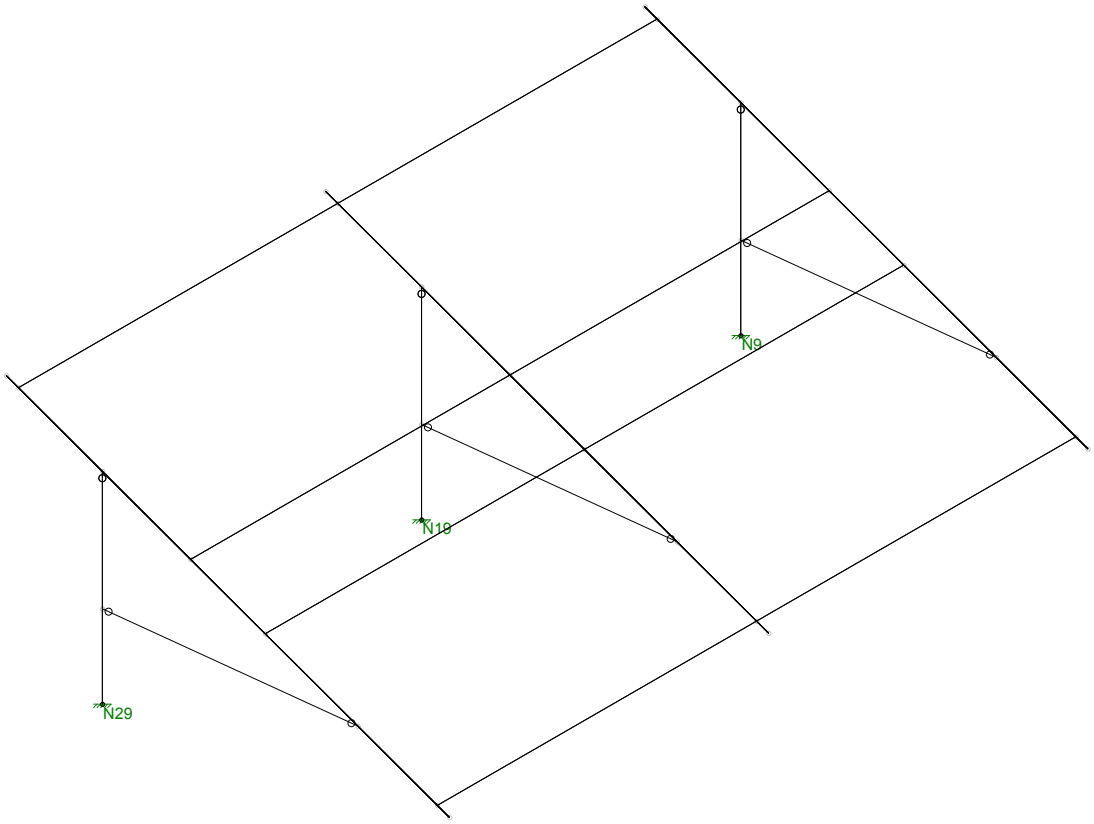


Schletter, Inc.		20° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

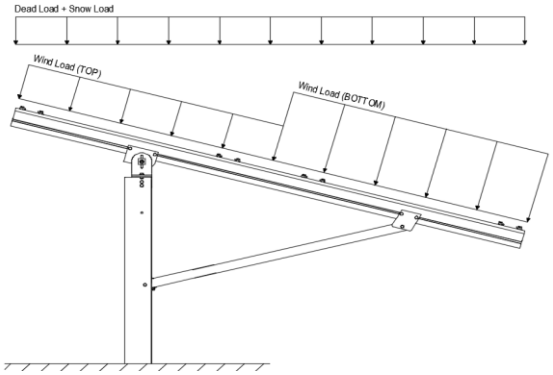
1.2 Construction

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

PV modules are required to meet the following specifications:

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

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



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

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

2.3 Wind Loads

Design Wind Speed, V =	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

$Cf+_{TOP}$ =	1.05	*(Pressure)*	*Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.*
$Cf+_{BOTTOM}$ =	1.65		
$Cf-_{TOP}$ =	-2.12	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1		

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

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

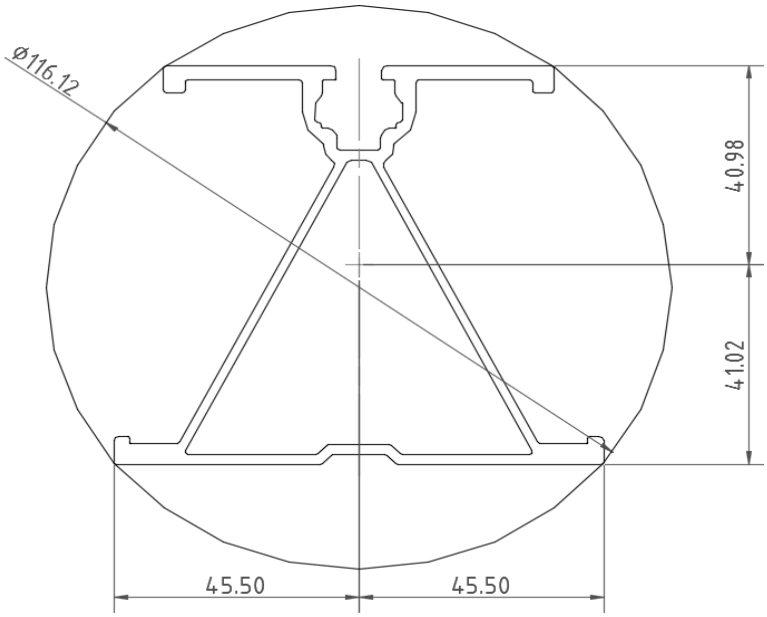
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	0.920	k-ft
M_z =	0.151	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	46%	

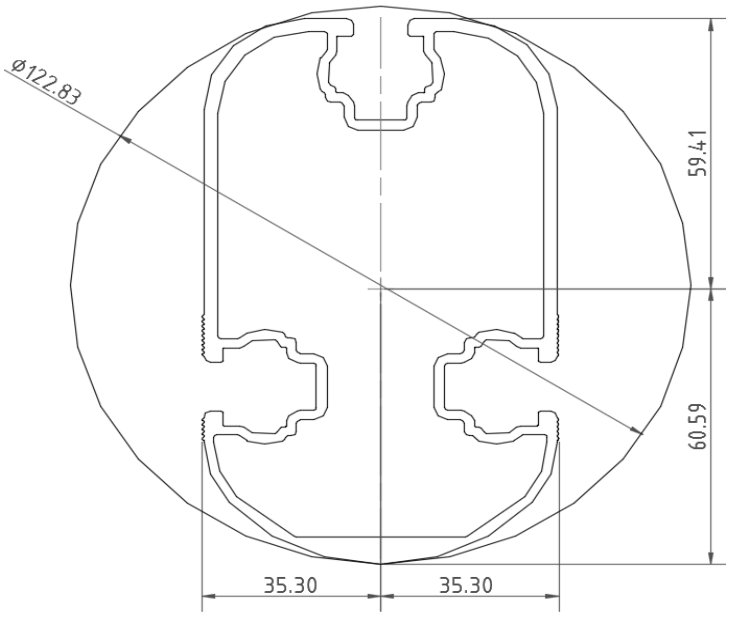


DETAIL VIEW

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 =	3.031	k-ft
M_z =	0.000	k-ft
P_n =	6.273	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	72%	

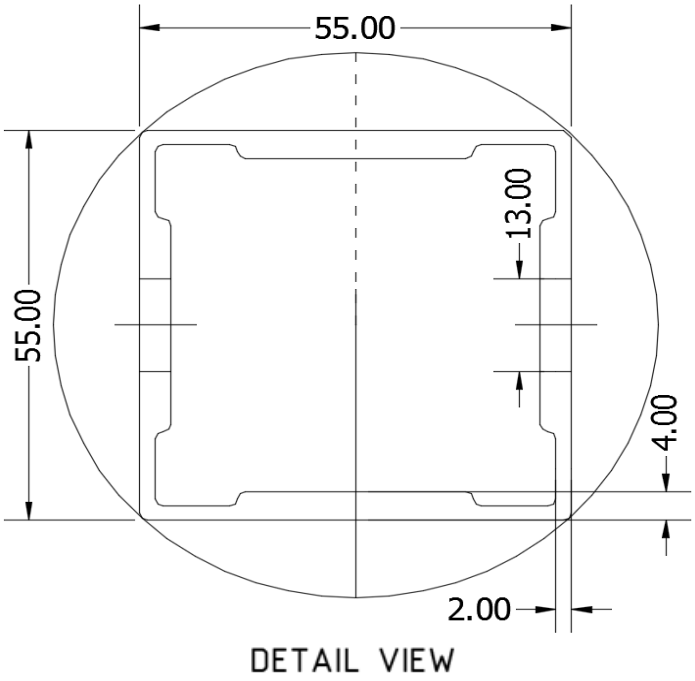


DETAIL VIEW

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).

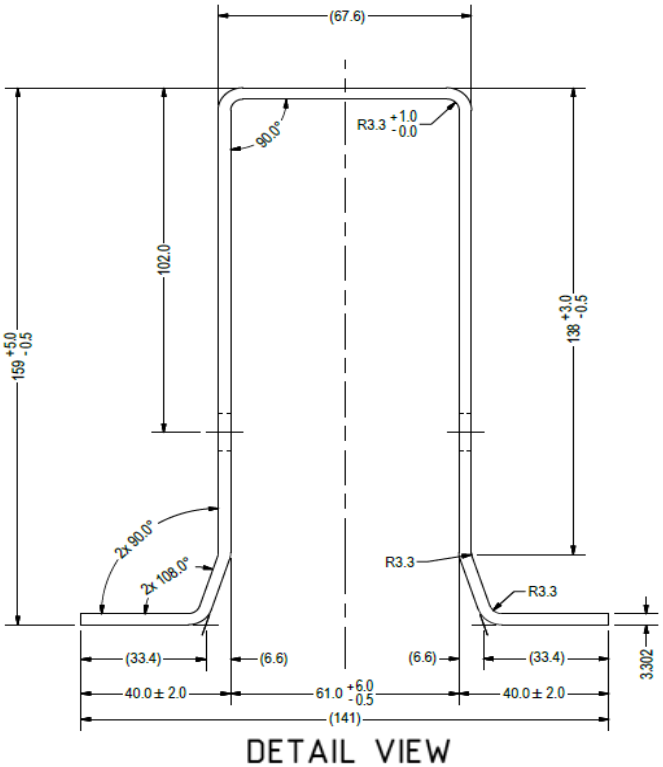
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.008	k-ft
M_z =	0.000	k-ft
P_n =	6.271	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	67%	



4.4 Post Design

Galvanized steel posts are a roll formed steel section, that are either ram driven into the ground or placed in a concrete foundation at a defined depth. Embedment depths will be provided on the structural drawings or through a geotechnical testing report. See Appendix A.4 for detailed member calculations. Section units are in (mm).

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	72.67	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	15.430	k-ft
M_z =	0.000	k-ft
P_r =	5.606	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.013	k
Utilization =	97%	



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 =	4.05	k
Maximum Lateral Load =	1.95	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 =	1.60	k
Height of Pole Above Grade, H =	5.06	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

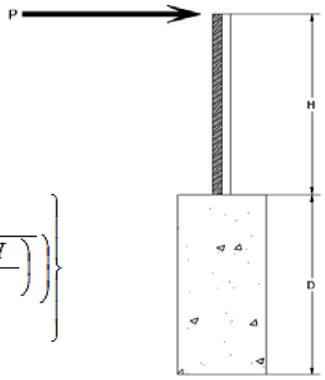
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.60	k
Height of Pole Above Grade, H =	5.06	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
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 =	8.64	
Required Footing Depth, D =	12.46	ft

2nd Trial @ D_2 =	7.86	ft
Lateral Soil Bearing @ D/3, S_1 =	0.52	ksf
Lateral Soil Bearing @ D, S_3 =	1.57	ksf
Constant 2.34P/(S_1B), A =	3.57	
Required Footing Depth, D =	6.57	ft

3rd Trial @ D_3 =	7.21	ft
Lateral Soil Bearing @ D/3, S_1 =	0.48	ksf
Lateral Soil Bearing @ D, S_3 =	1.44	ksf
Constant 2.34P/(S_1B), A =	3.89	
Required Footing Depth, D =	6.97	ft

4th Trial @ D_4 =	7.09	ft
Lateral Soil Bearing @ D/3, S_1 =	0.47	ksf
Lateral Soil Bearing @ D, S_3 =	1.42	ksf
Constant 2.34P/(S_1B), A =	3.96	
Required Footing Depth, D =	7.05	ft

5th Trial @ D_5 =	7.07	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 =	3.97	
Required Footing Depth, D =	7.25	ft

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

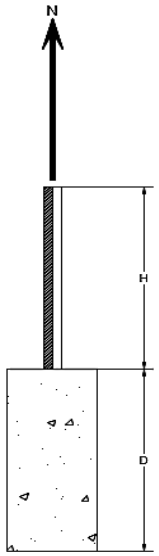
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	1.85	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 =	1.19	k
Required Concrete Volume, V =	8.20	ft^3
Required Footing Depth, D =	2.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	3.96
2	0.4	0.2	118.10	3.85
3	0.6	0.2	118.10	3.75
4	0.8	0.2	118.10	3.65
5	1	0.2	118.10	3.54
6	1.2	0.2	118.10	3.44
7	1.4	0.2	118.10	3.34
8	1.6	0.2	118.10	3.23
9	1.8	0.2	118.10	3.13
10	2	0.2	118.10	3.02
11	2.2	0.2	118.10	2.92
12	2.4	0.2	118.10	2.82
13	2.6	0.2	118.10	2.71
14	2.8	0.2	118.10	2.61
15	0	0.0	0.00	2.61
16	0	0.0	0.00	2.61
17	0	0.0	0.00	2.61
18	0	0.0	0.00	2.61
19	0	0.0	0.00	2.61
20	0	0.0	0.00	2.61
21	0	0.0	0.00	2.61
22	0	0.0	0.00	2.61
23	0	0.0	0.00	2.61
24	0	0.0	0.00	2.61
25	0	0.0	0.00	2.61
26	0	0.0	0.00	2.61
27	0	0.0	0.00	2.61
28	0	0.0	0.00	2.61
29	0	0.0	0.00	2.61
30	0	0.0	0.00	2.61
31	0	0.0	0.00	2.61
32	0	0.0	0.00	2.61
33	0	0.0	0.00	2.61
34	0	0.0	0.00	2.61
Max	2.8	Sum	0.66	

A 2ft diameter x 2.75ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	7.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.48	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	26.70	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

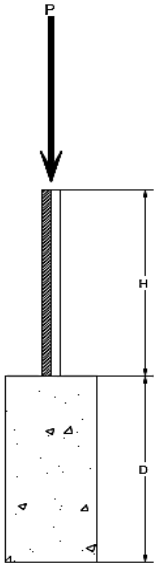
Weight of Concrete

Footing Volume	22.78	ft^3
Weight	3.30	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	4.01	k
1/3 Increase for Wind =	1.33	
Total Resistance =	11.62	k
Applied Force =	6.79	k
Utilization =	58%	

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



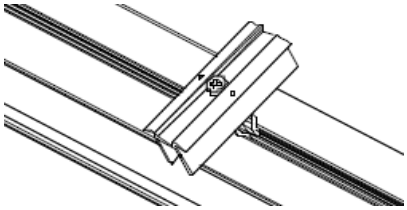
6. DESIGN OF JOINTS AND CONNECTIONS

6.1 Anchorage of Modules to Purlins and Connection of Purlins to Girders

Modules are secured to the purlins with Schletter, Inc. Rapid2+ mounting clamps. Purlins are secured to the girders with the use of 40mm mounting clamps. The reliability of calculations is uncertain due to limited standards, therefore the strength of the clamp fasteners has been evaluated by load testing.

