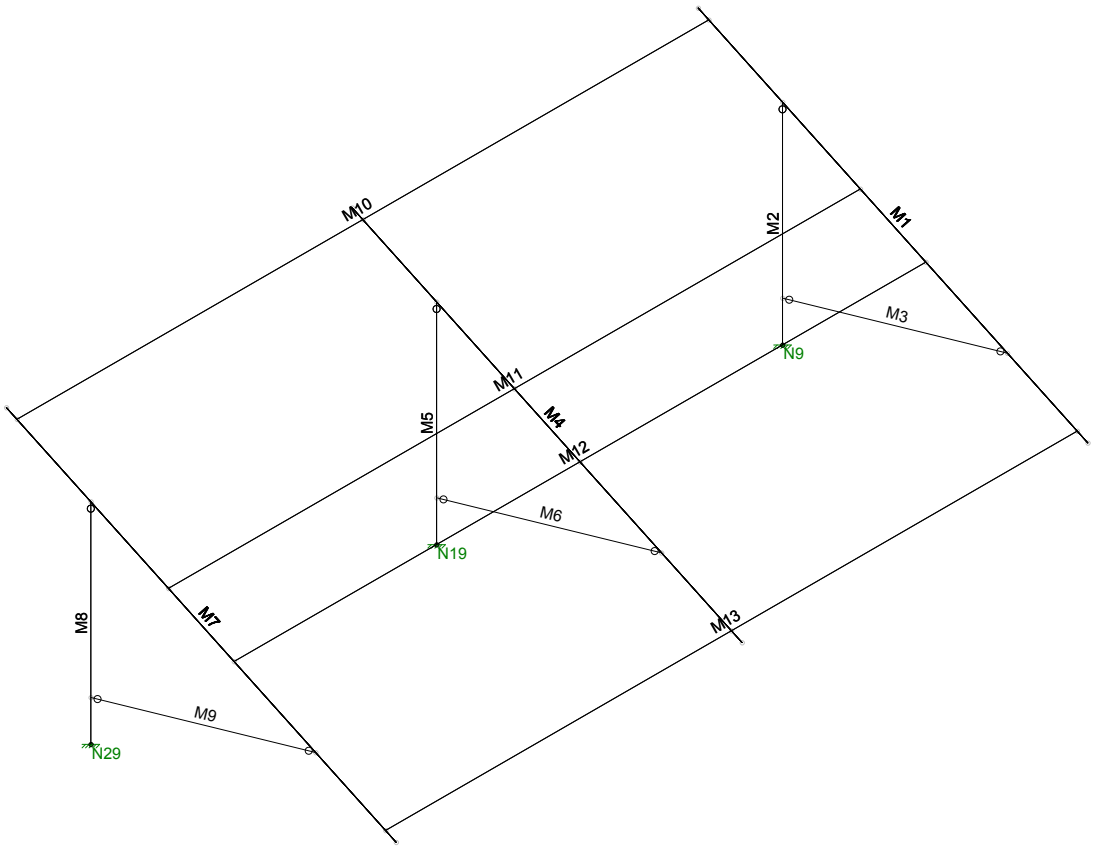


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

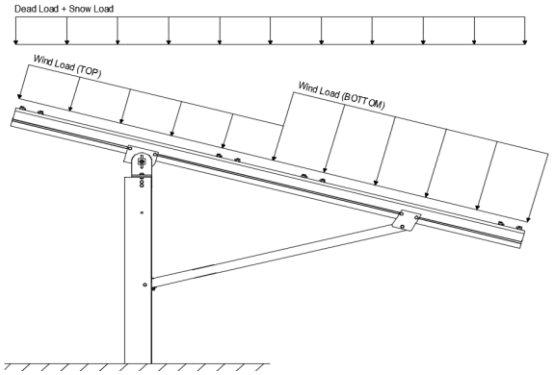
1.2 Construction

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 =	115 mph	Exposure Category = C
Height <	15 ft	Importance Category = II

Peak Velocity Pressure, q_z = 20.76 psf *Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.1	*(Pressure)*
$Cf+_{BOTTOM}$ =	1.7	
$Cf-_{TOP}$ =	-2.2	*(Suction)*
$Cf-_{BOTTOM}$ =	-1	

Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.

2.4 Seismic Loads

S_S =	2.50	R =	1.25
S_{DS} =	1.67	C_S =	0.8
S_1 =	1.00	ρ =	1.3
S_{D1} =	1.00	Ω =	1.25
T_a =	0.08	C_d =	1.25

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

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

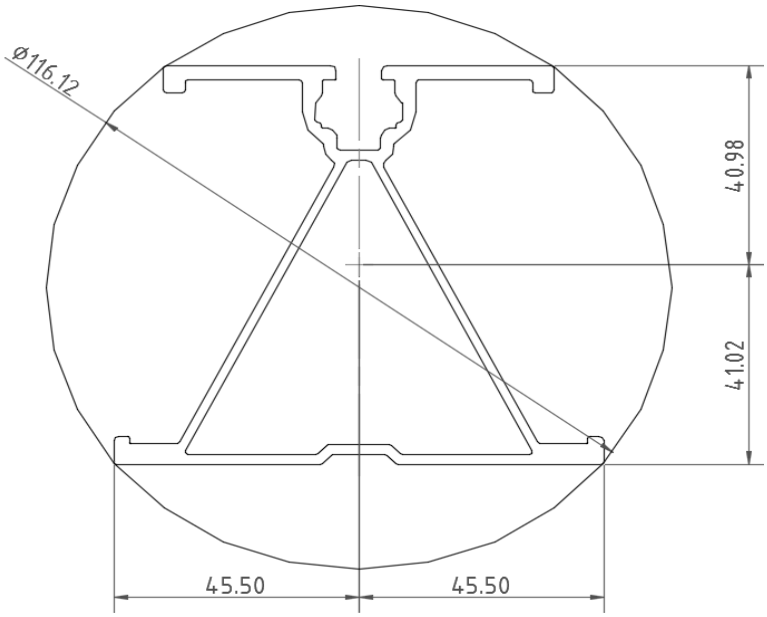
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	108	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 =	1.314	k-ft
M_z =	0.134	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	59%	

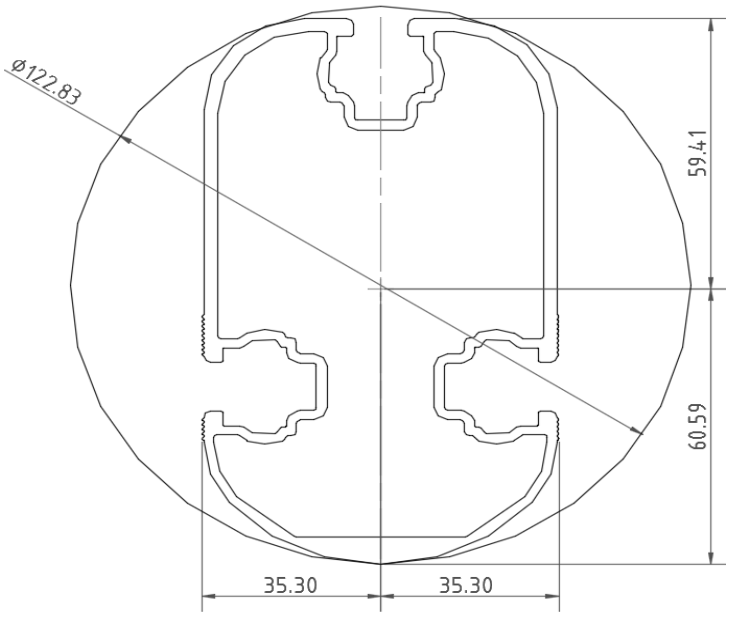


DETAIL VIEW

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 =	3.101	k-ft
M_z =	0.000	k-ft
P_n =	4.439	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	70%	

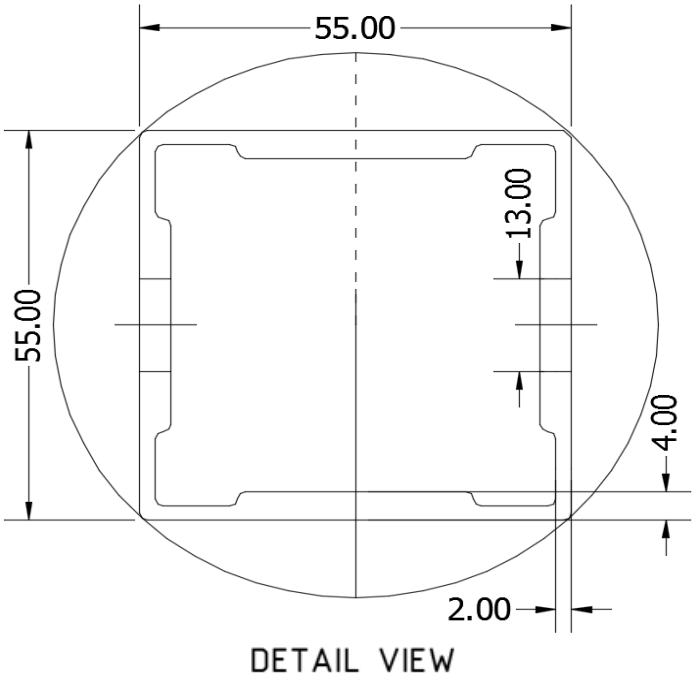


DETAIL VIEW

4.3 Strut Design

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

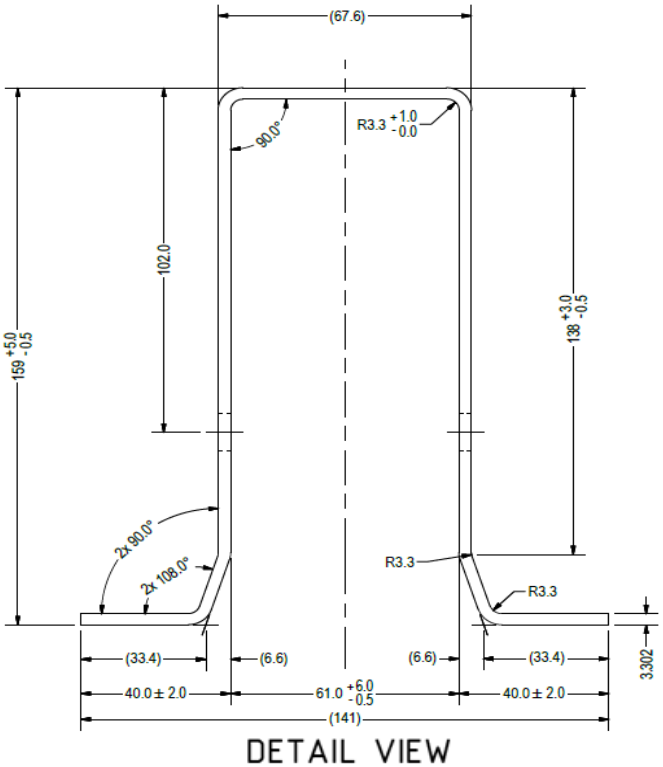
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.777	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	51%	



4.4 Post Design

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

Post Type =	**FG8**	
Steel Type =	J2340	
F_{ty} =	60	ksi
L_b =	81.31	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	14.191	k-ft
M_z =	0.000	k-ft
P_r =	6.024	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	k
Utilization =	95%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	5.06	k
Maximum Lateral Load =	2.75	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

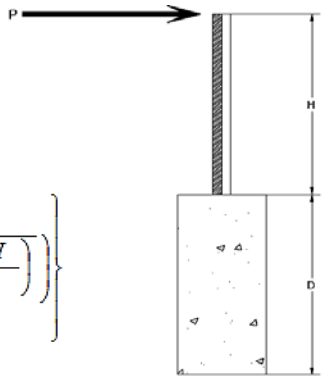
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



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 =	7.39	
Required Footing Depth, D =	11.45	ft

2nd Trial @ D_2 =	7.35	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 =	6.45	ft

3rd Trial @ D_3 =	6.90	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 =	3.48	
Required Footing Depth, D =	6.73	ft

4th Trial @ D_4 =	6.82	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 =	3.52	
Required Footing Depth, D =	6.79	ft

5th Trial @ D_5 =	6.80	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 =	3.53	
Required Footing Depth, D =	7.00	ft

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

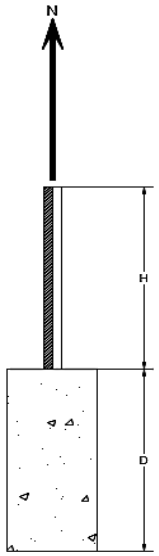
5.4 Uplifting Force Resistance

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 =	2.31	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 =	1.51	k
Required Concrete Volume, V =	10.43	ft^3
Required Footing Depth, D =	3.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	4.98
2	0.4	0.2	118.10	4.87
3	0.6	0.2	118.10	4.77
4	0.8	0.2	118.10	4.67
5	1	0.2	118.10	4.56
6	1.2	0.2	118.10	4.46
7	1.4	0.2	118.10	4.36
8	1.6	0.2	118.10	4.25
9	1.8	0.2	118.10	4.15
10	2	0.2	118.10	4.04
11	2.2	0.2	118.10	3.94
12	2.4	0.2	118.10	3.84
13	2.6	0.2	118.10	3.73
14	2.8	0.2	118.10	3.63
15	3	0.2	118.10	3.53
16	3.2	0.2	118.10	3.42
17	3.4	0.2	118.10	3.32
18	0	0.0	0.00	3.32
19	0	0.0	0.00	3.32
20	0	0.0	0.00	3.32
21	0	0.0	0.00	3.32
22	0	0.0	0.00	3.32
23	0	0.0	0.00	3.32
24	0	0.0	0.00	3.32
25	0	0.0	0.00	3.32
26	0	0.0	0.00	3.32
27	0	0.0	0.00	3.32
28	0	0.0	0.00	3.32
29	0	0.0	0.00	3.32
30	0	0.0	0.00	3.32
31	0	0.0	0.00	3.32
32	0	0.0	0.00	3.32
33	0	0.0	0.00	3.32
34	0	0.0	0.00	3.32
Max	3.4	Sum	0.80	

A 2ft diameter x 3.5ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	7.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.86	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

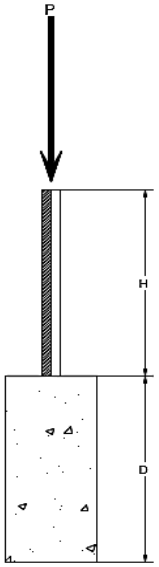
Weight of Concrete

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 =	7.05	k
Utilization =	62%	

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



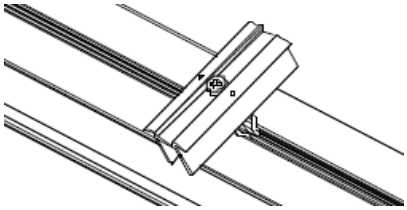
6. DESIGN OF JOINTS AND CONNECTIONS

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.

