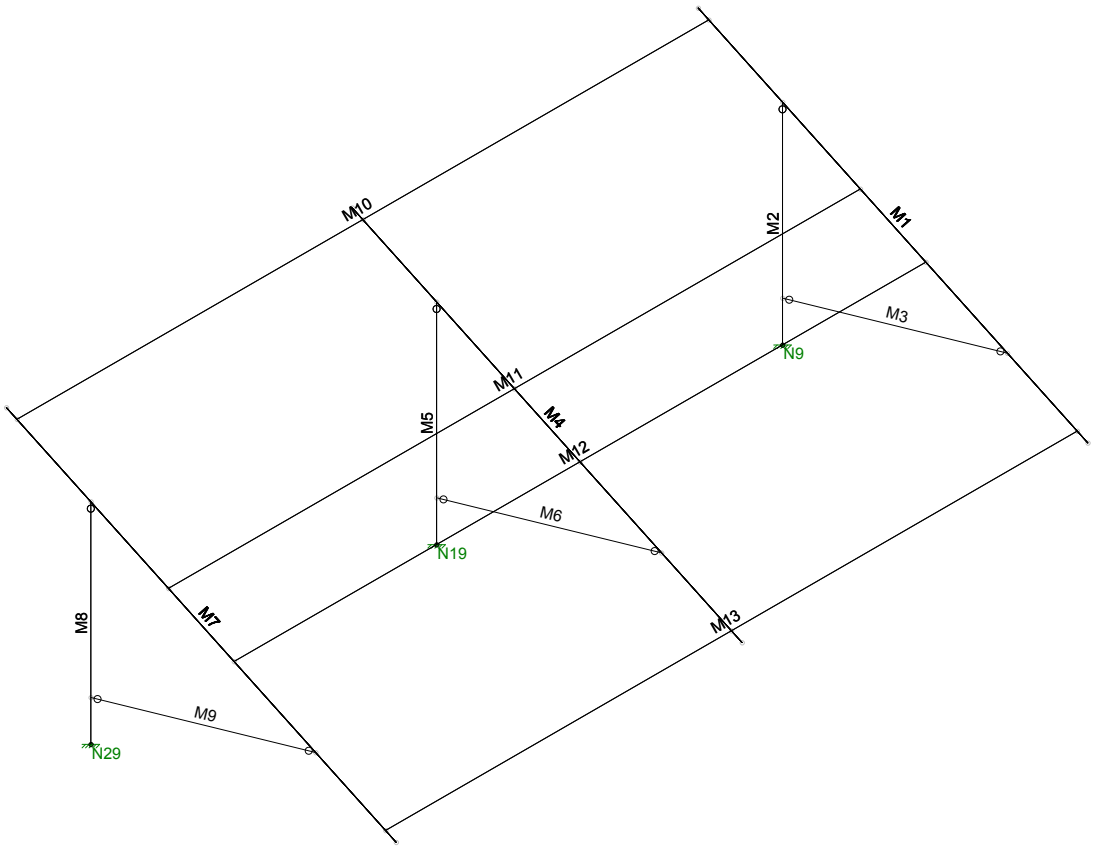


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

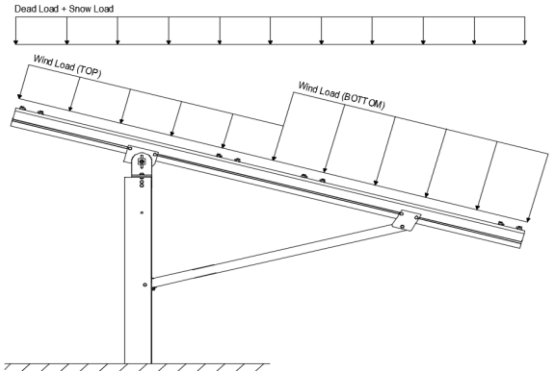
1.2 Construction

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00 psf	
Sloped Roof Snow Load, P_s =	18.56 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	0.82	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V =	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 7-10, Eq. 27.3-1)*

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 + 0.5W
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

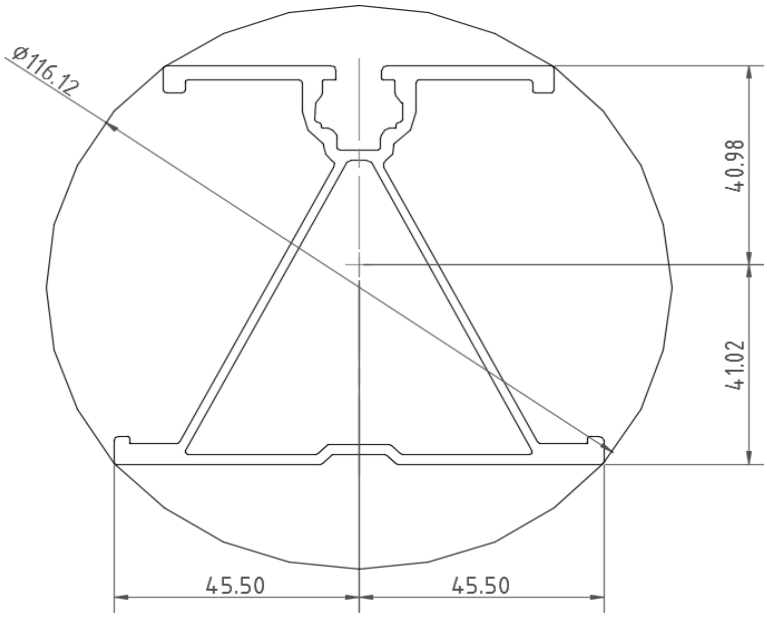
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	114	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 =	1.421	k-ft
M_z =	0.172	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	66%	

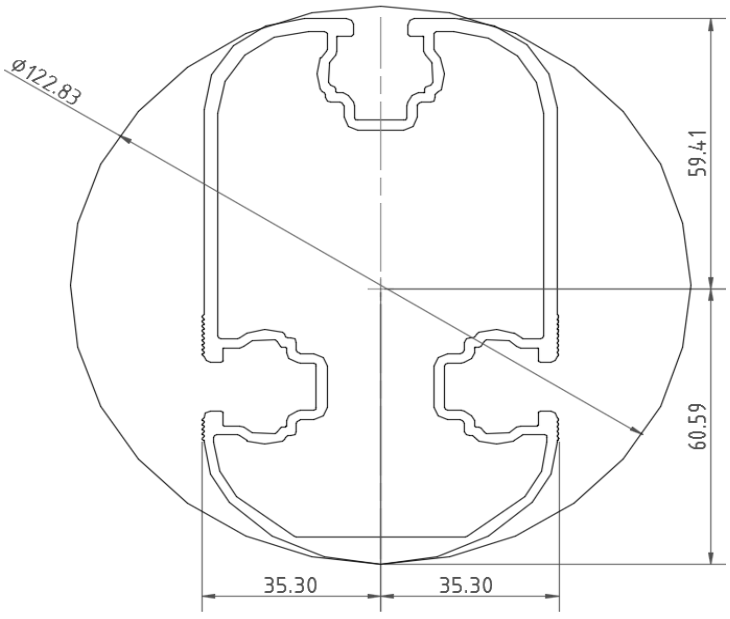


DETAIL VIEW

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 =	3.186	k-ft
M_z =	0.000	k-ft
P_n =	4.614	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	72%	

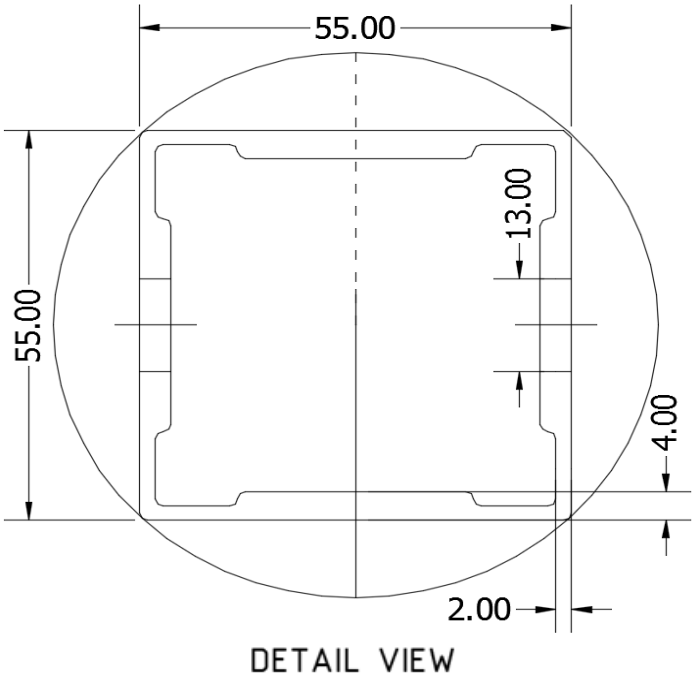


DETAIL VIEW

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).

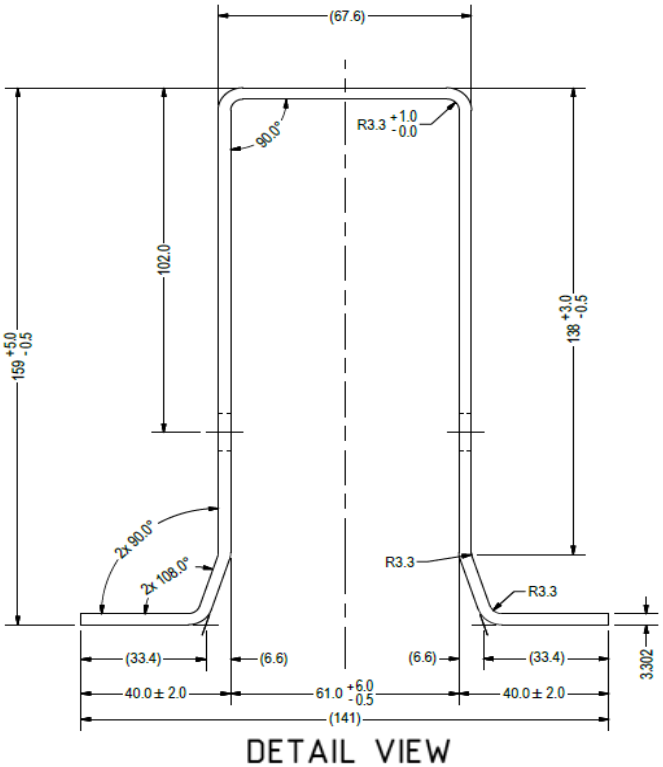
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.756	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	51%	



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 =	14.924	k-ft
M_z =	0.000	k-ft
P_r =	6.212	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	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 =	4.86	k
Maximum Lateral Load =	2.65	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)

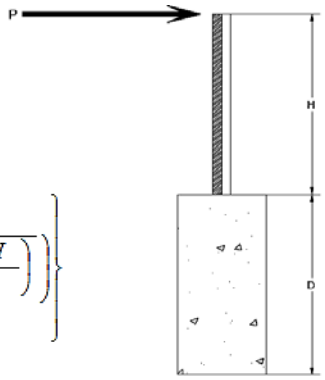
Lateral Force @ Top of Pole, P =	1.44	k
Height of Pole Above Grade, H =	5.78	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.44	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 =	7.75		
Required Footing Depth, D =	11.86	ft	
2nd Trial @ D_2 =	7.56	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.50	ksf	
Lateral Soil Bearing @ D, S_3 =	1.51	ksf	
Constant 2.34P/(S_1B), A =	3.33		
Required Footing Depth, D =	6.54	ft	
3rd Trial @ D_3 =	7.05	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.47	ksf	
Lateral Soil Bearing @ D, S_3 =	1.41	ksf	
Constant 2.34P/(S_1B), A =	3.57		
Required Footing Depth, D =	6.85	ft	
4th Trial @ D_4 =	6.95	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf	
Lateral Soil Bearing @ D, S_3 =	1.39	ksf	
Constant 2.34P/(S_1B), A =	3.62		
Required Footing Depth, D =	6.92	ft	
5th Trial @ D_5 =	6.94	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf	
Lateral Soil Bearing @ D, S_3 =	1.39	ksf	
Constant 2.34P/(S_1B), A =	3.63		
Required Footing Depth, D =	7.00	ft	

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

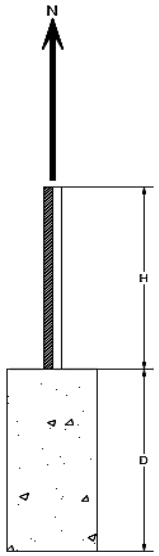
5.4 Uplifting Force Resistance

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 =	2.22	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 =	1.42	k
Required Concrete Volume, V =	9.77	ft^3
Required Footing Depth, D =	3.25	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	4.77
2	0.4	0.2	118.10	4.66
3	0.6	0.2	118.10	4.56
4	0.8	0.2	118.10	4.46
5	1	0.2	118.10	4.35
6	1.2	0.2	118.10	4.25
7	1.4	0.2	118.10	4.15
8	1.6	0.2	118.10	4.04
9	1.8	0.2	118.10	3.94
10	2	0.2	118.10	3.83
11	2.2	0.2	118.10	3.73
12	2.4	0.2	118.10	3.63
13	2.6	0.2	118.10	3.52
14	2.8	0.2	118.10	3.42
15	3	0.2	118.10	3.32
16	3.2	0.2	118.10	3.21
17	3.4	0.2	118.10	3.11
18	0	0.0	0.00	3.11
19	0	0.0	0.00	3.11
20	0	0.0	0.00	3.11
21	0	0.0	0.00	3.11
22	0	0.0	0.00	3.11
23	0	0.0	0.00	3.11
24	0	0.0	0.00	3.11
25	0	0.0	0.00	3.11
26	0	0.0	0.00	3.11
27	0	0.0	0.00	3.11
28	0	0.0	0.00	3.11
29	0	0.0	0.00	3.11
30	0	0.0	0.00	3.11
31	0	0.0	0.00	3.11
32	0	0.0	0.00	3.11
33	0	0.0	0.00	3.11
34	0	0.0	0.00	3.11
Max	3.4	Sum	0.80	

A 2ft diameter x 3.25ft 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 =	3.94	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

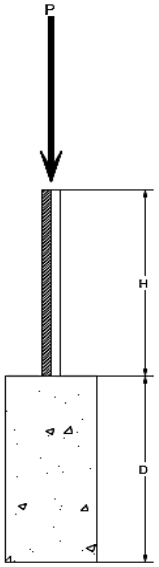
Weight of Concrete

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 =	7.13	k
Utilization =	63%	

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



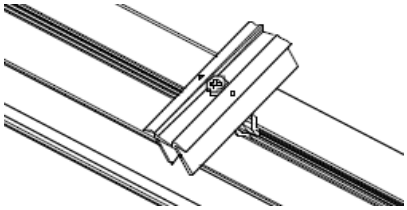
6. DESIGN OF JOINTS AND CONNECTIONS

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.