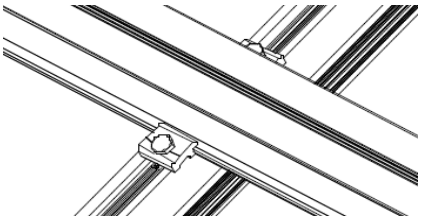
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.437 k
Allowable Uplift	=	1.214 k
Utilization	=	36%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.224 k
Allowable Uplift	=	2.180 k
Utilization	=	56%

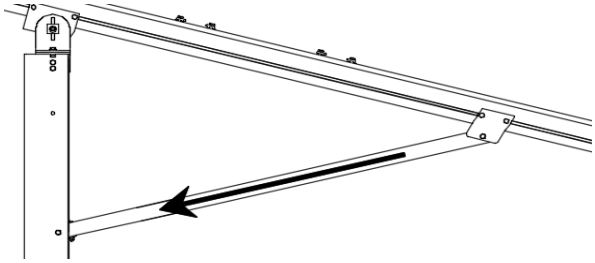


6.2 Strut Connections

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

Maximum Axial Load	=	6.271 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	71%

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

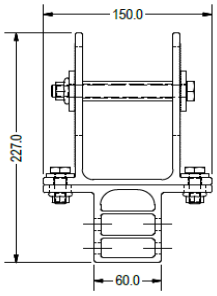


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

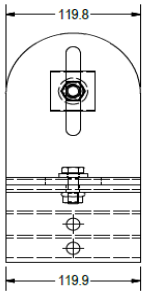
6.3 Girder to Post Connection

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.

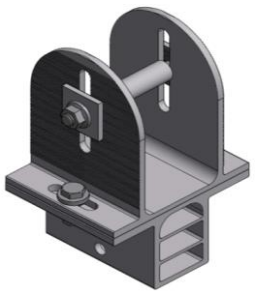
Maximum Tensile Load	=	2.566 k
Allowable Load	=	5.649 k
Utilization	=	45%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

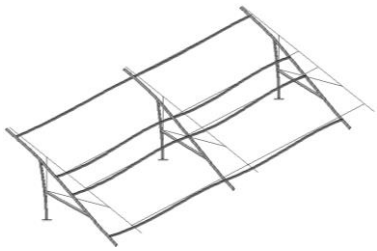
7.1 Seismic Drift

The racking structure has been analyzed under seismic loading. The allowable story drift of the structure must fall within the limits provided by (ASCE 7, Table 12.12-1).

Mean Height, h_{sx}	=	57.36 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.147 in
Max Drift, Δ_{MAX}	=	0.663 in

0.663 ≤ 1.147, OK.

The racking structure's reaction to seismic loads is shown to the right. The deflections have been magnified to provide a clear portrayal of potential story drift.



APPENDIX A

A.1 Design of Aluminum Purlins - Aluminum Design Manual, 2005 Edition

Purlin = **S1.5**

Strong Axis:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	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 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 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

$\varphi F_L St$= 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

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:	Weak Axis:
3.4.14	**3.4.14**
L_b = 74.8031 in	L_b = 74.8031
J = 1.98	J = 1.98
80.5199	80.5199
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$
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= 30.5 ksi	φF_L= 30.5
3.4.16	**3.4.16**
b/t = 24.5	b/t = 24.5
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$
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= 28.2 ksi	φF_L= 28.2 ksi
3.4.16.1 Not Used	**3.4.16.1**
Rb/t = 0.0	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 = 24.5	h/t = 24.5
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$
S1 = 36.9	S1 = 36.9
m = 0.65	m = 0.65
C_0 = 27.5	C_0 = 27.5
Cc = 27.5	Cc = 27.5
$S2 = \frac{k_1 Bbr}{mDbr}$	$S2 = \frac{k_1 Bbr}{mDbr}$
S2 = 77.3	S2 = 77.3
φF_L= 1.3φyFcy	φF_L= 1.3φyFcy
φF_L= 43.2 ksi	φF_L= 43.2 ksi
φF_LSt= 28.2 ksi	φF_LWk= 28.2 ksi
Ix = 279836 mm^4	Iy = 279836 mm^4
0.672 in^4	0.672 in^4
y = 27.5 mm	x = 27.5 mm
Sx = 0.621 in^3	Sy = 0.621 in^3
M_{max}St = 1.460 k-ft	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 =	72.67	in	
Pr =	5.61	k	(LRFD Factored Load)
Mr (Strong) =	15.43	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

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

Torsional/Flexural Torsional Buckling:

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

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1639	<	0.2	
Utilization =	0.97	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.164	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 97%

APPENDIX B

B.1

The following pages will contain the results from RISA. Please refer back to Section 2 for load information and Section 4-5 for member and foundation design.

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead Load, Max	DL		-1				4		
2	Dead Load, Min	DL		-1				4		
3	Snow Load	SL						4		
4	Wind Load - Pressure	WL						4		
5	Wind Load - Suction	WL						4		
6	Seismic - Lateral	EL			.8			8		

