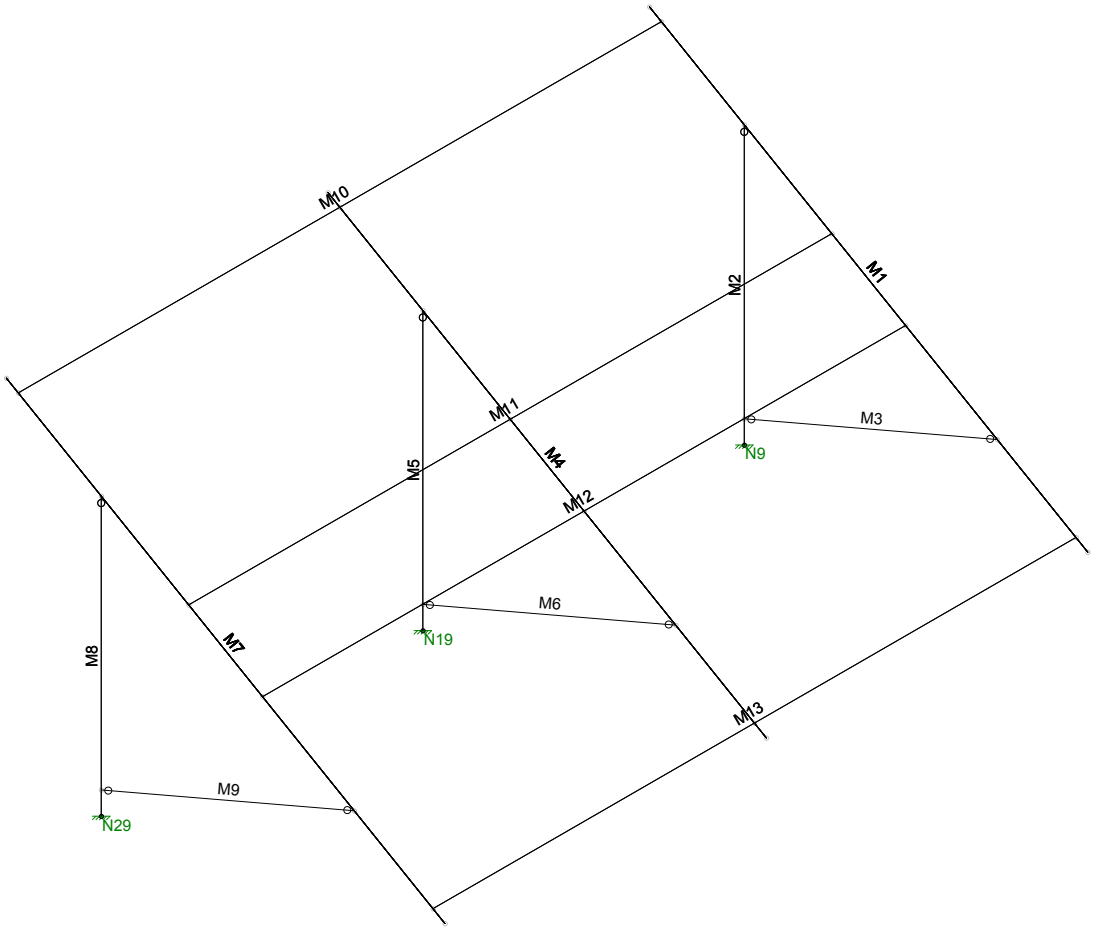


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

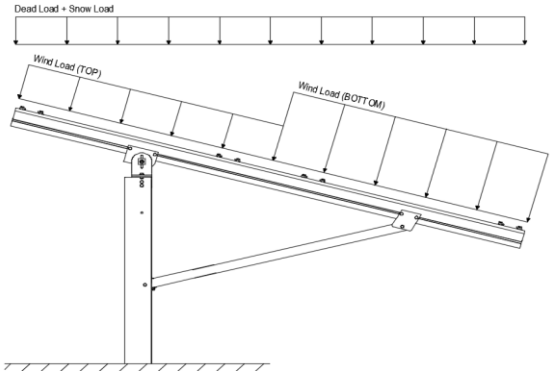
1.2 Construction

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 =	30°
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 =	16.49	psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00		
C_s =	0.73		
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

$Cf+_{TOP}$ =	1.15	*(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.*
$Cf+_{BOTTOM}$ =	1.85		
$Cf-_{TOP}$ =	-2.3	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1.1		

2.4 Seismic Loads

S_S =	2.50	R =	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.*
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	

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

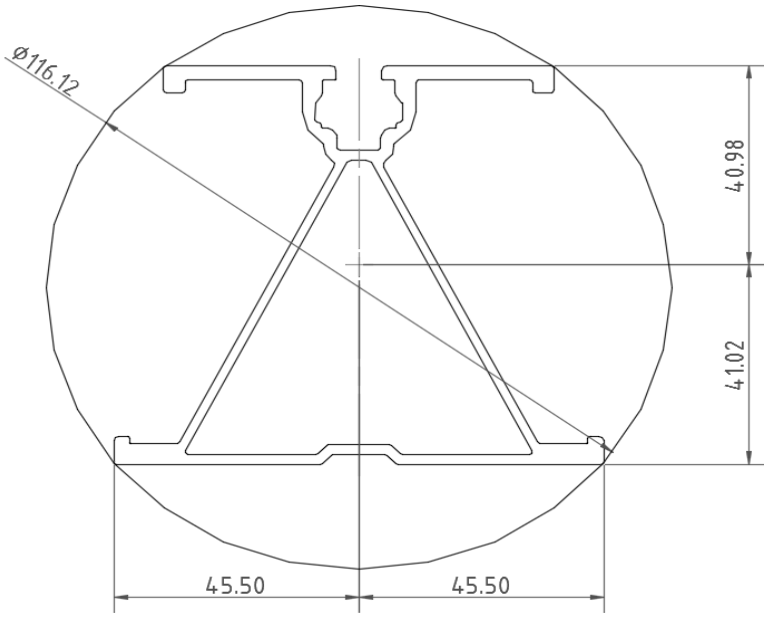
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	1.768	k-ft
M_z =	0.073	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	70%	

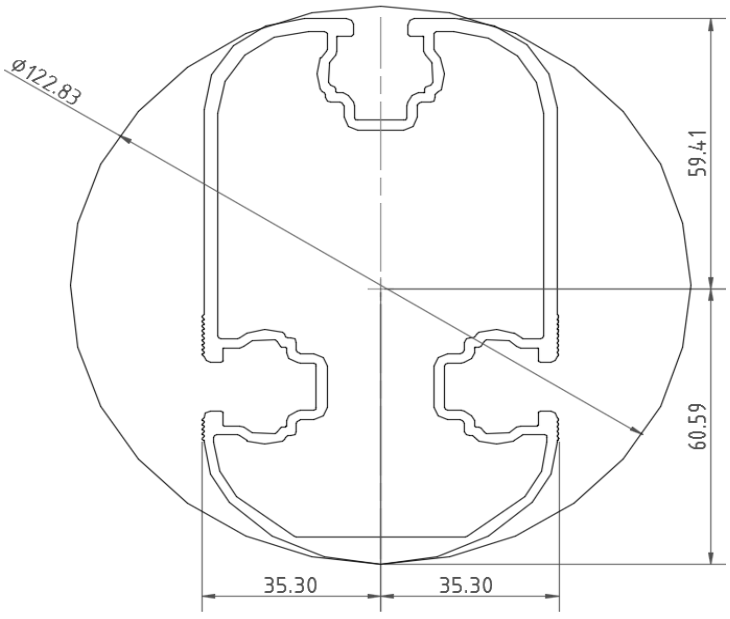


DETAIL VIEW

4.2 Girder Design

Loads from purlins are transferred to the posts using an inclined girder, which is connected to the steel post. Loads on the girder result from the support reactions of the purlins. See Appendix A.2 for detailed member calculations. Section units are in (mm).

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.296	k-ft
M_z =	0.000	k-ft
P_n =	1.496	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	89%	

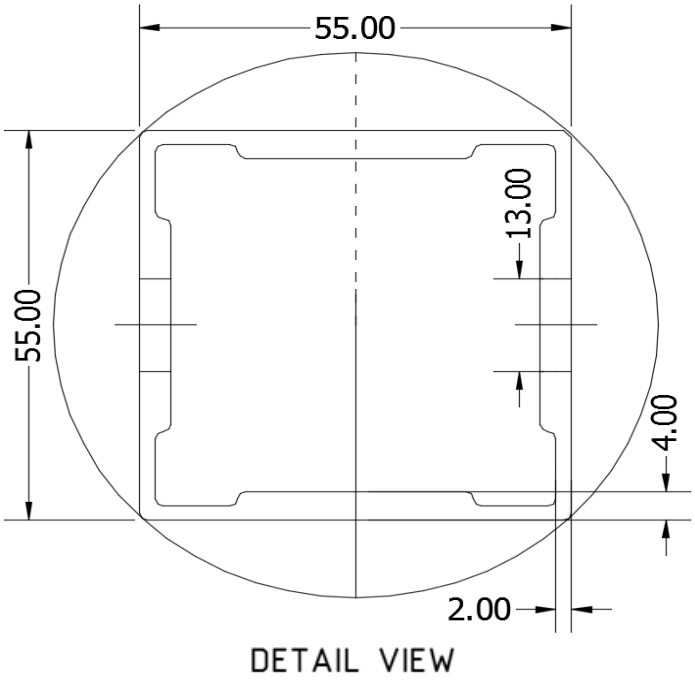


DETAIL VIEW

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).

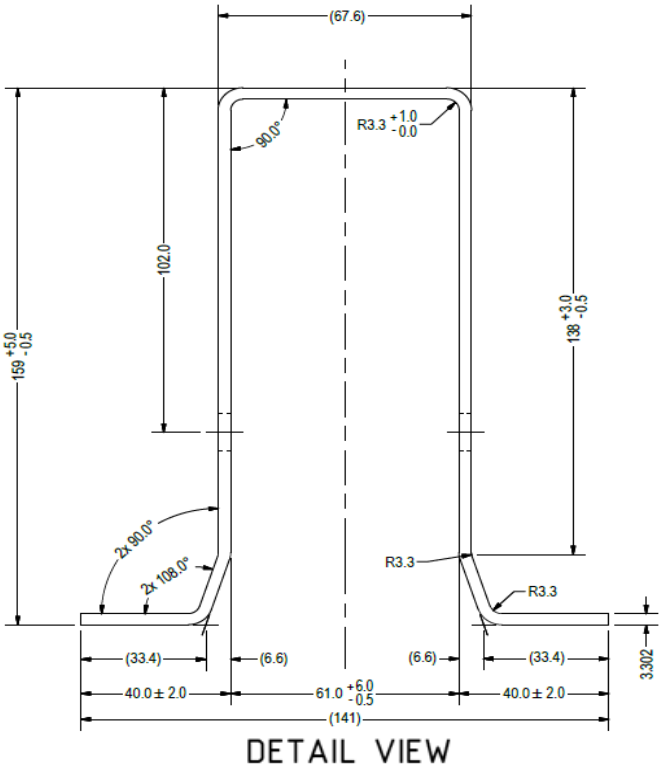
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.040	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	54%	



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 =	89.60	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	13.006	k-ft
M_z =	0.000	k-ft
P_r =	-5.243	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	83%	



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 =	6.78	k
Maximum Lateral Load =	4.08	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 =	0.98	k
Height of Pole Above Grade, H =	6.47	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

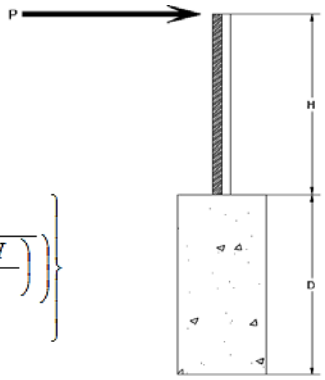
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	0.98	k
Height of Pole Above Grade, H =	6.47	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 =	5.28	
Required Footing Depth, D =	9.28	ft

2nd Trial @ D_2 =	6.27	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.25	ksf
Constant 2.34P/(S_1B), A =	2.74	
Required Footing Depth, D =	5.97	ft

3rd Trial @ D_3 =	6.12	ft
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf
Lateral Soil Bearing @ D, S_3 =	1.22	ksf
Constant 2.34P/(S_1B), A =	2.80	
Required Footing Depth, D =	6.06	ft

4th Trial @ D_4 =	6.09	ft
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf
Lateral Soil Bearing @ D, S_3 =	1.22	ksf
Constant 2.34P/(S_1B), A =	2.82	
Required Footing Depth, D =	6.08	ft

5th Trial @ D_5 =	6.08	ft
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf
Lateral Soil Bearing @ D, S_3 =	1.22	ksf
Constant 2.34P/(S_1B), A =	2.82	
Required Footing Depth, D =	6.25	ft

A 2ft diameter x 6.25ft deep footing unrestrained at ground level is required for the racking structure.

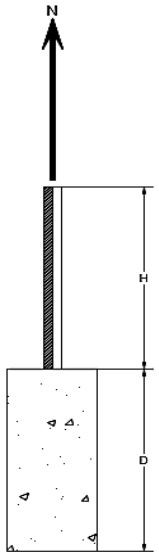
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.11	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	2.02	k
Required Concrete Volume, V =	13.94	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.72
2	0.4	0.2	118.10	6.62
3	0.6	0.2	118.10	6.51
4	0.8	0.2	118.10	6.41
5	1	0.2	118.10	6.30
6	1.2	0.2	118.10	6.20
7	1.4	0.2	118.10	6.10
8	1.6	0.2	118.10	5.99
9	1.8	0.2	118.10	5.89
10	2	0.2	118.10	5.79
11	2.2	0.2	118.10	5.68
12	2.4	0.2	118.10	5.58
13	2.6	0.2	118.10	5.47
14	2.8	0.2	118.10	5.37
15	3	0.2	118.10	5.27
16	3.2	0.2	118.10	5.16
17	3.4	0.2	118.10	5.06
18	3.6	0.2	118.10	4.96
19	3.8	0.2	118.10	4.85
20	4	0.2	118.10	4.75
21	4.2	0.2	118.10	4.64
22	4.4	0.2	118.10	4.54
23	4.6	0.2	118.10	4.44
24	0	0.0	0.00	4.44
25	0	0.0	0.00	4.44
26	0	0.0	0.00	4.44
27	0	0.0	0.00	4.44
28	0	0.0	0.00	4.44
29	0	0.0	0.00	4.44
30	0	0.0	0.00	4.44
31	0	0.0	0.00	4.44
32	0	0.0	0.00	4.44
33	0	0.0	0.00	4.44
34	0	0.0	0.00	4.44
Max	4.6	Sum	1.09	

A 2ft diameter x 4.5ft 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 =	6.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.13	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	20.42	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

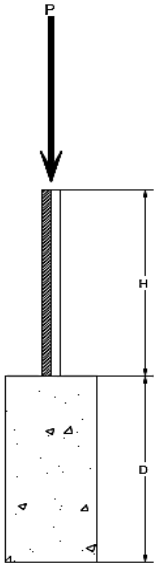
Weight of Concrete

Footing Volume	19.63	ft^3
Weight	2.85	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.06	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.37	k
Applied Force =	6.98	k
Utilization =	67%	

A 2ft diameter footing passes at a depth of 6.25ft.