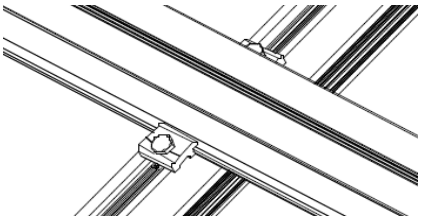
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.499 k
Allowable Uplift	=	1.214 k
Utilization	=	41%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.581 k
Allowable Uplift	=	2.180 k
Utilization	=	73%

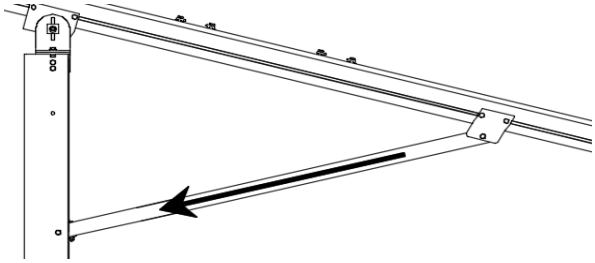


6.2 Strut Connections

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

Maximum Axial Load	=	4.777 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	54%

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

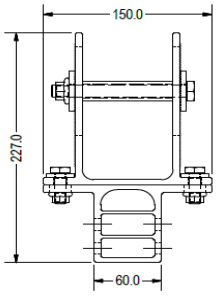


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

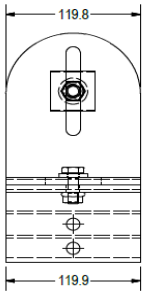
6.3 Girder to Post Connection

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

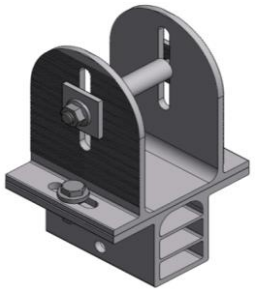
Maximum Tensile Load	=	3.289 k
Allowable Load	=	5.649 k
Utilization	=	58%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

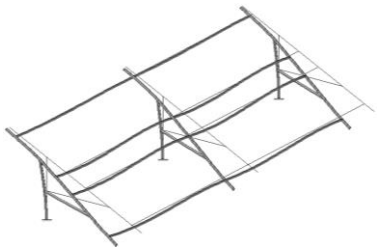
7.1 Seismic Drift

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}	=	0.829 in

0.829 ≤ 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 =	108 in	L_b =	108
J =	0.432	J =	0.432
	298.779		190.005
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	27.7 ksi	φF_L=	28.9
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 =	6.02 k	(LRFD Factored Load)
Mr (Strong) =	14.19 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 =	0.2168 ≥	0.2	
Utilization =	0.95 <	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65 k-ft

Flange Local Buckling:

Mn =	14.39 k-ft

Pr/Pc =	0.217 ≥	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 95%

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	-74.938	-74.938	0	0
2	M11	y	-74.938	-74.938	0	0
3	M12	y	-115.813	-115.813	0	0
4	M13	y	-115.813	-115.813	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	149.875	149.875	0	0
2	M11	y	149.875	149.875	0	0
3	M12	y	68.125	68.125	0	0
4	M13	y	68.125	68.125	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	416.499	2	2336.935	1	157.253	1	.254	1	.009	5	7.727	1
2		min	-675.312	3	-1277.595	3	-353.84	5	-1.614	5	-.005	1	.675	12
3	N19	max	2069.136	2	6059.792	1	0	2	0	1	.009	4	13.318	1
4		min	-1966.085	3	-3892.723	3	-375.613	5	-1.681	4	0	3	.451	15
5	N29	max	416.499	2	2336.935	1	134.832	3	.178	3	.01	4	7.727	1
6		min	-675.312	3	-1277.595	3	-392.864	4	-1.701	4	-.002	3	-.412	5
7	Totals:	max	2902.135	2	10733.662	1	0	10						
8		min	-3316.708	3	-6447.913	3	-1096.784	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	-7.433	12	223.795	3	2.636	3	.04	3	.336	1	.221	2
4			min	-223.32	1	-593.848	2	-161.092	1	-.198	1	.008	12	-.082	3
5		3	max	-7.82	12	222.552	3	2.636	3	.04	3	.23	1	.612	2
6			min	-224.093	1	-595.506	2	-161.092	1	-.198	1	.009	12	-.228	3
7		4	max	-8.206	12	221.308	3	2.636	3	.04	3	.125	1	1.003	2
8			min	-224.866	1	-597.165	2	-161.092	1	-.198	1	.009	12	-.374	3
9		5	max	461.81	3	556.768	2	15.258	3	-.002	10	.168	1	1.183	2
10			min	-1556.683	1	-197.367	3	-197.321	1	-.027	3	-.033	3	-.442	3
11		6	max	461.23	3	555.11	2	15.258	3	-.002	10	.044	2	.818	2
12			min	-1557.456	1	-198.61	3	-197.321	1	-.027	3	-.031	5	-.312	3
13		7	max	460.65	3	553.452	2	15.258	3	-.002	10	-.008	12	.454	2
14			min	-1558.229	1	-199.854	3	-197.321	1	-.027	3	-.093	4	-.181	3
15		8	max	460.07	3	551.794	2	15.258	3	-.002	10	-.003	12	.095	1
16			min	-1559.003	1	-201.097	3	-197.321	1	-.027	3	-.221	1	-.05	3
17		9	max	449.648	3	4.355	9	29.831	3	.018	5	.116	1	.014	3
18			min	-1797.276	1	-2.759	2	-247.06	1	-.144	2	.012	12	-.075	2
19		10	max	449.068	3	2.974	9	29.831	3	.018	5	.039	3	.014	3
20			min	-1798.05	1	-4.417	2	-247.06	1	-.144	2	-.046	1	-.073	2
21		11	max	448.488	3	1.592	9	29.831	3	.018	5	.058	3	.015	3
22			min	-1798.823	1	-6.075	2	-247.06	1	-.144	2	-.208	1	-.072	1
23		12	max	434.638	3	529.26	3	16.963	2	.195	3	.158	1	.087	1
24			min	-2031.725	1	-459.878	1	-221.542	4	-.235	1	.028	10	-.156	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	434.058	3	528.017	3	16.963	2	.195	3	.141	1	.39	1
26			min	-2032.498	1	-461.536	1	-223.127	4	-.235	1	-.037	5	-.502	3
27		14	max	433.478	3	526.773	3	16.963	2	.195	3	.125	1	.693	1
28			min	-2033.271	1	-463.194	1	-224.713	4	-.235	1	-.177	5	-.848	3
29		15	max	432.898	3	525.53	3	16.963	2	.195	3	.114	2	.997	1
30			min	-2034.044	1	-464.852	1	-226.298	4	-.235	1	-.319	5	-1.194	3
31		16	max	225.224	1	460.233	1	75.195	5	.16	1	.011	3	.759	1
32			min	7.159	12	-543.062	3	-145.379	1	-.282	3	-.223	4	-.911	3
33		17	max	224.451	1	458.575	1	73.61	5	.16	1	.007	3	.457	1
34			min	6.772	12	-544.306	3	-145.379	1	-.282	3	-.257	1	-.555	3
35		18	max	223.678	1	456.917	1	72.024	5	.16	1	.003	3	.157	1
36			min	6.386	12	-545.549	3	-145.379	1	-.282	3	-.353	1	-.197	3
37		19	max	0	1	0	15	0	1	0	1	0	1	0	1
38			min	0	1	-.001	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.007	1	0	4	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	-14.503	15	672.509	3	0	1	.034	4	.286	4	.479	2
42			min	-330.833	1	-1567.874	2	-106.828	5	0	1	0	1	-.212	3
43		3	max	-14.736	15	671.265	3	0	1	.034	4	.216	4	1.509	2
44			min	-331.606	1	-1569.533	2	-108.413	5	0	1	0	1	-.653	3
45		4	max	-14.969	15	670.022	3	0	1	.034	4	.145	4	2.539	2
46			min	-332.379	1	-1571.191	2	-109.999	5	0	1	0	1	-1.093	3
47		5	max	1534.839	3	1562.502	2	0	1	0	1	.025	4	2.995	2
48			min	-3886.868	1	-697.586	3	-105.922	4	-.022	4	0	1	-1.281	3
49		6	max	1534.259	3	1560.844	2	0	1	0	1	0	1	1.97	2
50			min	-3887.642	1	-698.83	3	-107.507	4	-.022	4	-.045	5	-.823	3
51		7	max	1533.679	3	1559.186	2	0	1	0	1	0	1	.946	2
52			min	-3888.415	1	-700.073	3	-109.093	4	-.022	4	-.116	4	-.364	3
53		8	max	1533.099	3	1557.527	2	0	1	0	1	0	1	.096	3
54			min	-3889.188	1	-701.317	3	-110.678	4	-.022	4	-.188	4	-.104	1
55		9	max	1504.563	3	14.694	3	0	1	.014	4	.163	4	.314	3
56			min	-4190.112	1	-103.758	1	-242.783	4	0	1	0	1	-.571	1
57		10	max	1503.983	3	13.451	3	0	1	.014	4	.004	5	.305	3
58			min	-4190.885	1	-105.416	1	-244.368	4	0	1	0	1	-.503	1
59		11	max	1503.403	3	12.207	3	0	1	.014	4	0	1	.297	3
60			min	-4191.659	1	-107.074	1	-245.954	4	0	1	-.158	4	-.433	1
61		12	max	1481.724	3	1538.086	3	0	1	.142	4	.16	5	.063	1
62			min	-4503.327	1	-1527.313	1	-248.088	5	0	1	0	1	-.192	3
63		13	max	1481.144	3	1536.842	3	0	1	.142	4	0	1	1.066	1
64			min	-4504.1	1	-1528.971	1	-249.674	5	0	1	-.004	4	-1.201	3
65		14	max	1480.564	3	1535.599	3	0	1	.142	4	0	1	2.07	1
66			min	-4504.873	1	-1530.629	1	-251.26	5	0	1	-.168	4	-2.209	3
67		15	max	1479.984	3	1534.355	3	0	1	.142	4	0	1	3.075	1
68			min	-4505.646	1	-1532.287	1	-252.845	5	0	1	-.334	4	-3.217	3
69		16	max	331.663	1	1428.327	1	59.578	5	0	1	0	1	2.341	1
70			min	14.864	15	-1498.939	3	0	1	-.138	4	-.188	5	-2.442	3
71		17	max	330.89	1	1426.669	1	57.992	5	0	1	0	1	1.404	1
72			min	14.631	15	-1500.182	3	0	1	-.138	4	-.149	5	-1.458	3
73		18	max	330.117	1	1425.011	1	56.407	5	0	1	0	1	.469	1
74			min	14.028	10	-1501.426	3	0	1	-.138	4	-.112	4	-.474	3
75		19	max	0	1	0	2	0	1	0	1	0	1	0	1
76			min	0	1	-.003	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.003	1	.001	4	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	24.152	5	223.795	3	161.092	1	.198	1	.142	5	.221	2
80			min	-223.32	1	-593.848	2	-46.496	5	-.04	3	-.336	1	-.082	3
81		3	max	23.791	5	222.552	3	161.092	1	.198	1	.111	5	.612	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	-224.093	1	-595.506	2	-48.082	5	-.04	3	-.23	1	-.228	3
83		4	max	23.43	5	221.308	3	161.092	1	.198	1	.079	5	1.003	2
84			min	-224.866	1	-597.165	2	-49.667	5	-.04	3	-.125	1	-.374	3
85		5	max	461.81	3	556.768	2	197.321	1	.027	3	.033	3	1.183	2
86			min	-1556.683	1	-197.367	3	-42.363	5	-.018	5	-.168	1	-.442	3
87		6	max	461.23	3	555.11	2	197.321	1	.027	3	.023	3	.818	2
88			min	-1557.456	1	-198.61	3	-43.948	5	-.018	5	-.044	2	-.312	3
89		7	max	460.65	3	553.452	2	197.321	1	.027	3	.091	1	.454	2
90			min	-1558.229	1	-199.854	3	-45.534	5	-.018	5	-.063	5	-.181	3
91		8	max	460.07	3	551.794	2	197.321	1	.027	3	.221	1	.095	1
92			min	-1559.003	1	-201.097	3	-47.119	5	-.018	5	-.093	5	-.05	3
93		9	max	449.648	3	4.355	9	247.06	1	.144	2	.074	5	.014	3
94			min	-1797.276	1	-2.759	2	-85.93	5	.018	15	-.116	1	-.075	2
95		10	max	449.068	3	2.974	9	247.06	1	.144	2	.046	1	.014	3
96			min	-1798.05	1	-4.417	2	-87.515	5	.018	15	-.039	3	-.073	2
97		11	max	448.488	3	1.592	9	247.06	1	.144	2	.208	1	.015	3
98			min	-1798.823	1	-6.075	2	-89.101	5	.018	15	-.058	3	-.072	1
99		12	max	434.638	3	529.26	3	128.626	3	.235	1	.084	5	.087	1
100			min	-2031.725	1	-459.878	1	-207.04	5	-.195	3	-.158	1	-.156	3
101		13	max	434.058	3	528.017	3	128.626	3	.235	1	.029	3	.39	1
102			min	-2032.498	1	-461.536	1	-208.625	5	-.195	3	-.141	1	-.502	3
103		14	max	433.478	3	526.773	3	128.626	3	.235	1	.114	3	.693	1
104			min	-2033.271	1	-463.194	1	-210.211	5	-.195	3	-.211	4	-.848	3
105		15	max	432.898	3	525.53	3	128.626	3	.235	1	.198	3	.997	1
106			min	-2034.044	1	-464.852	1	-211.796	5	-.195	3	-.344	4	-1.194	3
107		16	max	225.224	1	460.233	1	145.379	1	.282	3	.162	1	.759	1
108			min	2.097	15	-543.062	3	4.24	12	-.16	1	-.175	5	-.911	3
109		17	max	224.451	1	458.575	1	145.379	1	.282	3	.257	1	.457	1
110			min	1.864	15	-544.306	3	4.24	12	-.16	1	-.116	5	-.555	3
111		18	max	223.678	1	456.917	1	145.379	1	.282	3	.353	1	.157	1
112			min	1.631	15	-545.549	3	4.24	12	-.16	1	-.057	5	-.197	3
113		19	max	0	1	0	5	0	12	0	1	0	1	0	1
114			min	0	1	-.001	3	0	4	0	1	0	1	0	1
115	M10	1	max	145.426	1	455.949	1	-1.407	15	.004	1	.401	1	.16	1
116			min	4.242	12	-546.736	3	-223.494	1	-.014	3	-.027	5	-.282	3
117		2	max	145.426	1	326.129	1	.329	15	.004	1	.199	1	.192	3
118			min	4.242	12	-402.537	3	-180.43	1	-.014	3	-.028	5	-.231	1
119		3	max	145.426	1	196.309	1	2.758	5	.004	1	.056	2	.523	3
120			min	4.242	12	-258.338	3	-137.366	1	-.014	3	-.027	5	-.492	1
121		4	max	145.426	1	66.489	1	5.443	5	.004	1	.007	10	.709	3
122			min	4.242	12	-114.139	3	-94.302	1	-.014	3	-.076	1	-.623	1
123		5	max	145.426	1	30.061	3	8.129	5	.004	1	-.009	12	.751	3
124			min	4.242	12	-63.331	1	-51.238	1	-.014	3	-.148	1	-.625	1
125		6	max	145.426	1	174.26	3	11.63	4	.004	1	-.004	15	.649	3
126			min	4.242	12	-193.151	1	-20.701	2	-.014	3	-.178	1	-.497	1
127		7	max	145.426	1	318.459	3	34.89	1	.004	1	.005	5	.403	3
128			min	4.242	12	-322.971	1	-7.749	10	-.014	3	-.165	1	-.239	1
129		8	max	145.426	1	462.658	3	77.954	1	.004	1	.02	5	.149	1
130			min	2.67	15	-452.791	1	-2.954	10	-.014	3	-.108	1	-.022	5
131		9	max	145.426	1	606.857	3	121.018	1	.004	1	.046	4	.667	1
132			min	-7.369	5	-582.611	1	1.842	10	-.014	3	-.068	2	-.523	3
133		10	max	145.426	1	751.056	3	15.267	3	.014	3	.134	1	1.314	1
134			min	4.242	12	33.622	15	-164.082	1	-.002	14	-.04	10	-1.202	3
135		11	max	145.426	1	582.611	1	2.363	5	.014	3	.022	9	.667	1
136			min	4.242	12	-606.857	3	-121.018	1	-.004	1	-.068	2	-.523	3
137		12	max	145.426	1	452.791	1	5.048	5	.014	3	.004	3	.149	1
138			min	4.242	12	-462.658	3	-77.954	1	-.004	1	-.108	1	.008	12