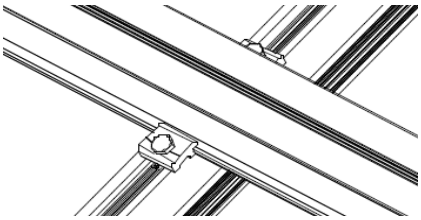
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.455 k
Allowable Uplift	=	1.214 k
Utilization	=	37%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.517 k
Allowable Uplift	=	2.180 k
Utilization	=	70%

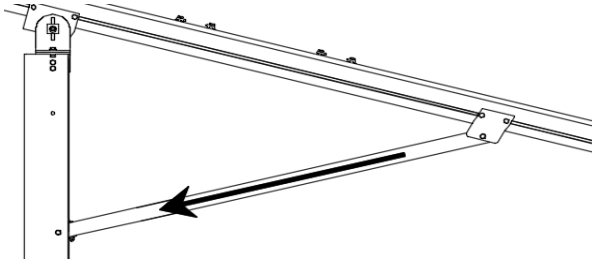


6.2 Strut Connections

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

Maximum Axial Load	=	4.756 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	53%

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

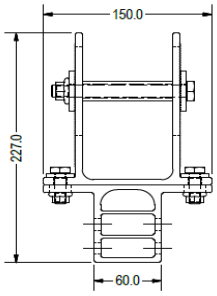


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

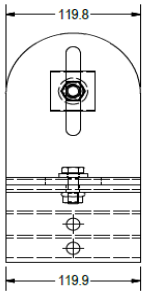
6.3 Girder to Post Connection

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.

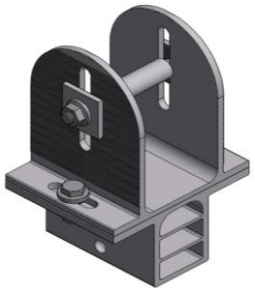
Maximum Tensile Load	=	3.166 k
Allowable Load	=	5.649 k
Utilization	=	56%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

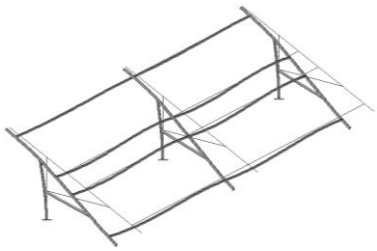
7.1 Seismic Drift

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}	=	62.39 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.248 in
Max Drift, Δ_{MAX}	=	0.889 in

0.889 ≤ 1.248, 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 =	114 in	L_b =	114
J =	0.432	J =	0.432
	315.377		200.561
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	27.5 ksi	φF_L=	28.8
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)