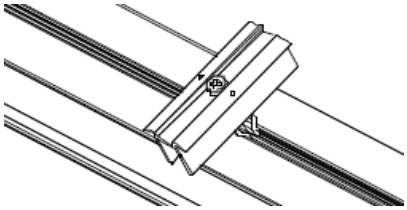
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

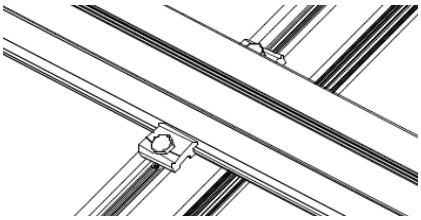
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.672 k
Allowable Uplift	=	1.214 k
Utilization	=	55%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.152 k
Allowable Uplift	=	2.180 k
Utilization	=	99%

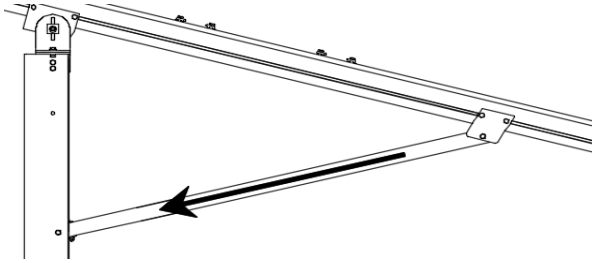


6.2 Strut Connections

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	=	5.040 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	57%

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

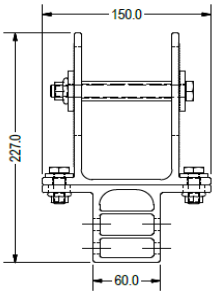


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

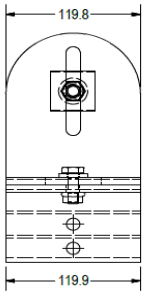
6.3 Girder to Post Connection

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.

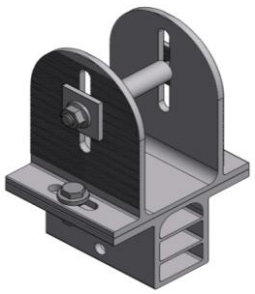
Maximum Tensile Load	=	4.434 k
Allowable Load	=	5.649 k
Utilization	=	78%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

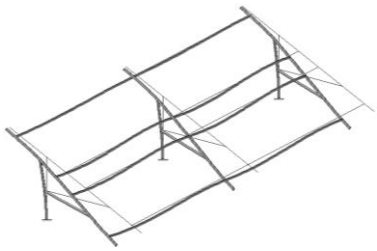
7.1 Seismic Drift

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}	=	79.13 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.583 in
Max Drift, Δ_{MAX}	=	1.055 in

1.055 ≤ 1.583, 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:	Weak Axis:
3.4.14	**3.4.14**
L_b = 74.8031 in	L_b = 74.8031
J = 0.942	J = 0.942
116.737	116.737
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$
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= 29.9 ksi	φF_L= 29.9
3.4.16	**3.4.16**
b/t = 24.5	b/t = 24.5
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$
S1 = 12.2	S1 = 12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$	$S2 = \frac{k_1 Bp}{1.6Dp}$
S2 = 46.7	S2 = 46.7
φF_L= φb[Bp-1.6Dp*b/t]	φF_L= φb[Bp-1.6Dp*b/t]
φF_L= 28.2 ksi	φF_L= 28.2 ksi
3.4.16.1 Not Used	**3.4.16.1**
Rb/t = 0.0	N/A for Weak Direction
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$	
S1 = 1.1	
$S2 = C_t$	
S2 = 141.0	
φF_L= 1.17φyFcy	
φF_L= 38.9 ksi	
3.4.18	**3.4.18**
h/t = 24.5	h/t = 24.5
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$
S1 = 36.9	S1 = 36.9
m = 0.65	m = 0.65
C_0 = 27.5	C_0 = 27.5
Cc = 27.5	Cc = 27.5
$S2 = \frac{k_1 Bbr}{mDbr}$	$S2 = \frac{k_1 Bbr}{mDbr}$
S2 = 77.3	S2 = 77.3
φF_L= 1.3φyFcy	φF_L= 1.3φyFcy
φF_L= 43.2 ksi	φF_L= 43.2 ksi
φF_LSt= 28.2 ksi	φF_LWk= 28.2 ksi
Ix = 279836 mm^4	Iy = 279836 mm^4
0.672 in^4	0.672 in^4
y = 27.5 mm	x = 27.5 mm
Sx = 0.621 in^3	Sy = 0.621 in^3
M_{max}St = 1.460 k-ft	M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

$$S1^* = \frac{Bc - Fcy}{1.6Dc^*}$$

$S1^*$ = 0.33515

$$S2^* = \frac{Cc}{\pi}\sqrt{Fcy/E}$$

$S2^*$ = 1.23671

φcc = 0.82226

$\varphi F_L = (\varphi ccFcy)/(\lambda^2)$

φF_L = 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

φF_L = 33.25 ksi

φF_L = 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	89.60	in
Pr =	-5.24	k (LRFD Factored Load)
Mr (Strong) =	13.01	k-ft (LRFD Factored Load)
Mr (Weak) =	0.00	k-ft (LRFD Factored Load)

Flexural Buckling:

kL/r =	128.92		
4.71√(E/Fy) =	103.55	=> kL/r	> 4.71√(E/Fy)
Fcr =	15.10	ksi	
Fe =	17.22	ksi	
Pn =	33.677	k	

Torsional/Flexural Torsional Buckling:

Fcr =	11.6026	ksi
Fey =	43.9243	ksi
Fez =	14.9387	ksi
Pn =	25.8738	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1557 <	0.2	
Utilization =	0.83 <	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.156 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 83%

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	-46.866	-46.866	0	0
2	M11	Y	-46.866	-46.866	0	0
3	M12	Y	-46.866	-46.866	0	0
4	M13	Y	-46.866	-46.866	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	-100.114	-100.114	0	0
2	M11	y	-100.114	-100.114	0	0
3	M12	y	-161.053	-161.053	0	0
4	M13	y	-161.053	-161.053	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	200.228	200.228	0	0
2	M11	y	200.228	200.228	0	0
3	M12	y	95.761	95.761	0	0
4	M13	y	95.761	95.761	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	793.429	2	2350.858	2	154.547	2	.242	1	.021	5	6.477	1
2		min	-1127.805	3	-1673.026	3	-359.651	5	-1.764	5	-.013	2	.858	15
3	N19	max	3114.147	2	6412.263	2	0	1	0	3	.023	4	10.624	1
4		min	-3072.192	3	-5203.036	3	-382.129	5	-1.84	4	0	10	.42	15
5	N29	max	793.429	2	2350.858	2	179.748	3	.279	3	.024	4	6.477	1
6		min	-1127.805	3	-1673.026	3	-392.043	4	-1.846	4	-.005	3	-.441	5
7	Totals:	max	4701.006	2	11113.979	2	0	2						
8		min	-5327.802	3	-8549.088	3	-1113.129	4						