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	145.426	1	322.971	1	7.749	10	.014	3	-.003	12	.403	3
140			min	-.042	15	-318.459	3	-34.89	1	-.004	1	-.165	1	-.239	1
141		14	max	145.426	1	193.151	1	20.701	2	.014	3	-.007	12	.649	3
142			min	-11.495	5	-174.26	3	-4.68	3	-.004	1	-.178	1	-.497	1
143		15	max	145.426	1	63.331	1	51.238	1	.014	3	-.002	15	.751	3
144			min	-23.295	5	-30.061	3	-2.033	3	-.004	1	-.148	1	-.625	1
145		16	max	145.426	1	114.139	3	94.302	1	.014	3	.012	5	.709	3
146			min	-35.096	5	-66.489	1	.614	3	-.004	1	-.076	1	-.623	1
147		17	max	145.426	1	258.338	3	137.366	1	.014	3	.056	2	.523	3
148			min	-46.896	5	-196.309	1	2.47	12	-.004	1	-.013	3	-.492	1
149		18	max	145.426	1	402.537	3	180.43	1	.014	3	.199	1	.192	3
150			min	-58.697	5	-326.129	1	4.234	12	-.004	1	-.008	3	-.231	1
151		19	max	145.426	1	546.736	3	223.494	1	.014	3	.401	1	.16	1
152			min	-70.497	5	-455.949	1	5.999	12	-.004	1	0	3	-.282	3
153	M11	1	max	221.05	1	458.846	1	40.079	5	.002	3	.458	1	.124	4
154			min	-158.307	3	-532.66	3	-233.032	1	-.013	1	-.221	5	-.274	3
155		2	max	221.05	1	329.026	1	42.764	5	.002	3	.246	1	.186	3
156			min	-158.307	3	-388.461	3	-189.968	1	-.013	1	-.18	5	-.285	1
157		3	max	221.05	1	199.206	1	45.45	5	.002	3	.078	1	.502	3
158			min	-158.307	3	-244.261	3	-146.904	1	-.013	1	-.136	5	-.549	1
159		4	max	221.05	1	69.385	1	48.135	5	.002	3	.011	10	.675	3
160			min	-158.307	3	-100.062	3	-103.84	1	-.013	1	-.103	4	-.683	1
161		5	max	221.05	1	44.137	3	50.821	5	.002	3	-.003	12	.703	3
162			min	-158.307	3	-60.435	1	-60.776	1	-.013	1	-.13	1	-.688	1
163		6	max	221.05	1	188.336	3	53.506	5	.002	3	.013	5	.586	3
164			min	-158.307	3	-190.255	1	-25.153	2	-.013	1	-.169	1	-.562	1
165		7	max	221.05	1	332.535	3	64.574	4	.002	3	.068	5	.326	3
166			min	-158.307	3	-320.075	1	-9.179	10	-.013	1	-.165	1	-.307	1
167		8	max	221.05	1	476.734	3	76.622	4	.002	3	.125	5	.078	1
168			min	-158.307	3	-449.895	1	-4.384	10	-.013	1	-.118	1	-.079	3
169		9	max	221.05	1	620.933	3	111.48	1	.002	3	.19	4	.593	1
170			min	-158.307	3	-579.715	1	.412	10	-.013	1	-.077	2	-.628	3
171		10	max	221.05	1	765.132	3	154.544	1	.006	9	.284	4	1.237	1
172			min	-158.307	3	-709.535	1	-62.025	14	-.013	1	-.044	10	-1.321	3
173		11	max	221.05	1	579.715	1	46.121	5	.013	1	.01	9	.593	1
174			min	-158.307	3	-620.933	3	-111.48	1	-.002	3	-.183	5	-.628	3
175		12	max	221.05	1	449.895	1	48.806	5	.013	1	0	3	.078	1
176			min	-158.307	3	-476.734	3	-68.416	1	-.002	3	-.155	4	-.079	3
177		13	max	221.05	1	320.075	1	51.492	5	.013	1	-.003	12	.326	3
178			min	-158.307	3	-332.535	3	-25.352	1	-.002	3	-.165	1	-.307	1
179		14	max	221.05	1	190.255	1	55.663	4	.013	1	-.004	12	.586	3
180			min	-158.307	3	-188.336	3	.053	3	-.002	3	-.169	1	-.562	1
181		15	max	221.05	1	60.435	1	67.712	4	.013	1	.023	5	.703	3
182			min	-158.307	3	-44.137	3	1.818	12	-.002	3	-.13	1	-.688	1
183		16	max	221.05	1	100.062	3	103.84	1	.013	1	.081	5	.675	3
184			min	-158.307	3	-69.385	1	3.582	12	-.002	3	-.047	1	-.683	1
185		17	max	221.05	1	244.261	3	146.904	1	.013	1	.153	4	.502	3
186			min	-158.307	3	-199.206	1	5.347	12	-.002	3	.004	12	-.549	1
187		18	max	221.05	1	388.461	3	189.968	1	.013	1	.251	4	.186	3
188			min	-158.307	3	-329.026	1	7.111	12	-.002	3	.01	12	-.285	1
189		19	max	221.05	1	532.66	3	233.032	1	.013	1	.458	1	.109	1
190			min	-158.307	3	-458.846	1	8.876	12	-.002	3	.018	12	-.274	3
191	M12	1	max	36.998	5	552.186	2	38.293	5	0	3	.483	1	.141	2
192			min	-48.344	1	-203.457	3	-237.302	1	-.01	1	-.211	5	.029	15
193		2	max	25.197	5	399.029	2	40.979	5	0	3	.267	1	.224	3
194			min	-48.344	1	-141.008	3	-194.238	1	-.01	1	-.172	5	-.344	1
195		3	max	14.625	3	245.872	2	43.664	5	0	3	.095	1	.334	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	-48.344	1	-78.559	3	-151.174	1	-.01	1	-.13	5	-.66	1
197		4	max	14.625	3	92.715	2	46.35	5	0	3	.016	10	.381	3
198			min	-48.344	1	-16.11	3	-108.11	1	-.01	1	-.097	4	-.827	2
199		5	max	14.625	3	46.339	3	49.035	5	0	3	-.007	10	.366	3
200			min	-48.344	1	-60.442	2	-65.046	1	-.01	1	-.122	1	-.843	2
201		6	max	14.625	3	108.788	3	51.721	5	0	3	.014	5	.289	3
202			min	-48.344	1	-213.599	2	-28.971	2	-.01	1	-.165	1	-.706	2
203		7	max	14.625	3	171.237	3	62.253	4	0	3	.067	5	.149	3
204			min	-48.344	1	-366.756	2	-11.557	2	-.01	1	-.166	1	-.421	1
205		8	max	14.625	3	233.686	3	74.301	4	0	3	.122	5	.028	2
206			min	-57.435	4	-519.913	2	-6.287	10	-.01	1	-.123	1	-.054	3
207		9	max	14.625	3	296.135	3	107.21	1	0	3	.184	4	.624	2
208			min	-69.235	4	-673.07	2	-1.491	10	-.01	1	-.085	2	-.319	3
209		10	max	14.625	3	358.584	3	150.274	1	0	3	.277	4	1.374	2
210			min	-81.036	4	-826.228	2	3.305	10	-.01	1	-.053	2	-.646	3
211		11	max	49.532	5	673.07	2	44.727	5	.01	1	.013	3	.624	2
212			min	-48.344	1	-296.135	3	-107.21	1	0	5	-.18	5	-.319	3
213		12	max	37.732	5	519.913	2	47.413	5	.01	1	.003	3	.028	2
214			min	-48.344	1	-233.686	3	-64.146	1	0	5	-.154	4	-.054	3
215		13	max	25.931	5	366.756	2	50.098	5	.01	1	-.003	12	.149	3
216			min	-48.344	1	-171.237	3	-22.358	9	0	5	-.166	1	-.421	1
217		14	max	14.625	3	213.599	2	55.024	4	.01	1	-.006	12	.289	3
218			min	-48.344	1	-108.788	3	-3.393	3	0	5	-.165	1	-.706	2
219		15	max	14.625	3	60.442	2	67.073	4	.01	1	.021	5	.366	3
220			min	-48.344	1	-46.339	3	-.746	3	0	5	-.122	1	-.843	2
221		16	max	14.625	3	16.11	3	108.11	1	.01	1	.078	5	.381	3
222			min	-48.344	1	-92.715	2	1.527	12	0	5	-.036	9	-.827	2
223		17	max	14.625	3	78.559	3	151.174	1	.01	1	.151	4	.334	3
224			min	-48.344	1	-245.872	2	3.291	12	0	5	-.007	3	-.66	1
225		18	max	14.625	3	141.008	3	194.238	1	.01	1	.267	1	.224	3
226			min	-48.344	1	-399.029	2	5.056	12	0	5	-.001	3	-.344	1
227		19	max	14.625	3	203.457	3	237.302	1	.01	1	.483	1	.141	2
228			min	-56.629	4	-552.186	2	6.82	12	0	5	.006	12	-.036	5
229	M13	1	max	44.778	5	592.949	2	24.518	5	.007	3	.39	1	.198	1
230			min	-160.879	1	-225.071	3	-221.879	1	-.023	1	-.157	5	-.04	3
231		2	max	32.977	5	439.792	2	27.203	5	.007	3	.19	1	.154	3
232			min	-160.879	1	-162.622	3	-178.815	1	-.023	1	-.131	5	-.327	2
233		3	max	21.177	5	288.75	1	29.889	5	.007	3	.05	2	.285	3
234			min	-160.879	1	-100.173	3	-135.751	1	-.023	1	-.103	5	-.69	2
235		4	max	9.376	5	138.492	1	32.574	5	.007	3	.004	10	.354	3
236			min	-160.879	1	-37.724	3	-92.687	1	-.023	1	-.093	4	-.9	2
237		5	max	2.636	3	24.725	3	35.26	5	.007	3	-.006	12	.361	3
238			min	-160.879	1	-19.679	2	-49.623	1	-.023	1	-.153	1	-.957	1
239		6	max	2.636	3	87.174	3	39.117	4	.007	3	0	15	.305	3
240			min	-160.879	1	-172.836	2	-19.433	2	-.023	1	-.181	1	-.87	1
241		7	max	2.636	3	149.623	3	51.166	4	.007	3	.038	5	.187	3
242			min	-160.879	1	-325.993	2	-7.146	10	-.023	1	-.166	1	-.633	1
243		8	max	2.636	3	212.072	3	79.569	1	.007	3	.08	5	.006	3
244			min	-160.879	1	-479.15	2	-2.351	10	-.023	1	-.108	1	-.246	1
245		9	max	2.636	3	274.521	3	122.633	1	.007	3	.133	4	.347	2
246			min	-160.879	1	-632.307	2	2.445	10	-.023	1	-.067	2	-.238	3
247		10	max	2.636	3	785.464	2	114.18	14	.007	3	.214	4	1.056	2
248			min	-160.879	1	-336.97	3	-165.697	1	-.023	1	-.039	10	-.543	3
249		11	max	32.136	5	632.307	2	29.301	5	.023	1	.023	9	.347	2
250			min	-160.879	1	-274.521	3	-122.633	1	-.007	3	-.12	5	-.238	3
251		12	max	20.335	5	479.15	2	31.987	5	.023	1	.003	3	.006	3
252			min	-160.879	1	-212.072	3	-79.569	1	-.007	3	-.108	1	-.246	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	8.535	5	325.993	2	34.672	5	.023	1	-.003	12	.187	3
254			min	-160.879	1	-149.623	3	-36.505	1	-.007	3	-.166	1	-.633	1
255		14	max	2.636	3	172.836	2	37.358	5	.023	1	-.006	12	.305	3
256			min	-160.879	1	-87.174	3	-2.926	3	-.007	3	-.181	1	-.87	1
257		15	max	2.636	3	19.679	2	49.623	1	.023	1	.018	5	.361	3
258			min	-160.879	1	-24.725	3	-.279	3	-.007	3	-.153	1	-.957	1
259		16	max	2.636	3	37.724	3	92.687	1	.023	1	.06	5	.354	3
260			min	-160.879	1	-138.492	1	1.753	12	-.007	3	-.082	1	-.9	2
261		17	max	2.636	3	100.173	3	135.751	1	.023	1	.106	4	.285	3
262			min	-160.879	1	-288.75	1	3.518	12	-.007	3	-.005	3	-.69	2
263		18	max	2.636	3	162.622	3	178.815	1	.023	1	.19	1	.154	3
264			min	-160.879	1	-439.792	2	5.282	12	-.007	3	.001	3	-.327	2
265		19	max	2.636	3	225.071	3	221.879	1	.023	1	.39	1	.198	1
266			min	-160.879	1	-592.949	2	7.047	12	-.007	3	.008	12	-.04	3
267	M2	1	max	2336.935	1	675.011	3	157.561	1	.009	5	1.614	5	7.727	1
268			min	-1277.595	3	-413.592	2	-353.997	5	-.005	1	-.254	1	.675	12
269		2	max	2334.013	1	675.011	3	157.561	1	.009	5	1.501	5	7.737	1
270			min	-1279.786	3	-413.592	2	-351.465	5	-.005	1	-.203	1	.545	12
271		3	max	2331.091	1	675.011	3	157.561	1	.009	5	1.388	5	7.747	1
272			min	-1281.978	3	-413.592	2	-348.932	5	-.005	1	-.153	1	.414	12
273		4	max	2328.17	1	675.011	3	157.561	1	.009	5	1.277	4	7.757	1
274			min	-1284.169	3	-413.592	2	-346.4	5	-.005	1	-.102	1	.284	12
275		5	max	1853.169	1	1665.957	1	119.674	1	.002	1	1.172	4	7.484	1
276			min	-1115.548	3	47.53	12	-330.191	5	0	5	-.102	1	.214	12
277		6	max	1850.247	1	1665.957	1	119.674	1	.002	1	1.071	4	6.949	1
278			min	-1117.739	3	47.53	12	-327.659	5	0	5	-.063	1	.198	12