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

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 =	6.21	k	(LRFD Factored Load)
Mr (Strong) =	14.92	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 =	0.2235	≥	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 =	0.224	≥	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	-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 + 0.5W	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	404.841	2	2393.044	1	175.102	1	.28	1	.01	5	7.883	1
2		min	-653.319	3	-1221.69	3	-368.283	5	-1.687	5	-.006	1	.677	12
3	N19	max	1993.085	2	6248.619	1	0	12	0	3	.01	4	14.089	1
4		min	-1896.524	3	-3735.982	3	-392.006	5	-1.759	4	0	1	.482	15
5	N29	max	404.841	2	2393.044	1	140.04	3	.184	3	.011	4	7.883	1
6		min	-653.319	3	-1221.69	3	-412.824	4	-1.784	4	-.002	3	-.393	5
7	Totals:	max	2802.767	2	11034.707	1	0	1						
8		min	-3203.162	3	-6179.363	3	-1143.986	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	.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	-8.024	12	213.085	3	1.95	3	.039	3	.359	1	.223	1
4			min	-231.359	1	-595.108	1	-172.263	1	-.209	1	.01	12	-.077	3
5		3	max	-8.411	12	211.841	3	1.95	3	.039	3	.246	1	.614	1
6			min	-232.132	1	-596.766	1	-172.263	1	-.209	1	.01	12	-.217	3
7		4	max	-8.797	12	210.598	3	1.95	3	.039	3	.133	1	1.006	1
8			min	-232.905	1	-598.424	1	-172.263	1	-.209	1	.01	12	-.355	3
9		5	max	439.059	3	559.45	1	15.082	3	.001	2	.181	1	1.186	1
10			min	-1582.895	1	-189.09	3	-211.67	1	-.031	3	-.034	3	-.42	3
11		6	max	438.479	3	557.792	1	15.082	3	.001	2	.047	2	.82	1
12			min	-1583.668	1	-190.334	3	-211.67	1	-.031	3	-.032	5	-.296	3
13		7	max	437.899	3	556.134	1	15.082	3	.001	2	-.009	12	.454	1
14			min	-1584.441	1	-191.577	3	-211.67	1	-.031	3	-.097	4	-.17	3
15		8	max	437.319	3	554.476	1	15.082	3	.001	2	-.003	12	.09	1
16			min	-1585.215	1	-192.821	3	-211.67	1	-.031	3	-.235	1	-.044	3
17		9	max	425.879	3	3.765	9	29.7	3	.019	5	.12	1	.017	3
18			min	-1830.985	1	-4.157	2	-262.34	1	-.15	2	.013	12	-.079	2
19		10	max	425.299	3	2.383	9	29.7	3	.019	5	.04	3	.017	3
20			min	-1831.759	1	-5.815	2	-262.34	1	-.15	2	-.052	1	-.078	1
21		11	max	424.72	3	1.001	9	29.7	3	.019	5	.06	3	.018	3
22			min	-1832.532	1	-7.473	2	-262.34	1	-.15	2	-.224	1	-.077	1
23		12	max	410.072	3	510.051	3	23.792	2	.206	3	.166	1	.088	1
24			min	-2072.819	1	-476.132	1	-231.36	4	-.264	1	.026	10	-.145	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
25		13	max	409.492	3	508.807	3	23.792	2	.206	3	.153	1	.401	1
26			min	-2073.592	1	-477.79	1	-232.946	4	-.264	1	-.042	5	-.479	3
27		14	max	408.912	3	507.564	3	23.792	2	.206	3	.139	1	.715	1
28			min	-2074.365	1	-479.448	1	-234.531	4	-.264	1	-.189	5	-.813	3
29		15	max	408.332	3	506.32	3	23.792	2	.206	3	.126	2	1.03	1
30			min	-2075.138	1	-481.107	1	-236.117	4	-.264	1	-.337	5	-1.146	3
31		16	max	233.273	1	475.559	1	79.045	5	.183	1	.01	3	.783	1
32			min	7.774	12	-521.397	3	-155.077	1	-.291	3	-.239	4	-.875	3
33		17	max	232.5	1	473.901	1	77.459	5	.183	1	.006	3	.472	1
34			min	7.387	12	-522.64	3	-155.077	1	-.291	3	-.275	1	-.532	3
35		18	max	231.727	1	472.243	1	75.874	5	.183	1	0	3	.161	1
36			min	7.001	12	-523.884	3	-155.077	1	-.291	3	-.377	1	-.189	3
37		19	max	0	1	0	15	0	1	0	1	0	1	0	1
38			min	0	1	-.001	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.007	1	0	4	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	-15.489	15	646.277	3	0	1	.036	4	.302	4	.477	2
42			min	-357.819	1	-1558.129	2	-112.816	5	0	1	0	1	-.204	3
43		3	max	-15.722	15	645.033	3	0	1	.036	4	.228	4	1.5	2
44			min	-358.592	1	-1559.787	2	-114.402	5	0	1	0	1	-.628	3
45		4	max	-15.956	15	643.79	3	0	1	.036	4	.153	4	2.524	2
46			min	-359.365	1	-1561.445	2	-115.987	5	0	1	0	1	-1.05	3
47		5	max	1469.242	3	1557.735	1	0	1	0	1	.027	4	2.978	2
48			min	-4007.644	1	-667.288	3	-111.498	4	-.023	4	0	1	-1.232	3
49		6	max	1468.663	3	1556.077	1	0	1	0	1	0	1	1.963	2
50			min	-4008.417	1	-668.532	3	-113.083	4	-.023	4	-.047	5	-.794	3
51		7	max	1468.083	3	1554.419	1	0	1	0	1	0	1	.949	2
52			min	-4009.191	1	-669.775	3	-114.669	4	-.023	4	-.121	4	-.355	3
53		8	max	1467.503	3	1552.761	1	0	1	0	1	0	1	.085	3
54			min	-4009.964	1	-671.019	3	-116.254	4	-.023	4	-.197	4	-.094	1
55		9	max	1438.354	3	15.138	3	0	1	.015	4	.17	4	.294	3
56			min	-4338.958	1	-102.985	1	-253.614	4	0	1	0	1	-.574	1
57		10	max	1437.775	3	13.894	3	0	1	.015	4	.004	5	.284	3
58			min	-4339.731	1	-104.643	1	-255.199	4	0	1	0	1	-.505	1
59		11	max	1437.195	3	12.65	3	0	1	.015	4	0	1	.276	3
60			min	-4340.505	1	-106.301	1	-256.785	4	0	1	-.165	4	-.436	1
61		12	max	1414.463	3	1477.957	3	0	1	.149	4	.164	5	.072	1
62			min	-4680.467	1	-1565.703	1	-261.13	5	0	1	0	1	-.195	3
63		13	max	1413.883	3	1476.714	3	0	1	.149	4	0	1	1.1	1
64			min	-4681.24	1	-1567.361	1	-262.716	5	0	1	-.008	4	-1.164	3
65		14	max	1413.303	3	1475.47	3	0	1	.149	4	0	1	2.129	1
66			min	-4682.013	1	-1569.019	1	-264.301	5	0	1	-.181	4	-2.133	3
67		15	max	1412.723	3	1474.226	3	0	1	.149	4	0	1	3.159	1
68			min	-4682.786	1	-1570.677	1	-265.887	5	0	1	-.355	4	-3.101	3
69		16	max	358.629	1	1466.608	1	62.265	5	0	1	0	1	2.405	1
70			min	15.842	15	-1444.243	3	0	1	-.147	4	-.201	5	-2.354	3
71		17	max	357.856	1	1464.95	1	60.68	5	0	1	0	1	1.443	1
72			min	15.609	15	-1445.487	3	0	1	-.147	4	-.161	5	-1.406	3
73		18	max	357.083	1	1463.292	1	59.094	5	0	1	0	1	.483	1
74			min	15.375	15	-1446.73	3	0	1	-.147	4	-.122	4	-.457	3
75		19	max	0	1	0	2	0	1	0	1	0	1	0	1
76			min	0	1	-.003	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.003	1	.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	23.532	5	213.085	3	172.263	1	.209	1	.149	5	.223	1
80			min	-231.359	1	-595.108	1	-48.63	5	-.039	3	-.359	1	-.077	3
81		3	max	23.171	5	211.841	3	172.263	1	.209	1	.116	5	.614	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
82			min	-232.132	1	-596.766	1	-50.216	5	-.039	3	-.246	1	-.217	3
83		4	max	22.81	5	210.598	3	172.263	1	.209	1	.083	5	1.006	1
84			min	-232.905	1	-598.424	1	-51.801	5	-.039	3	-.133	1	-.355	3
85		5	max	439.059	3	559.45	1	211.67	1	.031	3	.034	3	1.186	1
86			min	-1582.895	1	-189.09	3	-43.721	5	-.019	4	-.181	1	-.42	3
87		6	max	438.479	3	557.792	1	211.67	1	.031	3	.024	3	.82	1
88			min	-1583.668	1	-190.334	3	-45.306	5	-.019	4	-.047	2	-.296	3
89		7	max	437.899	3	556.134	1	211.67	1	.031	3	.096	1	.454	1
90			min	-1584.441	1	-191.577	3	-46.892	5	-.019	4	-.065	5	-.17	3
91		8	max	437.319	3	554.476	1	211.67	1	.031	3	.235	1	.09	1
92			min	-1585.215	1	-192.821	3	-48.477	5	-.019	4	-.097	5	-.044	3
93		9	max	425.879	3	3.765	9	262.34	1	.15	2	.077	5	.017	3
94			min	-1830.985	1	-4.157	2	-90.392	5	.019	15	-.12	1	-.079	2
95		10	max	425.299	3	2.383	9	262.34	1	.15	2	.052	1	.017	3
96			min	-1831.759	1	-5.815	2	-91.977	5	.019	15	-.04	3	-.078	1
97		11	max	424.72	3	1.001	9	262.34	1	.15	2	.224	1	.018	3
98			min	-1832.532	1	-7.473	2	-93.563	5	.019	15	-.06	3	-.077	1
99		12	max	410.072	3	510.051	3	134.407	3	.264	1	.085	5	.088	1
100			min	-2072.819	1	-476.132	1	-217.413	5	-.206	3	-.166	1	-.145	3
101		13	max	409.492	3	508.807	3	134.407	3	.264	1	.03	3	.401	1
102			min	-2073.592	1	-477.79	1	-218.999	5	-.206	3	-.153	1	-.479	3
103		14	max	408.912	3	507.564	3	134.407	3	.264	1	.119	3	.715	1
104			min	-2074.365	1	-479.448	1	-220.584	5	-.206	3	-.227	4	-.813	3
105		15	max	408.332	3	506.32	3	134.407	3	.264	1	.207	3	1.03	1
106			min	-2075.138	1	-481.107	1	-222.17	5	-.206	3	-.368	4	-1.146	3
107		16	max	233.273	1	475.559	1	155.077	1	.291	3	.174	1	.783	1
108			min	2.196	15	-521.397	3	4.937	12	-.183	1	-.187	5	-.875	3
109		17	max	232.5	1	473.901	1	155.077	1	.291	3	.275	1	.472	1
110			min	1.963	15	-522.64	3	4.937	12	-.183	1	-.124	5	-.532	3
111		18	max	231.727	1	472.243	1	155.077	1	.291	3	.377	1	.161	1
112			min	1.73	15	-523.884	3	4.937	12	-.183	1	-.061	5	-.189	3
113		19	max	0	1	0	5	0	12	0	1	0	1	0	1
114			min	0	1	-.001	3	0	4	0	1	0	1	0	1
115	M10	1	max	155.124	1	471.277	1	-1.506	15	.003	1	.429	1	.183	1
116			min	4.939	12	-525.068	3	-231.602	1	-.013	3	-.03	5	-.291	3
117		2	max	155.124	1	337.609	1	.327	15	.003	1	.209	1	.19	3
118			min	4.939	12	-386.315	3	-186.145	1	-.013	3	-.032	5	-.244	1
119		3	max	155.124	1	203.941	1	2.887	5	.003	1	.052	2	.525	3
120			min	4.939	12	-247.562	3	-140.689	1	-.013	3	-.03	5	-.529	1
121		4	max	155.124	1	70.273	1	5.721	5	.003	1	.005	10	.713	3
122			min	4.939	12	-108.809	3	-95.232	1	-.013	3	-.088	1	-.674	1
123		5	max	155.124	1	29.944	3	8.556	5	.003	1	-.01	12	.755	3
124			min	4.939	12	-63.394	1	-49.776	1	-.013	3	-.165	1	-.678	1
125		6	max	155.124	1	168.697	3	12.765	4	.003	1	-.005	15	.65	3
126			min	4.939	12	-197.062	1	-17.033	2	-.013	3	-.194	1	-.54	1
127		7	max	155.124	1	307.45	3	41.137	1	.003	1	.006	5	.398	3
128			min	4.939	12	-330.73	1	-5.642	10	-.013	3	-.174	1	-.262	1
129		8	max	155.124	1	446.203	3	86.594	1	.003	1	.023	5	.158	1
130			min	3.087	15	-464.398	1	-.58	10	-.013	3	-.107	1	-.024	5
131		9	max	155.124	1	584.955	3	132.05	1	.003	1	.053	4	.719	1
132			min	-7.367	5	-598.065	1	4.482	10	-.013	3	-.056	2	-.544	3
133		10	max	155.124	1	296.776	14	177.507	1	.013	3	.172	1	1.421	1
134			min	4.939	12	-731.733	1	-95.182	14	-.003	1	-.031	10	-1.234	3
135		11	max	155.124	1	598.065	1	2.173	5	.013	3	.031	9	.719	1
136			min	4.939	12	-584.955	3	-132.05	1	-.003	1	-.056	2	-.544	3
137		12	max	155.124	1	464.398	1	5.007	5	.013	3	.004	3	.158	1
138			min	4.939	12	-446.203	3	-86.594	1	-.003	1	-.107	1	0	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
139		13	max	155.124	1	330.73	1	7.842	5	.013	3	-.004	12	.398	3
140			min	-.008	15	-307.45	3	-41.137	1	-.003	1	-.174	1	-.262	1
141		14	max	155.124	1	197.062	1	17.033	2	.013	3	-.008	12	.65	3
142			min	-12.075	5	-168.697	3	-4.455	3	-.003	1	-.194	1	-.54	1
143		15	max	155.124	1	63.394	1	49.776	1	.013	3	-.002	15	.755	3
144			min	-24.531	5	-29.944	3	-1.662	3	-.003	1	-.165	1	-.678	1
145		16	max	155.124	1	108.809	3	95.232	1	.013	3	.013	5	.713	3
146			min	-36.987	5	-70.273	1	1.026	12	-.003	1	-.088	1	-.674	1
147		17	max	155.124	1	247.562	3	140.689	1	.013	3	.052	2	.525	3
148			min	-49.443	5	-203.941	1	2.889	12	-.003	1	-.013	3	-.529	1
149		18	max	155.124	1	386.315	3	186.145	1	.013	3	.209	1	.19	3
150			min	-61.899	5	-337.609	1	4.751	12	-.003	1	-.007	3	-.244	1
151		19	max	155.124	1	525.068	3	231.602	1	.013	3	.429	1	.183	1
152			min	-74.355	5	-471.277	1	6.614	12	-.003	1	.002	3	-.291	3