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

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

Member Distributed Loads (BLC 4 : Wind Load - Pressure)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	-65.446	-65.446	0	0
2	M11	y	-65.446	-65.446	0	0
3	M12	y	-102.844	-102.844	0	0
4	M13	y	-102.844	-102.844	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	132.139	132.139	0	0
2	M11	y	132.139	132.139	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	195.296	2	2260.912	1	146.629	1	.225	1	.004	5	8.403	1
2		min	-408.476	3	-1065.67	3	-318.533	5	-1.312	5	-.002	1	-.375	3
3	N19	max	1451.283	2	5654.489	1	0	12	0	3	.004	4	13.632	1
4		min	-1311.443	3	-3116.404	3	-336.379	5	-1.362	4	0	1	-.376	3
5	N29	max	195.296	2	2260.912	1	96.158	3	.105	3	.004	4	8.403	1
6		min	-408.476	3	-1065.67	3	-354.619	4	-1.383	4	0	3	-.386	5
7	Totals:	max	1841.874	2	10176.314	1	0	1						
8		min	-2128.394	3	-5247.745	3	-985.37	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	-.077	3	196.424	3	13.58	3	.042	3	.293	1	.226	1
4			min	-198.03	1	-599.063	1	-142.668	1	-.187	1	-.018	3	-.073	3
5		3	max	-.546	3	195.135	3	13.58	3	.042	3	.199	1	.62	1
6			min	-198.656	1	-600.782	1	-142.668	1	-.187	1	-.009	3	-.202	3
7		4	max	-1.015	3	193.845	3	13.58	3	.042	3	.105	1	1.014	1
8			min	-199.282	1	-602.501	1	-142.668	1	-.187	1	0	3	-.329	3
9		5	max	737.793	3	553.974	1	21.944	3	0	3	.142	1	1.197	1
10			min	-2614.14	1	-169.217	3	-169.31	1	-.049	1	-.03	3	-.39	3
11		6	max	737.324	3	552.255	1	21.944	3	0	3	.031	2	.834	1
12			min	-2614.765	1	-170.506	3	-169.31	1	-.049	1	-.018	5	-.278	3
13		7	max	736.854	3	550.536	1	21.944	3	0	3	0	12	.473	1
14			min	-2615.391	1	-171.795	3	-169.31	1	-.049	1	-.08	1	-.166	3
15		8	max	736.385	3	548.816	1	21.944	3	0	3	.013	3	.112	1
16			min	-2616.017	1	-173.085	3	-169.31	1	-.049	1	-.192	1	-.053	3
17		9	max	737.871	3	17.937	1	36.594	3	.013	5	.11	4	.001	3
18			min	-2829.915	1	-4.02	3	-223.79	1	-.141	1	.001	12	-.055	1
19		10	max	737.402	3	16.218	1	36.594	3	.013	5	.025	3	.004	3
20			min	-2830.541	1	-5.309	3	-223.79	1	-.141	1	-.04	1	-.066	1
21		11	max	736.933	3	14.499	1	36.594	3	.013	5	.049	3	.008	3
22			min	-2831.166	1	-6.599	3	-223.79	1	-.141	1	-.187	1	-.076	1
23		12	max	735.507	3	405.182	3	4.473	10	.139	3	.144	4	.076	1
24			min	-3039.101	1	-438.618	1	-200.403	4	-.229	1	.015	12	-.123	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	735.038	3	403.893	3	4.473	10	.139	3	.118	1	.364	1
26			min	-3039.727	1	-440.337	1	-201.989	4	-.229	1	-.023	3	-.389	3
27		14	max	734.569	3	402.603	3	4.473	10	.139	3	.103	1	.654	1
28			min	-3040.353	1	-442.057	1	-203.574	4	-.229	1	-.136	5	-.653	3
29		15	max	734.1	3	401.314	3	4.473	10	.139	3	.089	1	.944	1
30			min	-3040.979	1	-443.776	1	-205.16	4	-.229	1	-.266	5	-.917	3
31		16	max	199.689	1	436.915	1	68.683	5	.115	1	.004	3	.718	1
32			min	-.545	3	-417.365	3	-140.969	1	-.177	3	-.206	4	-.7	3
33		17	max	199.063	1	435.196	1	67.097	5	.115	1	.015	3	.432	1
34			min	-1.014	3	-418.654	3	-140.969	1	-.177	3	-.212	1	-.426	3
35		18	max	198.437	1	433.477	1	65.512	5	.115	1	.026	3	.147	1
36			min	-1.483	3	-419.943	3	-140.969	1	-.177	3	-.304	1	-.151	3
37		19	max	0	1	0	15	0	1	0	1	0	1	0	1
38			min	0	1	0	1	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.006	1	0	4	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	3.914	10	506.08	3	0	1	.02	4	.252	4	.4	1
42			min	-236.888	1	-1347.293	1	-95.242	5	0	1	0	1	-.155	3
43		3	max	3.393	10	504.79	3	0	1	.02	4	.189	4	1.285	1
44			min	-237.514	1	-1349.012	1	-96.828	5	0	1	0	1	-.486	3
45		4	max	2.872	10	503.501	3	0	1	.02	4	.125	4	2.17	1
46			min	-238.14	1	-1350.731	1	-98.413	5	0	1	0	1	-.817	3
47		5	max	2090.978	3	1377.527	1	0	1	0	1	.036	4	2.556	1
48			min	-5947.801	1	-533.168	3	-100.273	4	-.009	4	0	1	-.957	3
49		6	max	2090.509	3	1375.808	1	0	1	0	1	0	1	1.652	1
50			min	-5948.426	1	-534.458	3	-101.858	4	-.009	4	-.031	5	-.606	3
51		7	max	2090.039	3	1374.088	1	0	1	0	1	0	1	.75	1
52			min	-5949.052	1	-535.747	3	-103.444	4	-.009	4	-.098	4	-.255	3
53		8	max	2089.57	3	1372.369	1	0	1	0	1	0	1	.097	3
54			min	-5949.678	1	-537.037	3	-105.03	4	-.009	4	-.166	4	-.151	1
55		9	max	2050.918	3	23.612	3	0	1	.011	4	.165	4	.265	3
56			min	-6154.83	1	-124.984	1	-230.767	4	0	1	0	1	-.573	1
57		10	max	2050.449	3	22.323	3	0	1	.011	4	.014	5	.25	3
58			min	-6155.456	1	-126.704	1	-232.352	4	0	1	0	1	-.49	1
59		11	max	2049.98	3	21.034	3	0	1	.011	4	0	1	.236	3
60			min	-6156.081	1	-128.423	1	-233.938	4	0	1	-.14	4	-.407	1
61		12	max	2017.151	3	1208.733	3	0	1	.106	4	.179	5	.075	1
62			min	-6373.16	1	-1486.441	1	-228.698	5	0	1	0	1	-.147	3
63		13	max	2016.681	3	1207.444	3	0	1	.106	4	.028	5	1.051	1
64			min	-6373.786	1	-1488.16	1	-230.283	5	0	1	0	1	-.939	3
65		14	max	2016.212	3	1206.154	3	0	1	.106	4	0	1	2.028	1
66			min	-6374.411	1	-1489.879	1	-231.869	5	0	1	-.123	4	-1.731	3
67		15	max	2015.743	3	1204.865	3	0	1	.106	4	0	1	3.006	1
68			min	-6375.037	1	-1491.598	1	-233.454	5	0	1	-.276	5	-2.522	3
69		16	max	237.326	1	1394.327	1	51.874	5	0	1	0	1	2.29	1
70			min	-3.415	10	-1174.083	3	0	1	-.1	4	-.188	5	-1.916	3
71		17	max	236.7	1	1392.608	1	50.288	5	0	1	0	1	1.375	1
72			min	-3.937	10	-1175.372	3	0	1	-.1	4	-.154	4	-1.145	3
73		18	max	236.074	1	1390.889	1	48.703	5	0	1	0	1	.462	1
74			min	-4.458	10	-1176.662	3	0	1	-.1	4	-.123	4	-.374	3
75		19	max	0	1	0	5	0	1	0	1	0	1	0	1
76			min	0	1	-.001	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.003	1	0	4	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	27.162	5	196.424	3	142.668	1	.187	1	.129	5	.226	1
80			min	-198.03	1	-599.063	1	-42.535	5	-.042	3	-.293	1	-.073	3
81		3	max	26.87	5	195.135	3	142.668	1	.187	1	.101	5	.62	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	-198.656	1	-600.782	1	-44.121	5	-.042	3	-.199	1	-.202	3
83		4	max	26.578	5	193.845	3	142.668	1	.187	1	.071	5	1.014	1
84			min	-199.282	1	-602.501	1	-45.707	5	-.042	3	-.105	1	-.329	3
85		5	max	737.793	3	553.974	1	169.31	1	.049	1	.03	3	1.197	1
86			min	-2614.14	1	-169.217	3	-44.703	5	-.005	5	-.142	1	-.39	3
87		6	max	737.324	3	552.255	1	169.31	1	.049	1	.015	3	.834	1
88			min	-2614.765	1	-170.506	3	-46.288	5	-.005	5	-.031	2	-.278	3
89		7	max	736.854	3	550.536	1	169.31	1	.049	1	.08	1	.473	1
90			min	-2615.391	1	-171.795	3	-47.874	5	-.005	5	-.051	5	-.166	3
91		8	max	736.385	3	548.816	1	169.31	1	.049	1	.192	1	.112	1
92			min	-2616.017	1	-173.085	3	-49.459	5	-.005	5	-.083	5	-.053	3
93		9	max	737.871	3	17.937	1	223.79	1	.141	1	.08	5	.001	3
94			min	-2829.915	1	-4.02	3	-80.352	5	.015	15	-.107	1	-.055	1
95		10	max	737.402	3	16.218	1	223.79	1	.141	1	.04	1	.004	3
96			min	-2830.541	1	-5.309	3	-81.938	5	.015	15	-.025	3	-.066	1
97		11	max	736.933	3	14.499	1	223.79	1	.141	1	.187	1	.008	3
98			min	-2831.166	1	-6.599	3	-83.524	5	.015	15	-.049	3	-.076	1
99		12	max	735.507	3	405.182	3	70.938	3	.229	1	.107	5	.076	1
100			min	-3039.101	1	-438.618	1	-191.516	5	-.139	3	-.133	1	-.123	3
101		13	max	735.038	3	403.893	3	70.938	3	.229	1	.023	3	.364	1
102			min	-3039.727	1	-440.337	1	-193.102	5	-.139	3	-.118	1	-.389	3
103		14	max	734.569	3	402.603	3	70.938	3	.229	1	.069	3	.654	1
104			min	-3040.353	1	-442.057	1	-194.687	5	-.139	3	-.164	4	-.653	3
105		15	max	734.1	3	401.314	3	70.938	3	.229	1	.116	3	.944	1
106			min	-3040.979	1	-443.776	1	-196.273	5	-.139	3	-.289	4	-.917	3
107		16	max	199.689	1	436.915	1	140.969	1	.177	3	.119	1	.718	1
108			min	-2.69	5	-417.365	3	-17.105	3	-.115	1	-.173	5	-.7	3
109		17	max	199.063	1	435.196	1	140.969	1	.177	3	.212	1	.432	1
110			min	-2.982	5	-418.654	3	-17.105	3	-.115	1	-.12	5	-.426	3
111		18	max	198.437	1	433.477	1	140.969	1	.177	3	.304	1	.147	1
112			min	-3.274	5	-419.943	3	-17.105	3	-.115	1	-.067	5	-.151	3
113		19	max	0	1	0	5	0	3	0	1	0	1	0	1
114			min	0	1	0	1	0	4	0	1	0	1	0	1
115	M10	1	max	140.993	1	432.926	1	3.55	5	.002	1	.351	1	.115	1
116			min	-17.106	3	-421.214	3	-198.379	1	-.01	3	-.041	5	-.177	3
117		2	max	140.993	1	307.514	1	5.482	5	.002	1	.191	1	.148	3
118			min	-17.106	3	-308.988	3	-163.319	1	-.01	3	-.037	5	-.214	1
119		3	max	140.993	1	182.102	1	7.414	5	.002	1	.066	2	.372	3
120			min	-17.106	3	-196.763	3	-128.26	1	-.01	3	-.031	5	-.431	1
121		4	max	140.993	1	56.689	1	9.346	5	.002	1	.012	10	.497	3
122			min	-17.106	3	-84.537	3	-93.2	1	-.01	3	-.038	14	-.538	1
123		5	max	140.993	1	27.689	3	11.278	5	.002	1	-.007	10	.523	3
124			min	-17.106	3	-68.723	1	-58.14	1	-.01	3	-.105	1	-.532	1
125		6	max	140.993	1	139.915	3	13.21	5	.002	1	-.002	12	.448	3
126			min	-17.106	3	-194.135	1	-29.863	2	-.01	3	-.141	1	-.415	1
127		7	max	140.993	1	252.141	3	20.5	4	.002	1	.009	5	.274	3
128			min	-17.106	3	-319.548	1	-16.061	2	-.01	3	-.146	1	-.187	1
129		8	max	140.993	1	364.366	3	47.038	1	.002	1	.024	5	.153	1
130			min	-17.106	3	-444.96	1	-9.445	10	-.01	3	-.119	1	-.015	5
131		9	max	140.993	1	476.592	3	82.098	1	.002	1	.04	5	.604	1
132			min	-17.106	3	-570.372	1	-5.996	10	-.01	3	-.093	2	-.374	3
133		10	max	140.993	1	695.785	1	6.573	5	.002	1	.075	4	1.167	1
134			min	-17.106	3	-588.818	3	-117.157	1	-.01	3	-.077	2	-.847	3
135		11	max	140.993	1	570.372	1	8.505	5	.01	3	.036	3	.604	1
136			min	-17.106	3	-476.592	3	-82.098	1	-.002	4	-.093	2	-.374	3
137		12	max	140.993	1	444.96	1	10.437	5	.01	3	.022	3	.153	1
138			min	-17.106	3	-364.366	3	-47.038	1	-.002	4	-.119	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	140.993	1	319.548	1	16.061	2	.01	3	.009	3	.274	3
140			min	-17.106	3	-252.141	3	-16.469	9	-.002	4	-.146	1	-.187	1
141		14	max	140.993	1	194.135	1	29.863	2	.01	3	-.002	12	.448	3
142			min	-17.106	3	-139.915	3	-11.461	3	-.002	4	-.141	1	-.415	1
143		15	max	140.993	1	68.723	1	58.14	1	.01	3	.002	5	.523	3
144			min	-22.028	5	-27.689	3	-9.557	3	-.002	4	-.105	1	-.532	1
145		16	max	140.993	1	84.537	3	93.2	1	.01	3	.018	5	.497	3
146			min	-32.518	5	-56.689	1	-7.653	3	-.002	4	-.037	1	-.538	1
147		17	max	140.993	1	196.763	3	128.26	1	.01	3	.066	2	.372	3
148			min	-43.007	5	-182.102	1	-5.749	3	-.002	4	-.025	3	-.431	1
149		18	max	140.993	1	308.988	3	163.319	1	.01	3	.191	1	.148	3
150			min	-53.496	5	-307.514	1	-3.845	3	-.002	4	-.029	3	-.214	1
151		19	max	140.993	1	421.214	3	198.379	1	.01	3	.351	1	.115	1
152			min	-63.986	5	-432.926	1	-1.941	3	-.002	4	-.032	3	-.177	3