279		7	max	1847.326	1	1665.957	1	119.674	1	.002	1	.971	4	6.415	1
280			min	-1119.93	3	47.53	12	-325.127	5	0	5	-.055	3	.183	12
281		8	max	1844.404	1	1665.957	1	119.674	1	.002	1	.872	4	5.88	1
282			min	-1122.122	3	47.53	12	-322.595	5	0	5	-.094	3	.168	12
283		9	max	1841.482	1	1665.957	1	119.674	1	.002	1	.773	4	5.345	1
284			min	-1124.313	3	47.53	12	-320.062	5	0	5	-.133	3	.153	12
285		10	max	1838.56	1	1665.957	1	119.674	1	.002	1	.675	4	4.811	1
286			min	-1126.504	3	47.53	12	-317.53	5	0	5	-.172	3	.137	12
287		11	max	1835.639	1	1665.957	1	119.674	1	.002	1	.578	4	4.276	1
288			min	-1128.695	3	47.53	12	-314.998	5	0	5	-.212	3	.122	12
289		12	max	1832.717	1	1665.957	1	119.674	1	.002	1	.482	4	3.742	1
290			min	-1130.887	3	47.53	12	-312.466	5	0	5	-.251	3	.107	12
291		13	max	1829.795	1	1665.957	1	119.674	1	.002	1	.387	4	3.207	1
292			min	-1133.078	3	47.53	12	-309.934	5	0	5	-.29	3	.092	12
293		14	max	1826.873	1	1665.957	1	119.674	1	.002	1	.292	4	2.673	1
294			min	-1135.269	3	47.53	12	-307.402	5	0	5	-.33	3	.076	12
295		15	max	1823.952	1	1665.957	1	119.674	1	.002	1	.282	1	2.138	1
296			min	-1137.461	3	47.53	12	-304.869	5	0	5	-.369	3	.061	12
297		16	max	1821.03	1	1665.957	1	119.674	1	.002	1	.321	1	1.604	1
298			min	-1139.652	3	47.53	12	-302.337	5	0	5	-.408	3	.046	12
299		17	max	1818.108	1	1665.957	1	119.674	1	.002	1	.359	1	1.069	1
300			min	-1141.843	3	47.53	12	-299.805	5	0	5	-.448	3	.031	12
301		18	max	1815.187	1	1665.957	1	119.674	1	.002	1	.397	1	.535	1
302			min	-1144.035	3	47.53	12	-297.273	5	0	5	-.487	3	.015	12
303		19	max	1812.265	1	1665.957	1	119.674	1	.002	1	.436	1	0	1
304			min	-1146.226	3	47.53	12	-294.741	5	0	5	-.526	3	0	1
305	M5	1	max	6059.792	1	1964.474	3	0	1	.009	4	1.681	4	13.318	1
306			min	-3892.723	3	-2055.104	2	-375.912	5	0	1	0	1	.451	15
307		2	max	6056.87	1	1964.474	3	0	1	.009	4	1.561	4	13.754	1
308			min	-3894.914	3	-2055.104	2	-373.38	5	0	1	0	1	.457	15
309		3	max	6053.949	1	1964.474	3	0	1	.009	4	1.443	4	14.19	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	-3897.106	3	-2055.104	2	-370.848	5	0	1	0	1	.462	15
311		4	max	6051.027	1	1964.474	3	0	1	.009	4	1.325	4	14.626	1
312			min	-3899.297	3	-2055.104	2	-368.316	5	0	1	0	1	.146	12
313		5	max	4843.094	1	3184.406	1	0	1	0	1	1.217	4	14.305	1
314			min	-3330.243	3	-30.785	3	-357.282	4	0	4	0	1	-.138	3
315		6	max	4840.172	1	3184.406	1	0	1	0	1	1.102	4	13.283	1
316			min	-3332.434	3	-30.785	3	-354.749	4	0	4	0	1	-.128	3
317		7	max	4837.25	1	3184.406	1	0	1	0	1	.989	4	12.261	1
318			min	-3334.625	3	-30.785	3	-352.217	4	0	4	0	1	-.119	3
319		8	max	4834.329	1	3184.406	1	0	1	0	1	.876	4	11.239	1
320			min	-3336.816	3	-30.785	3	-349.685	4	0	4	0	1	-.109	3
321		9	max	4831.407	1	3184.406	1	0	1	0	1	.765	4	10.218	1
322			min	-3339.008	3	-30.785	3	-347.153	4	0	4	0	1	-.099	3
323		10	max	4828.485	1	3184.406	1	0	1	0	1	.654	4	9.196	1
324			min	-3341.199	3	-30.785	3	-344.621	4	0	4	0	1	-.089	3
325		11	max	4825.564	1	3184.406	1	0	1	0	1	.543	4	8.174	1
326			min	-3343.39	3	-30.785	3	-342.089	4	0	4	0	1	-.079	3
327		12	max	4822.642	1	3184.406	1	0	1	0	1	.434	4	7.152	1
328			min	-3345.582	3	-30.785	3	-339.556	4	0	4	0	1	-.069	3
329		13	max	4819.72	1	3184.406	1	0	1	0	1	.326	4	6.131	1
330			min	-3347.773	3	-30.785	3	-337.024	4	0	4	0	1	-.059	3
331		14	max	4816.798	1	3184.406	1	0	1	0	1	.218	4	5.109	1
332			min	-3349.964	3	-30.785	3	-334.492	4	0	4	0	1	-.049	3
333		15	max	4813.877	1	3184.406	1	0	1	0	1	.111	4	4.087	1
334			min	-3352.156	3	-30.785	3	-331.96	4	0	4	0	1	-.04	3
335		16	max	4810.955	1	3184.406	1	0	1	0	1	.005	4	3.065	1
336			min	-3354.347	3	-30.785	3	-329.428	4	0	4	0	1	-.03	3
337		17	max	4808.033	1	3184.406	1	0	1	0	1	0	1	2.044	1
338			min	-3356.538	3	-30.785	3	-326.896	4	0	4	-.101	4	-.02	3
339		18	max	4805.111	1	3184.406	1	0	1	0	1	0	1	1.022	1
340			min	-3358.729	3	-30.785	3	-324.363	4	0	4	-.205	4	-.01	3
341		19	max	4802.19	1	3184.406	1	0	1	0	1	0	1	0	1
342			min	-3360.921	3	-30.785	3	-321.831	4	0	4	-.309	4	0	1
343	M8	1	max	2336.935	1	675.011	3	134.72	3	.01	4	1.701	4	7.727	1
344			min	-1277.595	3	-413.592	2	-393.414	4	-.002	3	-.178	3	-.412	5
345		2	max	2334.013	1	675.011	3	134.72	3	.01	4	1.575	4	7.737	1
346			min	-1279.786	3	-413.592	2	-390.882	4	-.002	3	-.135	3	-.365	5
347		3	max	2331.091	1	675.011	3	134.72	3	.01	4	1.45	4	7.747	1
348			min	-1281.978	3	-413.592	2	-388.349	4	-.002	3	-.092	3	-.318	5
349		4	max	2328.17	1	675.011	3	134.72	3	.01	4	1.326	4	7.757	1
350			min	-1284.169	3	-413.592	2	-385.817	4	-.002	3	-.049	3	-.27	5
351		5	max	1853.169	1	1665.957	1	122.521	3	0	3	1.219	4	7.484	1
352			min	-1115.548	3	-53.144	5	-364.471	4	-.002	1	-.024	3	-.239	5
353		6	max	1850.247	1	1665.957	1	122.521	3	0	3	1.102	4	6.949	1
354			min	-1117.739	3	-53.144	5	-361.938	4	-.002	1	.009	12	-.222	5
355		7	max	1847.326	1	1665.957	1	122.521	3	0	3	.987	4	6.415	1
356			min	-1119.93	3	-53.144	5	-359.406	4	-.002	1	-.002	10	-.205	5
357		8	max	1844.404	1	1665.957	1	122.521	3	0	3	.872	4	5.88	1
358			min	-1122.122	3	-53.144	5	-356.874	4	-.002	1	-.029	2	-.188	5
359		9	max	1841.482	1	1665.957	1	122.521	3	0	3	.758	4	5.345	1
360			min	-1124.313	3	-53.144	5	-354.342	4	-.002	1	-.062	2	-.171	5
361		10	max	1838.56	1	1665.957	1	122.521	3	0	3	.645	5	4.811	1
362			min	-1126.504	3	-53.144	5	-351.81	4	-.002	1	-.095	2	-.153	5
363		11	max	1835.639	1	1665.957	1	122.521	3	0	3	.541	5	4.276	1
364			min	-1128.695	3	-53.144	5	-349.278	4	-.002	1	-.129	1	-.136	5
365		12	max	1832.717	1	1665.957	1	122.521	3	0	3	.436	5	3.742	1
366			min	-1130.887	3	-53.144	5	-346.745	4	-.002	1	-.167	1	-.119	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	1829.795	1	1665.957	1	122.521	3	0	3	.333	5	3.207	1
368			min	-1133.078	3	-53.144	5	-344.213	4	-.002	1	-.205	1	-.102	5
369		14	max	1826.873	1	1665.957	1	122.521	3	0	3	.33	3	2.673	1
370			min	-1135.269	3	-53.144	5	-341.681	4	-.002	1	-.244	1	-.085	5
371		15	max	1823.952	1	1665.957	1	122.521	3	0	3	.369	3	2.138	1
372			min	-1137.461	3	-53.144	5	-339.149	4	-.002	1	-.282	1	-.068	5
373		16	max	1821.03	1	1665.957	1	122.521	3	0	3	.408	3	1.604	1
374			min	-1139.652	3	-53.144	5	-336.617	4	-.002	1	-.321	1	-.051	5
375		17	max	1818.108	1	1665.957	1	122.521	3	0	3	.448	3	1.069	1
376			min	-1141.843	3	-53.144	5	-334.085	4	-.002	1	-.359	1	-.034	5
377		18	max	1815.187	1	1665.957	1	122.521	3	0	3	.487	3	.535	1
378			min	-1144.035	3	-53.144	5	-331.552	4	-.002	1	-.397	1	-.017	5
379		19	max	1812.265	1	1665.957	1	122.521	3	0	3	.526	3	0	1
380			min	-1146.226	3	-53.144	5	-329.02	4	-.002	1	-.436	1	0	1
381	M3	1	max	1765.851	2	5.879	6	37.107	1	.017	3	.009	4	0	1
382			min	-630.054	3	1.382	15	-14.562	5	-.044	1	-.002	3	0	1
383		2	max	1765.704	2	5.226	6	37.107	1	.017	3	.019	1	0	15
384			min	-630.164	3	1.228	15	-14.103	5	-.044	1	-.007	3	-.002	6
385		3	max	1765.558	2	4.572	6	37.107	1	.017	3	.032	1	0	15
386			min	-630.274	3	1.075	15	-13.644	5	-.044	1	-.011	3	-.004	6
387		4	max	1765.411	2	3.919	6	37.107	1	.017	3	.045	1	-.001	15
388			min	-630.384	3	.921	15	-13.185	5	-.044	1	-.016	3	-.005	6
389		5	max	1765.265	2	3.266	6	37.107	1	.017	3	.059	1	-.002	15
390			min	-630.494	3	.768	15	-12.726	5	-.044	1	-.02	3	-.007	6
391		6	max	1765.118	2	2.613	6	37.107	1	.017	3	.072	1	-.002	15
392			min	-630.604	3	.614	15	-12.62	3	-.044	1	-.025	3	-.008	6
393		7	max	1764.971	2	1.96	6	37.107	1	.017	3	.085	1	-.002	15
394			min	-630.714	3	.461	15	-12.62	3	-.044	1	-.029	3	-.008	6
395		8	max	1764.825	2	1.306	6	37.107	1	.017	3	.098	1	-.002	15
396			min	-630.824	3	.307	15	-12.62	3	-.044	1	-.034	3	-.009	6
397		9	max	1764.678	2	.653	6	37.107	1	.017	3	.112	1	-.002	15
398			min	-630.934	3	.154	15	-12.62	3	-.044	1	-.038	3	-.009	6
399		10	max	1764.531	2	0	1	37.107	1	.017	3	.125	1	-.002	15
400			min	-631.044	3	0	1	-12.62	3	-.044	1	-.043	3	-.009	6
401		11	max	1764.385	2	-.154	15	37.107	1	.017	3	.138	1	-.002	15
402			min	-631.154	3	-.653	4	-12.62	3	-.044	1	-.047	3	-.009	6
403		12	max	1764.238	2	-.307	15	37.107	1	.017	3	.151	1	-.002	15
404			min	-631.264	3	-1.306	4	-12.62	3	-.044	1	-.052	3	-.009	6
405		13	max	1764.092	2	-.461	15	37.107	1	.017	3	.165	1	-.002	15
406			min	-631.374	3	-1.96	4	-12.62	3	-.044	1	-.056	3	-.008	6
407		14	max	1763.945	2	-.614	15	37.107	1	.017	3	.178	1	-.002	15
408			min	-631.484	3	-2.613	4	-12.62	3	-.044	1	-.061	3	-.008	6
409		15	max	1763.798	2	-.768	15	37.107	1	.017	3	.191	1	-.002	15
410			min	-631.594	3	-3.266	4	-12.62	3	-.044	1	-.065	3	-.007	6
411		16	max	1763.652	2	-.921	15	37.107	1	.017	3	.204	1	-.001	15
412			min	-631.704	3	-3.919	4	-12.62	3	-.044	1	-.07	3	-.005	6
413		17	max	1763.505	2	-1.075	15	37.107	1	.017	3	.218	1	0	15
414			min	-631.814	3	-4.572	4	-12.62	3	-.044	1	-.074	3	-.004	6
415		18	max	1763.359	2	-1.228	15	37.107	1	.017	3	.231	1	0	15
416			min	-631.924	3	-5.226	4	-12.62	3	-.044	1	-.079	3	-.002	6
417		19	max	1763.212	2	-1.382	15	37.107	1	.017	3	.244	1	0	1
418			min	-632.034	3	-5.879	4	-12.62	3	-.044	1	-.083	3	0	1
419	M6	1	max	4777.044	2	5.879	4	0	1	.011	4	.008	4	0	1
420			min	-2075.744	3	1.382	15	-16.664	4	0	1	0	1	0	1
421		2	max	4776.897	2	5.226	4	0	1	.011	4	.002	4	0	15
