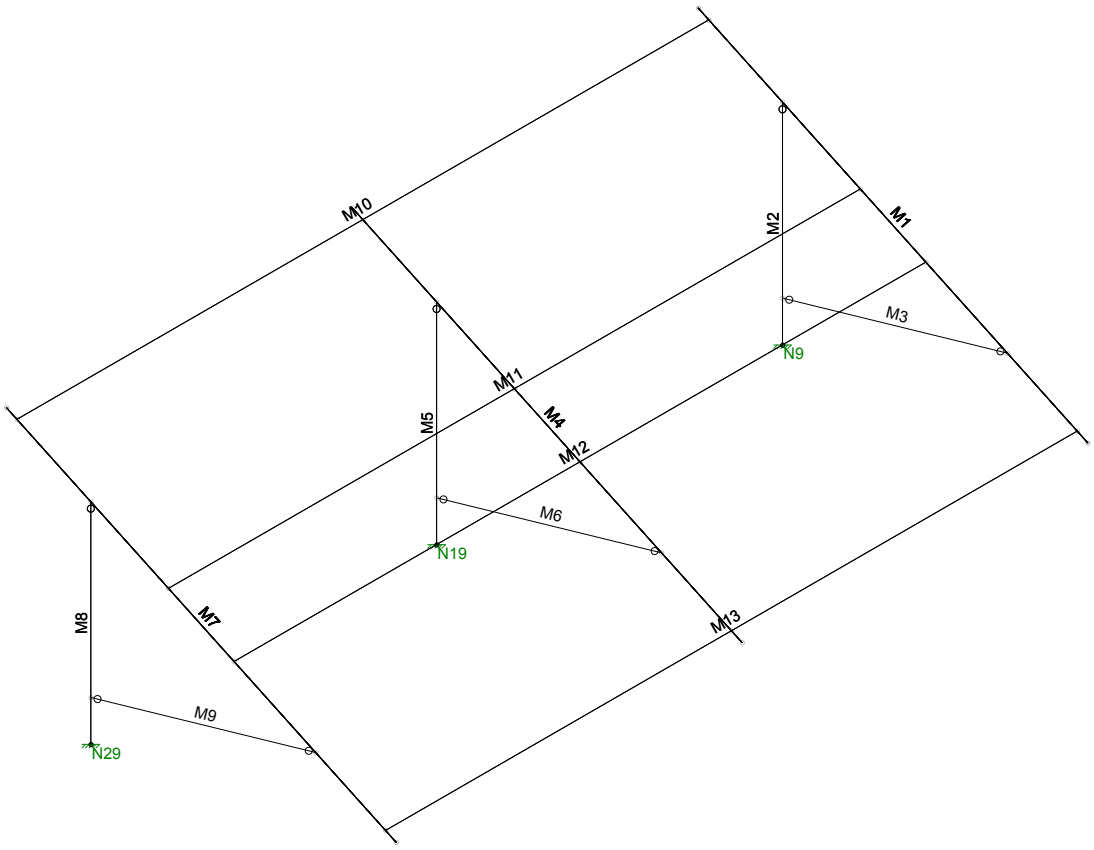


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

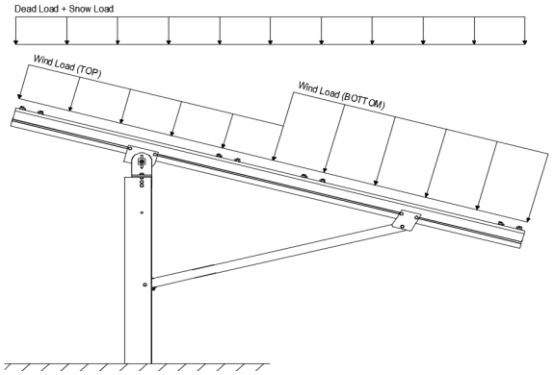
1.2 Construction

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

Pressure Coefficients

$Cf+_{TOP}$ =	1.1	*(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.*
$Cf+_{BOTTOM}$ =	1.7		
$Cf-_{TOP}$ =	-2.2	*(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 =	0.08	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

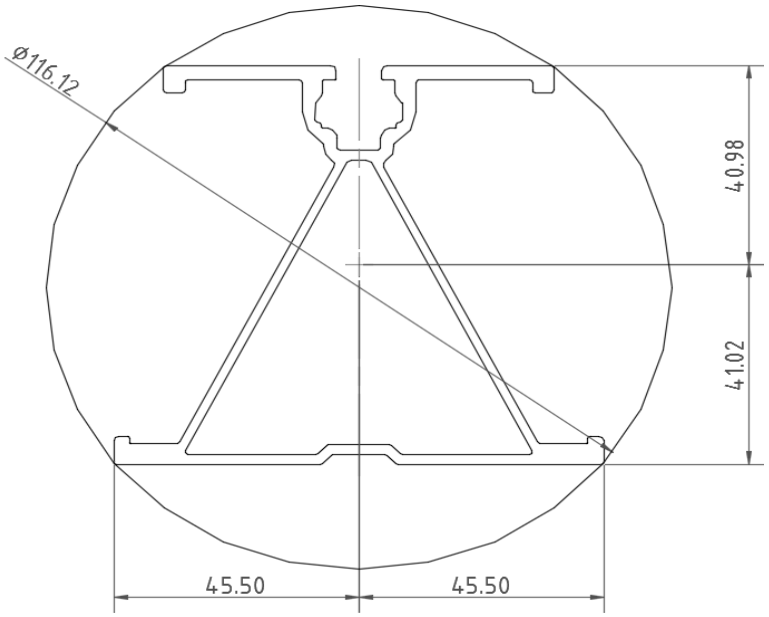
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	102	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 =	1.464	k-ft
M_z =	0.125	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	64%	

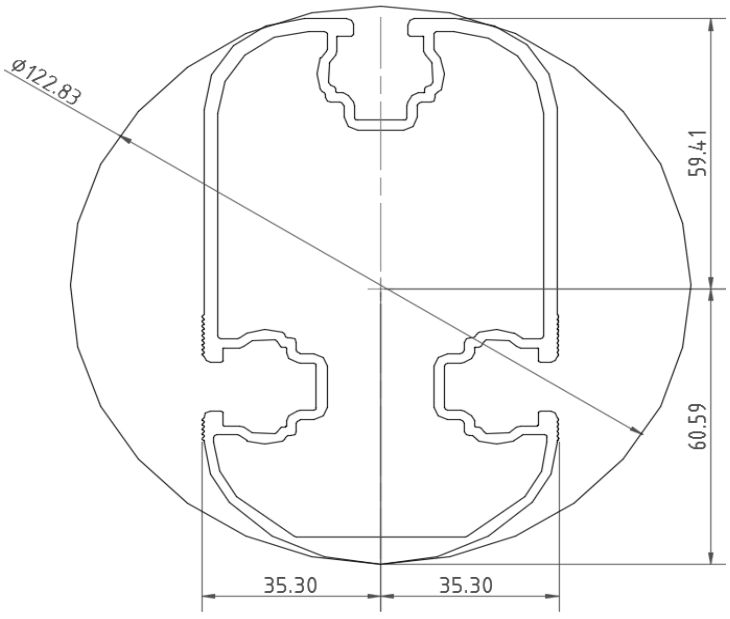


DETAIL VIEW

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 =	3.908	k-ft
M_z =	0.000	k-ft
P_n =	1.839	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	82%	

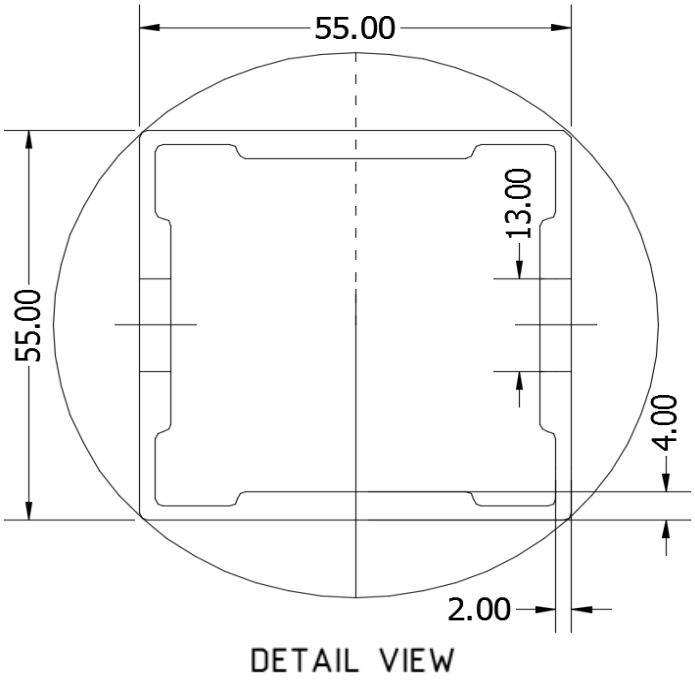


DETAIL VIEW

4.3 Strut Design

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

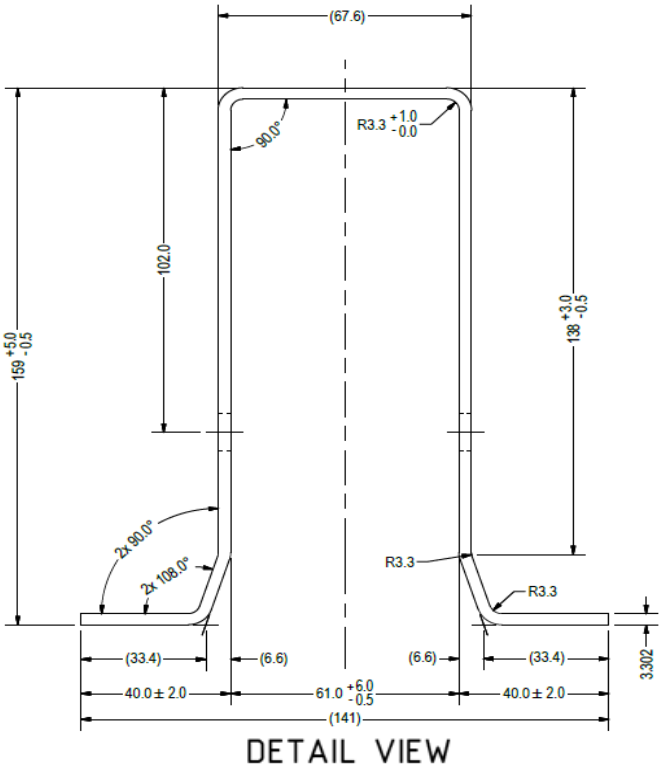
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.430	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	58%	



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 =	14.072	k-ft
M_z =	0.000	k-ft
P_r =	6.145	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	k
Utilization =	94%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

The following LRFD loads include a safety factor of 1.3, and are to be used in conjunction with a Schletter, Inc. Geotechnical Investigation Report. The forces below should fall within the guidelines provided in the Geotechnical Investigation Report. If a Geotechnical Investigation Report is not present, please proceed to Section 5.2 for a concrete footing design.

Maximum Tensile Load =	6.21	k
Maximum Lateral Load =	3.28	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 =	1.37	k
Height of Pole Above Grade, H =	5.78	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

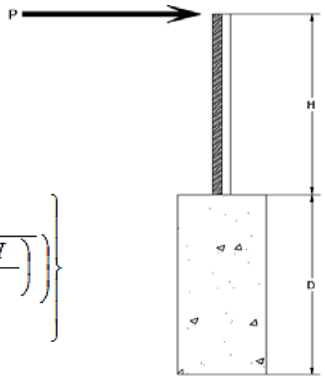
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.37	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 =	7.41	
Required Footing Depth, D =	11.48	ft

2nd Trial @ D_2 =	7.36	ft
Lateral Soil Bearing @ D/3, S_1 =	0.49	ksf
Lateral Soil Bearing @ D, S_3 =	1.47	ksf
Constant 2.34P/(S_1B), A =	3.27	
Required Footing Depth, D =	6.46	ft

3rd Trial @ D_3 =	6.91	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.38	ksf
Constant 2.34P/(S_1B), A =	3.49	
Required Footing Depth, D =	6.74	ft

4th Trial @ D_4 =	6.83	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.37	ksf
Constant 2.34P/(S_1B), A =	3.53	
Required Footing Depth, D =	6.80	ft

5th Trial @ D_5 =	6.81	ft
Lateral Soil Bearing @ D/3, S_1 =	0.45	ksf
Lateral Soil Bearing @ D, S_3 =	1.36	ksf
Constant 2.34P/(S_1B), A =	3.54	
Required Footing Depth, D =	7.00	ft

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

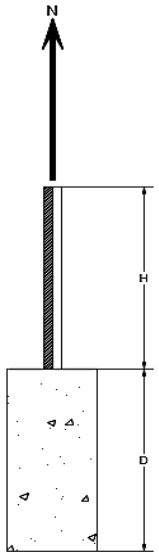
5.4 Uplifting Force Resistance

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 =	2.85	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 =	1.85	k
Required Concrete Volume, V =	12.79	ft^3
Required Footing Depth, D =	4.25	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.15
2	0.4	0.2	118.10	6.04
3	0.6	0.2	118.10	5.94
4	0.8	0.2	118.10	5.83
5	1	0.2	118.10	5.73
6	1.2	0.2	118.10	5.63
7	1.4	0.2	118.10	5.52
8	1.6	0.2	118.10	5.42
9	1.8	0.2	118.10	5.32
10	2	0.2	118.10	5.21
11	2.2	0.2	118.10	5.11
12	2.4	0.2	118.10	5.01
13	2.6	0.2	118.10	4.90
14	2.8	0.2	118.10	4.80
15	3	0.2	118.10	4.69
16	3.2	0.2	118.10	4.59
17	3.4	0.2	118.10	4.49
18	3.6	0.2	118.10	4.38
19	3.8	0.2	118.10	4.28
20	4	0.2	118.10	4.18
21	4.2	0.2	118.10	4.07
22	0	0.0	0.00	4.07
23	0	0.0	0.00	4.07
24	0	0.0	0.00	4.07
25	0	0.0	0.00	4.07
26	0	0.0	0.00	4.07
27	0	0.0	0.00	4.07
28	0	0.0	0.00	4.07
29	0	0.0	0.00	4.07
30	0	0.0	0.00	4.07
31	0	0.0	0.00	4.07
32	0	0.0	0.00	4.07
33	0	0.0	0.00	4.07
34	0	0.0	0.00	4.07
Max	4.2	Sum	0.99	

A 2ft diameter x 4.25ft 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 =	4.07	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

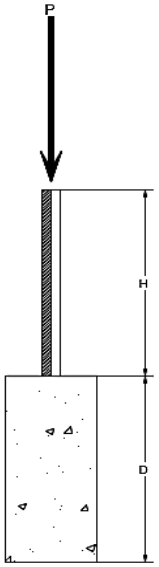
Weight of Concrete

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 =	7.25	k
Utilization =	64%	

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



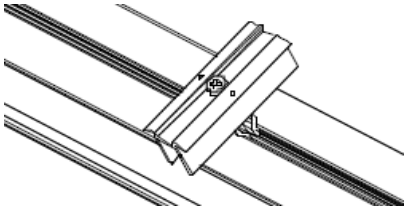
6. DESIGN OF JOINTS AND CONNECTIONS

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.