153	M11	1	max	200.659	1	452.138	1	49.075	5	.005	3	.402	1	.093	4
154			min	-107.372	3	-413.788	3	-208.127	1	-.017	1	-.224	5	-.172	3
155		2	max	200.659	1	326.726	1	51.007	5	.005	3	.233	1	.146	3
156			min	-107.372	3	-301.562	3	-173.067	1	-.017	1	-.18	5	-.258	1
157		3	max	200.659	1	201.313	1	52.939	5	.005	3	.095	1	.364	3
158			min	-107.372	3	-189.336	3	-138.008	1	-.017	1	-.134	5	-.492	1
159		4	max	200.659	1	75.901	1	54.871	5	.005	3	.022	2	.483	3
160			min	-107.372	3	-77.11	3	-102.948	1	-.017	1	-.092	4	-.616	1
161		5	max	200.659	1	35.115	3	56.803	5	.005	3	-.004	12	.502	3
162			min	-107.372	3	-49.511	1	-67.889	1	-.017	1	-.088	1	-.627	1
163		6	max	200.659	1	147.341	3	58.734	5	.005	3	.015	5	.42	3
164			min	-107.372	3	-174.924	1	-35.17	2	-.017	1	-.133	1	-.528	1
165		7	max	200.659	1	259.567	3	64.378	4	.005	3	.068	5	.24	3
166			min	-107.372	3	-300.336	1	-21.368	2	-.017	1	-.147	1	-.316	1
167		8	max	200.659	1	371.793	3	73.555	4	.005	3	.123	5	.006	1
168			min	-107.372	3	-425.748	1	-11.382	10	-.017	1	-.129	1	-.041	3
169		9	max	200.659	1	484.019	3	82.733	4	.005	3	.18	5	.441	1
170			min	-107.372	3	-551.161	1	-7.932	10	-.017	1	-.103	2	-.421	3
171		10	max	200.659	1	676.573	1	52.989	5	.017	1	.251	4	.986	1
172			min	-107.372	3	-596.244	3	-107.409	1	-.007	14	-.092	2	-.902	3
173		11	max	200.659	1	551.161	1	54.921	5	.017	1	.031	3	.441	1
174			min	-107.372	3	-484.019	3	-72.349	1	-.005	3	-.191	4	-.421	3
175		12	max	200.659	1	425.748	1	56.853	5	.017	1	.019	3	.023	4
176			min	-107.372	3	-371.793	3	-37.29	1	-.005	3	-.154	4	-.041	3
177		13	max	200.659	1	300.336	1	58.785	5	.017	1	.009	3	.24	3
178			min	-107.372	3	-259.567	3	-10.776	9	-.005	3	-.147	1	-.316	1
179		14	max	200.659	1	174.924	1	64.747	4	.017	1	0	3	.42	3
180			min	-107.372	3	-147.341	3	-8.489	3	-.005	3	-.133	1	-.528	1
181		15	max	200.659	1	49.511	1	73.924	4	.017	1	.026	5	.502	3
182			min	-107.372	3	-35.115	3	-6.585	3	-.005	3	-.088	1	-.627	1
183		16	max	200.659	1	77.11	3	102.948	1	.017	1	.082	5	.483	3
184			min	-107.372	3	-75.901	1	-4.681	3	-.005	3	-.019	9	-.616	1
185		17	max	200.659	1	189.336	3	138.008	1	.017	1	.155	4	.364	3
186			min	-107.372	3	-201.313	1	-2.777	3	-.005	3	-.014	3	-.492	1
187		18	max	200.659	1	301.562	3	173.067	1	.017	1	.241	4	.146	3
188			min	-107.372	3	-326.726	1	-.873	3	-.005	3	-.016	3	-.258	1
189		19	max	200.659	1	413.788	3	208.127	1	.017	1	.402	1	.089	1
190			min	-107.372	3	-452.138	1	1.031	3	-.005	3	-.016	3	-.172	3
191	M12	1	max	29.078	5	528.467	1	44.778	5	.003	3	.428	1	.096	2
192			min	-52.514	1	-170.726	3	-213.056	1	-.014	1	-.205	5	.019	15
193		2	max	18.589	5	386.433	1	46.709	5	.003	3	.254	1	.162	3
194			min	-52.514	1	-120.553	3	-177.997	1	-.014	1	-.165	5	-.315	1
195		3	max	14.74	3	244.4	1	48.641	5	.003	3	.112	1	.247	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-52.514	1	-70.38	3	-142.937	1	-.014	1	-.122	5	-.595	1
197		4	max	14.74	3	102.366	1	50.573	5	.003	3	.032	2	.287	3
198			min	-52.514	1	-20.206	3	-107.878	1	-.014	1	-.083	4	-.749	1
199		5	max	14.74	3	29.967	3	52.505	5	.003	3	0	10	.283	3
200			min	-52.514	1	-39.668	1	-72.818	1	-.014	1	-.08	1	-.777	1
201		6	max	14.74	3	80.14	3	54.437	5	.003	3	.015	5	.234	3
202			min	-52.514	1	-181.701	1	-39.117	2	-.014	1	-.129	1	-.679	1
203		7	max	14.74	3	130.314	3	59.414	4	.003	3	.064	5	.14	3
204			min	-52.514	1	-323.735	1	-25.315	2	-.014	1	-.147	1	-.454	1
205		8	max	14.74	3	180.487	3	68.591	4	.003	3	.115	5	.002	3
206			min	-55.252	4	-465.769	1	-13.243	10	-.014	1	-.134	1	-.103	1
207		9	max	14.74	3	230.66	3	77.769	4	.003	3	.168	5	.374	1
208			min	-65.741	4	-607.802	1	-9.793	10	-.014	1	-.111	2	-.181	3
209		10	max	14.74	3	749.836	1	91.007	14	.014	1	.234	4	.977	1
210			min	-76.23	4	-280.834	3	-102.479	1	-.006	14	-.103	2	-.408	3
211		11	max	48.068	5	607.802	1	51.057	5	.014	1	.037	3	.374	1
212			min	-52.514	1	-230.66	3	-67.42	1	-.003	3	-.182	4	-.181	3
213		12	max	37.579	5	465.769	1	52.989	5	.014	1	.022	3	.002	3
214			min	-52.514	1	-180.487	3	-32.36	1	-.003	3	-.147	4	-.103	1
215		13	max	27.09	5	323.735	1	54.921	5	.014	1	.01	3	.14	3
216			min	-52.514	1	-130.314	3	-13.39	3	-.003	3	-.147	1	-.454	1
217		14	max	16.6	5	181.701	1	61.742	4	.014	1	-.001	12	.234	3
218			min	-52.514	1	-80.14	3	-11.486	3	-.003	3	-.129	1	-.679	1
219		15	max	14.74	3	39.668	1	72.818	1	.014	1	.023	5	.283	3
220			min	-52.514	1	-29.967	3	-9.582	3	-.003	3	-.08	1	-.777	1
221		16	max	14.74	3	20.206	3	107.878	1	.014	1	.076	5	.287	3
222			min	-52.514	1	-102.366	1	-7.678	3	-.003	3	-.018	3	-.749	1
223		17	max	14.74	3	70.38	3	142.937	1	.014	1	.147	4	.247	3
224			min	-52.514	1	-244.4	1	-5.774	3	-.003	3	-.024	3	-.595	1
225		18	max	14.74	3	120.553	3	177.997	1	.014	1	.254	1	.162	3
226			min	-52.514	1	-386.433	1	-3.87	3	-.003	3	-.029	3	-.315	1
227		19	max	14.74	3	170.726	3	213.056	1	.014	1	.428	1	.096	2
228			min	-52.514	1	-528.467	1	-1.966	3	-.003	3	-.031	3	-.022	5
229	M13	1	max	40.827	5	599.516	1	27.458	5	.007	3	.34	1	.187	1
230			min	-142.509	1	-197.755	3	-196.81	1	-.025	1	-.143	5	-.042	3
231		2	max	30.338	5	457.482	1	29.39	5	.007	3	.181	1	.111	3
232			min	-142.509	1	-147.582	3	-161.751	1	-.025	1	-.118	5	-.283	1
233		3	max	19.848	5	315.449	1	31.321	5	.007	3	.06	2	.22	3
234			min	-142.509	1	-97.408	3	-126.691	1	-.025	1	-.091	5	-.627	1
235		4	max	13.58	3	173.415	1	33.253	5	.007	3	.01	10	.284	3
236			min	-142.509	1	-47.235	3	-91.632	1	-.025	1	-.075	4	-.844	1
237		5	max	13.58	3	31.381	1	35.185	5	.007	3	-.005	12	.304	3
238			min	-142.509	1	1.81	12	-56.572	1	-.025	1	-.11	1	-.935	1
239		6	max	13.58	3	53.112	3	37.117	5	.007	3	0	3	.279	3
240			min	-142.509	1	-110.652	1	-28.908	2	-.025	1	-.145	1	-.9	1
241		7	max	13.58	3	103.285	3	44.752	4	.007	3	.034	5	.209	3
242			min	-142.509	1	-252.686	1	-15.105	2	-.025	1	-.148	1	-.738	1
243		8	max	13.58	3	153.458	3	53.929	4	.007	3	.07	5	.095	3
244			min	-142.509	1	-394.72	1	-9.055	10	-.025	1	-.121	1	-.451	1
245		9	max	13.58	3	203.632	3	83.666	1	.007	3	.107	5	.011	10
246			min	-142.509	1	-536.753	1	-5.605	10	-.025	1	-.094	2	-.063	3
247		10	max	13.58	3	253.805	3	118.725	1	.025	1	.164	4	.504	1
248			min	-142.509	1	-678.787	1	-2.155	10	-.01	14	-.077	2	-.267	3
249		11	max	29.656	5	536.753	1	32.217	5	.025	1	.034	3	.011	10
250			min	-142.509	1	-203.632	3	-83.666	1	-.007	3	-.113	4	-.063	3
251		12	max	19.167	5	394.72	1	34.149	5	.025	1	.021	3	.095	3
252			min	-142.509	1	-153.458	3	-48.606	1	-.007	3	-.121	1	-.451	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	13.58	3	252.686	1	36.081	5	.025	1	.01	3	.209	3
254			min	-142.509	1	-103.285	3	-17.358	9	-.007	3	-.148	1	-.738	1
255		14	max	13.58	3	110.652	1	39.853	4	.025	1	0	3	.279	3
256			min	-142.509	1	-53.112	3	-9.922	3	-.007	3	-.145	1	-.9	1
257		15	max	13.58	3	2.481	5	56.572	1	.025	1	.019	5	.304	3
258			min	-142.509	1	-31.381	1	-8.018	3	-.007	3	-.11	1	-.935	1
259		16	max	13.58	3	47.235	3	91.632	1	.025	1	.056	5	.284	3
260			min	-142.509	1	-173.415	1	-6.114	3	-.007	3	-.044	1	-.844	1
261		17	max	13.58	3	97.408	3	126.691	1	.025	1	.1	4	.22	3
262			min	-142.509	1	-315.449	1	-4.21	3	-.007	3	-.018	3	-.627	1
263		18	max	13.58	3	147.582	3	161.751	1	.025	1	.181	1	.111	3
264			min	-142.509	1	-457.482	1	-2.307	3	-.007	3	-.021	3	-.283	1
265		19	max	13.58	3	197.755	3	196.81	1	.025	1	.34	1	.187	1
266			min	-142.509	1	-599.516	1	-.403	3	-.007	3	-.023	3	-.042	3
267	M2	1	max	2260.912	1	408.789	3	146.975	1	.004	5	1.312	5	8.403	1
268			min	-1065.67	3	-189.896	2	-318.726	5	-.002	1	-.225	1	-.375	3
269		2	max	2258.355	1	408.789	3	146.975	1	.004	5	1.222	5	8.378	1
270			min	-1067.588	3	-189.896	2	-316.51	5	-.002	1	-.184	1	-.49	3
271		3	max	2255.798	1	408.789	3	146.975	1	.004	5	1.134	5	8.354	1
272			min	-1069.507	3	-189.896	2	-314.293	5	-.002	1	-.143	1	-.605	3
273		4	max	2253.24	1	408.789	3	146.975	1	.004	5	1.046	5	8.33	1
274			min	-1071.425	3	-189.896	2	-312.077	5	-.002	1	-.102	1	-.72	3
275		5	max	2250.683	1	408.789	3	146.975	1	.004	5	.961	4	8.306	1
276			min	-1073.343	3	-189.896	2	-309.86	5	-.002	1	-.06	1	-.835	3
277		6	max	2248.125	1	408.789	3	146.975	1	.004	5	.88	4	8.281	1
278			min	-1075.261	3	-189.896	2	-307.644	5	-.002	1	-.03	3	-.95	3
279		7	max	2245.568	1	408.789	3	146.975	1	.004	5	.8	4	8.257	1
280			min	-1077.179	3	-189.896	2	-305.427	5	-.002	1	-.057	3	-1.064	3
281		8	max	2243.01	1	408.789	3	146.975	1	.004	5	.721	4	8.233	1
282			min	-1079.097	3	-189.896	2	-303.211	5	-.002	1	-.084	3	-1.179	3
283		9	max	1997.781	1	2754.587	1	117.999	1	.002	1	.643	4	7.737	1
284			min	-999.523	3	-409.185	3	-292.84	5	0	5	-.089	3	-1.149	3
285		10	max	1995.224	1	2754.587	1	117.999	1	.002	1	.565	4	6.963	1
286			min	-1001.441	3	-409.185	3	-290.624	5	0	5	-.114	3	-1.034	3
287		11	max	1992.666	1	2754.587	1	117.999	1	.002	1	.488	4	6.189	1
288			min	-1003.359	3	-409.185	3	-288.407	5	0	5	-.138	3	-.919	3
289		12	max	1990.109	1	2754.587	1	117.999	1	.002	1	.411	4	5.416	1
290			min	-1005.277	3	-409.185	3	-286.191	5	0	5	-.163	3	-.804	3
291		13	max	1987.551	1	2754.587	1	117.999	1	.002	1	.335	4	4.642	1
292			min	-1007.195	3	-409.185	3	-283.974	5	0	5	-.188	3	-.69	3
293		14	max	1984.994	1	2754.587	1	117.999	1	.002	1	.26	4	3.868	1
294			min	-1009.113	3	-409.185	3	-281.758	5	0	5	-.213	3	-.575	3
295		15	max	1982.436	1	2754.587	1	117.999	1	.002	1	.233	1	3.095	1
296			min	-1011.031	3	-409.185	3	-279.541	5	0	5	-.237	3	-.46	3
297		16	max	1979.879	1	2754.587	1	117.999	1	.002	1	.267	1	2.321	1
298			min	-1012.949	3	-409.185	3	-277.325	5	0	5	-.262	3	-.345	3
299		17	max	1977.321	1	2754.587	1	117.999	1	.002	1	.3	1	1.547	1
300			min	-1014.867	3	-409.185	3	-275.108	5	0	5	-.287	3	-.23	3
301		18	max	1974.764	1	2754.587	1	117.999	1	.002	1	.333	1	.774	1
302			min	-1016.786	3	-409.185	3	-272.892	5	0	5	-.312	3	-.115	3
303		19	max	1972.206	1	2754.587	1	117.999	1	.002	1	.366	1	0	1
304			min	-1018.704	3	-409.185	3	-270.676	5	0	5	-.336	3	0	1
305	M5	1	max	5654.489	1	1313.159	3	0	1	.004	4	1.362	4	13.632	1
306			min	-3116.404	3	-1427.686	2	-336.736	5	0	1	0	1	-.376	3
307		2	max	5651.932	1	1313.159	3	0	1	.004	4	1.268	4	13.924	1
308			min	-3118.322	3	-1427.686	2	-334.519	5	0	1	0	1	-.745	3
309		3	max	5649.374	1	1313.159	3	0	1	.004	4	1.174	4	14.215	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	-3120.24	3	-1427.686	2	-332.303	5	0	1	0	1	-1.114	3