422			min	-2075.854	3	1.228	15	-16.205	4	0	1	0	1	-.002	4
423		3	max	4776.75	2	4.572	4	0	1	.011	4	0	1	0	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
424			min	-2075.964	3	1.075	15	-15.746	4	0	1	-.004	4	-.004	4
425		4	max	4776.604	2	3.919	4	0	1	.011	4	0	1	-.001	15
426			min	-2076.074	3	.921	15	-15.287	4	0	1	-.009	4	-.005	4
427		5	max	4776.457	2	3.266	4	0	1	.011	4	0	1	-.002	15
428			min	-2076.183	3	.768	15	-14.827	4	0	1	-.015	4	-.007	4
429		6	max	4776.311	2	2.613	4	0	1	.011	4	0	1	-.002	15
430			min	-2076.293	3	.614	15	-14.368	4	0	1	-.02	4	-.008	4
431		7	max	4776.164	2	1.96	4	0	1	.011	4	0	1	-.002	15
432			min	-2076.403	3	.461	15	-13.909	4	0	1	-.025	4	-.008	4
433		8	max	4776.017	2	1.306	4	0	1	.011	4	0	1	-.002	15
434			min	-2076.513	3	.307	15	-13.45	4	0	1	-.03	4	-.009	4
435		9	max	4775.871	2	.653	4	0	1	.011	4	0	1	-.002	15
436			min	-2076.623	3	.154	15	-12.991	4	0	1	-.035	4	-.009	4
437		10	max	4775.724	2	0	1	0	1	.011	4	0	1	-.002	15
438			min	-2076.733	3	0	1	-12.532	4	0	1	-.039	4	-.009	4
439		11	max	4775.578	2	-.154	15	0	1	.011	4	0	1	-.002	15
440			min	-2076.843	3	-.653	6	-12.073	4	0	1	-.044	4	-.009	4
441		12	max	4775.431	2	-.307	15	0	1	.011	4	0	1	-.002	15
442			min	-2076.953	3	-1.306	6	-11.614	4	0	1	-.048	4	-.009	4
443		13	max	4775.284	2	-.461	15	0	1	.011	4	0	1	-.002	15
444			min	-2077.063	3	-1.96	6	-11.155	4	0	1	-.052	4	-.008	4
445		14	max	4775.138	2	-.614	15	0	1	.011	4	0	1	-.002	15
446			min	-2077.173	3	-2.613	6	-10.696	4	0	1	-.056	4	-.008	4
447		15	max	4774.991	2	-.768	15	0	1	.011	4	0	1	-.002	15
448			min	-2077.283	3	-3.266	6	-10.237	4	0	1	-.06	4	-.007	4
449		16	max	4774.845	2	-.921	15	0	1	.011	4	0	1	-.001	15
450			min	-2077.393	3	-3.919	6	-9.778	4	0	1	-.063	4	-.005	4
451		17	max	4774.698	2	-1.075	15	0	1	.011	4	0	1	0	15
452			min	-2077.503	3	-4.572	6	-9.319	4	0	1	-.067	4	-.004	4
453		18	max	4774.551	2	-1.228	15	0	1	.011	4	0	1	0	15
454			min	-2077.613	3	-5.226	6	-8.86	4	0	1	-.07	4	-.002	4
455		19	max	4774.405	2	-1.382	15	0	1	.011	4	0	1	0	1
456			min	-2077.723	3	-5.879	6	-8.401	4	0	1	-.073	4	0	1
457	M9	1	max	1765.851	2	5.879	4	12.62	3	.044	1	.008	5	0	1
458			min	-630.054	3	1.382	15	-37.107	1	-.017	3	-.006	2	0	1
459		2	max	1765.704	2	5.226	4	12.62	3	.044	1	.007	3	0	15
460			min	-630.164	3	1.228	15	-37.107	1	-.017	3	-.019	1	-.002	4
461		3	max	1765.558	2	4.572	4	12.62	3	.044	1	.011	3	0	15
462			min	-630.274	3	1.075	15	-37.107	1	-.017	3	-.032	1	-.004	4
463		4	max	1765.411	2	3.919	4	12.62	3	.044	1	.016	3	-.001	15
464			min	-630.384	3	.921	15	-37.107	1	-.017	3	-.045	1	-.005	4
465		5	max	1765.265	2	3.266	4	12.62	3	.044	1	.02	3	-.002	15
466			min	-630.494	3	.768	15	-37.107	1	-.017	3	-.059	1	-.007	4
467		6	max	1765.118	2	2.613	4	12.62	3	.044	1	.025	3	-.002	15
468			min	-630.604	3	.614	15	-37.107	1	-.017	3	-.072	1	-.008	4
469		7	max	1764.971	2	1.96	4	12.62	3	.044	1	.029	3	-.002	15
470			min	-630.714	3	.461	15	-37.107	1	-.017	3	-.085	1	-.008	4
471		8	max	1764.825	2	1.306	4	12.62	3	.044	1	.034	3	-.002	15
472			min	-630.824	3	.307	15	-37.107	1	-.017	3	-.098	1	-.009	4
473		9	max	1764.678	2	.653	4	12.62	3	.044	1	.038	3	-.002	15
474			min	-630.934	3	.154	15	-37.107	1	-.017	3	-.112	1	-.009	4
475		10	max	1764.531	2	0	1	12.62	3	.044	1	.043	3	-.002	15
476			min	-631.044	3	0	1	-37.107	1	-.017	3	-.125	1	-.009	4
477		11	max	1764.385	2	-.154	15	12.62	3	.044	1	.047	3	-.002	15
478			min	-631.154	3	-.653	6	-37.107	1	-.017	3	-.138	1	-.009	4
479		12	max	1764.238	2	-.307	15	12.62	3	.044	1	.052	3	-.002	15
480			min	-631.264	3	-1.306	6	-37.107	1	-.017	3	-.151	1	-.009	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1764.092	2	-.461	15	12.62	3	.044	1	.056	3	-.002	15
482			min	-631.374	3	-1.96	6	-37.107	1	-.017	3	-.165	1	-.008	4
483		14	max	1763.945	2	-.614	15	12.62	3	.044	1	.061	3	-.002	15
484			min	-631.484	3	-2.613	6	-37.107	1	-.017	3	-.178	1	-.008	4
485		15	max	1763.798	2	-.768	15	12.62	3	.044	1	.065	3	-.002	15
486			min	-631.594	3	-3.266	6	-37.107	1	-.017	3	-.191	1	-.007	4
487		16	max	1763.652	2	-.921	15	12.62	3	.044	1	.07	3	-.001	15
488			min	-631.704	3	-3.919	6	-37.107	1	-.017	3	-.204	1	-.005	4
489		17	max	1763.505	2	-1.075	15	12.62	3	.044	1	.074	3	0	15
490			min	-631.814	3	-4.572	6	-37.107	1	-.017	3	-.218	1	-.004	4
491		18	max	1763.359	2	-1.228	15	12.62	3	.044	1	.079	3	0	15
492			min	-631.924	3	-5.226	6	-37.107	1	-.017	3	-.231	1	-.002	4
493		19	max	1763.212	2	-1.382	15	12.62	3	.044	1	.083	3	0	1
494			min	-632.034	3	-5.879	6	-37.107	1	-.017	3	-.244	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	-.02	12	.054	3	.014	1	7.732e-3	3	NC	3	NC	1
2			min	-.512	1	-1.062	1	-.856	4	-2.531e-2	1	99.994	1	203.685	5
3		2	max	-.02	12	.03	3	0	12	7.474e-3	3	NC	12	NC	2
4			min	-.512	1	-.921	1	-.826	4	-2.403e-2	1	111.115	1	213.158	4
5		3	max	-.02	12	.007	3	0	3	6.967e-3	3	5255.436	12	NC	3
6			min	-.512	1	-.782	1	-.788	4	-2.151e-2	1	124.671	1	226.172	4
7		4	max	-.02	12	-.01	12	0	3	6.46e-3	3	3728.302	12	NC	3
8			min	-.512	1	-.653	1	-.742	4	-1.899e-2	1	140.67	1	243.917	4
9		5	max	-.02	12	-.017	12	.002	3	6.192e-3	3	3110.117	12	NC	3
10			min	-.511	1	-.539	1	-.692	4	-1.716e-2	1	158.547	1	267.071	4
11		6	max	-.02	12	-.021	12	.002	3	6.54e-3	3	2889.957	12	NC	3
12			min	-.511	1	-.444	1	-.64	4	-1.71e-2	1	177.465	1	296.138	4
13		7	max	-.02	12	-.021	12	.002	3	6.889e-3	3	2854.272	12	NC	1
14			min	-.51	1	-.361	1	-.589	4	-1.705e-2	1	197.968	1	331.462	4
15		8	max	-.02	12	-.02	12	0	1	7.237e-3	3	2915.804	12	NC	1
16			min	-.51	1	-.285	1	-.541	4	-1.699e-2	1	221.375	1	372.021	5
17		9	max	-.02	12	-.019	12	0	10	7.926e-3	3	3006.463	12	NC	1
18			min	-.509	1	-.211	1	-.498	4	-1.613e-2	1	250.476	1	419.052	5
19		10	max	-.02	12	-.015	15	.001	1	8.935e-3	3	3091.662	12	NC	1
20			min	-.508	1	-.135	1	-.453	4	-1.453e-2	1	289.14	1	483.403	5
21		11	max	-.021	12	-.007	15	.001	1	9.945e-3	3	3172.793	12	NC	1
22			min	-.507	1	-.058	1	-.407	4	-1.292e-2	1	342.834	1	572.28	5
23		12	max	-.021	12	.02	1	.003	3	9.26e-3	3	3240.865	12	NC	1
24			min	-.507	1	-.026	3	-.364	4	-1.064e-2	1	422.578	1	696.918	5
25		13	max	-.021	12	.096	1	.009	3	6.777e-3	3	3418.49	12	NC	1
26			min	-.506	1	-.023	3	-.317	4	-7.641e-3	1	548.162	1	906.007	5
27		14	max	-.021	12	.167	1	.014	3	4.293e-3	3	4102.764	12	NC	1
28			min	-.505	1	-.012	3	-.27	4	-5.962e-3	4	754.911	1	1276.887	5
29		15	max	-.021	12	.227	1	.013	3	1.809e-3	3	7161.232	12	NC	1
30			min	-.504	1	.008	12	-.23	4	-6.915e-3	4	1110.268	1	1950.01	5
31		16	max	-.021	12	.272	1	.012	1	4.762e-3	3	NC	3	NC	2
32			min	-.504	1	.029	15	-.201	4	-6.128e-3	4	1712.66	1	3153.061	5
33		17	max	-.021	12	.305	1	.015	1	8.354e-3	3	NC	10	NC	2
34			min	-.504	1	.036	15	-.181	4	-5.197e-3	1	2451.521	3	5674.888	5
35		18	max	-.021	12	.331	1	.008	1	1.194e-2	3	NC	2	NC	2
36			min	-.504	1	.044	15	-.168	4	-7.235e-3	1	1152.485	3	7750.072	1
37		19	max	-.021	12	.355	1	-.001	12	1.378e-2	3	NC	1	NC	1
38			min	-.504	1	.051	15	-.161	4	-8.275e-3	1	742.105	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	-.013	12	.221	3	0	1	6.399e-4	4	NC	3	NC	1
40			min	-.96	1	-2.08	1	-.855	4	0	1	54.578	1	203.662	4
41		2	max	-.013	12	.155	3	0	1	4.178e-4	4	3695.255	12	NC	1
42			min	-.96	1	-1.792	1	-.827	4	0	1	61.398	1	212.02	4
43		3	max	-.013	12	.093	3	0	1	0	1	2184.974	15	NC	1
44			min	-.96	1	-1.51	1	-.79	4	-1.769e-5	4	69.934	1	224.571	4
45		4	max	-.013	12	.041	3	0	1	0	1	2469.171	15	NC	1
46			min	-.96	1	-1.251	1	-.744	4	-4.532e-4	4	80.192	1	242.231	4
47		5	max	-.013	12	.006	3	0	1	0	1	2783.765	15	NC	1
48			min	-.959	1	-1.03	1	-.692	4	-6.896e-4	4	91.628	1	265.728	4
49		6	max	-.014	12	-.009	12	0	1	0	1	3110.388	15	NC	1
50			min	-.958	1	-.854	1	-.639	4	-4.141e-4	4	103.355	1	295.201	4
51		7	max	-.014	12	-.009	12	0	1	0	1	3461.282	15	NC	1
52			min	-.956	1	-.708	1	-.587	4	-1.387e-4	4	115.698	1	330.634	4
53		8	max	-.014	12	-.007	12	0	1	1.369e-4	5	3866.458	15	NC	1
54			min	-.954	1	-.576	1	-.541	4	0	1	129.732	1	371.157	4
55		9	max	-.015	12	-.005	12	0	1	1.787e-4	4	4389.922	15	NC	1
56			min	-.953	1	-.441	1	-.499	4	0	1	147.976	1	416.715	4
57		10	max	-.015	12	-.007	12	0	1	2.046e-6	5	5125.94	15	NC	1
58			min	-.951	1	-.297	1	-.453	4	-5.93e-7	14	174.165	1	482.017	4
59		11	max	-.015	12	-.005	15	0	1	0	1	6219.716	15	NC	1
60			min	-.949	1	-.145	1	-.407	4	-1.776e-4	4	214.105	1	571.875	4
61		12	max	-.016	12	.014	1	0	1	0	1	8001.399	15	NC	1
62			min	-.948	1	-.031	3	-.364	4	-1.145e-3	4	281.799	1	689.013	4
63		13	max	-.016	12	.172	1	0	1	0	1	NC	15	NC	1
64			min	-.946	1	-.042	3	-.319	4	-2.95e-3	4	411.403	1	887.242	4
65		14	max	-.017	12	.314	1	0	1	0	1	NC	5	NC	1
66			min	-.944	1	-.034	3	-.273	4	-4.756e-3	4	556.002	3	1243.679	4
67		15	max	-.017	12	.424	1	0	1	0	1	NC	5	NC	1
68			min	-.942	1	.006	12	-.234	4	-6.561e-3	4	665.709	3	1891.216	4
69		16	max	-.017	12	.487	1	0	1	0	1	NC	2	NC	1
70			min	-.942	1	.016	15	-.205	4	-5.175e-3	4	1162.671	3	3045.403	4
71		17	max	-.017	12	.514	1	0	1	0	1	NC	1	NC	1
72			min	-.942	1	.017	15	-.184	4	-3.415e-3	4	NC	1	5516.412	4
73		18	max	-.017	12	.519	1	0	1	0	1	NC	1	NC	1
74			min	-.942	1	.018	15	-.17	4	-1.655e-3	4	892.008	3	NC	1