153	M11	1	max	241.136	1	473.764	1	38.735	5	.002	3	.485	1	.133	4
154			min	-163.958	3	-514.019	3	-240.529	1	-.013	1	-.229	5	-.289	3
155		2	max	241.136	1	340.096	1	41.569	5	.002	3	.255	1	.18	3
156			min	-163.958	3	-375.266	3	-195.073	1	-.013	1	-.187	5	-.3	1
157		3	max	241.136	1	206.428	1	44.404	5	.002	3	.073	1	.503	3
158			min	-163.958	3	-236.513	3	-149.616	1	-.013	1	-.141	5	-.588	1
159		4	max	241.136	1	72.76	1	47.239	5	.002	3	.008	10	.68	3
160			min	-163.958	3	-97.76	3	-104.16	1	-.013	1	-.11	4	-.736	1
161		5	max	241.136	1	40.992	3	50.073	5	.002	3	-.004	12	.71	3
162			min	-163.958	3	-60.907	1	-58.703	1	-.013	1	-.147	1	-.742	1
163		6	max	241.136	1	179.745	3	52.908	5	.002	3	.013	5	.593	3
164			min	-163.958	3	-194.575	1	-20.89	2	-.013	1	-.185	1	-.607	1
165		7	max	241.136	1	318.498	3	65.29	4	.002	3	.07	5	.33	3
166			min	-163.958	3	-328.243	1	-6.772	10	-.013	1	-.175	1	-.331	1
167		8	max	241.136	1	457.251	3	78.009	4	.002	3	.131	5	.086	1
168			min	-163.958	3	-461.911	1	-1.71	10	-.013	1	-.117	1	-.079	3
169		9	max	241.136	1	596.004	3	123.123	1	.002	3	.201	4	.644	1
170			min	-163.958	3	-595.578	1	3.352	10	-.013	1	-.064	2	-.635	3
171		10	max	241.136	1	729.246	1	123.234	14	.011	2	.304	4	1.343	1
172			min	-163.958	3	-734.757	3	-168.579	1	-.013	1	-.035	10	-1.337	3
173		11	max	241.136	1	595.578	1	44.709	5	.013	1	.019	9	.644	1
174			min	-163.958	3	-596.004	3	-123.123	1	-.002	3	-.19	5	-.635	3
175		12	max	241.136	1	461.911	1	47.543	5	.013	1	-.001	12	.086	1
176			min	-163.958	3	-457.251	3	-77.666	1	-.002	3	-.161	4	-.079	3
177		13	max	241.136	1	328.243	1	50.378	5	.013	1	-.004	12	.33	3
178			min	-163.958	3	-318.498	3	-32.21	1	-.002	3	-.175	1	-.331	1
179		14	max	241.136	1	194.575	1	54.069	4	.013	1	-.005	12	.593	3
180			min	-163.958	3	-179.745	3	.078	12	-.002	3	-.185	1	-.607	1
181		15	max	241.136	1	60.907	1	66.788	4	.013	1	.023	5	.71	3
182			min	-163.958	3	-40.992	3	1.94	12	-.002	3	-.147	1	-.742	1
183		16	max	241.136	1	97.76	3	104.16	1	.013	1	.083	5	.68	3
184			min	-163.958	3	-72.76	1	3.803	12	-.002	3	-.061	1	-.736	1
185		17	max	241.136	1	236.513	3	149.616	1	.013	1	.158	4	.503	3
186			min	-163.958	3	-206.428	1	5.665	12	-.002	3	.004	12	-.588	1
187		18	max	241.136	1	375.266	3	195.073	1	.013	1	.262	4	.18	3
188			min	-163.958	3	-340.096	1	7.528	12	-.002	3	.011	12	-.3	1
189		19	max	241.136	1	514.019	3	240.529	1	.013	1	.485	1	.13	1
190			min	-163.958	3	-473.764	1	9.39	12	-.002	3	.02	12	-.289	3
191	M12	1	max	40.09	5	551.682	1	37.138	5	0	3	.512	1	.152	2
192			min	-49.133	1	-194.52	3	-244.789	1	-.01	1	-.22	5	.031	15
193		2	max	27.634	5	398.276	1	39.973	5	0	3	.277	1	.226	3
194			min	-49.133	1	-134.719	3	-199.333	1	-.01	1	-.179	5	-.366	1
195		3	max	15.178	5	244.871	1	42.808	5	0	3	.091	1	.337	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	-49.133	1	-74.917	3	-153.876	1	-.01	1	-.135	5	-.705	1
197		4	max	14.668	3	91.465	1	45.642	5	0	3	.013	10	.384	3
198			min	-49.133	1	-15.116	3	-108.42	1	-.01	1	-.104	4	-.883	1
199		5	max	14.668	3	44.686	3	48.477	5	0	3	-.008	12	.369	3
200			min	-49.133	1	-61.94	1	-62.964	1	-.01	1	-.138	1	-.898	1
201		6	max	14.668	3	104.488	3	51.312	5	0	3	.014	5	.29	3
202			min	-49.133	1	-215.346	1	-24.574	2	-.01	1	-.18	1	-.752	1
203		7	max	14.668	3	164.289	3	63.146	4	0	3	.069	5	.148	3
204			min	-49.133	1	-368.752	1	-8.585	10	-.01	1	-.175	1	-.443	1
205		8	max	14.668	3	224.091	3	75.864	4	0	3	.128	5	.038	2
206			min	-59.379	4	-522.157	1	-3.523	10	-.01	1	-.121	1	-.057	3
207		9	max	14.668	3	283.892	3	118.862	1	0	3	.196	4	.66	2
208			min	-71.835	4	-675.563	1	1.539	10	-.01	1	-.072	2	-.325	3
209		10	max	14.668	3	828.968	1	121.015	14	.01	1	.296	4	1.453	1
210			min	-84.291	4	-343.694	3	-164.319	1	-.005	14	-.041	10	-.656	3
211		11	max	51.355	5	675.563	1	43.513	5	.01	1	.015	9	.66	2
212			min	-49.133	1	-283.892	3	-118.862	1	0	5	-.187	5	-.325	3
213		12	max	38.899	5	522.157	1	46.348	5	.01	1	.002	3	.038	2
214			min	-49.133	1	-224.091	3	-73.406	1	0	5	-.16	4	-.057	3
215		13	max	26.443	5	368.752	1	49.182	5	.01	1	-.004	12	.148	3
216			min	-49.133	1	-164.289	3	-27.949	1	0	5	-.175	1	-.443	1
217		14	max	14.668	3	215.346	1	53.647	4	.01	1	-.007	12	.29	3
218			min	-49.133	1	-104.488	3	-3.11	3	0	5	-.18	1	-.752	1
219		15	max	14.668	3	61.94	1	66.365	4	.01	1	.021	5	.369	3
220			min	-49.133	1	-44.686	3	-.317	3	0	5	-.138	1	-.898	1
221		16	max	14.668	3	15.116	3	108.42	1	.01	1	.08	5	.384	3
222			min	-49.133	1	-91.465	1	1.882	12	0	5	-.048	1	-.883	1
223		17	max	14.668	3	74.917	3	153.876	1	.01	1	.157	4	.337	3
224			min	-49.133	1	-244.871	1	3.744	12	0	5	-.007	3	-.705	1
225		18	max	14.668	3	134.719	3	199.333	1	.01	1	.277	1	.226	3
226			min	-49.133	1	-398.276	1	5.607	12	0	5	0	3	-.366	1
227		19	max	14.668	3	194.52	3	244.789	1	.01	1	.512	1	.152	2
228			min	-60.493	4	-551.682	1	7.469	12	0	5	.008	12	-.038	5
229	M13	1	max	46.905	5	595.84	1	23.898	5	.006	3	.416	1	.209	1
230			min	-172.025	1	-214.36	3	-229.851	1	-.024	1	-.165	5	-.039	3
231		2	max	34.449	5	442.435	1	26.733	5	.006	3	.198	1	.155	3
232			min	-172.025	1	-154.558	3	-184.394	1	-.024	1	-.138	5	-.339	1
233		3	max	21.993	5	289.029	1	29.567	5	.006	3	.045	2	.287	3
234			min	-172.025	1	-94.757	3	-138.938	1	-.024	1	-.108	5	-.725	1
235		4	max	9.537	5	135.624	1	32.402	5	.006	3	.002	10	.355	3
236			min	-172.025	1	-34.955	3	-93.481	1	-.024	1	-.1	4	-.949	1
237		5	max	1.949	3	24.846	3	35.237	5	.006	3	-.007	12	.361	3
238			min	-172.025	1	-24.516	2	-48.025	1	-.024	1	-.17	1	-1.011	1
239		6	max	1.949	3	84.648	3	39.829	4	.006	3	0	15	.303	3
240			min	-172.025	1	-175.783	2	-15.681	2	-.024	1	-.197	1	-.911	1
241		7	max	1.949	3	144.449	3	52.547	4	.006	3	.04	5	.182	3
242			min	-172.025	1	-327.049	2	-5.004	10	-.024	1	-.176	1	-.65	1
243		8	max	1.949	3	204.251	3	88.345	1	.006	3	.085	5	-.002	12
244			min	-172.025	1	-478.315	2	.057	10	-.024	1	-.106	1	-.226	1
245		9	max	1.949	3	264.052	3	133.801	1	.006	3	.144	4	.402	2
246			min	-172.025	1	-631.404	1	5.119	10	-.024	1	-.054	2	-.249	3
247		10	max	1.949	3	323.854	3	179.258	1	.024	1	.233	4	1.146	2
248			min	-172.025	1	-784.81	1	9.125	12	-.009	14	-.03	10	-.559	3
249		11	max	33.714	5	631.404	1	28.647	5	.024	1	.032	9	.402	2
250			min	-172.025	1	-264.052	3	-133.801	1	-.006	3	-.126	5	-.249	3
251		12	max	21.258	5	478.315	2	31.482	5	.024	1	.002	3	-.002	12
252			min	-172.025	1	-204.251	3	-88.345	1	-.006	3	-.112	4	-.226	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	8.802	5	327.049	2	34.316	5	.024	1	-.004	12	.182	3
254			min	-172.025	1	-144.449	3	-42.888	1	-.006	3	-.176	1	-.65	1
255		14	max	1.949	3	175.783	2	37.151	5	.024	1	-.006	12	.303	3
256			min	-172.025	1	-84.648	3	-4.655	9	-.006	3	-.197	1	-.911	1
257		15	max	1.949	3	24.516	2	48.455	4	.024	1	.018	5	.361	3
258			min	-172.025	1	-24.846	3	.054	3	-.006	3	-.17	1	-1.011	1
259		16	max	1.949	3	34.955	3	93.481	1	.024	1	.062	5	.355	3
260			min	-172.025	1	-135.624	1	2.05	12	-.006	3	-.095	1	-.949	1
261		17	max	1.949	3	94.757	3	138.938	1	.024	1	.11	4	.287	3
262			min	-172.025	1	-289.029	1	3.913	12	-.006	3	-.005	3	-.725	1
263		18	max	1.949	3	154.558	3	184.394	1	.024	1	.198	1	.155	3
264			min	-172.025	1	-442.435	1	5.775	12	-.006	3	.002	12	-.339	1
265		19	max	1.949	3	214.36	3	229.851	1	.024	1	.416	1	.209	1
266			min	-172.025	1	-595.84	1	7.638	12	-.006	3	.009	12	-.039	3
267	M2	1	max	2393.044	1	653.029	3	175.449	1	.01	5	1.687	5	7.883	1
268			min	-1221.69	3	-401.999	2	-368.452	5	-.006	1	-.28	1	.677	12
269		2	max	2390.123	1	653.029	3	175.449	1	.01	5	1.569	5	7.891	1
270			min	-1223.882	3	-401.999	2	-365.92	5	-.006	1	-.224	1	.551	12
271		3	max	2387.201	1	653.029	3	175.449	1	.01	5	1.452	5	7.898	1
272			min	-1226.073	3	-401.999	2	-363.387	5	-.006	1	-.168	1	.425	12
273		4	max	2384.279	1	653.029	3	175.449	1	.01	5	1.336	4	7.905	1
274			min	-1228.264	3	-401.999	2	-360.855	5	-.006	1	-.112	1	.299	12
275		5	max	1903.286	1	1697.628	1	134.188	1	.002	1	1.227	4	7.626	1
276			min	-1067.666	3	51.246	12	-344.286	5	0	5	-.11	1	.23	12
277		6	max	1900.364	1	1697.628	1	134.188	1	.002	1	1.122	4	7.081	1
278			min	-1069.857	3	51.246	12	-341.754	5	0	5	-.067	1	.214	12
279		7	max	1897.442	1	1697.628	1	134.188	1	.002	1	1.018	4	6.536	1
280			min	-1072.048	3	51.246	12	-339.222	5	0	5	-.058	3	.197	12
281		8	max	1894.52	1	1697.628	1	134.188	1	.002	1	.915	4	5.992	1
282			min	-1074.239	3	51.246	12	-336.689	5	0	5	-.098	3	.181	12
283		9	max	1891.599	1	1697.628	1	134.188	1	.002	1	.813	4	5.447	1
284			min	-1076.431	3	51.246	12	-334.157	5	0	5	-.139	3	.164	12
285		10	max	1888.677	1	1697.628	1	134.188	1	.002	1	.711	4	4.902	1
286			min	-1078.622	3	51.246	12	-331.625	5	0	5	-.18	3	.148	12
287		11	max	1885.755	1	1697.628	1	134.188	1	.002	1	.61	4	4.358	1
288			min	-1080.813	3	51.246	12	-329.093	5	0	5	-.221	3	.132	12
289		12	max	1882.834	1	1697.628	1	134.188	1	.002	1	.51	4	3.813	1
290			min	-1083.005	3	51.246	12	-326.561	5	0	5	-.262	3	.115	12
291		13	max	1879.912	1	1697.628	1	134.188	1	.002	1	.411	4	3.268	1
292			min	-1085.196	3	51.246	12	-324.029	5	0	5	-.303	3	.099	12
293		14	max	1876.99	1	1697.628	1	134.188	1	.002	1	.313	4	2.724	1
294			min	-1087.387	3	51.246	12	-321.496	5	0	5	-.343	3	.082	12
295		15	max	1874.068	1	1697.628	1	134.188	1	.002	1	.321	1	2.179	1
296			min	-1089.579	3	51.246	12	-318.964	5	0	5	-.384	3	.066	12
297		16	max	1871.147	1	1697.628	1	134.188	1	.002	1	.364	1	1.634	1
298			min	-1091.77	3	51.246	12	-316.432	5	0	5	-.425	3	.049	12
299		17	max	1868.225	1	1697.628	1	134.188	1	.002	1	.407	1	1.089	1
300			min	-1093.961	3	51.246	12	-313.9	5	0	5	-.466	3	.033	12
301		18	max	1865.303	1	1697.628	1	134.188	1	.002	1	.45	1	.545	1
302			min	-1096.152	3	51.246	12	-311.368	5	0	5	-.507	3	.016	12
303		19	max	1862.381	1	1697.628	1	134.188	1	.002	1	.493	1	0	1
304			min	-1098.344	3	51.246	12	-308.836	5	0	5	-.547	3	0	1
305	M5	1	max	6248.619	1	1894.98	3	0	1	.01	4	1.759	4	14.089	1
306			min	-3735.982	3	-1978.735	2	-392.334	5	0	1	0	1	.482	15
307		2	max	6245.697	1	1894.98	3	0	1	.01	4	1.634	4	14.513	1
308			min	-3738.173	3	-1978.735	2	-389.802	5	0	1	0	1	.487	15
309		3	max	6242.775	1	1894.98	3	0	1	.01	4	1.51	4	14.938	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	-3740.364	3	-1978.735	2	-387.27	5	0	1	0	1	.493	15
311		4	max	6239.853	1	1894.98	3	0	1	.01	4	1.387	4	15.362	1
312			min	-3742.555	3	-1978.735	2	-384.738	5	0	1	0	1	.179	12
313		5	max	5005.447	1	3341.279	1	0	1	0	1	1.274	4	15.009	1
