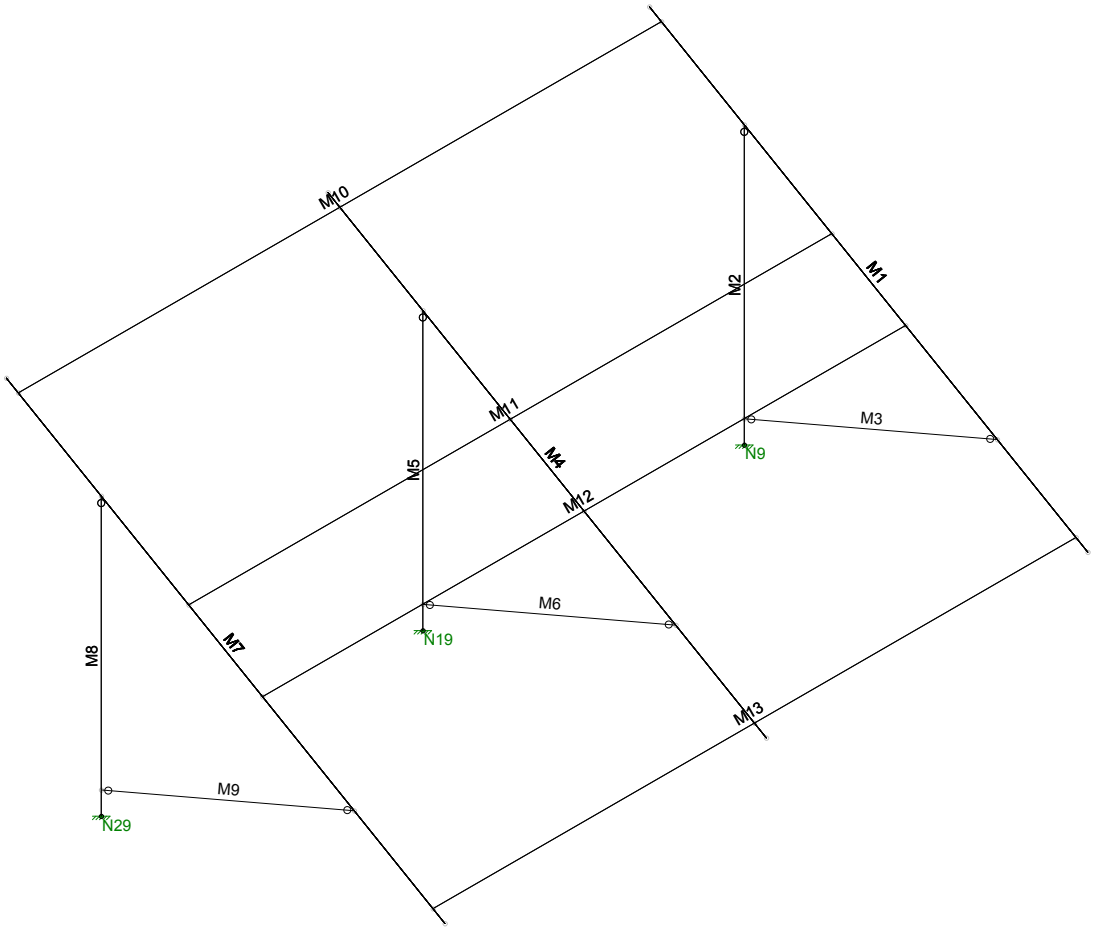


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

1.1 Project Description

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

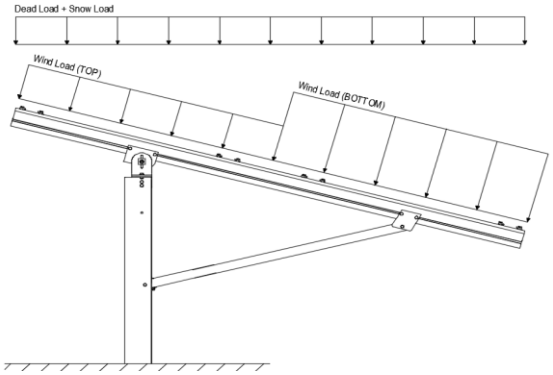
1.2 Construction

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

PV modules are required to meet the following specifications:

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

Modules Per Row =	2
Module Tilt =	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 7-05 - Chapter 6, Wind Loads
- ASCE 7-05 - Chapter 7, Snow Loads
- ASCE 7-05 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2003, 2006, 2009
- 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 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.73		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	100	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	15.70	psf	*Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

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 + 0.8W
1.2D + 1.6W + 0.5S
0.9D + 1.6W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)

Allowable Stress Design, ASD

Member deflection checks and foundation designs are done according to the following ASD load combinations:

1.0D + 1.0S
1.0D + 1.0W
1.0D + 0.75L + 0.75W + 0.75S
0.6D + 1.0W [M]
1.238D + 0.875E [O]
1.1785D + 0.65625E + 0.75S [O]
0.362D + 0.875E [O]

(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)

[M] *Uses the minimum allowable module dead load.*
[R] *Include redundancy factor of 1.3.*
[O] *Includes overstrength factor of 1.25. Used to check seismic drift.*

3. STRUCTURAL ANALYSIS

3.1 RISA Results

Appendix B.1 contains outputs from the structural analysis software package, RISA. These outputs are used to accurately determine resultant member and reaction forces from the loads seen throughout Section 2.

3.2 RISA Components

A member and node list has been provided below to correlate the RISA components with the design calculations in Section 4. Items of significance have been listed.

Purlins	Location
M10	Top
M11	Mid-Top
M12	Mid-Bottom
M13	Bottom

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

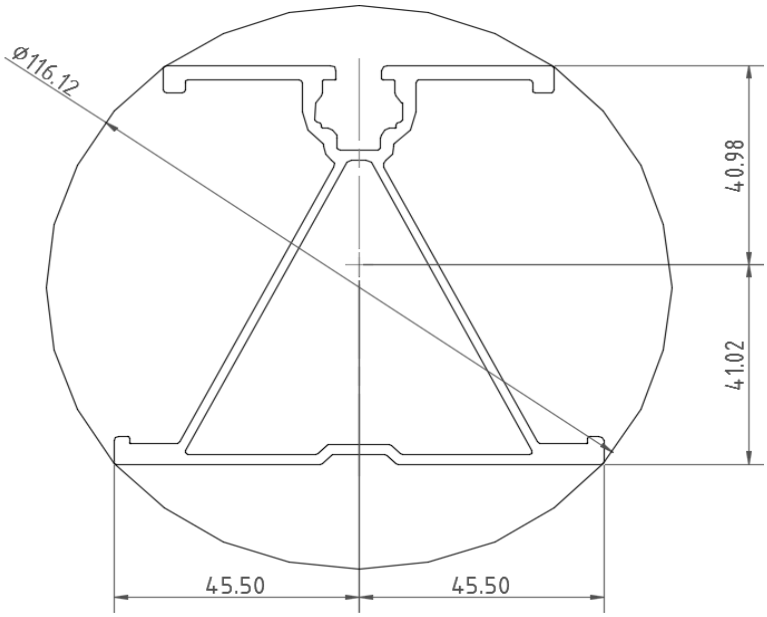
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

Aluminum purlins are used to transfer loads to the support structure. Purlins are designed as continous beams with cantilevers. These are considered beams with internal hinges that can be joined with splices at 25% of the support respective span. See Appendix A.1 for detailed member calculations. Section units are in (mm).

