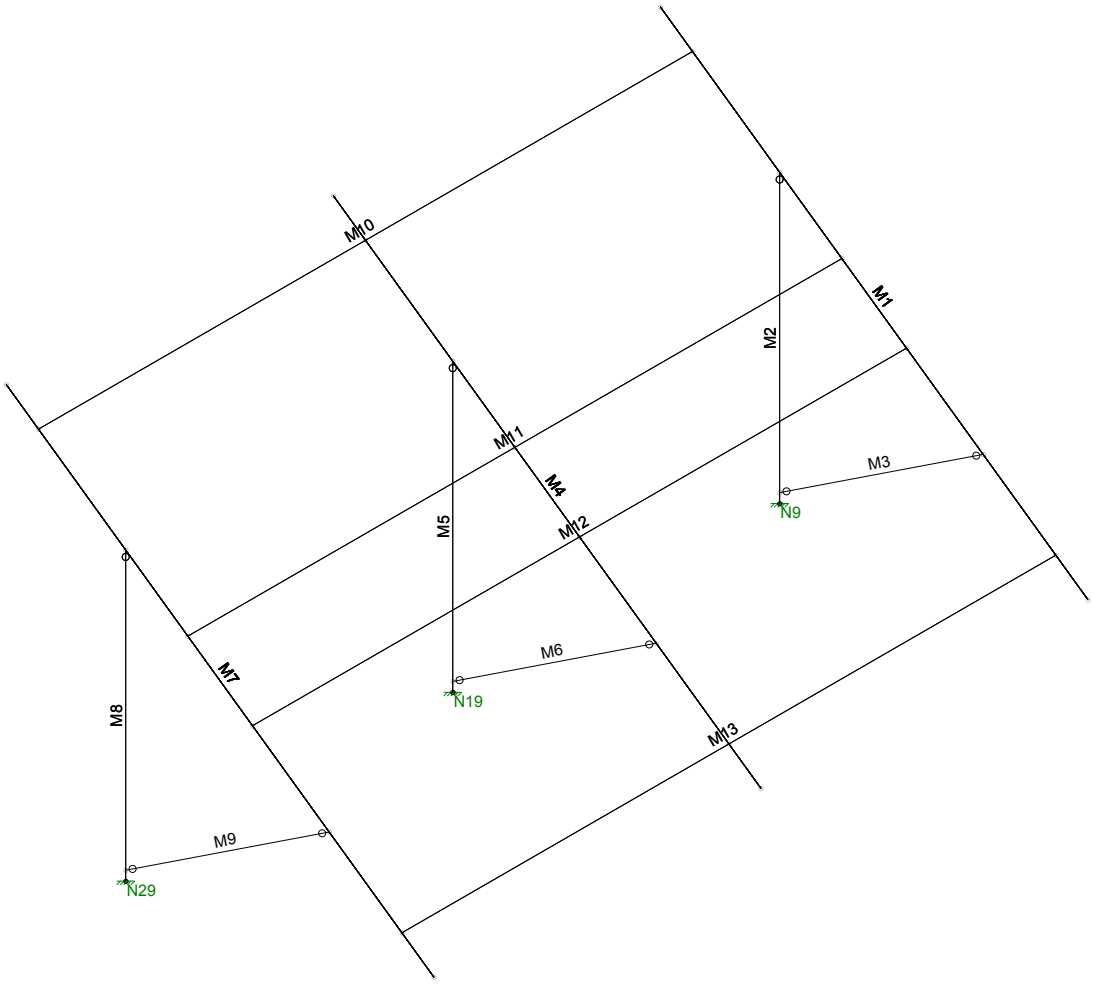


Schletter, Inc.		35° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

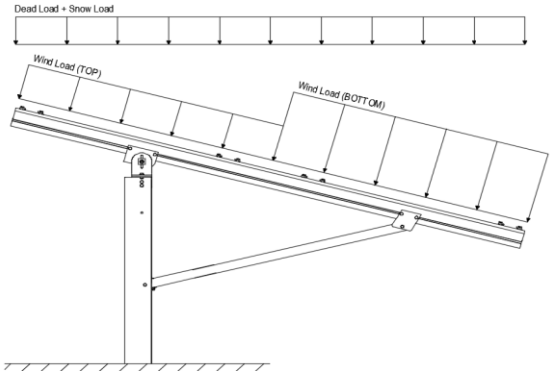
1.2 Construction

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 =	1700 mm	Height =	1550 mm
Width =	1050 mm	Width =	970 mm
Dead Load =	3.00 psf	Dead Load =	1.75 psf

Modules Per Row =	2
Module Tilt =	35°
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 =	14.43 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	0.64	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V =	110 mph	Exposure Category = C	
Height <	15 ft	Importance Category = II	
Peak Velocity Pressure, q_z =	19.00 psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*	

Pressure Coefficients

$Cf+_{TOP}$ =	1.2	*(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.*
$Cf+_{BOTTOM}$ =	2		
$Cf-_{TOP}$ =	-2.4	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1.2		

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

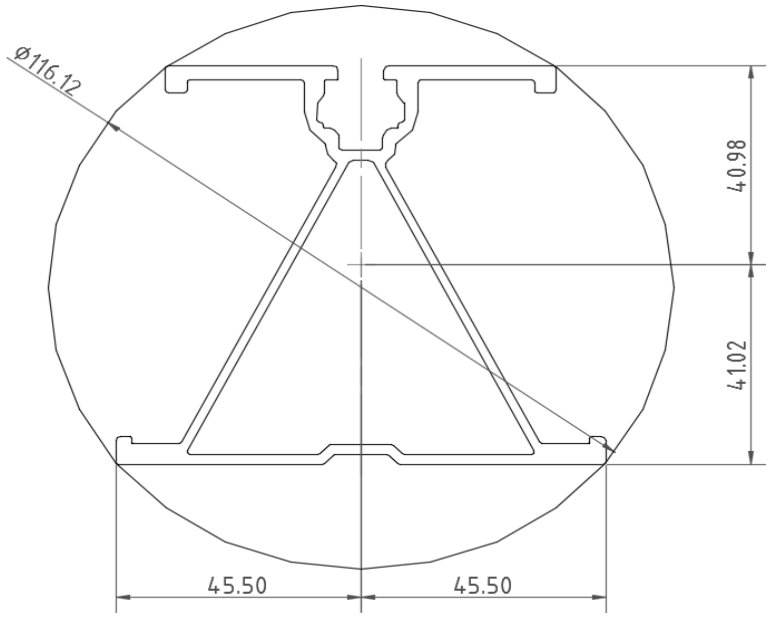
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	144	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 =	1.782	k-ft
M_z =	0.414	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	100%	

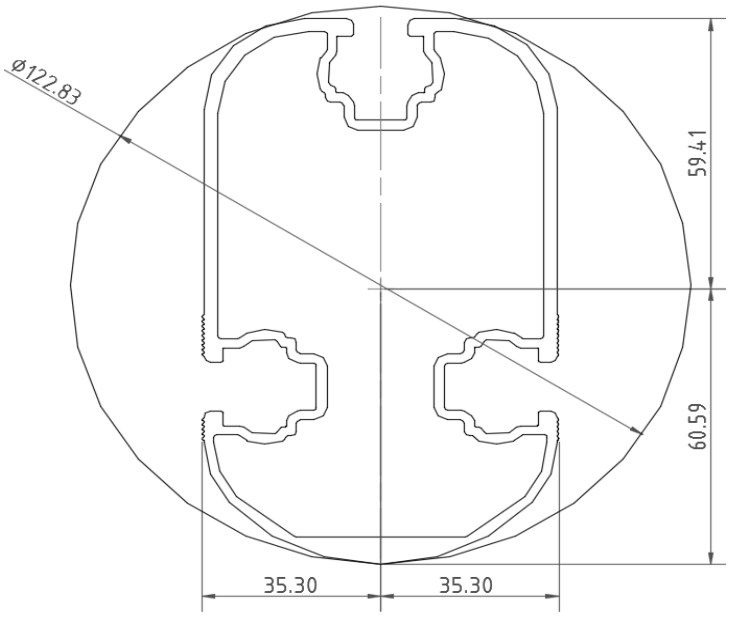


DETAIL VIEW

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 =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	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 =	3.774	k-ft
M_z =	0.000	k-ft
P_n =	0.019	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	75%	

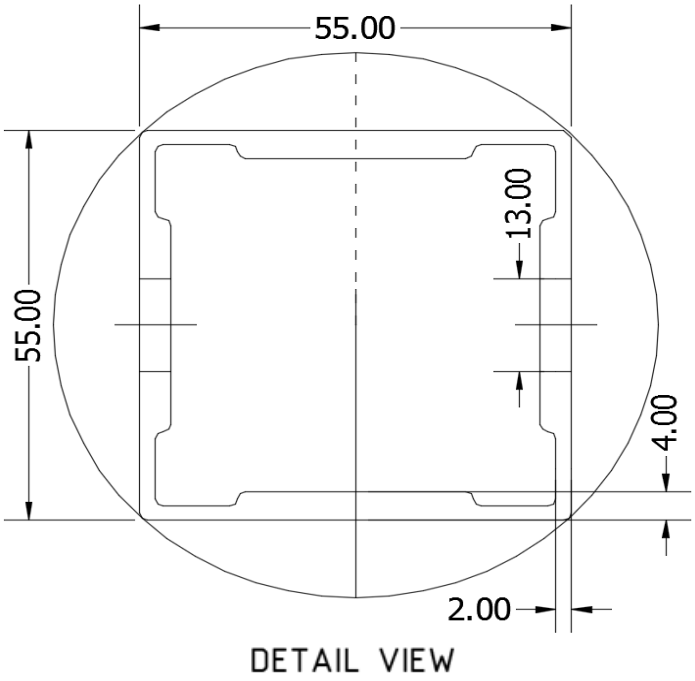


DETAIL VIEW

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).

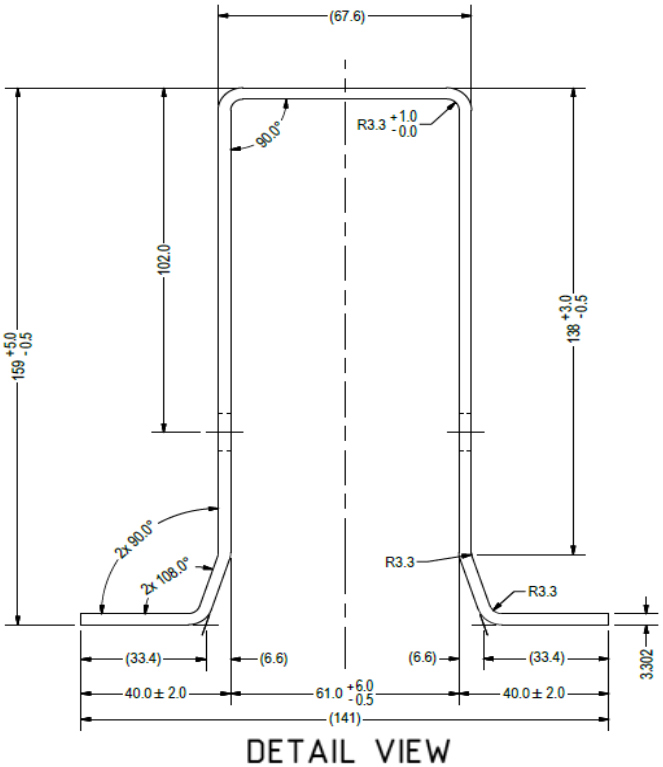
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.460	k-ft
P_n =	3.803	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	61%	



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 =	85.68	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 =	16.800	k-ft
M_z =	0.000	k-ft
P_r =	-4.146	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	28.060	k
Utilization =	99%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	5.36	k
Maximum Lateral Load =	3.88	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)

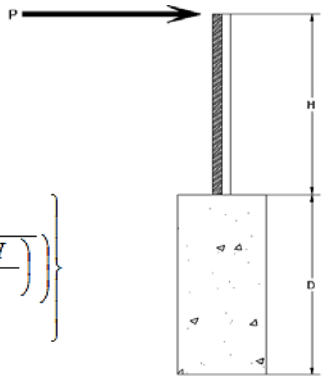
Lateral Force @ Top of Pole, P =	1.06	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft
Lateral Bearing @ Bottom =	S_3	
Lateral Bearing @ D/3 =	S_1	
Required Depth =	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 =	1.06	k
Height of Pole Above Grade, H =	7.14	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	4th Trial @ D_4 =	6.43	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf	Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf	Lateral Soil Bearing @ D, S_3 =	1.29	ksf
Constant 2.34P/(S_1B), A =	5.74		Constant 2.34P/(S_1B), A =	2.90	
Required Footing Depth, D =	10.14	ft	Required Footing Depth, D =	6.42	ft
2nd Trial @ D_2 =	6.69	ft	5th Trial @ D_5 =	6.42	ft
Lateral Soil Bearing @ D/3, S_1 =	0.45	ksf	Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf
Lateral Soil Bearing @ D, S_3 =	1.34	ksf	Lateral Soil Bearing @ D, S_3 =	1.28	ksf
Constant 2.34P/(S_1B), A =	2.78		Constant 2.34P/(S_1B), A =	2.90	
Required Footing Depth, D =	6.25	ft	Required Footing Depth, D =	6.50	ft
3rd Trial @ D_3 =	6.47	ft			
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf			
Lateral Soil Bearing @ D, S_3 =	1.29	ksf			
Constant 2.34P/(S_1B), A =	2.88				
Required Footing Depth, D =	6.39	ft			

A 2ft diameter x 6.5ft deep footing unrestrained at ground level is required for the racking structure.

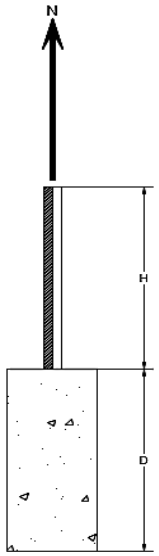
5.4 Uplifting Force Resistance

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 =	2.45	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 =	1.60	k
Required Concrete Volume, V =	11.02	ft^3
Required Footing Depth, D =	3.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.27
2	0.4	0.2	118.10	5.17
3	0.6	0.2	118.10	5.06
4	0.8	0.2	118.10	4.96
5	1	0.2	118.10	4.86
6	1.2	0.2	118.10	4.75
7	1.4	0.2	118.10	4.65
8	1.6	0.2	118.10	4.54
9	1.8	0.2	118.10	4.44
10	2	0.2	118.10	4.34
11	2.2	0.2	118.10	4.23
12	2.4	0.2	118.10	4.13
13	2.6	0.2	118.10	4.03
14	2.8	0.2	118.10	3.92
15	3	0.2	118.10	3.82
16	3.2	0.2	118.10	3.71
17	3.4	0.2	118.10	3.61
18	3.6	0.2	118.10	3.51
19	0	0.0	0.00	3.51
20	0	0.0	0.00	3.51
21	0	0.0	0.00	3.51
22	0	0.0	0.00	3.51
23	0	0.0	0.00	3.51
24	0	0.0	0.00	3.51
25	0	0.0	0.00	3.51
26	0	0.0	0.00	3.51
27	0	0.0	0.00	3.51
28	0	0.0	0.00	3.51
29	0	0.0	0.00	3.51
30	0	0.0	0.00	3.51
31	0	0.0	0.00	3.51
32	0	0.0	0.00	3.51
33	0	0.0	0.00	3.51
34	0	0.0	0.00	3.51
Max	3.6	Sum	0.85	

A 2ft diameter x 3.75ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.75	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	21.99	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

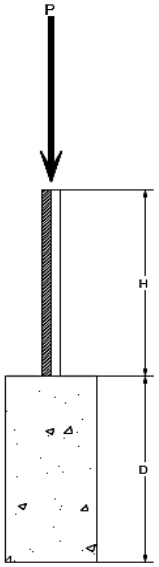
Weight of Concrete

Footing Volume	20.42	ft^3
Weight	2.96	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.30	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.68	k
Applied Force =	6.71	k
Utilization =	63%	

A 2ft diameter footing passes at a depth of 6.5ft.