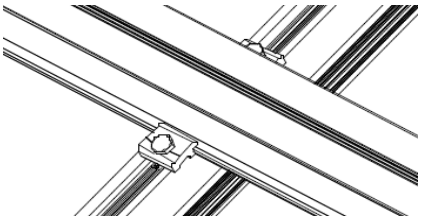
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.642 k
Allowable Uplift	=	1.214 k
Utilization	=	53%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.935 k
Allowable Uplift	=	2.180 k
Utilization	=	89%

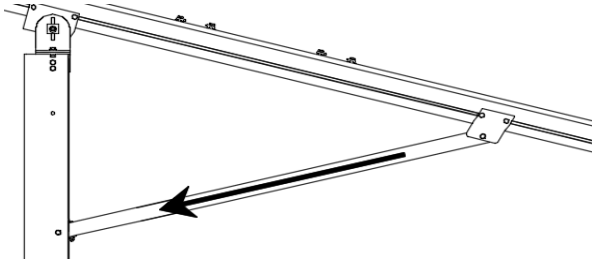


6.2 Strut Connections

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

Maximum Axial Load	=	5.430 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	61%

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

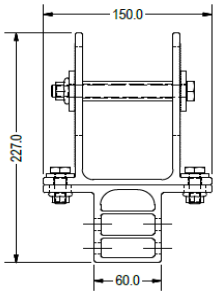


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

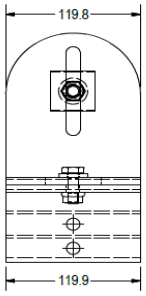
6.3 Girder to Post Connection

In order to connect the girder to the post, custom extruded sections are assembled to create a post head piece. The reliability of calculations is uncertain due to limited standards, therefore the strength of the head piece has been evaluated by load testing.

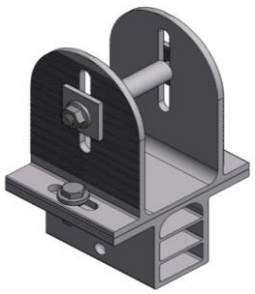
Maximum Tensile Load	=	4.001 k
Allowable Load	=	5.649 k
Utilization	=	71%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

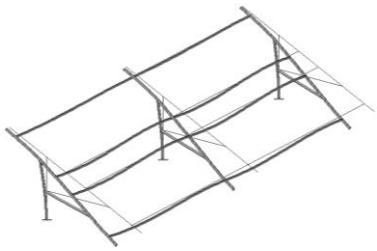
7.1 Seismic Drift

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}	=	0.772 in

0.772 ≤ 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 = 102 in	L_b = 102
J = 0.432	J = 0.432
282.18	179.449
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$
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= 27.9 ksi	φF_L= 29.0
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

$\varphi F_L St$= 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:

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 =	6.15	k	(LRFD Factored Load)
Mr (Strong) =	14.07	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 =	0.2211	≥	0.2	
Utilization =	0.94	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.221	≥	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 94%

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	-95.761	-95.761	0	0
2	M11	y	-95.761	-95.761	0	0
3	M12	y	-147.995	-147.995	0	0
4	M13	y	-147.995	-147.995	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	191.523	191.523	0	0
2	M11	y	191.523	191.523	0	0
3	M12	y	87.056	87.056	0	0
4	M13	y	87.056	87.056	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

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

Load Combinations

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

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	512.672	2	2394.804	1	148.172	1	.239	1	.008	5	7.846	1
2		min	-811.82	3	-1584.64	3	-339.305	5	-1.541	5	-.005	2	.733	12
3	N19	max	2477.191	2	6180.243	1	0	2	0	9	.009	4	13.014	1
4		min	-2379.268	3	-4775.243	3	-359.23	5	-1.603	4	0	12	.421	15
5	N29	max	512.672	2	2394.804	1	151.842	3	.203	3	.01	4	7.846	1
6		min	-811.82	3	-1584.64	3	-373.311	4	-1.618	4	-.002	3	-.432	5
7	Totals:	max	3502.535	2	10969.851	1	0	2						
8		min	-4002.907	3	-7944.523	3	-1049.582	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.004	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	-6.507	12	277.831	3	5.13	3	.048	3	.321	1	.255	2
4			min	-217.568	1	-684.609	2	-154.551	1	-.208	2	.006	12	-.101	3
5		3	max	-6.894	12	276.588	3	5.13	3	.048	3	.22	1	.705	2
6			min	-218.341	1	-686.267	2	-154.551	1	-.208	2	.007	12	-.283	3
7		4	max	-7.28	12	275.344	3	5.13	3	.048	3	.118	1	1.156	2
8			min	-219.114	1	-687.926	2	-154.551	1	-.208	2	.009	12	-.464	3
9		5	max	579.222	3	637.681	2	19.456	3	-.004	9	.161	1	1.364	2
10			min	-1653.668	2	-244.135	3	-189.796	1	-.028	3	-.039	3	-.549	3
11		6	max	578.642	3	636.023	2	19.456	3	-.004	9	.047	2	.946	2
12			min	-1654.441	2	-245.379	3	-189.796	1	-.028	3	-.03	5	-.389	3
13		7	max	578.062	3	634.365	2	19.456	3	-.004	9	-.008	12	.529	2
14			min	-1655.215	2	-246.622	3	-189.796	1	-.028	3	-.088	4	-.227	3
15		8	max	577.482	3	632.707	2	19.456	3	-.004	9	0	3	.113	2
16			min	-1655.988	2	-247.866	3	-189.796	1	-.028	3	-.212	1	-.065	3
17		9	max	568.879	3	4.867	9	36.871	3	.017	5	.113	1	.013	3
18			min	-1855.928	1	-2.053	2	-238.129	1	-.157	2	.012	12	-.079	2
19		10	max	568.299	3	3.485	9	36.871	3	.017	5	.043	3	.012	3
20			min	-1856.701	1	-3.711	2	-238.129	1	-.157	2	-.043	1	-.077	2
21		11	max	567.719	3	2.103	9	36.871	3	.017	5	.067	3	.012	3
22			min	-1857.474	1	-5.369	2	-238.129	1	-.157	2	-.2	1	-.074	2
23		12	max	554.807	3	643.575	3	15.216	10	.216	3	.152	1	.091	1
24			min	-2085.384	1	-466.674	1	-211.45	4	-.22	1	.032	10	-.195	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	554.227	3	642.332	3	15.216	10	.216	3	.135	1	.398	1
26			min	-2086.157	1	-468.332	1	-213.035	4	-.22	1	-.034	3	-.617	3
27		14	max	553.647	3	641.088	3	15.216	10	.216	3	.117	1	.706	1
28			min	-2086.93	1	-469.99	1	-214.621	4	-.22	1	-.166	5	-1.038	3
29		15	max	553.067	3	639.845	3	15.216	10	.216	3	.115	2	1.015	1
30			min	-2087.703	1	-471.648	1	-216.206	4	-.22	1	-.3	5	-1.459	3
31		16	max	219.423	1	467.853	1	71.337	5	.147	1	.015	3	.772	1
32			min	6.029	12	-663.428	3	-139.067	1	-.32	3	-.208	4	-1.113	3
33		17	max	218.65	1	466.195	1	69.752	5	.147	1	.012	3	.466	1
34			min	5.643	12	-664.672	3	-139.067	1	-.32	3	-.245	1	-.678	3
35		18	max	217.877	1	464.537	1	68.166	5	.147	1	.009	3	.16	1
36			min	5.256	12	-665.915	3	-139.067	1	-.32	3	-.337	1	-.241	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	2	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	-3.83	10	823.756	3	0	1	.033	4	.27	4	.544	2
42			min	-299.273	1	-1780.228	2	-100.841	5	0	1	0	1	-.259	3
43		3	max	-4.474	10	822.512	3	0	1	.033	4	.203	4	1.712	2
44			min	-300.046	1	-1781.886	2	-102.427	5	0	1	0	1	-.799	3
45		4	max	-5.118	10	821.269	3	0	1	.033	4	.136	4	2.882	2
46			min	-300.819	1	-1783.544	2	-104.012	5	0	1	0	1	-1.338	3
47		5	max	1893.724	3	1780.056	2	0	1	0	1	.023	4	3.398	2
48			min	-4231.755	2	-859.239	3	-100.343	4	-.02	4	0	1	-1.568	3
49		6	max	1893.144	3	1778.398	2	0	1	0	1	0	1	2.23	2
50			min	-4232.528	2	-860.482	3	-101.928	4	-.02	4	-.044	5	-1.004	3
51		7	max	1892.564	3	1776.74	2	0	1	0	1	0	1	1.064	2
52			min	-4233.301	2	-861.726	3	-103.514	4	-.02	4	-.111	4	-.439	3
53		8	max	1891.984	3	1775.082	2	0	1	0	1	0	1	.127	3
54			min	-4234.074	2	-862.969	3	-105.099	4	-.02	4	-.179	4	-.121	1
55		9	max	1862.458	3	16.963	3	0	1	.013	4	.156	4	.396	3
56			min	-4288.742	2	-116.158	2	-231.854	4	0	1	0	1	-.644	2
57		10	max	1861.878	3	15.72	3	0	1	.013	4	.004	5	.385	3
58			min	-4289.516	2	-117.816	2	-233.44	4	0	1	0	1	-.568	2
59		11	max	1861.298	3	14.476	3	0	1	.013	4	0	1	.375	3
60			min	-4290.289	2	-119.474	2	-235.025	4	0	1	-.15	4	-.49	2
61		12	max	1840.388	3	1875.219	3	0	1	.135	4	.155	5	.052	1
62			min	-4548.673	1	-1567	1	-235.065	5	0	1	0	1	-.22	3
63		13	max	1839.808	3	1873.975	3	0	1	.135	4	0	15	1.081	1
64			min	-4549.447	1	-1568.658	1	-236.651	5	0	1	0	14	-1.45	3
65		14	max	1839.228	3	1872.732	3	0	1	.135	4	0	1	2.111	1
66			min	-4550.22	1	-1570.316	1	-238.236	5	0	1	-.156	4	-2.679	3
67		15	max	1838.648	3	1871.488	3	0	1	.135	4	0	1	3.142	1
68			min	-4550.993	1	-1571.975	1	-239.822	5	0	1	-.313	4	-3.908	3
69		16	max	300.201	1	1460.492	1	56.859	5	0	1	0	1	2.392	1
70			min	4.18	10	-1822.145	3	0	1	-.13	4	-.174	5	-2.967	3
71		17	max	299.428	1	1458.834	1	55.273	5	0	1	0	1	1.434	1
72			min	3.536	10	-1823.388	3	0	1	-.13	4	-.138	5	-1.771	3
73		18	max	298.655	1	1457.175	1	53.688	5	0	1	0	1	.478	1
74			min	2.891	10	-1824.632	3	0	1	-.13	4	-.102	4	-.574	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	.004	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	24.781	5	277.831	3	154.551	1	.208	2	.135	5	.255	2
80			min	-217.568	1	-684.609	2	-44.33	5	-.048	3	-.321	1	-.101	3
81		3	max	24.421	5	276.588	3	154.551	1	.208	2	.105	5	.705	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
82			min	-218.341	1	-686.267	2	-45.916	5	-.048	3	-.22	1	-.283	3
83		4	max	24.06	5	275.344	3	154.551	1	.208	2	.075	5	1.156	2
84			min	-219.114	1	-687.926	2	-47.501	5	-.048	3	-.118	1	-.464	3
85		5	max	579.222	3	637.681	2	189.796	1	.028	3	.039	3	1.364	2
86			min	-1653.668	2	-244.135	3	-40.946	5	-.016	5	-.161	1	-.549	3
87		6	max	578.642	3	636.023	2	189.796	1	.028	3	.026	3	.946	2
88			min	-1654.441	2	-245.379	3	-42.532	5	-.016	5	-.047	2	-.389	3
89		7	max	578.062	3	634.365	2	189.796	1	.028	3	.088	1	.529	2
90			min	-1655.215	2	-246.622	3	-44.117	5	-.016	5	-.061	5	-.227	3
91		8	max	577.482	3	632.707	2	189.796	1	.028	3	.212	1	.113	2
92			min	-1655.988	2	-247.866	3	-45.703	5	-.016	5	-.09	5	-.065	3
93		9	max	568.879	3	4.867	9	238.129	1	.157	2	.071	5	.013	3
94			min	-1855.928	1	-2.053	2	-81.451	5	.017	15	-.113	1	-.079	2
95		10	max	568.299	3	3.485	9	238.129	1	.157	2	.043	1	.012	3
96			min	-1856.701	1	-3.711	2	-83.037	5	.017	15	-.043	3	-.077	2
97		11	max	567.719	3	2.103	9	238.129	1	.157	2	.2	1	.012	3
98			min	-1857.474	1	-5.369	2	-84.622	5	.017	15	-.067	3	-.074	2
99		12	max	554.807	3	643.575	3	142.615	3	.22	1	.084	5	.091	1
100			min	-2085.384	1	-466.674	1	-196.686	5	-.216	3	-.152	1	-.195	3
101		13	max	554.227	3	642.332	3	142.615	3	.22	1	.034	3	.398	1
102			min	-2086.157	1	-468.332	1	-198.271	5	-.216	3	-.135	1	-.617	3
103		14	max	553.647	3	641.088	3	142.615	3	.22	1	.128	3	.706	1
104			min	-2086.93	1	-469.99	1	-199.857	5	-.216	3	-.195	4	-1.038	3
105		15	max	553.067	3	639.845	3	142.615	3	.22	1	.221	3	1.015	1
106			min	-2087.703	1	-471.648	1	-201.442	5	-.216	3	-.322	4	-1.459	3
107		16	max	219.423	1	467.853	1	139.067	1	.32	3	.154	1	.772	1
108			min	2.012	15	-663.428	3	3.348	12	-.147	1	-.164	5	-1.113	3
109		17	max	218.65	1	466.195	1	139.067	1	.32	3	.245	1	.466	1
110			min	1.779	15	-664.672	3	3.348	12	-.147	1	-.108	5	-.678	3
111		18	max	217.877	1	464.537	1	139.067	1	.32	3	.337	1	.16	1
112			min	1.546	15	-665.915	3	3.348	12	-.147	1	-.052	5	-.241	3
113		19	max	0	1	0	5	0	12	0	1	0	1	0	1
114			min	0	1	-.001	3	0	1	0	1	0	1	0	1
115	M10	1	max	139.113	1	463.587	1	-1.321	15	.005	1	.383	1	.147	1
116			min	3.35	12	-667.102	3	-217.674	1	-.018	3	-.024	5	-.32	3
117		2	max	139.113	1	331.146	1	.318	15	.005	1	.197	1	.227	3
118			min	3.35	12	-491.58	3	-177.002	1	-.018	3	-.026	5	-.229	1
119		3	max	139.113	1	198.705	1	2.609	5	.005	1	.07	2	.609	3
120			min	3.35	12	-316.058	3	-136.331	1	-.018	3	-.024	5	-.479	1
121		4	max	139.113	1	66.264	1	5.145	5	.005	1	.012	10	.824	3
122			min	3.35	12	-140.535	3	-95.659	1	-.018	3	-.061	1	-.604	1
123		5	max	139.113	1	34.987	3	7.681	5	.005	1	-.009	12	.874	3
124			min	3.35	12	-66.177	1	-54.988	1	-.018	3	-.132	1	-.604	1
125		6	max	139.113	1	210.509	3	10.477	4	.005	1	-.004	15	.758	3
126			min	3.35	12	-198.618	1	-28.967	2	-.018	3	-.165	1	-.479	1
127		7	max	139.113	1	386.031	3	27.479	14	.005	1	.005	5	.477	3
128			min	3.35	12	-331.059	1	-12.534	10	-.018	3	-.159	1	-.229	1
129		8	max	139.113	1	561.554	3	67.027	1	.005	1	.018	5	.146	1
130			min	2.278	15	-463.5	1	-8.005	10	-.018	3	-.115	1	-.021	5
131		9	max	139.113	1	737.076	3	107.699	1	.005	1	.039	4	.647	1
132			min	-7.333	5	-595.941	1	-3.475	10	-.018	3	-.094	2	-.584	3
133		10	max	139.113	1	912.598	3	148.37	1	.018	3	.105	14	1.272	1
134			min	3.35	12	-728.382	1	-82.619	14	-.005	1	-.067	2	-1.363	3
135		11	max	139.113	1	595.941	1	3.475	10	.018	3	.017	3	.647	1
136			min	3.35	12	-737.076	3	-107.699	1	-.005	1	-.094	2	-.584	3
137		12	max	139.113	1	463.5	1	8.005	10	.018	3	.006	3	.146	1
138			min	3.35	12	-561.554	3	-67.027	1	-.005	1	-.115	1	.018	12