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	114	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 =	1.859	k-ft
M_z =	0.068	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	73%	

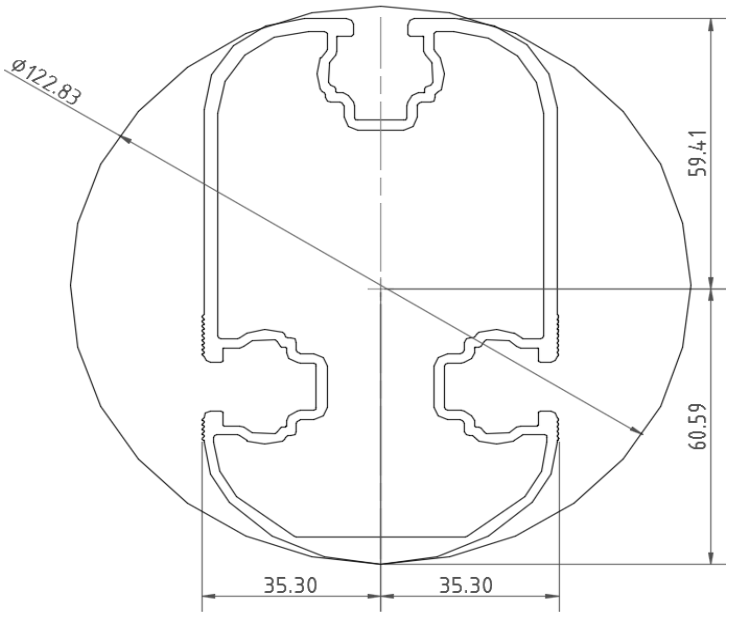


DETAIL VIEW

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 =	4.299	k-ft
M_z =	0.000	k-ft
P_n =	1.477	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	89%	

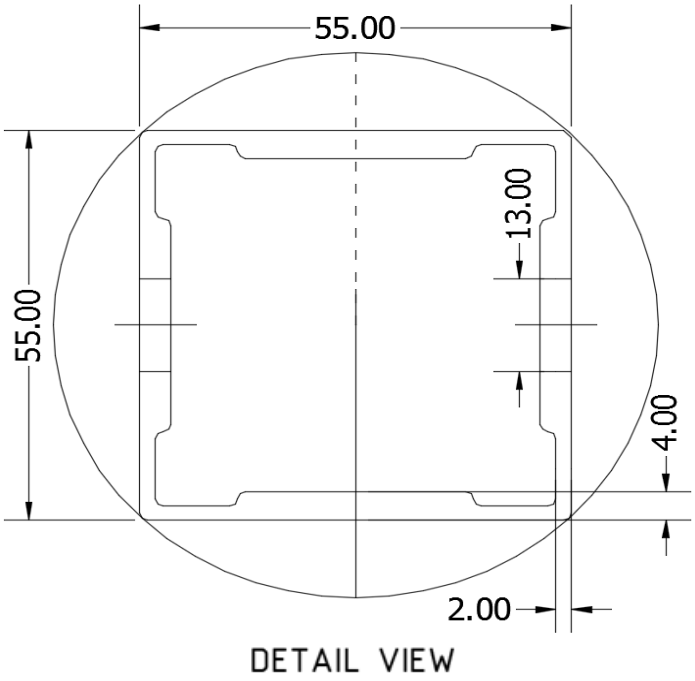


DETAIL VIEW

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).

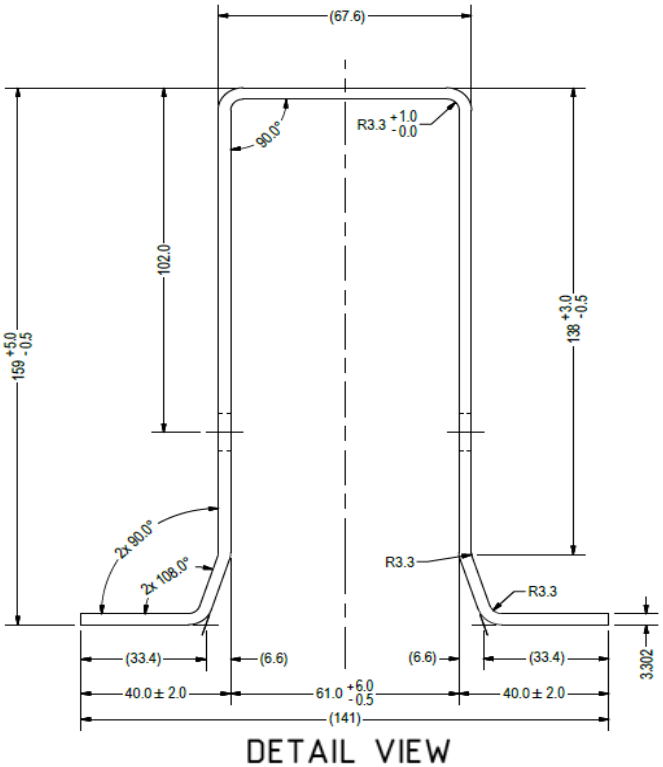
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.095	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 =	11.535	k-ft
M_z =	0.000	k-ft
P_r =	6.288	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	k
Utilization =	86%	