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	.001	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-16.139	12	313.427	3	-10.982	12	.046	3	.314	1	.268	2
4			min	-220.662	1	-725.682	2	-144.815	1	-.221	2	.036	12	-.112	3
5		3	max	-16.596	12	312.238	3	-10.982	12	.046	3	.219	1	.744	2
6			min	-221.577	1	-727.267	2	-144.815	1	-.221	2	.029	12	-.317	3
7		4	max	-17.054	12	311.05	3	-10.982	12	.046	3	.124	1	1.222	2
8			min	-222.492	1	-728.851	2	-144.815	1	-.221	2	.019	10	-.522	3
9		5	max	412.17	3	679.851	2	1.787	3	.03	2	.154	1	1.442	2
10			min	-1177.347	2	-280.15	3	-184.011	1	-.058	3	-.033	3	-.617	3
11		6	max	411.484	3	678.267	2	1.787	3	.03	2	.05	2	.996	2
12			min	-1178.261	2	-281.338	3	-184.011	1	-.058	3	-.042	5	-.433	3
13		7	max	410.798	3	676.682	2	1.787	3	.03	2	-.013	10	.551	2
14			min	-1179.176	2	-282.526	3	-184.011	1	-.058	3	-.101	4	-.248	3
15		8	max	410.112	3	675.098	2	1.787	3	.03	2	-.019	12	.108	2
16			min	-1180.091	2	-283.715	3	-184.011	1	-.058	3	-.208	1	-.062	3
17		9	max	384.197	3	9.197	3	15.04	3	.02	5	.108	1	.028	3
18			min	-1344.106	1	-16.277	2	-230.216	1	-.158	2	.013	10	-.097	2
19		10	max	383.511	3	8.009	3	15.04	3	.02	5	.054	3	.023	3
20			min	-1345.021	1	-17.862	2	-230.216	1	-.158	2	-.048	2	-.086	2
21		11	max	382.825	3	6.82	3	15.04	3	.02	5	.064	3	.018	3
22			min	-1345.936	1	-19.446	2	-230.216	1	-.158	2	-.195	1	-.073	2
23		12	max	351.818	3	725.715	3	44.583	2	.256	3	.15	1	.094	2
24			min	-1576.165	1	-478.344	2	-219.355	4	-.226	2	.022	10	-.215	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	351.132	3	724.526	3	44.583	2	.256	3	.138	1	.408	2
26			min	-1577.08	1	-479.928	2	-220.94	4	-.226	2	-.063	5	-.691	3
27		14	max	350.446	3	723.338	3	44.583	2	.256	3	.126	2	.724	2
28			min	-1577.995	1	-481.513	2	-222.526	4	-.226	2	-.2	5	-1.166	3
29		15	max	349.76	3	722.15	3	44.583	2	.256	3	.155	2	1.04	2
30			min	-1578.909	1	-483.097	2	-224.111	4	-.226	2	-.338	5	-1.64	3
31		16	max	222.956	1	478.235	2	73.576	5	.183	2	.027	3	.792	2
32			min	14.446	15	-745.78	3	-121.885	1	-.404	3	-.202	4	-1.253	3
33		17	max	222.041	1	476.651	2	71.991	5	.183	2	-.004	12	.479	2
34			min	14.17	15	-746.968	3	-121.885	1	-.404	3	-.251	1	-.763	3
35		18	max	221.127	1	475.067	2	70.405	5	.183	2	-.023	12	.167	2
36			min	13.895	15	-748.156	3	-121.885	1	-.404	3	-.331	1	-.272	3
37		19	max	0	1	0	2	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.008	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	-6.67	12	995.547	3	0	1	.051	4	.279	4	.628	2
42			min	-358.839	1	-2022.932	2	-105.647	5	0	1	0	1	-.319	3
43		3	max	-7.128	12	994.359	3	0	1	.051	4	.21	4	1.955	2
44			min	-359.754	1	-2024.517	2	-107.232	5	0	1	0	1	-.972	3
45		4	max	-7.585	12	993.17	3	0	1	.051	4	.14	4	3.284	2
46			min	-360.669	1	-2026.101	2	-108.818	5	0	1	0	1	-1.624	3
47		5	max	1504.24	3	2004.4	2	0	1	0	1	.009	4	3.874	2
48			min	-3189.799	2	-1024.797	3	-97.173	4	-.036	4	0	1	-1.905	3
49		6	max	1503.554	3	2002.815	2	0	1	0	1	0	1	2.559	2
50			min	-3190.713	2	-1025.985	3	-98.759	4	-.036	4	-.055	5	-1.232	3
51		7	max	1502.867	3	2001.231	2	0	1	0	1	0	1	1.245	2
52			min	-3191.628	2	-1027.174	3	-100.344	4	-.036	4	-.12	4	-.558	3
53		8	max	1502.181	3	1999.646	2	0	1	0	1	0	1	.116	3
54			min	-3192.543	2	-1028.362	3	-101.93	4	-.036	4	-.187	4	-.085	1
55		9	max	1495.59	3	7.879	3	0	1	.015	4	.143	5	.434	3
56			min	-3296.883	2	-103.493	2	-228.049	4	0	1	0	1	-.678	2
57		10	max	1494.904	3	6.691	3	0	1	.015	4	0	1	.43	3
58			min	-3297.798	2	-105.078	2	-229.635	4	0	1	-.008	4	-.609	2
59		11	max	1494.218	3	5.502	3	0	1	.015	4	0	1	.426	3
60			min	-3298.713	2	-106.662	2	-231.22	4	0	1	-.159	4	-.54	2
61		12	max	1497.809	3	2065.536	3	0	1	.162	4	.12	5	.034	9
62			min	-3518.457	1	-1575.065	2	-238.454	5	0	1	0	1	-.234	3
63		13	max	1497.122	3	2064.347	3	0	1	.162	4	0	1	1.014	1
64			min	-3519.372	1	-1576.65	2	-240.039	5	0	1	-.038	4	-1.589	3
65		14	max	1496.436	3	2063.159	3	0	1	.162	4	0	1	2.049	2
66			min	-3520.287	1	-1578.234	2	-241.625	5	0	1	-.196	4	-2.943	3
67		15	max	1495.75	3	2061.971	3	0	1	.162	4	0	1	3.086	2
68			min	-3521.202	1	-1579.819	2	-243.21	5	0	1	-.355	4	-4.296	3
69		16	max	359.74	1	1437.894	2	62.686	5	0	1	0	1	2.35	2
70			min	9.92	12	-2005.171	3	0	1	-.159	4	-.151	5	-3.261	3
71		17	max	358.825	1	1436.31	2	61.1	5	0	1	0	1	1.407	2
72			min	9.463	12	-2006.36	3	0	1	-.159	4	-.111	5	-1.945	3
73		18	max	357.91	1	1434.725	2	59.515	5	0	1	0	1	.465	2
74			min	9.005	12	-2007.548	3	0	1	-.159	4	-.071	4	-.628	3
75		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
76			min	0	1	-.005	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.004	1	.002	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	21.371	5	313.427	3	144.815	1	.221	2	.136	5	.268	2
80			min	-220.662	1	-725.682	2	-46.676	5	-.046	3	-.314	1	-.112	3
81		3	max	20.945	5	312.238	3	144.815	1	.221	2	.105	5	.744	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	-221.577	1	-727.267	2	-48.262	5	-.046	3	-.219	1	-.317	3
83		4	max	20.518	5	311.05	3	144.815	1	.221	2	.073	5	1.222	2
84			min	-222.492	1	-728.851	2	-49.847	5	-.046	3	-.124	1	-.522	3
85		5	max	412.17	3	679.851	2	184.011	1	.058	3	.033	3	1.442	2
86			min	-1177.347	2	-280.15	3	-35.667	5	-.033	4	-.154	1	-.617	3
87		6	max	411.484	3	678.267	2	184.011	1	.058	3	.032	3	.996	2
88			min	-1178.261	2	-281.338	3	-37.253	5	-.033	4	-.05	2	-.433	3
89		7	max	410.798	3	676.682	2	184.011	1	.058	3	.087	1	.551	2
90			min	-1179.176	2	-282.526	3	-38.838	5	-.033	4	-.069	5	-.248	3
91		8	max	410.112	3	675.098	2	184.011	1	.058	3	.208	1	.108	2
92			min	-1180.091	2	-283.715	3	-40.424	5	-.033	4	-.095	5	-.062	3
93		9	max	384.197	3	9.197	3	230.216	1	.158	2	.059	5	.028	3
94			min	-1344.106	1	-16.277	2	-81.492	5	.018	15	-.108	1	-.097	2
95		10	max	383.511	3	8.009	3	230.216	1	.158	2	.048	2	.023	3
96			min	-1345.021	1	-17.862	2	-83.078	5	.018	15	-.054	3	-.086	2
97		11	max	382.825	3	6.82	3	230.216	1	.158	2	.195	1	.018	3
98			min	-1345.936	1	-19.446	2	-84.664	5	.018	15	-.064	3	-.073	2
99		12	max	351.818	3	725.715	3	208.793	3	.226	2	.053	5	.094	2
100			min	-1576.165	1	-478.344	2	-200.074	5	-.256	3	-.15	1	-.215	3
101		13	max	351.132	3	724.526	3	208.793	3	.226	2	.036	3	.408	2
102			min	-1577.08	1	-479.928	2	-201.66	5	-.256	3	-.138	1	-.691	3
103		14	max	350.446	3	723.338	3	208.793	3	.226	2	.173	3	.724	2
104			min	-1577.995	1	-481.513	2	-203.246	5	-.256	3	-.232	4	-1.166	3
105		15	max	349.76	3	722.15	3	208.793	3	.226	2	.31	3	1.04	2
106			min	-1578.909	1	-483.097	2	-204.831	5	-.256	3	-.359	4	-1.64	3
107		16	max	222.956	1	478.235	2	121.885	1	.404	3	.171	1	.792	2
108			min	6.746	15	-745.78	3	23.699	10	-.183	2	-.148	5	-1.253	3
109		17	max	222.041	1	476.651	2	121.885	1	.404	3	.251	1	.479	2
110			min	6.47	15	-746.968	3	23.699	10	-.183	2	-.089	5	-.763	3
111		18	max	221.127	1	475.067	2	121.885	1	.404	3	.331	1	.167	2
112			min	6.194	15	-748.156	3	23.699	10	-.183	2	-.031	5	-.272	3
113		19	max	0	1	0	2	0	15	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	121.937	1	473.435	2	-5.928	15	.008	2	.372	1	.183	2
116			min	23.696	10	-749.256	3	-220.609	1	-.022	3	-.002	5	-.404	3
117		2	max	121.937	1	341.235	2	-3.874	15	.008	2	.174	1	.248	3
118			min	23.696	10	-554.452	3	-176.308	1	-.022	3	-.01	5	-.224	2
119		3	max	121.937	1	209.035	2	-1.82	15	.008	2	.042	2	.705	3
120			min	23.696	10	-359.647	3	-132.007	1	-.022	3	-.015	4	-.499	2
121		4	max	121.937	1	76.835	2	.233	15	.008	2	.001	10	.967	3
122			min	23.696	10	-164.843	3	-87.706	1	-.022	3	-.09	1	-.642	2
123		5	max	121.937	1	29.961	3	3.299	5	.008	2	-.009	12	1.035	3
124			min	23.696	10	-57.37	1	-43.405	1	-.022	3	-.156	1	-.653	2
125		6	max	121.937	1	224.766	3	8.994	4	.008	2	-.006	15	.907	3
126			min	17.574	15	-187.564	2	-14.25	2	-.022	3	-.177	1	-.531	2
127		7	max	121.937	1	419.57	3	45.198	1	.008	2	0	15	.585	3
128			min	9.631	15	-319.764	2	-3.824	10	-.022	3	-.154	1	-.278	2
129		8	max	121.937	1	614.375	3	89.499	1	.008	2	.01	5	.123	1
130			min	1.689	15	-451.964	2	-.469	3	-.022	3	-.087	1	-.027	5
131		9	max	121.937	1	809.179	3	133.8	1	.008	2	.044	14	.626	2
132			min	-8.834	5	-584.164	2	2.165	12	-.022	3	-.043	2	-.644	3
133		10	max	121.937	1	242.163	14	178.101	1	-.001	15	.181	1	1.277	2
134			min	23.696	10	-1003.983	3	-99.958	14	-.022	3	-.023	3	-1.55	3
135		11	max	121.937	1	584.164	2	-2.165	12	.022	3	.04	9	.626	2
136			min	16.946	15	-809.179	3	-133.8	1	-.008	2	-.043	2	-.644	3
137		12	max	121.937	1	451.964	2	.469	3	.022	3	-.012	15	.123	1
138			min	9.004	15	-614.375	3	-89.499	1	-.008	2	-.087	1	.026	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	121.937	1	319.764	2	3.824	10	.022	3	-.012	15	.585	3
140			min	1.061	15	-419.57	3	-45.198	1	-.008	2	-.154	1	-.278	2
141		14	max	121.937	1	187.564	2	14.25	2	.022	3	-.01	15	.907	3
142			min	-9.855	5	-224.766	3	-6.967	9	-.008	2	-.177	1	-.531	2
143		15	max	121.937	1	57.37	1	43.405	1	.022	3	-.005	15	1.035	3
144			min	-21.656	5	-29.961	3	5.406	15	-.008	2	-.156	1	-.653	2
145		16	max	121.937	1	164.843	3	87.706	1	.022	3	.001	5	.967	3
146			min	-33.456	5	-76.835	2	7.46	15	-.008	2	-.09	1	-.642	2
147		17	max	121.937	1	359.647	3	132.007	1	.022	3	.042	2	.705	3
148			min	-45.257	5	-209.035	2	9.514	15	-.008	2	-.002	9	-.499	2
149		18	max	121.937	1	554.452	3	176.308	1	.022	3	.174	1	.248	3
150			min	-57.057	5	-341.235	2	11.567	15	-.008	2	.019	12	-.224	2
151		19	max	121.937	1	749.256	3	220.609	1	.022	3	.372	1	.183	2
152			min	-68.858	5	-473.435	2	13.621	15	-.008	2	.033	15	-.404	3
153	M11	1	max	211.321	1	456.772	2	32.842	5	0	12	.428	1	.136	4
154			min	-223.654	3	-720.594	3	-230.007	1	-.009	1	-.195	5	-.373	3
155		2	max	211.321	1	324.572	2	36.019	5	0	12	.22	1	.25	3
156			min	-223.654	3	-525.79	3	-185.706	1	-.009	1	-.16	5	-.322	2
157		3	max	211.321	1	192.372	2	39.196	5	0	12	.057	2	.679	3
158			min	-223.654	3	-330.985	3	-141.405	1	-.009	1	-.123	5	-.581	2
159		4	max	211.321	1	61.329	1	42.373	5	0	12	.021	3	.912	3
160			min	-223.654	3	-136.181	3	-97.104	1	-.009	1	-.1	4	-.707	2
161		5	max	211.321	1	58.623	3	45.55	5	0	12	.002	3	.951	3
162			min	-223.654	3	-72.028	2	-52.803	1	-.009	1	-.137	1	-.701	2
163		6	max	211.321	1	253.428	3	49.253	4	0	12	.009	5	.795	3