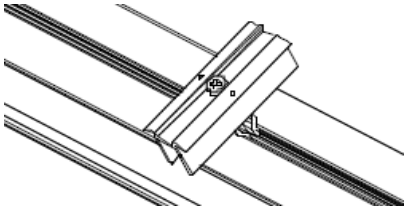
6. DESIGN OF JOINTS AND CONNECTIONS

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.

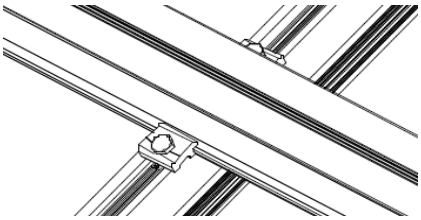
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.423 k
Allowable Uplift	=	1.214 k
Utilization	=	35%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.799 k
Allowable Uplift	=	2.180 k
Utilization	=	83%

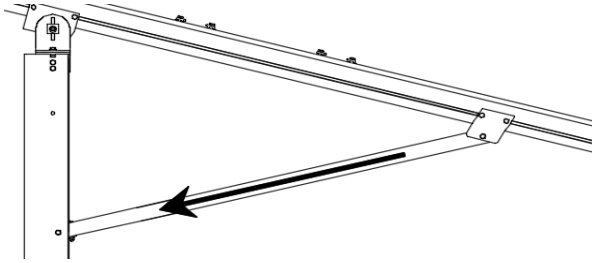


6.2 Strut Connections

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	=	3.803 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	43%

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

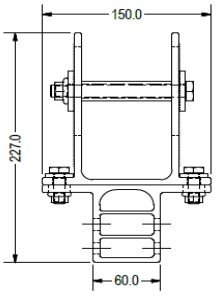


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

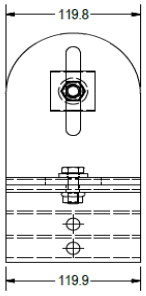
6.3 Girder to Post Connection

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.

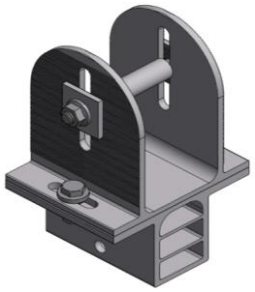
Maximum Tensile Load	=	3.830 k
Allowable Load	=	5.649 k
Utilization	=	68%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

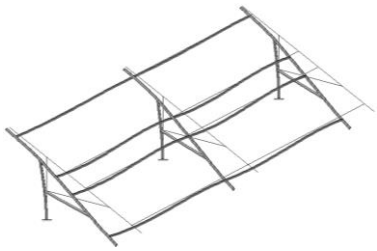
7.1 Seismic Drift

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}	=	77.78 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.556 in
Max Drift, Δ_{MAX}	=	0.862 in

0.862 ≤ 1.556, 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 =	144 in	L_b =	144
J =	0.432	J =	0.432
	398.372		253.34
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	26.8 ksi	φF_L=	28.2
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 = 63.8189 in
J = 1.98
82.1278

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

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 = 30.5 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 = 63.8189
J = 1.98
89.1294

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

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 = 30.3

3.4.16

b/t = 16.3333

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7
φF_L = φb[Bp-1.6Dp*b/t]
φF_L = 31.6 ksi

3.4.16.1 Used

Rb/t = 20.0

$$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$$

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= φb[Bt-Dt*√(Rb/t)]

φF_L= 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L St$= 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

$M_{max}St$ = 5.001 k-ft

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

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= 30.2 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 = 61

J = 0.942

95.1963

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

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= 30.2

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 = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

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

φF_L = 13.6667 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 = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	85.68	in	
Pr =	-4.15	k	(LRFD Factored Load)
Mr (Strong) =	16.80	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	123.28			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	16.52	ksi		
Fe =	18.83	ksi		
Pn =	36.831	k		

Torsional/Flexural Torsional Buckling:

Fcr =	12.5831	ksi
Fey =	48.0382	ksi
Fez =	16.1601	ksi
Pn =	28.0602	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1126	<	0.2	
Utilization =	0.99	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.113	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 99%

APPENDIX B

B.1

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

Basic Load Cases

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

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

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-8.366	-8.366	0	0
2	M11	Y	-8.366	-8.366	0	0
3	M12	Y	-8.366	-8.366	0	0
4	M13	Y	-8.366	-8.366	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	-4.45	-4.45	0	0
2	M11	Y	-4.45	-4.45	0	0
3	M12	Y	-4.45	-4.45	0	0
4	M13	Y	-4.45	-4.45	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	-32.97	-32.97	0	0
2	M11	Y	-32.97	-32.97	0	0
3	M12	Y	-32.97	-32.97	0	0
4	M13	Y	-32.97	-32.97	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	-63.577	-63.577	0	0
2	M11	y	-63.577	-63.577	0	0
3	M12	y	-105.961	-105.961	0	0
4	M13	y	-105.961	-105.961	0	0

Member Distributed Loads (BLC 5 : Wind Load - Suction)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	y	127.153	127.153	0	0
2	M11	y	127.153	127.153	0	0
3	M12	y	63.577	63.577	0	0
4	M13	y	63.577	63.577	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	6.693	6.693	0	0
2	M11	Z	6.693	6.693	0	0
3	M12	Z	6.693	6.693	0	0
4	M13	Z	6.693	6.693	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	887.911	2	2120.777	1	308.038	2	.449	2	.049	5	4.556	3
2		min	-1132.49	3	-1331.725	3	-388.136	5	-1.793	5	-.04	2	.18	10
3	N19	max	2891.843	2	5600.751	2	0	2	0	1	.053	4	9.981	3
4		min	-2986.135	3	-4108.157	3	-428.839	5	-1.894	4	0	3	.036	10
5	N29	max	887.911	2	2120.777	1	323.122	3	.532	3	.056	4	4.556	3
6		min	-1132.49	3	-1331.725	3	-456.034	4	-1.923	4	-.02	3	-.11	5
7	Totals:	max	4667.664	2	9818.722	1	0	1						
8		min	-5251.115	3	-6771.608	3	-1231.968	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	.006	1	.003	4	0	1	0	1	0	1
2			min	0	1	0	3	-.002	1	0	1	0	1	0	1
3		2	max	-.299	15	-.427	15	0	12	0	1	0	12	0	6
4			min	-1.274	6	-1.817	6	-1.498	5	0	1	0	5	0	15
5		3	max	-19.921	12	273.285	3	-23.478	12	.083	3	.333	1	.267	2
6			min	-220.809	1	-626.448	2	-175.137	1	-.288	2	.045	10	-.113	3
7		4	max	-20.417	12	272.222	3	-23.478	12	.083	3	.224	1	.657	2
8			min	-221.801	1	-627.866	2	-175.137	1	-.288	2	.028	10	-.282	3
9		5	max	-20.913	12	271.159	3	-23.478	12	.083	3	.115	1	1.047	2
10			min	-222.794	1	-629.283	2	-175.137	1	-.288	2	.011	10	-.451	3
11		6	max	141.736	3	559.163	2	10.152	3	.144	2	.116	2	1.001	2
12			min	-612.681	1	-176.192	3	-256.275	1	-.13	3	-.045	3	-.455	3
13		7	max	140.991	3	557.746	2	10.152	3	.144	2	.012	10	.655	2
14			min	-613.674	1	-177.255	3	-256.275	1	-.13	3	-.096	4	-.345	3
15		8	max	140.247	3	556.329	2	10.152	3	.144	2	-.021	12	.309	2
16			min	-614.666	1	-178.318	3	-256.275	1	-.13	3	-.205	1	-.235	3
17		9	max	109.039	3	85.639	3	-12.521	12	.021	5	.105	1	.109	1
18			min	-842.767	1	-71.313	2	-261.955	1	-.216	2	-.008	10	-.179	3
19		10	max	108.295	3	84.576	3	-12.521	12	.021	5	.064	3	.15	2
20			min	-843.76	1	-72.731	2	-261.955	1	-.216	2	-.064	4	-.232	3
21		11	max	107.551	3	83.512	3	-12.521	12	.021	5	.052	3	.195	2
22			min	-844.752	1	-74.148	2	-261.955	1	-.216	2	-.22	1	-.284	3
23		12	max	72.981	3	709.948	3	203.904	2	.456	3	.207	1	.407	2
24			min	-1070.128	1	-491.256	2	-404.839	3	-.416	2	-.086	5	-.579	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	72.236	3	708.885	3	203.904	2	.456	3	.259	1	.712	2
26			min	-1071.121	1	-492.673	2	-404.839	3	-.416	2	-.235	3	-1.02	3
27		14	max	223.703	1	441.532	2	81.223	5	.31	2	.192	3	1.006	2
28			min	12.204	15	-625.8	3	-129.012	3	-.51	3	-.224	4	-1.441	3
29		15	max	222.71	1	440.115	2	79.723	5	.31	2	.112	3	.732	2
30			min	11.905	15	-626.863	3	-129.012	3	-.51	3	-.22	1	-1.052	3
31		16	max	221.718	1	438.697	2	78.224	5	.31	2	.032	3	.459	2
32			min	11.605	15	-627.926	3	-129.012	3	-.51	3	-.29	1	-.663	3
33		17	max	220.725	1	437.28	2	76.724	5	.31	2	-.031	12	.188	2
34			min	11.306	15	-628.989	3	-129.012	3	-.51	3	-.36	1	-.273	3
35		18	max	1.274	4	1.819	6	1.501	4	0	1	0	12	0	6
36			min	.299	15	.428	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.004	2	.002	1	0	1	0	1	0	1
38			min	0	1	-.007	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.015	1	.003	4	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	-.299	15	-.427	15	0	1	0	1	0	1	0	6
42			min	-1.274	4	-1.815	6	-1.499	5	0	1	0	5	0	15
43		3	max	-12.315	12	867.557	3	0	1	.07	4	.225	4	.722	2
44			min	-453.558	1	-1850.087	2	-119.739	5	0	1	0	1	-.345	3
45		4	max	-12.811	12	866.494	3	0	1	.07	4	.151	4	1.871	2
46			min	-454.551	1	-1851.505	2	-121.239	5	0	1	0	1	-.883	3
47		5	max	-13.307	12	865.431	3	0	1	.07	4	.076	4	3.021	2
48			min	-455.543	1	-1852.922	2	-122.738	5	0	1	0	1	-1.421	3
49		6	max	594.213	3	1681.845	2	0	1	0	1	0	1	2.874	2
50			min	-1605.038	2	-663.166	3	-89.774	4	-.063	4	-.046	5	-1.397	3
51		7	max	593.469	3	1680.427	2	0	1	0	1	0	1	1.83	2
52			min	-1606.031	2	-664.229	3	-91.274	4	-.063	4	-.101	4	-.985	3
53		8	max	592.725	3	1679.01	2	0	1	0	1	0	1	.788	2
54			min	-1607.023	2	-665.292	3	-92.773	4	-.063	4	-.158	4	-.573	3
55		9	max	579.139	3	222.193	3	0	1	.019	4	.071	5	.172	1
56			min	-2038.453	1	-182.103	1	-208.446	4	0	1	0	1	-.366	3
57		10	max	578.395	3	221.13	3	0	1	.019	4	0	1	.286	1
58			min	-2039.445	1	-183.521	1	-209.945	4	0	1	-.059	4	-.504	3
59		11	max	577.65	3	220.067	3	0	1	.019	4	0	1	.4	1
60			min	-2040.438	1	-184.938	1	-211.445	4	0	1	-.19	4	-.641	3
61		12	max	570.789	3	1907.284	3	0	1	.194	4	0	1	.997	1
62			min	-2481.884	1	-1442.433	2	-252.022	5	0	1	-.081	4	-1.457	3
63		13	max	570.045	3	1906.22	3	0	1	.194	4	0	1	1.891	2
64			min	-2482.876	1	-1443.85	2	-253.522	5	0	1	-.237	4	-2.64	3
65		14	max	456.703	1	1224.642	2	82.481	5	0	1	0	1	2.751	2
66			min	13.722	12	-1680.088	3	0	1	-.14	4	-.159	5	-3.774	3
67		15	max	455.71	1	1223.224	2	80.981	5	0	1	0	1	1.991	2
68			min	13.226	12	-1681.151	3	0	1	-.14	4	-.108	5	-2.731	3
69		16	max	454.718	1	1221.807	2	79.481	5	0	1	0	1	1.232	2
70			min	12.729	12	-1682.214	3	0	1	-.14	4	-.059	5	-1.687	3
71		17	max	453.725	1	1220.389	2	77.982	5	0	1	0	1	.475	2
72			min	12.233	12	-1683.277	3	0	1	-.14	4	-.01	5	-.643	3
73		18	max	1.274	6	1.821	6	1.5	4	0	1	0	1	0	6
74			min	.299	15	.428	15	0	1	0	1	0	4	0	15
75		19	max	0	1	.011	2	0	4	0	1	0	1	0	1
76			min	0	1	-.017	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.005	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.299	15	-.428	15	.002	1	0	1	0	1	0	4
80			min	-1.274	6	-1.817	4	-1.498	5	0	1	0	5	0	15
81		3	max	4.012	5	273.285	3	175.137	1	.288	2	.091	5	.267	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	-220.809	1	-626.448	2	-52.681	5	-.083	3	-.333	1	-.113	3
83		4	max	3.549	5	272.222	3	175.137	1	.288	2	.058	5	.657	2
84			min	-221.801	1	-627.866	2	-54.181	5	-.083	3	-.224	1	-.282	3
85		5	max	3.086	5	271.159	3	175.137	1	.288	2	.024	5	1.047	2
86			min	-222.794	1	-629.283	2	-55.68	5	-.083	3	-.115	1	-.451	3
87		6	max	141.736	3	559.163	2	256.275	1	.13	3	.045	3	1.001	2
88			min	-612.681	1	-176.192	3	-21.494	5	-.144	2	-.116	2	-.455	3
89		7	max	140.991	3	557.746	2	256.275	1	.13	3	.046	1	.655	2
90			min	-613.674	1	-177.255	3	-22.994	5	-.144	2	-.068	5	-.345	3
91		8	max	140.247	3	556.329	2	256.275	1	.13	3	.205	1	.309	2
92			min	-614.666	1	-178.318	3	-24.493	5	-.144	2	-.083	5	-.235	3
93		9	max	109.039	3	85.639	3	261.955	1	.216	2	.008	10	.109	1
94			min	-842.767	1	-71.313	2	-88.006	5	.019	15	-.105	1	-.179	3
95		10	max	108.295	3	84.576	3	261.955	1	.216	2	.064	2	.15	2
96			min	-843.76	1	-72.731	2	-89.505	5	.019	15	-.064	3	-.232	3
97		11	max	107.551	3	83.512	3	261.955	1	.216	2	.22	1	.195	2
98			min	-844.752	1	-74.148	2	-91.005	5	.019	15	-.106	5	-.284	3
99		12	max	72.981	3	709.948	3	404.839	3	.416	2	-.011	12	.407	2
100			min	-1070.128	1	-491.256	2	-216.079	5	-.456	3	-.207	1	-.579	3
101		13	max	72.236	3	708.885	3	404.839	3	.416	2	.235	3	.712	2
102			min	-1071.121	1	-492.673	2	-217.579	5	-.456	3	-.303	4	-1.02	3
103		14	max	223.703	1	441.532	2	140.395	4	.51	3	.154	2	1.006	2
104			min	15.052	15	-625.8	3	-10.853	10	-.31	2	-.192	3	-1.441	3
105		15	max	222.71	1	440.115	2	138.895	4	.51	3	.22	1	.732	2
106			min	14.753	15	-626.863	3	-10.853	10	-.31	2	-.119	5	-1.052	3
107		16	max	221.718	1	438.697	2	137.396	4	.51	3	.29	1	.459	2
108			min	14.453	15	-627.926	3	-10.853	10	-.31	2	-.055	5	-.663	3
109		17	max	220.725	1	437.28	2	135.896	4	.51	3	.36	1	.188	2
110			min	14.154	15	-628.989	3	-10.853	10	-.31	2	.004	15	-.273	3
111		18	max	1.274	6	1.82	4	1.5	5	0	1	0	1	0	4
112			min	.299	15	.428	15	-.002	1	0	1	0	5	0	15
113		19	max	0	1	.004	2	0	5	0	1	0	1	0	1
114			min	0	1	-.007	3	-.002	1	0	1	0	1	0	1
115	M10	1	max	132.917	4	433.993	2	-13.559	15	.01	2	.405	1	.31	2
116			min	-10.857	10	-631.34	3	-218.844	1	-.019	3	.032	15	-.51	3
117		2	max	129.028	3	318.282	2	-10.826	15	.01	2	.147	1	.223	3
118			min	-10.857	10	-467.655	3	-169.443	1	-.019	3	.016	15	-.199	1
119		3	max	129.028	3	202.572	2	-8.094	15	.01	2	.033	3	.737	3
120			min	-10.857	10	-303.971	3	-120.042	1	-.019	3	-.046	1	-.539	2
121		4	max	129.028	3	86.861	2	-5.361	15	.01	2	.007	3	1.033	3
122			min	-10.857	10	-140.286	3	-70.64	1	-.019	3	-.174	1	-.732	2
123		5	max	129.028	3	23.399	3	-2.514	10	.01	2	-.009	12	1.111	3
124			min	-10.857	10	-32.779	1	-21.239	1	-.019	3	-.235	1	-.771	2
125		6	max	129.028	3	187.083	3	28.162	1	.01	2	-.013	15	.971	3
126			min	-10.857	10	-145.716	1	-9.123	3	-.019	3	-.23	1	-.655	2
127		7	max	129.028	3	350.768	3	77.563	1	.01	2	-.011	15	.612	3
128			min	-10.857	10	-260.27	2	-5.025	3	-.019	3	-.16	1	-.385	2
129		8	max	129.028	3	514.452	3	126.964	1	.01	2	-.001	10	.063	1
130			min	-10.857	10	-375.981	2	-.927	3	-.019	3	-.042	3	-.025	5
131		9	max	129.028	3	678.137	3	176.365	1	.01	2	.179	1	.634	1
132			min	-11.851	5	-491.691	2	2.79	12	-.019	3	-.04	3	-.759	3
133		10	max	129.028	3	607.402	2	5.523	12	.019	3	.447	1	1.355	1
134			min	-10.857	10	-841.821	3	-225.766	1	-.01	2	-.033	3	-1.773	3
135		11	max	129.028	3	491.691	2	-2.79	12	.019	3	.179	1	.634	1
136			min	-10.857	10	-678.137	3	-176.365	1	-.01	2	-.04	3	-.759	3
137		12	max	129.028	3	375.981	2	.927	3	.019	3	.003	5	.063	1
138			min	-10.857	10	-514.452	3	-126.964	1	-.01	2	-.042	3	.017	10