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 =	6.75	k
Maximum Lateral Load =	4.07	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)

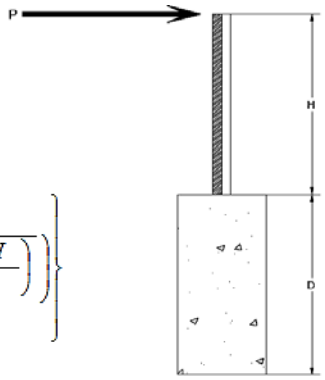
Lateral Force @ Top of Pole, P =	1.05	k
Height of Pole Above Grade, H =	6.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.05	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 =	5.66		
Required Footing Depth, D =	9.75	ft	
2nd Trial @ D_2 =	6.50	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf	
Lateral Soil Bearing @ D, S_3 =	1.30	ksf	
Constant 2.34P/(S_1B), A =	2.83		
Required Footing Depth, D =	6.10	ft	
3rd Trial @ D_3 =	6.30	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf	
Lateral Soil Bearing @ D, S_3 =	1.26	ksf	
Constant 2.34P/(S_1B), A =	2.92		
Required Footing Depth, D =	6.22	ft	

4th Trial @ D_4 =	6.26	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 =	2.94	
Required Footing Depth, D =	6.25	ft
5th Trial @ D_5 =	6.26	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 =	2.94	
Required Footing Depth, D =	6.50	ft

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

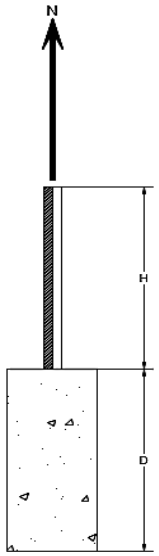
5.4 Uplifting Force Resistance

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 =	3.23	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 =	2.10	k
Required Concrete Volume, V =	14.47	ft^3
Required Footing Depth, D =	4.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.99
2	0.4	0.2	118.10	6.89
3	0.6	0.2	118.10	6.79
4	0.8	0.2	118.10	6.68
5	1	0.2	118.10	6.58
6	1.2	0.2	118.10	6.47
7	1.4	0.2	118.10	6.37
8	1.6	0.2	118.10	6.27
9	1.8	0.2	118.10	6.16
10	2	0.2	118.10	6.06
11	2.2	0.2	118.10	5.96
12	2.4	0.2	118.10	5.85
13	2.6	0.2	118.10	5.75
14	2.8	0.2	118.10	5.64
15	3	0.2	118.10	5.54
16	3.2	0.2	118.10	5.44
17	3.4	0.2	118.10	5.33
18	3.6	0.2	118.10	5.23
19	3.8	0.2	118.10	5.13
20	4	0.2	118.10	5.02
21	4.2	0.2	118.10	4.92
22	4.4	0.2	118.10	4.81
23	4.6	0.2	118.10	4.71
24	4.8	0.2	118.10	4.61
25	0	0.0	0.00	4.61
26	0	0.0	0.00	4.61
27	0	0.0	0.00	4.61
28	0	0.0	0.00	4.61
29	0	0.0	0.00	4.61
30	0	0.0	0.00	4.61
31	0	0.0	0.00	4.61
32	0	0.0	0.00	4.61
33	0	0.0	0.00	4.61
34	0	0.0	0.00	4.61
Max	4.8	Sum	1.13	