75		19	max	-.017	12	.538	3	0	1	0	1	NC	1	NC	1
76			min	-.942	1	.018	15	-.159	4	-7.574e-4	4	446.465	3	NC	1
77	M7	1	max	.019	5	.054	3	0	12	2.531e-2	1	NC	3	NC	1
78			min	-.512	1	-1.062	1	-.862	4	-7.732e-3	3	99.994	1	200.336	4
79		2	max	.019	5	.03	3	.01	1	2.403e-2	1	NC	5	NC	2
80			min	-.512	1	-.921	1	-.821	4	-7.474e-3	3	111.115	1	212.758	4
81		3	max	.019	5	.019	5	.022	1	2.151e-2	1	NC	5	NC	3
82			min	-.512	1	-.782	1	-.777	4	-6.967e-3	3	124.671	1	227.816	4
83		4	max	.018	5	.019	5	.024	1	1.899e-2	1	NC	5	NC	3
84			min	-.512	1	-.653	1	-.73	4	-6.46e-3	3	140.67	1	246.306	4
85		5	max	.018	5	.018	5	.022	1	1.716e-2	1	NC	5	NC	3
86			min	-.511	1	-.539	1	-.682	4	-6.192e-3	3	158.547	1	269.104	4
87		6	max	.019	5	.016	5	.014	1	1.71e-2	1	NC	5	NC	3
88			min	-.511	1	-.444	1	-.633	4	-6.54e-3	3	177.465	1	296.245	4
89		7	max	.019	5	.014	5	.005	1	1.705e-2	1	NC	5	NC	1
90			min	-.51	1	-.361	1	-.587	4	-6.889e-3	3	197.968	1	328.306	4
91		8	max	.019	5	.011	5	0	10	1.699e-2	1	NC	5	NC	1
92			min	-.51	1	-.285	1	-.542	4	-7.237e-3	3	221.375	1	366.423	4
93		9	max	.019	5	.009	5	0	3	1.613e-2	1	NC	5	NC	1
94			min	-.509	1	-.211	1	-.498	4	-7.926e-3	3	250.476	1	412.758	4
95		10	max	.019	5	.006	5	.001	3	1.453e-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	-.508	1	-.135	1	-.453	4	-8.935e-3	3	289.14	1	474.808	4
97		11	max	.019	5	.004	5	0	3	1.292e-2	1	NC	5	NC	1
98			min	-.507	1	-.058	1	-.408	4	-9.945e-3	3	342.834	1	560.927	4
99		12	max	.019	5	.02	1	.005	1	1.064e-2	1	NC	7	NC	1
100			min	-.507	1	-.026	3	-.361	4	-9.26e-3	3	422.578	1	686.823	4
101		13	max	.019	5	.096	1	.008	1	7.641e-3	1	NC	13	NC	1
102			min	-.506	1	-.023	3	-.314	4	-6.777e-3	3	548.162	1	893.325	4
103		14	max	.019	5	.167	1	.006	2	4.645e-3	1	NC	4	NC	1
104			min	-.505	1	-.012	3	-.269	4	-4.8e-3	5	754.911	1	1242	4
105		15	max	.019	5	.227	1	.002	10	1.648e-3	1	NC	4	NC	1
106			min	-.504	1	-.008	5	-.233	4	-6.436e-3	5	1110.268	1	1816.033	4
107		16	max	.019	5	.272	1	-.001	10	3.158e-3	1	NC	3	NC	2
108			min	-.504	1	-.014	5	-.208	4	-5.287e-3	5	1712.66	1	2684.748	4
109		17	max	.019	5	.305	1	-.003	10	5.197e-3	1	NC	4	NC	2
110			min	-.504	1	-.02	5	-.188	4	-8.354e-3	3	2451.521	3	4237.704	4
111		18	max	.019	5	.331	1	-.001	12	7.235e-3	1	NC	2	NC	2
112			min	-.504	1	-.027	5	-.172	4	-1.194e-2	3	1152.485	3	7750.072	1
113		19	max	.019	5	.355	1	.012	1	8.275e-3	1	NC	1	NC	1
114			min	-.504	1	-.034	5	-.155	4	-1.378e-2	3	742.105	3	NC	1
115	M10	1	max	.001	1	.343	1	.504	1	8.618e-3	3	NC	1	NC	1
116			min	-.163	4	-.031	5	-.019	5	-9.046e-4	5	NC	1	NC	1
117		2	max	.001	1	.381	3	.564	1	9.891e-3	3	NC	4	NC	3
118			min	-.163	4	-.016	5	-.002	15	-7.956e-4	5	1274.336	3	3621.045	1
119		3	max	0	1	.536	3	.656	1	1.116e-2	3	NC	4	NC	3
120			min	-.163	4	-.007	5	.007	15	-6.865e-4	5	665.273	3	1424.407	1
121		4	max	0	1	.651	3	.755	1	1.244e-2	3	NC	5	NC	3
122			min	-.164	4	-.002	5	.012	15	-5.774e-4	5	491.675	3	861.807	1
123		5	max	0	1	.71	3	.843	1	1.371e-2	3	NC	5	NC	3
124			min	-.164	4	0	15	.015	15	-4.683e-4	5	433.188	3	638.744	1
125		6	max	0	1	.711	3	.907	1	1.498e-2	3	NC	4	NC	3
126			min	-.164	4	.002	15	.017	15	-3.593e-4	5	432.62	3	536.484	1
127		7	max	0	1	.661	3	.944	1	1.625e-2	3	NC	4	NC	3
128			min	-.164	4	.004	15	.018	15	-2.693e-4	10	480.653	3	491.721	1
129		8	max	0	1	.58	3	.955	1	1.752e-2	3	NC	4	NC	3
130			min	-.164	4	.008	15	.019	15	-4.65e-4	2	586.172	3	479.734	1
131		9	max	0	1	.499	3	.949	1	1.88e-2	3	NC	5	NC	3
132			min	-.164	4	.012	15	.018	12	-7.706e-4	2	751.077	3	485.889	1
133		10	max	0	1	.518	1	.942	1	2.007e-2	3	NC	5	NC	3
134			min	-.164	4	.018	15	.017	12	-1.076e-3	2	867.09	3	493.123	1
135		11	max	0	12	.499	3	.949	1	1.88e-2	3	NC	5	NC	3
136			min	-.164	4	.021	15	.018	12	-7.706e-4	2	751.077	3	485.889	1
137		12	max	0	12	.58	3	.955	1	1.752e-2	3	NC	4	NC	3
138			min	-.164	4	.02	15	.021	12	-4.65e-4	2	586.172	3	479.734	1
139		13	max	0	12	.661	3	.944	1	1.625e-2	3	NC	5	NC	3
140			min	-.164	4	.017	15	.024	12	-2.693e-4	10	480.653	3	491.721	1
141		14	max	0	12	.711	3	.907	1	1.498e-2	3	NC	5	NC	3
142			min	-.164	4	.014	15	.027	12	-1.143e-4	10	432.62	3	536.484	1
143		15	max	0	12	.71	3	.843	1	1.371e-2	3	NC	15	NC	3
144			min	-.164	4	.013	15	.028	12	4.074e-5	10	433.188	3	638.744	1
145		16	max	0	12	.651	3	.755	1	1.244e-2	3	NC	15	NC	3
146			min	-.164	4	.015	15	.028	12	1.958e-4	10	491.675	3	861.807	1
147		17	max	0	12	.536	3	.656	1	1.116e-2	3	NC	15	NC	3
148			min	-.164	4	.021	15	.027	12	3.508e-4	10	665.273	3	1424.407	1
149		18	max	0	12	.381	3	.564	1	9.891e-3	3	NC	5	NC	3
150			min	-.164	4	.031	15	.024	12	5.058e-4	10	1274.336	3	3621.045	1
151		19	max	0	12	.343	1	.504	1	8.618e-3	3	NC	1	NC	1
152			min	-.164	4	.047	15	.021	12	6.608e-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	.507	1	9.894e-3	1	NC	1	NC	1
154			min	-.384	4	-.026	3	-.019	5	-2.998e-4	5	NC	1	NC	1
155		2	max	.002	1	.103	3	.551	1	1.103e-2	1	NC	4	NC	3
156			min	-.384	4	-.162	1	.019	12	-1.56e-4	5	1505.635	1	4039.47	4
157		3	max	.001	1	.219	3	.635	1	1.217e-2	1	NC	5	NC	3
158			min	-.384	4	-.284	1	.019	12	-2.417e-4	3	814.553	1	1685.926	1
159		4	max	.001	1	.296	3	.732	1	1.331e-2	1	NC	5	NC	3
160			min	-.384	4	-.363	1	.019	12	-4.393e-4	3	627.567	1	959.494	1
161		5	max	.001	1	.32	3	.822	1	1.444e-2	1	NC	5	NC	3
162			min	-.384	4	-.388	1	.019	12	-6.37e-4	3	584.044	1	685.421	1
163		6	max	0	1	.29	3	.892	1	1.558e-2	1	NC	5	NC	3
164			min	-.385	4	-.36	1	.011	15	-8.346e-4	3	632.011	1	560.976	1
165		7	max	0	1	.214	3	.936	1	1.672e-2	1	NC	5	NC	3
166			min	-.385	4	-.288	1	-.001	15	-1.032e-3	3	800.214	1	503.981	1
167		8	max	0	1	.113	3	.953	1	1.786e-2	1	NC	5	NC	3
168			min	-.385	4	-.193	1	-.007	5	-1.23e-3	3	1237.345	1	483.897	1
169		9	max	0	1	.019	3	.953	1	1.9e-2	1	NC	4	NC	3
170			min	-.385	4	-.105	1	.002	15	-1.428e-3	3	2504.765	1	484.43	1
171		10	max	0	1	-.002	15	.949	1	2.013e-2	1	NC	3	NC	3
172			min	-.385	4	-.064	1	.016	12	-1.625e-3	3	4717.7	1	489.29	1
173		11	max	0	3	.019	3	.953	1	1.9e-2	1	NC	4	NC	3
174			min	-.385	4	-.105	1	.016	12	-1.428e-3	3	2504.765	1	484.43	1
175		12	max	0	3	.113	3	.953	1	1.786e-2	1	NC	5	NC	3
176			min	-.385	4	-.193	1	.018	12	-1.23e-3	3	1237.345	1	483.897	1
177		13	max	0	3	.214	3	.936	1	1.672e-2	1	NC	5	NC	3
178			min	-.385	4	-.288	1	.019	12	-1.032e-3	3	800.214	1	503.981	1
179		14	max	0	3	.29	3	.892	1	1.558e-2	1	NC	15	NC	3
180			min	-.385	4	-.36	1	.019	12	-8.346e-4	3	632.011	1	560.976	1
181		15	max	0	3	.32	3	.822	1	1.444e-2	1	NC	15	NC	3
182			min	-.385	4	-.388	1	.019	12	-6.37e-4	3	584.044	1	685.421	1
183		16	max	0	3	.296	3	.732	1	1.331e-2	1	9882.59	15	NC	3
184			min	-.385	4	-.363	1	.016	15	-4.393e-4	3	627.567	1	959.494	1
185		17	max	.001	3	.219	3	.635	1	1.217e-2	1	NC	15	NC	3
186			min	-.385	4	-.284	1	.01	15	-2.417e-4	3	814.553	1	1685.926	1
187		18	max	.001	3	.103	3	.551	1	1.103e-2	1	NC	5	NC	3
188			min	-.385	4	-.162	1	.019	15	-4.401e-5	3	1505.635	1	4894.896	1
189		19	max	.001	3	-.004	15	.507	1	9.894e-3	1	NC	1	NC	1
190			min	-.385	4	-.026	3	.021	12	1.317e-4	12	NC	1	NC	1
191	M12	1	max	0	3	.01	5	.509	1	9.47e-3	1	NC	1	NC	1
192			min	-.521	4	-.249	1	-.019	5	-3.375e-4	5	NC	1	NC	1
193		2	max	0	3	.053	3	.547	1	1.032e-2	1	NC	5	NC	3
194			min	-.521	4	-.451	1	.019	15	-2.044e-4	5	1072.547	1	4311.413	4
195		3	max	0	3	.12	3	.627	1	1.117e-2	1	NC	5	NC	3
196			min	-.521	4	-.626	1	.023	12	-7.13e-5	5	573.762	1	1828.374	1
197		4	max	0	3	.161	3	.724	1	1.203e-2	1	NC	5	NC	3
198			min	-.521	4	-.75	1	.024	12	2.499e-5	15	431.864	1	1007.15	1
199		5	max	0	3	.171	3	.815	1	1.288e-2	1	NC	5	NC	3
200			min	-.521	4	-.809	1	.023	15	1.135e-4	15	386.172	1	706.379	1
201		6	max	0	3	.154	3	.888	1	1.373e-2	1	NC	5	NC	3
202			min	-.521	4	-.802	1	.01	15	1.799e-4	12	390.748	1	570.994	1
203		7	max	0	3	.113	3	.934	1	1.458e-2	1	NC	5	NC	3
204			min	-.521	4	-.741	1	-.002	15	1.795e-4	12	439.728	1	508.191	1
205		8	max	0	3	.062	3	.955	1	1.544e-2	1	NC	5	NC	3
206			min	-.521	4	-.647	1	-.007	5	1.792e-4	12	543.734	1	484.348	1
207		9	max	0	3	.015	3	.957	1	1.629e-2	1	NC	5	NC	3
208			min	-.521	4	-.555	1	.003	15	1.789e-4	12	707.124	1	482.3	1
209		10	max	0	1	-.006	12	.954	1	1.714e-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	-.52	4	-.512	1	.015	12	1.785e-4	12	823.416	1	486.072	1
211		11	max	0	1	.015	3	.957	1	1.629e-2	1	NC	5	NC	3
212			min	-.52	4	-.555	1	.016	12	1.789e-4	12	707.124	1	482.3	1
213		12	max	0	1	.062	3	.955	1	1.544e-2	1	NC	5	NC	3
214			min	-.52	4	-.647	1	.018	12	1.792e-4	12	543.734	1	484.348	1
215		13	max	0	1	.113	3	.934	1	1.458e-2	1	NC	15	NC	3
216			min	-.52	4	-.741	1	.021	12	1.795e-4	12	439.728	1	508.191	1
217		14	max	0	1	.154	3	.888	1	1.373e-2	1	NC	15	NC	3
218			min	-.52	4	-.802	1	.023	12	1.799e-4	12	390.748	1	570.994	1
219		15	max	0	1	.171	3	.815	1	1.288e-2	1	NC	15	NC	3
220			min	-.52	4	-.809	1	.024	12	1.802e-4	12	386.172	1	706.379	1
221		16	max	0	1	.161	3	.724	1	1.203e-2	1	NC	15	NC	3
222			min	-.52	4	-.75	1	.018	15	1.805e-4	12	431.864	1	1007.15	1
223		17	max	0	1	.12	3	.627	1	1.117e-2	1	NC	15	NC	3
224			min	-.52	4	-.626	1	.012	15	1.808e-4	12	573.762	1	1828.374	1
225		18	max	0	1	.053	3	.547	1	1.032e-2	1	NC	5	NC	3