314			min	-3197.456	3	-17.811	3	-373.964	4	0	4	0	1	-.08	3
315		6	max	5002.526	1	3341.279	1	0	1	0	1	1.155	4	13.937	1
316			min	-3199.647	3	-17.811	3	-371.432	4	0	4	0	1	-.074	3
317		7	max	4999.604	1	3341.279	1	0	1	0	1	1.036	4	12.865	1
318			min	-3201.839	3	-17.811	3	-368.9	4	0	4	0	1	-.069	3
319		8	max	4996.682	1	3341.279	1	0	1	0	1	.918	4	11.793	1
320			min	-3204.03	3	-17.811	3	-366.368	4	0	4	0	1	-.063	3
321		9	max	4993.761	1	3341.279	1	0	1	0	1	.801	4	10.721	1
322			min	-3206.221	3	-17.811	3	-363.835	4	0	4	0	1	-.057	3
323		10	max	4990.839	1	3341.279	1	0	1	0	1	.685	4	9.649	1
324			min	-3208.413	3	-17.811	3	-361.303	4	0	4	0	1	-.051	3
325		11	max	4987.917	1	3341.279	1	0	1	0	1	.569	4	8.577	1
326			min	-3210.604	3	-17.811	3	-358.771	4	0	4	0	1	-.046	3
327		12	max	4984.995	1	3341.279	1	0	1	0	1	.454	4	7.505	1
328			min	-3212.795	3	-17.811	3	-356.239	4	0	4	0	1	-.04	3
329		13	max	4982.074	1	3341.279	1	0	1	0	1	.34	4	6.433	1
330			min	-3214.986	3	-17.811	3	-353.707	4	0	4	0	1	-.034	3
331		14	max	4979.152	1	3341.279	1	0	1	0	1	.227	4	5.36	1
332			min	-3217.178	3	-17.811	3	-351.175	4	0	4	0	1	-.029	3
333		15	max	4976.23	1	3341.279	1	0	1	0	1	.115	4	4.288	1
334			min	-3219.369	3	-17.811	3	-348.642	4	0	4	0	1	-.023	3
335		16	max	4973.308	1	3341.279	1	0	1	0	1	.004	4	3.216	1
336			min	-3221.56	3	-17.811	3	-346.11	4	0	4	0	1	-.017	3
337		17	max	4970.387	1	3341.279	1	0	1	0	1	0	1	2.144	1
338			min	-3223.752	3	-17.811	3	-343.578	4	0	4	-.107	4	-.011	3
339		18	max	4967.465	1	3341.279	1	0	1	0	1	0	1	1.072	1
340			min	-3225.943	3	-17.811	3	-341.046	4	0	4	-.217	4	-.006	3
341		19	max	4964.543	1	3341.279	1	0	1	0	1	0	1	0	1
342			min	-3228.134	3	-17.811	3	-338.514	4	0	4	-.326	4	0	1
343	M8	1	max	2393.044	1	653.029	3	139.929	3	.011	4	1.784	4	7.883	1
344			min	-1221.69	3	-401.999	2	-413.425	4	-.002	3	-.184	3	-.393	5
345		2	max	2390.123	1	653.029	3	139.929	3	.011	4	1.652	4	7.891	1
346			min	-1223.882	3	-401.999	2	-410.893	4	-.002	3	-.139	3	-.346	5
347		3	max	2387.201	1	653.029	3	139.929	3	.011	4	1.521	4	7.898	1
348			min	-1226.073	3	-401.999	2	-408.361	4	-.002	3	-.094	3	-.299	5
349		4	max	2384.279	1	653.029	3	139.929	3	.011	4	1.39	4	7.905	1
350			min	-1228.264	3	-401.999	2	-405.828	4	-.002	3	-.05	3	-.252	5
351		5	max	1903.286	1	1697.628	1	127.218	3	0	3	1.278	4	7.626	1
352			min	-1067.666	3	-49.216	5	-383.48	4	-.002	1	-.024	3	-.221	5
353		6	max	1900.364	1	1697.628	1	127.218	3	0	3	1.156	4	7.081	1
354			min	-1069.857	3	-49.216	5	-380.947	4	-.002	1	.01	12	-.205	5
355		7	max	1897.442	1	1697.628	1	127.218	3	0	3	1.034	4	6.536	1
356			min	-1072.048	3	-49.216	5	-378.415	4	-.002	1	-.004	10	-.189	5
357		8	max	1894.52	1	1697.628	1	127.218	3	0	3	.913	4	5.992	1
358			min	-1074.239	3	-49.216	5	-375.883	4	-.002	1	-.035	2	-.174	5
359		9	max	1891.599	1	1697.628	1	127.218	3	0	3	.793	4	5.447	1
360			min	-1076.431	3	-49.216	5	-373.351	4	-.002	1	-.07	2	-.158	5
361		10	max	1888.677	1	1697.628	1	127.218	3	0	3	.676	5	4.902	1
362			min	-1078.622	3	-49.216	5	-370.819	4	-.002	1	-.106	2	-.142	5
363		11	max	1885.755	1	1697.628	1	127.218	3	0	3	.566	5	4.358	1
364			min	-1080.813	3	-49.216	5	-368.287	4	-.002	1	-.148	1	-.126	5
365		12	max	1882.834	1	1697.628	1	127.218	3	0	3	.457	5	3.813	1
366			min	-1083.005	3	-49.216	5	-365.754	4	-.002	1	-.191	1	-.111	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	1879.912	1	1697.628	1	127.218	3	0	3	.348	5	3.268	1
368			min	-1085.196	3	-49.216	5	-363.222	4	-.002	1	-.235	1	-.095	5
369		14	max	1876.99	1	1697.628	1	127.218	3	0	3	.343	3	2.724	1
370			min	-1087.387	3	-49.216	5	-360.69	4	-.002	1	-.278	1	-.079	5
371		15	max	1874.068	1	1697.628	1	127.218	3	0	3	.384	3	2.179	1
372			min	-1089.579	3	-49.216	5	-358.158	4	-.002	1	-.321	1	-.063	5
373		16	max	1871.147	1	1697.628	1	127.218	3	0	3	.425	3	1.634	1
374			min	-1091.77	3	-49.216	5	-355.626	4	-.002	1	-.364	1	-.047	5
375		17	max	1868.225	1	1697.628	1	127.218	3	0	3	.466	3	1.089	1
376			min	-1093.961	3	-49.216	5	-353.094	4	-.002	1	-.407	1	-.032	5
377		18	max	1865.303	1	1697.628	1	127.218	3	0	3	.507	3	.545	1
378			min	-1096.152	3	-49.216	5	-350.561	4	-.002	1	-.45	1	-.016	5
379		19	max	1862.381	1	1697.628	1	127.218	3	0	3	.547	3	0	1
380			min	-1098.344	3	-49.216	5	-348.029	4	-.002	1	-.493	1	0	1
381	M3	1	max	1772.805	1	5.879	4	40.373	1	.017	3	.01	4	0	1
382			min	-601.093	3	1.382	15	-15.019	5	-.048	1	-.002	3	0	1
383		2	max	1772.659	1	5.226	4	40.373	1	.017	3	.021	1	0	15
384			min	-601.203	3	1.228	15	-14.56	5	-.048	1	-.007	3	-.002	4
385		3	max	1772.512	1	4.572	4	40.373	1	.017	3	.035	1	0	15
386			min	-601.312	3	1.075	15	-14.101	5	-.048	1	-.012	3	-.004	4
387		4	max	1772.366	1	3.919	4	40.373	1	.017	3	.049	1	-.001	15
388			min	-601.422	3	.921	15	-13.642	5	-.048	1	-.016	3	-.005	4
389		5	max	1772.219	1	3.266	4	40.373	1	.017	3	.064	1	-.002	15
390			min	-601.532	3	.768	15	-13.183	5	-.048	1	-.021	3	-.007	4
391		6	max	1772.072	1	2.613	4	40.373	1	.017	3	.078	1	-.002	15
392			min	-601.642	3	.614	15	-13.131	3	-.048	1	-.026	3	-.008	4
393		7	max	1771.926	1	1.96	4	40.373	1	.017	3	.093	1	-.002	15
394			min	-601.752	3	.461	15	-13.131	3	-.048	1	-.03	3	-.008	4
395		8	max	1771.779	1	1.306	4	40.373	1	.017	3	.107	1	-.002	15
396			min	-601.862	3	.307	15	-13.131	3	-.048	1	-.035	3	-.009	4
397		9	max	1771.633	1	.653	4	40.373	1	.017	3	.122	1	-.002	15
398			min	-601.972	3	.154	15	-13.131	3	-.048	1	-.04	3	-.009	4
399		10	max	1771.486	1	0	1	40.373	1	.017	3	.136	1	-.002	15
400			min	-602.082	3	0	1	-13.131	3	-.048	1	-.044	3	-.009	4
401		11	max	1771.339	1	-.154	15	40.373	1	.017	3	.15	1	-.002	15
402			min	-602.192	3	-.653	6	-13.131	3	-.048	1	-.049	3	-.009	4
403		12	max	1771.193	1	-.307	15	40.373	1	.017	3	.165	1	-.002	15
404			min	-602.302	3	-1.306	6	-13.131	3	-.048	1	-.054	3	-.009	4
405		13	max	1771.046	1	-.461	15	40.373	1	.017	3	.179	1	-.002	15
406			min	-602.412	3	-1.96	6	-13.131	3	-.048	1	-.059	3	-.008	4
407		14	max	1770.899	1	-.614	15	40.373	1	.017	3	.194	1	-.002	15
408			min	-602.522	3	-2.613	6	-13.131	3	-.048	1	-.063	3	-.008	4
409		15	max	1770.753	1	-.768	15	40.373	1	.017	3	.208	1	-.002	15
410			min	-602.632	3	-3.266	6	-13.131	3	-.048	1	-.068	3	-.007	4
411		16	max	1770.606	1	-.921	15	40.373	1	.017	3	.222	1	-.001	15
412			min	-602.742	3	-3.919	6	-13.131	3	-.048	1	-.073	3	-.005	4
413		17	max	1770.46	1	-1.075	15	40.373	1	.017	3	.237	1	0	15
414			min	-602.852	3	-4.572	6	-13.131	3	-.048	1	-.077	3	-.004	4
415		18	max	1770.313	1	-1.228	15	40.373	1	.017	3	.251	1	0	15
416			min	-602.962	3	-5.226	6	-13.131	3	-.048	1	-.082	3	-.002	4
417		19	max	1770.166	1	-1.382	15	40.373	1	.017	3	.266	1	0	1
418			min	-603.072	3	-5.879	6	-13.131	3	-.048	1	-.087	3	0	1
419	M6	1	max	4755.744	1	5.879	6	0	1	.011	4	.008	4	0	1
420			min	-1989.683	3	1.382	15	-17.393	4	0	1	0	1	0	1
421		2	max	4755.597	1	5.226	6	0	1	.011	4	.002	4	0	15
422			min	-1989.793	3	1.228	15	-16.934	4	0	1	0	1	-.002	6
423		3	max	4755.45	1	4.572	6	0	1	.011	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	-1989.903	3	1.075	15	-16.475	4	0	1	-.004	4	-.004	6
425		4	max	4755.304	1	3.919	6	0	1	.011	4	0	1	-.001	15
426			min	-1990.013	3	.921	15	-16.016	4	0	1	-.01	4	-.005	6
427		5	max	4755.157	1	3.266	6	0	1	.011	4	0	1	-.002	15
428			min	-1990.123	3	.768	15	-15.556	4	0	1	-.015	4	-.007	6
429		6	max	4755.011	1	2.613	6	0	1	.011	4	0	1	-.002	15
430			min	-1990.233	3	.614	15	-15.097	4	0	1	-.021	4	-.008	6
431		7	max	4754.864	1	1.96	6	0	1	.011	4	0	1	-.002	15
432			min	-1990.343	3	.461	15	-14.638	4	0	1	-.026	4	-.008	6
433		8	max	4754.717	1	1.306	6	0	1	.011	4	0	1	-.002	15
434			min	-1990.453	3	.307	15	-14.179	4	0	1	-.031	4	-.009	6
435		9	max	4754.571	1	.653	6	0	1	.011	4	0	1	-.002	15
436			min	-1990.563	3	.154	15	-13.72	4	0	1	-.036	4	-.009	6
437		10	max	4754.424	1	0	1	0	1	.011	4	0	1	-.002	15
438			min	-1990.673	3	0	1	-13.261	4	0	1	-.041	4	-.009	6
439		11	max	4754.278	1	-.154	15	0	1	.011	4	0	1	-.002	15
440			min	-1990.783	3	-.653	4	-12.802	4	0	1	-.046	4	-.009	6
441		12	max	4754.131	1	-.307	15	0	1	.011	4	0	1	-.002	15
442			min	-1990.893	3	-1.306	4	-12.343	4	0	1	-.05	4	-.009	6
443		13	max	4753.984	1	-.461	15	0	1	.011	4	0	1	-.002	15
444			min	-1991.003	3	-1.96	4	-11.884	4	0	1	-.055	4	-.008	6
445		14	max	4753.838	1	-.614	15	0	1	.011	4	0	1	-.002	15
446			min	-1991.113	3	-2.613	4	-11.425	4	0	1	-.059	4	-.008	6
447		15	max	4753.691	1	-.768	15	0	1	.011	4	0	1	-.002	15
448			min	-1991.223	3	-3.266	4	-10.966	4	0	1	-.063	4	-.007	6
449		16	max	4753.544	1	-.921	15	0	1	.011	4	0	1	-.001	15
450			min	-1991.333	3	-3.919	4	-10.507	4	0	1	-.066	4	-.005	6
451		17	max	4753.398	1	-1.075	15	0	1	.011	4	0	1	0	15
452			min	-1991.443	3	-4.572	4	-10.048	4	0	1	-.07	4	-.004	6
453		18	max	4753.251	1	-1.228	15	0	1	.011	4	0	1	0	15
454			min	-1991.553	3	-5.226	4	-9.589	4	0	1	-.074	4	-.002	6
455		19	max	4753.105	1	-1.382	15	0	1	.011	4	0	1	0	1
456			min	-1991.663	3	-5.879	4	-9.13	4	0	1	-.077	4	0	1
457	M9	1	max	1772.805	1	5.879	6	13.131	3	.048	1	.008	5	0	1
458			min	-601.093	3	1.382	15	-40.373	1	-.017	3	-.006	1	0	1
459		2	max	1772.659	1	5.226	6	13.131	3	.048	1	.007	3	0	15
460			min	-601.203	3	1.228	15	-40.373	1	-.017	3	-.021	1	-.002	6
461		3	max	1772.512	1	4.572	6	13.131	3	.048	1	.012	3	0	15
462			min	-601.312	3	1.075	15	-40.373	1	-.017	3	-.035	1	-.004	6
463		4	max	1772.366	1	3.919	6	13.131	3	.048	1	.016	3	-.001	15
464			min	-601.422	3	.921	15	-40.373	1	-.017	3	-.049	1	-.005	6
465		5	max	1772.219	1	3.266	6	13.131	3	.048	1	.021	3	-.002	15
466			min	-601.532	3	.768	15	-40.373	1	-.017	3	-.064	1	-.007	6
467		6	max	1772.072	1	2.613	6	13.131	3	.048	1	.026	3	-.002	15
468			min	-601.642	3	.614	15	-40.373	1	-.017	3	-.078	1	-.008	6
469		7	max	1771.926	1	1.96	6	13.131	3	.048	1	.03	3	-.002	15
470			min	-601.752	3	.461	15	-40.373	1	-.017	3	-.093	1	-.008	6
471		8	max	1771.779	1	1.306	6	13.131	3	.048	1	.035	3	-.002	15
472			min	-601.862	3	.307	15	-40.373	1	-.017	3	-.107	1	-.009	6
473		9	max	1771.633	1	.653	6	13.131	3	.048	1	.04	3	-.002	15
474			min	-601.972	3	.154	15	-40.373	1	-.017	3	-.122	1	-.009	6
475		10	max	1771.486	1	0	1	13.131	3	.048	1	.044	3	-.002	15
476			min	-602.082	3	0	1	-40.373	1	-.017	3	-.136	1	-.009	6
477		11	max	1771.339	1	-.154	15	13.131	3	.048	1	.049	3	-.002	15
478			min	-602.192	3	-.653	4	-40.373	1	-.017	3	-.15	1	-.009	6
479		12	max	1771.193	1	-.307	15	13.131	3	.048	1	.054	3	-.002	15
480			min	-602.302	3	-1.306	4	-40.373	1	-.017	3	-.165	1	-.009	6