A 2ft diameter x 4.75ft 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 =	4.34	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

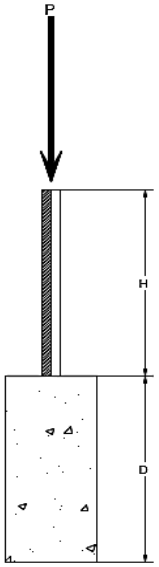
Weight of Concrete

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 =	7.30	k
Utilization =	68%	

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



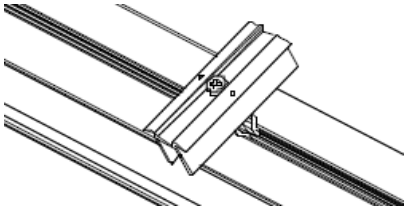
6. DESIGN OF JOINTS AND CONNECTIONS

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.

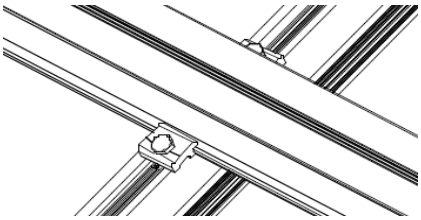
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.635 k
Allowable Uplift	=	1.214 k
Utilization	=	52%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.145 k
Allowable Uplift	=	2.180 k
Utilization	=	98%

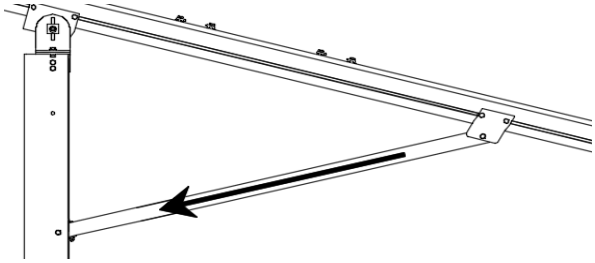


6.2 Strut Connections

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	=	5.095 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)

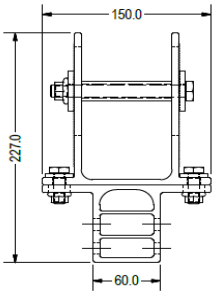


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

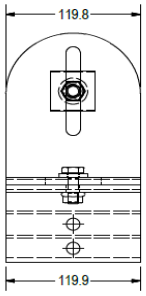
6.3 Girder to Post Connection

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.

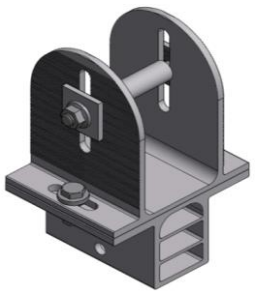
Maximum Tensile Load	=	4.424 k
Allowable Load	=	5.649 k
Utilization	=	78%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

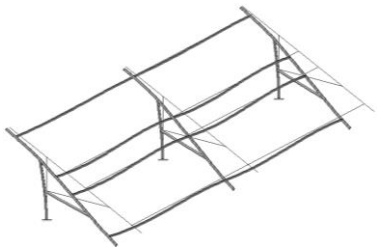
7.1 Seismic Drift

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}	=	1.119 in

1.119 ≤ 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 = 114 in	L_b = 114
J = 0.432	J = 0.432
315.377	200.561
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$
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= 27.5 ksi	φF_L= 28.8
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

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

$\varphi F_L St$= 30.1 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

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 74.8031 in

J = 0.942

116.737

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

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56

φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]

φF_L= 29.9 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 74.8031

J = 0.942

116.737

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

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56

φF_L= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]

φF_L= 29.9

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

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

φF_L = 9.61085 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

φF_L = 33.25 ksi

φF_L = 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	89.60	in	
Pr =	6.29	k	(LRFD Factored Load)
Mr (Strong) =	11.54	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 =	0.27	≥	0.2		
Utilization =	0.86	<	1.0	OK	