311		4	max	5646.817	1	1313.159	3	0	1	.004	4	1.082	4	14.507	1
312			min	-3122.159	3	-1427.686	2	-330.086	5	0	1	0	1	-1.483	3
313		5	max	5644.259	1	1313.159	3	0	1	.004	4	.99	4	14.798	1
314			min	-3124.077	3	-1427.686	2	-327.87	5	0	1	0	1	-1.852	3
315		6	max	5641.702	1	1313.159	3	0	1	.004	4	.898	4	15.09	1
316			min	-3125.995	3	-1427.686	2	-325.653	5	0	1	0	1	-2.22	3
317		7	max	5639.144	1	1313.159	3	0	1	.004	4	.807	4	15.381	1
318			min	-3127.913	3	-1427.686	2	-323.437	5	0	1	0	1	-2.589	3
319		8	max	5636.587	1	1313.159	3	0	1	.004	4	.717	4	15.673	1
320			min	-3129.831	3	-1427.686	2	-321.22	5	0	1	0	1	-2.958	3
321		9	max	5135.971	1	5285.732	1	0	1	0	1	.643	4	14.846	1
322			min	-2885.192	3	-1036.496	3	-317.641	4	0	4	0	1	-2.911	3
323		10	max	5133.414	1	5285.732	1	0	1	0	1	.554	4	13.361	1
324			min	-2887.11	3	-1036.496	3	-315.424	4	0	4	0	1	-2.62	3
325		11	max	5130.856	1	5285.732	1	0	1	0	1	.465	4	11.876	1
326			min	-2889.028	3	-1036.496	3	-313.208	4	0	4	0	1	-2.329	3
327		12	max	5128.299	1	5285.732	1	0	1	0	1	.378	4	10.392	1
328			min	-2890.946	3	-1036.496	3	-310.991	4	0	4	0	1	-2.038	3
329		13	max	5125.741	1	5285.732	1	0	1	0	1	.291	4	8.907	1
330			min	-2892.865	3	-1036.496	3	-308.775	4	0	4	0	1	-1.747	3
331		14	max	5123.184	1	5285.732	1	0	1	0	1	.204	4	7.423	1
332			min	-2894.783	3	-1036.496	3	-306.558	4	0	4	0	1	-1.456	3
333		15	max	5120.626	1	5285.732	1	0	1	0	1	.118	4	5.938	1
334			min	-2896.701	3	-1036.496	3	-304.342	4	0	4	0	1	-1.164	3
335		16	max	5118.069	1	5285.732	1	0	1	0	1	.033	4	4.454	1
336			min	-2898.619	3	-1036.496	3	-302.125	4	0	4	0	1	-.873	3
337		17	max	5115.511	1	5285.732	1	0	1	0	1	0	1	2.969	1
338			min	-2900.537	3	-1036.496	3	-299.909	4	0	4	-.052	5	-.582	3
339		18	max	5112.954	1	5285.732	1	0	1	0	1	0	1	1.485	1
340			min	-2902.455	3	-1036.496	3	-297.693	4	0	4	-.135	4	-.291	3
341		19	max	5110.396	1	5285.732	1	0	1	0	1	0	1	0	1
342			min	-2904.373	3	-1036.496	3	-295.476	4	0	4	-.218	4	0	1
343	M8	1	max	2260.912	1	408.789	3	96.104	3	.004	4	1.383	4	8.403	1
344			min	-1065.67	3	-189.896	2	-355.314	4	0	3	-.105	3	-.386	5
345		2	max	2258.355	1	408.789	3	96.104	3	.004	4	1.283	4	8.378	1
346			min	-1067.588	3	-189.896	2	-353.098	4	0	3	-.078	3	-.49	3
347		3	max	2255.798	1	408.789	3	96.104	3	.004	4	1.185	4	8.354	1
348			min	-1069.507	3	-189.896	2	-350.881	4	0	3	-.051	3	-.605	3
349		4	max	2253.24	1	408.789	3	96.104	3	.004	4	1.086	4	8.33	1
350			min	-1071.425	3	-189.896	2	-348.665	4	0	3	-.024	3	-.72	3
351		5	max	2250.683	1	408.789	3	96.104	3	.004	4	.989	4	8.306	1
352			min	-1073.343	3	-189.896	2	-346.448	4	0	3	.002	12	-.835	3
353		6	max	2248.125	1	408.789	3	96.104	3	.004	4	.892	4	8.281	1
354			min	-1075.261	3	-189.896	2	-344.232	4	0	3	-.004	10	-.95	3
355		7	max	2245.568	1	408.789	3	96.104	3	.004	4	.795	4	8.257	1
356			min	-1077.179	3	-189.896	2	-342.016	4	0	3	-.032	2	-1.064	3
357		8	max	2243.01	1	408.789	3	96.104	3	.004	4	.7	4	8.233	1
358			min	-1079.097	3	-189.896	2	-339.799	4	0	3	-.064	2	-1.179	3
359		9	max	1997.781	1	2754.587	1	88.117	3	0	3	.632	4	7.737	1
360			min	-999.523	3	-409.185	3	-326.566	4	-.002	1	-.035	2	-1.149	3
361		10	max	1995.224	1	2754.587	1	88.117	3	0	3	.54	4	6.963	1
362			min	-1001.441	3	-409.185	3	-324.349	4	-.002	1	-.068	1	-1.034	3
363		11	max	1992.666	1	2754.587	1	88.117	3	0	3	.456	5	6.189	1
364			min	-1003.359	3	-409.185	3	-322.133	4	-.002	1	-.101	1	-.919	3
365		12	max	1990.109	1	2754.587	1	88.117	3	0	3	.372	5	5.416	1
366			min	-1005.277	3	-409.185	3	-319.916	4	-.002	1	-.134	1	-.804	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
367		13	max	1987.551	1	2754.587	1	88.117	3	0	3	.29	5	4.642	1
368			min	-1007.195	3	-409.185	3	-317.7	4	-.002	1	-.167	1	-.69	3
369		14	max	1984.994	1	2754.587	1	88.117	3	0	3	.213	3	3.868	1
370			min	-1009.113	3	-409.185	3	-315.483	4	-.002	1	-.2	1	-.575	3
371		15	max	1982.436	1	2754.587	1	88.117	3	0	3	.237	3	3.095	1
372			min	-1011.031	3	-409.185	3	-313.267	4	-.002	1	-.233	1	-.46	3
373		16	max	1979.879	1	2754.587	1	88.117	3	0	3	.262	3	2.321	1
374			min	-1012.949	3	-409.185	3	-311.05	4	-.002	1	-.267	1	-.345	3
375		17	max	1977.321	1	2754.587	1	88.117	3	0	3	.287	3	1.547	1
376			min	-1014.867	3	-409.185	3	-308.834	4	-.002	1	-.3	1	-.23	3
377		18	max	1974.764	1	2754.587	1	88.117	3	0	3	.312	3	.774	1
378			min	-1016.786	3	-409.185	3	-306.617	4	-.002	1	-.333	1	-.115	3
379		19	max	1972.206	1	2754.587	1	88.117	3	0	3	.336	3	0	1
380			min	-1018.704	3	-409.185	3	-304.401	4	-.002	1	-.366	1	0	1
381	M3	1	max	2664.94	1	6.095	4	27.741	1	.021	3	.004	4	0	1
382			min	-823.032	3	1.433	15	-9.015	5	-.065	1	0	3	0	1
383		2	max	2664.886	1	5.418	4	27.741	1	.021	3	.013	1	0	15
384			min	-823.072	3	1.274	15	-8.555	5	-.065	1	-.004	3	-.002	4
385		3	max	2664.832	1	4.741	4	27.741	1	.021	3	.023	1	0	15
386			min	-823.113	3	1.114	15	-8.341	3	-.065	1	-.007	3	-.004	4
387		4	max	2664.778	1	4.064	4	27.741	1	.021	3	.033	1	-.001	15
388			min	-823.153	3	.955	15	-8.341	3	-.065	1	-.01	3	-.005	4
389		5	max	2664.724	1	3.386	4	27.741	1	.021	3	.043	1	-.002	15
390			min	-823.194	3	.796	15	-8.341	3	-.065	1	-.013	3	-.007	4
391		6	max	2664.67	1	2.709	4	27.741	1	.021	3	.053	1	-.002	15
392			min	-823.234	3	.637	15	-8.341	3	-.065	1	-.016	3	-.008	4
393		7	max	2664.616	1	2.032	4	27.741	1	.021	3	.062	1	-.002	15
394			min	-823.274	3	.478	15	-8.341	3	-.065	1	-.019	3	-.009	4
395		8	max	2664.562	1	1.355	4	27.741	1	.021	3	.072	1	-.002	15
396			min	-823.315	3	.318	15	-8.341	3	-.065	1	-.022	3	-.009	4
397		9	max	2664.508	1	.677	4	27.741	1	.021	3	.082	1	-.002	15
398			min	-823.355	3	.159	15	-8.341	3	-.065	1	-.025	3	-.01	4
399		10	max	2664.454	1	0	1	27.741	1	.021	3	.092	1	-.002	15
400			min	-823.396	3	0	1	-8.341	3	-.065	1	-.028	3	-.01	4
401		11	max	2664.4	1	-.159	15	27.741	1	.021	3	.102	1	-.002	15
402			min	-823.436	3	-.677	6	-8.341	3	-.065	1	-.031	3	-.01	4
403		12	max	2664.346	1	-.318	15	27.741	1	.021	3	.112	1	-.002	15
404			min	-823.477	3	-1.355	6	-8.341	3	-.065	1	-.034	3	-.009	4
405		13	max	2664.292	1	-.478	15	27.741	1	.021	3	.122	1	-.002	15
406			min	-823.517	3	-2.032	6	-8.341	3	-.065	1	-.037	3	-.009	4
407		14	max	2664.238	1	-.637	15	27.741	1	.021	3	.132	1	-.002	15
408			min	-823.558	3	-2.709	6	-8.341	3	-.065	1	-.04	3	-.008	4
409		15	max	2664.184	1	-.796	15	27.741	1	.021	3	.142	1	-.002	15
410			min	-823.598	3	-3.386	6	-8.341	3	-.065	1	-.043	3	-.007	4
411		16	max	2664.13	1	-.955	15	27.741	1	.021	3	.152	1	-.001	15
412			min	-823.639	3	-4.064	6	-8.341	3	-.065	1	-.046	3	-.005	4
413		17	max	2664.076	1	-1.114	15	27.741	1	.021	3	.162	1	0	15
414			min	-823.679	3	-4.741	6	-8.341	3	-.065	1	-.049	3	-.004	4
415		18	max	2664.022	1	-1.274	15	27.741	1	.021	3	.172	1	0	15
416			min	-823.72	3	-5.418	6	-8.341	3	-.065	1	-.052	3	-.002	4
417		19	max	2663.968	1	-1.433	15	27.741	1	.021	3	.181	1	0	1
418			min	-823.76	3	-6.095	6	-8.341	3	-.065	1	-.055	3	0	1
419	M6	1	max	6271.455	1	6.095	6	0	1	.015	4	.003	4	0	1
420			min	-2369.677	3	1.433	15	-9.946	4	0	1	0	1	0	1
421		2	max	6271.401	1	5.418	6	0	1	.015	4	0	1	0	15
422			min	-2369.718	3	1.274	15	-9.486	4	0	1	0	4	-.002	6
423		3	max	6271.347	1	4.741	6	0	1	.015	4	0	1	0	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
424			min	-2369.758	3	1.114	15	-9.026	4	0	1	-.004	4	-.004	6
425		4	max	6271.293	1	4.064	6	0	1	.015	4	0	1	-.001	15
426			min	-2369.799	3	.955	15	-8.567	4	0	1	-.007	4	-.005	6
427		5	max	6271.239	1	3.386	6	0	1	.015	4	0	1	-.002	15
428			min	-2369.839	3	.796	15	-8.107	4	0	1	-.01	4	-.007	6
429		6	max	6271.185	1	2.709	6	0	1	.015	4	0	1	-.002	15
430			min	-2369.88	3	.637	15	-7.647	4	0	1	-.013	4	-.008	6
431		7	max	6271.131	1	2.032	6	0	1	.015	4	0	1	-.002	15
432			min	-2369.92	3	.478	15	-7.187	4	0	1	-.016	4	-.009	6
433		8	max	6271.077	1	1.355	6	0	1	.015	4	0	1	-.002	15
434			min	-2369.961	3	.318	15	-6.728	4	0	1	-.018	4	-.009	6
435		9	max	6271.023	1	.677	6	0	1	.015	4	0	1	-.002	15
436			min	-2370.001	3	.159	15	-6.268	4	0	1	-.02	4	-.01	6
437		10	max	6270.969	1	0	1	0	1	.015	4	0	1	-.002	15
438			min	-2370.042	3	0	1	-5.808	4	0	1	-.022	4	-.01	6
439		11	max	6270.915	1	-.159	15	0	1	.015	4	0	1	-.002	15
440			min	-2370.082	3	-.677	4	-5.348	4	0	1	-.024	4	-.01	6
441		12	max	6270.861	1	-.318	15	0	1	.015	4	0	1	-.002	15
442			min	-2370.123	3	-1.355	4	-4.889	4	0	1	-.026	4	-.009	6
443		13	max	6270.807	1	-.478	15	0	1	.015	4	0	1	-.002	15
444			min	-2370.163	3	-2.032	4	-4.429	4	0	1	-.028	4	-.009	6
445		14	max	6270.753	1	-.637	15	0	1	.015	4	0	1	-.002	15
446			min	-2370.204	3	-2.709	4	-3.969	4	0	1	-.029	4	-.008	6
447		15	max	6270.699	1	-.796	15	0	1	.015	4	0	1	-.002	15
448			min	-2370.244	3	-3.386	4	-3.509	4	0	1	-.031	4	-.007	6
449		16	max	6270.645	1	-.955	15	0	1	.015	4	0	1	-.001	15
450			min	-2370.285	3	-4.064	4	-3.05	4	0	1	-.032	4	-.005	6
451		17	max	6270.591	1	-1.114	15	0	1	.015	4	0	1	0	15
452			min	-2370.325	3	-4.741	4	-2.59	4	0	1	-.033	4	-.004	6
453		18	max	6270.537	1	-1.274	15	0	1	.015	4	0	1	0	15
454			min	-2370.366	3	-5.418	4	-2.13	4	0	1	-.034	4	-.002	6
455		19	max	6270.483	1	-1.433	15	0	1	.015	4	0	1	0	1
456			min	-2370.406	3	-6.095	4	-1.67	4	0	1	-.035	4	0	1
457	M9	1	max	2664.94	1	6.095	6	8.341	3	.065	1	.003	5	0	1
458			min	-823.032	3	1.433	15	-27.741	1	-.021	3	-.003	1	0	1
459		2	max	2664.886	1	5.418	6	8.341	3	.065	1	.004	3	0	15
460			min	-823.072	3	1.274	15	-27.741	1	-.021	3	-.013	1	-.002	6
461		3	max	2664.832	1	4.741	6	8.341	3	.065	1	.007	3	0	15
462			min	-823.113	3	1.114	15	-27.741	1	-.021	3	-.023	1	-.004	6
463		4	max	2664.778	1	4.064	6	8.341	3	.065	1	.01	3	-.001	15
464			min	-823.153	3	.955	15	-27.741	1	-.021	3	-.033	1	-.005	6
465		5	max	2664.724	1	3.386	6	8.341	3	.065	1	.013	3	-.002	15
466			min	-823.194	3	.796	15	-27.741	1	-.021	3	-.043	1	-.007	6
467		6	max	2664.67	1	2.709	6	8.341	3	.065	1	.016	3	-.002	15
468			min	-823.234	3	.637	15	-27.741	1	-.021	3	-.053	1	-.008	6
469		7	max	2664.616	1	2.032	6	8.341	3	.065	1	.019	3	-.002	15
470			min	-823.274	3	.478	15	-27.741	1	-.021	3	-.062	1	-.009	6
471		8	max	2664.562	1	1.355	6	8.341	3	.065	1	.022	3	-.002	15
472			min	-823.315	3	.318	15	-27.741	1	-.021	3	-.072	1	-.009	6
473		9	max	2664.508	1	.677	6	8.341	3	.065	1	.025	3	-.002	15