226			min	-.52	4	-.451	1	.02	15	1.812e-4	12	1072.547	1	5605.246	5
227		19	max	0	1	-.02	12	.509	1	9.47e-3	1	NC	1	NC	1
228			min	-.52	4	-.249	1	.02	12	1.815e-4	12	NC	1	NC	1
229	M13	1	max	0	3	.042	3	.512	1	1.8e-2	1	NC	1	NC	1
230			min	-.842	4	-.993	1	-.019	5	-3.024e-3	3	NC	1	NC	1
231		2	max	0	3	.134	3	.576	1	2.006e-2	1	NC	5	NC	3
232			min	-.842	4	-1.297	1	.015	15	-3.608e-3	3	710.351	1	3348.475	1
233		3	max	0	3	.213	3	.672	1	2.212e-2	1	NC	5	NC	3
234			min	-.842	4	-1.577	1	.022	12	-4.192e-3	3	369.831	1	1351.544	1
235		4	max	0	3	.271	3	.773	1	2.419e-2	1	NC	15	NC	3
236			min	-.842	4	-1.804	1	.023	12	-4.775e-3	3	266.321	1	828.056	1
237		5	max	0	3	.3	3	.861	1	2.625e-2	1	NC	15	NC	3
238			min	-.842	4	-1.961	1	.022	12	-5.359e-3	3	223.111	1	618.204	1
239		6	max	0	3	.302	3	.926	1	2.831e-2	1	9070.532	15	NC	3
240			min	-.842	4	-2.043	1	.021	15	-5.943e-3	3	205.666	1	521.596	1
241		7	max	0	3	.28	3	.962	1	3.037e-2	1	8396.527	15	NC	3
242			min	-.842	4	-2.057	1	.013	15	-6.527e-3	3	202.949	1	479.451	1
243		8	max	0	3	.243	3	.973	1	3.243e-2	1	8196.154	15	NC	3
244			min	-.842	4	-2.022	1	.008	15	-7.11e-3	3	209.886	1	468.554	1
245		9	max	0	3	.206	3	.967	1	3.45e-2	1	8260.501	15	NC	3
246			min	-.842	4	-1.968	1	.013	15	-7.694e-3	3	221.436	1	474.935	1
247		10	max	0	1	.189	3	.96	1	3.656e-2	1	8354.954	15	NC	3
248			min	-.842	4	-1.939	1	.013	12	-8.278e-3	3	228.343	1	482.084	1
249		11	max	0	1	.206	3	.967	1	3.45e-2	1	8022.786	15	NC	3
250			min	-.842	4	-1.968	1	.014	12	-7.694e-3	3	221.436	1	474.935	1
251		12	max	0	1	.243	3	.973	1	3.243e-2	1	7420.407	15	NC	3
252			min	-.842	4	-2.022	1	.017	12	-7.11e-3	3	209.886	1	468.554	1
253		13	max	0	1	.28	3	.962	1	3.037e-2	1	6952.897	15	NC	3
254			min	-.842	4	-2.057	1	.019	12	-6.527e-3	3	202.949	1	479.451	1
255		14	max	0	1	.302	3	.926	1	2.831e-2	1	6803.789	15	NC	3
256			min	-.842	4	-2.043	1	.021	12	-5.943e-3	3	205.666	1	521.596	1
257		15	max	0	1	.3	3	.861	1	2.625e-2	1	7105.566	15	NC	3
258			min	-.842	4	-1.961	1	.022	12	-5.359e-3	3	223.111	1	618.204	1
259		16	max	0	1	.271	3	.773	1	2.419e-2	1	8131.311	15	NC	3
260			min	-.842	4	-1.804	1	.021	15	-4.775e-3	3	266.321	1	828.056	1
261		17	max	.001	1	.213	3	.672	1	2.212e-2	1	NC	15	NC	3
262			min	-.842	4	-1.577	1	.017	15	-4.192e-3	3	369.831	1	1351.544	1
263		18	max	.001	1	.134	3	.576	1	2.006e-2	1	NC	5	NC	3
264			min	-.842	4	-1.297	1	.021	12	-3.608e-3	3	710.351	1	3348.475	1
265		19	max	.001	1	.042	3	.512	1	1.8e-2	1	NC	1	NC	1
266			min	-.842	4	-.993	1	.02	12	-3.024e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	12	.001	5	1.62e-3	1	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-2.872e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.004	5	3.241e-3	1	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-5.744e-3	5	7999.55	1	NC	1
273		4	max	0	3	-.002	12	.01	5	4.861e-3	1	NC	3	NC	1
274			min	0	1	-.02	1	-.001	1	-8.617e-3	5	3552.63	1	7091.693	5
275		5	max	0	3	-.002	12	.017	5	5.373e-3	1	NC	3	NC	1
276			min	0	1	-.035	1	-.002	1	-9.869e-3	5	1989.254	1	4106.466	5
277		6	max	0	3	-.003	12	.026	5	4.86e-3	1	NC	3	NC	1
278			min	0	1	-.054	1	-.003	1	-9.625e-3	5	1272.056	1	2702.583	5
279		7	max	0	3	-.005	12	.036	5	4.347e-3	1	NC	12	NC	1
280			min	0	1	-.078	1	-.004	1	-9.38e-3	5	888.321	1	1929.038	5
281		8	max	0	3	-.006	12	.048	5	3.854e-3	2	NC	12	NC	1
282			min	0	1	-.105	1	-.005	1	-9.135e-3	5	659.126	1	1456.654	5
283		9	max	0	3	-.007	12	.06	5	3.38e-3	2	9734.411	12	NC	1
284			min	0	1	-.136	1	-.006	1	-8.89e-3	5	511.206	1	1146.487	5
285		10	max	0	3	-.009	12	.074	5	2.906e-3	2	8137.439	12	NC	1
286			min	-.001	1	-.169	1	-.008	1	-8.645e-3	5	410.077	1	931.519	5
287		11	max	0	3	-.01	12	.089	5	2.432e-3	2	6936.821	12	NC	1
288			min	-.001	1	-.205	1	-.008	1	-8.401e-3	5	337.855	1	776.288	5
289		12	max	0	3	-.012	12	.105	5	1.958e-3	2	6009.12	12	NC	1
290			min	-.001	1	-.244	1	-.009	1	-8.156e-3	5	284.439	1	660.435	5
291		13	max	0	3	-.013	12	.121	4	1.484e-3	2	5276.149	12	NC	1
292			min	-.001	1	-.284	1	-.01	1	-7.911e-3	5	243.797	1	571.389	4
293		14	max	0	3	-.015	12	.138	4	1.011e-3	2	4686.24	12	NC	1
294			min	-.002	1	-.327	1	-.01	1	-7.666e-3	5	212.143	1	501.188	4
295		15	max	0	3	-.016	12	.156	4	5.368e-4	2	4204.001	12	NC	1
296			min	-.002	1	-.371	1	-.01	1	-7.488e-3	4	187.002	1	445.153	4
297		16	max	.001	3	-.018	12	.173	4	5.205e-4	3	3804.607	12	NC	1
298			min	-.002	1	-.416	1	-.009	1	-7.315e-3	4	166.707	1	399.736	4
299		17	max	.001	3	-.02	12	.191	4	7.39e-4	3	3470.059	12	NC	1
300			min	-.002	1	-.462	1	-.008	1	-7.142e-3	4	150.093	1	362.445	4
301		18	max	.001	3	-.022	12	.209	4	9.575e-4	3	3187.084	12	NC	1
302			min	-.002	1	-.508	1	-.009	3	-6.969e-3	4	136.33	1	331.487	4
303		19	max	.001	3	-.024	12	.227	4	1.176e-3	3	2945.707	12	NC	1
304			min	-.002	1	-.555	1	-.013	3	-6.796e-3	4	124.812	1	305.55	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	.001	4	0	1	NC	1	NC	1
308			min	0	1	-.004	1	0	1	-3.012e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.005	4	0	1	NC	3	NC	1
310			min	0	1	-.015	1	0	1	-6.024e-3	4	4669.391	1	NC	1
311		4	max	0	3	-.001	15	.01	4	0	1	NC	3	NC	1
312			min	-.001	1	-.034	1	0	1	-9.035e-3	4	2033.814	1	6813.614	4
313		5	max	0	3	-.002	15	.018	4	0	1	NC	3	NC	1
314			min	-.001	1	-.062	1	0	1	-1.034e-2	4	1120.098	1	3946.975	4
315		6	max	.001	3	-.003	15	.027	4	0	1	NC	3	NC	1
316			min	-.002	1	-.098	1	0	1	-1.007e-2	4	707.158	1	2598.42	4
317		7	max	.001	3	-.005	15	.037	4	0	1	NC	3	NC	1
318			min	-.002	1	-.142	1	0	1	-9.792e-3	4	489.525	1	1855.456	4
319		8	max	.002	3	-.006	15	.049	4	0	1	NC	3	NC	1
320			min	-.002	1	-.192	1	0	1	-9.518e-3	4	360.934	1	1401.851	4
321		9	max	.002	3	-.008	15	.063	4	0	1	NC	3	NC	1
322			min	-.003	1	-.249	1	0	1	-9.244e-3	4	278.607	1	1104.089	4
323		10	max	.002	3	-.01	12	.077	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	-.311	1	0	1	-8.97e-3	4	222.669	1	897.775	4
325		11	max	.002	3	-.011	12	.093	4	0	1	NC	3	NC	1
326			min	-.003	1	-.379	1	0	1	-8.696e-3	4	182.918	1	748.836	4
327		12	max	.002	3	-.012	12	.109	4	0	1	NC	3	NC	1
328			min	-.003	1	-.451	1	0	1	-8.422e-3	4	153.634	1	637.717	4
329		13	max	.003	3	-.013	12	.125	4	0	1	NC	3	NC	1
330			min	-.004	1	-.527	1	0	1	-8.148e-3	4	131.426	1	552.582	4
331		14	max	.003	3	-.014	12	.143	4	0	1	NC	3	NC	1
332			min	-.004	1	-.607	1	0	1	-7.874e-3	4	114.178	1	485.916	4
333		15	max	.003	3	-.015	12	.16	4	0	1	NC	3	NC	1
334			min	-.004	1	-.69	1	0	1	-7.6e-3	4	100.51	1	432.762	4
335		16	max	.003	3	-.016	12	.178	4	0	1	NC	3	NC	1
336			min	-.005	1	-.774	1	0	1	-7.326e-3	4	89.5	1	389.745	4
337		17	max	.003	3	-.018	12	.196	4	0	1	NC	3	NC	1
338			min	-.005	1	-.861	1	0	1	-7.052e-3	4	80.503	1	354.495	4
339		18	max	.003	3	-.019	12	.213	4	0	1	NC	3	NC	1
340			min	-.005	1	-.949	1	0	1	-6.778e-3	4	73.061	1	325.309	4
341		19	max	.004	3	-.02	12	.23	4	0	1	NC	3	NC	1
342			min	-.005	1	-1.037	1	0	1	-6.504e-3	4	66.842	1	300.944	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	.001	4	5.735e-4	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-3.251e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.005	4	1.147e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-6.502e-3	4	7999.55	1	NC	1
349		4	max	0	3	0	5	.01	4	1.721e-3	3	NC	3	NC	1
350			min	0	1	-.02	1	0	3	-9.752e-3	4	3552.63	1	6750.269	4
351		5	max	0	3	.002	5	.018	4	1.883e-3	3	NC	3	NC	1
352			min	0	1	-.035	1	-.001	3	-1.112e-2	4	1989.254	1	3915.258	4
353		6	max	0	3	.002	5	.027	4	1.664e-3	3	NC	3	NC	1
354			min	0	1	-.054	1	-.002	3	-1.076e-2	4	1272.056	1	2579.975	4
355		7	max	0	3	.003	5	.038	4	1.446e-3	3	NC	5	NC	1
356			min	0	1	-.078	1	-.003	3	-1.039e-2	4	888.321	1	1843.649	4
357		8	max	0	3	.004	5	.05	4	1.227e-3	3	NC	5	NC	1
358			min	0	1	-.105	1	-.003	3	-1.003e-2	4	659.126	1	1393.829	4
359		9	max	0	3	.006	5	.063	4	1.009e-3	3	NC	5	NC	1
360			min	0	1	-.136	1	-.003	3	-9.662e-3	4	511.206	1	1098.43	4
361		10	max	0	3	.007	5	.078	4	7.903e-4	3	NC	5	NC	1
362			min	-.001	1	-.169	1	-.003	3	-9.296e-3	4	410.077	1	893.695	4
363		11	max	0	3	.008	5	.093	4	5.718e-4	3	NC	15	NC	1
364			min	-.001	1	-.205	1	-.003	3	-8.931e-3	4	337.855	1	745.866	4
365		12	max	0	3	.009	5	.109	4	3.534e-4	3	NC	15	NC	1
366			min	-.001	1	-.244	1	-.003	3	-8.565e-3	4	284.439	1	635.564	4
367		13	max	0	3	.011	5	.126	4	1.349e-4	3	8953.503	15	NC	1
368			min	-.001	1	-.284	1	-.002	3	-8.199e-3	4	243.797	1	551.051	4
369		14	max	0	3	.012	5	.143	4	-5.141e-5	12	7857.689	15	NC	1
370			min	-.002	1	-.327	1	-.001	3	-7.834e-3	4	212.143	1	484.877	4
371		15	max	0	3	.014	5	.16	4	2.176e-5	9	6976.602	15	NC	1
372			min	-.002	1	-.371	1	0	12	-7.468e-3	4	187.002	1	432.123	4
373		16	max	.001	3	.016	5	.178	4	2.689e-4	1	6257.68	15	NC	1
374			min	-.002	1	-.416	1	.002	10	-7.129e-3	5	166.707	1	389.442	4
375		17	max	.001	3	.017	5	.196	4	7.818e-4	1	5663.559	15	NC	1
376			min	-.002	1	-.462	1	0	10	-6.841e-3	5	150.093	1	354.482	4
377		18	max	.001	3	.019	5	.213	4	1.295e-3	1	5167.186	15	NC	1
378			min	-.002	1	-.508	1	0	10	-6.553e-3	5	136.33	1	325.554	4
379		19	max	.001	3	.021	5	.23	4	1.808e-3	1	4748.573	15	NC	1
380			min	-.002	1	-.555	1	-.001	10	-6.265e-3	5	124.812	1	301.423	4

