	1
383		2	max	2143.767	2	5.226	4	36.922	2	.019	3	.019	2	0	15
384			min	-857.799	3	1.228	15	-14.301	3	-.045	2	-.008	3	-.002	4
385		3	max	2143.621	2	4.572	4	36.922	2	.019	3	.032	2	0	15
386			min	-857.909	3	1.075	15	-14.301	3	-.045	2	-.013	3	-.004	4
387		4	max	2143.474	2	3.919	4	36.922	2	.019	3	.045	2	-.001	15
388			min	-858.019	3	.921	15	-14.301	3	-.045	2	-.018	3	-.005	4
389		5	max	2143.328	2	3.266	4	36.922	2	.019	3	.059	2	-.002	15
390			min	-858.129	3	.768	15	-14.301	3	-.045	2	-.023	3	-.007	4
391		6	max	2143.181	2	2.613	4	36.922	2	.019	3	.072	2	-.002	15
392			min	-858.239	3	.614	15	-14.301	3	-.045	2	-.028	3	-.008	4
393		7	max	2143.034	2	1.96	4	36.922	2	.019	3	.085	2	-.002	15
394			min	-858.349	3	.461	15	-14.301	3	-.045	2	-.033	3	-.008	4
395		8	max	2142.888	2	1.306	4	36.922	2	.019	3	.098	2	-.002	15
396			min	-858.459	3	.307	15	-14.301	3	-.045	2	-.038	3	-.009	4
397		9	max	2142.741	2	.653	4	36.922	2	.019	3	.111	2	-.002	15
398			min	-858.569	3	.154	15	-14.301	3	-.045	2	-.043	3	-.009	4
399		10	max	2142.595	2	0	1	36.922	2	.019	3	.125	2	-.002	15
400			min	-858.678	3	0	1	-14.301	3	-.045	2	-.048	3	-.009	4
401		11	max	2142.448	2	-.154	15	36.922	2	.019	3	.138	2	-.002	15
402			min	-858.788	3	-.653	6	-14.301	3	-.045	2	-.054	3	-.009	4
403		12	max	2142.301	2	-.307	15	36.922	2	.019	3	.151	2	-.002	15
404			min	-858.898	3	-1.306	6	-14.301	3	-.045	2	-.059	3	-.009	4
405		13	max	2142.155	2	-.461	15	36.922	2	.019	3	.164	2	-.002	15
406			min	-859.008	3	-1.96	6	-14.301	3	-.045	2	-.064	3	-.008	4
407		14	max	2142.008	2	-.614	15	36.922	2	.019	3	.177	2	-.002	15
408			min	-859.118	3	-2.613	6	-14.301	3	-.045	2	-.069	3	-.008	4
409		15	max	2141.862	2	-.768	15	36.922	2	.019	3	.19	2	-.002	15
410			min	-859.228	3	-3.266	6	-14.301	3	-.045	2	-.074	3	-.007	4
411		16	max	2141.715	2	-.921	15	36.922	2	.019	3	.204	2	-.001	15
412			min	-859.338	3	-3.919	6	-14.301	3	-.045	2	-.079	3	-.005	4
413		17	max	2141.568	2	-1.075	15	36.922	2	.019	3	.217	2	0	15
414			min	-859.448	3	-4.572	6	-14.301	3	-.045	2	-.084	3	-.004	4
415		18	max	2141.422	2	-1.228	15	36.922	2	.019	3	.23	2	0	15
416			min	-859.558	3	-5.226	6	-14.301	3	-.045	2	-.089	3	-.002	4
417		19	max	2141.275	2	-1.382	15	36.922	2	.019	3	.243	2	0	1
418			min	-859.668	3	-5.879	6	-14.301	3	-.045	2	-.094	3	0	1
419	M6	1	max	5671.075	2	5.879	6	0	1	.009	4	.007	4	0	1
420			min	-2771.884	3	1.382	15	-15.281	4	0	1	0	1	0	1
421		2	max	5670.928	2	5.226	6	0	1	.009	4	.001	4	0	15
422			min	-2771.994	3	1.228	15	-14.822	4	0	1	0	1	-.002	6
423		3	max	5670.782	2	4.572	6	0	1	.009	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	-2772.104	3	1.075	15	-14.363	4	0	1	-.004	4	-.004	6
425		4	max	5670.635	2	3.919	6	0	1	.009	4	0	1	-.001	15
426			min	-2772.214	3	.921	15	-13.904	4	0	1	-.009	4	-.005	6
427		5	max	5670.489	2	3.266	6	0	1	.009	4	0	1	-.002	15
428			min	-2772.324	3	.768	15	-13.445	4	0	1	-.014	4	-.007	6
429		6	max	5670.342	2	2.613	6	0	1	.009	4	0	1	-.002	15
430			min	-2772.434	3	.614	15	-12.986	4	0	1	-.019	4	-.008	6
431		7	max	5670.195	2	1.96	6	0	1	.009	4	0	1	-.002	15
432			min	-2772.544	3	.461	15	-12.527	4	0	1	-.023	4	-.008	6
433		8	max	5670.049	2	1.306	6	0	1	.009	4	0	1	-.002	15
434			min	-2772.654	3	.307	15	-12.068	4	0	1	-.028	4	-.009	6
435		9	max	5669.902	2	.653	6	0	1	.009	4	0	1	-.002	15
436			min	-2772.764	3	.154	15	-11.609	4	0	1	-.032	4	-.009	6
437		10	max	5669.756	2	0	1	0	1	.009	4	0	1	-.002	15
438			min	-2772.874	3	0	1	-11.149	4	0	1	-.036	4	-.009	6
439		11	max	5669.609	2	-.154	15	0	1	.009	4	0	1	-.002	15
440			min	-2772.984	3	-.653	4	-10.69	4	0	1	-.04	4	-.009	6
441		12	max	5669.462	2	-.307	15	0	1	.009	4	0	1	-.002	15
442			min	-2773.094	3	-1.306	4	-10.231	4	0	1	-.043	4	-.009	6
443		13	max	5669.316	2	-.461	15	0	1	.009	4	0	1	-.002	15
444			min	-2773.204	3	-1.96	4	-9.772	4	0	1	-.047	4	-.008	6
445		14	max	5669.169	2	-.614	15	0	1	.009	4	0	1	-.002	15
446			min	-2773.314	3	-2.613	4	-9.313	4	0	1	-.05	4	-.008	6
447		15	max	5669.022	2	-.768	15	0	1	.009	4	0	1	-.002	15
448			min	-2773.424	3	-3.266	4	-8.854	4	0	1	-.054	4	-.007	6
449		16	max	5668.876	2	-.921	15	0	1	.009	4	0	1	-.001	15
450			min	-2773.533	3	-3.919	4	-8.395	4	0	1	-.057	4	-.005	6
451		17	max	5668.729	2	-1.075	15	0	1	.009	4	0	1	0	15
452			min	-2773.643	3	-4.572	4	-7.936	4	0	1	-.06	4	-.004	6
453		18	max	5668.583	2	-1.228	15	0	1	.009	4	0	1	0	15
454			min	-2773.753	3	-5.226	4	-7.477	4	0	1	-.062	4	-.002	6
455		19	max	5668.436	2	-1.382	15	0	1	.009	4	0	1	0	1
456			min	-2773.863	3	-5.879	4	-7.018	4	0	1	-.065	4	0	1
457	M9	1	max	2143.914	2	5.879	4	14.301	3	.045	2	.007	5	0	1