474			min	-823.355	3	.159	15	-27.741	1	-.021	3	-.082	1	-.01	6
475		10	max	2664.454	1	0	1	8.341	3	.065	1	.028	3	-.002	15
476			min	-823.396	3	0	1	-27.741	1	-.021	3	-.092	1	-.01	6
477		11	max	2664.4	1	-.159	15	8.341	3	.065	1	.031	3	-.002	15
478			min	-823.436	3	-.677	4	-27.741	1	-.021	3	-.102	1	-.01	6
479		12	max	2664.346	1	-.318	15	8.341	3	.065	1	.034	3	-.002	15
480			min	-823.477	3	-1.355	4	-27.741	1	-.021	3	-.112	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	2664.292	1	-.478	15	8.341	3	.065	1	.037	3	-.002	15
482			min	-823.517	3	-2.032	4	-27.741	1	-.021	3	-.122	1	-.009	6
483		14	max	2664.238	1	-.637	15	8.341	3	.065	1	.04	3	-.002	15
484			min	-823.558	3	-2.709	4	-27.741	1	-.021	3	-.132	1	-.008	6
485		15	max	2664.184	1	-.796	15	8.341	3	.065	1	.043	3	-.002	15
486			min	-823.598	3	-3.386	4	-27.741	1	-.021	3	-.142	1	-.007	6
487		16	max	2664.13	1	-.955	15	8.341	3	.065	1	.046	3	-.001	15
488			min	-823.639	3	-4.064	4	-27.741	1	-.021	3	-.152	1	-.005	6
489		17	max	2664.076	1	-1.114	15	8.341	3	.065	1	.049	3	0	15
490			min	-823.679	3	-4.741	4	-27.741	1	-.021	3	-.162	1	-.004	6
491		18	max	2664.022	1	-1.274	15	8.341	3	.065	1	.052	3	0	15
492			min	-823.72	3	-5.418	4	-27.741	1	-.021	3	-.172	1	-.002	6
493		19	max	2663.968	1	-1.433	15	8.341	3	.065	1	.055	3	0	1
494			min	-823.76	3	-6.095	4	-27.741	1	-.021	3	-.181	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	.055	3	.236	3	.012	1	7.748e-3	3	1882.78	12	NC	1
2			min	-.496	1	-1.425	1	-.685	4	-2.682e-2	1	78.22	1	232.399	5
3		2	max	.055	3	.199	3	0	3	7.473e-3	3	2636.426	12	NC	2
4			min	-.496	1	-1.26	1	-.66	4	-2.561e-2	1	86.037	1	242.347	4
5		3	max	.055	3	.163	3	.001	3	6.932e-3	3	4312.712	12	NC	3
6			min	-.496	1	-1.099	1	-.629	4	-2.324e-2	1	95.379	1	256.068	4
7		4	max	.055	3	.131	3	.002	3	6.391e-3	3	NC	12	NC	3
8			min	-.496	1	-.947	1	-.591	4	-2.086e-2	1	106.23	1	274.732	4
9		5	max	.055	3	.103	3	.002	3	6.001e-3	3	NC	3	NC	3
10			min	-.496	1	-.811	1	-.55	4	-1.898e-2	1	118.265	1	298.889	4
11		6	max	.054	3	.082	3	.002	3	5.999e-3	3	9744.354	12	NC	2
12			min	-.494	1	-.694	1	-.506	4	-1.835e-2	1	131.072	1	329.087	4
13		7	max	.054	3	.065	3	.001	3	5.996e-3	3	5813.515	12	NC	1
14			min	-.493	1	-.59	1	-.463	4	-1.773e-2	1	145.048	1	365.546	4
15		8	max	.054	3	.051	3	0	1	5.993e-3	3	4334.885	12	NC	1
16			min	-.492	1	-.493	1	-.423	4	-1.711e-2	1	161.011	1	407.052	5
17		9	max	.053	3	.037	3	0	10	6.203e-3	3	3494.666	12	NC	1
18			min	-.491	1	-.398	1	-.387	4	-1.588e-2	1	180.556	1	454.408	5
19		10	max	.053	3	.024	3	.001	1	6.613e-3	3	2924.613	12	NC	1
20			min	-.49	1	-.301	1	-.348	4	-1.409e-2	1	205.814	1	518.863	5
21		11	max	.053	3	.01	3	.001	1	7.024e-3	3	2512.763	12	NC	1
22			min	-.489	1	-.204	1	-.308	4	-1.23e-2	1	239.702	1	606.999	5
23		12	max	.052	3	-.003	12	.002	3	6.374e-3	3	2816.607	15	NC	1
24			min	-.488	1	-.105	1	-.27	4	-9.963e-3	1	287.705	1	729.024	5
25		13	max	.052	3	-.001	15	.006	3	4.599e-3	3	3296.038	15	NC	1
26			min	-.487	1	-.017	3	-.227	4	-7.046e-3	1	358.846	1	932.928	5
27		14	max	.052	3	.084	1	.008	3	2.824e-3	3	3971.674	15	NC	1
28			min	-.485	1	-.023	3	-.185	4	-4.404e-3	4	467.856	1	1291.46	5
29		15	max	.052	3	.166	1	.008	3	1.049e-3	3	4987.862	15	NC	1
30			min	-.484	1	-.019	3	-.147	4	-4.992e-3	4	641.244	1	1940.213	5
31		16	max	.052	3	.234	1	.009	1	2.878e-3	3	6675.531	15	NC	2
32			min	-.484	1	-.001	3	-.118	4	-4.419e-3	4	923.366	1	3111.169	5
33		17	max	.052	3	.29	1	.012	1	5.13e-3	3	NC	15	NC	2
34			min	-.484	1	.018	12	-.097	5	-3.71e-3	4	1458.647	1	5562.36	5
35		18	max	.052	3	.34	1	.006	1	7.382e-3	3	NC	5	NC	2
36			min	-.484	1	.034	15	-.084	4	-5.151e-3	1	2982.528	1	9512.464	1
37		19	max	.052	3	.387	1	0	12	8.53e-3	3	NC	1	NC	1
38			min	-.484	1	.042	15	-.076	4	-5.899e-3	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
39	M4	1	max	.126	3	.532	3	0	1	7.58e-4	4	1577.621	15	NC	1
40			min	-.896	1	-2.646	1	-.683	4	0	1	44.384	1	232.709	4
41		2	max	.126	3	.454	3	0	1	6.273e-4	4	1736.059	15	NC	1
42			min	-.896	1	-2.34	1	-.662	4	0	1	49.087	1	241.297	4
43		3	max	.126	3	.379	3	0	1	3.723e-4	5	2046.68	12	NC	1
44			min	-.896	1	-2.04	1	-.631	4	0	1	54.782	1	254.474	4
45		4	max	.126	3	.311	3	0	1	1.184e-4	5	4857.674	12	NC	1
46			min	-.896	1	-1.76	1	-.593	4	0	1	61.437	1	273.107	4
47		5	max	.125	3	.255	3	0	1	0	1	NC	3	NC	1
48			min	-.895	1	-1.514	1	-.55	4	-3.845e-5	4	68.769	1	297.773	4
49		6	max	.125	3	.215	3	0	1	7.726e-5	5	5291.281	12	NC	1
50			min	-.893	1	-1.308	1	-.506	4	0	1	76.407	1	328.624	4
51		7	max	.124	3	.184	3	0	1	1.88e-4	5	3165.45	12	NC	1
52			min	-.891	1	-1.127	1	-.462	4	0	1	84.643	1	365.454	4
53		8	max	.123	3	.158	3	0	1	2.991e-4	4	3246.68	15	NC	1
54			min	-.888	1	-.959	1	-.423	4	0	1	94.138	1	406.947	4
55		9	max	.122	3	.129	3	0	1	2.79e-4	4	3659.489	15	NC	1
56			min	-.886	1	-.787	1	-.387	4	0	1	106.26	1	452.743	4
57		10	max	.121	3	.096	3	0	1	1.351e-4	5	4224.705	15	NC	1
58			min	-.883	1	-.606	1	-.348	4	0	1	122.949	1	518.592	4
59		11	max	.12	3	.059	3	0	1	0	1	5034.811	15	NC	1
60			min	-.881	1	-.417	1	-.307	4	-1.07e-5	4	147.007	1	608.183	4
61		12	max	.12	3	.019	3	0	1	0	1	6283.501	15	NC	1
62			min	-.878	1	-.222	1	-.271	4	-7.375e-4	4	184.386	1	722.438	4
63		13	max	.119	3	0	15	0	1	0	1	8348.357	15	NC	1
64			min	-.876	1	-.029	2	-.229	4	-2.082e-3	4	246.914	1	916.363	4
65		14	max	.118	3	.151	1	0	1	0	1	NC	15	NC	1
66			min	-.873	1	-.044	3	-.186	4	-3.427e-3	4	358.258	1	1265.23	4
67		15	max	.117	3	.298	1	0	1	0	1	NC	5	NC	1
68			min	-.871	1	-.042	3	-.149	4	-4.772e-3	4	481.928	3	1907.049	4
69		16	max	.117	3	.4	1	0	1	0	1	NC	5	NC	1
70			min	-.87	1	-.001	3	-.12	4	-3.775e-3	4	559.737	3	3090.368	4
71		17	max	.117	3	.465	1	0	1	0	1	NC	5	NC	1
72			min	-.871	1	.014	15	-.099	4	-2.504e-3	4	776.914	3	5675.564	4
73		18	max	.117	3	.509	1	0	1	0	1	NC	4	NC	1
74			min	-.871	1	.015	15	-.085	4	-1.232e-3	4	1508.924	3	NC	1
75		19	max	.117	3	.547	1	0	1	0	1	NC	1	NC	1
76			min	-.871	1	.016	15	-.074	4	-5.84e-4	4	NC	1	NC	1
77	M7	1	max	.055	3	.236	3	0	3	2.682e-2	1	NC	5	NC	1
78			min	-.496	1	-1.425	1	-.69	4	-7.748e-3	3	78.22	1	229.091	4
79		2	max	.055	3	.199	3	.008	1	2.561e-2	1	NC	5	NC	2
80			min	-.496	1	-1.26	1	-.657	4	-7.473e-3	3	86.037	1	242.049	4
81		3	max	.055	3	.163	3	.018	1	2.324e-2	1	NC	5	NC	3
82			min	-.496	1	-1.099	1	-.621	4	-6.932e-3	3	95.379	1	257.827	4
83		4	max	.055	3	.131	3	.021	1	2.086e-2	1	NC	5	NC	3
84			min	-.496	1	-.947	1	-.582	4	-6.391e-3	3	106.23	1	277.223	4
85		5	max	.055	3	.103	3	.018	1	1.898e-2	1	NC	3	NC	3
86			min	-.496	1	-.811	1	-.542	4	-6.001e-3	3	118.265	1	301.055	4
87		6	max	.054	3	.082	3	.012	1	1.835e-2	1	NC	5	NC	2
88			min	-.494	1	-.694	1	-.501	4	-5.999e-3	3	131.072	1	329.406	4
89		7	max	.054	3	.065	3	.004	1	1.773e-2	1	NC	5	NC	1
90			min	-.493	1	-.59	1	-.462	4	-5.996e-3	3	145.048	1	362.761	4
91		8	max	.054	3	.051	3	0	10	1.711e-2	1	NC	5	NC	1
92			min	-.492	1	-.493	1	-.424	4	-5.993e-3	3	161.011	1	401.956	4
93		9	max	.053	3	.037	3	0	3	1.588e-2	1	NC	5	NC	1
94			min	-.491	1	-.398	1	-.387	4	-6.203e-3	3	180.556	1	448.773	4
95		10	max	.053	3	.024	3	0	3	1.409e-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	-.49	1	-.301	1	-.348	4	-6.613e-3	3	205.814	1	511.23	4
97		11	max	.053	3	.01	3	0	3	1.23e-2	1	NC	5	NC	1
98			min	-.489	1	-.204	1	-.308	4	-7.024e-3	3	239.702	1	597.147	4
99		12	max	.052	3	.002	5	.005	1	9.963e-3	1	NC	5	NC	1
100			min	-.488	1	-.105	1	-.268	4	-6.374e-3	3	287.705	1	721.005	4
101		13	max	.052	3	0	5	.007	1	7.046e-3	1	NC	5	NC	1
102			min	-.487	1	-.017	3	-.224	4	-4.599e-3	3	358.846	1	924.629	4
103		14	max	.052	3	.084	1	.005	1	4.128e-3	1	NC	5	NC	1
104			min	-.485	1	-.023	3	-.183	4	-3.39e-3	5	467.856	1	1270.106	4
105		15	max	.052	3	.166	1	0	2	1.21e-3	1	NC	5	NC	1
106			min	-.484	1	-.019	3	-.148	4	-4.644e-3	5	641.244	1	1853.431	4
107		16	max	.052	3	.234	1	-.001	10	2.217e-3	1	NC	4	NC	2
108			min	-.484	1	-.008	5	-.122	4	-3.812e-3	5	923.366	1	2784.64	4
109		17	max	.052	3	.29	1	-.002	12	3.684e-3	1	NC	4	NC	2
110			min	-.484	1	-.013	5	-.103	4	-5.13e-3	3	1458.647	1	4499.139	4
111		18	max	.052	3	.34	1	0	12	5.151e-3	1	NC	4	NC	2
112			min	-.484	1	-.018	5	-.087	4	-7.382e-3	3	2982.528	1	9188.418	4
113		19	max	.052	3	.387	1	.01	1	5.899e-3	1	NC	1	NC	1
114			min	-.484	1	-.023	5	-.071	4	-8.53e-3	3	4433.271	5	NC	1
115	M10	1	max	.001	1	.364	1	.484	1	6.053e-3	1	NC	1	NC	1
116			min	-.079	4	-.021	5	-.052	3	-6.981e-4	5	NC	1	NC	1
117		2	max	0	1	.301	1	.527	1	5.916e-3	1	NC	4	NC	3
118			min	-.079	4	-.011	5	-.052	3	-5.937e-4	5	2071.383	3	4466.767	1
119		3	max	0	1	.259	3	.595	1	6.336e-3	3	NC	4	NC	3
120			min	-.079	4	-.005	5	-.056	3	-4.893e-4	5	1086.904	3	1740.548	1
121		4	max	0	1	.32	3	.67	1	7.127e-3	3	NC	4	NC	3
122			min	-.079	4	-.001	5	-.064	3	-3.85e-4	5	807.479	3	1034.196	1
123		5	max	0	1	.351	3	.741	1	7.919e-3	3	NC	4	NC	5
124			min	-.079	4	0	15	-.074	3	-2.806e-4	5	715.782	3	748.222	1
125		6	max	0	1	.349	3	.799	1	8.71e-3	3	NC	4	NC	5
126			min	-.079	4	.003	15	-.085	3	-1.762e-4	5	720.592	3	610.093	1
127		7	max	0	1	.349	1	.84	1	9.501e-3	3	NC	1	NC	5
128			min	-.079	4	.005	15	-.096	3	-7.183e-5	5	809.866	3	540.24	1
129		8	max	0	1	.429	1	.862	1	1.029e-2	3	NC	4	NC	5
130			min	-.079	4	.008	15	-.107	3	1.501e-5	15	1004.976	3	507.855	1
131		9	max	0	1	.498	1	.87	1	1.108e-2	3	NC	5	NC	5
132			min	-.079	4	.012	15	-.114	3	8.543e-5	15	1319.163	3	497.41	1
133		10	max	0	1	.528	1	.871	1	1.188e-2	3	NC	5	NC	5
134			min	-.079	4	.016	15	-.117	3	1.558e-4	15	1167.103	1	496.836	1
135		11	max	0	3	.498	1	.87	1	1.108e-2	3	NC	5	NC	15
136			min	-.079	4	.018	15	-.114	3	2.38e-4	15	1319.163	3	497.41	1
137		12	max	0	3	.429	1	.862	1	1.029e-2	3	NC	4	NC	15
138			min	-.079	4	.018	15	-.107	3	3.201e-4	15	1004.976	3	507.855	1
139		13	max	0	3	.349	1	.84	1	9.501e-3	3	NC	1	NC	15
140			min	-.079	4	.017	15	-.096	3	4.022e-4	15	809.866	3	540.24	1
141		14	max	0	3	.349	3	.799	1	8.71e-3	3	NC	5	NC	5
142			min	-.079	4	.015	15	-.085	3	4.843e-4	15	720.592	3	610.093	1
143		15	max	0	3	.351	3	.741	1	7.919e-3	3	NC	5	NC	5
144			min	-.079	4	.015	15	-.074	3	5.664e-4	15	715.782	3	748.222	1
145		16	max	0	3	.32	3	.67	1	7.127e-3	3	NC	5	NC	3
146			min	-.079	4	.017	15	-.064	3	6.485e-4	15	807.479	3	1034.196	1
147		17	max	0	3	.259	3	.595	1	6.336e-3	3	NC	5	NC	3
148			min	-.079	4	.021	15	-.056	3	7.307e-4	15	1086.904	3	1740.548	1