Bending (Weak Axis):

Yielding:					
Mn =	14.65	k-ft			
Flange Local Buckling:					
Mn =	14.39	k-ft			
Pr/Pc =	0.270	≥	0.2		
Utilization =	0.00	<	1.0	OK	

Combined Forces

Utilization = 86%

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	-59.239	-59.239	0	0
2	M11	y	-59.239	-59.239	0	0
3	M12	y	-95.298	-95.298	0	0
4	M13	y	-95.298	-95.298	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	118.478	118.478	0	0
2	M11	y	118.478	118.478	0	0
3	M12	y	56.664	56.664	0	0
4	M13	y	56.664	56.664	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 + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
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 + 1.0W	Yes	Y		1	1			4	1														
11	ASD 1.0D + 0.75L + 0.75W + 0....	Yes	Y		1	1	3	.75	4	.75														
12	ASD 0.6D + 1.0W	Yes	Y		2	.6					5	1												
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	796.69	2	2398.595	1	170.219	2	.27	1	.023	5	6.668	1
2		min	-1123.488	3	-1667.831	3	-374.106	5	-1.843	5	-.014	2	.865	15
3	N19	max	3104.545	2	6505.827	2	0	3	0	1	.024	4	11.312	1
4		min	-3077.34	3	-5182.34	3	-398.666	5	-1.925	4	0	3	.447	15
5	N29	max	796.69	2	2398.595	1	193.68	3	.3	3	.025	4	6.668	1
6		min	-1123.488	3	-1667.831	3	-411.286	4	-1.936	4	-.006	3	-.421	5
7	Totals:	max	4697.925	2	11256.841	2	0	3						
8		min	-5324.317	3	-8518.001	3	-1160.331	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.004	1	.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	-16.297	12	311.705	3	-10.967	12	.05	3	.34	1	.268	2
4			min	-229.879	1	-727.789	2	-156.656	1	-.235	2	.038	12	-.111	3
5		3	max	-16.754	12	310.517	3	-10.967	12	.05	3	.237	1	.746	2
6			min	-230.793	1	-729.374	2	-156.656	1	-.235	2	.031	12	-.315	3
7		4	max	-17.212	12	309.328	3	-10.967	12	.05	3	.134	1	1.225	2
8			min	-231.708	1	-730.958	2	-156.656	1	-.235	2	.019	10	-.519	3
9		5	max	411.208	3	684.991	2	4.015	3	.038	2	.169	1	1.445	2
10			min	-1185.469	2	-280.413	3	-199.925	1	-.065	3	-.037	3	-.613	3
11		6	max	410.522	3	683.407	2	4.015	3	.038	2	.056	2	.996	2
12			min	-1186.383	2	-281.601	3	-199.925	1	-.065	3	-.044	5	-.429	3
13		7	max	409.836	3	681.822	2	4.015	3	.038	2	-.013	10	.548	2
14			min	-1187.298	2	-282.789	3	-199.925	1	-.065	3	-.106	4	-.243	3
15		8	max	409.15	3	680.238	2	4.015	3	.038	2	-.019	12	.101	2
16			min	-1188.213	2	-283.978	3	-199.925	1	-.065	3	-.224	1	-.058	3
17		9	max	383.569	3	7.932	3	18.721	3	.021	5	.113	1	.033	3
18			min	-1381.952	1	-17.771	2	-247.015	1	-.171	2	.012	10	-.105	2
19		10	max	382.882	3	6.744	3	18.721	3	.021	5	.059	3	.028	3
20			min	-1382.867	1	-19.356	2	-247.015	1	-.171	2	-.053	2	-.092	2