458			min	-857.689	3	1.382	15	-36.922	2	-.019	3	-.006	2	0	1
459		2	max	2143.767	2	5.226	4	14.301	3	.045	2	.008	3	0	15
460			min	-857.799	3	1.228	15	-36.922	2	-.019	3	-.019	2	-.002	4
461		3	max	2143.621	2	4.572	4	14.301	3	.045	2	.013	3	0	15
462			min	-857.909	3	1.075	15	-36.922	2	-.019	3	-.032	2	-.004	4
463		4	max	2143.474	2	3.919	4	14.301	3	.045	2	.018	3	-.001	15
464			min	-858.019	3	.921	15	-36.922	2	-.019	3	-.045	2	-.005	4
465		5	max	2143.328	2	3.266	4	14.301	3	.045	2	.023	3	-.002	15
466			min	-858.129	3	.768	15	-36.922	2	-.019	3	-.059	2	-.007	4
467		6	max	2143.181	2	2.613	4	14.301	3	.045	2	.028	3	-.002	15
468			min	-858.239	3	.614	15	-36.922	2	-.019	3	-.072	2	-.008	4
469		7	max	2143.034	2	1.96	4	14.301	3	.045	2	.033	3	-.002	15
470			min	-858.349	3	.461	15	-36.922	2	-.019	3	-.085	2	-.008	4
471		8	max	2142.888	2	1.306	4	14.301	3	.045	2	.038	3	-.002	15
472			min	-858.459	3	.307	15	-36.922	2	-.019	3	-.098	2	-.009	4
473		9	max	2142.741	2	.653	4	14.301	3	.045	2	.043	3	-.002	15
474			min	-858.569	3	.154	15	-36.922	2	-.019	3	-.111	2	-.009	4
475		10	max	2142.595	2	0	1	14.301	3	.045	2	.048	3	-.002	15
476			min	-858.678	3	0	1	-36.922	2	-.019	3	-.125	2	-.009	4
477		11	max	2142.448	2	-.154	15	14.301	3	.045	2	.054	3	-.002	15
478			min	-858.788	3	-.653	4	-36.922	2	-.019	3	-.138	2	-.009	4
479		12	max	2142.301	2	-.307	15	14.301	3	.045	2	.059	3	-.002	15
480			min	-858.898	3	-1.306	4	-36.922	2	-.019	3	-.151	2	-.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	2142.155	2	-.461	15	14.301	3	.045	2	.064	3	-.002	15
482			min	-859.008	3	-1.96	4	-36.922	2	-.019	3	-.164	2	-.008	4
483		14	max	2142.008	2	-.614	15	14.301	3	.045	2	.069	3	-.002	15
484			min	-859.118	3	-2.613	4	-36.922	2	-.019	3	-.177	2	-.008	4
485		15	max	2141.862	2	-.768	15	14.301	3	.045	2	.074	3	-.002	15
486			min	-859.228	3	-3.266	4	-36.922	2	-.019	3	-.19	2	-.007	4
487		16	max	2141.715	2	-.921	15	14.301	3	.045	2	.079	3	-.001	15
488			min	-859.338	3	-3.919	4	-36.922	2	-.019	3	-.204	2	-.005	4
489		17	max	2141.568	2	-1.075	15	14.301	3	.045	2	.084	3	0	15
490			min	-859.448	3	-4.572	4	-36.922	2	-.019	3	-.217	2	-.004	4
491		18	max	2141.422	2	-1.228	15	14.301	3	.045	2	.089	3	0	15
492			min	-859.558	3	-5.226	4	-36.922	2	-.019	3	-.23	2	-.002	4
493		19	max	2141.275	2	-1.382	15	14.301	3	.045	2	.094	3	0	1
494			min	-859.668	3	-5.879	4	-36.922	2	-.019	3	-.243	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	-.018	12	.098	3	.012	1	8.982e-3	3	NC	3	NC	1
2			min	-.521	1	-1.096	1	-.74	4	-2.589e-2	2	97.269	1	239.578	5
3		2	max	-.018	12	.063	3	0	3	8.652e-3	3	6541.819	12	NC	2
4			min	-.521	1	-.947	1	-.715	4	-2.453e-2	2	108.296	1	250.655	4
5		3	max	-.018	12	.03	3	0	3	8.005e-3	3	3348.065	12	NC	3
6			min	-.521	1	-.802	1	-.683	4	-2.188e-2	2	121.787	1	265.896	4
7		4	max	-.018	12	0	3	.001	3	7.359e-3	3	2361.846	12	NC	3
8			min	-.521	1	-.667	1	-.644	4	-1.922e-2	2	137.759	1	286.792	4
9		5	max	-.018	12	-.014	12	.002	3	6.984e-3	3	1949.829	12	NC	3
10			min	-.521	1	-.549	1	-.601	4	-1.725e-2	2	155.633	1	314.149	4
11		6	max	-.018	12	-.021	12	.003	3	7.306e-3	3	1782.438	12	NC	3
12			min	-.52	1	-.451	1	-.556	4	-1.706e-2	2	174.522	1	348.482	4
13		7	max	-.018	12	-.023	12	.002	3	7.628e-3	3	1723.794	12	NC	1
14			min	-.519	1	-.366	1	-.513	4	-1.687e-2	2	194.932	1	390.091	4
15		8	max	-.018	12	-.024	12	0	1	7.95e-3	3	1801.679	15	NC	1
16			min	-.519	1	-.288	1	-.473	4	-1.668e-2	2	218.146	1	437.422	5
17		9	max	-.018	12	-.021	15	0	10	8.663e-3	3	1978.152	15	NC	1
18			min	-.518	1	-.213	1	-.437	4	-1.556e-2	2	246.934	1	492.114	5
19		10	max	-.018	12	-.014	15	.001	2	9.743e-3	3	2194.094	15	NC	1
20			min	-.517	1	-.136	1	-.398	4	-1.359e-2	2	285.127	1	567.059	5
21		11	max	-.019	12	-.007	15	.001	1	1.082e-2	3	2464.466	15	NC	1
22			min	-.517	1	-.058	1	-.36	4	-1.161e-2	2	338.082	1	670.596	5
23		12	max	-.019	12	.021	1	.004	3	1.007e-2	3	2812.813	15	NC	1
24			min	-.516	1	-.036	3	-.323	4	-9.311e-3	2	416.579	1	815.679	5
25		13	max	-.019	12	.099	1	.01	3	7.385e-3	3	3278.652	15	NC	1
26			min	-.515	1	-.033	3	-.282	4	-6.674e-3	2	539.927	1	1061.3	5
27		14	max	-.019	12	.171	1	.015	3	4.696e-3	3	3932.74	15	NC	1
28			min	-.514	1	-.02	3	-.243	4	-5.138e-3	4	742.487	1	1500.842	5
29		15	max	-.019	12	.231	1	.014	3	2.007e-3	3	4916.033	15	NC	1
30			min	-.513	1	.007	12	-.208	4	-6.106e-3	4	1089.68	1	2303.981	5
31		16	max	-.019	12	.277	1	.012	1	5.398e-3	3	8224.917	12	NC	2
32			min	-.513	1	.029	15	-.183	4	-5.348e-3	4	1677.336	1	3739.605	5
33		17	max	-.019	12	.311	1	.014	1	9.503e-3	3	9838.735	15	NC	2