149		18	max	0	3	.301	1	.527	1	5.916e-3	1	NC	5	NC	3
150			min	-.079	4	.028	15	-.052	3	8.128e-4	15	2071.383	3	4466.767	1
151		19	max	0	3	.364	1	.484	1	6.053e-3	1	NC	1	NC	1
152			min	-.079	4	.038	15	-.052	3	8.949e-4	15	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	.002	1	.003	5	.488	1	1.252e-2	1	NC	1	NC	1
154			min	-.288	4	-.153	1	-.053	3	-1.765e-3	3	NC	1	NC	1
155		2	max	.001	1	.081	3	.521	1	1.388e-2	1	NC	4	NC	3
156			min	-.288	4	-.273	1	-.057	3	-2.138e-3	3	1600.19	1	4710.011	4
157		3	max	.001	1	.151	3	.583	1	1.524e-2	1	NC	5	NC	3
158			min	-.288	4	-.378	1	-.064	3	-2.512e-3	3	855.615	1	2035.382	1
159		4	max	.001	1	.199	3	.657	1	1.66e-2	1	NC	5	NC	12
160			min	-.288	4	-.452	1	-.072	3	-2.886e-3	3	643.157	1	1138.726	1
161		5	max	0	1	.217	3	.73	1	1.796e-2	1	NC	5	NC	12
162			min	-.288	4	-.488	1	-.082	3	-3.26e-3	3	573.744	1	794.488	1
163		6	max	0	1	.204	3	.792	1	1.932e-2	1	NC	5	NC	5
164			min	-.288	4	-.485	1	-.092	3	-3.634e-3	3	578.29	1	631.72	1
165		7	max	0	1	.166	3	.838	1	2.068e-2	1	NC	5	NC	5
166			min	-.288	4	-.45	1	-.102	3	-4.007e-3	3	646.703	1	548.93	1
167		8	max	0	1	.112	3	.866	1	2.204e-2	1	NC	5	NC	7
168			min	-.288	4	-.396	1	-.111	3	-4.381e-3	3	791.691	1	508.651	1
169		9	max	0	1	.062	3	.878	1	2.34e-2	1	NC	5	NC	5
170			min	-.288	4	-.343	1	-.118	3	-4.755e-3	3	1015.163	1	493.271	1
171		10	max	0	1	.039	3	.88	1	2.476e-2	1	NC	5	NC	5
172			min	-.289	4	-.317	1	-.12	3	-5.129e-3	3	1171.061	1	490.774	1
173		11	max	0	3	.062	3	.878	1	2.34e-2	1	NC	5	6486.387	15
174			min	-.289	4	-.343	1	-.118	3	-4.755e-3	3	1015.163	1	493.271	1
175		12	max	0	3	.112	3	.866	1	2.204e-2	1	NC	5	5709.691	15
176			min	-.289	4	-.396	1	-.111	3	-4.381e-3	3	791.691	1	508.651	1
177		13	max	0	3	.166	3	.838	1	2.068e-2	1	NC	5	7280.397	15
178			min	-.288	4	-.45	1	-.102	3	-4.007e-3	3	646.703	1	548.93	1
179		14	max	0	3	.204	3	.792	1	1.932e-2	1	NC	15	NC	5
180			min	-.288	4	-.485	1	-.092	3	-3.634e-3	3	578.29	1	631.72	1
181		15	max	0	3	.217	3	.73	1	1.796e-2	1	NC	15	NC	5
182			min	-.288	4	-.488	1	-.082	3	-3.26e-3	3	573.744	1	794.488	1
183		16	max	0	3	.199	3	.657	1	1.66e-2	1	NC	15	NC	4
184			min	-.288	4	-.452	1	-.072	3	-2.886e-3	3	643.157	1	1138.726	1
185		17	max	0	3	.151	3	.583	1	1.524e-2	1	NC	7	NC	3
186			min	-.288	4	-.378	1	-.064	3	-2.512e-3	3	855.615	1	2035.382	1
187		18	max	0	3	.081	3	.521	1	1.388e-2	1	NC	5	NC	3
188			min	-.288	4	-.273	1	-.057	3	-2.138e-3	3	1600.19	1	5940.229	1
189		19	max	0	3	.003	3	.488	1	1.252e-2	1	NC	1	NC	1
190			min	-.288	4	-.153	1	-.053	3	-1.765e-3	3	NC	1	NC	1
191	M12	1	max	0	3	.044	3	.492	1	1.213e-2	1	NC	1	NC	1
192			min	-.406	4	-.447	1	-.054	3	-1.738e-3	3	NC	1	NC	1
193		2	max	0	3	.106	3	.519	1	1.321e-2	1	NC	5	NC	2
194			min	-.406	4	-.624	1	-.055	3	-1.949e-3	3	1082.856	1	5217.276	4
195		3	max	0	3	.157	3	.579	1	1.429e-2	1	NC	5	NC	3
196			min	-.406	4	-.783	1	-.06	3	-2.16e-3	3	572.215	1	2209.395	1
197		4	max	0	3	.193	3	.653	1	1.536e-2	1	NC	5	NC	3
198			min	-.406	4	-.904	1	-.068	3	-2.372e-3	3	420.032	1	1193.238	1
199		5	max	0	3	.211	3	.727	1	1.644e-2	1	NC	5	NC	12
200			min	-.406	4	-.979	1	-.078	3	-2.583e-3	3	360.661	1	816.162	1
201		6	max	0	3	.212	3	.792	1	1.752e-2	1	NC	5	NC	5
202			min	-.406	4	-1.007	1	-.09	3	-2.794e-3	3	343.143	1	640.414	1
203		7	max	0	3	.199	3	.84	1	1.86e-2	1	NC	5	NC	5
204			min	-.406	4	-.992	1	-.101	3	-3.006e-3	3	352.416	1	551.105	1
205		8	max	0	3	.177	3	.871	1	1.968e-2	1	NC	5	NC	5
206			min	-.406	4	-.949	1	-.112	3	-3.217e-3	3	382.262	1	506.949	1
207		9	max	0	3	.155	3	.884	1	2.076e-2	1	NC	5	NC	5
208			min	-.406	4	-.901	1	-.12	3	-3.428e-3	3	422.982	1	489.167	1
209		10	max	0	1	.144	3	.887	1	2.184e-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	-.406	4	-.877	1	-.123	3	-3.639e-3	3	446.856	1	485.732	1
211		11	max	0	1	.155	3	.884	1	2.076e-2	1	NC	5	6669.044	15
212			min	-.406	4	-.901	1	-.12	3	-3.428e-3	3	422.982	1	489.167	1
213		12	max	0	1	.177	3	.871	1	1.968e-2	1	NC	15	5851.296	15
214			min	-.406	4	-.949	1	-.112	3	-3.217e-3	3	382.262	1	506.949	1
215		13	max	0	1	.199	3	.84	1	1.86e-2	1	NC	15	7336.367	15
216			min	-.406	4	-.992	1	-.101	3	-3.006e-3	3	352.416	1	551.105	1
217		14	max	0	1	.212	3	.792	1	1.752e-2	1	NC	15	NC	15
218			min	-.406	4	-1.007	1	-.09	3	-2.794e-3	3	343.143	1	640.414	1
219		15	max	0	1	.211	3	.727	1	1.644e-2	1	NC	15	NC	5
220			min	-.406	4	-.979	1	-.078	3	-2.583e-3	3	360.661	1	816.162	1
221		16	max	0	1	.193	3	.653	1	1.536e-2	1	NC	15	NC	3
222			min	-.406	4	-.904	1	-.068	3	-2.372e-3	3	420.032	1	1193.238	1
223		17	max	0	1	.157	3	.579	1	1.429e-2	1	NC	5	NC	3
224			min	-.406	4	-.783	1	-.06	3	-2.16e-3	3	572.215	1	2209.395	1
225		18	max	0	1	.106	3	.519	1	1.321e-2	1	NC	5	NC	2
226			min	-.406	4	-.624	1	-.055	3	-1.949e-3	3	1082.856	1	6563.823	5
227		19	max	0	1	.044	3	.492	1	1.213e-2	1	NC	1	NC	1
228			min	-.406	4	-.447	1	-.054	3	-1.738e-3	3	NC	1	NC	1
229	M13	1	max	0	3	.218	3	.496	1	2.089e-2	1	NC	1	NC	1
230			min	-.674	4	-1.344	1	-.055	3	-4.653e-3	3	NC	1	NC	1
231		2	max	0	3	.3	3	.544	1	2.288e-2	1	NC	5	NC	3
232			min	-.674	4	-1.631	1	-.058	3	-5.232e-3	3	669.842	1	4017.811	1
233		3	max	0	3	.375	3	.615	1	2.487e-2	1	NC	5	NC	3
234			min	-.674	4	-1.9	1	-.065	3	-5.811e-3	3	345.214	1	1617.618	1
235		4	max	0	3	.437	3	.693	1	2.686e-2	1	NC	15	NC	3
236			min	-.674	4	-2.131	1	-.073	3	-6.389e-3	3	243.938	1	976.767	1
237		5	max	0	3	.482	3	.765	1	2.884e-2	1	8893.711	15	NC	12
238			min	-.674	4	-2.31	1	-.083	3	-6.968e-3	3	198.811	1	713.267	1
239		6	max	0	3	.507	3	.824	1	3.083e-2	1	7636.223	15	NC	5
240			min	-.674	4	-2.431	1	-.095	3	-7.547e-3	3	176.725	1	584.928	1
241		7	max	0	3	.515	3	.865	1	3.282e-2	1	6986.589	15	NC	5
242			min	-.674	4	-2.495	1	-.106	3	-8.125e-3	3	166.758	1	519.79	1
243		8	max	0	3	.511	3	.888	1	3.481e-2	1	6690.716	15	NC	5
244			min	-.674	4	-2.515	1	-.116	3	-8.704e-3	3	164.007	1	489.62	1
245		9	max	0	3	.5	3	.896	1	3.68e-2	1	6603.655	15	NC	5
246			min	-.674	4	-2.507	1	-.123	3	-9.283e-3	3	165.174	1	479.989	1
247		10	max	0	1	.494	3	.896	1	3.879e-2	1	6599.493	15	NC	5
248			min	-.674	4	-2.497	1	-.126	3	-9.861e-3	3	166.594	1	479.533	1
249		11	max	0	1	.5	3	.896	1	3.68e-2	1	6499.327	15	9329.875	15
250			min	-.674	4	-2.507	1	-.123	3	-9.283e-3	3	165.174	1	479.989	1
251		12	max	0	1	.511	3	.888	1	3.481e-2	1	6361.049	15	8868.145	15
252			min	-.674	4	-2.515	1	-.116	3	-8.704e-3	3	164.007	1	489.62	1
253		13	max	0	1	.515	3	.865	1	3.282e-2	1	6345.975	15	NC	15
254			min	-.673	4	-2.495	1	-.106	3	-8.125e-3	3	166.758	1	519.79	1
255		14	max	0	1	.507	3	.824	1	3.083e-2	1	6579.047	15	NC	5
256			min	-.673	4	-2.431	1	-.095	3	-7.547e-3	3	176.725	1	584.928	1
257		15	max	0	1	.482	3	.765	1	2.884e-2	1	7221.752	15	NC	5
258			min	-.673	4	-2.31	1	-.083	3	-6.968e-3	3	198.811	1	713.267	1
259		16	max	0	1	.437	3	.693	1	2.686e-2	1	8620.243	15	NC	3
260			min	-.673	4	-2.131	1	-.073	3	-6.389e-3	3	243.938	1	976.767	1
261		17	max	0	1	.375	3	.615	1	2.487e-2	1	NC	15	NC	3
262			min	-.673	4	-1.9	1	-.065	3	-5.811e-3	3	345.214	1	1617.618	1
263		18	max	0	1	.3	3	.544	1	2.288e-2	1	NC	5	NC	3
264			min	-.673	4	-1.631	1	-.058	3	-5.232e-3	3	669.842	1	4017.811	1
265		19	max	.001	1	.218	3	.496	1	2.089e-2	1	NC	1	NC	1
266			min	-.673	4	-1.344	1	-.055	3	-4.653e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	3	0	5	5.374e-4	1	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-9.977e-4	5	NC	1	NC	1
271		3	max	0	3	0	3	.003	5	1.075e-3	1	NC	2	NC	1
272			min	0	1	-.007	1	0	1	-1.995e-3	5	8387.663	1	NC	1
273		4	max	0	3	0	3	.006	5	1.612e-3	1	NC	3	NC	1
274			min	0	1	-.016	1	0	1	-2.993e-3	5	3736.342	1	9904.323	5
275		5	max	0	3	.002	3	.011	5	2.15e-3	1	NC	3	NC	1
276			min	0	1	-.029	1	-.002	1	-3.991e-3	5	2105.102	1	5736.783	5
277		6	max	0	3	.003	3	.016	5	2.687e-3	1	NC	3	NC	1
278			min	0	1	-.045	1	-.002	1	-4.989e-3	5	1349.056	1	3775.143	5
279		7	max	0	3	.004	3	.023	5	3.224e-3	1	NC	3	NC	1
280			min	0	1	-.065	1	-.003	1	-5.986e-3	5	937.933	1	2694.352	5
281		8	max	0	3	.006	3	.03	5	3.762e-3	1	NC	12	NC	1
282			min	0	1	-.088	1	-.004	1	-6.984e-3	5	689.868	1	2034.511	5
283		9	max	0	3	.009	3	.038	5	3.647e-3	1	NC	12	NC	1
284			min	0	1	-.115	1	-.004	1	-7.234e-3	5	527.761	1	1601.329	5
285		10	max	0	3	.012	3	.047	5	3.15e-3	1	8904.405	12	NC	1
286			min	-.001	1	-.145	1	-.005	1	-7.045e-3	5	417.201	1	1300.941	5
287		11	max	0	3	.016	3	.056	5	2.652e-3	1	6848.454	12	NC	1
288			min	-.001	1	-.179	1	-.005	1	-6.856e-3	5	339.167	1	1083.798	5
289		12	max	0	3	.02	3	.066	5	2.154e-3	1	5449.618	12	NC	1
290			min	-.001	1	-.215	1	-.006	1	-6.667e-3	5	282.191	1	921.633	5
291		13	max	0	3	.024	3	.076	4	1.656e-3	1	4458.801	12	NC	1
292			min	-.001	1	-.253	1	-.006	1	-6.478e-3	5	239.386	1	797.118	4
293		14	max	0	3	.029	3	.087	4	1.159e-3	1	3733.024	12	NC	1
294			min	-.001	1	-.294	1	-.006	1	-6.289e-3	5	206.446	1	698.598	4
295		15	max	0	3	.034	3	.098	4	7.393e-4	2	3186.386	12	NC	1
296			min	-.002	1	-.336	1	-.006	1	-6.1e-3	5	180.577	1	619.954	4
297		16	max	0	3	.039	3	.109	4	3.249e-4	2	2764.893	12	NC	1
298			min	-.002	1	-.379	1	-.005	1	-5.948e-3	4	159.907	1	556.193	4
299		17	max	0	3	.044	3	.12	4	2.73e-4	3	2433.505	12	NC	1
300			min	-.002	1	-.424	1	-.005	1	-5.832e-3	4	143.145	1	503.82	4
301		18	max	0	3	.049	3	.132	4	4.48e-4	3	2168.602	12	NC	1
302			min	-.002	1	-.469	1	-.006	3	-5.715e-3	4	129.38	1	460.319	4
303		19	max	0	3	.055	3	.143	4	6.23e-4	3	1953.915	12	NC	1
304			min	-.002	1	-.514	1	-.008	3	-5.598e-3	4	117.954	1	423.848	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	12	0	4	0	1	NC	1	NC	1
308			min	0	1	-.003	1	0	1	-1.031e-3	4	NC	1	NC	1
309		3	max	0	3	0	3	.003	4	0	1	NC	3	NC	1
310			min	0	1	-.012	1	0	1	-2.062e-3	4	5227.697	1	NC	1
311		4	max	0	3	0	3	.006	4	0	1	NC	3	NC	1
312			min	0	1	-.027	1	0	1	-3.092e-3	4	2289.014	1	9545.58	4
313		5	max	0	3	.002	3	.011	4	0	1	NC	3	NC	1
314			min	-.001	1	-.048	1	0	1	-4.123e-3	4	1273.629	1	5531.612	4
315		6	max	0	3	.004	3	.017	4	0	1	NC	3	NC	1
316			min	-.001	1	-.075	1	0	1	-5.154e-3	4	807.585	1	3641.832	4
317		7	max	0	3	.008	3	.023	4	0	1	NC	5	NC	1
318			min	-.002	1	-.109	1	0	1	-6.185e-3	4	556.078	1	2600.451	4
319		8	max	.001	3	.012	3	.031	4	0	1	NC	15	NC	1
320			min	-.002	1	-.15	1	0	1	-7.215e-3	4	405.308	1	1964.582	4
321		9	max	.001	3	.017	3	.039	4	0	1	NC	15	NC	1
322			min	-.002	1	-.198	1	0	1	-7.471e-3	4	307.16	1	1547.035	4