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	129.028	3	260.27	2	5.025	3	.019	3	-.007	15	.612	3
140			min	-10.857	10	-350.768	3	-77.563	1	-.01	2	-.16	1	-.385	2
141		14	max	129.028	3	145.716	1	9.123	3	.019	3	-.013	15	.971	3
142			min	-10.857	10	-187.083	3	-28.162	1	-.01	2	-.23	1	-.655	2
143		15	max	129.028	3	32.779	1	21.239	1	.019	3	-.009	12	1.111	3
144			min	-18.98	5	-23.399	3	-.256	5	-.01	2	-.235	1	-.771	2
145		16	max	129.028	3	140.286	3	70.64	1	.019	3	.007	3	1.033	3
146			min	-32.667	5	-86.861	2	2.51	15	-.01	2	-.174	1	-.732	2
147		17	max	129.028	3	303.971	3	120.042	1	.019	3	.033	3	.737	3
148			min	-46.354	5	-202.572	2	5.242	15	-.01	2	-.046	1	-.539	2
149		18	max	129.028	3	467.655	3	169.443	1	.019	3	.147	1	.223	3
150			min	-60.041	5	-318.282	2	7.975	15	-.01	2	0	15	-.199	1
151		19	max	129.028	3	631.34	3	218.844	1	.019	3	.405	1	.31	2
152			min	-73.728	5	-433.993	2	10.707	15	-.01	2	.013	15	-.51	3
153	M11	1	max	344.902	1	414.491	2	2.246	5	0	10	.452	1	.227	1
154			min	-386.782	3	-627.364	3	-224.703	1	-.005	3	-.092	5	-.589	3
155		2	max	344.902	1	298.78	2	6.473	5	0	10	.185	1	.138	3
156			min	-386.782	3	-463.68	3	-175.302	1	-.005	3	-.086	5	-.275	2
157		3	max	344.902	1	183.07	2	10.7	5	0	10	.051	3	.647	3
158			min	-386.782	3	-299.995	3	-125.901	1	-.005	3	-.077	4	-.597	2
159		4	max	344.902	1	68.904	1	14.927	5	0	10	.021	3	.938	3
160			min	-386.782	3	-136.311	3	-76.5	1	-.005	3	-.15	1	-.764	2
161		5	max	344.902	1	27.374	3	19.155	5	0	10	-.004	12	1.011	3
162			min	-386.782	3	-48.351	2	-27.099	1	-.005	3	-.219	1	-.776	2
163		6	max	344.902	1	191.058	3	28.794	4	0	10	-.004	15	.865	3
164			min	-386.782	3	-164.062	2	-12.546	3	-.005	3	-.223	1	-.635	2
165		7	max	344.902	1	354.743	3	71.704	1	0	10	.028	5	.501	3
166			min	-386.782	3	-279.772	2	-8.448	3	-.005	3	-.16	1	-.339	2
167		8	max	344.902	1	518.427	3	121.105	1	0	10	.067	5	.111	2
168			min	-386.782	3	-395.483	2	-4.349	3	-.005	3	-.046	3	-.081	3
169		9	max	344.902	1	682.112	3	170.506	1	0	10	.163	1	.716	2
170			min	-386.782	3	-511.193	2	-.251	3	-.005	3	-.049	3	-.881	3
171		10	max	344.902	1	626.904	2	2.831	5	.005	3	.423	1	1.475	2
172			min	-386.782	3	-845.797	3	-219.907	1	-.001	14	-.047	3	-1.9	3
173		11	max	344.902	1	511.193	2	7.058	5	.005	3	.163	1	.716	2
174			min	-386.782	3	-682.112	3	-170.506	1	0	5	-.085	5	-.881	3
175		12	max	344.902	1	395.483	2	11.285	5	.005	3	-.002	10	.111	2
176			min	-386.782	3	-518.427	3	-121.105	1	0	5	-.082	4	-.081	3
177		13	max	344.902	1	279.772	2	15.512	5	.005	3	-.023	10	.501	3
178			min	-386.782	3	-354.743	3	-71.704	1	0	5	-.16	1	-.339	2
179		14	max	344.902	1	164.062	2	19.74	5	.005	3	-.016	12	.865	3
180			min	-386.782	3	-191.058	3	-22.302	1	0	5	-.223	1	-.635	2
181		15	max	344.902	1	48.351	2	31.13	4	.005	3	-.001	15	1.011	3
182			min	-386.782	3	-27.374	3	2.824	10	0	5	-.219	1	-.776	2
183		16	max	344.902	1	136.311	3	76.5	1	.005	3	.032	5	.938	3
184			min	-386.782	3	-68.904	1	10.372	10	0	5	-.15	1	-.764	2
185		17	max	344.902	1	299.995	3	125.901	1	.005	3	.073	5	.647	3
186			min	-386.782	3	-183.07	2	15.701	12	0	5	-.015	1	-.597	2
187		18	max	344.902	1	463.68	3	175.302	1	.005	3	.185	1	.138	3
188			min	-386.782	3	-298.78	2	18.433	12	0	5	.021	10	-.275	2
189		19	max	344.902	1	627.364	3	224.703	1	.005	3	.452	1	.227	1
190			min	-386.782	3	-414.491	2	21.166	12	0	5	.06	10	-.589	3
191	M12	1	max	61.972	5	625.387	2	6.708	5	0	10	.471	1	.359	2
192			min	-28.185	3	-265.083	3	-227.104	1	-.004	3	-.118	5	.003	12
193		2	max	55.688	2	453.164	2	10.936	5	0	10	.201	1	.304	3
194			min	-28.185	3	-186.166	3	-177.702	1	-.004	3	-.106	5	-.36	2
195		3	max	55.688	2	280.942	2	15.163	5	0	10	.037	3	.5	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	-28.185	3	-107.25	3	-128.301	1	-.004	3	-.09	4	-.849	2
197		4	max	55.688	2	108.719	2	19.39	5	0	10	.01	3	.59	3
198			min	-28.185	3	-28.333	3	-78.9	1	-.004	3	-.141	1	-1.109	2
199		5	max	55.688	2	50.583	3	23.617	5	0	10	-.008	12	.576	3
200			min	-28.185	3	-63.503	2	-29.499	1	-.004	3	-.213	1	-1.139	2
201		6	max	55.688	2	129.5	3	32.964	4	0	10	-.001	15	.456	3
202			min	-28.185	3	-235.726	2	-9.915	3	-.004	3	-.219	1	-.94	2
203		7	max	55.688	2	208.416	3	69.303	1	0	10	.037	5	.23	3
204			min	-31.874	14	-407.948	2	-5.817	3	-.004	3	-.16	1	-.511	2
205		8	max	55.688	2	287.333	3	118.704	1	0	10	.083	5	.148	2
206			min	-44.305	4	-580.171	2	-1.718	3	-.004	3	-.043	3	-.1	3
207		9	max	55.688	2	366.25	3	168.105	1	0	10	.174	4	1.037	2
208			min	-57.992	4	-752.393	2	2.263	12	-.004	3	-.042	3	-.536	3
209		10	max	55.688	2	924.616	2	135.713	14	.004	3	.414	1	2.155	2
210			min	-71.679	4	-445.166	3	-217.506	1	-.002	1	-.036	3	-1.077	3
211		11	max	55.688	2	752.393	2	11.756	5	.004	3	.157	1	1.037	2
212			min	-28.185	3	-366.25	3	-168.105	1	0	5	-.108	5	-.536	3
213		12	max	55.688	2	580.171	2	15.983	5	.004	3	-.004	10	.148	2
214			min	-28.185	3	-287.333	3	-118.704	1	0	5	-.098	4	-.1	3
215		13	max	55.688	2	407.948	2	20.211	5	.004	3	-.023	10	.23	3
216			min	-28.185	3	-208.416	3	-69.303	1	0	5	-.16	1	-.511	2
217		14	max	55.688	2	235.726	2	24.438	5	.004	3	-.018	12	.456	3
218			min	-28.185	3	-129.5	3	-19.902	1	0	5	-.219	1	-.94	2
219		15	max	55.688	2	63.503	2	36.225	4	.004	3	0	15	.576	3
220			min	-29.506	14	-50.583	3	4.272	10	0	5	-.213	1	-1.139	2
221		16	max	55.688	2	28.333	3	78.9	1	.004	3	.041	5	.59	3
222			min	-39.346	4	-108.719	2	11.397	12	0	5	-.141	1	-1.109	2
223		17	max	55.688	2	107.25	3	128.301	1	.004	3	.088	5	.5	3
224			min	-53.032	4	-280.942	2	14.13	12	0	5	-.003	1	-.849	2
225		18	max	55.688	2	186.166	3	177.702	1	.004	3	.201	1	.304	3
226			min	-66.719	4	-453.164	2	16.862	12	0	5	.03	10	-.36	2
227		19	max	55.688	2	265.083	3	227.104	1	.004	3	.471	1	.359	2
228			min	-80.406	4	-625.387	2	19.594	12	0	5	.067	12	-.065	5
229	M13	1	max	49.663	5	624.191	2	4.941	5	.003	3	.404	1	.288	2
230			min	-174.943	1	-275.412	3	-218.658	1	-.013	2	-.113	5	-.083	3
231		2	max	35.976	5	451.969	2	9.168	5	.003	3	.145	1	.231	3
232			min	-174.943	1	-196.495	3	-169.257	1	-.013	2	-.103	5	-.429	2
233		3	max	22.289	5	279.746	2	13.396	5	.003	3	.031	3	.441	3
234			min	-174.943	1	-117.579	3	-119.856	1	-.013	2	-.1	4	-.917	2
235		4	max	8.602	5	107.524	2	17.623	5	.003	3	.006	3	.545	3
236			min	-174.943	1	-38.662	3	-70.455	1	-.013	2	-.175	1	-1.175	2
237		5	max	-2.995	15	40.254	3	21.85	5	.003	3	-.01	12	.544	3
238			min	-174.943	1	-64.699	2	-21.053	1	-.013	2	-.236	1	-1.204	2
239		6	max	-12.207	15	119.171	3	33.109	4	.003	3	-.006	15	.437	3
240			min	-174.943	1	-236.921	2	-8.844	3	-.013	2	-.231	1	-1.002	2
241		7	max	-21.419	15	198.087	3	77.749	1	.003	3	.028	5	.226	3
242			min	-174.943	1	-409.144	2	-4.746	3	-.013	2	-.16	1	-.572	2
243		8	max	-23.478	12	277.004	3	127.15	1	.003	3	.071	5	.089	2
244			min	-174.943	1	-581.366	2	-.648	3	-.013	2	-.041	3	-.091	3
245		9	max	-23.478	12	355.92	3	176.551	1	.003	3	.179	1	.979	2
246			min	-174.943	1	-753.589	2	2.958	12	-.013	2	-.039	3	-.513	3
247		10	max	-23.478	12	925.811	2	138.846	14	0	15	.447	1	2.098	2
248			min	-174.943	1	-434.837	3	-225.952	1	-.013	2	-.032	3	-1.04	3
249		11	max	29.732	5	753.589	2	8.648	5	.013	2	.179	1	.979	2
250			min	-174.943	1	-355.92	3	-176.551	1	-.003	3	-.09	5	-.513	3
251		12	max	16.045	5	581.366	2	12.875	5	.013	2	-.001	10	.089	2
252			min	-174.943	1	-277.004	3	-127.15	1	-.003	3	-.082	4	-.091	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
253		13	max	2.358	5	409.144	2	17.102	5	.013	2	-.023	10	.226	3
254			min	-174.943	1	-198.087	3	-77.749	1	-.003	3	-.16	1	-.572	2
255		14	max	-7.182	15	236.921	2	21.329	5	.013	2	-.019	12	.437	3
256			min	-174.943	1	-119.171	3	-28.348	1	-.003	3	-.231	1	-1.002	2
257		15	max	-16.394	15	64.699	2	31.067	4	.013	2	.001	15	.544	3
258			min	-174.943	1	-40.254	3	2.389	10	-.003	3	-.236	1	-1.204	2
259		16	max	-23.478	12	38.662	3	70.455	1	.013	2	.038	5	.545	3
260			min	-174.943	1	-107.524	2	9.938	10	-.003	3	-.175	1	-1.175	2
261		17	max	-23.478	12	117.579	3	119.856	1	.013	2	.081	5	.441	3
262			min	-174.943	1	-279.746	2	13.435	12	-.003	3	-.048	1	-.917	2
263		18	max	-23.478	12	196.495	3	169.257	1	.013	2	.166	4	.231	3
264			min	-174.943	1	-451.969	2	16.167	12	-.003	3	.018	10	-.429	2
265		19	max	-23.478	12	275.412	3	218.658	1	.013	2	.404	1	.288	2
266			min	-174.943	1	-624.191	2	18.899	12	-.003	3	.056	10	-.083	3
267	M2	1	max	2120.777	1	1132.156	3	308.164	2	.049	5	1.793	5	4.556	3
268			min	-1331.725	3	-887.893	2	-388.171	5	-.04	2	-.449	2	.18	10
269		2	max	1537.642	1	728.768	3	211.431	2	.002	2	1.625	5	4.226	3
270			min	-1074.926	3	48.966	10	-350.665	5	-.001	3	-.342	2	.284	10
271		3	max	1534.535	1	728.768	3	211.431	2	.002	2	1.506	5	3.977	3
272			min	-1077.255	3	48.966	10	-347.973	5	-.001	3	-.27	2	.267	10
273		4	max	1531.429	1	728.768	3	211.431	2	.002	2	1.388	5	3.729	3
274			min	-1079.585	3	48.966	10	-345.281	5	-.001	3	-.202	1	.251	10
275		5	max	1528.323	1	728.768	3	211.431	2	.002	2	1.271	5	3.48	3
276			min	-1081.915	3	48.966	10	-342.589	5	-.001	3	-.136	1	.234	10
277		6	max	1525.217	1	728.768	3	211.431	2	.002	2	1.154	5	3.232	3
278			min	-1084.244	3	48.966	10	-339.897	5	-.001	3	-.069	1	.217	10
279		7	max	1522.111	1	728.768	3	211.431	2	.002	2	1.046	4	2.983	3
280			min	-1086.574	3	48.966	10	-337.205	5	-.001	3	-.048	3	.2	10
281		8	max	1519.005	1	728.768	3	211.431	2	.002	2	.94	4	2.734	3
282			min	-1088.903	3	48.966	10	-334.513	5	-.001	3	-.142	3	.184	10
283		9	max	1515.899	1	728.768	3	211.431	2	.002	2	.835	4	2.486	3