34			min	-.513	1	.036	15	-.166	5	-4.387e-3	4	2788.897	1	6372.942	1
35		18	max	-.019	12	.337	1	.007	1	1.361e-2	3	NC	5	NC	2
36			min	-.513	1	.043	15	-.155	4	-5.928e-3	2	1118.105	3	8538.3	1
37		19	max	-.019	12	.361	1	-.001	12	1.57e-2	3	NC	1	NC	1
38			min	-.513	1	.05	15	-.15	4	-6.774e-3	2	656.583	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
39	M4	1	max	-.004	3	.316	3	0	1	7.274e-4	4	NC	3	NC	1
40			min	-.915	1	-2.019	1	-.739	4	0	1	56.917	1	239.667	4
41		2	max	-.004	3	.228	3	0	1	5.219e-4	4	2608.6	12	NC	1
42			min	-.915	1	-1.734	1	-.716	4	0	1	64.273	1	249.255	4
43		3	max	-.004	3	.144	3	0	1	1.212e-4	5	2525.201	15	NC	1
44			min	-.914	1	-1.456	1	-.685	4	0	1	73.548	1	263.892	4
45		4	max	-.004	3	.074	3	0	1	0	1	2853.035	15	NC	1
46			min	-.914	1	-1.201	1	-.646	4	-2.842e-4	4	84.758	1	284.668	4
47		5	max	-.004	3	.026	3	0	1	0	1	3215.123	15	NC	1
48			min	-.914	1	-.986	1	-.601	4	-5.096e-4	4	97.259	1	312.429	4
49		6	max	-.005	12	.005	3	0	1	0	1	3589.742	15	NC	1
50			min	-.912	1	-.818	1	-.556	4	-2.784e-4	4	109.97	1	347.282	4
51		7	max	-.005	12	.001	3	0	1	0	1	3991.339	15	NC	1
52			min	-.911	1	-.679	1	-.512	4	-4.709e-5	4	123.206	1	389.085	4
53		8	max	-.006	12	.004	3	0	1	1.842e-4	4	4455.284	15	NC	1
54			min	-.909	1	-.555	1	-.472	4	0	1	138.162	1	436.556	4
55		9	max	-.006	12	.005	3	0	1	2.131e-4	4	5056.814	15	NC	1
56			min	-.907	1	-.427	1	-.437	4	0	1	157.721	1	489.373	4
57		10	max	-.007	12	-.002	12	0	1	5.205e-5	5	5906.76	15	NC	1
58			min	-.906	1	-.29	1	-.398	4	0	1	186.168	1	565.567	4
59		11	max	-.007	12	-.004	15	0	1	0	1	7176.892	15	NC	1
60			min	-.904	1	-.144	1	-.359	4	-1.104e-4	4	230.237	1	670.34	4
61		12	max	-.008	12	.009	1	0	1	0	1	9261.431	15	NC	1
62			min	-.902	1	-.036	3	-.324	4	-9.815e-4	4	306.693	1	805.674	4
63		13	max	-.008	12	.162	1	0	1	0	1	NC	15	NC	1
64			min	-.9	1	-.054	3	-.284	4	-2.606e-3	4	382.958	3	1036.444	4
65		14	max	-.009	12	.299	1	0	1	0	1	NC	5	NC	1
66			min	-.899	1	-.048	3	-.245	4	-4.23e-3	4	389.371	3	1454.264	4
67		15	max	-.009	12	.404	1	0	1	0	1	NC	5	NC	1
68			min	-.897	1	.002	12	-.212	4	-5.854e-3	4	452.423	3	2216.089	4
69		16	max	-.009	12	.461	1	0	1	0	1	NC	1	NC	1
70			min	-.897	1	.014	15	-.187	4	-4.638e-3	4	714.635	3	3569.536	4
71		17	max	-.01	12	.481	1	0	1	0	1	NC	1	NC	1
72			min	-.897	1	.015	15	-.17	4	-3.088e-3	4	4240.546	3	6452.278	4
73		18	max	-.01	12	.48	1	0	1	0	1	NC	1	NC	1
74			min	-.897	1	.015	15	-.157	4	-1.538e-3	4	880.142	3	NC	1
75		19	max	-.01	12	.68	3	0	1	0	1	NC	1	NC	1
76			min	-.897	1	.016	15	-.148	4	-7.47e-4	4	388.862	3	NC	1
77	M7	1	max	.021	5	.098	3	0	3	2.589e-2	2	NC	3	NC	1
78			min	-.521	1	-1.096	1	-.746	4	-8.982e-3	3	97.269	1	235.826	4
79		2	max	.021	5	.063	3	.009	1	2.453e-2	2	NC	5	NC	2
80			min	-.521	1	-.947	1	-.711	4	-8.652e-3	3	108.296	1	250.215	4
81		3	max	.021	5	.03	3	.019	1	2.188e-2	2	NC	5	NC	3
82			min	-.521	1	-.802	1	-.674	4	-8.005e-3	3	121.787	1	267.789	4
83		4	max	.021	5	.022	5	.022	1	1.922e-2	2	NC	5	NC	3
84			min	-.521	1	-.667	1	-.634	4	-7.359e-3	3	137.759	1	289.504	4
85		5	max	.021	5	.021	5	.019	1	1.725e-2	2	NC	5	NC	3
86			min	-.521	1	-.549	1	-.593	4	-6.984e-3	3	155.633	1	316.391	4
87		6	max	.021	5	.018	5	.012	1	1.706e-2	2	NC	5	NC	3
88			min	-.52	1	-.451	1	-.551	4	-7.306e-3	3	174.522	1	348.462	4
89		7	max	.021	5	.016	5	.004	2	1.687e-2	2	NC	5	NC	1
90			min	-.519	1	-.366	1	-.511	4	-7.628e-3	3	194.932	1	386.31	4
91		8	max	.021	5	.013	5	0	10	1.668e-2	2	NC	5	NC	1
92			min	-.519	1	-.288	1	-.473	4	-7.95e-3	3	218.146	1	431.09	4
93		9	max	.021	5	.01	5	0	3	1.556e-2	2	NC	5	NC	1
94			min	-.518	1	-.213	1	-.437	4	-8.663e-3	3	246.934	1	485.092	4
95		10	max	.021	5	.007	5	.001	3	1.359e-2	2	NC	7	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	-.517	1	-.136	1	-.399	4	-9.743e-3	3	285.127	1	557.428	4
97		11	max	.021	5	.004	5	0	3	1.161e-2	2	NC	13	NC	1
98			min	-.517	1	-.058	1	-.36	4	-1.082e-2	3	338.082	1	657.719	4
99		12	max	.021	5	.021	1	.005	1	9.311e-3	2	NC	13	NC	1
100			min	-.516	1	-.036	3	-.321	4	-1.007e-2	3	416.579	1	803.959	4
101		13	max	.021	5	.099	1	.007	2	6.674e-3	2	NC	4	NC	1
102			min	-.515	1	-.033	3	-.28	4	-7.385e-3	3	539.927	1	1045.535	4
103		14	max	.021	5	.171	1	.006	2	4.037e-3	2	NC	4	NC	1
104			min	-.514	1	-.02	3	-.242	4	-4.696e-3	3	742.487	1	1456.688	4
105		15	max	.021	5	.231	1	.001	10	1.4e-3	2	NC	4	NC	1
106			min	-.513	1	-.009	5	-.211	4	-5.749e-3	5	1089.68	1	2139.118	4
107		16	max	.021	5	.277	1	-.002	10	2.609e-3	2	NC	4	NC	2
108			min	-.513	1	-.015	5	-.189	4	-5.398e-3	3	1677.336	1	3175.669	4
109		17	max	.021	5	.311	1	-.003	12	4.268e-3	2	NC	4	NC	2
110			min	-.513	1	-.021	5	-.173	4	-9.503e-3	3	2788.897	1	5026.605	4