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	1771.046	1	-.461	15	13.131	3	.048	1	.059	3	-.002	15
482			min	-602.412	3	-1.96	4	-40.373	1	-.017	3	-.179	1	-.008	6
483		14	max	1770.899	1	-.614	15	13.131	3	.048	1	.063	3	-.002	15
484			min	-602.522	3	-2.613	4	-40.373	1	-.017	3	-.194	1	-.008	6
485		15	max	1770.753	1	-.768	15	13.131	3	.048	1	.068	3	-.002	15
486			min	-602.632	3	-3.266	4	-40.373	1	-.017	3	-.208	1	-.007	6
487		16	max	1770.606	1	-.921	15	13.131	3	.048	1	.073	3	-.001	15
488			min	-602.742	3	-3.919	4	-40.373	1	-.017	3	-.222	1	-.005	6
489		17	max	1770.46	1	-1.075	15	13.131	3	.048	1	.077	3	0	15
490			min	-602.852	3	-4.572	4	-40.373	1	-.017	3	-.237	1	-.004	6
491		18	max	1770.313	1	-1.228	15	13.131	3	.048	1	.082	3	0	15
492			min	-602.962	3	-5.226	4	-40.373	1	-.017	3	-.251	1	-.002	6
493		19	max	1770.166	1	-1.382	15	13.131	3	.048	1	.087	3	0	1
494			min	-603.072	3	-5.879	4	-40.373	1	-.017	3	-.266	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	-.021	12	.046	3	.015	1	7.961e-3	3	NC	3	NC	1
2			min	-.522	1	-1.08	1	-.917	4	-2.731e-2	1	98.382	1	188.317	5
3		2	max	-.021	12	.024	3	0	12	7.705e-3	3	NC	12	NC	2
4			min	-.522	1	-.936	1	-.885	4	-2.596e-2	1	109.293	1	197.101	4
5		3	max	-.021	12	.003	3	0	3	7.205e-3	3	5699.853	12	NC	3
6			min	-.522	1	-.796	1	-.843	4	-2.329e-2	1	122.584	1	209.16	4
7		4	max	-.021	12	-.012	12	0	3	6.704e-3	3	4051.485	12	NC	3
8			min	-.522	1	-.665	1	-.794	4	-2.062e-2	1	138.262	1	225.554	4
9		5	max	-.021	12	-.018	12	.002	3	6.453e-3	3	3392.169	12	NC	3
10			min	-.521	1	-.549	1	-.74	4	-1.871e-2	1	155.774	1	246.906	4
11		6	max	-.021	12	-.021	12	.002	3	6.843e-3	3	3170.621	12	NC	3
12			min	-.521	1	-.453	1	-.684	4	-1.873e-2	1	174.305	1	273.706	4
13		7	max	-.021	12	-.022	12	.002	3	7.232e-3	3	3155.602	12	NC	1
14			min	-.52	1	-.369	1	-.629	4	-1.874e-2	1	194.4	1	306.312	4
15		8	max	-.021	12	-.02	12	0	9	7.622e-3	3	3253.221	12	NC	1
16			min	-.519	1	-.292	1	-.577	4	-1.876e-2	1	217.365	1	343.917	5
17		9	max	-.021	12	-.018	12	0	2	8.356e-3	3	3386.78	12	NC	1
18			min	-.519	1	-.216	1	-.531	4	-1.788e-2	1	245.954	1	387.572	5
19		10	max	-.021	12	-.015	15	.002	1	9.415e-3	3	3515.031	12	NC	1
20			min	-.518	1	-.139	1	-.481	4	-1.617e-2	1	283.996	1	447.235	5
21		11	max	-.022	12	-.007	15	.001	1	1.047e-2	3	3638.649	12	NC	1
22			min	-.517	1	-.06	1	-.432	4	-1.446e-2	1	336.918	1	529.587	5
23		12	max	-.022	12	.02	1	.004	3	9.748e-3	3	3744.92	12	NC	1
24			min	-.516	1	-.024	3	-.385	4	-1.194e-2	1	415.696	1	645.044	5
25		13	max	-.022	12	.098	1	.01	3	7.128e-3	3	3992.589	12	NC	1
26			min	-.516	1	-.021	3	-.335	4	-8.582e-3	1	540.123	1	837.743	5
27		14	max	-.022	12	.17	1	.014	3	4.509e-3	3	4934.597	12	NC	1
28			min	-.515	1	-.01	3	-.285	4	-6.405e-3	4	745.707	1	1177.72	5
29		15	max	-.022	12	.232	1	.014	3	1.889e-3	3	9816.604	12	NC	1
30			min	-.514	1	.009	12	-.242	4	-7.341e-3	4	1100.578	1	1791.803	5
31		16	max	-.022	12	.277	1	.013	1	4.925e-3	3	NC	3	NC	2
32			min	-.514	1	.029	15	-.21	4	-6.55e-3	4	1703.899	1	2887.435	5
33		17	max	-.022	12	.311	1	.016	1	8.624e-3	3	NC	10	NC	2
34			min	-.514	1	.037	15	-.187	4	-5.929e-3	1	2255.481	3	5181.356	5
35		18	max	-.022	12	.337	1	.008	1	1.232e-2	3	NC	2	NC	2
36			min	-.514	1	.044	15	-.173	4	-8.262e-3	1	1128.895	3	7312.032	1
37		19	max	-.022	12	.36	1	-.001	12	1.421e-2	3	NC	1	NC	1
38			min	-.514	1	.051	15	-.166	4	-9.452e-3	1	742.124	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	-.015	12	.208	3	0	1	6.031e-4	4	NC	3	NC	1
40			min	-1.009	1	-2.176	1	-.916	4	0	1	51.96	1	188.247	4
41		2	max	-.015	12	.145	3	0	1	3.717e-4	4	3858.666	12	NC	1
42			min	-1.009	1	-1.875	1	-.886	4	0	1	58.39	1	196.076	4
43		3	max	-.015	12	.085	3	0	1	0	1	2045.84	15	NC	1
44			min	-1.009	1	-1.582	1	-.846	4	-8.2e-5	4	66.421	1	207.73	4
45		4	max	-.015	12	.035	3	0	1	0	1	2312.025	15	NC	1
46			min	-1.008	1	-1.311	1	-.796	4	-5.357e-4	4	76.058	1	224.055	4
47		5	max	-.015	12	.001	3	0	1	0	1	2606.922	15	NC	1
48			min	-1.008	1	-1.081	1	-.74	4	-7.79e-4	4	86.798	1	245.723	4
49		6	max	-.016	12	-.011	12	0	1	0	1	2913.506	15	NC	1
50			min	-1.006	1	-.897	1	-.683	4	-4.811e-4	4	97.838	1	272.884	4
51		7	max	-.016	12	-.012	12	0	1	0	1	3243.13	15	NC	1
52			min	-1.005	1	-.742	1	-.627	4	-1.832e-4	4	109.49	1	305.565	4
53		8	max	-.016	12	-.009	12	0	1	1.151e-4	5	3623.627	15	NC	1
54			min	-1.003	1	-.603	1	-.577	4	0	1	122.75	1	343.056	4
55		9	max	-.017	12	-.007	12	0	1	1.623e-4	4	4114.413	15	NC	1
56			min	-1.001	1	-.461	1	-.531	4	0	1	139.945	1	385.401	4
57		10	max	-.017	12	-.008	12	0	1	0	1	4802.928	15	NC	1
58			min	-1	1	-.309	1	-.481	4	-2.586e-5	4	164.514	1	445.893	4
59		11	max	-.017	12	-.005	15	0	1	0	1	5823.456	15	NC	1
60			min	-.998	1	-.15	1	-.431	4	-2.14e-4	4	201.767	1	529.116	4
61		12	max	-.018	12	.016	1	0	1	0	1	7479.965	15	NC	1
62			min	-.996	1	-.032	3	-.386	4	-1.232e-3	4	264.368	1	638.008	4
63		13	max	-.018	12	.182	1	0	1	0	1	NC	15	NC	1
64			min	-.994	1	-.041	3	-.336	4	-3.13e-3	4	382.573	1	821.483	4
65		14	max	-.018	12	.33	1	0	1	0	1	NC	5	NC	1
66			min	-.992	1	-.033	3	-.287	4	-5.028e-3	4	589.823	3	1149.916	4
67		15	max	-.019	12	.446	1	0	1	0	1	NC	5	NC	1
68			min	-.99	1	.007	12	-.245	4	-6.927e-3	4	713.128	3	1744.549	4
69		16	max	-.019	12	.514	1	0	1	0	1	NC	2	NC	1
70			min	-.99	1	.017	15	-.214	4	-5.456e-3	4	1288.831	3	2804.18	4
71		17	max	-.019	12	.544	1	0	1	0	1	NC	1	NC	1
72			min	-.99	1	.018	15	-.192	4	-3.59e-3	4	7644.18	12	5073.868	4
73		18	max	-.019	12	.551	1	0	1	0	1	NC	1	NC	1
74			min	-.991	1	.019	15	-.175	4	-1.725e-3	4	870.462	3	NC	1
75		19	max	-.019	12	.552	1	0	1	0	1	NC	1	NC	1
76			min	-.991	1	.019	15	-.164	4	-7.73e-4	4	447.459	3	NC	1
77	M7	1	max	.017	5	.046	3	0	12	2.731e-2	1	NC	3	NC	1
78			min	-.522	1	-1.08	1	-.925	4	-7.961e-3	3	98.382	1	185.158	4
79		2	max	.017	5	.024	3	.01	1	2.596e-2	1	NC	5	NC	2
80			min	-.522	1	-.936	1	-.88	4	-7.705e-3	3	109.293	1	196.722	4
81		3	max	.017	5	.017	5	.023	1	2.329e-2	1	NC	5	NC	3
82			min	-.522	1	-.796	1	-.832	4	-7.205e-3	3	122.584	1	210.691	4
83		4	max	.017	5	.017	5	.026	1	2.062e-2	1	NC	5	NC	3
84			min	-.522	1	-.665	1	-.782	4	-6.704e-3	3	138.262	1	227.792	4
85		5	max	.017	5	.017	5	.023	1	1.871e-2	1	NC	5	NC	3
86			min	-.521	1	-.549	1	-.729	4	-6.453e-3	3	155.774	1	248.835	4
87		6	max	.017	5	.015	5	.015	1	1.873e-2	1	NC	5	NC	3
88			min	-.521	1	-.453	1	-.677	4	-6.843e-3	3	174.305	1	273.863	4
89		7	max	.017	5	.013	5	.005	1	1.874e-2	1	NC	5	NC	1
90			min	-.52	1	-.369	1	-.626	4	-7.232e-3	3	194.4	1	303.434	4
91		8	max	.017	5	.01	5	0	10	1.876e-2	1	NC	5	NC	1
92			min	-.519	1	-.292	1	-.578	4	-7.622e-3	3	217.365	1	338.661	4
93		9	max	.017	5	.008	5	0	3	1.788e-2	1	NC	5	NC	1
94			min	-.519	1	-.216	1	-.531	4	-8.356e-3	3	245.954	1	381.628	4
95		10	max	.017	5	.006	5	.001	3	1.617e-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	-.518	1	-.139	1	-.482	4	-9.415e-3	3	283.996	1	439.139	4
97		11	max	.017	5	.003	5	0	3	1.446e-2	1	NC	5	NC	1
98			min	-.517	1	-.06	1	-.432	4	-1.047e-2	3	336.918	1	518.963	4
99		12	max	.017	5	.02	1	.006	1	1.194e-2	1	NC	5	NC	1
100			min	-.516	1	-.024	3	-.382	4	-9.748e-3	3	415.696	1	635.735	4
101		13	max	.017	5	.098	1	.009	1	8.582e-3	1	NC	7	NC	1
102			min	-.516	1	-.021	3	-.331	4	-7.128e-3	3	540.123	1	826.531	4
103		14	max	.017	5	.17	1	.007	2	5.221e-3	1	NC	4	NC	1
104			min	-.515	1	-.01	3	-.283	4	-5.066e-3	5	745.707	1	1147.217	4
105		15	max	.017	5	.232	1	.002	2	1.86e-3	1	NC	4	NC	1
106			min	-.514	1	-.008	5	-.244	4	-6.789e-3	5	1100.578	1	1672.629	4
107		16	max	.017	5	.277	1	0	10	3.595e-3	1	NC	3	NC	2
108			min	-.514	1	-.013	5	-.217	4	-5.572e-3	5	1703.899	1	2466.071	4
109		17	max	.017	5	.311	1	-.002	10	5.929e-3	1	NC	4	NC	2
110			min	-.514	1	-.019	5	-.196	4	-8.624e-3	3	2255.481	3	3885.706	4
111		18	max	.017	5	.337	1	-.001	12	8.262e-3	1	NC	2	NC	2
112			min	-.514	1	-.026	5	-.178	4	-1.232e-2	3	1128.895	3	7312.032	1
113		19	max	.017	5	.36	1	.013	1	9.452e-3	1	NC	1	NC	1
114			min	-.514	1	-.033	5	-.159	4	-1.421e-2	3	742.124	3	NC	1
115	M10	1	max	.001	1	.349	1	.514	1	8.292e-3	3	NC	1	NC	1
116			min	-.168	4	-.03	5	-.017	5	-8.983e-4	5	NC	1	NC	1
117		2	max	.001	1	.39	3	.583	1	9.535e-3	3	NC	4	NC	3
118			min	-.169	4	-.014	5	0	15	-7.885e-4	5	1232.745	3	3325.732	1
119		3	max	.001	1	.559	3	.689	1	1.078e-2	3	NC	4	NC	3
120			min	-.169	4	-.005	5	.01	15	-6.788e-4	5	643.787	3	1303.765	1
121		4	max	0	1	.683	3	.803	1	1.202e-2	3	NC	5	NC	3
122			min	-.169	4	-.005	10	.016	15	-5.69e-4	5	476.964	3	790.787	1
123		5	max	0	1	.745	3	.901	1	1.327e-2	3	NC	5	NC	3
124			min	-.169	4	-.004	10	.019	15	-4.593e-4	5	422.276	3	589.51	1
125		6	max	0	1	.741	3	.971	1	1.451e-2	3	NC	5	NC	3
126			min	-.169	4	.002	15	.02	15	-3.495e-4	5	425.217	3	499.337	1
127		7	max	0	1	.681	3	1.007	1	1.575e-2	3	NC	4	NC	3
128			min	-.169	4	.005	15	.019	15	-2.398e-4	5	478.9	3	462.68	1
129		8	max	0	1	.587	3	1.013	1	1.7e-2	3	NC	4	NC	3
130			min	-.169	4	.008	15	.02	15	-3.274e-4	10	597.121	3	457.153	1
131		9	max	0	1	.499	1	1.001	1	1.824e-2	3	NC	5	NC	3
132			min	-.169	4	.013	15	.02	12	-5.254e-4	2	790.052	3	468.696	1
133		10	max	0	1	.551	1	.991	1	1.948e-2	3	NC	5	NC	3
134			min	-.169	4	.019	15	.019	12	-7.914e-4	2	932.595	3	478.556	1
135		11	max	0	12	.499	1	1.001	1	1.824e-2	3	NC	5	NC	3
136			min	-.169	4	.022	15	.02	12	-5.254e-4	2	790.052	3	468.696	1
137		12	max	0	12	.587	3	1.013	1	1.7e-2	3	NC	4	NC	3
138			min	-.169	4	.02	15	.023	12	-3.274e-4	10	597.121	3	457.153	1
139		13	max	0	12	.681	3	1.007	1	1.575e-2	3	NC	5	NC	3
140			min	-.169	4	.016	15	.027	12	-1.928e-4	10	478.9	3	462.68	1
141		14	max	0	12	.741	3	.971	1	1.451e-2	3	NC	15	NC	3
142			min	-.169	4	.012	15	.03	12	-5.827e-5	10	425.217	3	499.337	1
143		15	max	0	12	.745	3	.901	1	1.327e-2	3	NC	15	NC	3
144			min	-.169	4	-.004	10	.031	12	7.629e-5	10	422.276	3	589.51	1
145		16	max	0	12	.683	3	.803	1	1.202e-2	3	9111.7	15	NC	3
146			min	-.169	4	-.005	10	.031	12	2.108e-4	10	476.964	3	790.787	1
147		17	max	0	12	.559	3	.689	1	1.078e-2	3	NC	15	NC	3
148			min	-.169	4	.017	15	.029	12	3.454e-4	10	643.787	3	1303.765	1
149		18	max	0	12	.39	3	.583	1	9.535e-3	3	NC	5	NC	3
150			min	-.169	4	.029	15	.026	12	4.8e-4	10	1232.745	3	3325.732	1
151		19	max	0	12	.349	1	.514	1	8.292e-3	3	NC	1	NC	1
152			min	-.169	4	.048	15	.022	12	6.145e-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	.002	1	.002	5	.517	1	1.011e-2	1	NC	1	NC	1
154			min	-.407	4	-.025	3	-.017	5	-2.751e-4	5	NC	1	NC	1
155		2	max	.002	1	.12	3	.568	1	1.133e-2	1	NC	4	NC	3
156			min	-.407	4	-.19	1	.02	12	-1.272e-4	5	1337.425	1	3670.812	4
157		3	max	.002	1	.25	3	.666	1	1.254e-2	1	NC	5	NC	3
158			min	-.407	4	-.335	1	.02	12	-1.822e-4	3	722.735	1	1531.028	1
159		4	max	.001	1	.336	3	.777	1	1.376e-2	1	NC	5	NC	3
160			min	-.407	4	-.429	1	.021	12	-3.662e-4	3	556.816	1	876.455	1
161		5	max	.001	1	.363	3	.878	1	1.498e-2	1	NC	5	NC	3
162			min	-.407	4	-.459	1	.022	12	-5.501e-4	3	518.822	1	631.061	1
163		6	max	0	1	.329	3	.954	1	1.619e-2	1	NC	5	NC	3
164			min	-.407	4	-.424	1	.013	15	-7.341e-4	3	563.14	1	521.595	1
165		7	max	0	1	.243	3	.998	1	1.741e-2	1	NC	5	NC	3
166			min	-.408	4	-.337	1	-.002	15	-9.18e-4	3	717.792	1	474.143	1
167		8	max	0	1	.129	3	1.011	1	1.863e-2	1	NC	5	NC	3
168			min	-.408	4	-.222	1	-.011	5	-1.102e-3	3	1127.831	1	461.247	1
169		9	max	0	1	.023	3	1.005	1	1.984e-2	1	NC	4	NC	3
170			min	-.408	4	-.115	1	0	15	-1.286e-3	3	2392.539	1	467.444	1
171		10	max	0	1	-.002	15	.997	1	2.106e-2	1	NC	3	NC	3
172			min	-.408	4	-.066	1	.018	12	-1.47e-3	3	4913.479	1	474.966	1
173		11	max	0	3	.023	3	1.005	1	1.984e-2	1	NC	4	NC	3
174			min	-.408	4	-.115	1	.018	12	-1.286e-3	3	2392.539	1	467.444	1
175		12	max	0	3	.129	3	1.011	1	1.863e-2	1	NC	5	NC	3
176			min	-.408	4	-.222	1	.02	12	-1.102e-3	3	1127.831	1	461.247	1
177		13	max	0	3	.243	3	.998	1	1.741e-2	1	NC	5	NC	3
178			min	-.408	4	-.337	1	.021	12	-9.18e-4	3	717.792	1	474.143	1
179		14	max	0	3	.329	3	.954	1	1.619e-2	1	NC	15	NC	3
180			min	-.408	4	-.424	1	.022	12	-7.341e-4	3	563.14	1	521.595	1
181		15	max	0	3	.363	3	.878	1	1.498e-2	1	9248.385	15	NC	3
182			min	-.408	4	-.459	1	.022	12	-5.501e-4	3	518.822	1	631.061	1
183		16	max	0	3	.336	3	.777	1	1.376e-2	1	8808.993	15	NC	3
184			min	-.408	4	-.429	1	.014	15	-3.662e-4	3	556.816	1	876.455	1
185		17	max	.001	3	.25	3	.666	1	1.254e-2	1	NC	15	NC	3
186			min	-.408	4	-.335	1	.006	15	-1.822e-4	3	722.735	1	1531.028	1
187		18	max	.001	3	.12	3	.568	1	1.133e-2	1	NC	5	NC	3
188			min	-.408	4	-.19	1	.015	15	1.758e-6	3	1337.425	1	4432.91	1
189		19	max	.001	3	-.004	15	.517	1	1.011e-2	1	NC	1	NC	1
190			min	-.408	4	-.025	3	.022	12	1.524e-4	12	NC	1	NC	1
191	M12	1	max	0	3	.009	5	.519	1	9.649e-3	1	NC	1	NC	1
192			min	-.555	4	-.255	1	-.017	5	-3.147e-4	5	NC	1	NC	1
193		2	max	0	3	.063	3	.563	1	1.058e-2	1	NC	5	NC	3
194			min	-.555	4	-.49	1	.023	12	-1.777e-4	5	968.888	1	3907.579	4
195		3	max	0	3	.137	3	.656	1	1.152e-2	1	NC	5	NC	3
196			min	-.555	4	-.695	1	.025	12	-4.361e-5	15	518.757	1	1663.469	1
197		4	max	0	3	.182	3	.767	1	1.245e-2	1	NC	5	NC	3
198			min	-.555	4	-.838	1	.026	12	4.741e-5	15	391.376	1	921.446	1
199		5	max	0	3	.193	3	.869	1	1.339e-2	1	NC	5	NC	3
200			min	-.555	4	-.904	1	.027	12	1.384e-4	15	351.435	1	651.292	1
201		6	max	0	3	.172	3	.948	1	1.432e-2	1	NC	5	NC	3
202			min	-.555	4	-.892	1	.011	15	2.073e-4	12	358.061	1	531.59	1
203		7	max	0	3	.126	3	.995	1	1.525e-2	1	NC	5	NC	3
204			min	-.555	4	-.815	1	-.003	15	2.059e-4	12	407.521	1	478.613	1
205		8	max	0	3	.067	3	1.013	1	1.619e-2	1	NC	5	NC	3
206			min	-.555	4	-.699	1	-.011	5	2.046e-4	12	513.308	1	462.026	1
207		9	max	0	3	.014	3	1.009	1	1.712e-2	1	NC	5	NC	3
208			min	-.555	4	-.588	1	0	15	2.033e-4	12	685.858	1	465.582	1
209		10	max	0	1	-.008	12	1.002	1	1.806e-2	1	NC	3	NC	3