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	139.113	1	331.059	1	12.534	10	.018	3	-.002	12	.477	3
140			min	-.071	15	-386.031	3	-27.016	9	-.005	1	-.159	1	-.229	1
141		14	max	139.113	1	198.618	1	28.967	2	.018	3	-.006	12	.758	3
142			min	-10.908	5	-210.509	3	-5.758	3	-.005	1	-.165	1	-.479	1
143		15	max	139.113	1	66.177	1	54.988	1	.018	3	-.001	15	.874	3
144			min	-22.053	5	-34.987	3	-3.258	3	-.005	1	-.132	1	-.604	1
145		16	max	139.113	1	140.535	3	95.659	1	.018	3	.012	10	.824	3
146			min	-33.198	5	-66.264	1	-.758	3	-.005	1	-.061	1	-.604	1
147		17	max	139.113	1	316.058	3	136.331	1	.018	3	.07	2	.609	3
148			min	-44.343	5	-198.705	1	1.536	12	-.005	1	-.015	3	-.479	1
149		18	max	139.113	1	491.58	3	177.002	1	.018	3	.197	1	.227	3
150			min	-55.488	5	-331.146	1	3.203	12	-.005	1	-.012	3	-.229	1
151		19	max	139.113	1	667.102	3	217.674	1	.018	3	.383	1	.147	1
152			min	-66.632	5	-463.587	1	4.869	12	-.005	1	-.007	3	-.32	3
153	M11	1	max	210.371	1	466.488	1	41.489	5	.003	3	.441	1	.115	4
154			min	-179.273	3	-646.406	3	-228.006	1	-.013	1	-.213	5	-.303	3
155		2	max	210.371	1	334.047	1	44.025	5	.003	3	.245	1	.225	3
156			min	-179.273	3	-470.884	3	-187.335	1	-.013	1	-.173	5	-.293	2
157		3	max	210.371	1	201.606	1	46.561	5	.003	3	.089	2	.587	3
158			min	-179.273	3	-295.362	3	-146.663	1	-.013	1	-.13	5	-.538	1
159		4	max	210.371	1	69.165	1	49.098	5	.003	3	.018	2	.783	3
160			min	-179.273	3	-119.84	3	-105.992	1	-.013	1	-.097	4	-.666	1
161		5	max	210.371	1	55.683	3	51.634	5	.003	3	-.002	12	.813	3
162			min	-179.273	3	-64.335	2	-65.32	1	-.013	1	-.113	1	-.669	1
163		6	max	210.371	1	231.205	3	54.17	5	.003	3	.013	5	.677	3
164			min	-179.273	3	-195.717	1	-34.356	2	-.013	1	-.155	1	-.547	1
165		7	max	210.371	1	406.727	3	63.921	4	.003	3	.065	5	.376	3
166			min	-179.273	3	-328.158	1	-17.909	2	-.013	1	-.16	1	-.299	1
167		8	max	210.371	1	582.249	3	75.3	4	.003	3	.12	5	.073	1
168			min	-179.273	3	-460.599	1	-9.923	10	-.013	1	-.125	1	-.091	3
169		9	max	210.371	1	757.772	3	97.366	1	.003	3	.178	4	.571	1
170			min	-179.273	3	-593.04	1	-5.394	10	-.013	1	-.105	2	-.724	3
171		10	max	210.371	1	933.294	3	138.038	1	-.001	15	.265	4	1.193	1
172			min	-179.273	3	-725.481	1	-54.889	14	-.013	1	-.083	2	-1.522	3
173		11	max	210.371	1	593.04	1	47.599	5	.013	1	.007	3	.571	1
174			min	-179.273	3	-757.772	3	-97.366	1	-.003	3	-.177	4	-.724	3
175		12	max	210.371	1	460.599	1	50.135	5	.013	1	.001	3	.073	1
176			min	-179.273	3	-582.249	3	-56.695	1	-.003	3	-.149	4	-.091	3
177		13	max	210.371	1	328.158	1	52.671	5	.013	1	-.002	12	.376	3
178			min	-179.273	3	-406.727	3	-20.817	9	-.003	3	-.16	1	-.299	1
179		14	max	210.371	1	195.717	1	57.324	4	.013	1	-.003	12	.677	3
180			min	-179.273	3	-231.205	3	-.138	3	-.003	3	-.155	1	-.547	1
181		15	max	210.371	1	64.335	2	68.703	4	.013	1	.023	5	.813	3
182			min	-179.273	3	-55.683	3	1.614	12	-.003	3	-.113	1	-.669	1
183		16	max	210.371	1	119.84	3	105.992	1	.013	1	.078	5	.783	3
184			min	-179.273	3	-69.165	1	3.281	12	-.003	3	-.034	9	-.666	1
185		17	max	210.371	1	295.362	3	146.663	1	.013	1	.148	4	.587	3
186			min	-179.273	3	-201.606	1	4.947	12	-.003	3	.004	12	-.538	1
187		18	max	210.371	1	470.884	3	187.335	1	.013	1	.245	1	.225	3
188			min	-179.273	3	-334.047	1	6.614	12	-.003	3	.01	12	-.293	2
189		19	max	210.371	1	646.406	3	228.006	1	.013	1	.441	1	.093	1
190			min	-179.273	3	-466.488	1	8.28	12	-.003	3	.017	12	-.303	3
191	M12	1	max	33.947	5	631.971	2	39.494	5	0	3	.466	1	.147	2
192			min	-46.957	1	-251.266	3	-232.534	1	-.01	1	-.203	5	.027	15
193		2	max	22.802	5	456.928	2	42.031	5	0	3	.266	1	.26	3
194			min	-46.957	1	-174.407	3	-191.862	1	-.01	1	-.165	5	-.367	2
195		3	max	17.493	3	281.886	2	44.567	5	0	3	.106	2	.388	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-46.957	1	-97.548	3	-151.191	1	-.01	1	-.124	5	-.716	2
197		4	max	17.493	3	106.844	2	47.103	5	0	3	.03	2	.444	3
198			min	-46.957	1	-20.689	3	-110.519	1	-.01	1	-.091	4	-.899	2
199		5	max	17.493	3	56.17	3	49.64	5	0	3	-.003	10	.427	3
200			min	-46.957	1	-68.199	2	-69.847	1	-.01	1	-.105	1	-.918	2
201		6	max	17.493	3	133.029	3	52.176	5	0	3	.013	5	.338	3
202			min	-46.957	1	-243.241	2	-38.797	2	-.01	1	-.152	1	-.771	2
203		7	max	17.493	3	209.888	3	61.404	4	0	3	.064	5	.176	3
204			min	-46.957	1	-418.284	2	-22.351	2	-.01	1	-.16	1	-.458	2
205		8	max	17.493	3	286.747	3	72.783	4	0	3	.117	5	.02	2
206			min	-55.456	4	-593.326	2	-12.209	10	-.01	1	-.13	1	-.058	3
207		9	max	17.493	3	363.605	3	92.839	1	0	3	.172	4	.663	2
208			min	-66.601	4	-768.368	2	-7.68	10	-.01	1	-.114	2	-.366	3
209		10	max	17.493	3	440.464	3	133.511	1	0	12	.257	4	1.471	2
210			min	-77.746	4	-943.411	2	-98.582	9	-.01	1	-.096	2	-.745	3
211		11	max	47.661	5	768.368	2	45.989	5	.01	1	.016	3	.663	2
212			min	-46.957	1	-363.605	3	-92.839	1	0	5	-.174	4	-.366	3
213		12	max	36.516	5	593.326	2	48.526	5	.01	1	.006	3	.02	2
214			min	-46.957	1	-286.747	3	-52.167	1	0	5	-.148	4	-.058	3
215		13	max	25.371	5	418.284	2	51.062	5	.01	1	-.002	12	.176	3
216			min	-46.957	1	-209.888	3	-18.926	9	0	5	-.16	1	-.458	2
217		14	max	17.493	3	243.241	2	56.451	4	.01	1	-.005	12	.338	3
218			min	-46.957	1	-133.029	3	-4.477	3	0	5	-.152	1	-.771	2
219		15	max	17.493	3	68.199	2	69.847	1	.01	1	.021	5	.427	3
220			min	-46.957	1	-56.17	3	-1.978	3	0	5	-.105	1	-.918	2
221		16	max	17.493	3	20.689	3	110.519	1	.01	1	.075	5	.444	3
222			min	-46.957	1	-106.844	2	.522	3	0	5	-.029	9	-.899	2
223		17	max	17.493	3	97.548	3	151.191	1	.01	1	.146	4	.388	3
224			min	-46.957	1	-281.886	2	2.355	12	0	5	-.01	3	-.716	2
225		18	max	17.493	3	174.407	3	191.862	1	.01	1	.266	1	.26	3
226			min	-46.957	1	-456.928	2	4.021	12	0	5	-.006	3	-.367	2
227		19	max	17.493	3	251.266	3	232.534	1	.01	1	.466	1	.147	2
228			min	-52.818	4	-631.971	2	5.688	12	0	5	0	3	-.034	5
229	M13	1	max	42.619	5	683.826	2	25.147	5	.008	3	.373	1	.208	2
230			min	-154.353	1	-279.117	3	-216.146	1	-.026	2	-.15	5	-.048	3
231		2	max	31.474	5	508.784	2	27.683	5	.008	3	.188	1	.179	3
232			min	-154.353	1	-202.258	3	-175.474	1	-.026	2	-.125	5	-.356	2
233		3	max	20.329	5	333.742	2	30.22	5	.008	3	.063	2	.334	3
234			min	-154.353	1	-125.399	3	-134.803	1	-.026	2	-.098	5	-.753	2
235		4	max	9.184	5	158.699	2	32.756	5	.008	3	.009	10	.416	3
236			min	-154.353	1	-48.541	3	-94.131	1	-.026	2	-.086	4	-.986	2
237		5	max	5.129	3	28.318	3	35.292	5	.008	3	-.006	12	.426	3
238			min	-154.353	1	-16.343	2	-53.46	1	-.026	2	-.137	1	-1.053	2
239		6	max	5.129	3	105.177	3	38.416	4	.008	3	0	15	.363	3
240			min	-154.353	1	-191.386	2	-27.682	2	-.026	2	-.168	1	-.955	2
241		7	max	5.129	3	182.036	3	49.796	4	.008	3	.036	5	.227	3
242			min	-154.353	1	-366.428	2	-11.903	10	-.026	2	-.161	1	-.692	2
243		8	max	5.129	3	258.895	3	68.555	1	.008	3	.075	5	.019	3
244			min	-154.353	1	-541.47	2	-7.374	10	-.026	2	-.115	1	-.278	1
245		9	max	5.129	3	335.754	3	109.227	1	.008	3	.122	4	.331	2
246			min	-154.353	1	-716.513	2	-2.845	10	-.026	2	-.094	2	-.262	3
247		10	max	5.129	3	891.555	2	107.631	14	-.001	15	.196	4	1.09	2
248			min	-154.353	1	-230.505	14	-149.898	1	-.026	2	-.066	2	-.616	3
249		11	max	30.529	5	716.513	2	29.964	5	.026	2	.014	3	.331	2
250			min	-154.353	1	-335.754	3	-109.227	1	-.008	3	-.114	5	-.262	3
251		12	max	19.384	5	541.47	2	32.5	5	.026	2	.005	3	.019	3
252			min	-154.353	1	-258.895	3	-68.555	1	-.008	3	-.115	1	-.278	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	8.239	5	366.428	2	35.037	5	.026	2	-.002	12	.227	3
254			min	-154.353	1	-182.036	3	-27.883	1	-.008	3	-.161	1	-.692	2