111		18	max	.021	5	.337	1	-.001	12	5.928e-3	2	NC	4	NC	2
112			min	-.513	1	-.029	5	-.159	4	-1.361e-2	3	1118.105	3	8538.3	1
113		19	max	.021	5	.361	1	.011	1	6.774e-3	2	NC	1	NC	1
114			min	-.513	1	-.036	5	-.145	4	-1.57e-2	3	656.583	3	NC	1
115	M10	1	max	0	1	.349	1	.513	1	1.129e-2	3	NC	1	NC	1
116			min	-.152	4	-.032	5	-.021	5	-9.188e-4	5	NC	1	NC	1
117		2	max	0	1	.442	3	.559	1	1.29e-2	3	NC	4	NC	3
118			min	-.152	4	-.02	5	-.008	5	-8.107e-4	5	1122.829	3	4192.713	1
119		3	max	0	1	.599	3	.629	1	1.45e-2	3	NC	4	NC	3
120			min	-.152	4	-.011	5	0	15	-7.025e-4	5	585.372	3	1656.895	1
121		4	max	0	1	.717	3	.706	1	1.611e-2	3	NC	4	NC	3
122			min	-.152	4	-.006	5	.006	15	-5.943e-4	5	430.022	3	994.423	1
123		5	max	0	1	.783	3	.778	1	1.772e-2	3	NC	4	NC	3
124			min	-.152	4	-.002	5	.009	15	-4.862e-4	5	374.597	3	725.918	1
125		6	max	0	1	.793	3	.835	1	1.932e-2	3	NC	4	NC	3
126			min	-.152	4	0	15	.012	15	-3.78e-4	5	367.219	3	597.164	1
127		7	max	0	1	.755	3	.873	1	2.093e-2	3	NC	4	NC	3
128			min	-.152	4	.003	15	.014	15	-6.728e-4	2	396.172	3	533.572	1
129		8	max	0	1	.686	3	.893	1	2.253e-2	3	NC	4	NC	3
130			min	-.152	4	.006	15	.013	12	-1.119e-3	2	461.807	3	506.04	1
131		9	max	0	1	.615	3	.898	1	2.414e-2	3	NC	4	NC	3
132			min	-.152	4	.01	15	.011	12	-1.565e-3	2	557.102	3	499.341	1
133		10	max	0	1	.581	3	.897	1	2.575e-2	3	NC	5	NC	3
134			min	-.152	4	.015	15	.01	12	-2.012e-3	2	618.747	3	500.458	1
135		11	max	0	12	.615	3	.898	1	2.414e-2	3	NC	4	NC	3
136			min	-.152	4	.019	15	.011	12	-1.565e-3	2	557.102	3	499.341	1
137		12	max	0	12	.686	3	.893	1	2.253e-2	3	NC	4	NC	3
138			min	-.152	4	.019	15	.013	12	-1.119e-3	2	461.807	3	506.04	1
139		13	max	0	12	.755	3	.873	1	2.093e-2	3	NC	4	NC	3
140			min	-.152	4	.019	15	.016	12	-6.728e-4	2	396.172	3	533.572	1
141		14	max	0	12	.793	3	.835	1	1.932e-2	3	NC	5	NC	3
142			min	-.152	4	.018	15	.019	12	-3.445e-4	10	367.219	3	597.164	1
143		15	max	0	12	.783	3	.778	1	1.772e-2	3	NC	15	NC	3
144			min	-.152	4	.018	15	.022	12	-1.01e-4	10	374.597	3	725.918	1
145		16	max	0	12	.717	3	.706	1	1.611e-2	3	NC	15	NC	3
146			min	-.152	4	.021	15	.023	12	1.426e-4	10	430.022	3	994.423	1
147		17	max	0	12	.599	3	.629	1	1.45e-2	3	NC	7	NC	3
148			min	-.152	4	.026	15	.023	12	3.861e-4	10	585.372	3	1656.895	1
149		18	max	0	12	.442	3	.559	1	1.29e-2	3	NC	5	NC	3
150			min	-.152	4	.035	15	.022	12	6.297e-4	10	1122.829	3	4192.713	1
151		19	max	0	12	.349	1	.513	1	1.129e-2	3	NC	1	NC	1
152			min	-.152	4	.047	15	.019	12	8.733e-4	10	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	.002	5	.516	1	1.002e-2	1	NC	1	NC	1
154			min	-.34	4	-.036	3	-.021	5	-3.501e-4	5	NC	1	NC	1
155		2	max	.001	1	.088	3	.549	1	1.106e-2	1	NC	4	NC	3
156			min	-.34	4	-.124	2	.011	15	-2.9e-4	3	1545.149	3	4965.403	4
157		3	max	.001	1	.198	3	.613	1	1.211e-2	1	NC	5	NC	3
158			min	-.34	4	-.217	2	.015	12	-5.734e-4	3	819.199	3	1985.406	1
159		4	max	0	1	.271	3	.688	1	1.315e-2	1	NC	5	NC	3
160			min	-.34	4	-.277	2	.014	12	-8.568e-4	3	624.712	3	1114.075	1
161		5	max	0	1	.295	3	.762	1	1.42e-2	1	NC	5	NC	3
162			min	-.34	4	-.298	2	.013	12	-1.14e-3	3	580.513	3	780.891	1
163		6	max	0	1	.267	3	.824	1	1.525e-2	1	NC	5	NC	3
164			min	-.34	4	-.279	2	.008	15	-1.424e-3	3	634.192	3	624.503	1
165		7	max	0	1	.196	3	.868	1	1.629e-2	1	NC	5	NC	3
166			min	-.341	4	-.229	2	0	15	-1.707e-3	3	827.165	3	546.256	1
167		8	max	0	1	.102	3	.893	1	1.734e-2	1	NC	5	NC	3
168			min	-.341	4	-.161	2	-.002	15	-1.99e-3	3	1306.289	2	509.683	1
169		9	max	0	1	.015	3	.902	1	1.838e-2	1	NC	4	NC	3
170			min	-.341	4	-.098	2	.005	15	-2.274e-3	3	2284.659	2	497.27	1
171		10	max	0	1	-.002	15	.903	1	1.943e-2	1	NC	3	NC	3
172			min	-.341	4	-.069	2	.008	12	-2.557e-3	3	3482.051	2	496.145	1
173		11	max	0	3	.015	3	.902	1	1.838e-2	1	NC	4	NC	3
174			min	-.341	4	-.098	2	.008	12	-2.274e-3	3	2284.659	2	497.27	1
175		12	max	0	3	.102	3	.893	1	1.734e-2	1	NC	5	NC	3
176			min	-.341	4	-.161	2	.009	12	-1.99e-3	3	1306.289	2	509.683	1
177		13	max	0	3	.196	3	.868	1	1.629e-2	1	NC	5	NC	3
178			min	-.341	4	-.229	2	.011	12	-1.707e-3	3	827.165	3	546.256	1
179		14	max	0	3	.267	3	.824	1	1.525e-2	1	NC	5	NC	3
180			min	-.341	4	-.279	2	.012	12	-1.424e-3	3	634.192	3	624.503	1
181		15	max	0	3	.295	3	.762	1	1.42e-2	1	NC	15	NC	3
182			min	-.341	4	-.298	2	.013	12	-1.14e-3	3	580.513	3	780.891	1
183		16	max	0	3	.271	3	.688	1	1.315e-2	1	NC	15	NC	3
184			min	-.341	4	-.277	2	.014	12	-8.568e-4	3	624.712	3	1114.075	1
185		17	max	.001	3	.198	3	.613	1	1.211e-2	1	NC	15	NC	3
186			min	-.341	4	-.217	2	.015	12	-5.734e-4	3	819.199	3	1985.406	1