164			min	-223.654	3	-204.227	2	-18.036	2	-.009	1	-.168	1	-.563	2
165		7	max	211.321	1	448.232	3	62.677	4	0	12	.059	5	.444	3
166			min	-223.654	3	-336.427	2	-11.272	3	-.009	1	-.154	1	-.293	2
167		8	max	211.321	1	643.036	3	80.1	1	0	12	.113	5	.11	2
168			min	-223.654	3	-468.627	2	-8.141	3	-.009	1	-.096	1	-.101	3
169		9	max	211.321	1	837.841	3	124.401	1	0	12	.18	4	.644	2
170			min	-223.654	3	-600.827	2	-5.01	3	-.009	1	-.051	2	-.842	3
171		10	max	211.321	1	1032.645	3	85.406	11	0	12	.276	4	1.311	2
172			min	-223.654	3	-733.027	2	-168.702	1	-.009	1	-.046	3	-1.777	3
173		11	max	211.321	1	600.827	2	38.972	5	.009	1	.027	9	.644	2
174			min	-223.654	3	-837.841	3	-124.401	1	0	5	-.163	5	-.842	3
175		12	max	211.321	1	468.627	2	42.149	5	.009	1	-.022	12	.11	2
176			min	-223.654	3	-643.036	3	-80.1	1	0	5	-.139	4	-.101	3
177		13	max	211.321	1	336.427	2	45.327	5	.009	1	-.017	12	.444	3
178			min	-223.654	3	-448.232	3	-35.799	1	0	5	-.154	1	-.293	2
179		14	max	211.321	1	204.227	2	48.504	5	.009	1	-.009	12	.795	3
180			min	-223.654	3	-253.428	3	-.78	9	0	5	-.168	1	-.563	2
181		15	max	211.321	1	72.028	2	61.841	4	.009	1	.018	5	.951	3
182			min	-223.654	3	-58.623	3	10.852	12	0	5	-.137	1	-.701	2
183		16	max	211.321	1	136.181	3	97.104	1	.009	1	.071	5	.912	3
184			min	-223.654	3	-61.329	1	12.94	12	0	5	-.062	1	-.707	2
185		17	max	211.321	1	330.985	3	141.405	1	.009	1	.136	4	.679	3
186			min	-223.654	3	-192.372	2	15.028	12	0	5	.023	9	-.581	2
187		18	max	211.321	1	525.79	3	185.706	1	.009	1	.232	4	.25	3
188			min	-223.654	3	-324.572	2	17.115	12	0	5	.043	12	-.322	2
189		19	max	211.321	1	720.594	3	230.007	1	.009	1	.428	1	.091	1
190			min	-223.654	3	-456.772	2	19.203	12	0	5	.061	12	-.373	3
191	M12	1	max	39.299	5	688.936	2	33.015	5	0	15	.452	1	.188	2
192			min	-45.25	1	-294.289	3	-233.978	1	-.006	1	-.194	5	.035	9
193		2	max	27.499	5	495.797	2	36.192	5	0	15	.24	1	.309	3
194			min	-45.25	1	-203.952	3	-189.677	1	-.006	1	-.16	5	-.405	2
195		3	max	15.698	5	302.658	2	39.37	5	0	15	.074	2	.467	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	-45.25	1	-113.614	3	-145.376	1	-.006	1	-.122	5	-.804	2
197		4	max	13.285	3	109.519	2	42.547	5	0	15	.011	10	.536	3
198			min	-45.25	1	-23.277	3	-101.075	1	-.006	1	-.097	4	-1.01	2
199		5	max	13.285	3	67.06	3	45.724	5	0	15	-.005	12	.514	3
200			min	-45.25	1	-83.62	2	-56.774	1	-.006	1	-.13	1	-1.023	2
201		6	max	13.285	3	157.398	3	49.019	4	0	15	.011	5	.402	3
202			min	-45.25	1	-276.758	2	-22.379	2	-.006	1	-.164	1	-.843	2
203		7	max	13.285	3	247.735	3	62.443	4	0	15	.061	5	.199	3
204			min	-45.25	1	-469.897	2	-7.209	10	-.006	1	-.155	1	-.469	2
205		8	max	13.285	3	338.072	3	76.129	1	0	15	.115	5	.097	2
206			min	-56.114	4	-663.036	2	-3.325	3	-.006	1	-.101	1	-.094	3
207		9	max	13.285	3	428.41	3	120.43	1	0	15	.181	4	.857	2
208			min	-67.915	4	-856.175	2	-.194	3	-.006	1	-.06	2	-.477	3
209		10	max	13.285	3	518.747	3	164.731	1	.006	1	.277	4	1.81	2
210			min	-79.715	4	-1049.314	2	-115.707	9	-.003	3	-.032	10	-.951	3
211		11	max	46.1	5	856.175	2	39.491	5	.006	1	.024	9	.857	2
212			min	-45.25	1	-428.41	3	-120.43	1	0	5	-.166	5	-.477	3
213		12	max	34.3	5	663.036	2	42.668	5	.006	1	-.019	12	.097	2
214			min	-45.25	1	-338.072	3	-76.129	1	0	5	-.143	4	-.094	3
215		13	max	22.499	5	469.897	2	45.845	5	.006	1	-.017	12	.199	3
216			min	-45.25	1	-247.735	3	-31.828	1	0	5	-.155	1	-.469	2
217		14	max	13.285	3	276.758	2	49.584	4	.006	1	-.012	12	.402	3
218			min	-45.25	1	-157.398	3	.719	9	0	5	-.164	1	-.843	2
219		15	max	13.285	3	83.62	2	63.008	4	.006	1	.017	5	.514	3
220			min	-45.25	1	-67.06	3	7.973	12	0	5	-.13	1	-1.023	2
221		16	max	13.285	3	23.277	3	101.075	1	.006	1	.071	5	.536	3
222			min	-45.25	1	-109.519	2	10.06	12	0	5	-.051	1	-1.01	2
223		17	max	13.285	3	113.614	3	145.376	1	.006	1	.139	4	.467	3
224			min	-45.25	1	-302.658	2	12.148	12	0	5	.015	12	-.804	2
225		18	max	13.285	3	203.952	3	189.677	1	.006	1	.24	1	.309	3
226			min	-49.369	4	-495.797	2	14.235	12	0	5	.028	12	-.405	2
227		19	max	13.285	3	294.289	3	233.978	1	.006	1	.452	1	.188	2
228			min	-61.169	4	-688.936	2	16.323	12	0	5	.044	12	-.049	5
229	M13	1	max	44.974	5	725.043	2	21.804	5	.007	3	.363	1	.221	2
230			min	-144.614	1	-314.638	3	-219.266	1	-.025	2	-.152	5	-.046	3
231		2	max	33.174	5	531.904	2	24.981	5	.007	3	.166	1	.223	3
232			min	-144.614	1	-224.301	3	-174.965	1	-.025	2	-.128	5	-.407	2
233		3	max	21.373	5	338.765	2	28.158	5	.007	3	.035	2	.402	3
234			min	-144.614	1	-133.963	3	-130.664	1	-.025	2	-.104	4	-.842	2
235		4	max	9.573	5	145.626	2	31.336	5	.007	3	.005	3	.491	3
236			min	-144.614	1	-43.626	3	-86.363	1	-.025	2	-.097	4	-1.085	2
237		5	max	-1.212	15	46.711	3	34.513	5	.007	3	-.006	12	.489	3
238			min	-144.614	1	-47.513	2	-42.062	1	-.025	2	-.16	1	-1.134	2
239		6	max	-9.154	15	137.049	3	40.523	4	.007	3	-.002	15	.398	3
240			min	-144.614	1	-240.651	2	-12.903	2	-.025	2	-.18	1	-.99	2
241		7	max	-10.982	12	227.386	3	53.947	4	.007	3	.036	5	.215	3
242			min	-144.614	1	-433.79	2	-5.502	3	-.025	2	-.155	1	-.652	2
243		8	max	-10.982	12	317.724	3	90.841	1	.007	3	.079	5	-.01	15
244			min	-144.614	1	-626.929	2	-2.37	3	-.025	2	-.087	1	-.14	1
245		9	max	-10.982	12	408.061	3	135.142	1	.007	3	.139	4	.601	2
246			min	-144.614	1	-820.068	2	.761	3	-.025	2	-.042	2	-.42	3
247		10	max	-10.982	12	1013.207	2	123.953	9	.025	2	.227	4	1.518	2
248			min	-144.614	1	-588.326	11	-179.443	1	-.007	14	-.028	3	-.873	3
249		11	max	31.178	5	820.068	2	26.491	5	.025	2	.041	9	.601	2
250			min	-144.614	1	-408.061	3	-135.142	1	-.007	3	-.115	5	-.42	3
251		12	max	19.377	5	626.929	2	29.668	5	.025	2	-.019	12	.002	5
252			min	-144.614	1	-317.724	3	-90.841	1	-.007	3	-.101	4	-.14	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	7.577	5	433.79	2	32.845	5	.025	2	-.016	12	.215	3
254			min	-144.614	1	-227.386	3	-46.54	1	-.007	3	-.155	1	-.652	2
255		14	max	-2.538	15	240.651	2	36.023	5	.025	2	-.012	12	.398	3
256			min	-144.614	1	-137.049	3	-7.527	9	-.007	3	-.18	1	-.99	2
257		15	max	-10.481	15	47.513	2	46.924	4	.025	2	.016	5	.489	3
258			min	-144.614	1	-46.711	3	7.324	12	-.007	3	-.16	1	-1.134	2
259		16	max	-10.982	12	43.626	3	86.363	1	.025	2	.057	5	.491	3
260			min	-144.614	1	-145.626	2	9.411	12	-.007	3	-.096	1	-1.085	2
261		17	max	-10.982	12	133.963	3	130.664	1	.025	2	.101	5	.402	3
262			min	-144.614	1	-338.765	2	11.499	12	-.007	3	-.005	9	-.842	2
263		18	max	-10.982	12	224.301	3	174.965	1	.025	2	.18	4	.223	3
264			min	-144.614	1	-531.904	2	13.586	12	-.007	3	.025	12	-.407	2
265		19	max	-10.982	12	314.638	3	219.266	1	.025	2	.363	1	.221	2
266			min	-144.614	1	-725.043	2	15.674	12	-.007	3	.04	12	-.046	3
267	M2	1	max	2350.858	2	1127.114	3	154.704	2	.021	5	1.764	5	6.477	1
268			min	-1673.026	3	-792.174	2	-359.739	5	-.013	2	-.242	1	.858	15
269		2	max	2347.587	2	1127.114	3	154.704	2	.021	5	1.635	5	6.563	1
270			min	-1675.48	3	-792.174	2	-356.903	5	-.013	2	-.19	1	.818	15
271		3	max	1754.205	1	1112.149	1	108.172	2	.001	2	1.502	5	6.393	1
272			min	-1394.413	3	134.65	15	-333.454	5	0	3	-.167	1	.774	15
273		4	max	1750.934	1	1112.149	1	108.172	2	.001	2	1.383	5	5.993	1
274			min	-1396.866	3	134.65	15	-330.618	5	0	3	-.13	1	.726	15
275		5	max	1747.662	1	1112.149	1	108.172	2	.001	2	1.265	4	5.594	1
276			min	-1399.32	3	134.65	15	-327.783	5	0	3	-.093	1	.677	15
277		6	max	1744.391	1	1112.149	1	108.172	2	.001	2	1.152	4	5.194	1
278			min	-1401.774	3	134.65	15	-324.948	5	0	3	-.055	1	.629	15
279		7	max	1741.119	1	1112.149	1	108.172	2	.001	2	1.039	4	4.795	1
280			min	-1404.227	3	134.65	15	-322.113	5	0	3	-.066	3	.581	15
281		8	max	1737.848	1	1112.149	1	108.172	2	.001	2	.928	4	4.395	1
282			min	-1406.681	3	134.65	15	-319.277	5	0	3	-.124	3	.532	15
283		9	max	1734.576	1	1112.149	1	108.172	2	.001	2	.817	4	3.996	1
284			min	-1409.134	3	134.65	15	-316.442	5	0	3	-.182	3	.484	15
285		10	max	1731.305	1	1112.149	1	108.172	2	.001	2	.708	4	3.596	1
286			min	-1411.588	3	134.65	15	-313.607	5	0	3	-.24	3	.435	15
287		11	max	1728.033	1	1112.149	1	108.172	2	.001	2	.599	4	3.196	1
288			min	-1414.041	3	134.65	15	-310.772	5	0	3	-.298	3	.387	15
289		12	max	1724.762	1	1112.149	1	108.172	2	.001	2	.492	4	2.797	1
290			min	-1416.495	3	134.65	15	-307.936	5	0	3	-.356	3	.339	15
291		13	max	1721.491	1	1112.149	1	108.172	2	.001	2	.385	4	2.397	1
292			min	-1418.949	3	134.65	15	-305.101	5	0	3	-.414	3	.29	15
293		14	max	1718.219	1	1112.149	1	108.172	2	.001	2	.28	4	1.998	1
294			min	-1421.402	3	134.65	15	-302.266	5	0	3	-.472	3	.242	15
295		15	max	1714.948	1	1112.149	1	108.172	2	.001	2	.317	2	1.598	1
296			min	-1423.856	3	134.65	15	-299.431	5	0	3	-.53	3	.194	15
297		16	max	1711.676	1	1112.149	1	108.172	2	.001	2	.356	2	1.199	1
298			min	-1426.309	3	134.65	15	-296.595	5	0	3	-.588	3	.145	15
299		17	max	1708.405	1	1112.149	1	108.172	2	.001	2	.395	2	.799	1
300			min	-1428.763	3	134.65	15	-293.76	5	0	3	-.646	3	.097	15
301		18	max	1705.133	1	1112.149	1	108.172	2	.001	2	.434	2	.4	1
302			min	-1431.217	3	134.65	15	-290.925	5	0	3	-.704	3	.048	15
303		19	max	1701.862	1	1112.149	1	108.172	2	.001	2	.472	2	0	1
304			min	-1433.67	3	134.65	15	-288.089	5	0	3	-.762	3	0	1
305	M5	1	max	6412.263	2	3068.158	3	0	1	.023	4	1.84	4	10.624	1
306			min	-5203.036	3	-3108.554	2	-382.296	5	0	1	0	1	.42	15
307		2	max	6408.991	2	3068.158	3	0	1	.023	4	1.704	4	11.292	1
308			min	-5205.489	3	-3108.554	2	-379.461	5	0	1	0	1	.426	15
309		3	max	4533.732	1	1954.436	1	0	1	0	1	1.565	4	11.235	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	-4230.906	3	72.263	15	-359.413	4	0	4	0	1	.415	15
311		4	max	4530.46	1	1954.436	1	0	1	0	1	1.436	4	10.533	1
312			min	-4233.36	3	72.263	15	-356.578	4	0	4	0	1	.389	15
313		5	max	4527.189	1	1954.436	1	0	1	0	1	1.309	4	9.83	1
314			min	-4235.813	3	72.263	15	-353.743	4	0	4	0	1	.363	15
315		6	max	4523.917	1	1954.436	1	0	1	0	1	1.182	4	9.128	1
316			min	-4238.267	3	72.263	15	-350.907	4	0	4	0	1	.338	15
317		7	max	4520.646	1	1954.436	1	0	1	0	1	1.057	4	8.426	1
318			min	-4240.721	3	72.263	15	-348.072	4	0	4	0	1	.312	15
319		8	max	4517.374	1	1954.436	1	0	1	0	1	.932	4	7.724	1
320			min	-4243.174	3	72.263	15	-345.237	4	0	4	0	1	.286	15
321		9	max	4514.103	1	1954.436	1	0	1	0	1	.808	4	7.022	1