21		11	max	382.196	3	5.555	3	18.721	3	.021	5	.071	3	.024	3
22			min	-1383.781	1	-20.94	2	-247.015	1	-.171	2	-.211	1	-.079	2
23		12	max	351.641	3	724.631	3	54.081	2	.28	3	.16	1	.092	1
24			min	-1622.742	1	-486.975	2	-229.444	4	-.252	2	.021	10	-.208	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	350.955	3	723.443	3	54.081	2	.28	3	.151	1	.411	2
26			min	-1623.657	1	-488.56	2	-231.03	4	-.252	2	-.069	5	-.683	3
27		14	max	350.269	3	722.254	3	54.081	2	.28	3	.141	1	.733	2
28			min	-1624.572	1	-490.144	2	-232.616	4	-.252	2	-.213	5	-1.157	3
29		15	max	349.583	3	721.066	3	54.081	2	.28	3	.175	2	1.055	2
30			min	-1625.487	1	-491.728	2	-234.201	4	-.252	2	-.358	5	-1.631	3
31		16	max	232.184	1	485.215	2	77.322	5	.203	2	.031	3	.803	2
32			min	15.221	15	-741.688	3	-130.925	1	-.429	3	-.217	4	-1.245	3
33		17	max	231.269	1	483.63	2	75.737	5	.203	2	-.002	3	.485	2
34			min	14.946	15	-742.876	3	-130.925	1	-.429	3	-.273	1	-.758	3
35		18	max	230.354	1	482.046	2	74.151	5	.203	2	-.023	12	.168	2
36			min	14.67	15	-744.064	3	-130.925	1	-.429	3	-.359	1	-.27	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	.001	4	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	-8.442	12	992.439	3	0	1	.053	4	.295	4	.637	2
42			min	-384.708	1	-2048.303	2	-111.526	5	0	1	0	1	-.319	3
43		3	max	-8.899	12	991.25	3	0	1	.053	4	.222	4	1.981	2
44			min	-385.622	1	-2049.888	2	-113.111	5	0	1	0	1	-.969	3
45		4	max	-9.357	12	990.062	3	0	1	.053	4	.148	4	3.327	2
46			min	-386.537	1	-2051.472	2	-114.697	5	0	1	0	1	-1.619	3
47		5	max	1493.541	3	2023.166	2	0	1	0	1	.01	4	3.925	2
48			min	-3238.432	2	-1017.86	3	-102.243	4	-.038	4	0	1	-1.9	3
49		6	max	1492.855	3	2021.581	2	0	1	0	1	0	1	2.598	2
50			min	-3239.347	2	-1019.048	3	-103.828	4	-.038	4	-.058	5	-1.232	3
51		7	max	1492.169	3	2019.997	2	0	1	0	1	0	1	1.272	2
52			min	-3240.262	2	-1020.236	3	-105.414	4	-.038	4	-.126	4	-.563	3
53		8	max	1491.483	3	2018.412	2	0	1	0	1	0	1	.107	3
54			min	-3241.177	2	-1021.425	3	-106.999	4	-.038	4	-.196	4	-.075	1
55		9	max	1481.091	3	10.239	3	0	1	.016	4	.148	5	.423	3
56			min	-3359.759	2	-101.733	2	-238.166	4	0	1	0	1	-.671	2
57		10	max	1480.405	3	9.051	3	0	1	.016	4	0	1	.416	3
58			min	-3360.674	2	-103.317	2	-239.751	4	0	1	-.009	4	-.604	2
59		11	max	1479.719	3	7.862	3	0	1	.016	4	0	1	.411	3
60			min	-3361.589	2	-104.902	2	-241.337	4	0	1	-.167	4	-.535	2
61		12	max	1479.276	3	2059.707	3	0	1	.171	4	.123	5	.043	1
62			min	-3672.81	1	-1589.947	2	-251.099	5	0	1	0	1	-.248	3
63		13	max	1478.59	3	2058.519	3	0	1	.171	4	0	1	1.053	1
64			min	-3673.725	1	-1591.532	2	-252.684	5	0	1	-.043	4	-1.599	3
65		14	max	1477.904	3	2057.331	3	0	1	.171	4	0	1	2.078	2