187		18	max	.001	3	.088	3	.549	1	1.106e-2	1	NC	5	NC	3
188			min	-.341	4	-.124	2	.016	12	-2.9e-4	3	1545.149	3	5798.007	1
189		19	max	.001	3	-.003	15	.516	1	1.002e-2	1	NC	1	NC	1
190			min	-.341	4	-.036	3	.019	12	-6.64e-6	3	NC	1	NC	1
191	M12	1	max	0	3	.011	5	.518	1	9.644e-3	1	NC	1	NC	1
192			min	-.456	4	-.252	1	-.021	5	-3.844e-4	5	NC	1	NC	1
193		2	max	0	3	.046	3	.547	1	1.037e-2	1	NC	5	NC	2
194			min	-.456	4	-.409	1	.009	15	-2.589e-4	5	1096.184	2	5333.093	4
195		3	max	0	3	.111	3	.608	1	1.11e-2	1	NC	5	NC	3
196			min	-.456	4	-.549	2	.019	12	-1.334e-4	5	585.353	2	2150.454	1
197		4	max	0	3	.153	3	.683	1	1.183e-2	1	NC	5	NC	3
198			min	-.456	4	-.658	2	.019	12	-2.03e-5	15	439.492	2	1167.171	1
199		5	max	0	3	.165	3	.758	1	1.256e-2	1	NC	5	NC	3
200			min	-.455	4	-.712	2	.015	15	2.743e-5	3	391.604	2	802.963	1
201		6	max	0	3	.151	3	.821	1	1.328e-2	1	NC	5	NC	3
202			min	-.455	4	-.708	2	.007	15	2.588e-5	3	394.187	2	634.199	1
203		7	max	0	3	.115	3	.868	1	1.401e-2	1	NC	5	NC	3
204			min	-.455	4	-.658	2	0	15	2.433e-5	3	440.08	2	549.678	1
205		8	max	0	3	.068	3	.895	1	1.474e-2	1	NC	5	NC	3
206			min	-.455	4	-.591	1	-.002	15	2.279e-5	3	537.497	2	509.337	1
207		9	max	0	3	.025	3	.907	1	1.547e-2	1	NC	5	NC	3
208			min	-.455	4	-.525	1	.005	15	2.124e-5	3	687.164	2	494.567	1
209		10	max	0	1	.005	3	.908	1	1.619e-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	-.455	4	-.494	1	.006	12	1.969e-5	3	791.008	1	492.516	1
211		11	max	0	1	.025	3	.907	1	1.547e-2	1	NC	5	NC	3
212			min	-.455	4	-.525	1	.007	12	2.124e-5	3	687.164	2	494.567	1
213		12	max	0	1	.068	3	.895	1	1.474e-2	1	NC	5	NC	3
214			min	-.455	4	-.591	1	.009	12	2.279e-5	3	537.497	2	509.337	1
215		13	max	0	1	.115	3	.868	1	1.401e-2	1	NC	5	NC	3
216			min	-.455	4	-.658	2	.012	12	2.433e-5	3	440.08	2	549.678	1
217		14	max	0	1	.151	3	.821	1	1.328e-2	1	NC	15	NC	3
218			min	-.455	4	-.708	2	.015	12	2.588e-5	3	394.187	2	634.199	1
219		15	max	0	1	.165	3	.758	1	1.256e-2	1	NC	15	NC	3
220			min	-.455	4	-.712	2	.017	12	2.743e-5	3	391.604	2	802.963	1
221		16	max	0	1	.153	3	.683	1	1.183e-2	1	NC	15	NC	3
222			min	-.455	4	-.658	2	.019	12	2.898e-5	3	439.492	2	1167.171	1
223		17	max	0	1	.111	3	.608	1	1.11e-2	1	NC	5	NC	3
224			min	-.455	4	-.549	2	.019	15	3.053e-5	3	585.353	2	2150.454	1
225		18	max	0	1	.046	3	.547	1	1.037e-2	1	NC	5	NC	2
226			min	-.455	4	-.409	1	.019	12	3.207e-5	3	1096.184	2	6825.013	1
227		19	max	0	1	-.023	12	.518	1	9.644e-3	1	NC	1	NC	1
228			min	-.455	4	-.252	1	.018	12	3.362e-5	3	NC	1	NC	1
229	M13	1	max	0	3	.081	3	.521	1	1.904e-2	2	NC	1	NC	1
230			min	-.729	4	-1.023	1	-.021	5	-4.454e-3	3	NC	1	NC	1
231		2	max	0	3	.176	3	.571	1	2.12e-2	2	NC	5	NC	3
232			min	-.729	4	-1.273	1	.007	15	-5.193e-3	3	695.368	2	3878.762	1
233		3	max	0	3	.259	3	.643	1	2.335e-2	2	NC	5	NC	3
234			min	-.729	4	-1.505	1	.017	12	-5.932e-3	3	361.709	2	1570.201	1
235		4	max	0	3	.321	3	.722	1	2.551e-2	2	NC	5	NC	3
236			min	-.729	4	-1.703	2	.016	12	-6.671e-3	3	259.809	2	953.775	1
237		5	max	0	3	.357	3	.795	1	2.766e-2	2	NC	15	NC	3
238			min	-.729	4	-1.85	2	.015	12	-7.41e-3	3	216.744	2	701.125	1
239		6	max	0	3	.365	3	.853	1	2.982e-2	2	NC	15	NC	3
240			min	-.729	4	-1.931	2	.013	12	-8.149e-3	3	198.612	2	579.28	1
241		7	max	0	3	.35	3	.891	1	3.197e-2	2	9906.192	15	NC	3
242			min	-.729	4	-1.952	2	.01	12	-8.888e-3	3	194.476	2	519.002	1
243		8	max	0	3	.32	3	.911	1	3.413e-2	2	9477.142	15	NC	3
244			min	-.729	4	-1.93	1	.007	12	-9.627e-3	3	199.29	2	493	1
245		9	max	0	3	.288	3	.916	1	3.628e-2	2	9385.103	15	NC	5
246			min	-.729	4	-1.898	1	.005	12	-1.037e-2	3	208.401	2	486.831	1
247		10	max	0	1	.273	3	.915	1	3.844e-2	2	9416.206	15	NC	5
248			min	-.729	4	-1.88	1	.004	3	-1.11e-2	3	213.972	2	488.001	1
249		11	max	0	1	.288	3	.916	1	3.628e-2	2	9134.997	15	NC	12
250			min	-.729	4	-1.898	1	.005	12	-1.037e-2	3	208.401	2	486.831	1
251		12	max	0	1	.32	3	.911	1	3.413e-2	2	8624.18	15	NC	3
252			min	-.729	4	-1.93	1	.007	12	-9.627e-3	3	199.29	2	493	1
253		13	max	0	1	.35	3	.891	1	3.197e-2	2	8249.563	15	NC	3
254			min	-.729	4	-1.952	2	.01	12	-8.888e-3	3	194.476	2	519.002	1
255		14	max	0	1	.365	3	.853	1	2.982e-2	2	8210.653	15	NC	3
256			min	-.728	4	-1.931	2	.013	12	-8.149e-3	3	198.612	2	579.28	1
257		15	max	0	1	.357	3	.795	1	2.766e-2	2	8683.239	15	NC	3
258			min	-.728	4	-1.85	2	.015	12	-7.41e-3	3	216.744	2	701.125	1
259		16	max	0	1	.321	3	.722	1	2.551e-2	2	NC	15	NC	3
260			min	-.728	4	-1.703	2	.016	12	-6.671e-3	3	259.809	2	953.775	1
261		17	max	0	1	.259	3	.643	1	2.335e-2	2	NC	15	NC	3
262			min	-.728	4	-1.505	1	.017	12	-5.932e-3	3	361.709	2	1570.201	1