322			min	-4245.628	3	72.263	15	-342.402	4	0	4	0	1	.26	15
323		10	max	4510.832	1	1954.436	1	0	1	0	1	.686	4	6.32	1
324			min	-4248.081	3	72.263	15	-339.566	4	0	4	0	1	.234	15
325		11	max	4507.56	1	1954.436	1	0	1	0	1	.564	4	5.617	1
326			min	-4250.535	3	72.263	15	-336.731	4	0	4	0	1	.208	15
327		12	max	4504.289	1	1954.436	1	0	1	0	1	.444	4	4.915	1
328			min	-4252.989	3	72.263	15	-333.896	4	0	4	0	1	.182	15
329		13	max	4501.017	1	1954.436	1	0	1	0	1	.325	4	4.213	1
330			min	-4255.442	3	72.263	15	-331.061	4	0	4	0	1	.156	15
331		14	max	4497.746	1	1954.436	1	0	1	0	1	.206	4	3.511	1
332			min	-4257.896	3	72.263	15	-328.225	4	0	4	0	1	.13	15
333		15	max	4494.474	1	1954.436	1	0	1	0	1	.089	4	2.809	1
334			min	-4260.349	3	72.263	15	-325.39	4	0	4	0	1	.104	15
335		16	max	4491.203	1	1954.436	1	0	1	0	1	0	1	2.107	1
336			min	-4262.803	3	72.263	15	-322.555	4	0	4	-.028	5	.078	15
337		17	max	4487.931	1	1954.436	1	0	1	0	1	0	1	1.404	1
338			min	-4265.256	3	72.263	15	-319.719	4	0	4	-.143	4	.052	15
339		18	max	4484.66	1	1954.436	1	0	1	0	1	0	1	.702	1
340			min	-4267.71	3	72.263	15	-316.884	4	0	4	-.257	4	.026	15
341		19	max	4481.388	1	1954.436	1	0	1	0	1	0	1	0	1
342			min	-4270.164	3	72.263	15	-314.049	4	0	4	-.371	4	0	1
343	M8	1	max	2350.858	2	1127.114	3	179.609	3	.024	4	1.846	4	6.477	1
344			min	-1673.026	3	-792.174	2	-392.338	4	-.005	3	-.279	3	-.441	5
345		2	max	2347.587	2	1127.114	3	179.609	3	.024	4	1.706	4	6.563	1
346			min	-1675.48	3	-792.174	2	-389.503	4	-.005	3	-.215	3	-.392	5
347		3	max	1754.205	1	1112.149	1	161.309	3	0	3	1.565	4	6.393	1
348			min	-1394.413	3	-62.052	5	-360.949	4	-.001	2	-.166	3	-.357	5
349		4	max	1750.934	1	1112.149	1	161.309	3	0	3	1.436	4	5.993	1
350			min	-1396.866	3	-62.052	5	-358.113	4	-.001	2	-.108	3	-.334	5
351		5	max	1747.662	1	1112.149	1	161.309	3	0	3	1.308	4	5.594	1
352			min	-1399.32	3	-62.052	5	-355.278	4	-.001	2	-.05	3	-.312	5
353		6	max	1744.391	1	1112.149	1	161.309	3	0	3	1.181	4	5.194	1
354			min	-1401.774	3	-62.052	5	-352.443	4	-.001	2	.005	12	-.29	5
355		7	max	1741.119	1	1112.149	1	161.309	3	0	3	1.055	4	4.795	1
356			min	-1404.227	3	-62.052	5	-349.608	4	-.001	2	-.007	10	-.268	5
357		8	max	1737.848	1	1112.149	1	161.309	3	0	3	.93	4	4.395	1
358			min	-1406.681	3	-62.052	5	-346.772	4	-.001	2	-.045	2	-.245	5
359		9	max	1734.576	1	1112.149	1	161.309	3	0	3	.806	4	3.996	1
360			min	-1409.134	3	-62.052	5	-343.937	4	-.001	2	-.084	2	-.223	5
361		10	max	1731.305	1	1112.149	1	161.309	3	0	3	.683	4	3.596	1
362			min	-1411.588	3	-62.052	5	-341.102	4	-.001	2	-.123	2	-.201	5
363		11	max	1728.033	1	1112.149	1	161.309	3	0	3	.567	5	3.196	1
364			min	-1414.041	3	-62.052	5	-338.267	4	-.001	2	-.161	2	-.178	5
365		12	max	1724.762	1	1112.149	1	161.309	3	0	3	.452	5	2.797	1
366			min	-1416.495	3	-62.052	5	-335.431	4	-.001	2	-.2	2	-.156	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	1721.491	1	1112.149	1	161.309	3	0	3	.414	3	2.397	1
368			min	-1418.949	3	-62.052	5	-332.596	4	-.001	2	-.239	2	-.134	5
369		14	max	1718.219	1	1112.149	1	161.309	3	0	3	.472	3	1.998	1
370			min	-1421.402	3	-62.052	5	-329.761	4	-.001	2	-.278	2	-.111	5
371		15	max	1714.948	1	1112.149	1	161.309	3	0	3	.53	3	1.598	1
372			min	-1423.856	3	-62.052	5	-326.925	4	-.001	2	-.317	2	-.089	5
373		16	max	1711.676	1	1112.149	1	161.309	3	0	3	.588	3	1.199	1
374			min	-1426.309	3	-62.052	5	-324.09	4	-.001	2	-.356	2	-.067	5
375		17	max	1708.405	1	1112.149	1	161.309	3	0	3	.646	3	.799	1
376			min	-1428.763	3	-62.052	5	-321.255	4	-.001	2	-.395	2	-.045	5
377		18	max	1705.133	1	1112.149	1	161.309	3	0	3	.704	3	.4	1
378			min	-1431.217	3	-62.052	5	-318.42	4	-.001	2	-.434	2	-.022	5
379		19	max	1701.862	1	1112.149	1	161.309	3	0	3	.762	3	0	1
380			min	-1433.67	3	-62.052	5	-315.584	4	-.001	2	-.472	2	0	1
381	M3	1	max	1767.304	2	5.617	4	45.956	2	.013	3	.024	5	0	1
382			min	-732.094	3	1.32	15	-21.473	5	-.029	2	-.003	2	0	1
383		2	max	1767.095	2	4.993	4	45.956	2	.013	3	.018	4	0	15
384			min	-732.251	3	1.174	15	-21.014	5	-.029	2	-.006	3	-.002	4
385		3	max	1766.886	2	4.369	4	45.956	2	.013	3	.03	2	0	15
386			min	-732.407	3	1.027	15	-20.555	5	-.029	2	-.012	3	-.004	4
387		4	max	1766.678	2	3.745	4	45.956	2	.013	3	.046	2	-.001	15
388			min	-732.563	3	.88	15	-20.097	5	-.029	2	-.019	3	-.005	4
389		5	max	1766.469	2	3.121	4	45.956	2	.013	3	.062	2	-.001	15
390			min	-732.72	3	.734	15	-19.638	5	-.029	2	-.026	3	-.006	4
391		6	max	1766.26	2	2.497	4	45.956	2	.013	3	.079	2	-.002	15
392			min	-732.876	3	.587	15	-19.179	5	-.029	2	-.033	3	-.007	4
393		7	max	1766.052	2	1.872	4	45.956	2	.013	3	.095	2	-.002	15
394			min	-733.033	3	.44	15	-18.828	3	-.029	2	-.039	3	-.008	4
395		8	max	1765.843	2	1.248	4	45.956	2	.013	3	.112	2	-.002	15
396			min	-733.189	3	.293	15	-18.828	3	-.029	2	-.046	3	-.009	4
397		9	max	1765.635	2	.624	4	45.956	2	.013	3	.128	2	-.002	15
398			min	-733.346	3	.147	15	-18.828	3	-.029	2	-.053	3	-.009	4
399		10	max	1765.426	2	0	1	45.956	2	.013	3	.144	2	-.002	15
400			min	-733.502	3	0	1	-18.828	3	-.029	2	-.059	3	-.009	4
401		11	max	1765.217	2	-.147	15	45.956	2	.013	3	.161	2	-.002	15
402			min	-733.659	3	-.624	6	-18.828	3	-.029	2	-.066	3	-.009	4
403		12	max	1765.009	2	-.293	15	45.956	2	.013	3	.177	2	-.002	15
404			min	-733.815	3	-1.248	6	-18.828	3	-.029	2	-.073	3	-.009	4
405		13	max	1764.8	2	-.44	15	45.956	2	.013	3	.193	2	-.002	15
406			min	-733.972	3	-1.872	6	-18.828	3	-.029	2	-.08	3	-.008	4
407		14	max	1764.592	2	-.587	15	45.956	2	.013	3	.21	2	-.002	15
408			min	-734.128	3	-2.497	6	-18.828	3	-.029	2	-.086	3	-.007	4
409		15	max	1764.383	2	-.734	15	45.956	2	.013	3	.226	2	-.001	15
410			min	-734.284	3	-3.121	6	-18.828	3	-.029	2	-.093	3	-.006	4
411		16	max	1764.174	2	-.88	15	45.956	2	.013	3	.243	2	-.001	15
412			min	-734.441	3	-3.745	6	-18.828	3	-.029	2	-.1	3	-.005	4
413		17	max	1763.966	2	-1.027	15	45.956	2	.013	3	.259	2	0	15
414			min	-734.597	3	-4.369	6	-18.828	3	-.029	2	-.106	3	-.004	4
415		18	max	1763.757	2	-1.174	15	45.956	2	.013	3	.275	2	0	15
416			min	-734.754	3	-4.993	6	-18.828	3	-.029	2	-.113	3	-.002	4
417		19	max	1763.549	2	-1.32	15	45.956	2	.013	3	.292	2	0	1
418			min	-734.91	3	-5.617	6	-18.828	3	-.029	2	-.12	3	0	1
419	M6	1	max	5039.659	2	5.617	4	0	1	.003	5	.024	4	0	1
420			min	-2514.782	3	1.32	15	-24.415	4	0	1	0	1	0	1
421		2	max	5039.45	2	4.993	4	0	1	.003	5	.016	4	0	15
422			min	-2514.939	3	1.174	15	-23.956	4	0	1	0	1	-.002	4
423		3	max	5039.241	2	4.369	4	0	1	.003	5	.007	4	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	-2515.095	3	1.027	15	-23.498	4	0	1	0	1	-.004	4
425		4	max	5039.033	2	3.745	4	0	1	.003	5	0	1	-.001	15
426			min	-2515.252	3	.88	15	-23.039	4	0	1	0	5	-.005	4
427		5	max	5038.824	2	3.121	4	0	1	.003	5	0	1	-.001	15
428			min	-2515.408	3	.734	15	-22.58	4	0	1	-.009	4	-.006	4
429		6	max	5038.615	2	2.497	4	0	1	.003	5	0	1	-.002	15
430			min	-2515.565	3	.587	15	-22.122	4	0	1	-.017	4	-.007	4
431		7	max	5038.407	2	1.872	4	0	1	.003	5	0	1	-.002	15
432			min	-2515.721	3	.44	15	-21.663	4	0	1	-.025	4	-.008	4
433		8	max	5038.198	2	1.248	4	0	1	.003	5	0	1	-.002	15
434			min	-2515.877	3	.293	15	-21.204	4	0	1	-.032	4	-.009	4
435		9	max	5037.99	2	.624	4	0	1	.003	5	0	1	-.002	15
436			min	-2516.034	3	.147	15	-20.746	4	0	1	-.04	4	-.009	4
437		10	max	5037.781	2	0	1	0	1	.003	5	0	1	-.002	15
438			min	-2516.19	3	0	1	-20.287	4	0	1	-.047	4	-.009	4
439		11	max	5037.572	2	-.147	15	0	1	.003	5	0	1	-.002	15
440			min	-2516.347	3	-.624	6	-19.828	4	0	1	-.054	4	-.009	4
441		12	max	5037.364	2	-.293	15	0	1	.003	5	0	1	-.002	15
442			min	-2516.503	3	-1.248	6	-19.37	4	0	1	-.061	4	-.009	4
443		13	max	5037.155	2	-.44	15	0	1	.003	5	0	1	-.002	15
444			min	-2516.66	3	-1.872	6	-18.911	4	0	1	-.068	4	-.008	4
445		14	max	5036.947	2	-.587	15	0	1	.003	5	0	1	-.002	15
446			min	-2516.816	3	-2.497	6	-18.453	4	0	1	-.075	4	-.007	4
447		15	max	5036.738	2	-.734	15	0	1	.003	5	0	1	-.001	15
448			min	-2516.973	3	-3.121	6	-17.994	4	0	1	-.081	4	-.006	4
449		16	max	5036.529	2	-.88	15	0	1	.003	5	0	1	-.001	15
450			min	-2517.129	3	-3.745	6	-17.535	4	0	1	-.088	4	-.005	4
451		17	max	5036.321	2	-1.027	15	0	1	.003	5	0	1	0	15
452			min	-2517.286	3	-4.369	6	-17.077	4	0	1	-.094	4	-.004	4
453		18	max	5036.112	2	-1.174	15	0	1	.003	5	0	1	0	15
454			min	-2517.442	3	-4.993	6	-16.618	4	0	1	-.1	4	-.002	4
455		19	max	5035.904	2	-1.32	15	0	1	.003	5	0	1	0	1
456			min	-2517.598	3	-5.617	6	-16.159	4	0	1	-.106	4	0	1
457	M9	1	max	1767.304	2	5.617	6	18.828	3	.029	2	.025	4	0	1
458			min	-732.094	3	1.32	15	-45.956	2	-.013	3	-.001	3	0	1
459		2	max	1767.095	2	4.993	6	18.828	3	.029	2	.016	5	0	15
460			min	-732.251	3	1.174	15	-45.956	2	-.013	3	-.013	2	-.002	6
461		3	max	1766.886	2	4.369	6	18.828	3	.029	2	.012	3	0	15
462			min	-732.407	3	1.027	15	-45.956	2	-.013	3	-.03	2	-.004	6
463		4	max	1766.678	2	3.745	6	18.828	3	.029	2	.019	3	-.001	15
464			min	-732.563	3	.88	15	-45.956	2	-.013	3	-.046	2	-.005	6
465		5	max	1766.469	2	3.121	6	18.828	3	.029	2	.026	3	-.001	15
466			min	-732.72	3	.734	15	-45.956	2	-.013	3	-.062	2	-.006	6
467		6	max	1766.26	2	2.497	6	18.828	3	.029	2	.033	3	-.002	15
468			min	-732.876	3	.587	15	-45.956	2	-.013	3	-.079	2	-.007	6
469		7	max	1766.052	2	1.872	6	18.828	3	.029	2	.039	3	-.002	15
470			min	-733.033	3	.44	15	-45.956	2	-.013	3	-.095	2	-.008	6
471		8	max	1765.843	2	1.248	6	18.828	3	.029	2	.046	3	-.002	15
472			min	-733.189	3	.293	15	-45.956	2	-.013	3	-.112	2	-.009	6
473		9	max	1765.635	2	.624	6	18.828	3	.029	2	.053	3	-.002	15
474			min	-733.346	3	.147	15	-45.956	2	-.013	3	-.128	2	-.009	6
475		10	max	1765.426	2	0	1	18.828	3	.029	2	.059	3	-.002	15
476			min	-733.502	3	0	1	-45.956	2	-.013	3	-.144	2	-.009	6
477		11	max	1765.217	2	-.147	15	18.828	3	.029	2	.066	3	-.002	15
478			min	-733.659	3	-.624	4	-45.956	2	-.013	3	-.161	2	-.009	6
479		12	max	1765.009	2	-.293	15	18.828	3	.029	2	.073	3	-.002	15
480			min	-733.815	3	-1.248	4	-45.956	2	-.013	3	-.177	2	-.009	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1764.8	2	-.44	15	18.828	3	.029	2	.08	3	-.002	15
482			min	-733.972	3	-1.872	4	-45.956	2	-.013	3	-.193	2	-.008	6
483		14	max	1764.592	2	-.587	15	18.828	3	.029	2	.086	3	-.002	15