284			min	-1091.233	3	48.966	10	-331.821	5	-.001	3	-.237	3	.167	10
285		10	max	1512.793	1	728.768	3	211.431	2	.002	2	.731	4	2.237	3
286			min	-1093.562	3	48.966	10	-329.129	5	-.001	3	-.331	3	.15	10
287		11	max	1509.687	1	728.768	3	211.431	2	.002	2	.628	4	1.989	3
288			min	-1095.892	3	48.966	10	-326.437	5	-.001	3	-.425	3	.134	10
289		12	max	1506.581	1	728.768	3	211.431	2	.002	2	.526	4	1.74	3
290			min	-1098.222	3	48.966	10	-323.745	5	-.001	3	-.519	3	.117	10
291		13	max	1503.475	1	728.768	3	211.431	2	.002	2	.451	2	1.492	3
292			min	-1100.551	3	48.966	10	-321.053	5	-.001	3	-.613	3	.1	10
293		14	max	1500.368	1	728.768	3	211.431	2	.002	2	.523	2	1.243	3
294			min	-1102.881	3	48.966	10	-318.362	5	-.001	3	-.707	3	.084	10
295		15	max	1497.262	1	728.768	3	211.431	2	.002	2	.595	2	.994	3
296			min	-1105.21	3	48.966	10	-315.67	5	-.001	3	-.801	3	.067	10
297		16	max	1494.156	1	728.768	3	211.431	2	.002	2	.668	2	.746	3
298			min	-1107.54	3	48.966	10	-312.978	5	-.001	3	-.895	3	.05	10
299		17	max	1491.05	1	728.768	3	211.431	2	.002	2	.74	2	.497	3
300			min	-1109.869	3	48.966	10	-310.286	5	-.001	3	-.99	3	.033	10
301		18	max	1487.944	1	728.768	3	211.431	2	.002	2	.812	2	.249	3
302			min	-1112.199	3	48.966	10	-307.594	5	-.001	3	-1.084	3	.017	10
303		19	max	1484.838	1	728.768	3	211.431	2	.002	2	.884	2	0	1
304			min	-1114.528	3	48.966	10	-304.902	5	-.001	3	-1.178	3	0	1
305	M5	1	max	5600.751	2	2983.802	3	0	1	.053	4	1.894	4	9.981	3
306			min	-4108.157	3	-2892.159	2	-428.918	5	0	1	0	1	.036	10
307		2	max	3885.417	1	1579.444	3	0	1	0	1	1.713	4	9.159	3
308			min	-3219.233	3	57.992	15	-388.385	4	0	4	0	1	.336	15
309		3	max	3882.311	1	1579.444	3	0	1	0	1	1.581	4	8.62	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
310			min	-3221.562	3	57.992	15	-385.693	4	0	4	0	1	.317	15
311		4	max	3879.204	1	1579.444	3	0	1	0	1	1.45	4	8.081	3
312			min	-3223.892	3	57.992	15	-383.001	4	0	4	0	1	.297	15
313		5	max	3876.098	1	1579.444	3	0	1	0	1	1.319	4	7.543	3
314			min	-3226.221	3	57.992	15	-380.31	4	0	4	0	1	.277	15
315		6	max	3872.992	1	1579.444	3	0	1	0	1	1.19	4	7.004	3
316			min	-3228.551	3	57.992	15	-377.618	4	0	4	0	1	.257	15
317		7	max	3869.886	1	1579.444	3	0	1	0	1	1.062	4	6.465	3
318			min	-3230.88	3	57.992	15	-374.926	4	0	4	0	1	.237	15
319		8	max	3866.78	1	1579.444	3	0	1	0	1	.934	4	5.926	3
320			min	-3233.21	3	57.992	15	-372.234	4	0	4	0	1	.218	15
321		9	max	3863.674	1	1579.444	3	0	1	0	1	.808	4	5.388	3
322			min	-3235.54	3	57.992	15	-369.542	4	0	4	0	1	.198	15
323		10	max	3860.568	1	1579.444	3	0	1	0	1	.682	4	4.849	3
324			min	-3237.869	3	57.992	15	-366.85	4	0	4	0	1	.178	15
325		11	max	3857.462	1	1579.444	3	0	1	0	1	.558	4	4.31	3
326			min	-3240.199	3	57.992	15	-364.158	4	0	4	0	1	.158	15
327		12	max	3854.356	1	1579.444	3	0	1	0	1	.434	4	3.771	3
328			min	-3242.528	3	57.992	15	-361.466	4	0	4	0	1	.138	15
329		13	max	3851.25	1	1579.444	3	0	1	0	1	.311	4	3.233	3
330			min	-3244.858	3	57.992	15	-358.774	4	0	4	0	1	.119	15
331		14	max	3848.144	1	1579.444	3	0	1	0	1	.189	4	2.694	3
332			min	-3247.187	3	57.992	15	-356.082	4	0	4	0	1	.099	15
333		15	max	3845.037	1	1579.444	3	0	1	0	1	.068	4	2.155	3
334			min	-3249.517	3	57.992	15	-353.39	4	0	4	0	1	.079	15
335		16	max	3841.931	1	1579.444	3	0	1	0	1	0	1	1.616	3
336			min	-3251.847	3	57.992	15	-350.698	4	0	4	-.052	5	.059	15
337		17	max	3838.825	1	1579.444	3	0	1	0	1	0	1	1.078	3
338			min	-3254.176	3	57.992	15	-348.006	4	0	4	-.171	4	.04	15
339		18	max	3835.719	1	1579.444	3	0	1	0	1	0	1	.539	3
340			min	-3256.506	3	57.992	15	-345.314	4	0	4	-.289	4	.02	15
341		19	max	3832.613	1	1579.444	3	0	1	0	1	0	1	0	1
342			min	-3258.835	3	57.992	15	-342.622	4	0	4	-.407	4	0	1
343	M8	1	max	2120.777	1	1132.156	3	323.026	3	.056	4	1.923	4	4.556	3
344			min	-1331.725	3	-887.893	2	-456.171	4	-.02	3	-.532	3	-.11	5
345		2	max	1537.642	1	728.768	3	275.965	3	.001	3	1.731	4	4.226	3
346			min	-1074.926	3	-16.007	5	-402.909	4	-.002	2	-.422	3	-.093	5
347		3	max	1534.535	1	728.768	3	275.965	3	.001	3	1.594	4	3.977	3
348			min	-1077.255	3	-16.007	5	-400.217	4	-.002	2	-.328	3	-.087	5
349		4	max	1531.429	1	728.768	3	275.965	3	.001	3	1.458	4	3.729	3
350			min	-1079.585	3	-16.007	5	-397.525	4	-.002	2	-.234	3	-.082	5
351		5	max	1528.323	1	728.768	3	275.965	3	.001	3	1.323	4	3.48	3
352			min	-1081.915	3	-16.007	5	-394.833	4	-.002	2	-.14	3	-.076	5
353		6	max	1525.217	1	728.768	3	275.965	3	.001	3	1.189	4	3.232	3
354			min	-1084.244	3	-16.007	5	-392.141	4	-.002	2	-.046	3	-.071	5
355		7	max	1522.111	1	728.768	3	275.965	3	.001	3	1.055	4	2.983	3
356			min	-1086.574	3	-16.007	5	-389.449	4	-.002	2	-.018	2	-.066	5
357		8	max	1519.005	1	728.768	3	275.965	3	.001	3	.923	4	2.734	3
358			min	-1088.903	3	-16.007	5	-386.757	4	-.002	2	-.091	2	-.06	5
359		9	max	1515.899	1	728.768	3	275.965	3	.001	3	.799	5	2.486	3
360			min	-1091.233	3	-16.007	5	-384.065	4	-.002	2	-.163	2	-.055	5
361		10	max	1512.793	1	728.768	3	275.965	3	.001	3	.68	5	2.237	3
362			min	-1093.562	3	-16.007	5	-381.373	4	-.002	2	-.235	2	-.049	5
363		11	max	1509.687	1	728.768	3	275.965	3	.001	3	.561	5	1.989	3
364			min	-1095.892	3	-16.007	5	-378.681	4	-.002	2	-.307	2	-.044	5
365		12	max	1506.581	1	728.768	3	275.965	3	.001	3	.519	3	1.74	3
366			min	-1098.222	3	-16.007	5	-375.989	4	-.002	2	-.379	2	-.038	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	1503.475	1	728.768	3	275.965	3	.001	3	.613	3	1.492	3
368			min	-1100.551	3	-16.007	5	-373.297	4	-.002	2	-.451	2	-.033	5
369		14	max	1500.368	1	728.768	3	275.965	3	.001	3	.707	3	1.243	3
370			min	-1102.881	3	-16.007	5	-370.605	4	-.002	2	-.523	2	-.027	5
371		15	max	1497.262	1	728.768	3	275.965	3	.001	3	.801	3	.994	3
372			min	-1105.21	3	-16.007	5	-367.913	4	-.002	2	-.595	2	-.022	5
373		16	max	1494.156	1	728.768	3	275.965	3	.001	3	.895	3	.746	3
374			min	-1107.54	3	-16.007	5	-365.221	4	-.002	2	-.668	2	-.016	5
375		17	max	1491.05	1	728.768	3	275.965	3	.001	3	.99	3	.497	3
376			min	-1109.869	3	-16.007	5	-362.529	4	-.002	2	-.74	2	-.011	5
377		18	max	1487.944	1	728.768	3	275.965	3	.001	3	1.084	3	.249	3
378			min	-1112.199	3	-16.007	5	-359.837	4	-.002	2	-.812	2	-.005	5
379		19	max	1484.838	1	728.768	3	275.965	3	.001	3	1.178	3	0	1
380			min	-1114.528	3	-16.007	5	-357.146	4	-.002	2	-.884	2	0	1
381	M3	1	max	1283.787	2	4.147	6	96.29	2	.007	3	.064	5	0	1
382			min	-475.733	3	.975	15	-47.337	3	-.01	2	-.043	2	0	1
383		2	max	1283.549	2	3.686	6	96.29	2	.007	3	.053	5	0	15
384			min	-475.911	3	.866	15	-47.337	3	-.01	2	-.015	2	-.001	6
385		3	max	1283.311	2	3.225	6	96.29	2	.007	3	.045	4	0	15
386			min	-476.09	3	.758	15	-47.337	3	-.01	2	-.006	3	-.002	6
387		4	max	1283.073	2	2.765	6	96.29	2	.007	3	.041	2	0	15
388			min	-476.268	3	.65	15	-47.337	3	-.01	2	-.02	3	-.003	6
389		5	max	1282.835	2	2.304	6	96.29	2	.007	3	.069	2	0	15
390			min	-476.447	3	.542	15	-47.337	3	-.01	2	-.034	3	-.004	6
391		6	max	1282.597	2	1.843	6	96.29	2	.007	3	.097	2	-.001	15
392			min	-476.625	3	.433	15	-47.337	3	-.01	2	-.048	3	-.004	6
393		7	max	1282.359	2	1.382	6	96.29	2	.007	3	.125	2	-.001	15
394			min	-476.804	3	.325	15	-47.337	3	-.01	2	-.061	3	-.005	6
395		8	max	1282.121	2	.922	6	96.29	2	.007	3	.153	2	-.001	15
396			min	-476.982	3	.217	15	-47.337	3	-.01	2	-.075	3	-.005	6
397		9	max	1281.883	2	.461	6	96.29	2	.007	3	.181	2	-.001	15
398			min	-477.161	3	.108	15	-47.337	3	-.01	2	-.089	3	-.005	6
399		10	max	1281.645	2	0	1	96.29	2	.007	3	.209	2	-.001	15
400			min	-477.339	3	0	1	-47.337	3	-.01	2	-.103	3	-.005	6
401		11	max	1281.407	2	-.108	15	96.29	2	.007	3	.237	2	-.001	15
402			min	-477.518	3	-.461	4	-47.337	3	-.01	2	-.116	3	-.005	6
403		12	max	1281.169	2	-.217	15	96.29	2	.007	3	.264	2	-.001	15
404			min	-477.696	3	-.922	4	-47.337	3	-.01	2	-.13	3	-.005	6
405		13	max	1280.931	2	-.325	15	96.29	2	.007	3	.292	2	-.001	15
406			min	-477.875	3	-1.382	4	-47.337	3	-.01	2	-.144	3	-.005	6
407		14	max	1280.693	2	-.433	15	96.29	2	.007	3	.32	2	-.001	15
408			min	-478.053	3	-1.843	4	-47.337	3	-.01	2	-.158	3	-.004	6
409		15	max	1280.455	2	-.542	15	96.29	2	.007	3	.348	2	0	15
410			min	-478.232	3	-2.304	4	-47.337	3	-.01	2	-.171	3	-.004	6
411		16	max	1280.217	2	-.65	15	96.29	2	.007	3	.376	2	0	15
412			min	-478.41	3	-2.765	4	-47.337	3	-.01	2	-.185	3	-.003	6
413		17	max	1279.979	2	-.758	15	96.29	2	.007	3	.404	2	0	15
414			min	-478.589	3	-3.225	4	-47.337	3	-.01	2	-.199	3	-.002	6
415		18	max	1279.741	2	-.866	15	96.29	2	.007	3	.432	2	0	15
416			min	-478.767	3	-3.686	4	-47.337	3	-.01	2	-.213	3	-.001	6
417		19	max	1279.503	2	-.975	15	96.29	2	.007	3	.46	2	0	1
418			min	-478.946	3	-4.147	4	-47.337	3	-.01	2	-.226	3	0	1
419	M6	1	max	3802.618	2	4.147	4	0	1	0	1	.068	4	0	1
420			min	-1639.602	3	.975	15	-43.921	4	-.005	4	0	1	0	1
421		2	max	3802.38	2	3.686	4	0	1	0	1	.055	4	0	15
422			min	-1639.78	3	.866	15	-43.548	4	-.005	4	0	1	-.001	4
423		3	max	3802.142	2	3.225	4	0	1	0	1	.042	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	-1639.959	3	.758	15	-43.175	4	-.005	4	0	1	-.002	4
425		4	max	3801.904	2	2.765	4	0	1	0	1	.03	4	0	15
426			min	-1640.137	3	.65	15	-42.802	4	-.005	4	0	1	-.003	4
427		5	max	3801.666	2	2.304	4	0	1	0	1	.018	4	0	15
428			min	-1640.316	3	.542	15	-42.428	4	-.005	4	0	1	-.004	4
429		6	max	3801.428	2	1.843	4	0	1	0	1	.005	4	-.001	15
430			min	-1640.494	3	.433	15	-42.055	4	-.005	4	0	1	-.004	4
431		7	max	3801.19	2	1.382	4	0	1	0	1	0	1	-.001	15
432			min	-1640.673	3	.325	15	-41.682	4	-.005	4	-.007	4	-.005	4