323		10	max	.001	3	.025	3	.048	4	0	1	8222.334	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.003	1	-.252	1	0	1	-7.27e-3	4	240.724	1	1257.417	4
325		11	max	.002	3	.033	3	.058	4	0	1	6656.702	15	NC	1
326			min	-.003	1	-.312	1	0	1	-7.07e-3	4	194.275	1	1048.083	4
327		12	max	.002	3	.042	3	.068	4	0	1	5519.128	15	NC	1
328			min	-.003	1	-.378	1	0	1	-6.87e-3	4	160.652	1	891.801	4
329		13	max	.002	3	.052	3	.079	4	0	1	4668.191	15	NC	1
330			min	-.003	1	-.447	1	0	1	-6.67e-3	4	135.584	1	772.012	4
331		14	max	.002	3	.063	3	.089	4	0	1	4015.834	15	NC	1
332			min	-.004	1	-.521	1	0	1	-6.47e-3	4	116.421	1	678.179	4
333		15	max	.002	3	.074	3	.101	4	0	1	3505.255	15	NC	1
334			min	-.004	1	-.598	1	0	1	-6.27e-3	4	101.461	1	603.346	4
335		16	max	.002	3	.086	3	.112	4	0	1	3098.477	15	NC	1
336			min	-.004	1	-.677	1	0	1	-6.07e-3	4	89.569	1	542.757	4
337		17	max	.003	3	.098	3	.123	4	0	1	2769.503	15	NC	1
338			min	-.004	1	-.759	1	0	1	-5.87e-3	4	79.97	1	493.081	4
339		18	max	.003	3	.111	3	.134	4	0	1	2499.979	15	NC	1
340			min	-.005	1	-.841	1	0	1	-5.67e-3	4	72.119	1	451.924	4
341		19	max	.003	3	.124	3	.145	4	0	1	2276.736	15	NC	1
342			min	-.005	1	-.924	1	0	1	-5.469e-3	4	65.627	1	417.53	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	0	4	1.679e-4	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-1.123e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	3.358e-4	3	NC	2	NC	1
348			min	0	1	-.007	1	0	3	-2.246e-3	4	8387.663	1	NC	1
349		4	max	0	3	0	3	.006	4	5.037e-4	3	NC	3	NC	1
350			min	0	1	-.016	1	0	3	-3.37e-3	4	3736.342	1	9420.691	4
351		5	max	0	3	.002	3	.011	4	6.716e-4	3	NC	3	NC	1
352			min	0	1	-.029	1	0	3	-4.493e-3	4	2105.102	1	5466.683	4
353		6	max	0	3	.003	3	.017	4	8.394e-4	3	NC	3	NC	1
354			min	0	1	-.045	1	0	3	-5.616e-3	4	1349.056	1	3603.919	4
355		7	max	0	3	.004	3	.024	4	1.007e-3	3	NC	3	NC	1
356			min	0	1	-.065	1	-.001	3	-6.739e-3	4	937.933	1	2576.9	4
357		8	max	0	3	.006	3	.031	4	1.175e-3	3	NC	5	NC	1
358			min	0	1	-.088	1	-.001	3	-7.863e-3	4	689.868	1	1949.546	4
359		9	max	0	3	.009	3	.039	4	1.127e-3	3	NC	5	NC	1
360			min	0	1	-.115	1	-.001	3	-8.086e-3	4	527.761	1	1537.409	4
361		10	max	0	3	.012	3	.048	4	9.521e-4	3	NC	5	NC	1
362			min	-.001	1	-.145	1	-.001	3	-7.78e-3	4	417.201	1	1251.198	4
363		11	max	0	3	.016	3	.058	4	7.771e-4	3	NC	5	NC	1
364			min	-.001	1	-.179	1	-.001	3	-7.475e-3	4	339.167	1	1044.125	4
365		12	max	0	3	.02	3	.068	4	6.021e-4	3	NC	7	NC	1
366			min	-.001	1	-.215	1	0	3	-7.17e-3	4	282.191	1	889.425	4
367		13	max	0	3	.024	3	.079	4	4.27e-4	3	NC	15	NC	1
368			min	-.001	1	-.253	1	0	3	-6.864e-3	4	239.386	1	770.795	4
369		14	max	0	3	.029	3	.089	4	2.52e-4	3	NC	15	NC	1
370			min	-.001	1	-.294	1	0	12	-6.559e-3	4	206.446	1	677.849	4
371		15	max	0	3	.034	3	.1	4	7.703e-5	3	9838.279	15	NC	1
372			min	-.002	1	-.336	1	0	12	-6.253e-3	4	180.577	1	603.721	4
373		16	max	0	3	.039	3	.112	4	7.801e-8	9	8949.698	15	NC	1
374			min	-.002	1	-.379	1	0	10	-5.948e-3	4	159.907	1	543.715	4
375		17	max	0	3	.044	3	.123	4	3.343e-4	1	8201.607	15	NC	1
376			min	-.002	1	-.424	1	0	10	-5.682e-3	5	143.145	1	494.537	4
377		18	max	0	3	.049	3	.134	4	8.32e-4	1	7565.102	15	NC	1
378			min	-.002	1	-.469	1	0	10	-5.453e-3	5	129.38	1	453.821	4
379		19	max	0	3	.055	3	.145	4	1.33e-3	1	7018.637	15	NC	1
380			min	-.002	1	-.514	1	0	10	-5.224e-3	5	117.954	1	419.832	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	.097	1	.001	3	.033	5	1.647e-3	4	NC	1	NC	1
382			min	-.007	3	-.011	1	-.004	1	-1.127e-4	3	NC	1	NC	1
383		2	max	.096	1	.007	3	.065	5	1.62e-3	4	NC	1	NC	3
384			min	-.007	3	-.066	1	-.021	1	-4.082e-4	3	NC	1	4244.544	1
385		3	max	.095	1	.013	3	.098	5	2.103e-3	1	NC	1	NC	4
386			min	-.007	3	-.121	1	-.037	1	-7.038e-4	3	6794.905	3	2146.953	1
387		4	max	.094	1	.018	3	.13	5	3.04e-3	1	NC	1	NC	4
388			min	-.006	3	-.176	1	-.053	1	-9.994e-4	3	4505.433	3	1456.965	1
389		5	max	.092	1	.024	3	.162	5	3.977e-3	1	NC	1	NC	4
390			min	-.006	3	-.231	1	-.068	1	-1.295e-3	3	3354.841	3	1119.62	1
391		6	max	.091	1	.03	3	.194	5	4.914e-3	1	NC	1	NC	4
392			min	-.005	3	-.286	1	-.081	1	-1.591e-3	3	2660.533	3	924.213	1
393		7	max	.09	1	.036	3	.226	5	5.851e-3	1	NC	1	NC	4
394			min	-.005	3	-.341	1	-.093	1	-1.886e-3	3	2194.974	3	800.832	1
395		8	max	.089	1	.043	3	.257	5	6.788e-3	1	NC	5	NC	4
396			min	-.005	3	-.395	1	-.102	1	-2.182e-3	3	1860.635	3	719.902	1
397		9	max	.088	1	.049	3	.287	5	7.725e-3	1	NC	5	NC	4
398			min	-.004	3	-.449	1	-.109	1	-2.477e-3	3	1608.733	3	667.134	1
399		10	max	.087	1	.056	3	.317	5	8.662e-3	1	NC	5	NC	4
400			min	-.004	3	-.503	1	-.114	1	-2.773e-3	3	1412.141	3	635.27	1
401		11	max	.086	1	.063	3	.347	5	9.599e-3	1	NC	5	NC	4
402			min	-.004	3	-.557	1	-.115	1	-3.068e-3	3	1254.558	3	620.944	1
403		12	max	.085	1	.07	3	.376	5	1.054e-2	1	NC	5	NC	4
404			min	-.003	3	-.61	1	-.114	1	-3.364e-3	3	1125.589	3	559.967	14
405		13	max	.084	1	.077	3	.404	5	1.147e-2	1	NC	1	NC	4
406			min	-.003	3	-.663	1	-.108	1	-3.66e-3	3	1018.283	3	500.572	14
407		14	max	.083	1	.084	3	.431	5	1.241e-2	1	NC	1	NC	4
408			min	-.003	3	-.716	1	-.099	1	-3.955e-3	3	927.807	3	449.919	14
409		15	max	.081	1	.092	3	.457	5	1.335e-2	1	NC	1	NC	4
410			min	-.002	3	-.769	1	-.085	1	-4.251e-3	3	850.696	3	406.213	14
411		16	max	.08	1	.1	3	.483	5	1.428e-2	1	NC	1	NC	4
412			min	-.002	3	-.821	1	-.067	1	-4.546e-3	3	784.392	3	368.135	14
413		17	max	.079	1	.107	3	.508	5	1.522e-2	1	NC	1	NC	4
414			min	-.002	3	-.874	1	-.043	1	-4.842e-3	3	726.97	3	334.695	14
415		18	max	.078	1	.115	3	.534	4	1.616e-2	1	NC	1	NC	4
416			min	-.001	3	-.926	1	-.016	2	-5.137e-3	3	676.945	3	305.129	14
417		19	max	.077	1	.123	3	.562	4	1.71e-2	1	NC	1	NC	1
418			min	-.001	3	-.978	1	-.002	3	-5.433e-3	3	633.161	3	278.841	14
419	M6	1	max	.165	1	.003	3	.034	4	1.646e-3	4	NC	1	NC	1
420			min	-.013	3	-.019	1	0	1	0	1	NC	1	NC	1
421		2	max	.163	1	.018	3	.067	4	1.424e-3	4	NC	1	NC	1
422			min	-.012	3	-.12	1	0	1	0	1	5066.061	3	NC	1
423		3	max	.16	1	.033	3	.101	4	1.201e-3	4	NC	1	NC	1
424			min	-.012	3	-.221	1	0	1	0	1	2529.813	3	9343.196	4
425		4	max	.158	1	.048	3	.134	4	9.784e-4	4	NC	1	NC	1
426			min	-.011	3	-.322	1	0	1	0	1	1683.134	3	6298.599	4
427		5	max	.155	1	.064	3	.167	4	7.558e-4	4	NC	1	NC	1
428			min	-.01	3	-.423	1	0	1	0	1	1258.953	3	4818.716	4
429		6	max	.152	1	.08	3	.2	4	5.332e-4	4	NC	1	NC	1
430			min	-.009	3	-.523	1	0	1	0	1	1003.858	3	3967.478	4
431		7	max	.15	1	.095	3	.233	4	3.106e-4	4	NC	1	NC	1
432			min	-.008	3	-.624	1	0	1	0	1	833.377	3	3434.614	4
433		8	max	.147	1	.111	3	.265	4	8.797e-5	4	NC	5	NC	1
434			min	-.007	3	-.724	1	0	1	0	1	711.308	3	3089.1	4
435		9	max	.145	1	.127	3	.296	4	0	1	NC	5	NC	1
436			min	-.006	3	-.824	1	0	1	-1.476e-4	5	619.55	3	2867.821	4
437		10	max	.142	1	.144	3	.327	4	0	1	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	-.005	3	-.923	1	0	1	-3.681e-4	5	548.044	3	2738.917	4
439		11	max	.139	1	.16	3	.356	4	0	1	NC	5	NC	1
440			min	-.004	3	-1.023	1	0	1	-5.886e-4	5	490.754	3	2687.87	4
441		12	max	.137	1	.177	3	.386	4	0	1	NC	5	NC	1
442			min	-.003	3	-1.122	1	0	1	-8.09e-4	5	443.839	3	2712.541	4
443		13	max	.134	1	.193	3	.414	4	0	1	NC	1	NC	1
444			min	-.002	3	-1.221	1	0	1	-1.029e-3	5	404.736	3	2823.384	4
445		14	max	.132	1	.21	3	.441	4	0	1	NC	1	NC	1
446			min	0	3	-1.32	1	0	1	-1.25e-3	5	371.668	3	3049.52	4
447		15	max	.129	1	.228	3	.468	4	0	1	NC	1	NC	1
448			min	0	3	-1.418	1	0	1	-1.47e-3	5	343.368	3	3457.437	4
449		16	max	.126	1	.245	3	.493	4	0	1	NC	1	NC	1
450			min	.001	12	-1.517	1	0	1	-1.693e-3	4	318.903	3	4209.555	4
451		17	max	.124	1	.262	3	.517	4	0	1	NC	1	NC	1
452			min	.002	12	-1.615	1	0	1	-1.916e-3	4	297.574	3	5800.609	4
453		18	max	.121	1	.28	3	.541	4	0	1	NC	1	NC	1
454			min	.002	12	-1.713	1	0	1	-2.138e-3	4	278.845	3	NC	1
455		19	max	.119	1	.297	3	.563	4	0	1	NC	1	NC	1
456			min	.003	12	-1.811	1	0	1	-2.361e-3	4	262.3	3	NC	1
457	M9	1	max	.097	1	.001	3	.034	4	1.579e-3	4	NC	1	NC	1
458			min	-.007	3	-.011	1	-.001	3	-2.557e-4	2	NC	1	NC	1
459		2	max	.096	1	.007	3	.071	4	1.345e-3	5	NC	1	NC	3
460			min	-.007	3	-.066	1	-.007	3	-1.166e-3	1	NC	1	4244.544	1
461		3	max	.095	1	.013	3	.107	4	1.113e-3	5	NC	1	NC	12
462			min	-.007	3	-.121	1	-.012	3	-2.103e-3	1	6794.905	3	2146.953	1
463		4	max	.094	1	.018	3	.143	4	9.994e-4	3	NC	1	8186.727	12
464			min	-.006	3	-.176	1	-.017	3	-3.04e-3	1	4505.433	3	1456.965	1
465		5	max	.092	1	.024	3	.179	4	1.295e-3	3	NC	1	6290.977	12
466			min	-.006	3	-.231	1	-.021	3	-3.977e-3	1	3354.841	3	1119.62	1
467		6	max	.091	1	.03	3	.214	4	1.591e-3	3	NC	1	5192.867	12
468			min	-.005	3	-.286	1	-.025	3	-4.914e-3	1	2660.533	3	924.213	1
469		7	max	.09	1	.036	3	.248	4	1.886e-3	3	NC	1	4499.51	12
470			min	-.005	3	-.341	1	-.029	3	-5.851e-3	1	2194.974	3	800.832	1
471		8	max	.089	1	.043	3	.281	4	2.182e-3	3	NC	5	4044.706	12
472			min	-.005	3	-.395	1	-.032	3	-6.788e-3	1	1860.635	3	719.902	1
473		9	max	.088	1	.049	3	.314	4	2.477e-3	3	NC	5	3748.15	12
474			min	-.004	3	-.449	1	-.034	3	-7.725e-3	1	1608.733	3	667.134	1
475		10	max	.087	1	.056	3	.345	4	2.773e-3	3	NC	5	3569.054	12
476			min	-.004	3	-.503	1	-.036	3	-8.662e-3	1	1412.141	3	635.27	1
477		11	max	.086	1	.063	3	.375	4	3.068e-3	3	NC	5	3488.5	12
478			min	-.004	5	-.557	1	-.037	3	-9.599e-3	1	1254.558	3	620.944	1
479		12	max	.085	1	.07	3	.403	4	3.364e-3	3	NC	5	3503.079	12
480			min	-.004	5	-.61	1	-.036	3	-1.054e-2	1	1125.589	3	623.55	1
481		13	max	.084	1	.077	3	.43	4	3.66e-3	3	NC	1	3624.993	12
482			min	-.004	5	-.663	1	-.035	3	-1.147e-2	1	1018.283	3	645.262	1
483		14	max	.083	1	.084	3	.456	4	3.955e-3	3	NC	1	3889.388	12
484			min	-.004	5	-.716	1	-.032	3	-1.241e-2	1	927.807	3	692.336	1
485		15	max	.081	1	.092	3	.479	4	4.251e-3	3	NC	1	4377.128	12
486			min	-.004	5	-.769	1	-.028	3	-1.335e-2	1	850.696	3	779.169	1
487		16	max	.08	1	.1	3	.501	4	4.546e-3	3	NC	1	5291.468	15
488			min	-.004	5	-.821	1	-.023	3	-1.428e-2	1	784.392	3	941.018	1
489		17	max	.079	1	.107	3	.52	4	4.842e-3	3	NC	1	7280.229	15
490			min	-.004	5	-.874	1	-.016	3	-1.522e-2	1	726.97	3	1285.374	1
491		18	max	.078	1	.115	3	.538	4	5.137e-3	3	NC	1	NC	12
492			min	-.004	5	-.926	1	-.008	3	-1.616e-2	1	676.945	3	2352.106	1
493		19	max	.077	1	.123	3	.553	4	5.433e-3	3	NC	1	NC	1
494			min	-.004	5	-.978	1	-.019	1	-1.71e-2	1	633.161	3	NC	1