484			min	-734.128	3	-2.497	4	-45.956	2	-.013	3	-.21	2	-.007	6
485		15	max	1764.383	2	-.734	15	18.828	3	.029	2	.093	3	-.001	15
486			min	-734.284	3	-3.121	4	-45.956	2	-.013	3	-.226	2	-.006	6
487		16	max	1764.174	2	-.88	15	18.828	3	.029	2	.1	3	-.001	15
488			min	-734.441	3	-3.745	4	-45.956	2	-.013	3	-.243	2	-.005	6
489		17	max	1763.966	2	-1.027	15	18.828	3	.029	2	.106	3	0	15
490			min	-734.597	3	-4.369	4	-45.956	2	-.013	3	-.259	2	-.004	6
491		18	max	1763.757	2	-1.174	15	18.828	3	.029	2	.113	3	0	15
492			min	-734.754	3	-4.993	4	-45.956	2	-.013	3	-.275	2	-.002	6
493		19	max	1763.549	2	-1.32	15	18.828	3	.029	2	.12	3	0	1
494			min	-734.91	3	-5.617	4	-45.956	2	-.013	3	-.292	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	-.058	15	-.063	12	.013	1	8.92e-3	3	NC	3	NC	1
2			min	-.477	1	-.8	1	-.903	4	-2.583e-2	2	125.42	1	219.226	5
3		2	max	-.058	15	-.065	15	0	12	8.619e-3	3	NC	12	NC	2
4			min	-.477	1	-.674	1	-.874	4	-2.439e-2	2	141.221	1	230.378	4
5		3	max	-.058	15	-.056	15	-.002	12	8.028e-3	3	9428.071	12	NC	3
6			min	-.477	1	-.551	1	-.835	4	-2.158e-2	2	160.991	1	245.614	4
7		4	max	-.058	15	-.048	15	-.001	12	7.437e-3	3	7400.933	12	NC	3
8			min	-.477	1	-.437	1	-.79	4	-1.876e-2	2	184.879	1	266.605	4
9		5	max	-.058	15	-.041	15	0	3	7.216e-3	3	7713.267	12	NC	3
10			min	-.477	1	-.339	1	-.74	4	-1.684e-2	2	211.931	1	294.367	4
11		6	max	-.058	15	-.033	15	.002	3	7.949e-3	3	NC	12	NC	3
12			min	-.476	1	-.26	1	-.689	4	-1.721e-2	2	240.446	1	329.489	4
13		7	max	-.058	15	-.026	15	.002	3	8.682e-3	3	NC	3	NC	1
14			min	-.476	1	-.193	1	-.639	4	-1.759e-2	2	271.068	1	372.548	4
15		8	max	-.058	15	-.019	15	0	3	9.414e-3	3	NC	3	NC	1
16			min	-.475	1	-.134	1	-.593	4	-1.797e-2	2	305.886	1	421.991	5
17		9	max	-.058	15	-.012	15	0	2	1.054e-2	3	5749.693	12	NC	1
18			min	-.475	1	-.075	1	-.552	4	-1.712e-2	2	349.869	1	480.682	5
19		10	max	-.058	15	-.002	10	.001	2	1.203e-2	3	3768.132	12	NC	1
20			min	-.474	1	-.043	3	-.509	4	-1.51e-2	2	410.233	1	562.308	5
21		11	max	-.058	15	.045	1	.001	1	1.351e-2	3	2813.912	12	NC	1
22			min	-.474	1	-.022	3	-.466	4	-1.309e-2	2	497.667	1	677.473	5
23		12	max	-.058	15	.107	1	.005	3	1.27e-2	3	3552.575	10	NC	1
24			min	-.473	1	-.002	3	-.425	4	-1.066e-2	2	635.673	1	843.122	5
25		13	max	-.058	15	.167	1	.013	3	9.444e-3	3	7826.027	10	NC	1
26			min	-.472	1	.014	12	-.383	4	-7.776e-3	2	872.772	1	1130.152	5
27		14	max	-.058	15	.222	1	.02	3	6.187e-3	3	NC	10	NC	1
28			min	-.472	1	.025	15	-.341	4	-6.727e-3	4	921.55	3	1662.54	5
29		15	max	-.058	15	.266	1	.02	3	2.93e-3	3	NC	2	NC	1
30			min	-.471	1	.032	15	-.308	4	-8.029e-3	4	688.852	3	2667.864	5
31		16	max	-.058	15	.295	1	.013	3	7.191e-3	3	NC	11	NC	2
32			min	-.471	1	.04	15	-.284	4	-7.038e-3	4	501.329	3	4475.443	5
33		17	max	-.058	15	.312	1	.016	1	1.233e-2	3	NC	11	NC	2
34			min	-.471	1	.047	15	-.27	4	-6.135e-3	2	373.755	3	5843.792	1
35		18	max	-.058	15	.389	3	.008	1	1.748e-2	3	NC	1	NC	2
36			min	-.471	1	.055	15	-.261	4	-8.47e-3	2	290.726	3	7928.178	1
37		19	max	-.058	15	.501	3	-.002	12	2.01e-2	3	NC	1	NC	1
38			min	-.471	1	.062	15	-.258	4	-9.661e-3	2	236.325	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	-.031	15	-.032	12	0	1	5.549e-4	4	NC	3	NC	1
40			min	-.836	1	-1.54	1	-.903	4	0	1	72.313	1	219.02	4
41		2	max	-.031	15	-.042	15	0	1	2.259e-4	5	4125.398	12	NC	1
42			min	-.836	1	-1.279	1	-.875	4	0	1	83.433	1	228.805	4
43		3	max	-.031	15	-.035	15	0	1	0	1	2612.751	15	NC	1
44			min	-.836	1	-1.025	1	-.838	4	-4.198e-4	4	98.096	1	243.495	4
45		4	max	-.031	15	-.028	15	0	1	0	1	2980.678	15	NC	1
46			min	-.836	1	-.795	1	-.792	4	-1.065e-3	4	116.64	1	264.288	4
47		5	max	-.031	15	-.022	15	0	1	0	1	3390.075	15	NC	1
48			min	-.835	1	-.607	1	-.74	4	-1.403e-3	4	138.005	1	292.243	4
49		6	max	-.031	15	-.018	15	0	1	0	1	3812.447	15	NC	1
50			min	-.834	1	-.467	1	-.688	4	-9.499e-4	4	159.725	1	327.583	4
51		7	max	-.031	15	-.014	15	0	1	0	1	4262.162	15	NC	1
52			min	-.833	1	-.359	1	-.638	4	-4.967e-4	4	181.885	1	370.494	4
53		8	max	-.031	15	-.01	15	0	1	0	1	4779.642	15	NC	1
54			min	-.832	1	-.266	1	-.593	4	-4.341e-5	4	206.534	1	420.235	4
55		9	max	-.031	15	-.006	15	0	1	7.941e-5	4	NC	12	NC	1
56			min	-.831	1	-.171	1	-.553	4	0	1	239.679	1	476.976	4
57		10	max	-.031	15	-.003	15	0	1	0	1	NC	3	NC	1
58			min	-.83	1	-.067	1	-.509	4	-1.09e-4	4	291.077	1	559.377	4
59		11	max	-.031	15	.046	1	0	1	0	1	7915.891	15	NC	1
60			min	-.828	1	-.008	3	-.465	4	-2.973e-4	4	378.486	1	675.208	4
61		12	max	-.031	15	.166	1	0	1	0	1	NC	15	NC	1
62			min	-.827	1	.006	15	-.426	4	-1.397e-3	4	556.983	1	829.947	4
63		13	max	-.031	15	.286	1	0	1	0	1	NC	2	NC	1
64			min	-.825	1	.01	15	-.385	4	-3.464e-3	4	1053.349	1	1097.369	4
65		14	max	-.031	15	.39	1	0	1	0	1	NC	5	NC	1
66			min	-.824	1	.014	15	-.344	4	-5.531e-3	4	1137.809	3	1591.444	4
67		15	max	-.031	15	.463	1	0	1	0	1	NC	4	NC	1
68			min	-.823	1	.017	15	-.312	4	-7.598e-3	4	649.453	3	2494.517	4
69		16	max	-.031	15	.491	1	0	1	0	1	NC	4	NC	1
70			min	-.823	1	.019	15	-.291	4	-6.003e-3	4	375.615	3	4030.212	4
71		17	max	-.031	15	.547	3	0	1	0	1	NC	4	NC	1
72			min	-.823	1	.02	15	-.275	4	-3.978e-3	4	241.317	3	7223.143	4
73		18	max	-.031	15	.787	3	0	1	0	1	NC	4	NC	1
74			min	-.823	1	.02	15	-.264	4	-1.952e-3	4	171.295	3	NC	1
75		19	max	-.031	15	1.037	3	0	1	0	1	NC	1	NC	1
76			min	-.823	1	.02	15	-.255	4	-9.193e-4	4	131.643	3	NC	1
77	M7	1	max	.027	5	.02	5	-.001	12	2.583e-2	2	NC	3	NC	1
78			min	-.477	1	-.8	1	-.91	4	-8.92e-3	3	125.42	1	215.316	4
79		2	max	.027	5	.021	5	.009	1	2.439e-2	2	NC	5	NC	2
80			min	-.477	1	-.674	1	-.869	4	-8.619e-3	3	141.221	1	229.844	4
81		3	max	.027	5	.02	5	.021	1	2.158e-2	2	NC	5	NC	3
82			min	-.477	1	-.551	1	-.825	4	-8.028e-3	3	160.991	1	247.552	4
83		4	max	.027	5	.02	5	.023	1	1.876e-2	2	NC	5	NC	3
84			min	-.477	1	-.437	1	-.778	4	-7.437e-3	3	184.879	1	269.429	4
85		5	max	.027	5	.018	5	.021	1	1.684e-2	2	NC	5	NC	3
86			min	-.477	1	-.339	1	-.73	4	-7.216e-3	3	211.931	1	296.611	4
87		6	max	.027	5	.016	5	.013	1	1.721e-2	2	NC	5	NC	3
88			min	-.476	1	-.26	1	-.683	4	-7.949e-3	3	240.446	1	329.185	4
89		7	max	.027	5	.013	5	.005	2	1.759e-2	2	NC	3	NC	1
90			min	-.476	1	-.193	1	-.637	4	-8.682e-3	3	271.068	1	368.002	4
91		8	max	.027	5	.01	5	0	2	1.797e-2	2	NC	3	NC	1
92			min	-.475	1	-.134	1	-.594	4	-9.414e-3	3	305.886	1	414.745	4
93		9	max	.027	5	.006	5	.001	3	1.712e-2	2	NC	7	NC	1
94			min	-.475	1	-.075	1	-.552	4	-1.054e-2	3	349.869	1	472.501	4
95		10	max	.027	5	.003	5	.002	3	1.51e-2	2	NC	13	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	-.474	1	-.043	3	-.509	4	-1.203e-2	3	410.233	1	550.848	4
97		11	max	.027	5	.045	1	0	12	1.309e-2	2	NC	13	NC	1
98			min	-.474	1	-.022	3	-.466	4	-1.351e-2	3	497.667	1	661.628	4
99		12	max	.027	5	.107	1	.005	1	1.066e-2	2	NC	4	NC	1
100			min	-.473	1	-.003	5	-.423	4	-1.27e-2	3	635.673	1	827.822	4
101		13	max	.027	5	.167	1	.008	2	7.776e-3	2	NC	4	NC	1
102			min	-.472	1	-.006	5	-.38	4	-9.444e-3	3	872.772	1	1107.042	4
103		14	max	.027	5	.222	1	.008	2	4.894e-3	2	NC	4	NC	1
104			min	-.472	1	-.01	5	-.341	4	-6.187e-3	3	921.55	3	1590.552	4
105		15	max	.027	5	.266	1	.003	2	2.013e-3	2	NC	2	NC	1
106			min	-.471	1	-.015	5	-.312	4	-7.517e-3	5	688.852	3	2381.739	4
107		16	max	.027	5	.295	1	0	10	3.8e-3	2	NC	4	NC	2
108			min	-.471	1	-.021	5	-.293	4	-7.191e-3	3	501.329	3	3490.978	4
109		17	max	.027	5	.312	1	-.003	10	6.135e-3	2	NC	4	NC	2
110			min	-.471	1	-.029	5	-.278	4	-1.233e-2	3	373.755	3	5371.575	4
111		18	max	.027	5	.389	3	-.002	10	8.47e-3	2	NC	1	NC	2
112			min	-.471	1	-.036	5	-.266	4	-1.748e-2	3	290.726	3	7928.178	1
113		19	max	.027	5	.501	3	.011	1	9.661e-3	2	NC	1	NC	1
114			min	-.471	1	-.045	5	-.252	4	-2.01e-2	3	236.325	3	NC	1
115	M10	1	max	.001	1	.446	3	.471	1	1.423e-2	3	NC	1	NC	1
116			min	-.259	4	-.041	5	-.027	5	-1.219e-3	2	NC	1	NC	1
117		2	max	0	1	.694	3	.528	1	1.615e-2	3	NC	4	NC	3
118			min	-.259	4	-.022	5	-.013	5	-1.901e-3	2	872.214	3	3827.445	1
119		3	max	0	1	.923	3	.613	1	1.808e-2	3	NC	4	NC	5
120			min	-.259	4	-.032	10	0	15	-2.583e-3	2	452.909	3	1530.2	1
121		4	max	0	1	1.098	3	.701	1	2.e-2	3	NC	4	NC	5
122			min	-.259	4	-.078	2	.006	15	-3.265e-3	2	331.52	3	940.807	1
123		5	max	0	1	1.197	3	.776	1	2.193e-2	3	NC	4	NC	5
124			min	-.259	4	-.09	2	.011	15	-3.947e-3	2	287.725	3	710.025	1
125		6	max	0	1	1.215	3	.826	1	2.386e-2	3	NC	4	NC	5
126			min	-.259	4	-.054	10	.015	15	-4.629e-3	2	280.854	3	609.174	1
127		7	max	0	1	1.163	3	.849	1	2.578e-2	3	NC	4	NC	5
128			min	-.259	4	-.013	10	.018	15	-5.311e-3	2	301.36	3	572.499	1
129		8	max	0	1	1.066	3	.847	1	2.771e-2	3	NC	1	NC	5
130			min	-.259	4	.008	15	.02	15	-5.993e-3	2	348.789	3	574.417	1
131		9	max	0	1	.964	3	.833	1	2.963e-2	3	NC	4	NC	5
132			min	-.259	4	.013	15	.024	15	-6.675e-3	2	417.222	3	597.449	1
133		10	max	0	1	.915	3	.823	1	3.156e-2	3	NC	5	NC	5
134			min	-.259	4	.02	15	.031	15	-7.357e-3	2	461.038	3	614.321	1
135		11	max	0	10	.964	3	.833	1	2.963e-2	3	NC	4	NC	15
136			min	-.259	4	.024	15	.038	15	-6.675e-3	2	417.222	3	597.449	1
137		12	max	0	10	1.066	3	.847	1	2.771e-2	3	NC	1	NC	15
138			min	-.259	4	.024	15	.044	15	-5.993e-3	2	348.789	3	574.417	1
139		13	max	0	10	1.163	3	.849	1	2.578e-2	3	NC	5	NC	15
140			min	-.259	4	-.013	10	.048	15	-5.311e-3	2	301.36	3	572.499	1
141		14	max	0	10	1.215	3	.826	1	2.386e-2	3	NC	15	NC	15
142			min	-.26	4	-.054	10	.051	15	-4.629e-3	2	280.854	3	609.174	1
143		15	max	0	10	1.197	3	.776	1	2.193e-2	3	NC	15	NC	5
144			min	-.26	4	-.09	2	.051	15	-3.947e-3	2	287.725	3	710.025	1
145		16	max	0	10	1.098	3	.701	1	2.e-2	3	9271.469	15	NC	5
146			min	-.26	4	-.078	2	.051	15	-3.265e-3	2	331.52	3	940.807	1
147		17	max	0	10	.923	3	.613	1	1.808e-2	3	NC	15	NC	5
148			min	-.26	4	-.032	10	.051	15	-2.583e-3	2	452.909	3	1530.2	1
149		18	max	0	10	.694	3	.528	1	1.615e-2	3	NC	5	NC	3
150			min	-.26	4	.022	10	.053	15	-1.901e-3	2	872.214	3	3827.445	1
151		19	max	0	10	.446	3	.471	1	1.423e-2	3	NC	1	NC	1
152			min	-.26	4	.059	15	.058	15	-1.219e-3	2	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	.077	1	.473	1	7.837e-3	1	NC	1	NC	1
154			min	-.444	4	-.012	3	-.027	5	-3.911e-4	5	NC	1	NC	1
155		2	max	.002	1	.165	3	.514	1	8.653e-3	1	NC	4	NC	3
156			min	-.444	4	-.078	2	.013	15	-2.529e-4	5	1221.145	3	4375.025	4