433		8	max	3800.952	2	.922	4	0	1	0	1	0	1	-.001	15
434			min	-1640.851	3	.217	15	-41.308	4	-.005	4	-.019	4	-.005	4
435		9	max	3800.714	2	.461	4	0	1	0	1	0	1	-.001	15
436			min	-1641.03	3	.108	15	-40.935	4	-.005	4	-.031	4	-.005	4
437		10	max	3800.476	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1641.208	3	0	1	-40.562	4	-.005	4	-.043	4	-.005	4
439		11	max	3800.238	2	-.108	15	0	1	0	1	0	1	-.001	15
440			min	-1641.387	3	-.461	6	-40.188	4	-.005	4	-.054	4	-.005	4
441		12	max	3800	2	-.217	15	0	1	0	1	0	1	-.001	15
442			min	-1641.565	3	-.922	6	-39.815	4	-.005	4	-.066	4	-.005	4
443		13	max	3799.762	2	-.325	15	0	1	0	1	0	1	-.001	15
444			min	-1641.744	3	-1.382	6	-39.442	4	-.005	4	-.077	4	-.005	4
445		14	max	3799.524	2	-.433	15	0	1	0	1	0	1	-.001	15
446			min	-1641.922	3	-1.843	6	-39.068	4	-.005	4	-.089	4	-.004	4
447		15	max	3799.286	2	-.542	15	0	1	0	1	0	1	0	15
448			min	-1642.101	3	-2.304	6	-38.695	4	-.005	4	-.1	4	-.004	4
449		16	max	3799.048	2	-.65	15	0	1	0	1	0	1	0	15
450			min	-1642.279	3	-2.765	6	-38.322	4	-.005	4	-.111	4	-.003	4
451		17	max	3798.81	2	-.758	15	0	1	0	1	0	1	0	15
452			min	-1642.458	3	-3.225	6	-37.948	4	-.005	4	-.122	4	-.002	4
453		18	max	3798.572	2	-.866	15	0	1	0	1	0	1	0	15
454			min	-1642.636	3	-3.686	6	-37.575	4	-.005	4	-.133	4	-.001	4
455		19	max	3798.334	2	-.975	15	0	1	0	1	0	1	0	1
456			min	-1642.815	3	-4.147	6	-37.202	4	-.005	4	-.144	4	0	1
457	M9	1	max	1283.787	2	4.147	4	47.337	3	.01	2	.072	4	0	1
458			min	-475.733	3	.975	15	-96.29	2	-.007	3	-.021	3	0	1
459		2	max	1283.549	2	3.686	4	47.337	3	.01	2	.057	4	0	15
460			min	-475.911	3	.866	15	-96.29	2	-.007	3	-.007	3	-.001	4
461		3	max	1283.311	2	3.225	4	47.337	3	.01	2	.042	5	0	15
462			min	-476.09	3	.758	15	-96.29	2	-.007	3	-.013	2	-.002	4
463		4	max	1283.073	2	2.765	4	47.337	3	.01	2	.03	5	0	15
464			min	-476.268	3	.65	15	-96.29	2	-.007	3	-.041	2	-.003	4
465		5	max	1282.835	2	2.304	4	47.337	3	.01	2	.034	3	0	15
466			min	-476.447	3	.542	15	-96.29	2	-.007	3	-.069	2	-.004	4
467		6	max	1282.597	2	1.843	4	47.337	3	.01	2	.048	3	-.001	15
468			min	-476.625	3	.433	15	-96.29	2	-.007	3	-.097	2	-.004	4
469		7	max	1282.359	2	1.382	4	47.337	3	.01	2	.061	3	-.001	15
470			min	-476.804	3	.325	15	-96.29	2	-.007	3	-.125	2	-.005	4
471		8	max	1282.121	2	.922	4	47.337	3	.01	2	.075	3	-.001	15
472			min	-476.982	3	.217	15	-96.29	2	-.007	3	-.153	2	-.005	4
473		9	max	1281.883	2	.461	4	47.337	3	.01	2	.089	3	-.001	15
474			min	-477.161	3	.108	15	-96.29	2	-.007	3	-.181	2	-.005	4
475		10	max	1281.645	2	0	1	47.337	3	.01	2	.103	3	-.001	15
476			min	-477.339	3	0	1	-96.29	2	-.007	3	-.209	2	-.005	4
477		11	max	1281.407	2	-.108	15	47.337	3	.01	2	.116	3	-.001	15
478			min	-477.518	3	-.461	6	-96.29	2	-.007	3	-.237	2	-.005	4
479		12	max	1281.169	2	-.217	15	47.337	3	.01	2	.13	3	-.001	15
480			min	-477.696	3	-.922	6	-96.29	2	-.007	3	-.264	2	-.005	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	1280.931	2	-.325	15	47.337	3	.01	2	.144	3	-.001	15
482			min	-477.875	3	-1.382	6	-96.29	2	-.007	3	-.292	2	-.005	4
483		14	max	1280.693	2	-.433	15	47.337	3	.01	2	.158	3	-.001	15
484			min	-478.053	3	-1.843	6	-96.29	2	-.007	3	-.32	2	-.004	4
485		15	max	1280.455	2	-.542	15	47.337	3	.01	2	.171	3	0	15
486			min	-478.232	3	-2.304	6	-96.29	2	-.007	3	-.348	2	-.004	4
487		16	max	1280.217	2	-.65	15	47.337	3	.01	2	.185	3	0	15
488			min	-478.41	3	-2.765	6	-96.29	2	-.007	3	-.376	2	-.003	4
489		17	max	1279.979	2	-.758	15	47.337	3	.01	2	.199	3	0	15
490			min	-478.589	3	-3.225	6	-96.29	2	-.007	3	-.404	2	-.002	4
491		18	max	1279.741	2	-.866	15	47.337	3	.01	2	.213	3	0	15
492			min	-478.767	3	-3.686	6	-96.29	2	-.007	3	-.432	2	-.001	4
493		19	max	1279.503	2	-.975	15	47.337	3	.01	2	.226	3	0	1
494			min	-478.946	3	-4.147	6	-96.29	2	-.007	3	-.46	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	-.018	10	-.032	15	.033	1	1.18e-2	3	NC	3	NC	3
2			min	-.252	3	-.38	1	-.702	5	-2.83e-2	2	324.01	1	314.48	5
3		2	max	-.018	10	-.027	15	.01	1	1.18e-2	3	NC	3	NC	3
4			min	-.252	3	-.308	1	-.673	4	-2.83e-2	2	392.567	1	338.995	5
5		3	max	-.018	10	-.022	15	-.001	12	1.114e-2	3	NC	3	NC	2
6			min	-.252	3	-.236	1	-.645	4	-2.604e-2	2	498.096	1	369.018	5
7		4	max	-.018	10	-.018	15	-.002	12	1.014e-2	3	NC	3	NC	1
8			min	-.252	3	-.166	1	-.61	4	-2.257e-2	2	671.292	1	411.017	5
9		5	max	-.018	10	-.013	15	0	12	9.136e-3	3	NC	3	NC	1
10			min	-.252	3	-.104	1	-.569	4	-1.909e-2	2	833.019	14	469.445	5
11		6	max	-.018	10	-.002	10	.001	3	9.65e-3	3	NC	5	NC	2
12			min	-.252	3	-.087	3	-.526	4	-1.87e-2	2	979.798	14	550.192	5
13		7	max	-.018	10	.009	2	.002	3	1.121e-2	3	NC	5	NC	2
14			min	-.252	3	-.069	3	-.483	4	-2.043e-2	2	866.643	2	659.88	5
15		8	max	-.018	10	.024	2	.001	3	1.278e-2	3	NC	5	NC	2
16			min	-.252	3	-.045	3	-.444	4	-2.216e-2	2	792.889	2	809.972	5
17		9	max	-.018	10	.04	1	0	12	1.435e-2	3	NC	1	NC	2
18			min	-.252	3	-.019	3	-.41	4	-2.232e-2	2	747.355	2	1018.74	5
19		10	max	-.018	10	.065	1	0	3	1.596e-2	3	NC	5	NC	2
20			min	-.252	3	.006	15	-.377	4	-1.973e-2	2	711.567	2	1365.403	5
21		11	max	-.017	10	.089	1	.003	3	1.757e-2	3	NC	5	NC	2
22			min	-.252	3	.01	15	-.345	4	-1.713e-2	2	686.265	2	2007.604	5
23		12	max	-.017	10	.109	1	.008	3	1.464e-2	3	NC	5	NC	2
24			min	-.252	3	.013	15	-.319	4	-1.3e-2	2	671.293	2	3424.396	5
25		13	max	-.017	10	.125	1	.014	3	9.155e-3	3	NC	5	NC	2
26			min	-.252	3	.017	15	-.294	4	-7.996e-3	2	584.303	3	5771.645	1
27		14	max	-.017	10	.18	3	.011	3	3.925e-3	3	NC	5	NC	2
28			min	-.252	3	.011	10	-.276	4	-7.674e-3	4	466.635	3	4101.929	1
29		15	max	-.017	10	.257	3	.013	1	1.006e-2	3	NC	5	NC	3
30			min	-.252	3	-.005	10	-.267	5	-7.034e-3	4	367.663	3	3037.885	1
31		16	max	-.017	10	.349	3	.017	1	1.62e-2	3	NC	5	NC	3
32			min	-.252	3	-.026	10	-.266	5	-1.064e-2	2	293.649	3	2811.361	1
33		17	max	-.017	10	.45	3	.01	1	2.234e-2	3	NC	5	NC	3
34			min	-.252	3	-.058	2	-.268	4	-1.436e-2	2	240.42	3	3282.245	1
35		18	max	-.017	10	.555	3	-.001	10	2.634e-2	3	NC	4	NC	2
36			min	-.252	3	-.102	2	-.277	4	-1.679e-2	2	202.427	3	6108.136	1
37		19	max	-.017	10	.659	3	-.004	12	2.634e-2	3	NC	1	NC	1
38			min	-.252	3	-.145	2	-.286	4	-1.679e-2	2	174.83	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	-.02	15	-.035	15	0	1	2.476e-5	5	NC	3	NC	1
40			min	-.544	3	-.85	1	-.7	4	0	1	193.849	1	314.3	4
41		2	max	-.02	15	-.029	15	0	1	2.476e-5	5	NC	10	NC	1
42			min	-.544	3	-.679	1	-.674	4	0	1	257.863	1	334.93	4
43		3	max	-.02	15	-.022	15	0	1	0	1	5856.822	12	NC	1
44			min	-.544	3	-.507	1	-.645	4	-5.221e-4	4	385.516	1	360.417	4
45		4	max	-.02	15	-.016	15	0	1	0	1	6090.347	15	NC	1
46			min	-.544	3	-.342	1	-.61	4	-1.36e-3	4	541.932	9	398.816	4
47		5	max	-.02	15	-.011	15	0	1	0	1	8176.321	15	NC	1
48			min	-.544	3	-.206	3	-.568	4	-2.199e-3	4	376.386	2	454.569	4
49		6	max	-.02	15	0	10	0	1	0	1	NC	15	NC	1
50			min	-.545	3	-.19	3	-.525	4	-2.094e-3	4	298.841	2	533.417	4
51		7	max	-.02	15	.034	2	0	1	0	1	NC	3	NC	1
52			min	-.545	3	-.154	3	-.483	4	-1.336e-3	4	268.044	2	640.87	4
53		8	max	-.02	15	.06	2	0	1	0	1	NC	5	NC	1
54			min	-.545	3	-.105	3	-.444	4	-5.784e-4	4	254.697	2	785.428	4
55		9	max	-.02	15	.085	1	0	1	0	1	NC	4	NC	1
56			min	-.545	3	-.048	3	-.411	4	-1.757e-4	4	247.245	2	977.717	4
57		10	max	-.02	15	.129	1	0	1	0	1	NC	4	NC	1
58			min	-.545	3	.006	15	-.377	4	-4.008e-4	4	240.957	2	1297.376	4
59		11	max	-.02	15	.169	1	0	1	0	1	NC	5	NC	1
60			min	-.546	3	.009	15	-.345	4	-6.259e-4	4	236.539	2	1870.577	4
61		12	max	-.02	15	.203	1	0	1	0	1	NC	5	NC	1
62			min	-.546	3	.011	15	-.318	4	-2.199e-3	4	234.29	2	2982.468	4
63		13	max	-.02	15	.257	3	0	1	0	1	NC	5	NC	1
64			min	-.546	3	.013	15	-.295	4	-4.535e-3	4	237.592	2	6173.056	4
65		14	max	-.02	15	.391	3	0	1	0	1	NC	5	NC	1
66			min	-.546	3	.012	10	-.28	4	-6.783e-3	4	251.153	3	NC	1
67		15	max	-.02	15	.575	3	0	1	0	1	NC	5	NC	1
68			min	-.546	3	-.03	10	-.275	4	-5.101e-3	4	186.648	3	NC	1
69		16	max	-.02	15	.797	3	0	1	0	1	NC	5	NC	1
70			min	-.546	3	-.107	2	-.273	4	-3.418e-3	4	142.537	3	NC	1
71		17	max	-.02	15	1.043	3	0	1	0	1	NC	5	NC	1
72			min	-.546	3	-.223	2	-.273	4	-1.736e-3	4	113.022	3	NC	1
73		18	max	-.02	15	1.297	3	0	1	0	1	NC	4	NC	1
74			min	-.546	3	-.345	2	-.273	4	-6.389e-4	4	93.085	3	NC	1
75		19	max	-.02	15	1.55	3	0	1	0	1	NC	1	NC	1
76			min	-.546	3	-.467	2	-.273	4	-6.389e-4	4	79.153	3	NC	1
77	M7	1	max	.005	5	-.004	15	-.004	12	2.83e-2	2	NC	3	NC	3
78			min	-.252	3	-.38	1	-.72	4	-1.18e-2	3	324.01	1	295.088	4
79		2	max	.005	5	-.003	15	-.001	12	2.83e-2	2	NC	3	NC	3
80			min	-.252	3	-.308	1	-.679	4	-1.18e-2	3	392.567	1	323.825	4
81		3	max	.005	5	-.001	15	.01	1	2.604e-2	2	NC	3	NC	2
82			min	-.252	3	-.236	1	-.639	4	-1.114e-2	3	498.096	1	358.821	4
83		4	max	.005	5	0	15	.019	1	2.257e-2	2	NC	3	NC	1
84			min	-.252	3	-.166	1	-.599	5	-1.014e-2	3	671.292	1	402.544	4
85		5	max	.005	5	.001	5	.019	1	1.909e-2	2	NC	3	NC	1
86			min	-.252	3	-.104	1	-.558	5	-9.136e-3	3	850.249	9	458.423	4
87		6	max	.005	5	.002	5	.015	1	1.87e-2	2	NC	5	NC	2
88			min	-.252	3	-.087	3	-.518	4	-9.65e-3	3	1021.493	2	530.865	4
89		7	max	.005	5	.009	2	.007	1	2.043e-2	2	NC	5	NC	2
90			min	-.252	3	-.069	3	-.48	4	-1.121e-2	3	866.643	2	623.536	4
91		8	max	.005	5	.024	2	.002	2	2.216e-2	2	NC	4	NC	2
92			min	-.252	3	-.045	3	-.445	4	-1.278e-2	3	792.889	2	747.462	4
93		9	max	.005	5	.04	1	0	2	2.232e-2	2	NC	1	NC	2
94			min	-.252	3	-.019	3	-.41	4	-1.435e-2	3	747.355	2	925.152	4
95		10	max	.005	5	.065	1	0	2	1.973e-2	2	NC	4	NC	2