263		18	max	0	1	.176	3	.571	1	2.12e-2	2	NC	5	NC	3
264			min	-.728	4	-1.273	1	.017	12	-5.193e-3	3	695.368	2	3878.762	1
265		19	max	.001	1	.081	3	.521	1	1.904e-2	2	NC	1	NC	1
266			min	-.728	4	-1.023	1	.018	12	-4.454e-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	15	.001	5	1.651e-3	2	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-2.522e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.004	5	3.302e-3	2	NC	3	NC	1
272			min	0	1	-.009	1	0	1	-5.043e-3	5	7925.723	1	NC	1
273		4	max	0	3	-.002	12	.009	5	4.953e-3	2	NC	3	NC	1
274			min	0	1	-.02	1	-.001	1	-7.565e-3	5	3513.398	1	7802.17	5
275		5	max	0	3	-.003	12	.015	5	5.493e-3	2	NC	3	NC	1
276			min	0	1	-.035	1	-.002	1	-8.663e-3	5	1964.162	1	4519.027	5
277		6	max	0	3	-.004	12	.023	5	5.004e-3	2	NC	3	NC	1
278			min	0	1	-.055	1	-.003	1	-8.445e-3	5	1254.45	1	2974.775	5
279		7	max	0	3	-.005	12	.033	5	4.516e-3	2	NC	12	NC	1
280			min	0	1	-.079	1	-.004	1	-8.226e-3	5	875.272	1	2123.755	5
281		8	max	0	3	-.006	12	.043	5	4.027e-3	2	NC	12	NC	1
282			min	0	1	-.107	1	-.005	1	-8.008e-3	5	649.038	1	1603.996	5
283		9	max	0	3	-.007	12	.055	5	3.538e-3	2	9701.865	12	NC	1
284			min	0	1	-.138	1	-.006	1	-7.789e-3	5	503.145	1	1262.689	5
285		10	max	0	3	-.008	12	.068	5	3.05e-3	2	8228.295	12	NC	1
286			min	-.001	1	-.172	1	-.007	1	-7.571e-3	5	403.462	1	1026.119	5
287		11	max	0	3	-.01	12	.081	5	2.561e-3	2	7103.046	12	NC	1
288			min	-.001	1	-.209	1	-.007	1	-7.352e-3	5	332.308	1	855.275	5
289		12	max	.001	3	-.011	12	.095	5	2.073e-3	2	6221.099	12	NC	1
290			min	-.001	1	-.248	1	-.008	1	-7.134e-3	5	279.703	1	727.761	5
291		13	max	.001	3	-.013	12	.11	5	1.584e-3	2	5515.12	12	NC	1
292			min	-.001	1	-.289	1	-.009	1	-6.915e-3	5	239.69	1	630.016	5
293		14	max	.001	3	-.014	12	.125	4	1.096e-3	2	4940.078	12	NC	1
294			min	-.002	1	-.332	1	-.009	1	-6.697e-3	5	208.536	1	552.9	4
295		15	max	.001	3	-.016	12	.141	4	6.071e-4	2	4464.773	12	NC	1
296			min	-.002	1	-.377	1	-.009	1	-6.53e-3	4	183.797	1	491.303	4
297		16	max	.001	3	-.017	12	.157	4	5.867e-4	3	4067.06	12	NC	1
298			min	-.002	1	-.423	1	-.008	1	-6.368e-3	4	163.831	1	441.382	4
299		17	max	.001	3	-.019	12	.173	4	8.333e-4	3	3730.72	12	NC	1
300			min	-.002	1	-.47	1	-.008	1	-6.206e-3	4	147.49	1	400.397	4
301		18	max	.002	3	-.02	12	.189	4	1.08e-3	3	3443.665	12	NC	1
302			min	-.002	1	-.517	1	-.009	3	-6.044e-3	4	133.954	1	366.378	4
303		19	max	.002	3	-.022	12	.205	4	1.327e-3	3	3196.723	12	NC	1
304			min	-.002	1	-.565	1	-.014	3	-5.882e-3	4	122.628	1	337.884	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	15	.001	4	0	1	NC	1	NC	1
308			min	0	2	-.003	1	0	1	-2.631e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.004	4	0	1	NC	3	NC	1
310			min	0	2	-.014	1	0	1	-5.263e-3	4	5037.536	1	NC	1
311		4	max	0	3	0	15	.009	4	0	1	NC	3	NC	1
312			min	-.001	2	-.032	1	0	1	-7.894e-3	4	2180.546	1	7514.096	4
313		5	max	.001	3	-.002	15	.016	4	0	1	NC	3	NC	1
314			min	-.001	2	-.058	1	0	1	-9.033e-3	4	1194.696	1	4353.662	4
315		6	max	.001	3	-.003	15	.024	4	0	1	NC	3	NC	1
316			min	-.002	2	-.092	1	0	1	-8.793e-3	4	751.297	1	2866.689	4
317		7	max	.002	3	-.004	15	.034	4	0	1	NC	3	NC	1
318			min	-.002	2	-.134	1	0	1	-8.553e-3	4	518.702	1	2047.324	4
319		8	max	.002	3	-.005	15	.045	4	0	1	NC	3	NC	1
320			min	-.002	2	-.182	1	0	1	-8.312e-3	4	381.722	1	1547.001	4
321		9	max	.002	3	-.007	15	.057	4	0	1	NC	3	NC	1
322			min	-.003	2	-.236	1	0	1	-8.072e-3	4	294.237	1	1218.53	4
323		10	max	.003	3	-.009	15	.07	4	0	1	NC	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.003	2	-.295	1	0	1	-7.832e-3	4	234.905	1	990.912	4
325		11	max	.003	3	-.01	12	.084	4	0	1	NC	3	NC	1
326			min	-.003	2	-.359	1	0	1	-7.591e-3	4	192.802	1	826.576	4
327		12	max	.003	3	-.01	12	.098	4	0	1	NC	3	NC	1
328			min	-.003	2	-.428	1	0	1	-7.351e-3	4	161.824	1	703.956	4
329		13	max	.003	3	-.01	12	.114	4	0	1	NC	3	NC	1
330			min	-.004	2	-.501	1	0	1	-7.111e-3	4	138.353	1	609.999	4
331		14	max	.004	3	-.011	12	.129	4	0	1	NC	3	NC	1
332			min	-.004	1	-.577	1	0	1	-6.87e-3	4	120.139	1	536.418	4
333		15	max	.004	3	-.011	12	.145	4	0	1	NC	3	NC	1
334			min	-.004	1	-.656	1	0	1	-6.63e-3	4	105.716	1	477.742	4
335		16	max	.004	3	-.011	12	.161	4	0	1	NC	3	NC	1
336			min	-.005	1	-.736	1	0	1	-6.39e-3	4	94.105	1	430.249	4
337		17	max	.004	3	-.011	12	.177	4	0	1	NC	3	NC	1
338			min	-.005	1	-.819	1	0	1	-6.149e-3	4	84.621	1	391.325	4
339		18	max	.005	3	-.012	12	.193	4	0	1	NC	3	NC	1
340			min	-.005	1	-.903	1	0	1	-5.909e-3	4	76.78	1	359.091	4
341		19	max	.005	3	-.012	12	.209	4	0	1	NC	3	NC	1