157		3	max	.001	1	.324	3	.591	1	9.469e-3	1	NC	4	NC	3
158			min	-.444	4	-.195	2	.028	15	-1.146e-4	5	644.411	3	1835.482	1
159		4	max	.001	1	.429	3	.677	1	1.029e-2	1	NC	5	NC	12
160			min	-.445	4	-.266	2	.029	15	-2.996e-7	15	489.878	3	1058.692	1
161		5	max	.001	1	.464	3	.754	1	1.11e-2	1	NC	5	9217.212	15
162			min	-.445	4	-.282	2	.022	15	9.163e-5	15	454.207	3	768.687	1
163		6	max	0	1	.424	3	.81	1	1.192e-2	1	NC	5	NC	5
164			min	-.445	4	-.244	2	.01	15	1.836e-4	15	495.414	3	641.617	1
165		7	max	0	1	.323	3	.839	1	1.273e-2	1	NC	5	NC	5
166			min	-.445	4	-.161	2	0	15	2.755e-4	15	645.468	3	590.019	1
167		8	max	0	1	.188	3	.845	1	1.355e-2	1	NC	4	NC	5
168			min	-.445	4	-.057	2	-.004	15	3.674e-4	15	1083.687	3	581.432	1
169		9	max	0	1	.065	1	.835	1	1.437e-2	1	NC	1	NC	5
170			min	-.445	4	.001	15	.004	15	4.593e-4	15	2945.422	3	596.506	1
171		10	max	0	1	.106	1	.828	1	1.518e-2	1	NC	2	NC	5
172			min	-.445	4	.003	12	.031	15	5.513e-4	15	7222.454	1	609.772	1
173		11	max	0	3	.065	1	.835	1	1.437e-2	1	NC	1	6243.536	15
174			min	-.445	4	.004	15	.058	15	5.928e-4	15	2945.422	3	596.506	1
175		12	max	0	3	.188	3	.845	1	1.355e-2	1	NC	4	5352.668	15
176			min	-.445	4	-.057	2	.068	15	6.344e-4	15	1083.687	3	581.432	1
177		13	max	0	3	.323	3	.839	1	1.273e-2	1	NC	5	6547.83	15
178			min	-.445	4	-.161	2	.065	15	6.76e-4	15	645.468	3	590.019	1
179		14	max	0	3	.424	3	.81	1	1.192e-2	1	NC	15	NC	15
180			min	-.445	4	-.244	2	.054	15	7.176e-4	15	495.414	3	641.617	1
181		15	max	.001	3	.464	3	.754	1	1.11e-2	1	NC	15	NC	5
182			min	-.445	4	-.282	2	.039	15	7.591e-4	15	454.207	3	768.687	1
183		16	max	.001	3	.429	3	.677	1	1.029e-2	1	9544.321	15	NC	4
184			min	-.445	4	-.266	2	.026	15	8.007e-4	15	489.878	3	1058.692	1
185		17	max	.001	3	.324	3	.591	1	9.469e-3	1	NC	15	NC	3
186			min	-.445	4	-.195	2	.021	15	8.423e-4	15	644.411	3	1835.482	1
187		18	max	.002	3	.165	3	.514	1	8.653e-3	1	NC	5	NC	3
188			min	-.445	4	-.078	2	.029	15	8.839e-4	15	1221.145	3	5271.004	1
189		19	max	.002	3	.077	1	.473	1	7.837e-3	1	NC	1	NC	1
190			min	-.445	4	-.012	3	.058	15	9.254e-4	15	NC	1	NC	1
191	M12	1	max	0	3	.008	5	.475	1	7.419e-3	1	NC	1	NC	1
192			min	-.573	4	-.106	1	-.027	5	-4.28e-4	5	NC	1	NC	1
193		2	max	0	3	.036	3	.51	1	7.939e-3	1	NC	4	NC	2
194			min	-.573	4	-.29	2	.012	15	-3.e-4	5	998.346	2	4523.065	4
195		3	max	0	3	.124	3	.583	1	8.458e-3	1	NC	5	NC	12
196			min	-.573	4	-.475	2	.027	15	-1.721e-4	5	537.459	2	1996.167	1
197		4	max	0	3	.174	3	.669	1	8.978e-3	1	NC	5	7900.829	12
198			min	-.573	4	-.598	2	.028	15	-4.426e-5	15	411.492	2	1114.253	1
199		5	max	0	3	.183	3	.747	1	9.497e-3	1	NC	5	9849.715	15
200			min	-.573	4	-.642	2	.02	15	4.104e-5	15	379.555	2	794.201	1
201		6	max	0	3	.151	3	.805	1	1.002e-2	1	NC	5	NC	5
202			min	-.573	4	-.607	2	.009	15	1.263e-4	15	404.974	2	654.582	1
203		7	max	0	3	.089	3	.837	1	1.054e-2	1	NC	5	NC	5
204			min	-.573	4	-.505	2	-.001	15	2.116e-4	15	499.93	2	596.09	1
205		8	max	0	3	.011	3	.846	1	1.106e-2	1	NC	5	NC	7
206			min	-.573	4	-.373	1	-.006	5	2.969e-4	15	732.725	2	582.754	1
207		9	max	0	3	-.007	15	.838	1	1.158e-2	1	NC	3	NC	5
208			min	-.573	4	-.269	1	.004	15	3.823e-4	15	1297.232	2	594.278	1
209		10	max	0	1	-.008	15	.831	1	1.209e-2	1	NC	3	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.573	4	-.222	1	.031	15	4.676e-4	15	1865.09	1	605.943	1
211		11	max	0	1	-.011	15	.838	1	1.158e-2	1	NC	3	6115.094	15
212			min	-.573	4	-.269	1	.059	15	5.169e-4	15	1297.232	2	594.278	1
213		12	max	0	1	.011	3	.846	1	1.106e-2	1	NC	5	5210.473	15
214			min	-.573	4	-.373	1	.069	15	5.662e-4	15	732.725	2	582.754	1
215		13	max	0	1	.089	3	.837	1	1.054e-2	1	NC	5	6311.269	15
216			min	-.573	4	-.505	2	.067	15	6.156e-4	15	499.93	2	596.09	1
217		14	max	0	1	.151	3	.805	1	1.002e-2	1	NC	15	NC	15
218			min	-.573	4	-.607	2	.055	15	6.649e-4	15	404.974	2	654.582	1
219		15	max	0	1	.183	3	.747	1	9.497e-3	1	NC	15	NC	5
220			min	-.573	4	-.642	2	.04	15	7.143e-4	15	379.555	2	794.201	1
221		16	max	0	1	.174	3	.669	1	8.978e-3	1	NC	15	NC	4
222			min	-.573	4	-.598	2	.027	15	7.636e-4	15	411.492	2	1114.253	1
223		17	max	0	1	.124	3	.583	1	8.458e-3	1	NC	15	NC	4
224			min	-.573	4	-.475	2	.021	15	8.13e-4	15	537.459	2	1996.167	1
225		18	max	0	1	.036	3	.51	1	7.939e-3	1	NC	5	NC	2
226			min	-.573	4	-.29	2	.03	15	8.623e-4	15	998.346	2	6036.859	5
227		19	max	0	1	-.015	15	.475	1	7.419e-3	1	NC	1	NC	1
228			min	-.573	4	-.106	1	.058	15	9.116e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.02	5	.477	1	1.604e-2	1	NC	1	NC	1
230			min	-.89	4	-.739	1	-.027	5	-1.801e-3	3	NC	1	NC	1
231		2	max	0	12	.01	5	.537	1	1.806e-2	2	NC	5	NC	3
232			min	-.89	4	-1.006	1	.01	15	-2.429e-3	3	698.087	2	3580.166	1
233		3	max	0	12	.087	3	.625	1	2.023e-2	2	NC	5	NC	12
234			min	-.89	4	-1.249	1	.026	15	-3.057e-3	3	367.47	2	1462.491	1
235		4	max	0	12	.143	3	.715	1	2.241e-2	2	NC	5	7539.163	12
236			min	-.89	4	-1.445	2	.03	15	-3.685e-3	3	269.794	2	908.647	1
237		5	max	0	12	.161	3	.79	1	2.458e-2	2	NC	15	7583.682	15
238			min	-.89	4	-1.573	2	.027	15	-4.313e-3	3	232.603	2	689.878	1
239		6	max	0	12	.141	3	.841	1	2.675e-2	2	NC	15	NC	15
240			min	-.89	4	-1.613	2	.019	15	-4.941e-3	3	223.154	2	594.055	1
241		7	max	0	12	.09	3	.863	1	2.892e-2	2	NC	15	NC	5
242			min	-.89	4	-1.585	1	.012	15	-5.569e-3	3	232.256	2	559.51	1
243		8	max	0	12	.022	3	.861	1	3.109e-2	2	NC	15	NC	5
244			min	-.89	4	-1.522	1	.008	15	-6.198e-3	3	256.66	2	562.006	1
245		9	max	0	12	-.032	12	.846	1	3.327e-2	2	NC	15	NC	5
246			min	-.89	4	-1.449	1	.013	15	-6.826e-3	3	290.034	2	584.716	1
247		10	max	0	1	-.046	15	.836	1	3.544e-2	2	NC	12	NC	5
248			min	-.89	4	-1.412	1	.031	15	-7.454e-3	3	309.943	2	601.191	1
249		11	max	0	1	-.032	12	.846	1	3.327e-2	2	NC	15	8114.285	15
250			min	-.89	4	-1.449	1	.05	15	-6.826e-3	3	290.034	2	584.716	1
251		12	max	0	1	.022	3	.861	1	3.109e-2	2	9490.07	15	7344.794	15
252			min	-.89	4	-1.522	1	.058	15	-6.198e-3	3	256.66	2	562.006	1
253		13	max	0	1	.09	3	.863	1	2.892e-2	2	8415.366	15	9440.946	15
254			min	-.89	4	-1.585	1	.055	15	-5.569e-3	3	232.256	2	559.51	1
255		14	max	0	1	.141	3	.841	1	2.675e-2	2	7844.254	15	NC	5
256			min	-.89	4	-1.613	2	.047	15	-4.941e-3	3	223.154	2	594.055	1
257		15	max	0	1	.161	3	.79	1	2.458e-2	2	7861.489	15	NC	5
258			min	-.89	4	-1.573	2	.037	15	-4.313e-3	3	232.603	2	689.878	1
259		16	max	0	1	.143	3	.715	1	2.241e-2	2	8682.596	15	NC	13
260			min	-.89	4	-1.445	2	.028	15	-3.685e-3	3	269.794	2	908.647	1
261		17	max	0	1	.087	3	.625	1	2.023e-2	2	NC	15	NC	4
262			min	-.89	4	-1.249	1	.025	15	-3.057e-3	3	367.47	2	1462.491	1
263		18	max	.001	1	0	3	.537	1	1.806e-2	2	NC	5	NC	3
264			min	-.889	4	-1.006	1	.034	15	-2.429e-3	3	698.087	2	3580.166	1
265		19	max	.001	1	-.067	12	.477	1	1.604e-2	1	NC	1	NC	1
266			min	-.889	4	-.739	1	.058	15	-1.801e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	.002	5	4.598e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	1	-7.671e-3	5	NC	1	NC	1
271		3	max	0	3	-.001	15	.006	5	6.49e-3	2	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-1.114e-2	5	8409.378	1	NC	1
273		4	max	0	3	-.003	15	.013	5	5.971e-3	2	NC	5	NC	1
274			min	0	1	-.021	1	-.002	1	-1.085e-2	5	3729.178	1	5834.003	5
275		5	max	0	3	-.005	15	.023	5	5.451e-3	2	NC	5	NC	1
276			min	0	1	-.037	1	-.003	1	-1.057e-2	5	2120.677	1	3380.955	5
277		6	max	0	3	-.007	15	.035	5	4.931e-3	2	NC	15	NC	1
278			min	0	1	-.056	1	-.004	1	-1.029e-2	5	1378.082	1	2226.054	5
279		7	max	0	3	-.01	15	.049	5	4.411e-3	2	7843.198	15	NC	1
280			min	0	1	-.08	1	-.005	1	-1.001e-2	5	973.851	1	1589.632	5
281		8	max	0	3	-.013	15	.065	5	3.892e-3	2	5892.671	15	NC	1
282			min	0	1	-.106	1	-.007	1	-9.728e-3	5	729.203	1	1201.121	5
283		9	max	0	3	-.017	15	.082	5	3.372e-3	2	4613.622	15	NC	1
284			min	0	1	-.136	1	-.008	1	-9.446e-3	5	569.516	1	945.907	5
285		10	max	0	3	-.021	15	.101	5	2.852e-3	2	3729.25	15	NC	1
286			min	-.001	1	-.169	1	-.009	1	-9.164e-3	5	459.484	1	769.157	5
287		11	max	0	3	-.025	15	.121	5	2.333e-3	2	3090.925	15	NC	1
288			min	-.001	1	-.204	1	-.01	1	-8.883e-3	5	380.275	1	641.431	5
289		12	max	.001	3	-.03	15	.142	5	1.813e-3	2	2615.147	15	NC	3
290			min	-.001	1	-.241	1	-.011	1	-8.601e-3	5	321.361	1	546.132	5
291		13	max	.001	3	-.034	15	.164	4	1.293e-3	2	2250.584	15	NC	3
292			min	-.001	1	-.281	1	-.012	1	-8.351e-3	4	276.297	1	472.687	4
293		14	max	.001	3	-.039	15	.187	4	7.733e-4	2	1965.053	15	NC	3
294			min	-.002	1	-.322	1	-.012	1	-8.127e-3	4	241.052	1	415.08	4
295		15	max	.001	3	-.045	15	.21	4	8.839e-4	3	1737.171	15	NC	1
296			min	-.002	1	-.364	1	-.012	1	-7.903e-3	4	212.956	1	369.108	4
297		16	max	.001	3	-.05	15	.234	4	1.181e-3	3	1552.412	15	NC	1
298			min	-.002	1	-.408	1	-.011	1	-7.678e-3	4	190.201	1	331.859	4
299		17	max	.002	3	-.055	15	.258	4	1.478e-3	3	1400.598	15	NC	1
300			min	-.002	1	-.452	1	-.01	1	-7.454e-3	4	171.52	1	301.289	4
301		18	max	.002	3	-.061	15	.281	4	1.775e-3	3	1274.4	15	NC	1
302			min	-.002	1	-.497	1	-.012	3	-7.23e-3	4	156.003	1	275.928	4
303		19	max	.002	3	-.066	15	.305	4	2.072e-3	3	1168.468	15	NC	1
304			min	-.002	1	-.543	1	-.019	3	-7.006e-3	4	142.988	1	254.7	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	.002	4	0	1	NC	1	NC	1
308			min	0	2	-.003	1	0	1	-8.079e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.006	4	0	1	NC	4	NC	1
310			min	0	2	-.015	1	0	1	-1.172e-2	4	5085.38	1	NC	1
311		4	max	0	3	-.001	15	.014	4	0	1	NC	5	NC	1
312			min	-.001	2	-.035	1	0	1	-1.14e-2	4	2203.317	1	5594.823	4
313		5	max	.001	3	-.002	15	.024	4	0	1	NC	5	NC	1
314			min	-.001	2	-.063	1	0	1	-1.108e-2	4	1240.321	1	3243.868	4
315		6	max	.002	3	-.004	15	.036	4	0	1	NC	5	NC	1
316			min	-.002	2	-.097	1	0	1	-1.075e-2	4	801.453	1	2137.129	4
317		7	max	.002	3	-.005	15	.051	4	0	1	NC	15	NC	1
318			min	-.002	2	-.138	1	0	1	-1.043e-2	4	564.332	1	1527.259	4
319		8	max	.002	3	-.007	15	.067	4	0	1	NC	15	NC	1
320			min	-.002	2	-.184	1	0	1	-1.011e-2	4	421.517	1	1154.954	4
321		9	max	.002	3	-.009	15	.085	4	0	1	8769.923	15	NC	1
322			min	-.003	2	-.236	1	0	1	-9.794e-3	4	328.616	1	910.387	4
323		10	max	.003	3	-.011	15	.105	4	0	1	7075.162	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.003	1	-.293	1	0	1	-9.474e-3	4	264.765	1	741.015	4