255		14	max	5.129	3	191.386	2	37.573	5	.026	2	-.005	12	.363	3
256			min	-154.353	1	-105.177	3	-3.666	3	-.008	3	-.168	1	-.955	2
257		15	max	5.129	3	16.343	2	53.46	1	.026	2	.018	5	.426	3
258			min	-154.353	1	-28.318	3	-1.166	3	-.008	3	-.137	1	-1.053	2
259		16	max	5.129	3	48.541	3	94.131	1	.026	2	.057	5	.416	3
260			min	-154.353	1	-158.699	2	1.121	12	-.008	3	-.067	1	-.986	2
261		17	max	5.129	3	125.399	3	134.803	1	.026	2	.102	4	.334	3
262			min	-154.353	1	-333.742	2	2.787	12	-.008	3	-.006	3	-.753	2
263		18	max	5.129	3	202.258	3	175.474	1	.026	2	.188	1	.179	3
264			min	-154.353	1	-508.784	2	4.454	12	-.008	3	-.001	3	-.356	2
265		19	max	5.129	3	279.117	3	216.146	1	.026	2	.373	1	.208	2
266			min	-154.353	1	-683.826	2	6.12	12	-.008	3	.005	12	-.048	3
267	M2	1	max	2394.804	1	811.418	3	148.469	1	.008	5	1.541	5	7.846	1
268			min	-1584.64	3	-509.039	2	-339.45	5	-.005	2	-.239	1	.733	12
269		2	max	2391.882	1	811.418	3	148.469	1	.008	5	1.432	5	7.872	1
270			min	-1586.831	3	-509.039	2	-336.918	5	-.005	2	-.191	1	.577	12
271		3	max	2388.96	1	811.418	3	148.469	1	.008	5	1.325	5	7.898	1
272			min	-1589.022	3	-509.039	2	-334.386	5	-.005	2	-.144	1	.42	12
273		4	max	2386.039	1	811.418	3	148.469	1	.008	5	1.218	4	7.924	1
274			min	-1591.214	3	-509.039	2	-331.854	5	-.005	2	-.096	1	.264	12
275		5	max	1887.181	1	1703.587	1	111.61	1	.002	2	1.118	5	7.653	1
276			min	-1380.061	3	40.501	12	-316.006	5	0	3	-.097	1	.182	12
277		6	max	1884.259	1	1703.587	1	111.61	1	.002	2	1.021	4	7.106	1
278			min	-1382.253	3	40.501	12	-313.474	5	0	3	-.061	1	.169	12
279		7	max	1881.338	1	1703.587	1	111.61	1	.002	2	.924	4	6.559	1
280			min	-1384.444	3	40.501	12	-310.942	5	0	3	-.06	3	.156	12
281		8	max	1878.416	1	1703.587	1	111.61	1	.002	2	.829	4	6.013	1
282			min	-1386.635	3	40.501	12	-308.41	5	0	3	-.104	3	.143	12
283		9	max	1875.494	1	1703.587	1	111.61	1	.002	2	.734	4	5.466	1
284			min	-1388.827	3	40.501	12	-305.878	5	0	3	-.148	3	.13	12
285		10	max	1872.573	1	1703.587	1	111.61	1	.002	2	.64	4	4.92	1
286			min	-1391.018	3	40.501	12	-303.345	5	0	3	-.192	3	.117	12
287		11	max	1869.651	1	1703.587	1	111.61	1	.002	2	.547	4	4.373	1
288			min	-1393.209	3	40.501	12	-300.813	5	0	3	-.237	3	.104	12
289		12	max	1866.729	1	1703.587	1	111.61	1	.002	2	.455	4	3.826	1
290			min	-1395.401	3	40.501	12	-298.281	5	0	3	-.281	3	.091	12
291		13	max	1863.807	1	1703.587	1	111.61	1	.002	2	.363	4	3.28	1
292			min	-1397.592	3	40.501	12	-295.749	5	0	3	-.325	3	.078	12
293		14	max	1860.886	1	1703.587	1	111.61	1	.002	2	.273	4	2.733	1
294			min	-1399.783	3	40.501	12	-293.217	5	0	3	-.37	3	.065	12
295		15	max	1857.964	1	1703.587	1	111.61	1	.002	2	.262	2	2.186	1
296			min	-1401.974	3	40.501	12	-290.685	5	0	3	-.414	3	.052	12
297		16	max	1855.042	1	1703.587	1	111.61	1	.002	2	.297	1	1.64	1
298			min	-1404.166	3	40.501	12	-288.152	5	0	3	-.458	3	.039	12
299		17	max	1852.12	1	1703.587	1	111.61	1	.002	2	.333	1	1.093	1
300			min	-1406.357	3	40.501	12	-285.62	5	0	3	-.502	3	.026	12
301		18	max	1849.199	1	1703.587	1	111.61	1	.002	2	.368	1	.547	1
302			min	-1408.548	3	40.501	12	-283.088	5	0	3	-.547	3	.013	12
303		19	max	1846.277	1	1703.587	1	111.61	1	.002	2	.404	1	0	1
304			min	-1410.74	3	40.501	12	-280.556	5	0	3	-.591	3	0	1
305	M5	1	max	6180.243	1	2377.094	3	0	1	.009	4	1.603	4	13.014	1
306			min	-4775.243	3	-2460.388	2	-359.501	5	0	1	0	1	.421	15
307		2	max	6177.321	1	2377.094	3	0	1	.009	4	1.489	4	13.514	1
308			min	-4777.434	3	-2460.388	2	-356.968	5	0	1	0	1	.426	15
309		3	max	6174.4	1	2377.094	3	0	1	.009	4	1.375	4	14.014	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	-4779.626	3	-2460.388	2	-354.436	5	0	1	0	1	.432	15
311		4	max	6171.478	1	2377.094	3	0	1	.009	4	1.262	4	14.514	1
312			min	-4781.817	3	-2460.388	2	-351.904	5	0	1	0	1	.015	3
313		5	max	4914.315	1	3166.945	1	0	1	0	1	1.159	4	14.226	1
314			min	-4080.202	3	-75.459	3	-340.656	4	0	4	0	1	-.339	3
315		6	max	4911.393	1	3166.945	1	0	1	0	1	1.05	4	13.21	1
316			min	-4082.393	3	-75.459	3	-338.123	4	0	4	0	1	-.315	3
317		7	max	4908.471	1	3166.945	1	0	1	0	1	.942	4	12.194	1
318			min	-4084.585	3	-75.459	3	-335.591	4	0	4	0	1	-.291	3
319		8	max	4905.549	1	3166.945	1	0	1	0	1	.835	4	11.178	1
320			min	-4086.776	3	-75.459	3	-333.059	4	0	4	0	1	-.266	3
321		9	max	4902.628	1	3166.945	1	0	1	0	1	.728	4	10.162	1
322			min	-4088.967	3	-75.459	3	-330.527	4	0	4	0	1	-.242	3
323		10	max	4899.706	1	3166.945	1	0	1	0	1	.623	4	9.145	1
324			min	-4091.159	3	-75.459	3	-327.995	4	0	4	0	1	-.218	3
325		11	max	4896.784	1	3166.945	1	0	1	0	1	.518	4	8.129	1
326			min	-4093.35	3	-75.459	3	-325.463	4	0	4	0	1	-.194	3
327		12	max	4893.863	1	3166.945	1	0	1	0	1	.414	4	7.113	1
328			min	-4095.541	3	-75.459	3	-322.93	4	0	4	0	1	-.169	3
329		13	max	4890.941	1	3166.945	1	0	1	0	1	.311	4	6.097	1
330			min	-4097.733	3	-75.459	3	-320.398	4	0	4	0	1	-.145	3
331		14	max	4888.019	1	3166.945	1	0	1	0	1	.208	4	5.081	1
332			min	-4099.924	3	-75.459	3	-317.866	4	0	4	0	1	-.121	3
333		15	max	4885.097	1	3166.945	1	0	1	0	1	.107	4	4.065	1
334			min	-4102.115	3	-75.459	3	-315.334	4	0	4	0	1	-.097	3
335		16	max	4882.176	1	3166.945	1	0	1	0	1	.006	4	3.048	1
336			min	-4104.306	3	-75.459	3	-312.802	4	0	4	0	1	-.073	3
337		17	max	4879.254	1	3166.945	1	0	1	0	1	0	1	2.032	1
338			min	-4106.498	3	-75.459	3	-310.27	4	0	4	-.094	4	-.048	3
339		18	max	4876.332	1	3166.945	1	0	1	0	1	0	1	1.016	1
340			min	-4108.689	3	-75.459	3	-307.737	4	0	4	-.193	4	-.024	3
341		19	max	4873.41	1	3166.945	1	0	1	0	1	0	1	0	1
342			min	-4110.88	3	-75.459	3	-305.205	4	0	4	-.292	4	0	1
343	M8	1	max	2394.804	1	811.418	3	151.683	3	.01	4	1.618	4	7.846	1
344			min	-1584.64	3	-509.039	2	-373.812	4	-.002	3	-.203	3	-.432	5
345		2	max	2391.882	1	811.418	3	151.683	3	.01	4	1.498	4	7.872	1
346			min	-1586.831	3	-509.039	2	-371.28	4	-.002	3	-.154	3	-.385	5
347		3	max	2388.96	1	811.418	3	151.683	3	.01	4	1.379	4	7.898	1
348			min	-1589.022	3	-509.039	2	-368.747	4	-.002	3	-.105	3	-.337	5
349		4	max	2386.039	1	811.418	3	151.683	3	.01	4	1.262	4	7.924	1
350			min	-1591.214	3	-509.039	2	-366.215	4	-.002	3	-.057	3	-.289	5
351		5	max	1887.181	1	1703.587	1	137.944	3	0	3	1.16	4	7.653	1
352			min	-1380.061	3	-57.125	5	-345.829	4	-.002	2	-.029	3	-.257	5
353		6	max	1884.259	1	1703.587	1	137.944	3	0	3	1.049	4	7.106	1
354			min	-1382.253	3	-57.125	5	-343.297	4	-.002	2	.01	12	-.238	5
355		7	max	1881.338	1	1703.587	1	137.944	3	0	3	.94	4	6.559	1
356			min	-1384.444	3	-57.125	5	-340.764	4	-.002	2	-.001	10	-.22	5
357		8	max	1878.416	1	1703.587	1	137.944	3	0	3	.831	4	6.013	1
358			min	-1386.635	3	-57.125	5	-338.232	4	-.002	2	-.028	2	-.202	5
359		9	max	1875.494	1	1703.587	1	137.944	3	0	3	.723	4	5.466	1
360			min	-1388.827	3	-57.125	5	-335.7	4	-.002	2	-.062	2	-.183	5
361		10	max	1872.573	1	1703.587	1	137.944	3	0	3	.615	4	4.92	1
362			min	-1391.018	3	-57.125	5	-333.168	4	-.002	2	-.095	2	-.165	5
363		11	max	1869.651	1	1703.587	1	137.944	3	0	3	.515	5	4.373	1
364			min	-1393.209	3	-57.125	5	-330.636	4	-.002	2	-.128	2	-.147	5
365		12	max	1866.729	1	1703.587	1	137.944	3	0	3	.416	5	3.826	1
366			min	-1395.401	3	-57.125	5	-328.103	4	-.002	2	-.162	2	-.128	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	1863.807	1	1703.587	1	137.944	3	0	3	.325	3	3.28	1
368			min	-1397.592	3	-57.125	5	-325.571	4	-.002	2	-.195	2	-.11	5
369		14	max	1860.886	1	1703.587	1	137.944	3	0	3	.37	3	2.733	1
370			min	-1399.783	3	-57.125	5	-323.039	4	-.002	2	-.228	2	-.092	5
371		15	max	1857.964	1	1703.587	1	137.944	3	0	3	.414	3	2.186	1
372			min	-1401.974	3	-57.125	5	-320.507	4	-.002	2	-.262	2	-.073	5