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
381	M3	1	max	.025	1	0	12	.013	5	1.381e-3	2	NC	1	NC	1
382			min	.002	12	-.008	1	-.002	1	-1.015e-3	5	NC	1	NC	1
383		2	max	.024	1	-.002	12	.056	5	2.e-3	2	NC	1	NC	4
384			min	.002	12	-.051	1	-.025	1	-1.109e-3	5	NC	1	3120.154	1
385		3	max	.024	1	-.005	12	.1	5	2.619e-3	2	NC	1	NC	4
386			min	.002	12	-.095	1	-.048	1	-1.204e-3	5	NC	1	1579.712	1
387		4	max	.023	1	-.007	12	.143	5	3.248e-3	1	NC	1	NC	4
388			min	.002	12	-.138	1	-.07	1	-1.299e-3	5	NC	1	1072.945	1
389		5	max	.022	1	-.008	12	.187	5	3.879e-3	1	NC	1	9532.307	6
390			min	.003	12	-.181	1	-.09	1	-1.394e-3	5	NC	1	825.163	1
391		6	max	.022	1	-.01	12	.23	5	4.51e-3	1	NC	1	7616.473	6
392			min	.003	15	-.224	1	-.108	1	-1.615e-3	3	9670.313	6	681.638	1
393		7	max	.021	1	-.012	12	.272	5	5.141e-3	1	NC	1	6427.153	6
394			min	.003	15	-.267	1	-.124	1	-1.853e-3	3	8575.823	6	591.032	1
395		8	max	.02	1	-.014	12	.314	5	5.772e-3	1	NC	1	5655.131	6
396			min	.003	15	-.31	1	-.137	1	-2.091e-3	3	7918.965	6	531.629	1
397		9	max	.019	1	-.015	12	.355	5	6.402e-3	1	NC	3	5151.445	6
398			min	.003	15	-.352	1	-.147	1	-2.329e-3	3	7565.404	6	492.94	1
399		10	max	.019	1	-.017	12	.395	5	7.033e-3	1	NC	3	4839.585	6
400			min	.003	15	-.394	1	-.154	1	-2.567e-3	3	7453.555	6	469.643	1
401		11	max	.018	1	-.018	12	.434	5	7.664e-3	1	NC	3	4681.776	6
402			min	.003	15	-.436	1	-.156	1	-2.805e-3	3	7565.404	6	459.277	1
403		12	max	.017	1	-.019	12	.472	5	8.295e-3	1	NC	1	4665.968	6
404			min	.003	15	-.478	1	-.154	1	-3.043e-3	3	7918.965	6	411.765	14
405		13	max	.016	1	-.02	12	.508	5	8.926e-3	1	NC	1	4803.781	6
406			min	.002	15	-.519	1	-.147	1	-3.281e-3	3	8575.823	6	369.795	14
407		14	max	.016	1	-.021	12	.544	5	9.556e-3	1	NC	1	5139.156	6
408			min	.002	15	-.561	1	-.134	1	-3.519e-3	3	9670.313	6	334.068	14
409		15	max	.015	1	-.022	12	.577	5	1.019e-2	1	NC	1	5778.176	6
410			min	.002	15	-.602	1	-.117	2	-3.757e-3	3	NC	1	303.275	14
411		16	max	.014	1	-.023	12	.609	5	1.082e-2	1	NC	1	6984.259	6
412			min	.002	15	-.643	1	-.094	2	-3.995e-3	3	NC	1	276.46	14
413		17	max	.014	1	-.024	12	.64	5	1.145e-2	1	NC	1	9563.763	6
414			min	.002	10	-.684	1	-.064	2	-4.233e-3	3	NC	1	252.902	14
415		18	max	.013	1	-.024	12	.672	4	1.208e-2	1	NC	1	NC	4
416			min	.002	10	-.724	1	-.028	2	-4.471e-3	3	NC	1	232.05	14
417		19	max	.012	1	-.025	12	.706	4	1.271e-2	1	NC	1	NC	1
418			min	.002	10	-.765	1	-.001	3	-4.709e-3	3	NC	1	213.476	14
419	M6	1	max	.044	1	0	15	.013	4	0	1	NC	1	NC	1
420			min	.001	15	-.014	1	0	1	-1.08e-3	5	NC	1	NC	1
421		2	max	.042	1	-.002	12	.059	4	0	1	NC	1	NC	1
422			min	.001	15	-.095	1	0	1	-1.232e-3	4	NC	1	NC	1
423		3	max	.04	1	-.002	12	.105	4	0	1	NC	1	NC	1
424			min	.001	15	-.176	1	0	1	-1.384e-3	4	NC	1	5497.356	4
425		4	max	.038	1	-.003	12	.15	4	0	1	NC	1	NC	1
426			min	.001	15	-.257	1	0	1	-1.536e-3	4	NC	1	3681.749	4
427		5	max	.036	1	-.004	12	.195	4	0	1	NC	1	NC	1
428			min	.001	15	-.338	1	0	1	-1.689e-3	4	NC	1	2798.374	4
429		6	max	.035	1	-.005	12	.24	4	0	1	NC	1	NC	1
430			min	.001	15	-.419	1	0	1	-1.841e-3	4	9670.313	4	2289.041	4
431		7	max	.033	1	-.006	12	.284	4	0	1	NC	1	NC	1
432			min	.001	15	-.5	1	0	1	-1.993e-3	4	8575.823	4	1968.668	4
433		8	max	.031	1	-.006	12	.327	4	0	1	NC	1	NC	1
434			min	.001	15	-.58	1	0	1	-2.145e-3	4	7918.965	4	1758.994	4
435		9	max	.029	1	-.007	12	.369	4	0	1	NC	3	NC	1
436			min	.001	15	-.66	1	0	1	-2.297e-3	4	7565.404	4	1622.178	4
437		10	max	.027	1	-.007	3	.41	4	0	1	NC	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	.001	15	-.74	1	0	1	-2.45e-3	4	7453.555	4	1538.896	4
439		11	max	.025	1	-.007	3	.45	4	0	1	NC	3	NC	1
440			min	0	15	-.819	1	0	1	-2.602e-3	4	7565.404	4	1499.986	4
441		12	max	.023	1	-.007	3	.489	4	0	1	NC	1	NC	1
442			min	0	15	-.899	1	0	1	-2.754e-3	4	7918.965	4	1503.361	4
443		13	max	.021	1	-.006	3	.525	4	0	1	NC	1	NC	1
444			min	0	15	-.978	1	0	1	-2.906e-3	4	8575.823	4	1553.89	4
445		14	max	.019	1	-.006	3	.561	4	0	1	NC	1	NC	1
446			min	0	15	-1.057	1	0	1	-3.058e-3	4	9670.313	4	1666.465	4
447		15	max	.018	3	-.005	3	.594	4	0	1	NC	1	NC	1
448			min	0	15	-1.136	1	0	1	-3.211e-3	4	NC	1	1875.774	4
449		16	max	.018	3	-.004	3	.625	4	0	1	NC	1	NC	1
450			min	0	10	-1.214	1	0	1	-3.363e-3	4	NC	1	2267.081	4
451		17	max	.019	3	-.003	3	.655	4	0	1	NC	1	NC	1
452			min	-.001	10	-1.293	1	0	1	-3.515e-3	4	NC	1	3100.621	4
453		18	max	.02	3	-.002	3	.682	4	0	1	NC	1	NC	1
454			min	-.002	10	-1.371	1	0	1	-3.667e-3	4	NC	1	5683.776	4
455		19	max	.021	3	0	3	.707	4	0	1	NC	1	NC	1
456			min	-.003	10	-1.449	1	0	1	-3.819e-3	4	NC	1	NC	1
457	M9	1	max	.025	1	0	5	.014	4	4.25e-4	3	NC	1	NC	1
458			min	-.001	5	-.008	1	-.001	3	-1.381e-3	2	NC	1	NC	1
459		2	max	.024	1	.001	5	.063	4	6.63e-4	3	NC	1	NC	5
460			min	-.001	5	-.051	1	-.01	3	-2.e-3	2	NC	1	3120.154	1
461		3	max	.024	1	.002	5	.111	4	9.01e-4	3	NC	1	7780.95	12
462			min	-.001	5	-.095	1	-.018	3	-2.619e-3	2	NC	1	1579.712	1
463		4	max	.023	1	.003	5	.16	4	1.139e-3	3	NC	1	5286.746	12
464			min	-.001	5	-.138	1	-.025	3	-3.248e-3	1	NC	1	1072.945	1
465		5	max	.022	1	.004	5	.208	4	1.377e-3	3	NC	1	4067.178	12
466			min	-.001	5	-.181	1	-.033	3	-3.879e-3	1	NC	1	825.163	1
467		6	max	.022	1	.005	5	.255	4	1.615e-3	3	NC	1	3360.765	12
468			min	-.001	5	-.224	1	-.039	3	-4.51e-3	1	9670.313	4	681.638	1
469		7	max	.021	1	.006	5	.302	4	1.853e-3	3	NC	1	2914.847	12
470			min	-.001	5	-.267	1	-.045	3	-5.141e-3	1	8575.823	4	591.032	1
471		8	max	.02	1	.007	5	.347	4	2.091e-3	3	NC	1	2622.557	12
472			min	-.002	5	-.31	1	-.05	3	-5.772e-3	1	7918.965	4	531.629	1
473		9	max	.019	1	.008	5	.39	4	2.329e-3	3	NC	3	2432.282	12
474			min	-.002	5	-.352	1	-.054	3	-6.402e-3	1	7565.404	4	492.94	1
475		10	max	.019	1	.009	5	.432	4	2.567e-3	3	NC	3	2317.841	12
476			min	-.002	5	-.394	1	-.056	3	-7.033e-3	1	7453.555	4	469.643	1
477		11	max	.018	1	.011	5	.472	4	2.805e-3	3	NC	3	2267.148	12
478			min	-.002	5	-.436	1	-.057	3	-7.664e-3	1	7356.536	5	459.277	1
479		12	max	.017	1	.012	5	.509	4	3.043e-3	3	NC	1	2278.144	12
480			min	-.002	5	-.478	1	-.057	3	-8.295e-3	1	6390.615	5	461.416	1
481		13	max	.016	1	.014	5	.545	4	3.281e-3	3	NC	1	2358.901	12
482			min	-.002	5	-.519	1	-.055	3	-8.926e-3	1	5605.489	5	477.686	1
483		14	max	.016	1	.016	5	.577	4	3.519e-3	3	NC	1	2532.435	12
484			min	-.002	5	-.561	1	-.051	3	-9.556e-3	1	4960.425	5	512.741	1
485		15	max	.015	1	.018	5	.607	4	3.757e-3	3	NC	1	2851.58	12
486			min	-.002	5	-.602	1	-.045	3	-1.019e-2	1	4425.725	5	577.266	1
487		16	max	.014	1	.02	5	.634	4	3.995e-3	3	NC	1	3445.649	12
488			min	-.002	5	-.643	1	-.037	3	-1.082e-2	1	3979.241	5	697.423	1
489		17	max	.014	1	.022	5	.658	4	4.233e-3	3	NC	1	4708.792	12
490			min	-.002	5	-.684	1	-.026	3	-1.145e-2	1	3604.165	5	952.958	1
491		18	max	.013	1	.024	5	.678	4	4.471e-3	3	NC	1	8620.491	12
492			min	-.002	5	-.724	1	-.014	3	-1.208e-2	1	3287.554	5	1744.368	1
493		19	max	.012	1	.026	5	.695	4	4.709e-3	3	NC	1	NC	1
494			min	-.002	5	-.765	1	-.023	1	-1.271e-2	1	3019.336	5	NC	1