325		11	max	.003	3	-.013	15	.125	4	0	1	5855.247	15	NC	1
326			min	-.003	1	-.355	1	0	1	-9.154e-3	4	218.889	1	618.633	4
327		12	max	.003	3	-.016	15	.147	4	0	1	4947.961	15	NC	1
328			min	-.003	1	-.42	1	0	1	-8.834e-3	4	184.82	1	527.336	4
329		13	max	.003	3	-.018	15	.17	4	0	1	4253.985	15	NC	1
330			min	-.004	1	-.489	1	0	1	-8.513e-3	4	158.792	1	457.365	4
331		14	max	.004	3	-.021	15	.193	4	0	1	3711.251	15	NC	1
332			min	-.004	1	-.56	1	0	1	-8.193e-3	4	138.457	1	402.578	4
333		15	max	.004	3	-.024	15	.216	4	0	1	3278.633	15	NC	1
334			min	-.004	1	-.635	1	0	1	-7.873e-3	4	122.261	1	358.9	4
335		16	max	.004	3	-.027	15	.24	4	0	1	2928.25	15	NC	1
336			min	-.005	1	-.711	1	0	1	-7.553e-3	4	109.153	1	323.558	4
337		17	max	.005	3	-.029	15	.263	4	0	1	2640.61	15	NC	1
338			min	-.005	1	-.789	1	0	1	-7.232e-3	4	98.399	1	294.608	4
339		18	max	.005	3	-.032	15	.287	4	0	1	2401.696	15	NC	1
340			min	-.005	1	-.867	1	0	1	-6.912e-3	4	89.471	1	270.654	4
341		19	max	.005	3	-.035	15	.31	4	0	1	2201.293	15	NC	1
342			min	-.006	1	-.947	1	0	1	-6.592e-3	4	81.987	1	250.671	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	.002	4	1.929e-3	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-8.488e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.006	4	2.681e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-1.228e-2	4	8409.378	1	NC	1
349		4	max	0	3	.001	5	.014	4	2.384e-3	3	NC	4	NC	1
350			min	0	1	-.021	1	-.002	3	-1.19e-2	4	3729.178	1	5585.04	4
351		5	max	0	3	.002	5	.024	4	2.087e-3	3	NC	4	NC	1
352			min	0	1	-.037	1	-.003	3	-1.152e-2	4	2120.677	1	3239.356	4
353		6	max	0	3	.003	5	.036	4	1.79e-3	3	NC	4	NC	1
354			min	0	1	-.056	1	-.004	3	-1.113e-2	4	1378.082	1	2134.696	4
355		7	max	0	3	.005	5	.051	4	1.493e-3	3	NC	5	NC	1
356			min	0	1	-.08	1	-.005	3	-1.075e-2	4	973.851	1	1525.833	4
357		8	max	0	3	.006	5	.067	4	1.196e-3	3	NC	5	NC	1
358			min	0	1	-.106	1	-.006	3	-1.037e-2	4	729.203	1	1154.083	4
359		9	max	0	3	.008	5	.085	4	8.985e-4	3	NC	7	NC	1
360			min	0	1	-.136	1	-.007	3	-9.985e-3	4	569.516	1	909.854	4
361		10	max	0	3	.01	5	.105	4	6.015e-4	3	NC	15	NC	1
362			min	-.001	1	-.169	1	-.008	3	-9.602e-3	4	459.484	1	740.701	4
363		11	max	0	3	.012	5	.125	4	3.044e-4	3	9365.352	15	NC	1
364			min	-.001	1	-.204	1	-.008	3	-9.218e-3	4	380.275	1	618.471	4
365		12	max	.001	3	.014	5	.147	4	7.328e-6	3	7935.148	15	NC	3
366			min	-.001	1	-.241	1	-.008	3	-8.835e-3	4	321.361	1	527.284	4
367		13	max	.001	3	.016	5	.17	4	-1.102e-4	9	6836.97	15	NC	3
368			min	-.001	1	-.281	1	-.007	3	-8.452e-3	4	276.297	1	457.397	4
369		14	max	.001	3	.019	5	.193	4	6.23e-5	9	5975.361	15	NC	3
370			min	-.002	1	-.322	1	-.005	3	-8.069e-3	4	241.052	1	402.676	4
371		15	max	.001	3	.021	5	.216	4	2.348e-4	9	5286.705	15	NC	1
372			min	-.002	1	-.364	1	-.002	3	-7.704e-3	5	212.956	1	359.052	4
373		16	max	.001	3	.023	5	.24	4	6.223e-4	1	4727.658	15	NC	1
374			min	-.002	1	-.408	1	0	12	-7.385e-3	5	190.201	1	323.757	4
375		17	max	.002	3	.026	5	.263	4	1.09e-3	1	4267.797	15	NC	1
376			min	-.002	1	-.452	1	.001	10	-7.066e-3	5	171.52	1	294.848	4
377		18	max	.002	3	.028	5	.286	4	1.558e-3	1	3885.162	15	NC	1
378			min	-.002	1	-.497	1	0	10	-6.746e-3	5	156.003	1	270.933	4
379		19	max	.002	3	.031	5	.309	4	2.026e-3	1	3563.7	15	NC	1
380			min	-.002	1	-.543	1	-.002	10	-6.427e-3	5	142.988	1	250.987	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	.004	1	0	15	.003	5	2.563e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	1	-3.514e-3	5	NC	1	NC	1
383		2	max	.004	1	-.005	15	.05	5	2.977e-3	2	NC	1	NC	4
384			min	0	15	-.037	1	-.027	2	-3.512e-3	5	NC	1	2781.305	2
385		3	max	.003	1	-.009	15	.097	5	3.391e-3	2	NC	1	NC	4
386			min	0	10	-.071	1	-.054	2	-3.51e-3	5	NC	1	1401.438	2
387		4	max	.003	3	-.013	15	.144	5	3.805e-3	2	NC	1	9956.01	13
388			min	0	10	-.106	1	-.079	2	-3.508e-3	5	NC	1	947.747	2
389		5	max	.004	3	-.018	15	.192	5	4.22e-3	2	NC	1	7176.927	13
390			min	0	10	-.14	1	-.103	2	-3.506e-3	5	NC	1	726.009	2
391		6	max	.004	3	-.022	15	.239	5	4.634e-3	2	NC	1	5614.077	13
392			min	0	10	-.174	1	-.125	2	-3.504e-3	5	NC	1	597.571	2
393		7	max	.004	3	-.026	15	.286	5	5.048e-3	2	NC	1	4647.076	13
394			min	-.001	2	-.208	1	-.144	2	-3.502e-3	5	8990.605	4	516.428	2
395		8	max	.005	3	-.03	15	.332	5	5.462e-3	2	NC	1	4016.703	13
396			min	-.002	2	-.242	1	-.161	2	-3.5e-3	5	8301.976	4	463.11	2
397		9	max	.005	3	-.034	15	.377	5	5.876e-3	2	NC	1	3598.254	13
398			min	-.003	2	-.275	1	-.173	2	-3.498e-3	5	7931.316	4	428.2	2
399		10	max	.005	3	-.038	15	.422	5	6.29e-3	2	NC	1	3327.045	13
400			min	-.004	2	-.309	1	-.182	2	-3.496e-3	5	7814.056	4	406.9	2
401		11	max	.005	3	-.042	15	.465	5	6.704e-3	2	NC	1	3169.659	13
402			min	-.004	2	-.342	1	-.186	2	-3.494e-3	5	7931.316	4	391.664	14
403		12	max	.006	3	-.046	15	.507	5	7.119e-3	2	NC	1	3112.361	13
404			min	-.005	2	-.375	1	-.184	2	-3.492e-3	5	8301.976	4	352.181	14
405		13	max	.006	3	-.05	15	.547	5	7.533e-3	2	NC	1	3158.044	13
406			min	-.006	2	-.407	1	-.177	2	-3.49e-3	5	8990.605	4	319.25	14
407		14	max	.006	3	-.054	15	.585	5	7.947e-3	2	NC	1	3330.507	13
408			min	-.006	2	-.44	1	-.164	2	-3.488e-3	5	NC	1	291.353	14
409		15	max	.007	3	-.058	15	.621	5	8.361e-3	2	NC	1	3691.93	13
410			min	-.007	2	-.472	1	-.144	2	-3.678e-3	3	NC	1	267.408	14
411		16	max	.007	3	-.061	15	.656	5	8.775e-3	2	NC	1	4400.05	13
412			min	-.008	2	-.504	1	-.116	2	-3.871e-3	3	NC	1	246.621	14
413		17	max	.007	3	-.065	15	.687	5	9.189e-3	2	NC	1	5940.803	13
414			min	-.009	2	-.536	1	-.081	2	-4.063e-3	3	NC	1	228.397	14
415		18	max	.008	3	-.068	15	.722	4	9.604e-3	2	NC	1	NC	13
416			min	-.009	2	-.568	1	-.037	2	-4.255e-3	3	NC	1	212.281	14
417		19	max	.008	3	-.072	15	.754	4	1.002e-2	2	NC	1	NC	1
418			min	-.01	2	-.6	1	0	3	-4.447e-3	3	NC	1	197.921	14
419	M6	1	max	.007	1	0	15	.004	4	0	1	NC	1	NC	1
420			min	0	15	-.004	1	0	1	-3.711e-3	4	NC	1	NC	1
421		2	max	.006	3	-.003	15	.052	4	0	1	NC	1	NC	1
422			min	0	15	-.064	1	0	1	-3.749e-3	4	NC	1	NC	1
423		3	max	.007	3	-.005	15	.102	4	0	1	NC	1	NC	1
424			min	0	10	-.124	1	0	1	-3.788e-3	4	NC	1	5192.029	4
425		4	max	.008	3	-.008	15	.152	4	0	1	NC	1	NC	1
426			min	-.001	2	-.184	1	0	1	-3.826e-3	4	NC	1	3385.835	4
427		5	max	.009	3	-.01	15	.201	4	0	1	NC	1	NC	1
428			min	-.003	2	-.244	1	0	1	-3.864e-3	4	NC	1	2514.38	4
429		6	max	.01	3	-.013	15	.251	4	0	1	NC	1	NC	1
430			min	-.006	2	-.303	1	0	1	-3.902e-3	4	NC	1	2015.014	4
431		7	max	.011	3	-.015	15	.299	4	0	1	NC	1	NC	1
432			min	-.008	2	-.363	1	0	1	-3.94e-3	4	8990.605	4	1701.603	4
433		8	max	.012	3	-.017	15	.347	4	0	1	NC	1	NC	1
434			min	-.01	2	-.422	1	0	1	-3.978e-3	4	8301.976	4	1495.552	4
435		9	max	.013	3	-.02	15	.394	4	0	1	NC	1	NC	1
436			min	-.012	2	-.481	1	0	1	-4.017e-3	4	7931.316	4	1358.764	4
437		10	max	.014	3	-.022	15	.44	4	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	-.014	2	-.54	1	0	1	-4.055e-3	4	7814.056	4	1271.493	4
439		11	max	.015	3	-.024	15	.484	4	0	1	NC	1	NC	1
440			min	-.016	2	-.599	1	0	1	-4.093e-3	4	7931.316	4	1223.821	4
441		12	max	.016	3	-.026	15	.526	4	0	1	NC	1	NC	1
442			min	-.018	2	-.657	1	0	1	-4.131e-3	4	8301.976	4	1212.324	4
443		13	max	.017	3	-.028	15	.567	4	0	1	NC	1	NC	1
444			min	-.02	2	-.715	1	0	1	-4.169e-3	4	8990.605	4	1239.488	4
445		14	max	.018	3	-.03	15	.605	4	0	1	NC	1	NC	1
446			min	-.022	2	-.773	1	0	1	-4.207e-3	4	NC	1	1315.772	4
447		15	max	.019	3	-.032	15	.641	4	0	1	NC	1	NC	1
448			min	-.024	2	-.831	1	0	1	-4.246e-3	4	NC	1	1466.845	4
449		16	max	.02	3	-.034	15	.674	4	0	1	NC	1	NC	1
450			min	-.026	2	-.889	1	0	1	-4.284e-3	4	NC	1	1756.767	4
451		17	max	.021	3	-.036	15	.704	4	0	1	NC	1	NC	1
452			min	-.028	2	-.946	1	0	1	-4.322e-3	4	NC	1	2381.966	4
453		18	max	.022	3	-.037	15	.731	4	0	1	NC	1	NC	1
454			min	-.03	2	-1.004	1	0	1	-4.36e-3	4	NC	1	4330.482	4
455		19	max	.023	3	-.039	15	.755	4	0	1	NC	1	NC	1
456			min	-.033	2	-1.061	1	0	1	-4.398e-3	4	NC	1	NC	1
457	M9	1	max	.004	1	0	5	.004	4	9.889e-4	3	NC	1	NC	1
458			min	0	5	-.002	1	0	3	-3.947e-3	4	NC	1	NC	1
459		2	max	.004	1	.001	5	.055	4	1.181e-3	3	NC	1	NC	5
460			min	0	5	-.037	1	-.012	3	-4.008e-3	4	NC	1	2781.305	2
461		3	max	.003	1	.003	5	.107	4	1.373e-3	3	NC	1	7724.507	15
462			min	0	5	-.071	1	-.023	3	-4.068e-3	4	NC	1	1401.438	2
463		4	max	.003	3	.004	5	.159	4	1.565e-3	3	NC	1	5036.504	15
464			min	0	5	-.106	1	-.034	3	-4.129e-3	4	NC	1	947.747	2
465		5	max	.004	3	.005	5	.21	4	1.757e-3	3	NC	1	3739.685	15
466			min	0	5	-.14	1	-.044	3	-4.22e-3	2	NC	1	726.009	2
467		6	max	.004	3	.006	5	.261	4	1.949e-3	3	NC	1	2996.621	15
468			min	0	10	-.174	1	-.054	3	-4.634e-3	2	NC	1	597.571	2
469		7	max	.004	3	.008	5	.312	4	2.142e-3	3	NC	1	2530.278	15
470			min	-.001	2	-.208	1	-.062	3	-5.048e-3	2	8990.605	6	516.428	2
471		8	max	.005	3	.009	5	.361	4	2.334e-3	3	NC	1	2223.687	15
472			min	-.002	2	-.242	1	-.069	3	-5.462e-3	2	8257.108	5	463.11	2
473		9	max	.005	3	.011	5	.409	4	2.526e-3	3	NC	1	2020.144	15
474			min	-.003	2	-.275	1	-.074	3	-5.876e-3	2	7011.679	5	428.2	2
475		10	max	.005	3	.013	5	.455	4	2.718e-3	3	NC	1	1890.264	15
476			min	-.004	2	-.309	1	-.078	3	-6.29e-3	2	6042.675	5	406.9	2
477		11	max	.005	3	.015	5	.499	4	2.91e-3	3	NC	1	1819.281	15
478			min	-.004	2	-.342	1	-.08	3	-6.704e-3	2	5270.48	5	396.955	2
479		12	max	.006	3	.017	5	.541	4	3.102e-3	3	NC	1	1802.09	15
480			min	-.005	2	-.375	1	-.08	3	-7.119e-3	2	4643.788	5	397.903	2
481		13	max	.006	3	.019	5	.58	4	3.294e-3	3	NC	1	1842.375	15
482			min	-.006	2	-.407	1	-.077	3	-7.533e-3	2	4127.885	5	411.065	2
483		14	max	.006	3	.021	5	.616	4	3.486e-3	3	NC	1	1955.675	15
484			min	-.006	2	-.44	1	-.072	3	-7.947e-3	2	3698.349	5	440.36	2
485		15	max	.007	3	.023	5	.649	4	3.678e-3	3	NC	1	2180.127	15
486			min	-.007	2	-.472	1	-.064	3	-8.361e-3	2	3337.441	5	494.858	2
487		16	max	.007	3	.026	5	.678	4	3.871e-3	3	NC	1	2610.929	15
488			min	-.008	2	-.504	1	-.053	3	-8.775e-3	2	3031.948	5	596.822	2
489		17	max	.007	3	.028	5	.704	4	4.063e-3	3	NC	1	3539.98	15
490			min	-.009	2	-.536	1	-.039	3	-9.189e-3	2	2771.815	5	814.159	2
491		18	max	.008	3	.03	5	.726	4	4.255e-3	3	NC	1	6435.571	15
492			min	-.009	2	-.568	1	-.021	3	-9.604e-3	2	2549.266	5	1487.995	2
493		19	max	.008	3	.033	5	.743	4	4.447e-3	3	NC	1	NC	1
494			min	-.01	2	-.6	1	-.022	1	-1.002e-2	2	2358.204	5	NC	1