373		16	max	1855.042	1	1703.587	1	137.944	3	0	3	.458	3	1.64	1
374			min	-1404.166	3	-57.125	5	-317.975	4	-.002	2	-.297	1	-.055	5
375		17	max	1852.12	1	1703.587	1	137.944	3	0	3	.502	3	1.093	1
376			min	-1406.357	3	-57.125	5	-315.443	4	-.002	2	-.333	1	-.037	5
377		18	max	1849.199	1	1703.587	1	137.944	3	0	3	.547	3	.547	1
378			min	-1408.548	3	-57.125	5	-312.91	4	-.002	2	-.368	1	-.018	5
379		19	max	1846.277	1	1703.587	1	137.944	3	0	3	.591	3	0	1
380			min	-1410.74	3	-57.125	5	-310.378	4	-.002	2	-.404	1	0	1
381	M3	1	max	2026.637	2	5.879	6	37.742	2	.019	3	.008	4	0	1
382			min	-783.809	3	1.382	15	-14.32	3	-.046	2	-.002	3	0	1
383		2	max	2026.49	2	5.226	6	37.742	2	.019	3	.02	2	0	15
384			min	-783.919	3	1.228	15	-14.32	3	-.046	2	-.008	3	-.002	6
385		3	max	2026.344	2	4.572	6	37.742	2	.019	3	.033	2	0	15
386			min	-784.029	3	1.075	15	-14.32	3	-.046	2	-.013	3	-.004	6
387		4	max	2026.197	2	3.919	6	37.742	2	.019	3	.046	2	-.001	15
388			min	-784.139	3	.921	15	-14.32	3	-.046	2	-.018	3	-.005	6
389		5	max	2026.051	2	3.266	6	37.742	2	.019	3	.06	2	-.002	15
390			min	-784.249	3	.768	15	-14.32	3	-.046	2	-.023	3	-.007	6
391		6	max	2025.904	2	2.613	6	37.742	2	.019	3	.073	2	-.002	15
392			min	-784.359	3	.614	15	-14.32	3	-.046	2	-.028	3	-.008	6
393		7	max	2025.757	2	1.96	6	37.742	2	.019	3	.087	2	-.002	15
394			min	-784.469	3	.461	15	-14.32	3	-.046	2	-.033	3	-.008	6
395		8	max	2025.611	2	1.306	6	37.742	2	.019	3	.1	2	-.002	15
396			min	-784.579	3	.307	15	-14.32	3	-.046	2	-.038	3	-.009	6
397		9	max	2025.464	2	.653	6	37.742	2	.019	3	.114	2	-.002	15
398			min	-784.689	3	.154	15	-14.32	3	-.046	2	-.043	3	-.009	6
399		10	max	2025.317	2	0	1	37.742	2	.019	3	.127	2	-.002	15
400			min	-784.799	3	0	1	-14.32	3	-.046	2	-.048	3	-.009	6
401		11	max	2025.171	2	-.154	15	37.742	2	.019	3	.141	2	-.002	15
402			min	-784.909	3	-.653	4	-14.32	3	-.046	2	-.054	3	-.009	6
403		12	max	2025.024	2	-.307	15	37.742	2	.019	3	.154	2	-.002	15
404			min	-785.019	3	-1.306	4	-14.32	3	-.046	2	-.059	3	-.009	6
405		13	max	2024.878	2	-.461	15	37.742	2	.019	3	.168	2	-.002	15
406			min	-785.129	3	-1.96	4	-14.32	3	-.046	2	-.064	3	-.008	6
407		14	max	2024.731	2	-.614	15	37.742	2	.019	3	.181	2	-.002	15
408			min	-785.239	3	-2.613	4	-14.32	3	-.046	2	-.069	3	-.008	6
409		15	max	2024.584	2	-.768	15	37.742	2	.019	3	.195	2	-.002	15
410			min	-785.349	3	-3.266	4	-14.32	3	-.046	2	-.074	3	-.007	6
411		16	max	2024.438	2	-.921	15	37.742	2	.019	3	.208	2	-.001	15
412			min	-785.459	3	-3.919	4	-14.32	3	-.046	2	-.079	3	-.005	6
413		17	max	2024.291	2	-1.075	15	37.742	2	.019	3	.222	2	0	15
414			min	-785.568	3	-4.572	4	-14.32	3	-.046	2	-.084	3	-.004	6
415		18	max	2024.145	2	-1.228	15	37.742	2	.019	3	.235	2	0	15
416			min	-785.678	3	-5.226	4	-14.32	3	-.046	2	-.089	3	-.002	6
417		19	max	2023.998	2	-1.382	15	37.742	2	.019	3	.249	2	0	1
418			min	-785.788	3	-5.879	4	-14.32	3	-.046	2	-.095	3	0	1
419	M6	1	max	5429.964	2	5.879	4	0	1	.01	4	.007	4	0	1
420			min	-2552.67	3	1.382	15	-15.959	4	0	1	0	1	0	1
421		2	max	5429.817	2	5.226	4	0	1	.01	4	.002	4	0	15
422			min	-2552.78	3	1.228	15	-15.5	4	0	1	0	1	-.002	4
423		3	max	5429.671	2	4.572	4	0	1	.01	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	-2552.89	3	1.075	15	-15.041	4	0	1	-.004	4	-.004	4
425		4	max	5429.524	2	3.919	4	0	1	.01	4	0	1	-.001	15
426			min	-2552.999	3	.921	15	-14.582	4	0	1	-.009	4	-.005	4
427		5	max	5429.377	2	3.266	4	0	1	.01	4	0	1	-.002	15
428			min	-2553.109	3	.768	15	-14.123	4	0	1	-.014	4	-.007	4
429		6	max	5429.231	2	2.613	4	0	1	.01	4	0	1	-.002	15
430			min	-2553.219	3	.614	15	-13.664	4	0	1	-.019	4	-.008	4
431		7	max	5429.084	2	1.96	4	0	1	.01	4	0	1	-.002	15
432			min	-2553.329	3	.461	15	-13.205	4	0	1	-.024	4	-.008	4
433		8	max	5428.937	2	1.306	4	0	1	.01	4	0	1	-.002	15
434			min	-2553.439	3	.307	15	-12.746	4	0	1	-.029	4	-.009	4
435		9	max	5428.791	2	.653	4	0	1	.01	4	0	1	-.002	15
436			min	-2553.549	3	.154	15	-12.287	4	0	1	-.033	4	-.009	4
437		10	max	5428.644	2	0	1	0	1	.01	4	0	1	-.002	15
438			min	-2553.659	3	0	1	-11.828	4	0	1	-.037	4	-.009	4
439		11	max	5428.498	2	-.154	15	0	1	.01	4	0	1	-.002	15
440			min	-2553.769	3	-.653	6	-11.369	4	0	1	-.042	4	-.009	4
441		12	max	5428.351	2	-.307	15	0	1	.01	4	0	1	-.002	15
442			min	-2553.879	3	-1.306	6	-10.91	4	0	1	-.046	4	-.009	4
443		13	max	5428.204	2	-.461	15	0	1	.01	4	0	1	-.002	15
444			min	-2553.989	3	-1.96	6	-10.451	4	0	1	-.049	4	-.008	4
445		14	max	5428.058	2	-.614	15	0	1	.01	4	0	1	-.002	15
446			min	-2554.099	3	-2.613	6	-9.991	4	0	1	-.053	4	-.008	4
447		15	max	5427.911	2	-.768	15	0	1	.01	4	0	1	-.002	15
448			min	-2554.209	3	-3.266	6	-9.532	4	0	1	-.057	4	-.007	4
449		16	max	5427.765	2	-.921	15	0	1	.01	4	0	1	-.001	15
450			min	-2554.319	3	-3.919	6	-9.073	4	0	1	-.06	4	-.005	4
451		17	max	5427.618	2	-1.075	15	0	1	.01	4	0	1	0	15
452			min	-2554.429	3	-4.572	6	-8.614	4	0	1	-.063	4	-.004	4
453		18	max	5427.471	2	-1.228	15	0	1	.01	4	0	1	0	15
454			min	-2554.539	3	-5.226	6	-8.155	4	0	1	-.066	4	-.002	4
455		19	max	5427.325	2	-1.382	15	0	1	.01	4	0	1	0	1
456			min	-2554.649	3	-5.879	6	-7.696	4	0	1	-.069	4	0	1
457	M9	1	max	2026.637	2	5.879	4	14.32	3	.046	2	.007	5	0	1
458			min	-783.809	3	1.382	15	-37.742	2	-.019	3	-.006	2	0	1
459		2	max	2026.49	2	5.226	4	14.32	3	.046	2	.008	3	0	15
460			min	-783.919	3	1.228	15	-37.742	2	-.019	3	-.02	2	-.002	4
461		3	max	2026.344	2	4.572	4	14.32	3	.046	2	.013	3	0	15
462			min	-784.029	3	1.075	15	-37.742	2	-.019	3	-.033	2	-.004	4
463		4	max	2026.197	2	3.919	4	14.32	3	.046	2	.018	3	-.001	15
464			min	-784.139	3	.921	15	-37.742	2	-.019	3	-.046	2	-.005	4
465		5	max	2026.051	2	3.266	4	14.32	3	.046	2	.023	3	-.002	15
466			min	-784.249	3	.768	15	-37.742	2	-.019	3	-.06	2	-.007	4
467		6	max	2025.904	2	2.613	4	14.32	3	.046	2	.028	3	-.002	15
468			min	-784.359	3	.614	15	-37.742	2	-.019	3	-.073	2	-.008	4
469		7	max	2025.757	2	1.96	4	14.32	3	.046	2	.033	3	-.002	15
470			min	-784.469	3	.461	15	-37.742	2	-.019	3	-.087	2	-.008	4
471		8	max	2025.611	2	1.306	4	14.32	3	.046	2	.038	3	-.002	15
472			min	-784.579	3	.307	15	-37.742	2	-.019	3	-.1	2	-.009	4
473		9	max	2025.464	2	.653	4	14.32	3	.046	2	.043	3	-.002	15
474			min	-784.689	3	.154	15	-37.742	2	-.019	3	-.114	2	-.009	4
475		10	max	2025.317	2	0	1	14.32	3	.046	2	.048	3	-.002	15
476			min	-784.799	3	0	1	-37.742	2	-.019	3	-.127	2	-.009	4
477		11	max	2025.171	2	-.154	15	14.32	3	.046	2	.054	3	-.002	15
478			min	-784.909	3	-.653	6	-37.742	2	-.019	3	-.141	2	-.009	4
479		12	max	2025.024	2	-.307	15	14.32	3	.046	2	.059	3	-.002	15
480			min	-785.019	3	-1.306	6	-37.742	2	-.019	3	-.154	2	-.009	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	2024.878	2	-.461	15	14.32	3	.046	2	.064	3	-.002	15
482			min	-785.129	3	-1.96	6	-37.742	2	-.019	3	-.168	2	-.008	4
483		14	max	2024.731	2	-.614	15	14.32	3	.046	2	.069	3	-.002	15
484			min	-785.239	3	-2.613	6	-37.742	2	-.019	3	-.181	2	-.008	4
485		15	max	2024.584	2	-.768	15	14.32	3	.046	2	.074	3	-.002	15
486			min	-785.349	3	-3.266	6	-37.742	2	-.019	3	-.195	2	-.007	4
487		16	max	2024.438	2	-.921	15	14.32	3	.046	2	.079	3	-.001	15
488			min	-785.459	3	-3.919	6	-37.742	2	-.019	3	-.208	2	-.005	4
489		17	max	2024.291	2	-1.075	15	14.32	3	.046	2	.084	3	0	15
490			min	-785.568	3	-4.572	6	-37.742	2	-.019	3	-.222	2	-.004	4
491		18	max	2024.145	2	-1.228	15	14.32	3	.046	2	.089	3	0	15
492			min	-785.678	3	-5.226	6	-37.742	2	-.019	3	-.235	2	-.002	4
493		19	max	2023.998	2	-1.382	15	14.32	3	.046	2	.095	3	0	1
494			min	-785.788	3	-5.879	6	-37.742	2	-.019	3	-.249	2	0	1