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	-.252	3	0	15	-.377	4	-1.596e-2	3	711.567	2	1202.804	4
97		11	max	.005	5	.089	1	.002	2	1.713e-2	2	NC	4	NC	2
98			min	-.252	3	0	15	-.345	4	-1.757e-2	3	686.265	2	1685.718	4
99		12	max	.006	5	.109	1	.008	1	1.3e-2	2	NC	5	NC	2
100			min	-.252	3	0	15	-.315	4	-1.464e-2	3	671.293	2	2685.708	4
101		13	max	.006	5	.125	1	.009	2	7.996e-3	2	NC	5	NC	2
102			min	-.252	3	-.002	5	-.292	4	-9.155e-3	3	584.303	3	5083.691	4
103		14	max	.006	5	.18	3	.004	2	3.185e-3	2	NC	5	NC	2
104			min	-.252	3	-.004	5	-.279	4	-6.766e-3	5	466.635	3	4101.929	1
105		15	max	.006	5	.257	3	-.002	10	6.911e-3	2	NC	5	NC	3
106			min	-.252	3	-.007	5	-.276	4	-1.006e-2	3	367.663	3	3037.885	1
107		16	max	.005	5	.349	3	-.001	12	1.064e-2	2	NC	5	NC	3
108			min	-.252	3	-.026	10	-.275	4	-1.62e-2	3	293.649	3	2811.361	1
109		17	max	.005	5	.45	3	0	12	1.436e-2	2	NC	4	NC	3
110			min	-.252	3	-.058	2	-.274	4	-2.234e-2	3	240.42	3	3282.245	1
111		18	max	.005	5	.555	3	.009	1	1.679e-2	2	NC	4	NC	2
112			min	-.252	3	-.102	2	-.27	4	-2.634e-2	3	202.427	3	6108.136	1
113		19	max	.005	5	.659	3	.031	1	1.679e-2	2	NC	1	NC	1
114			min	-.252	3	-.145	2	-.27	5	-2.634e-2	3	174.83	3	NC	1
115	M10	1	max	.001	3	.518	3	.252	3	1.404e-2	3	NC	1	NC	1
116			min	-.272	4	-.087	2	-.005	5	-5.838e-3	2	NC	1	NC	1
117		2	max	.001	3	.957	3	.282	1	1.626e-2	3	NC	4	NC	3
118			min	-.272	4	-.364	2	0	15	-7.006e-3	2	656.765	3	3144.658	1
119		3	max	.001	3	1.366	3	.417	1	1.848e-2	3	NC	5	NC	5
120			min	-.272	4	-.617	2	.007	15	-8.174e-3	2	339.561	3	1272.915	1
121		4	max	0	3	1.675	3	.54	1	2.07e-2	3	NC	5	NC	5
122			min	-.272	4	-.795	2	.016	15	-9.342e-3	2	249.06	3	824.507	1
123		5	max	0	3	1.84	3	.615	1	2.293e-2	3	NC	5	NC	15
124			min	-.273	4	-.871	2	.023	15	-1.051e-2	2	217.965	3	678.14	1
125		6	max	0	3	1.85	3	.625	1	2.515e-2	3	NC	5	NC	15
126			min	-.273	4	-.841	2	.027	15	-1.168e-2	2	216.207	3	661.973	1
127		7	max	0	3	1.727	3	.572	1	2.737e-2	3	NC	5	NC	15
128			min	-.273	4	-.72	2	.028	15	-1.285e-2	2	238.336	3	754.47	1
129		8	max	0	3	1.519	3	.525	3	2.959e-2	3	NC	5	NC	5
130			min	-.273	4	-.546	2	.026	15	-1.401e-2	2	287.753	3	1011.749	1
131		9	max	0	3	1.309	3	.541	3	3.181e-2	3	NC	4	NC	5
132			min	-.273	4	-.38	2	.022	15	-1.518e-2	2	364.154	3	996.742	3
133		10	max	0	1	1.209	3	.546	3	3.404e-2	3	NC	4	NC	5
134			min	-.273	4	-.302	2	.02	15	-1.635e-2	2	417.038	3	979.241	3
135		11	max	0	10	1.309	3	.541	3	3.181e-2	3	NC	4	NC	5
136			min	-.273	4	-.38	2	.023	15	-1.518e-2	2	364.154	3	996.742	3
137		12	max	0	10	1.519	3	.525	3	2.959e-2	3	NC	5	NC	5
138			min	-.273	4	-.546	2	.031	15	-1.401e-2	2	287.753	3	1011.749	1
139		13	max	0	10	1.727	3	.572	1	2.737e-2	3	NC	15	NC	15
140			min	-.273	4	-.72	2	.039	15	-1.285e-2	2	238.336	3	754.47	1
141		14	max	0	10	1.85	3	.625	1	2.515e-2	3	8063.062	15	NC	15
142			min	-.273	4	-.841	2	.046	15	-1.168e-2	2	216.207	3	661.973	1
143		15	max	0	10	1.84	3	.615	1	2.293e-2	3	6547.405	15	NC	15
144			min	-.273	4	-.871	2	.049	15	-1.051e-2	2	217.965	3	678.14	1
145		16	max	0	10	1.675	3	.54	1	2.07e-2	3	6270.753	15	NC	15
146			min	-.273	4	-.795	2	.048	15	-9.342e-3	2	249.06	3	824.507	1
147		17	max	0	10	1.366	3	.417	1	1.848e-2	3	7237.09	15	NC	5
148			min	-.273	4	-.617	2	.043	15	-8.174e-3	2	339.561	3	1272.915	1
149		18	max	0	10	.957	3	.282	1	1.626e-2	3	NC	15	NC	3
150			min	-.273	4	-.364	2	.031	10	-7.006e-3	2	656.765	3	3144.658	1
151		19	max	0	10	.518	3	.252	3	1.404e-2	3	NC	1	NC	1
152			min	-.273	4	-.087	2	.017	10	-5.838e-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	.004	1	.096	1	.252	3	4.77e-3	3	NC	1	NC	1
154			min	-.334	4	0	15	-.005	5	-1.153e-4	5	NC	1	NC	1
155		2	max	.003	1	.368	3	.259	1	5.381e-3	3	NC	4	NC	3
156			min	-.334	4	-.209	2	.028	15	-4.804e-5	5	919.659	3	4224.66	1
157		3	max	.003	1	.664	3	.382	1	5.992e-3	3	NC	5	NC	12
158			min	-.334	4	-.433	2	.044	15	-1.947e-6	10	472.603	3	1511.99	1
159		4	max	.003	1	.872	3	.501	1	6.602e-3	3	NC	5	6492.711	15
160			min	-.334	4	-.574	2	.046	15	-2.056e-5	10	352.565	3	929.036	1
161		5	max	.002	1	.949	3	.58	1	7.213e-3	3	NC	5	8583.479	15
162			min	-.334	4	-.609	2	.037	15	-3.917e-5	10	321.945	3	741.341	1
163		6	max	.002	1	.887	3	.598	1	7.824e-3	3	NC	5	NC	5
164			min	-.334	4	-.537	2	.021	15	-5.778e-5	10	346.061	3	708.731	1
165		7	max	.001	1	.705	3	.554	1	8.434e-3	3	NC	5	NC	5
166			min	-.335	4	-.377	2	.005	15	-7.639e-5	10	442.809	3	794.009	1
167		8	max	0	1	.455	3	.518	3	9.045e-3	3	NC	5	NC	5
168			min	-.335	4	-.171	2	-.007	5	-9.501e-5	10	719.263	3	1046.06	1
169		9	max	0	1	.219	3	.539	3	9.656e-3	3	NC	1	NC	4
170			min	-.335	4	-.002	10	-.004	5	-1.136e-4	10	1751.917	3	1004.411	3
171		10	max	0	1	.182	1	.546	3	1.027e-2	3	NC	4	NC	5
172			min	-.335	4	.01	15	.02	15	-1.322e-4	10	3368.089	1	980.831	3
173		11	max	0	3	.219	3	.539	3	9.656e-3	3	NC	1	NC	10
174			min	-.335	4	-.002	10	.031	10	-1.136e-4	10	1751.917	3	1004.411	3
175		12	max	0	3	.455	3	.518	3	9.045e-3	3	NC	5	9440.402	10
176			min	-.335	4	-.171	2	.048	10	-9.501e-5	10	719.263	3	1046.06	1
177		13	max	.001	3	.705	3	.554	1	8.434e-3	3	NC	5	6806.27	15
178			min	-.335	4	-.377	2	.06	15	-7.639e-5	10	442.809	3	794.009	1
179		14	max	.002	3	.887	3	.598	1	7.824e-3	3	9022.633	15	NC	15
180			min	-.335	4	-.537	2	.049	15	-5.778e-5	10	346.061	3	708.731	1
181		15	max	.002	3	.949	3	.58	1	7.213e-3	3	6865.55	15	NC	5
182			min	-.335	4	-.609	2	.031	15	-3.917e-5	10	321.945	3	741.341	1
183		16	max	.003	3	.872	3	.501	1	6.602e-3	3	6324.209	15	NC	5
184			min	-.335	4	-.574	2	.013	15	-2.056e-5	10	352.565	3	929.036	1
185		17	max	.003	3	.664	3	.382	1	5.992e-3	3	7101.186	15	NC	4
186			min	-.335	4	-.433	2	.002	15	-1.947e-6	10	472.603	3	1511.99	1
187		18	max	.004	3	.368	3	.259	1	5.381e-3	3	NC	15	NC	3
188			min	-.335	4	-.209	2	.004	15	1.666e-5	10	919.659	3	4224.66	1
189		19	max	.004	3	.096	1	.252	3	4.77e-3	3	NC	1	NC	1
190			min	-.336	4	.011	15	.017	10	3.528e-5	10	NC	1	NC	1
191	M12	1	max	0	2	.031	1	.252	3	3.597e-3	3	NC	1	NC	1
192			min	-.422	4	-.029	3	-.005	5	-6.621e-5	5	NC	1	NC	1
193		2	max	0	2	.183	3	.269	3	4.055e-3	3	NC	5	NC	2
194			min	-.422	4	-.348	2	.025	10	-6.055e-6	15	760.412	2	4235.162	4
195		3	max	0	2	.354	3	.368	1	4.513e-3	3	NC	5	NC	10
196			min	-.422	4	-.679	2	.041	10	4.156e-5	15	405.966	2	1635.09	1
197		4	max	0	2	.455	3	.486	1	4.971e-3	3	NC	5	7443.45	10
198			min	-.422	4	-.893	2	.05	15	8.917e-5	15	312.029	2	978.455	1
199		5	max	0	2	.474	3	.566	1	5.428e-3	3	NC	5	8406.858	15
200			min	-.422	4	-.952	2	.037	15	1.368e-4	15	293.039	2	769.632	1
201		6	max	0	2	.413	3	.587	1	5.886e-3	3	NC	5	NC	5
202			min	-.422	4	-.854	2	.018	15	1.844e-4	15	325.566	2	728.668	1
203		7	max	0	2	.289	3	.548	1	6.344e-3	3	NC	5	NC	5
204			min	-.422	4	-.626	2	0	15	2.32e-4	15	438.653	2	809.812	1
205		8	max	0	2	.134	3	.522	3	6.802e-3	3	NC	5	NC	10
206			min	-.422	4	-.329	2	-.018	5	2.796e-4	15	801.848	2	1057.842	1
207		9	max	0	2	0	5	.54	3	7.26e-3	3	NC	3	NC	4
208			min	-.422	4	-.055	2	-.012	5	3.272e-4	15	3372.736	2	1001.436	3
209		10	max	0	1	.07	2	.545	3	7.718e-3	3	NC	4	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	-.422	4	-.069	3	.02	15	3.748e-4	15	7217.768	3	982.464	3
211		11	max	0	3	-.001	15	.54	3	7.26e-3	3	NC	3	NC	10
212			min	-.422	4	-.055	2	.031	10	3.892e-4	15	3372.736	2	1001.436	3
213		12	max	0	3	.134	3	.522	3	6.802e-3	3	NC	5	NC	10
214			min	-.422	4	-.329	2	.046	10	4.036e-4	15	801.848	2	1057.842	1
215		13	max	0	3	.289	3	.548	1	6.344e-3	3	NC	15	6772.422	10
216			min	-.422	4	-.626	2	.06	10	4.18e-4	15	438.653	2	809.812	1
217		14	max	0	3	.413	3	.587	1	5.886e-3	3	8407.143	15	9247.639	15
218			min	-.422	4	-.854	2	.051	15	4.324e-4	15	325.566	2	728.668	1
219		15	max	0	3	.474	3	.566	1	5.428e-3	3	7072.092	15	NC	5
220			min	-.422	4	-.952	2	.029	15	4.468e-4	15	293.039	2	769.632	1
221		16	max	0	3	.455	3	.486	1	4.971e-3	3	6969.192	15	NC	5
222			min	-.422	4	-.893	2	.008	15	4.612e-4	15	312.029	2	978.455	1