342			min	-.005	1	-.987	1	0	1	-5.669e-3	4	70.23	1	332.173	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	.001	4	6.477e-4	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-2.818e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	1.295e-3	3	NC	3	NC	1
348			min	0	1	-.009	1	0	3	-5.637e-3	4	7925.723	1	NC	1
349		4	max	0	3	.001	5	.009	4	1.943e-3	3	NC	3	NC	1
350			min	0	1	-.02	1	-.001	3	-8.455e-3	4	3513.398	1	7476.582	4
351		5	max	0	3	.002	5	.016	4	2.126e-3	3	NC	3	NC	1
352			min	0	1	-.035	1	-.002	3	-9.646e-3	4	1964.162	1	4336.227	4
353		6	max	0	3	.003	5	.024	4	1.879e-3	3	NC	3	NC	1
354			min	0	1	-.055	1	-.002	3	-9.333e-3	4	1254.45	1	2857.254	4
355		7	max	0	3	.004	5	.034	4	1.633e-3	3	NC	5	NC	1
356			min	0	1	-.079	1	-.003	3	-9.02e-3	4	875.272	1	2041.685	4
357		8	max	0	3	.005	5	.045	4	1.386e-3	3	NC	5	NC	1
358			min	0	1	-.107	1	-.004	3	-8.707e-3	4	649.038	1	1543.439	4
359		9	max	0	3	.006	5	.057	4	1.14e-3	3	NC	5	NC	1
360			min	0	1	-.138	1	-.004	3	-8.394e-3	4	503.145	1	1216.22	4
361		10	max	0	3	.008	5	.07	4	8.93e-4	3	NC	15	NC	1
362			min	-.001	1	-.172	1	-.004	3	-8.081e-3	4	403.462	1	989.417	4
363		11	max	0	3	.009	5	.084	4	6.464e-4	3	NC	15	NC	1
364			min	-.001	1	-.209	1	-.004	3	-7.768e-3	4	332.308	1	825.642	4
365		12	max	.001	3	.011	5	.099	4	3.998e-4	3	9252.334	15	NC	1
366			min	-.001	1	-.248	1	-.004	3	-7.454e-3	4	279.703	1	703.428	4
367		13	max	.001	3	.012	5	.114	4	1.531e-4	3	8004.004	15	NC	1
368			min	-.001	1	-.289	1	-.003	3	-7.141e-3	4	239.69	1	609.777	4
369		14	max	.001	3	.014	5	.129	4	-5.9e-5	12	7019.067	15	NC	1
370			min	-.002	1	-.332	1	-.002	3	-6.828e-3	4	208.536	1	536.435	4
371		15	max	.001	3	.016	5	.145	4	1.73e-5	9	6227.984	15	NC	1
372			min	-.002	1	-.377	1	0	12	-6.515e-3	4	183.797	1	477.955	4
373		16	max	.001	3	.018	5	.161	4	1.936e-4	9	5583.116	15	NC	1
374			min	-.002	1	-.423	1	.002	12	-6.223e-3	5	163.831	1	430.628	4
375		17	max	.001	3	.019	5	.177	4	6.372e-4	1	5050.647	15	NC	1
376			min	-.002	1	-.47	1	.001	10	-5.971e-3	5	147.49	1	391.848	4
377		18	max	.002	3	.021	5	.193	4	1.098e-3	1	4606.121	15	NC	1
378			min	-.002	1	-.517	1	0	10	-5.718e-3	5	133.954	1	359.745	4
379		19	max	.002	3	.023	5	.208	4	1.558e-3	1	4231.494	15	NC	1
380			min	-.002	1	-.565	1	0	10	-5.466e-3	5	122.628	1	332.949	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	.025	1	0	12	.012	5	1.444e-3	2	NC	1	NC	1
382			min	.002	12	-.008	1	-.002	1	-8.375e-4	5	NC	1	NC	1
383		2	max	.025	1	-.002	12	.05	5	2.087e-3	2	NC	1	NC	4
384			min	.002	12	-.052	1	-.025	2	-9.264e-4	5	NC	1	3127.313	2
385		3	max	.024	1	-.004	12	.088	5	2.729e-3	2	NC	1	NC	4
386			min	.003	15	-.096	1	-.048	2	-1.015e-3	5	NC	1	1583.537	2
387		4	max	.023	1	-.006	12	.126	5	3.371e-3	2	NC	1	NC	6
388			min	.003	15	-.141	1	-.07	2	-1.283e-3	3	NC	1	1075.668	2
389		5	max	.022	1	-.007	12	.164	5	4.014e-3	2	NC	1	8077.929	13
390			min	.003	15	-.185	1	-.091	2	-1.552e-3	3	NC	1	827.344	2
391		6	max	.022	1	-.009	12	.202	5	4.656e-3	2	NC	1	6563.749	13
392			min	.003	15	-.228	1	-.109	2	-1.821e-3	3	9670.313	4	683.505	2
393		7	max	.021	1	-.01	12	.239	5	5.299e-3	2	NC	1	5615.587	13
394			min	.003	15	-.272	1	-.126	2	-2.089e-3	3	8575.823	4	592.704	2
395		8	max	.02	1	-.012	12	.276	5	5.941e-3	2	NC	1	4997.304	13
396			min	.003	15	-.316	1	-.139	2	-2.358e-3	3	7918.965	4	533.177	2
397		9	max	.019	1	-.013	12	.311	5	6.584e-3	2	NC	3	4594.804	13
398			min	.003	15	-.359	1	-.15	2	-2.627e-3	3	7565.404	4	494.413	2
399		10	max	.019	1	-.014	12	.346	5	7.226e-3	2	NC	3	4349.743	13
400			min	.003	15	-.402	1	-.157	2	-2.896e-3	3	7453.555	4	471.08	2
401		11	max	.018	1	-.015	12	.38	5	7.869e-3	2	NC	3	4234.164	13
402			min	.003	15	-.444	1	-.159	2	-3.164e-3	3	7565.404	4	460.712	2
403		12	max	.017	1	-.016	12	.413	5	8.511e-3	2	NC	1	4241.032	13
404			min	.002	15	-.487	1	-.158	2	-3.433e-3	3	7918.965	4	459.113	14
405		13	max	.016	1	-.017	12	.445	5	9.153e-3	2	NC	1	4383.547	13
406			min	.002	15	-.529	1	-.151	2	-3.702e-3	3	8575.823	4	414.282	14
407		14	max	.015	1	-.017	12	.475	5	9.796e-3	2	NC	1	4703.729	13
408			min	.002	15	-.571	1	-.139	2	-3.97e-3	3	9670.313	4	376.103	14
409		15	max	.015	1	-.018	12	.504	5	1.044e-2	2	NC	1	5300.156	13
410			min	.002	15	-.613	1	-.121	2	-4.239e-3	3	NC	1	343.166	14
411		16	max	.014	1	-.019	12	.532	5	1.108e-2	2	NC	1	6415.655	13
412			min	.002	15	-.655	1	-.097	2	-4.508e-3	3	NC	1	314.44	14
413		17	max	.013	1	-.019	12	.558	5	1.172e-2	2	NC	1	8791.78	13
414			min	.002	15	-.697	1	-.067	2	-4.777e-3	3	NC	1	289.152	14
415		18	max	.012	1	-.019	12	.585	4	1.237e-2	2	NC	1	NC	4
416			min	.002	10	-.738	1	-.029	2	-5.045e-3	3	NC	1	266.712	14
417		19	max	.012	1	-.02	12	.613	4	1.301e-2	2	NC	1	NC	1