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	-.019	12	.082	3	.013	1	8.888e-3	3	NC	3	NC	1
2			min	-.523	1	-1.094	1	-.796	4	-2.624e-2	2	97.361	1	220.721	5
3		2	max	-.019	12	.051	3	0	3	8.575e-3	3	7781.522	12	NC	2
4			min	-.523	1	-.946	1	-.769	4	-2.49e-2	2	108.327	1	230.956	4
5		3	max	-.019	12	.021	3	0	3	7.962e-3	3	3985.846	12	NC	3
6			min	-.523	1	-.802	1	-.734	4	-2.225e-2	2	121.725	1	245.027	4
7		4	max	-.019	12	-.004	3	.001	3	7.349e-3	3	2817.774	12	NC	3
8			min	-.522	1	-.668	1	-.692	4	-1.961e-2	2	137.57	1	264.269	4
9		5	max	-.019	12	-.015	12	.002	3	7.007e-3	3	2335.402	12	NC	3
10			min	-.522	1	-.551	1	-.645	4	-1.768e-2	2	155.288	1	289.42	4
11		6	max	-.019	12	-.021	12	.003	3	7.364e-3	3	2148.016	12	NC	3
12			min	-.522	1	-.453	1	-.597	4	-1.755e-2	2	174.013	1	320.993	4
13		7	max	-.019	12	-.022	12	.002	3	7.721e-3	3	2093.449	12	NC	1
14			min	-.521	1	-.368	1	-.55	4	-1.743e-2	2	194.263	1	359.314	4
15		8	max	-.019	12	-.022	12	0	1	8.078e-3	3	2104.981	12	NC	1
16			min	-.52	1	-.29	1	-.506	4	-1.73e-2	2	217.327	1	403.11	5
17		9	max	-.019	12	-.021	12	0	10	8.821e-3	3	2134.246	12	NC	1
18			min	-.52	1	-.214	1	-.467	4	-1.622e-2	2	245.967	1	453.819	5
19		10	max	-.02	12	-.014	15	.001	1	9.927e-3	3	2181.433	15	NC	1
20			min	-.519	1	-.137	1	-.425	4	-1.422e-2	2	284.006	1	523.264	5
21		11	max	-.02	12	-.007	15	.001	1	1.103e-2	3	2451.467	15	NC	1
22			min	-.518	1	-.059	1	-.383	4	-1.222e-2	2	336.818	1	619.209	5
23		12	max	-.02	12	.021	1	.004	3	1.027e-2	3	2800.044	15	NC	1
24			min	-.517	1	-.032	3	-.343	4	-9.952e-3	1	415.232	1	753.739	5
25		13	max	-.02	12	.099	1	.01	3	7.521e-3	3	3267.027	15	NC	1
26			min	-.516	1	-.029	3	-.299	4	-7.146e-3	1	538.697	1	980.511	5
27		14	max	-.02	12	.171	1	.015	3	4.772e-3	3	3923.41	15	NC	1
28			min	-.516	1	-.017	3	-.256	4	-5.54e-3	4	741.933	1	1384.703	5
29		15	max	-.02	12	.232	1	.015	3	2.023e-3	3	4910.298	15	NC	1
30			min	-.515	1	.008	12	-.219	4	-6.504e-3	4	1091.237	1	2121.207	5
31		16	max	-.02	12	.278	1	.012	1	5.378e-3	3	NC	12	NC	2
32			min	-.515	1	.029	15	-.192	4	-5.727e-3	4	1683.471	1	3438.538	5
33		17	max	-.02	12	.311	1	.015	1	9.449e-3	3	NC	10	NC	2
34			min	-.515	1	.036	15	-.173	4	-4.774e-3	1	2803.879	1	6056.67	1
35		18	max	-.02	12	.338	1	.008	1	1.352e-2	3	NC	5	NC	2
36			min	-.515	1	.043	15	-.162	4	-6.639e-3	1	1111.357	3	8086.247	1
37		19	max	-.02	12	.362	1	-.001	12	1.56e-2	3	NC	1	NC	1
38			min	-.515	1	.051	15	-.156	4	-7.591e-3	1	675.915	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	-.008	12	.287	3	0	1	6.811e-4	4	NC	3	NC	1
40			min	-.952	1	-2.085	1	-.796	4	0	1	54.811	1	220.751	4
41		2	max	-.008	12	.206	3	0	1	4.676e-4	4	2961.078	12	NC	1
42			min	-.952	1	-1.793	1	-.771	4	0	1	61.794	1	229.694	4
43		3	max	-.008	12	.128	3	0	1	5.216e-5	5	2343.567	15	NC	1
44			min	-.951	1	-1.507	1	-.736	4	0	1	70.57	1	243.235	4
45		4	max	-.008	12	.063	3	0	1	0	1	2648.187	15	NC	1
46			min	-.951	1	-1.245	1	-.694	4	-3.695e-4	4	81.152	1	262.375	4
47		5	max	-.008	12	.019	3	0	1	0	1	2985.05	15	NC	1
48			min	-.951	1	-1.024	1	-.646	4	-6.e-4	4	92.951	1	287.898	4
49		6	max	-.009	12	0	3	0	1	0	1	3334.236	15	NC	1
50			min	-.949	1	-.849	1	-.596	4	-3.467e-4	4	104.994	1	319.93	4
51		7	max	-.009	12	-.004	3	0	1	0	1	3709.009	15	NC	1
52			min	-.948	1	-.704	1	-.549	4	-9.343e-5	4	117.594	1	358.399	4
53		8	max	-.009	12	-.001	3	0	1	1.598e-4	4	4141.875	15	NC	1
54			min	-.946	1	-.574	1	-.506	4	0	1	131.866	1	402.244	4
55		9	max	-.01	12	0	3	0	1	1.955e-4	4	4702.087	15	NC	1
56			min	-.944	1	-.441	1	-.468	4	0	1	150.472	1	451.293	4
57		10	max	-.01	12	-.004	12	0	1	2.728e-5	5	5491.667	15	NC	1
58			min	-.943	1	-.298	1	-.425	4	0	1	177.36	1	521.829	4
59		11	max	-.011	12	-.004	15	0	1	0	1	6668.263	15	NC	1
60			min	-.941	1	-.147	1	-.382	4	-1.431e-4	4	218.694	1	618.875	4
61		12	max	-.011	12	.012	1	0	1	0	1	8591.98	15	NC	1
62			min	-.939	1	-.036	3	-.344	4	-1.062e-3	4	289.584	1	744.845	4
63		13	max	-.012	12	.17	1	0	1	0	1	NC	15	NC	1
64			min	-.937	1	-.051	3	-.301	4	-2.776e-3	4	418.72	3	958.884	4
65		14	max	-.012	12	.311	1	0	1	0	1	NC	5	NC	1
66			min	-.935	1	-.044	3	-.259	4	-4.489e-3	4	427.674	3	1345.24	4
67		15	max	-.013	12	.42	1	0	1	0	1	NC	5	NC	1
68			min	-.934	1	.004	12	-.223	4	-6.203e-3	4	501.055	3	2048.864	4
69		16	max	-.013	12	.481	1	0	1	0	1	NC	2	NC	1
70			min	-.933	1	.015	15	-.196	4	-4.902e-3	4	810.761	3	3301.886	4
71		17	max	-.013	12	.505	1	0	1	0	1	NC	1	NC	1
72			min	-.934	1	.016	15	-.177	4	-3.247e-3	4	6928.631	3	5979.749	4
73		18	max	-.013	12	.506	1	0	1	0	1	NC	1	NC	1
74			min	-.934	1	.016	15	-.163	4	-1.593e-3	4	878.677	3	NC	1
75		19	max	-.013	12	.638	3	0	1	0	1	NC	1	NC	1
76			min	-.934	1	.017	15	-.153	4	-7.486e-4	4	403.326	3	NC	1
77	M7	1	max	.02	5	.082	3	0	3	2.624e-2	2	NC	3	NC	1
78			min	-.523	1	-1.094	1	-.803	4	-8.888e-3	3	97.361	1	217.174	4
79		2	max	.02	5	.051	3	.009	1	2.49e-2	2	NC	5	NC	2
80			min	-.523	1	-.946	1	-.765	4	-8.575e-3	3	108.327	1	230.535	4
81		3	max	.02	5	.021	3	.021	1	2.225e-2	2	NC	5	NC	3
82			min	-.523	1	-.802	1	-.724	4	-7.962e-3	3	121.725	1	246.793	4
83		4	max	.02	5	.02	5	.023	1	1.961e-2	2	NC	5	NC	3
84			min	-.522	1	-.668	1	-.681	4	-7.349e-3	3	137.57	1	266.817	4
85		5	max	.02	5	.019	5	.021	1	1.768e-2	2	NC	5	NC	3
86			min	-.522	1	-.551	1	-.636	4	-7.007e-3	3	155.288	1	291.558	4
87		6	max	.02	5	.017	5	.013	1	1.755e-2	2	NC	5	NC	3
88			min	-.522	1	-.453	1	-.592	4	-7.364e-3	3	174.013	1	321.042	4
89		7	max	.02	5	.015	5	.005	1	1.743e-2	2	NC	5	NC	1
90			min	-.521	1	-.368	1	-.548	4	-7.721e-3	3	194.263	1	355.855	4
91		8	max	.02	5	.012	5	0	10	1.73e-2	2	NC	5	NC	1
92			min	-.52	1	-.29	1	-.507	4	-8.078e-3	3	217.327	1	397.151	4
93		9	max	.02	5	.009	5	0	3	1.622e-2	2	NC	5	NC	1
94			min	-.52	1	-.214	1	-.467	4	-8.821e-3	3	245.967	1	447.162	4
95		10	max	.02	5	.006	5	.001	3	1.422e-2	2	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	-.519	1	-.137	1	-.426	4	-9.927e-3	3	284.006	1	514.153	4
97		11	max	.02	5	.004	5	0	3	1.222e-2	2	NC	7	NC	1
98			min	-.518	1	-.059	1	-.383	4	-1.103e-2	3	336.818	1	607.098	4
99		12	max	.02	5	.021	1	.005	1	9.952e-3	1	NC	13	NC	1
100			min	-.517	1	-.032	3	-.341	4	-1.027e-2	3	415.232	1	742.832	4
101		13	max	.02	5	.099	1	.007	1	7.146e-3	1	NC	13	NC	1
102			min	-.516	1	-.029	3	-.297	4	-7.521e-3	3	538.697	1	966.293	4
103		14	max	.02	5	.171	1	.006	2	4.339e-3	1	NC	4	NC	1
104			min	-.516	1	-.017	3	-.255	4	-4.772e-3	3	741.933	1	1345.205	4
105		15	max	.02	5	.232	1	.001	10	1.533e-3	1	NC	4	NC	1
106			min	-.515	1	-.009	5	-.222	4	-6.089e-3	5	1091.237	1	1971.765	4
107		16	max	.02	5	.278	1	-.002	10	2.908e-3	1	NC	4	NC	2
108			min	-.515	1	-.014	5	-.199	4	-5.378e-3	3	1683.471	1	2921.824	4
109		17	max	.02	5	.311	1	-.003	10	4.774e-3	1	NC	4	NC	2
110			min	-.515	1	-.021	5	-.181	4	-9.449e-3	3	2803.879	1	4619.019	4
111		18	max	.02	5	.338	1	-.001	12	6.639e-3	1	NC	4	NC	2
112			min	-.515	1	-.028	5	-.165	4	-1.352e-2	3	1111.357	3	8086.247	1
113		19	max	.02	5	.362	1	.011	1	7.591e-3	1	NC	1	NC	1
114			min	-.515	1	-.035	5	-.15	4	-1.56e-2	3	675.915	3	NC	1
115	M10	1	max	.001	1	.35	1	.515	1	1.041e-2	3	NC	1	NC	1
116			min	-.158	4	-.031	5	-.02	5	-9.115e-4	5	NC	1	NC	1
117		2	max	0	1	.432	3	.568	1	1.193e-2	3	NC	4	NC	3
118			min	-.158	4	-.018	5	-.005	5	-8.029e-4	5	1128.117	3	3867.849	1
119		3	max	0	1	.598	3	.649	1	1.344e-2	3	NC	4	NC	3
120			min	-.158	4	-.009	5	.004	15	-6.944e-4	5	588.658	3	1523.362	1
121		4	max	0	1	.722	3	.737	1	1.496e-2	3	NC	4	NC	3
122			min	-.158	4	-.004	5	.009	15	-5.859e-4	5	433.894	3	916.971	1
123		5	max	0	1	.788	3	.818	1	1.648e-2	3	NC	4	NC	3
124			min	-.158	4	0	15	.012	15	-4.773e-4	5	380.313	3	673.638	1
125		6	max	0	1	.793	3	.88	1	1.799e-2	3	NC	4	NC	3
126			min	-.158	4	.001	15	.014	15	-3.688e-4	5	376.563	3	559.085	1
127		7	max	0	1	.746	3	.919	1	1.951e-2	3	NC	4	NC	3
128			min	-.158	4	.004	15	.016	15	-4.391e-4	2	412.63	3	504.998	1
129		8	max	0	1	.666	3	.936	1	2.103e-2	3	NC	4	NC	3
130			min	-.158	4	.007	15	.017	12	-8.229e-4	2	492.416	3	484.694	1
131		9	max	0	1	.584	3	.937	1	2.254e-2	3	NC	4	NC	3
132			min	-.158	4	.011	15	.014	12	-1.207e-3	2	612.431	3	483.506	1
133		10	max	0	1	.546	3	.934	1	2.406e-2	3	NC	5	NC	3
134			min	-.158	4	.017	15	.013	12	-1.59e-3	2	693.312	3	487.106	1
135		11	max	0	12	.584	3	.937	1	2.254e-2	3	NC	5	NC	3
136			min	-.158	4	.02	15	.014	12	-1.207e-3	2	612.431	3	483.506	1
137		12	max	0	12	.666	3	.936	1	2.103e-2	3	NC	4	NC	3
138			min	-.158	4	.02	15	.017	12	-8.229e-4	2	492.416	3	484.694	1
139		13	max	0	12	.746	3	.919	1	1.951e-2	3	NC	4	NC	3
140			min	-.158	4	.018	15	.02	12	-4.391e-4	2	412.63	3	504.998	1
141		14	max	0	12	.793	3	.88	1	1.799e-2	3	NC	5	NC	3
142			min	-.158	4	.016	15	.023	12	-2.346e-4	10	376.563	3	559.085	1
143		15	max	0	12	.788	3	.818	1	1.648e-2	3	NC	15	NC	3
144			min	-.158	4	.016	15	.025	12	-3.422e-5	10	380.313	3	673.638	1
145		16	max	0	12	.722	3	.737	1	1.496e-2	3	NC	15	NC	3
146			min	-.158	4	.018	15	.025	12	1.662e-4	10	433.894	3	916.971	1
147		17	max	0	12	.598	3	.649	1	1.344e-2	3	NC	15	NC	3
148			min	-.158	4	.024	15	.025	12	3.665e-4	10	588.658	3	1523.362	1
149		18	max	0	12	.432	3	.568	1	1.193e-2	3	NC	5	NC	3
150			min	-.158	4	.033	15	.023	12	5.669e-4	10	1128.117	3	3867.849	1
151		19	max	0	12	.35	1	.515	1	1.041e-2	3	NC	1	NC	1
152			min	-.158	4	.047	15	.02	12	7.673e-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	.518	1	1.008e-2	1	NC	1	NC	1
154			min	-.362	4	-.032	3	-.02	5	-3.247e-4	5	NC	1	NC	1
155		2	max	.002	1	.103	3	.556	1	1.119e-2	1	NC	4	NC	3
156			min	-.362	4	-.144	1	.015	15	-2.057e-4	3	1509.224	3	4466.458	4
157		3	max	.001	1	.223	3	.63	1	1.23e-2	1	NC	5	NC	3
158			min	-.362	4	-.251	1	.016	12	-4.598e-4	3	798.719	3	1812.179	1
159		4	max	.001	1	.303	3	.717	1	1.341e-2	1	NC	5	NC	3
160			min	-.362	4	-.321	1	.016	12	-7.138e-4	3	608.758	3	1023.28	1
161		5	max	0	1	.328	3	.8	1	1.453e-2	1	NC	5	NC	3
162			min	-.362	4	-.344	1	.016	12	-9.678e-4	3	566.053	3	723.315	1