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	-.555	4	-.535	1	.017	12	2.02e-4	12	813.915	1	471.954	1
211		11	max	0	1	.014	3	1.009	1	1.712e-2	1	NC	5	NC	3
212			min	-.555	4	-.588	1	.018	12	2.033e-4	12	685.858	1	465.582	1
213		12	max	0	1	.067	3	1.013	1	1.619e-2	1	NC	5	NC	3
214			min	-.555	4	-.699	1	.02	12	2.046e-4	12	513.308	1	462.026	1
215		13	max	0	1	.126	3	.995	1	1.525e-2	1	NC	15	NC	3
216			min	-.555	4	-.815	1	.023	12	2.059e-4	12	407.521	1	478.613	1
217		14	max	0	1	.172	3	.948	1	1.432e-2	1	9770.834	15	NC	3
218			min	-.555	4	-.892	1	.026	12	2.073e-4	12	358.061	1	531.59	1
219		15	max	0	1	.193	3	.869	1	1.339e-2	1	9152.961	15	NC	3
220			min	-.555	4	-.904	1	.027	12	2.086e-4	12	351.435	1	651.292	1
221		16	max	0	1	.182	3	.767	1	1.245e-2	1	9680.188	15	NC	3
222			min	-.555	4	-.838	1	.016	15	2.099e-4	12	391.376	1	921.446	1
223		17	max	0	1	.137	3	.656	1	1.152e-2	1	NC	15	NC	3
224			min	-.555	4	-.695	1	.007	15	2.112e-4	12	518.757	1	1663.469	1
225		18	max	0	1	.063	3	.563	1	1.058e-2	1	NC	5	NC	3
226			min	-.555	4	-.49	1	.016	15	2.125e-4	12	968.888	1	5104.794	5
227		19	max	0	1	-.019	12	.519	1	9.649e-3	1	NC	1	NC	1
228			min	-.555	4	-.255	1	.021	12	2.138e-4	12	NC	1	NC	1
229	M13	1	max	0	3	.035	3	.522	1	1.825e-2	1	NC	1	NC	1
230			min	-.903	4	-1.01	1	-.017	5	-2.801e-3	3	NC	1	NC	1
231		2	max	0	3	.134	3	.596	1	2.045e-2	1	NC	5	NC	3
232			min	-.903	4	-1.356	1	.02	15	-3.373e-3	3	658.348	1	3069.933	1
233		3	max	0	3	.22	3	.706	1	2.265e-2	1	NC	5	NC	3
234			min	-.903	4	-1.674	1	.024	12	-3.945e-3	3	343.424	1	1236.439	1
235		4	max	0	3	.282	3	.822	1	2.485e-2	1	NC	15	NC	3
236			min	-.903	4	-1.928	1	.025	12	-4.517e-3	3	248.202	1	759.801	1
237		5	max	0	3	.312	3	.921	1	2.706e-2	1	9631.533	15	NC	3
238			min	-.903	4	-2.1	1	.025	12	-5.088e-3	3	209.055	1	570.698	1
239		6	max	0	3	.31	3	.991	1	2.926e-2	1	8350.333	15	NC	3
240			min	-.903	4	-2.184	1	.024	15	-5.66e-3	3	194.134	1	485.698	1
241		7	max	0	3	.283	3	1.027	1	3.146e-2	1	7808.25	15	NC	3
242			min	-.903	4	-2.189	1	.013	15	-6.232e-3	3	193.401	1	451.407	1
243		8	max	0	3	.24	3	1.032	1	3.367e-2	1	7705.364	15	NC	3
244			min	-.903	4	-2.137	1	.008	15	-6.804e-3	3	202.286	1	446.823	1
245		9	max	0	3	.197	3	1.019	1	3.587e-2	1	7842.733	15	NC	3
246			min	-.903	4	-2.066	1	.012	15	-7.376e-3	3	215.797	1	458.497	1
247		10	max	0	1	.177	3	1.009	1	3.807e-2	1	7969.428	15	NC	3
248			min	-.903	4	-2.029	1	.015	12	-7.948e-3	3	223.756	1	468.228	1
249		11	max	0	1	.197	3	1.019	1	3.587e-2	1	7606.958	15	NC	3
250			min	-.903	4	-2.066	1	.016	12	-7.376e-3	3	215.797	1	458.497	1
251		12	max	0	1	.24	3	1.032	1	3.367e-2	1	6953.348	15	NC	3
252			min	-.903	4	-2.137	1	.019	12	-6.804e-3	3	202.286	1	446.823	1
253		13	max	0	1	.283	3	1.027	1	3.146e-2	1	6440.397	15	NC	3
254			min	-.903	4	-2.189	1	.022	12	-6.232e-3	3	193.401	1	451.407	1
255		14	max	0	1	.31	3	.991	1	2.926e-2	1	6244.167	15	NC	3
256			min	-.902	4	-2.184	1	.024	12	-5.66e-3	3	194.134	1	485.698	1
257		15	max	0	1	.312	3	.921	1	2.706e-2	1	6477.076	15	NC	3
258			min	-.902	4	-2.1	1	.025	12	-5.088e-3	3	209.055	1	570.698	1
259		16	max	.001	1	.282	3	.822	1	2.485e-2	1	7377.979	15	NC	3
260			min	-.902	4	-1.928	1	.018	15	-4.517e-3	3	248.202	1	759.801	1
261		17	max	.001	1	.22	3	.706	1	2.265e-2	1	9732.692	15	NC	3
262			min	-.902	4	-1.674	1	.014	15	-3.945e-3	3	343.424	1	1236.439	1
263		18	max	.001	1	.134	3	.596	1	2.045e-2	1	NC	5	NC	3
264			min	-.902	4	-1.356	1	.022	12	-3.373e-3	3	658.348	1	3069.933	1
265		19	max	.002	1	.035	3	.522	1	1.825e-2	1	NC	1	NC	1
266			min	-.902	4	-1.01	1	.021	12	-2.801e-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	12	.001	5	1.764e-3	1	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-3.058e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.005	5	3.529e-3	1	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-6.116e-3	5	7839.972	1	NC	1
273		4	max	0	3	-.002	12	.01	5	5.293e-3	1	NC	3	NC	1
274			min	0	1	-.02	1	-.002	1	-9.174e-3	5	3482.538	1	6784.169	5
275		5	max	0	3	-.003	12	.018	5	5.849e-3	1	NC	3	NC	1
276			min	0	1	-.036	1	-.002	1	-1.051e-2	5	1950.385	1	3927.935	5
277		6	max	0	3	-.004	12	.027	5	5.289e-3	1	NC	3	NC	1
278			min	0	1	-.056	1	-.004	1	-1.025e-2	5	1247.39	1	2584.818	5
279		7	max	0	3	-.005	12	.038	5	4.729e-3	1	NC	12	NC	1
280			min	0	1	-.08	1	-.005	1	-9.993e-3	5	871.187	1	1844.806	5
281		8	max	0	3	-.006	12	.05	5	4.169e-3	1	NC	12	NC	1
282			min	0	1	-.107	1	-.006	1	-9.734e-3	5	646.462	1	1392.924	5
283		9	max	0	3	-.007	12	.063	5	3.609e-3	1	9471.529	12	NC	1
284			min	-.001	1	-.138	1	-.007	1	-9.476e-3	5	501.413	1	1096.231	5
285		10	max	0	3	-.009	12	.078	5	3.059e-3	2	7898.281	12	NC	1
286			min	-.001	1	-.172	1	-.008	1	-9.218e-3	5	402.24	1	890.611	5
287		11	max	0	3	-.01	12	.093	5	2.558e-3	2	6718.813	12	NC	2
288			min	-.001	1	-.209	1	-.009	1	-8.959e-3	5	331.41	1	742.134	5
289		12	max	0	3	-.012	12	.11	5	2.056e-3	2	5809.735	12	NC	3
290			min	-.001	1	-.248	1	-.01	1	-8.701e-3	5	279.021	1	631.325	5
291		13	max	0	3	-.014	12	.127	4	1.555e-3	2	5093.091	12	NC	3
292			min	-.001	1	-.29	1	-.01	1	-8.443e-3	5	239.159	1	545.991	4
293		14	max	0	3	-.015	12	.145	4	1.054e-3	2	4517.49	12	NC	3
294			min	-.002	1	-.333	1	-.01	1	-8.184e-3	5	208.111	1	478.801	4
295		15	max	0	3	-.017	12	.163	4	5.521e-4	2	4047.811	12	NC	2
296			min	-.002	1	-.378	1	-.01	1	-8.001e-3	4	183.451	1	425.167	4
297		16	max	0	3	-.019	12	.182	4	5.398e-4	3	3659.47	12	NC	1
298			min	-.002	1	-.424	1	-.009	1	-7.823e-3	4	163.544	1	381.696	4
299		17	max	.001	3	-.021	12	.2	4	7.671e-4	3	3334.682	12	NC	1
300			min	-.002	1	-.471	1	-.008	1	-7.646e-3	4	147.247	1	345.999	4
301		18	max	.001	3	-.023	12	.219	4	9.945e-4	3	3060.354	12	NC	1
302			min	-.002	1	-.518	1	-.009	3	-7.468e-3	4	133.746	1	316.362	4
303		19	max	.001	3	-.025	12	.238	4	1.222e-3	3	2826.664	12	NC	1
304			min	-.002	1	-.566	1	-.014	3	-7.29e-3	4	122.447	1	291.527	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	1	-.004	1	0	1	-3.214e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.005	4	0	1	NC	3	NC	1
310			min	0	1	-.016	1	0	1	-6.428e-3	4	4411.786	1	NC	1
311		4	max	0	3	-.001	15	.011	4	0	1	NC	3	NC	1
312			min	-.001	1	-.036	1	0	1	-9.643e-3	4	1924.688	1	6509.999	4
313		5	max	0	3	-.002	15	.018	4	0	1	NC	3	NC	1
314			min	-.001	1	-.065	1	0	1	-1.104e-2	4	1061.423	1	3770.744	4
315		6	max	.001	3	-.003	15	.028	4	0	1	NC	3	NC	1
316			min	-.002	1	-.103	1	0	1	-1.074e-2	4	670.8	1	2482.191	4
317		7	max	.001	3	-.005	15	.039	4	0	1	NC	3	NC	1
318			min	-.002	1	-.149	1	0	1	-1.045e-2	4	464.679	1	1772.341	4
319		8	max	.001	3	-.007	15	.052	4	0	1	NC	3	NC	1
320			min	-.002	1	-.202	1	0	1	-1.016e-2	4	342.785	1	1338.983	4
321		9	max	.002	3	-.009	15	.066	4	0	1	NC	3	NC	1
322			min	-.003	1	-.262	1	0	1	-9.869e-3	4	264.696	1	1054.529	4
323		10	max	.002	3	-.01	12	.081	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	1	-.328	1	0	1	-9.578e-3	4	211.612	1	857.447	4
325		11	max	.002	3	-.012	12	.097	4	0	1	NC	3	NC	1
326			min	-.003	1	-.399	1	0	1	-9.286e-3	4	173.874	1	715.179	4
327		12	max	.002	3	-.013	12	.114	4	0	1	NC	3	NC	1
328			min	-.004	1	-.474	1	0	1	-8.994e-3	4	146.065	1	609.042	4
329		13	max	.002	3	-.014	12	.131	4	0	1	NC	3	NC	1
330			min	-.004	1	-.555	1	0	1	-8.703e-3	4	124.97	1	527.728	4
331		14	max	.003	3	-.015	12	.149	4	0	1	NC	3	NC	1
332			min	-.004	1	-.638	1	0	1	-8.411e-3	4	108.582	1	464.059	4
333		15	max	.003	3	-.017	12	.168	4	0	1	NC	3	NC	1
334			min	-.004	1	-.725	1	0	1	-8.12e-3	4	95.595	1	413.296	4
335		16	max	.003	3	-.018	12	.186	4	0	1	NC	3	NC	1
336			min	-.005	1	-.814	1	0	1	-7.828e-3	4	85.13	1	372.218	4
337		17	max	.003	3	-.019	12	.205	4	0	1	NC	3	NC	1
338			min	-.005	1	-.905	1	0	1	-7.536e-3	4	76.578	1	338.558	4
339		18	max	.003	3	-.02	12	.223	4	0	1	NC	3	NC	1
340			min	-.005	1	-.997	1	0	1	-7.245e-3	4	69.504	1	310.693	4
341		19	max	.004	3	-.022	12	.241	4	0	1	NC	3	NC	1
342			min	-.006	1	-1.09	1	0	1	-6.953e-3	4	63.591	1	287.432	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	5.974e-4	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-3.482e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.005	4	1.195e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-6.965e-3	4	7839.972	1	NC	1
349		4	max	0	3	0	5	.011	4	1.792e-3	3	NC	3	NC	1
350			min	0	1	-.02	1	0	3	-1.045e-2	4	3482.538	1	6434.761	4
351		5	max	0	3	.002	5	.019	4	1.961e-3	3	NC	3	NC	1
352			min	0	1	-.036	1	-.002	3	-1.192e-2	4	1950.385	1	3732.489	4
353		6	max	0	3	.002	5	.028	4	1.734e-3	3	NC	3	NC	1
354			min	0	1	-.056	1	-.002	3	-1.152e-2	4	1247.39	1	2459.649	4