418			min	.002	10	-.779	1	-.002	3	-5.314e-3	3	NC	1	246.661	14
419	M6	1	max	.041	1	0	15	.012	4	0	1	NC	1	NC	1
420			min	.001	15	-.013	1	0	1	-8.843e-4	5	NC	1	NC	1
421		2	max	.039	1	0	3	.052	4	0	1	NC	1	NC	1
422			min	.001	15	-.091	1	0	1	-1.02e-3	4	NC	1	NC	1
423		3	max	.037	1	0	3	.092	4	0	1	NC	1	NC	1
424			min	.001	15	-.168	1	0	1	-1.156e-3	4	NC	1	6000.893	4
425		4	max	.035	1	0	3	.132	4	0	1	NC	1	NC	1
426			min	.001	15	-.246	1	0	1	-1.291e-3	4	NC	1	4022.736	4
427		5	max	.033	1	.001	3	.171	4	0	1	NC	1	NC	1
428			min	.001	15	-.323	1	0	1	-1.427e-3	4	NC	1	3060.348	4
429		6	max	.031	1	.002	3	.21	4	0	1	NC	1	NC	1
430			min	.001	15	-.401	1	0	1	-1.563e-3	4	9670.313	6	2505.595	4
431		7	max	.029	1	.003	3	.249	4	0	1	NC	1	NC	1
432			min	.001	15	-.478	1	0	1	-1.699e-3	4	8575.823	6	2156.841	4
433		8	max	.027	1	.004	3	.286	4	0	1	NC	1	NC	1
434			min	0	15	-.554	1	0	1	-1.835e-3	4	7918.965	6	1928.842	4
435		9	max	.025	1	.005	3	.323	4	0	1	NC	3	NC	1
436			min	0	15	-.631	1	0	1	-1.971e-3	4	7565.404	6	1780.394	4
437		10	max	.023	1	.006	3	.359	4	0	1	NC	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	0	15	-.707	1	0	1	-2.106e-3	4	7453.555	6	1690.489	4
439		11	max	.021	1	.008	3	.393	4	0	1	NC	5	NC	1
440			min	0	15	-.783	1	0	1	-2.242e-3	4	7565.404	6	1649.211	4
441		12	max	.019	1	.009	3	.427	4	0	1	NC	1	NC	1
442			min	0	15	-.859	1	0	1	-2.378e-3	4	7654.687	3	1654.398	4
443		13	max	.02	3	.011	3	.458	4	0	1	NC	1	NC	1
444			min	0	15	-.935	1	0	1	-2.514e-3	4	6456.743	3	1711.539	4
445		14	max	.021	3	.013	3	.489	4	0	1	NC	1	NC	1
446			min	0	10	-1.01	1	0	1	-2.65e-3	4	5519.524	3	1837.195	4
447		15	max	.022	3	.015	3	.518	4	0	1	NC	1	NC	1
448			min	0	10	-1.086	1	0	1	-2.786e-3	4	4777.083	3	2069.833	4
449		16	max	.024	3	.018	3	.544	4	0	1	NC	1	NC	1
450			min	-.002	10	-1.161	1	0	1	-2.921e-3	4	4182.493	3	2503.927	4
451		17	max	.025	3	.02	3	.57	4	0	1	NC	1	NC	1
452			min	-.003	10	-1.236	1	0	1	-3.057e-3	4	3701.828	3	3427.731	4
453		18	max	.026	3	.023	3	.593	4	0	1	NC	1	NC	1
454			min	-.005	10	-1.31	1	0	1	-3.193e-3	4	3310.219	3	6289.311	4
455		19	max	.027	3	.025	3	.614	4	0	1	NC	1	NC	1
456			min	-.007	2	-1.385	1	0	1	-3.329e-3	4	2989.219	3	NC	1
457	M9	1	max	.025	1	0	5	.012	4	4.77e-4	3	NC	1	NC	1
458			min	-.001	5	-.008	1	-.001	3	-1.444e-3	2	NC	1	NC	1
459		2	max	.025	1	.001	5	.055	4	7.457e-4	3	NC	1	NC	5
460			min	-.001	5	-.052	1	-.011	3	-2.087e-3	2	NC	1	3127.313	2
461		3	max	.024	1	.002	5	.097	4	1.014e-3	3	NC	1	8412.341	15
462			min	-.001	5	-.096	1	-.02	3	-2.729e-3	2	NC	1	1583.537	2
463		4	max	.023	1	.003	5	.14	4	1.283e-3	3	NC	1	5640.784	15
464			min	-.001	5	-.141	1	-.029	3	-3.371e-3	2	NC	1	1075.668	2
465		5	max	.022	1	.004	5	.181	4	1.552e-3	3	NC	1	4292.092	15
466			min	-.002	5	-.185	1	-.037	3	-4.014e-3	2	NC	1	827.344	2
467		6	max	.022	1	.006	5	.222	4	1.821e-3	3	NC	1	3514.46	15
468			min	-.002	5	-.228	1	-.044	3	-4.656e-3	2	9670.313	4	683.505	2
469		7	max	.021	1	.007	5	.262	4	2.089e-3	3	NC	1	3025.445	15
470			min	-.002	5	-.272	1	-.051	3	-5.299e-3	2	8575.823	4	592.704	2
471		8	max	.02	1	.008	5	.302	4	2.358e-3	3	NC	1	2705.629	15
472			min	-.002	5	-.316	1	-.056	3	-5.941e-3	2	7918.965	4	533.177	2
473		9	max	.019	1	.01	5	.339	4	2.627e-3	3	NC	3	2497.286	15
474			min	-.002	5	-.359	1	-.06	3	-6.584e-3	2	7565.404	4	494.413	2
475		10	max	.019	1	.011	5	.375	4	2.896e-3	3	NC	3	2370.977	15
476			min	-.002	5	-.402	1	-.063	3	-7.226e-3	2	7107.166	5	471.08	2
477		11	max	.018	1	.013	5	.41	4	3.164e-3	3	NC	3	2312.802	15
478			min	-.002	5	-.444	1	-.065	3	-7.869e-3	2	6154.65	5	460.712	2
479		12	max	.017	1	.015	5	.443	4	3.433e-3	3	NC	1	2319.719	15
480			min	-.002	5	-.487	1	-.064	3	-8.511e-3	2	5385.632	5	462.886	2
481		13	max	.016	1	.017	5	.473	4	3.702e-3	3	NC	1	2399.398	15
482			min	-.002	5	-.529	1	-.062	3	-9.153e-3	2	4756.223	5	479.236	2
483		14	max	.015	1	.019	5	.502	4	3.97e-3	3	NC	1	2575.013	15
484			min	-.002	5	-.571	1	-.057	3	-9.796e-3	2	4235.414	5	514.433	2
485		15	max	.015	1	.021	5	.528	4	4.239e-3	3	NC	1	2900.393	15
486			min	-.002	5	-.613	1	-.05	3	-1.044e-2	2	3800.619	5	579.2	2
487		16	max	.014	1	.023	5	.551	4	4.508e-3	3	NC	1	3507.764	15
488			min	-.002	5	-.655	1	-.041	3	-1.108e-2	2	3434.985	5	699.794	2
489		17	max	.013	1	.025	5	.572	4	4.777e-3	3	NC	1	4800.576	15
490			min	-.002	5	-.697	1	-.03	3	-1.172e-2	2	3125.692	5	956.24	2
491		18	max	.012	1	.027	5	.589	4	5.045e-3	3	NC	1	8805.588	15
492			min	-.002	5	-.738	1	-.015	3	-1.237e-2	2	2862.832	5	1750.451	2
493		19	max	.012	1	.03	5	.604	4	5.314e-3	3	NC	1	NC	1
494			min	-.002	5	-.779	1	-.02	1	-1.301e-2	2	2638.661	5	NC	1