163		6	max	0	1	.297	3	.867	1	1.564e-2	1	NC	5	NC	3
164			min	-.362	4	-.321	1	.01	15	-1.222e-3	3	619.857	3	584.371	1
165		7	max	0	1	.218	3	.912	1	1.675e-2	1	NC	5	NC	3
166			min	-.362	4	-.259	1	0	15	-1.476e-3	3	813.227	3	517.121	1
167		8	max	0	1	.115	3	.935	1	1.786e-2	1	NC	5	NC	3
168			min	-.362	4	-.177	1	-.004	5	-1.73e-3	3	1282.279	1	488.445	1
169		9	max	0	1	.018	3	.941	1	1.897e-2	1	NC	4	NC	3
170			min	-.362	4	-.101	1	.004	15	-1.984e-3	3	2406.65	2	481.749	1
171		10	max	0	1	-.002	15	.94	1	2.008e-2	1	NC	3	NC	3
172			min	-.363	4	-.066	1	.011	12	-2.238e-3	3	3970.237	2	483.122	1
173		11	max	0	3	.018	3	.941	1	1.897e-2	1	NC	4	NC	3
174			min	-.363	4	-.101	1	.012	12	-1.984e-3	3	2406.65	2	481.749	1
175		12	max	0	3	.115	3	.935	1	1.786e-2	1	NC	5	NC	3
176			min	-.363	4	-.177	1	.013	12	-1.73e-3	3	1282.279	1	488.445	1
177		13	max	0	3	.218	3	.912	1	1.675e-2	1	NC	5	NC	3
178			min	-.363	4	-.259	1	.014	12	-1.476e-3	3	813.227	3	517.121	1
179		14	max	0	3	.297	3	.867	1	1.564e-2	1	NC	15	NC	3
180			min	-.362	4	-.321	1	.015	12	-1.222e-3	3	619.857	3	584.371	1
181		15	max	0	3	.328	3	.8	1	1.453e-2	1	NC	15	NC	3
182			min	-.362	4	-.344	1	.016	12	-9.678e-4	3	566.053	3	723.315	1
183		16	max	0	3	.303	3	.717	1	1.341e-2	1	NC	15	NC	3
184			min	-.362	4	-.321	1	.016	12	-7.138e-4	3	608.758	3	1023.28	1
185		17	max	.001	3	.223	3	.63	1	1.23e-2	1	NC	15	NC	3
186			min	-.362	4	-.251	1	.014	15	-4.598e-4	3	798.719	3	1812.179	1
187		18	max	.001	3	.103	3	.556	1	1.119e-2	1	NC	5	NC	3
188			min	-.362	4	-.144	1	.017	12	-2.057e-4	3	1509.224	3	5279.32	1
189		19	max	.001	3	-.004	15	.518	1	1.008e-2	1	NC	1	NC	1
190			min	-.362	4	-.032	3	.02	12	4.832e-5	3	NC	1	NC	1
191	M12	1	max	0	3	.011	5	.52	1	9.668e-3	1	NC	1	NC	1
192			min	-.488	4	-.254	1	-.02	5	-3.607e-4	5	NC	1	NC	1
193		2	max	0	3	.054	3	.553	1	1.047e-2	1	NC	5	NC	3
194			min	-.488	4	-.436	1	.014	15	-2.314e-4	5	1053.037	2	4781.294	4
195		3	max	0	3	.125	3	.624	1	1.128e-2	1	NC	5	NC	3
196			min	-.488	4	-.594	1	.021	12	-1.022e-4	5	562.828	2	1965.581	1
197		4	max	0	3	.168	3	.71	1	1.208e-2	1	NC	5	NC	3
198			min	-.487	4	-.707	1	.021	12	2.426e-6	15	423.681	2	1073.526	1
199		5	max	0	3	.181	3	.794	1	1.289e-2	1	NC	5	NC	3
200			min	-.487	4	-.763	1	.019	15	8.845e-5	15	379.288	2	744.764	1
201		6	max	0	3	.164	3	.863	1	1.37e-2	1	NC	5	NC	3
202			min	-.487	4	-.76	1	.008	15	8.645e-5	3	384.738	2	594.188	1
203		7	max	0	3	.123	3	.912	1	1.45e-2	1	NC	5	NC	3
204			min	-.487	4	-.709	1	0	15	7.918e-5	3	434.926	2	520.918	1
205		8	max	0	3	.07	3	.938	1	1.531e-2	1	NC	5	NC	3
206			min	-.487	4	-.628	1	-.004	5	7.19e-5	3	541.967	2	488.508	1
207		9	max	0	3	.022	3	.946	1	1.611e-2	1	NC	5	NC	3
208			min	-.487	4	-.548	1	.004	15	6.463e-5	3	691.961	1	479.383	1
209		10	max	0	1	0	3	.945	1	1.692e-2	1	NC	5	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	-.487	4	-.511	1	.01	12	5.736e-5	3	793.107	1	479.774	1
211		11	max	0	1	.022	3	.946	1	1.611e-2	1	NC	5	NC	3
212			min	-.487	4	-.548	1	.011	12	6.463e-5	3	691.961	1	479.383	1
213		12	max	0	1	.07	3	.938	1	1.531e-2	1	NC	5	NC	3
214			min	-.487	4	-.628	1	.013	12	7.19e-5	3	541.967	2	488.508	1
215		13	max	0	1	.123	3	.912	1	1.45e-2	1	NC	15	NC	3
216			min	-.487	4	-.709	1	.016	12	7.918e-5	3	434.926	2	520.918	1
217		14	max	0	1	.164	3	.863	1	1.37e-2	1	NC	15	NC	3
218			min	-.487	4	-.76	1	.019	12	8.645e-5	3	384.738	2	594.188	1
219		15	max	0	1	.181	3	.794	1	1.289e-2	1	NC	15	NC	3
220			min	-.487	4	-.763	1	.02	12	9.372e-5	3	379.288	2	744.764	1
221		16	max	0	1	.168	3	.71	1	1.208e-2	1	NC	15	NC	3
222			min	-.487	4	-.707	1	.021	15	1.01e-4	3	423.681	2	1073.526	1
223		17	max	0	1	.125	3	.624	1	1.128e-2	1	NC	5	NC	3
224			min	-.487	4	-.594	1	.016	15	1.076e-4	12	562.828	2	1965.581	1
225		18	max	0	1	.054	3	.553	1	1.047e-2	1	NC	5	NC	3
226			min	-.487	4	-.436	1	.021	12	1.095e-4	12	1053.037	2	6186.702	5
227		19	max	0	1	-.022	12	.52	1	9.668e-3	1	NC	1	NC	1
228			min	-.487	4	-.254	1	.019	12	1.114e-4	12	NC	1	NC	1
229	M13	1	max	0	3	.067	3	.523	1	1.87e-2	1	NC	1	NC	1
230			min	-.784	4	-1.022	1	-.02	5	-3.948e-3	3	NC	1	NC	1
231		2	max	0	3	.166	3	.58	1	2.073e-2	1	NC	5	NC	3
232			min	-.784	4	-1.304	1	.011	15	-4.651e-3	3	685.95	2	3575.299	1
233		3	max	0	3	.253	3	.664	1	2.277e-2	1	NC	5	NC	3
234			min	-.784	4	-1.564	1	.019	12	-5.354e-3	3	357.518	2	1444.055	1
235		4	max	0	3	.317	3	.754	1	2.481e-2	1	NC	15	NC	3
236			min	-.784	4	-1.777	1	.019	12	-6.057e-3	3	257.756	2	880.094	1
237		5	max	0	3	.352	3	.836	1	2.684e-2	1	NC	15	NC	3
238			min	-.784	4	-1.928	1	.018	12	-6.759e-3	3	216.222	2	651.224	1
239		6	max	0	3	.357	3	.898	1	2.888e-2	1	9910.905	15	NC	3
240			min	-.784	4	-2.011	1	.016	12	-7.462e-3	3	199.622	2	542.922	1
241		7	max	0	3	.337	3	.938	1	3.097e-2	2	9084.891	15	NC	3
242			min	-.784	4	-2.033	1	.012	15	-8.165e-3	3	197.339	2	491.792	1
243		8	max	0	3	.302	3	.954	1	3.314e-2	2	8776.993	15	NC	3
244			min	-.784	4	-2.009	1	.009	15	-8.868e-3	3	204.492	2	472.808	1
245		9	max	0	3	.265	3	.955	1	3.53e-2	2	8765.557	15	NC	3
246			min	-.784	4	-1.966	1	.009	12	-9.571e-3	3	215.955	1	472.018	1
247		10	max	0	1	.247	3	.952	1	3.747e-2	2	8828.399	15	NC	3
248			min	-.784	4	-1.942	1	.008	12	-1.027e-2	3	221.682	1	475.617	1
249		11	max	0	1	.265	3	.955	1	3.53e-2	2	8523.365	15	NC	3
250			min	-.784	4	-1.966	1	.009	12	-9.571e-3	3	215.955	1	472.018	1
251		12	max	0	1	.302	3	.954	1	3.314e-2	2	7968.822	15	NC	3
252			min	-.784	4	-2.009	1	.011	12	-8.868e-3	3	204.492	2	472.808	1
253		13	max	0	1	.337	3	.938	1	3.097e-2	2	7547.653	15	NC	3
254			min	-.784	4	-2.033	1	.014	12	-8.165e-3	3	197.339	2	491.792	1
255		14	max	0	1	.357	3	.898	1	2.888e-2	1	7450.939	15	NC	3
256			min	-.784	4	-2.011	1	.016	12	-7.462e-3	3	199.622	2	542.922	1
257		15	max	0	1	.352	3	.836	1	2.684e-2	1	7832.086	15	NC	3
258			min	-.784	4	-1.928	1	.018	12	-6.759e-3	3	216.222	2	651.224	1
259		16	max	0	1	.317	3	.754	1	2.481e-2	1	9002.432	15	NC	3
260			min	-.784	4	-1.777	1	.019	12	-6.057e-3	3	257.756	2	880.094	1
261		17	max	0	1	.253	3	.664	1	2.277e-2	1	NC	15	NC	3
262			min	-.784	4	-1.564	1	.019	12	-5.354e-3	3	357.518	2	1444.055	1
263		18	max	.001	1	.166	3	.58	1	2.073e-2	1	NC	5	NC	3
264			min	-.784	4	-1.304	1	.019	12	-4.651e-3	3	685.95	2	3575.299	1
265		19	max	.001	1	.067	3	.523	1	1.87e-2	1	NC	1	NC	1
266			min	-.784	4	-1.022	1	.019	12	-3.948e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	.001	5	1.689e-3	2	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-2.693e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.004	5	3.378e-3	2	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-5.387e-3	5	7881.199	1	NC	1
273		4	max	0	3	-.002	12	.009	5	5.067e-3	2	NC	3	NC	1
274			min	0	1	-.02	1	-.001	1	-8.08e-3	5	3495.652	1	7429.458	5
275		5	max	0	3	-.003	12	.016	5	5.618e-3	2	NC	3	NC	1
276			min	0	1	-.035	1	-.002	1	-9.254e-3	5	1955.206	1	4302.583	5
277		6	max	0	3	-.004	12	.024	5	5.117e-3	2	NC	3	NC	1
278			min	0	1	-.055	1	-.003	1	-9.022e-3	5	1249.211	1	2831.964	5
279		7	max	0	3	-.005	12	.034	5	4.616e-3	2	NC	12	NC	1
280			min	0	1	-.079	1	-.004	1	-8.791e-3	5	871.85	1	2021.587	5
281		8	max	0	3	-.006	12	.045	5	4.115e-3	2	NC	12	NC	1
282			min	0	1	-.107	1	-.005	1	-8.559e-3	5	646.626	1	1526.683	5
283		9	max	0	3	-.007	12	.058	5	3.614e-3	2	9624.803	12	NC	1
284			min	0	1	-.138	1	-.006	1	-8.328e-3	5	501.348	1	1201.713	5
285		10	max	0	3	-.009	12	.071	5	3.113e-3	2	8109.768	12	NC	1
286			min	-.001	1	-.172	1	-.007	1	-8.096e-3	5	402.067	1	976.477	5
287		11	max	0	3	-.01	12	.085	5	2.611e-3	2	6960.736	12	NC	1
288			min	-.001	1	-.209	1	-.008	1	-7.865e-3	5	331.189	1	813.824	5
289		12	max	0	3	-.011	12	.1	5	2.11e-3	2	6065.826	12	NC	1
290			min	-.001	1	-.249	1	-.009	1	-7.633e-3	5	278.781	1	692.429	5
291		13	max	.001	3	-.013	12	.116	4	1.609e-3	2	5353.651	12	NC	1
292			min	-.001	1	-.29	1	-.009	1	-7.402e-3	5	238.915	1	599.285	4
293		14	max	.001	3	-.015	12	.132	4	1.108e-3	2	4776.702	12	NC	1
294			min	-.002	1	-.333	1	-.009	1	-7.17e-3	5	207.872	1	525.773	4
295		15	max	.001	3	-.016	12	.148	4	6.072e-4	2	4302.217	12	NC	1
296			min	-.002	1	-.378	1	-.009	1	-6.997e-3	4	183.219	1	467.096	4
297		16	max	.001	3	-.018	12	.165	4	5.869e-4	3	3907.06	12	NC	1
298			min	-.002	1	-.424	1	-.009	1	-6.829e-3	4	163.322	1	419.54	4
299		17	max	.001	3	-.019	12	.182	4	8.341e-4	3	3574.357	12	NC	1
300			min	-.002	1	-.471	1	-.008	1	-6.662e-3	4	147.036	1	380.494	4
301		18	max	.001	3	-.021	12	.199	4	1.081e-3	3	3291.591	12	NC	1
302			min	-.002	1	-.519	1	-.01	3	-6.494e-3	4	133.546	1	348.082	4
303		19	max	.002	3	-.023	12	.216	4	1.328e-3	3	3049.305	12	NC	1
304			min	-.002	1	-.567	1	-.014	3	-6.326e-3	4	122.256	1	320.931	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	-.003	1	0	1	-2.817e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.004	4	0	1	NC	3	NC	1
310			min	0	1	-.014	1	0	1	-5.635e-3	4	4783.679	1	NC	1
311		4	max	0	3	-.001	15	.01	4	0	1	NC	3	NC	1
312			min	-.001	1	-.033	1	0	1	-8.452e-3	4	2076.333	1	7146.768	4
313		5	max	.001	3	-.002	15	.017	4	0	1	NC	3	NC	1
314			min	-.001	1	-.061	1	0	1	-9.673e-3	4	1140.187	1	4140.381	4
315		6	max	.001	3	-.003	15	.025	4	0	1	NC	3	NC	1
316			min	-.002	1	-.096	1	0	1	-9.416e-3	4	718.25	1	2725.99	4
317		7	max	.002	3	-.004	15	.036	4	0	1	NC	3	NC	1
318			min	-.002	1	-.14	1	0	1	-9.159e-3	4	496.46	1	1946.689	4
319		8	max	.002	3	-.006	15	.047	4	0	1	NC	3	NC	1
320			min	-.002	1	-.19	1	0	1	-8.902e-3	4	365.655	1	1470.866	4
321		9	max	.002	3	-.008	15	.06	4	0	1	NC	3	NC	1
322			min	-.003	1	-.246	1	0	1	-8.645e-3	4	282.026	1	1158.5	4
323		10	max	.002	3	-.009	12	.074	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	-.308	1	0	1	-8.388e-3	4	225.263	1	942.055	4
325		11	max	.003	3	-.01	12	.088	4	0	1	NC	3	NC	1
326			min	-.003	1	-.375	1	0	1	-8.131e-3	4	184.958	1	785.794	4
327		12	max	.003	3	-.011	12	.104	4	0	1	NC	3	NC	1
328			min	-.003	1	-.446	1	0	1	-7.874e-3	4	155.287	1	669.206	4
329		13	max	.003	3	-.012	12	.12	4	0	1	NC	3	NC	1