355		7	max	0	3	.003	5	.039	4	1.507e-3	3	NC	5	NC	1
356			min	0	1	-.08	1	-.003	3	-1.113e-2	4	871.187	1	1757.748	4
357		8	max	0	3	.004	5	.052	4	1.279e-3	3	NC	5	NC	1
358			min	0	1	-.107	1	-.003	3	-1.073e-2	4	646.462	1	1328.962	4
359		9	max	0	3	.005	5	.066	4	1.052e-3	3	NC	5	NC	1
360			min	-.001	1	-.138	1	-.003	3	-1.034e-2	4	501.413	1	1047.381	4
361		10	max	0	3	.006	5	.081	4	8.244e-4	3	NC	5	NC	1
362			min	-.001	1	-.172	1	-.004	3	-9.947e-3	4	402.24	1	852.229	4
363		11	max	0	3	.008	5	.097	4	5.971e-4	3	NC	7	NC	2
364			min	-.001	1	-.209	1	-.003	3	-9.553e-3	4	331.41	1	711.324	4
365		12	max	0	3	.009	5	.114	4	3.697e-4	3	NC	15	NC	3
366			min	-.001	1	-.248	1	-.003	3	-9.159e-3	4	279.021	1	606.193	4
367		13	max	0	3	.01	5	.132	4	1.423e-4	3	9502.61	15	NC	3
368			min	-.001	1	-.29	1	-.002	3	-8.765e-3	4	239.159	1	525.647	4
369		14	max	0	3	.012	5	.15	4	-5.243e-5	12	8343.343	15	NC	3
370			min	-.002	1	-.333	1	0	3	-8.372e-3	4	208.111	1	462.585	4
371		15	max	0	3	.013	5	.168	4	2.579e-5	9	7410.644	15	NC	2
372			min	-.002	1	-.378	1	0	12	-7.978e-3	4	183.451	1	412.318	4
373		16	max	0	3	.015	5	.186	4	3.129e-4	1	6649.178	15	NC	1
374			min	-.002	1	-.424	1	.001	10	-7.614e-3	5	163.544	1	371.654	4
375		17	max	.001	3	.016	5	.205	4	8.732e-4	1	6019.583	15	NC	1
376			min	-.002	1	-.471	1	0	10	-7.308e-3	5	147.247	1	338.352	4
377		18	max	.001	3	.018	5	.223	4	1.433e-3	1	5493.332	15	NC	1
378			min	-.002	1	-.518	1	0	10	-7.001e-3	5	133.746	1	310.804	4
379		19	max	.001	3	.019	5	.241	4	1.994e-3	1	5049.338	15	NC	1
380			min	-.002	1	-.566	1	-.002	10	-6.694e-3	5	122.447	1	287.832	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	.026	1	0	12	.014	5	1.474e-3	1	NC	1	NC	1
382			min	.002	12	-.008	1	-.002	1	-1.114e-3	5	NC	1	NC	1
383		2	max	.025	1	-.003	12	.06	5	2.162e-3	1	NC	1	NC	4
384			min	.002	12	-.052	1	-.027	1	-1.212e-3	5	NC	1	2867.154	1
385		3	max	.024	1	-.005	12	.106	5	2.85e-3	1	NC	1	NC	4
386			min	.002	12	-.096	1	-.052	1	-1.31e-3	5	NC	1	1451.634	1
387		4	max	.023	1	-.007	12	.152	5	3.538e-3	1	NC	1	NC	4
388			min	.002	12	-.141	1	-.076	1	-1.408e-3	5	NC	1	985.964	1
389		5	max	.023	1	-.009	12	.198	5	4.226e-3	1	NC	1	NC	6
390			min	.003	12	-.185	1	-.098	1	-1.506e-3	5	NC	1	758.275	1
391		6	max	.022	1	-.011	12	.244	5	4.914e-3	1	NC	1	8651.887	6
392			min	.003	15	-.228	1	-.118	1	-1.683e-3	3	9670.313	4	626.389	1
393		7	max	.021	1	-.013	12	.289	5	5.601e-3	1	NC	1	7253.163	6
394			min	.003	15	-.272	1	-.135	1	-1.931e-3	3	8575.823	4	543.13	1
395		8	max	.02	1	-.014	12	.334	5	6.289e-3	1	NC	1	6347.393	6
396			min	.003	15	-.316	1	-.15	1	-2.179e-3	3	7918.965	4	488.545	1
397		9	max	.02	1	-.016	12	.378	5	6.977e-3	1	NC	3	5755.919	6
398			min	.003	15	-.359	1	-.16	1	-2.427e-3	3	7565.404	6	452.994	1
399		10	max	.019	1	-.017	12	.42	5	7.665e-3	1	NC	3	5386.919	6
400			min	.003	15	-.402	1	-.167	1	-2.674e-3	3	7453.555	4	431.587	1
401		11	max	.018	1	-.019	12	.462	5	8.353e-3	1	NC	3	5194.541	6
402			min	.003	15	-.445	1	-.17	1	-2.922e-3	3	7565.404	4	422.064	1
403		12	max	.018	1	-.02	12	.503	5	9.041e-3	1	NC	1	5162.942	6
404			min	.003	15	-.487	1	-.168	1	-3.17e-3	3	7918.965	4	390.979	14
405		13	max	.017	1	-.021	12	.542	5	9.729e-3	1	NC	1	5303.212	6
406			min	.003	15	-.529	1	-.16	1	-3.418e-3	3	8575.823	4	350.3	14
407		14	max	.016	1	-.022	12	.58	5	1.042e-2	1	NC	1	5662.438	6
408			min	.002	15	-.571	1	-.146	1	-3.666e-3	3	9670.313	4	315.689	14
409		15	max	.015	1	-.023	12	.616	5	1.11e-2	1	NC	1	6356.135	6
410			min	.002	15	-.613	1	-.127	1	-3.913e-3	3	NC	1	285.882	14
411		16	max	.015	1	-.024	12	.651	5	1.179e-2	1	NC	1	7672.409	6
412			min	.002	15	-.655	1	-.1	1	-4.161e-3	3	NC	1	259.952	14
413		17	max	.014	1	-.025	12	.684	5	1.248e-2	1	NC	1	NC	6
414			min	.002	10	-.697	1	-.068	2	-4.409e-3	3	NC	1	237.201	14
415		18	max	.013	1	-.026	12	.719	4	1.317e-2	1	NC	1	NC	4
416			min	.002	10	-.738	1	-.03	2	-4.657e-3	3	NC	1	217.095	14
417		19	max	.012	1	-.026	12	.755	4	1.386e-2	1	NC	1	NC	1
418			min	.002	10	-.78	1	-.001	3	-4.904e-3	3	NC	1	199.217	14
419	M6	1	max	.047	1	0	15	.014	4	0	1	NC	1	NC	1
420			min	.002	15	-.015	1	0	1	-1.19e-3	5	NC	1	NC	1
421		2	max	.045	1	-.002	12	.063	4	0	1	NC	1	NC	1
422			min	.002	15	-.1	1	0	1	-1.351e-3	4	NC	1	NC	1
423		3	max	.043	1	-.003	12	.111	4	0	1	NC	1	NC	1
424			min	.001	15	-.185	1	0	1	-1.512e-3	4	NC	1	5264.337	4
425		4	max	.041	1	-.004	12	.16	4	0	1	NC	1	NC	1
426			min	.001	15	-.27	1	0	1	-1.673e-3	4	NC	1	3524.174	4
427		5	max	.039	1	-.005	12	.208	4	0	1	NC	1	NC	1
428			min	.001	15	-.355	1	0	1	-1.834e-3	4	NC	1	2677.477	4
429		6	max	.037	1	-.006	12	.256	4	0	1	NC	1	NC	1
430			min	.001	15	-.44	1	0	1	-1.995e-3	4	9670.313	6	2189.239	4
431		7	max	.035	1	-.007	12	.303	4	0	1	NC	1	NC	1
432			min	.001	15	-.524	1	0	1	-2.156e-3	4	8575.823	6	1882.06	4
433		8	max	.033	1	-.008	12	.349	4	0	1	NC	1	NC	1
434			min	.001	15	-.608	1	0	1	-2.317e-3	4	7918.965	6	1680.925	4
435		9	max	.031	1	-.008	12	.394	4	0	1	NC	3	NC	1
436			min	.001	15	-.693	1	0	1	-2.478e-3	4	7565.404	6	1549.551	4
437		10	max	.029	1	-.009	12	.438	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	.001	15	-.776	1	0	1	-2.639e-3	4	7453.555	6	1469.4	4
439		11	max	.027	1	-.009	12	.48	4	0	1	NC	3	NC	1
440			min	.001	15	-.86	1	0	1	-2.801e-3	4	7565.404	6	1431.665	4
441		12	max	.025	1	-.01	12	.522	4	0	1	NC	1	NC	1
442			min	0	15	-.943	1	0	1	-2.962e-3	4	7918.965	6	1434.301	4
443		13	max	.023	1	-.01	12	.561	4	0	1	NC	1	NC	1
444			min	0	15	-1.026	1	0	1	-3.123e-3	4	8575.823	6	1481.902	4
445		14	max	.021	1	-.01	3	.599	4	0	1	NC	1	NC	1
446			min	0	15	-1.109	1	0	1	-3.284e-3	4	9670.313	6	1588.607	4
447		15	max	.019	1	-.009	3	.635	4	0	1	NC	1	NC	1
448			min	0	15	-1.192	1	0	1	-3.445e-3	4	NC	1	1787.395	4
449		16	max	.018	3	-.009	3	.668	4	0	1	NC	1	NC	1
450			min	0	10	-1.275	1	0	1	-3.606e-3	4	NC	1	2159.363	4
451		17	max	.019	3	-.008	3	.7	4	0	1	NC	1	NC	1
452			min	0	10	-1.357	1	0	1	-3.767e-3	4	NC	1	2952.052	4
453		18	max	.019	3	-.007	3	.729	4	0	1	NC	1	NC	1
454			min	-.002	10	-1.44	1	0	1	-3.928e-3	4	NC	1	5409.128	4
455		19	max	.02	3	-.006	3	.756	4	0	1	NC	1	NC	1
456			min	-.003	10	-1.522	1	0	1	-4.09e-3	4	NC	1	NC	1
457	M9	1	max	.026	1	0	5	.014	4	4.443e-4	3	NC	1	NC	1
458			min	-.001	5	-.008	1	-.001	3	-1.474e-3	1	NC	1	NC	1
459		2	max	.025	1	0	5	.067	4	6.921e-4	3	NC	1	NC	7
460			min	-.001	5	-.052	1	-.01	3	-2.162e-3	1	NC	1	2867.154	1
461		3	max	.024	1	.002	5	.119	4	9.399e-4	3	NC	1	7485.189	12
462			min	-.001	5	-.096	1	-.018	3	-2.85e-3	1	NC	1	1451.634	1
463		4	max	.023	1	.002	5	.171	4	1.188e-3	3	NC	1	5085.797	12
464			min	-.001	5	-.141	1	-.026	3	-3.538e-3	1	NC	1	985.964	1
465		5	max	.023	1	.003	5	.222	4	1.435e-3	3	NC	1	3912.588	12
466			min	-.001	5	-.185	1	-.034	3	-4.226e-3	1	NC	1	758.275	1
467		6	max	.022	1	.004	5	.273	4	1.683e-3	3	NC	1	3233.027	12
468			min	-.001	5	-.228	1	-.041	3	-4.914e-3	1	9670.313	6	626.389	1
469		7	max	.021	1	.005	5	.323	4	1.931e-3	3	NC	1	2804.06	12
470			min	-.001	5	-.272	1	-.047	3	-5.601e-3	1	8575.823	6	543.13	1
471		8	max	.02	1	.006	5	.371	4	2.179e-3	3	NC	1	2522.881	12
472			min	-.001	5	-.316	1	-.052	3	-6.289e-3	1	7918.965	6	488.545	1
473		9	max	.02	1	.007	5	.417	4	2.427e-3	3	NC	3	2339.839	12
474			min	-.002	5	-.359	1	-.056	3	-6.977e-3	1	7565.404	6	452.994	1
475		10	max	.019	1	.008	5	.462	4	2.674e-3	3	NC	3	2229.748	12
476			min	-.002	5	-.402	1	-.058	3	-7.665e-3	1	7453.555	6	431.587	1
477		11	max	.018	1	.01	5	.505	4	2.922e-3	3	NC	3	2180.983	12
478			min	-.002	5	-.445	1	-.06	3	-8.353e-3	1	7565.404	6	422.064	1
479		12	max	.018	1	.011	5	.545	4	3.17e-3	3	NC	1	2191.562	12
480			min	-.002	5	-.487	1	-.059	3	-9.041e-3	1	7031.54	5	424.031	1
481		13	max	.017	1	.013	5	.583	4	3.418e-3	3	NC	1	2269.251	12
482			min	-.002	5	-.529	1	-.057	3	-9.729e-3	1	6141.118	5	438.985	1
483		14	max	.016	1	.015	5	.618	4	3.666e-3	3	NC	1	2436.19	12
484			min	-.002	5	-.571	1	-.053	3	-1.042e-2	1	5413.036	5	471.202	1
485		15	max	.015	1	.016	5	.65	4	3.913e-3	3	NC	1	2743.207	12
486			min	-.002	5	-.613	1	-.047	3	-1.11e-2	1	4812.351	5	530.502	1
487		16	max	.015	1	.018	5	.679	4	4.161e-3	3	NC	1	3314.7	12
488			min	-.002	5	-.655	1	-.038	3	-1.179e-2	1	4313.05	5	640.927	1
489		17	max	.014	1	.02	5	.704	4	4.409e-3	3	NC	1	4529.84	12
490			min	-.002	5	-.697	1	-.028	3	-1.248e-2	1	3895.439	5	875.765	1
491		18	max	.013	1	.022	5	.726	4	4.657e-3	3	NC	1	8292.882	12
492			min	-.002	5	-.738	1	-.014	3	-1.317e-2	1	3544.409	5	1603.074	1
493		19	max	.012	1	.024	5	.744	4	4.904e-3	3	NC	1	NC	1
494			min	-.002	5	-.78	1	-.025	1	-1.386e-2	1	3248.241	5	NC	1