223		17	max	0	3	.354	3	.368	1	4.513e-3	3	8252.175	15	NC	4
224			min	-.422	4	-.679	2	-.006	5	4.756e-4	15	405.966	2	1635.09	1
225		18	max	0	3	.183	3	.269	3	4.055e-3	3	NC	15	NC	2
226			min	-.422	4	-.348	2	-.001	15	4.624e-4	10	760.412	2	4902.355	1
227		19	max	0	3	.031	1	.252	3	3.597e-3	3	NC	1	NC	1
228			min	-.422	4	-.029	3	.018	10	4.449e-4	10	NC	1	NC	1
229	M13	1	max	0	12	-.002	15	.252	3	9.701e-3	1	NC	1	NC	1
230			min	-.665	4	-.283	1	-.005	5	5.602e-5	3	NC	1	NC	1
231		2	max	0	12	.079	3	.286	1	1.118e-2	1	NC	5	NC	3
232			min	-.665	4	-.667	1	.033	10	-2.596e-4	3	633.681	2	3092.333	1
233		3	max	0	12	.234	3	.422	1	1.267e-2	1	NC	5	8304.788	10
234			min	-.665	4	-1.06	2	.053	10	-5.751e-4	3	338.363	2	1258.157	1
235		4	max	0	12	.328	3	.546	1	1.415e-2	1	NC	5	5547.45	10
236			min	-.665	4	-1.33	2	.057	15	-8.907e-4	3	256.87	2	816.599	1
237		5	max	0	12	.347	3	.622	1	1.563e-2	1	NC	5	6508.761	15
238			min	-.665	4	-1.437	2	.047	15	-1.206e-3	3	234.496	2	672.115	1
239		6	max	0	12	.289	3	.632	1	1.712e-2	1	NC	15	NC	15
240			min	-.665	4	-1.376	2	.03	15	-1.522e-3	3	246.565	2	655.947	1
241		7	max	0	12	.172	3	.579	1	1.86e-2	1	NC	15	NC	5
242			min	-.665	4	-1.178	2	.011	15	-1.837e-3	3	297.147	2	746.605	1
243		8	max	0	12	.024	3	.523	3	2.008e-2	1	NC	5	NC	5
244			min	-.665	4	-.926	1	-.003	15	-2.153e-3	3	415.928	2	997.895	1
245		9	max	0	12	-.028	15	.539	3	2.157e-2	1	NC	3	NC	5
246			min	-.665	4	-.716	1	-.003	15	-2.469e-3	3	664.774	1	1001.521	3
247		10	max	0	1	-.027	15	.544	3	2.305e-2	1	NC	5	NC	5
248			min	-.665	4	-.619	1	.02	15	-2.784e-3	3	857.45	1	984.392	3
249		11	max	0	1	-.031	15	.539	3	2.157e-2	1	NC	3	NC	10
250			min	-.664	4	-.716	1	.034	10	-2.469e-3	3	664.774	1	1001.521	3
251		12	max	0	1	.024	3	.523	3	2.008e-2	1	NC	15	8850.213	10
252			min	-.664	4	-.926	1	.051	10	-2.153e-3	3	415.928	2	997.895	1
253		13	max	0	1	.172	3	.579	1	1.86e-2	1	8509.533	15	7316.054	15
254			min	-.664	4	-1.178	2	.057	15	-1.837e-3	3	297.147	2	746.605	1
255		14	max	0	1	.289	3	.632	1	1.712e-2	1	6876.322	15	NC	15
256			min	-.664	4	-1.376	2	.044	15	-1.522e-3	3	246.565	2	655.947	1
257		15	max	.001	1	.347	3	.622	1	1.563e-2	1	6277.185	15	NC	5
258			min	-.664	4	-1.437	2	.025	15	-1.206e-3	3	234.496	2	672.115	1
259		16	max	.001	1	.328	3	.546	1	1.415e-2	1	6513.847	15	NC	5
260			min	-.664	4	-1.33	2	.007	15	-8.907e-4	3	256.87	2	816.599	1
261		17	max	.002	1	.234	3	.422	1	1.267e-2	1	8001.673	15	NC	4
262			min	-.664	4	-1.06	2	-.005	5	-5.751e-4	3	338.363	2	1258.157	1
263		18	max	.002	1	.079	3	.286	1	1.118e-2	1	NC	15	NC	3
264			min	-.664	4	-.667	1	0	15	-2.596e-4	3	633.681	2	3092.333	1
265		19	max	.002	1	-.026	15	.252	3	9.701e-3	1	NC	1	NC	1
266			min	-.664	4	-.283	1	.018	10	5.602e-5	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	10	.001	5	7.712e-3	2	NC	1	NC	1
270			min	0	1	-.002	3	0	2	-9.694e-3	5	NC	1	NC	1
271		3	max	0	3	0	10	.006	5	7.079e-3	2	NC	1	NC	1
272			min	0	1	-.006	3	-.001	2	-9.433e-3	5	NC	1	NC	1
273		4	max	0	3	0	10	.012	5	6.446e-3	2	NC	2	NC	1
274			min	0	1	-.013	3	-.003	2	-9.171e-3	5	5892.118	3	6111.954	5
275		5	max	0	3	-.001	10	.021	5	5.813e-3	2	NC	2	NC	1
276			min	0	1	-.022	3	-.004	2	-8.91e-3	5	3412.291	3	3544.165	5
277		6	max	0	3	-.002	10	.032	5	5.18e-3	2	NC	5	NC	1
278			min	0	1	-.033	3	-.006	2	-8.648e-3	5	2240.624	3	2334.252	5
279		7	max	0	3	-.003	10	.044	5	4.548e-3	2	NC	10	NC	9
280			min	0	1	-.046	3	-.008	2	-8.387e-3	5	1594.071	3	1667.146	5
281		8	max	0	3	-.004	10	.059	5	3.915e-3	2	NC	10	NC	9
282			min	0	1	-.061	3	-.01	1	-8.126e-3	5	1198.89	3	1259.421	5
283		9	max	0	3	-.005	10	.074	5	3.282e-3	2	NC	10	NC	9
284			min	0	1	-.078	3	-.012	1	-7.864e-3	5	939.49	3	991.694	5
285		10	max	0	3	-.006	10	.091	5	2.649e-3	2	NC	10	NC	9
286			min	0	1	-.097	3	-.014	1	-7.603e-3	5	759.842	3	806.191	5
287		11	max	0	3	-.008	10	.11	5	2.017e-3	2	9740.7	10	NC	9
288			min	0	1	-.117	3	-.015	1	-7.341e-3	5	630.143	3	672.205	5
289		12	max	0	3	-.009	10	.129	5	1.384e-3	2	8217.581	10	NC	9
290			min	-.001	1	-.138	3	-.016	1	-7.15e-3	4	533.359	3	572.192	5
291		13	max	0	3	-.01	10	.149	5	7.655e-4	3	7055.981	10	NC	9
292			min	-.001	1	-.16	3	-.016	1	-6.969e-3	4	459.171	3	495.527	5
293		14	max	0	3	-.012	10	.169	5	1.183e-3	3	6149.186	10	NC	9
294			min	-.001	1	-.184	3	-.016	1	-6.787e-3	4	401.017	3	435.454	5
295		15	max	0	3	-.014	10	.19	5	1.601e-3	3	5427.7	10	NC	9
296			min	-.001	1	-.208	3	-.015	1	-6.606e-3	4	354.591	3	387.533	5
297		16	max	.001	3	-.015	10	.211	5	2.018e-3	3	4844.238	10	NC	9
298			min	-.001	1	-.232	3	-.013	1	-6.424e-3	4	316.938	3	348.721	5
299		17	max	.001	3	-.017	10	.233	4	2.436e-3	3	4365.821	10	NC	9
300			min	-.002	1	-.258	3	-.01	1	-6.243e-3	4	285.989	3	316.71	4
301		18	max	.001	3	-.019	10	.254	4	2.853e-3	3	3968.876	10	NC	1
302			min	-.002	1	-.283	3	-.007	1	-6.062e-3	4	260.257	3	289.543	4
303		19	max	.001	3	-.02	10	.276	4	3.271e-3	3	3636.19	10	NC	1
304			min	-.002	1	-.309	3	-.012	3	-5.88e-3	4	238.651	3	266.772	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	10	.002	4	0	1	NC	1	NC	1
308			min	0	1	-.003	3	0	1	-1.048e-2	4	NC	1	NC	1
309		3	max	0	3	0	10	.006	4	0	1	NC	1	NC	1
310			min	0	1	-.013	3	0	1	-1.015e-2	4	5843.2	3	NC	1
311		4	max	0	3	0	10	.013	4	0	1	NC	2	NC	1
312			min	0	1	-.027	3	0	1	-9.815e-3	4	2707.906	3	5797.033	4
313		5	max	0	3	-.001	10	.022	4	0	1	NC	5	NC	1
314			min	-.001	1	-.047	3	0	1	-9.485e-3	4	1570.171	3	3366.199	4
315		6	max	.001	3	-.002	10	.033	4	0	1	NC	5	NC	1
316			min	-.001	1	-.071	3	0	1	-9.154e-3	4	1031.702	3	2220.178	4
317		7	max	.001	3	-.003	10	.046	4	0	1	NC	5	NC	1
318			min	-.002	1	-.1	3	0	1	-8.824e-3	4	734.286	3	1588.009	4
319		8	max	.001	3	-.005	10	.061	4	0	1	NC	10	NC	1
320			min	-.002	1	-.133	3	0	1	-8.494e-3	4	552.398	3	1201.498	4
321		9	max	.002	3	-.006	10	.078	4	0	1	NC	10	NC	1
322			min	-.002	1	-.17	3	0	1	-8.163e-3	4	432.959	3	947.631	4
323		10	max	.002	3	-.008	15	.095	4	0	1	9605.241	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	-.002	1	-.21	3	0	1	-7.833e-3	4	350.217	3	771.699	4
325		11	max	.002	3	-.009	15	.114	4	0	1	7961.089	15	NC	1
326			min	-.003	1	-.254	3	0	1	-7.502e-3	4	290.469	3	644.622	4
327		12	max	.002	3	-.011	15	.134	4	0	1	6735.271	15	NC	1
328			min	-.003	1	-.3	3	0	1	-7.172e-3	4	245.876	3	549.778	4
329		13	max	.002	3	-.013	15	.154	4	0	1	5796.305	15	NC	1
330			min	-.003	1	-.348	3	0	1	-6.842e-3	4	211.69	3	477.098	4
331		14	max	.003	3	-.015	15	.175	4	0	1	5060.705	15	NC	1
332			min	-.003	1	-.399	3	0	1	-6.511e-3	4	184.89	3	420.183	4
333		15	max	.003	3	-.016	15	.197	4	0	1	4473.713	15	NC	1
334			min	-.003	1	-.451	3	0	1	-6.181e-3	4	163.492	3	374.82	4
335		16	max	.003	3	-.018	15	.218	4	0	1	3997.849	15	NC	1
336			min	-.004	1	-.504	3	0	1	-5.851e-3	4	146.137	3	338.129	4
337		17	max	.003	3	-.02	15	.239	4	0	1	3606.841	15	NC	1
338			min	-.004	1	-.559	3	0	1	-5.52e-3	4	131.871	3	308.088	4
339		18	max	.004	3	-.022	15	.26	4	0	1	3281.834	15	NC	1
340			min	-.004	1	-.614	3	0	1	-5.19e-3	4	120.009	3	283.248	4
341		19	max	.004	3	-.024	15	.281	4	0	1	3009.012	15	NC	1
342			min	-.004	1	-.67	3	0	1	-4.859e-3	4	110.048	3	262.548	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	3.827e-3	3	NC	1	NC	1
346			min	0	1	-.002	3	0	3	-1.111e-2	4	NC	1	NC	1
347		3	max	0	3	0	5	.006	4	3.41e-3	3	NC	1	NC	1
348			min	0	1	-.006	3	-.002	3	-1.071e-2	4	NC	1	NC	1
349		4	max	0	3	0	5	.013	4	2.992e-3	3	NC	2	NC	1
350			min	0	1	-.013	3	-.003	3	-1.031e-2	4	5892.118	3	5728.155	4
351		5	max	0	3	0	5	.022	4	2.575e-3	3	NC	2	NC	1
352			min	0	1	-.022	3	-.005	3	-9.904e-3	4	3412.291	3	3329.516	4
353		6	max	0	3	0	5	.034	4	2.157e-3	3	NC	4	NC	1
354			min	0	1	-.033	3	-.008	3	-9.503e-3	4	2240.624	3	2197.993	4
355		7	max	0	3	.001	5	.047	4	1.74e-3	3	NC	5	NC	9
356			min	0	1	-.046	3	-.01	3	-9.101e-3	4	1594.071	3	1573.55	4
357		8	max	0	3	.001	5	.062	4	1.322e-3	3	NC	5	NC	9
358			min	0	1	-.061	3	-.012	3	-8.7e-3	4	1198.89	3	1191.642	4