330			min	-.004	1	-.522	1	0	1	-7.617e-3	4	132.797	1	579.876	4
331		14	max	.003	3	-.012	12	.136	4	0	1	NC	3	NC	1
332			min	-.004	1	-.601	1	0	1	-7.36e-3	4	115.338	1	509.922	4
333		15	max	.004	3	-.013	12	.153	4	0	1	NC	3	NC	1
334			min	-.004	1	-.683	1	0	1	-7.103e-3	4	101.509	1	454.142	4
335		16	max	.004	3	-.013	12	.169	4	0	1	NC	3	NC	1
336			min	-.005	1	-.767	1	0	1	-6.847e-3	4	90.372	1	408.997	4
337		17	max	.004	3	-.014	12	.186	4	0	1	NC	3	NC	1
338			min	-.005	1	-.853	1	0	1	-6.59e-3	4	81.275	1	372	4
339		18	max	.004	3	-.015	12	.203	4	0	1	NC	3	NC	1
340			min	-.005	1	-.94	1	0	1	-6.333e-3	4	73.752	1	341.365	4
341		19	max	.005	3	-.015	12	.219	4	0	1	NC	3	NC	1
342			min	-.006	1	-1.027	1	0	1	-6.076e-3	4	67.466	1	315.787	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	.001	4	6.494e-4	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-3.029e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	1.299e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-6.059e-3	4	7881.199	1	NC	1
349		4	max	0	3	.001	5	.01	4	1.948e-3	3	NC	3	NC	1
350			min	0	1	-.02	1	-.001	3	-9.088e-3	4	3495.652	1	7095.977	4
351		5	max	0	3	.002	5	.017	4	2.132e-3	3	NC	3	NC	1
352			min	0	1	-.035	1	-.002	3	-1.037e-2	4	1955.206	1	4115.59	4
353		6	max	0	3	.003	5	.026	4	1.885e-3	3	NC	3	NC	1
354			min	0	1	-.055	1	-.002	3	-1.003e-2	4	1249.211	1	2711.905	4
355		7	max	0	3	.004	5	.036	4	1.638e-3	3	NC	5	NC	1
356			min	0	1	-.079	1	-.003	3	-9.69e-3	4	871.85	1	1937.86	4
357		8	max	0	3	.005	5	.047	4	1.39e-3	3	NC	5	NC	1
358			min	0	1	-.107	1	-.003	3	-9.352e-3	4	646.626	1	1464.991	4
359		9	max	0	3	.006	5	.06	4	1.143e-3	3	NC	5	NC	1
360			min	0	1	-.138	1	-.004	3	-9.013e-3	4	501.348	1	1154.448	4
361		10	max	0	3	.007	5	.074	4	8.961e-4	3	NC	7	NC	1
362			min	-.001	1	-.172	1	-.004	3	-8.674e-3	4	402.067	1	939.211	4
363		11	max	0	3	.009	5	.088	4	6.489e-4	3	NC	15	NC	1
364			min	-.001	1	-.209	1	-.004	3	-8.335e-3	4	331.189	1	783.793	4
365		12	max	0	3	.01	5	.104	4	4.018e-4	3	9771.866	15	NC	1
366			min	-.001	1	-.249	1	-.004	3	-7.996e-3	4	278.781	1	667.822	4
367		13	max	.001	3	.012	5	.12	4	1.546e-4	3	8457.021	15	NC	1
368			min	-.001	1	-.29	1	-.003	3	-7.658e-3	4	238.915	1	578.961	4
369		14	max	.001	3	.013	5	.136	4	-5.664e-5	12	7418.998	15	NC	1
370			min	-.002	1	-.333	1	-.001	3	-7.319e-3	4	207.872	1	509.376	4
371		15	max	.001	3	.015	5	.153	4	1.892e-5	9	6584.853	15	NC	1
372			min	-.002	1	-.378	1	0	12	-6.98e-3	4	183.219	1	453.897	4
373		16	max	.001	3	.017	5	.169	4	2.187e-4	9	5904.575	15	NC	1
374			min	-.002	1	-.424	1	.002	12	-6.665e-3	5	163.322	1	409.005	4
375		17	max	.001	3	.018	5	.186	4	7.087e-4	1	5342.642	15	NC	1
376			min	-.002	1	-.471	1	.001	10	-6.395e-3	5	147.036	1	372.227	4
377		18	max	.001	3	.02	5	.203	4	1.204e-3	1	4873.35	15	NC	1
378			min	-.002	1	-.519	1	0	10	-6.125e-3	5	133.546	1	341.787	4
379		19	max	.002	3	.022	5	.219	4	1.7e-3	1	4477.721	15	NC	1
380			min	-.002	1	-.567	1	-.001	10	-5.856e-3	5	122.256	1	316.388	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	.012	5	1.476e-3	2	NC	1	NC	1
382			min	.002	12	-.008	1	-.002	1	-9.225e-4	5	NC	1	NC	1
383		2	max	.025	1	-.002	12	.053	5	2.134e-3	2	NC	1	NC	4
384			min	.002	12	-.052	1	-.026	2	-1.014e-3	5	NC	1	3058.725	2
385		3	max	.024	1	-.004	12	.094	5	2.792e-3	2	NC	1	NC	4
386			min	.002	12	-.097	1	-.049	2	-1.106e-3	5	NC	1	1548.821	2
387		4	max	.023	1	-.006	12	.135	5	3.45e-3	2	NC	1	NC	4
388			min	.003	15	-.141	1	-.072	2	-1.288e-3	3	NC	1	1052.095	2
389		5	max	.022	1	-.008	12	.175	5	4.108e-3	2	NC	1	8567.548	6
390			min	.003	15	-.185	1	-.093	2	-1.558e-3	3	NC	1	809.22	2
391		6	max	.022	1	-.01	12	.216	5	4.766e-3	2	NC	1	6885.703	6
392			min	.003	15	-.229	1	-.112	2	-1.827e-3	3	9670.313	6	668.537	2
393		7	max	.021	1	-.011	12	.255	5	5.424e-3	2	NC	1	5838.701	6
394			min	.003	15	-.273	1	-.129	2	-2.096e-3	3	8575.823	6	579.728	2
395		8	max	.02	1	-.013	12	.294	5	6.082e-3	2	NC	1	5158.252	6
396			min	.003	15	-.316	1	-.143	2	-2.366e-3	3	7918.965	6	521.507	2
397		9	max	.019	1	-.014	12	.333	5	6.74e-3	2	NC	3	4714.951	6
398			min	.003	15	-.36	1	-.153	2	-2.635e-3	3	7565.404	6	483.595	2
399		10	max	.019	1	-.015	12	.37	5	7.398e-3	2	NC	3	4442.428	6
400			min	.003	15	-.403	1	-.16	2	-2.905e-3	3	7453.555	6	460.774	2
401		11	max	.018	1	-.017	12	.407	5	8.056e-3	2	NC	3	4308.251	6
402			min	.003	15	-.446	1	-.163	2	-3.174e-3	3	7565.404	6	450.636	2
403		12	max	.017	1	-.018	12	.442	5	8.715e-3	2	NC	1	4302.826	6
404			min	.003	15	-.488	1	-.161	2	-3.443e-3	3	7918.965	6	434.438	14
405		13	max	.016	1	-.018	12	.476	5	9.373e-3	2	NC	1	4437.957	6
406			min	.002	15	-.531	1	-.154	2	-3.713e-3	3	8575.823	6	391.081	14
407		14	max	.016	1	-.019	12	.509	5	1.003e-2	2	NC	1	4755.153	6
408			min	.002	15	-.573	1	-.142	2	-3.982e-3	3	9670.313	6	354.16	14
409		15	max	.015	1	-.02	12	.54	5	1.069e-2	2	NC	1	5353.474	6
410			min	.002	15	-.615	1	-.124	2	-4.251e-3	3	NC	1	322.321	14
411		16	max	.014	1	-.021	12	.57	5	1.135e-2	2	NC	1	6478.118	6
412			min	.002	15	-.657	1	-.1	2	-4.521e-3	3	NC	1	294.571	14
413		17	max	.013	1	-.021	12	.598	5	1.2e-2	2	NC	1	8878.956	6
414			min	.002	15	-.698	1	-.069	2	-4.79e-3	3	NC	1	270.164	14
415		18	max	.013	1	-.022	12	.628	4	1.266e-2	2	NC	1	NC	4
416			min	.002	10	-.74	1	-.03	2	-5.06e-3	3	NC	1	248.531	14
417		19	max	.012	1	-.022	12	.659	4	1.332e-2	2	NC	1	NC	1
418			min	.002	10	-.782	1	-.002	3	-5.329e-3	3	NC	1	229.23	14
419	M6	1	max	.043	1	0	15	.013	4	0	1	NC	1	NC	1
420			min	.001	15	-.014	1	0	1	-9.783e-4	5	NC	1	NC	1
421		2	max	.041	1	0	3	.055	4	0	1	NC	1	NC	1
422			min	.001	15	-.094	1	0	1	-1.122e-3	4	NC	1	NC	1
423		3	max	.039	1	0	3	.098	4	0	1	NC	1	NC	1
424			min	.001	15	-.175	1	0	1	-1.265e-3	4	NC	1	5742.974	4
425		4	max	.037	1	0	3	.141	4	0	1	NC	1	NC	1
426			min	.001	15	-.255	1	0	1	-1.409e-3	4	NC	1	3847.993	4
427		5	max	.035	1	0	3	.183	4	0	1	NC	1	NC	1
428			min	.001	15	-.336	1	0	1	-1.553e-3	4	NC	1	2926.033	4
429		6	max	.033	1	0	3	.225	4	0	1	NC	1	NC	1
430			min	.001	15	-.416	1	0	1	-1.697e-3	4	9670.313	4	2394.516	4
431		7	max	.031	1	0	3	.266	4	0	1	NC	1	NC	1
432			min	.001	15	-.496	1	0	1	-1.84e-3	4	8575.823	4	2060.276	4
433		8	max	.029	1	0	3	.306	4	0	1	NC	1	NC	1
434			min	.001	15	-.576	1	0	1	-1.984e-3	4	7918.965	4	1841.642	4
435		9	max	.027	1	0	3	.346	4	0	1	NC	3	NC	1
436			min	0	15	-.655	1	0	1	-2.128e-3	4	7565.404	4	1699.129	4
437		10	max	.025	1	.002	3	.384	4	0	1	NC	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	0	15	-.735	1	0	1	-2.272e-3	4	7453.555	4	1612.591	4
439		11	max	.023	1	.003	3	.421	4	0	1	NC	3	NC	1
440			min	0	15	-.814	1	0	1	-2.415e-3	4	7565.404	4	1572.496	4
441		12	max	.021	1	.004	3	.457	4	0	1	NC	1	NC	1
442			min	0	15	-.893	1	0	1	-2.559e-3	4	7918.965	4	1576.717	4
443		13	max	.019	1	.005	3	.491	4	0	1	NC	1	NC	1
444			min	0	15	-.971	1	0	1	-2.703e-3	4	8575.823	4	1630.42	4
445		14	max	.02	3	.007	3	.524	4	0	1	NC	1	NC	1
446			min	0	15	-1.05	1	0	1	-2.847e-3	4	9670.313	4	1749.307	4
447		15	max	.021	3	.009	3	.555	4	0	1	NC	1	NC	1
448			min	0	10	-1.128	1	0	1	-2.991e-3	4	8218.4	3	1969.89	4
449		16	max	.022	3	.01	3	.584	4	0	1	NC	1	NC	1
450			min	-.001	10	-1.206	1	0	1	-3.134e-3	4	6888.18	3	2381.893	4
451		17	max	.023	3	.012	3	.611	4	0	1	NC	1	NC	1
452			min	-.002	10	-1.284	1	0	1	-3.278e-3	4	5883.732	3	3259.112	4
453		18	max	.024	3	.014	3	.637	4	0	1	NC	1	NC	1
454			min	-.004	10	-1.362	1	0	1	-3.422e-3	4	5110.982	3	5977.024	4
455		19	max	.025	3	.016	3	.66	4	0	1	NC	1	NC	1
456			min	-.005	2	-1.439	1	0	1	-3.566e-3	4	4507.817	3	NC	1
457	M9	1	max	.026	1	0	5	.013	4	4.8e-4	3	NC	1	NC	1
458			min	-.001	5	-.008	1	-.001	3	-1.476e-3	2	NC	1	NC	1
459		2	max	.025	1	.001	5	.059	4	7.494e-4	3	NC	1	NC	5
460			min	-.001	5	-.052	1	-.011	3	-2.134e-3	2	NC	1	3058.725	2
461		3	max	.024	1	.002	5	.104	4	1.019e-3	3	NC	1	8021.496	15
462			min	-.001	5	-.097	1	-.02	3	-2.792e-3	2	NC	1	1548.821	2
463		4	max	.023	1	.003	5	.15	4	1.288e-3	3	NC	1	5376.585	15
464			min	-.001	5	-.141	1	-.029	3	-3.45e-3	2	NC	1	1052.095	2
465		5	max	.022	1	.004	5	.194	4	1.558e-3	3	NC	1	4089.442	15
466			min	-.001	5	-.185	1	-.037	3	-4.108e-3	2	NC	1	809.22	2
467		6	max	.022	1	.005	5	.239	4	1.827e-3	3	NC	1	3347.193	15
468			min	-.002	5	-.229	1	-.044	3	-4.766e-3	2	9670.313	4	668.537	2
469		7	max	.021	1	.006	5	.282	4	2.096e-3	3	NC	1	2880.297	15
470			min	-.002	5	-.273	1	-.051	3	-5.424e-3	2	8575.823	4	579.728	2
471		8	max	.02	1	.007	5	.324	4	2.366e-3	3	NC	1	2574.784	15
472			min	-.002	5	-.316	1	-.056	3	-6.082e-3	2	7918.965	4	521.507	2
473		9	max	.019	1	.009	5	.364	4	2.635e-3	3	NC	3	2375.548	15
474			min	-.002	5	-.36	1	-.061	3	-6.74e-3	2	7565.404	4	483.595	2
475		10	max	.019	1	.01	5	.403	4	2.905e-3	3	NC	3	2254.468	15
476			min	-.002	5	-.403	1	-.063	3	-7.398e-3	2	7453.555	4	460.774	2
477		11	max	.018	1	.012	5	.44	4	3.174e-3	3	NC	3	2198.236	15
478			min	-.002	5	-.446	1	-.065	3	-8.056e-3	2	6707.666	5	450.636	2
479		12	max	.017	1	.014	5	.475	4	3.443e-3	3	NC	1	2203.881	15
480			min	-.002	5	-.488	1	-.064	3	-8.715e-3	2	5849.868	5	452.764	2
481		13	max	.016	1	.015	5	.508	4	3.713e-3	3	NC	1	2278.609	15
482			min	-.002	5	-.531	1	-.062	3	-9.373e-3	2	5149.964	5	468.759	2
483		14	max	.016	1	.017	5	.539	4	3.982e-3	3	NC	1	2444.326	15
484			min	-.002	5	-.573	1	-.057	3	-1.003e-2	2	4572.68	5	503.188	2
485		15	max	.015	1	.019	5	.567	4	4.251e-3	3	NC	1	2751.987	15
486			min	-.002	5	-.615	1	-.051	3	-1.069e-2	2	4092.303	5	566.542	2
487		16	max	.014	1	.021	5	.592	4	4.521e-3	3	NC	1	3326.803	15
488			min	-.002	5	-.657	1	-.041	3	-1.135e-2	2	3689.647	5	684.502	2
489		17	max	.013	1	.023	5	.614	4	4.79e-3	3	NC	1	4550.868	15
490			min	-.002	5	-.698	1	-.03	3	-1.2e-2	2	3350.127	5	935.348	2
491		18	max	.013	1	.026	5	.633	4	5.06e-3	3	NC	1	8343.739	15
492			min	-.002	5	-.74	1	-.015	3	-1.266e-2	2	3062.489	5	1712.213	2
493		19	max	.012	1	.028	5	.649	4	5.329e-3	3	NC	1	NC	1
494			min	-.002	5	-.782	1	-.022	1	-1.332e-2	2	2817.95	5	NC	1