359		9	max	0	3	.002	5	.078	4	9.046e-4	3	NC	5	NC	9
360			min	0	1	-.078	3	-.014	3	-8.299e-3	4	939.49	3	940.738	4
361		10	max	0	3	.002	5	.096	4	4.87e-4	3	NC	5	NC	9
362			min	0	1	-.097	3	-.016	3	-7.898e-3	4	759.842	3	766.834	4
363		11	max	0	3	.003	5	.115	4	6.953e-5	3	NC	5	NC	9
364			min	0	1	-.117	3	-.017	3	-7.497e-3	4	630.143	3	641.214	4
365		12	max	0	3	.003	5	.135	4	5.372e-5	9	NC	5	NC	9
366			min	-.001	1	-.138	3	-.017	3	-7.096e-3	4	533.359	3	547.462	4
367		13	max	0	3	.004	5	.155	4	2.697e-4	9	NC	5	NC	9
368			min	-.001	1	-.16	3	-.017	3	-6.749e-3	5	459.171	3	475.631	4
369		14	max	0	3	.004	5	.176	4	5.119e-4	1	NC	5	NC	9
370			min	-.001	1	-.184	3	-.015	3	-6.432e-3	5	401.017	3	419.401	4
371		15	max	0	3	.005	5	.197	4	1.083e-3	1	NC	5	NC	9
372			min	-.001	1	-.208	3	-.013	3	-6.115e-3	5	354.591	3	374.608	4
373		16	max	.001	3	.005	5	.218	4	1.653e-3	1	NC	5	NC	9
374			min	-.001	1	-.232	3	-.009	3	-5.797e-3	5	316.938	3	338.405	4
375		17	max	.001	3	.006	5	.239	4	2.224e-3	1	NC	5	NC	9
376			min	-.002	1	-.258	3	-.004	3	-5.48e-3	5	285.989	3	308.798	4
377		18	max	.001	3	.006	5	.259	4	2.795e-3	1	NC	5	NC	1
378			min	-.002	1	-.283	3	0	10	-5.163e-3	5	260.257	3	284.354	4
379		19	max	.001	3	.007	5	.279	4	3.365e-3	1	NC	5	NC	1
380			min	-.002	1	-.309	3	-.004	2	-4.846e-3	5	238.651	3	264.026	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	0	3	0	10	0	5	4.323e-3	2	NC	1	NC	1
382			min	0	10	0	3	0	2	-5.076e-3	5	NC	1	NC	1
383		2	max	0	3	-.002	10	.03	5	4.445e-3	2	NC	1	NC	4
384			min	0	2	-.016	3	-.024	2	-5.005e-3	5	NC	1	2371.098	6
385		3	max	0	3	-.003	10	.062	5	4.566e-3	2	NC	1	NC	4
386			min	0	2	-.031	3	-.048	2	-4.933e-3	5	NC	1	1161.979	6
387		4	max	.001	3	-.005	10	.094	5	4.688e-3	2	NC	1	NC	4
388			min	-.001	2	-.046	3	-.072	2	-4.862e-3	5	NC	1	760.876	6
389		5	max	.001	3	-.006	10	.126	5	4.81e-3	2	NC	1	NC	4
390			min	-.002	2	-.062	3	-.095	2	-4.791e-3	5	NC	1	561.635	6
391		6	max	.001	3	-.008	10	.159	5	4.931e-3	2	NC	1	NC	4
392			min	-.002	2	-.077	3	-.116	2	-4.72e-3	5	NC	1	443.045	6
393		7	max	.001	3	-.009	10	.193	5	5.053e-3	2	NC	1	NC	4
394			min	-.003	2	-.092	3	-.136	2	-4.649e-3	5	NC	1	364.716	6
395		8	max	.002	3	-.011	10	.227	5	5.175e-3	2	NC	1	NC	4
396			min	-.003	2	-.107	3	-.152	2	-4.578e-3	5	NC	1	309.345	6
397		9	max	.002	3	-.012	10	.26	5	5.297e-3	2	NC	1	NC	4
398			min	-.003	2	-.122	3	-.166	2	-4.506e-3	5	NC	1	268.29	6
399		10	max	.002	3	-.013	10	.293	5	5.418e-3	2	NC	1	NC	4
400			min	-.004	2	-.137	3	-.175	2	-4.435e-3	5	NC	1	236.752	6
401		11	max	.002	3	-.014	10	.326	5	5.54e-3	2	NC	1	NC	4
402			min	-.004	2	-.152	3	-.181	2	-4.364e-3	5	NC	1	211.858	6
403		12	max	.002	3	-.015	10	.358	5	5.662e-3	2	NC	1	NC	4
404			min	-.005	2	-.167	3	-.181	2	-4.293e-3	5	NC	1	191.783	6
405		13	max	.002	3	-.016	10	.388	5	5.783e-3	2	NC	1	NC	4
406			min	-.005	2	-.182	3	-.175	2	-4.222e-3	5	NC	1	175.311	6
407		14	max	.003	3	-.017	10	.418	5	5.905e-3	2	NC	1	9543.098	4
408			min	-.006	2	-.196	3	-.163	2	-4.15e-3	5	NC	1	161.604	6
409		15	max	.003	3	-.018	10	.447	5	6.027e-3	2	NC	1	9119.154	4
410			min	-.006	2	-.211	3	-.144	2	-4.079e-3	5	NC	1	150.066	6
411		16	max	.003	3	-.019	10	.474	5	6.148e-3	2	NC	1	9743.385	13
412			min	-.006	2	-.226	3	-.118	2	-4.008e-3	5	NC	1	140.259	6
413		17	max	.003	3	-.02	10	.499	5	6.27e-3	2	NC	1	NC	4
414			min	-.007	2	-.24	3	-.084	2	-3.937e-3	5	NC	1	131.858	6
415		18	max	.003	3	-.02	10	.524	4	6.392e-3	2	NC	1	NC	4
416			min	-.007	2	-.255	3	-.04	2	-3.866e-3	5	NC	1	124.616	6
417		19	max	.003	3	-.021	10	.552	4	6.514e-3	2	NC	1	NC	1
418			min	-.008	2	-.269	3	0	3	-3.794e-3	5	NC	1	118.341	6
419	M6	1	max	.001	3	0	10	0	4	0	1	NC	1	NC	1
420			min	0	2	0	3	0	1	-5.504e-3	4	NC	1	NC	1
421		2	max	.002	3	-.001	15	.033	4	0	1	NC	1	NC	1
422			min	-.002	2	-.033	3	0	1	-5.451e-3	4	NC	1	NC	1
423		3	max	.002	3	-.003	15	.066	4	0	1	NC	1	NC	1
424			min	-.003	2	-.066	3	0	1	-5.398e-3	4	NC	1	NC	1
425		4	max	.003	3	-.004	15	.101	4	0	1	NC	1	NC	1
426			min	-.004	2	-.098	3	0	1	-5.344e-3	4	NC	1	7207.976	4
427		5	max	.003	3	-.006	15	.136	4	0	1	NC	1	NC	1
428			min	-.005	2	-.131	3	0	1	-5.291e-3	4	NC	1	4734.303	4
429		6	max	.004	3	-.007	15	.172	4	0	1	NC	1	NC	1
430			min	-.007	2	-.163	3	0	1	-5.237e-3	4	NC	1	3451.299	4
431		7	max	.005	3	-.008	15	.207	4	0	1	NC	1	NC	1
432			min	-.008	2	-.196	3	0	1	-5.184e-3	4	NC	1	2701.958	4
433		8	max	.005	3	-.01	15	.243	4	0	1	NC	1	NC	1
434			min	-.009	2	-.228	3	0	1	-5.131e-3	4	NC	1	2231.488	4
435		9	max	.006	3	-.011	15	.278	4	0	1	NC	1	NC	1
436			min	-.01	2	-.261	3	0	1	-5.077e-3	4	NC	1	1924.148	4
437		10	max	.006	3	-.012	15	.312	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	-.012	2	-.293	3	0	1	-5.024e-3	4	NC	1	1721.905	4
439		11	max	.007	3	-.013	15	.345	4	0	1	NC	1	NC	1
440			min	-.013	2	-.325	3	0	1	-4.971e-3	4	NC	1	1594.37	4
441		12	max	.007	3	-.014	15	.378	4	0	1	NC	1	NC	1
442			min	-.014	2	-.357	3	0	1	-4.917e-3	4	NC	1	1526.572	4
443		13	max	.008	3	-.016	15	.409	4	0	1	NC	1	NC	1
444			min	-.016	2	-.389	3	0	1	-4.864e-3	4	NC	1	1514.365	4
445		14	max	.008	3	-.017	15	.438	4	0	1	NC	1	NC	1
446			min	-.017	2	-.421	3	0	1	-4.81e-3	4	NC	1	1564.676	4
447		15	max	.009	3	-.018	15	.465	4	0	1	NC	1	NC	1
448			min	-.018	2	-.453	3	0	1	-4.757e-3	4	NC	1	1702.236	4
449		16	max	.009	3	-.019	15	.49	4	0	1	NC	1	NC	1
450			min	-.019	2	-.485	3	0	1	-4.704e-3	4	NC	1	1993.874	4
451		17	max	.01	3	-.02	15	.513	4	0	1	NC	1	NC	1
452			min	-.021	2	-.517	3	0	1	-4.65e-3	4	NC	1	2648.977	4
453		18	max	.011	3	-.021	15	.533	4	0	1	NC	1	NC	1
454			min	-.022	2	-.549	3	0	1	-4.597e-3	4	NC	1	4726.425	4
455		19	max	.011	3	-.022	15	.551	4	0	1	NC	1	NC	1
456			min	-.023	2	-.581	3	0	1	-4.543e-3	4	NC	1	NC	1
457	M9	1	max	0	3	0	5	0	4	2.112e-3	3	NC	1	NC	1
458			min	0	10	0	3	0	3	-5.864e-3	4	NC	1	NC	1
459		2	max	0	3	0	15	.035	4	2.19e-3	3	NC	1	NC	4
460			min	0	2	-.016	3	-.012	3	-5.803e-3	4	NC	1	2565.199	2
461		3	max	0	3	0	15	.07	4	2.268e-3	3	NC	1	NC	5
462			min	0	2	-.031	3	-.024	3	-5.743e-3	4	NC	1	1274.142	2
463		4	max	.001	3	0	15	.107	4	2.346e-3	3	NC	1	NC	15
464			min	-.001	2	-.046	3	-.037	3	-5.682e-3	4	NC	1	850.734	2
465		5	max	.001	3	0	15	.144	4	2.424e-3	3	NC	1	7642.508	15
466			min	-.002	2	-.062	3	-.048	3	-5.621e-3	4	NC	1	644.286	2
467		6	max	.001	3	0	15	.181	4	2.502e-3	3	NC	1	5525.571	15
468			min	-.002	2	-.077	3	-.059	3	-5.56e-3	4	NC	1	524.874	2
469		7	max	.001	3	0	5	.218	4	2.58e-3	3	NC	1	4300.126	15
470			min	-.003	2	-.092	3	-.069	3	-5.499e-3	4	NC	1	449.391	2
471		8	max	.002	3	0	5	.255	4	2.658e-3	3	NC	1	3535.401	15
472			min	-.003	2	-.107	3	-.077	3	-5.439e-3	4	NC	1	399.589	2
473		9	max	.002	3	.001	5	.291	4	2.736e-3	3	NC	1	3037.756	15
474			min	-.003	2	-.122	3	-.084	3	-5.378e-3	4	NC	1	366.613	2
475		10	max	.002	3	.001	5	.326	4	2.814e-3	3	NC	1	2710.799	15
476			min	-.004	2	-.137	3	-.089	3	-5.418e-3	2	NC	1	345.906	2
477		11	max	.002	3	.002	5	.359	4	2.892e-3	3	NC	1	2504.23	15
478			min	-.004	2	-.152	3	-.092	3	-5.54e-3	2	NC	1	335.249	2
479		12	max	.002	3	.002	5	.391	4	2.97e-3	3	NC	1	2393.138	15
480			min	-.005	2	-.167	3	-.093	3	-5.662e-3	2	NC	1	334.022	2
481		13	max	.002	3	.003	5	.421	4	3.048e-3	3	NC	1	2370.155	15
482			min	-.005	2	-.182	3	-.09	3	-5.783e-3	2	NC	1	343.142	2
483		14	max	.003	3	.003	5	.449	4	3.126e-3	3	NC	1	2445.511	15
484			min	-.006	2	-.196	3	-.085	3	-5.905e-3	2	NC	1	365.686	2
485		15	max	.003	3	.003	5	.474	4	3.204e-3	3	NC	1	2657.339	15
486			min	-.006	2	-.211	3	-.076	3	-6.027e-3	2	NC	1	408.954	2
487		16	max	.003	3	.004	5	.496	4	3.282e-3	3	NC	1	3109.384	15
488			min	-.006	2	-.226	3	-.063	3	-6.148e-3	2	NC	1	490.986	2
489		17	max	.003	3	.005	5	.514	4	3.36e-3	3	NC	1	4127.245	15
490			min	-.007	2	-.24	3	-.046	3	-6.27e-3	2	NC	1	666.947	2
491		18	max	.003	3	.005	5	.53	4	3.438e-3	3	NC	1	7358.123	15
492			min	-.007	2	-.255	3	-.026	3	-6.392e-3	2	NC	1	1214.102	2
493		19	max	.003	3	.006	5	.541	5	3.516e-3	3	NC	1	NC	1
494			min	-.008	2	-.269	3	-.018	1	-6.514e-3	2	NC	1	NC	1