66			min	-3674.64	1	-1593.116	2	-254.27	5	0	1	-.21	4	-2.95	3
67		15	max	1477.218	3	2056.142	3	0	1	.171	4	0	1	3.124	2
68			min	-3675.554	1	-1594.701	2	-255.855	5	0	1	-.377	4	-4.299	3
69		16	max	385.585	1	1454.866	2	65.518	5	0	1	0	1	2.379	2
70			min	11.843	12	-2005.648	3	0	1	-.168	4	-.163	5	-3.263	3
71		17	max	384.671	1	1453.282	2	63.933	5	0	1	0	1	1.425	2
72			min	11.385	12	-2006.836	3	0	1	-.168	4	-.12	5	-1.947	3
73		18	max	383.756	1	1451.697	2	62.347	5	0	1	0	1	.471	2
74			min	10.928	12	-2008.024	3	0	1	-.168	4	-.079	4	-.63	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	20.573	5	311.705	3	156.656	1	.235	2	.142	5	.268	2
80			min	-229.879	1	-727.789	2	-48.771	5	-.05	3	-.34	1	-.111	3
81		3	max	20.146	5	310.517	3	156.656	1	.235	2	.11	5	.746	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	-230.793	1	-729.374	2	-50.357	5	-.05	3	-.237	1	-.315	3
83		4	max	19.719	5	309.328	3	156.656	1	.235	2	.076	5	1.225	2
84			min	-231.708	1	-730.958	2	-51.943	5	-.05	3	-.134	1	-.519	3
85		5	max	411.208	3	684.991	2	199.925	1	.065	3	.037	3	1.445	2
86			min	-1185.469	2	-280.413	3	-36.637	5	-.038	2	-.169	1	-.613	3
87		6	max	410.522	3	683.407	2	199.925	1	.065	3	.035	3	.996	2
88			min	-1186.383	2	-281.601	3	-38.223	5	-.038	2	-.056	2	-.429	3
89		7	max	409.836	3	681.822	2	199.925	1	.065	3	.093	1	.548	2
90			min	-1187.298	2	-282.789	3	-39.809	5	-.038	2	-.071	5	-.243	3
91		8	max	409.15	3	680.238	2	199.925	1	.065	3	.224	1	.101	2
92			min	-1188.213	2	-283.978	3	-41.394	5	-.038	2	-.098	5	-.058	3
93		9	max	383.569	3	7.932	3	247.015	1	.171	2	.061	5	.033	3
94			min	-1381.952	1	-17.771	2	-85.602	5	.019	15	-.113	1	-.105	2
95		10	max	382.882	3	6.744	3	247.015	1	.171	2	.053	2	.028	3
96			min	-1382.867	1	-19.356	2	-87.187	5	.019	15	-.059	3	-.092	2
97		11	max	382.196	3	5.555	3	247.015	1	.171	2	.211	1	.024	3
98			min	-1383.781	1	-20.94	2	-88.773	5	.019	15	-.071	3	-.079	2
99		12	max	351.641	3	724.631	3	222.854	3	.252	2	.051	5	.092	1
100			min	-1622.742	1	-486.975	2	-209.968	5	-.28	3	-.16	1	-.208	3
101		13	max	350.955	3	723.443	3	222.854	3	.252	2	.041	3	.411	2
102			min	-1623.657	1	-488.56	2	-211.554	5	-.28	3	-.151	1	-.683	3
103		14	max	350.269	3	722.254	3	222.854	3	.252	2	.187	3	.733	2
104			min	-1624.572	1	-490.144	2	-213.139	5	-.28	3	-.249	4	-1.157	3
105		15	max	349.583	3	721.066	3	222.854	3	.252	2	.334	3	1.055	2
106			min	-1625.487	1	-491.728	2	-214.725	5	-.28	3	-.383	4	-1.631	3
107		16	max	232.184	1	485.215	2	130.925	1	.429	3	.187	1	.803	2
108			min	6.9	15	-741.688	3	24.083	10	-.203	2	-.158	5	-1.245	3
109		17	max	231.269	1	483.63	2	130.925	1	.429	3	.273	1	.485	2
110			min	6.624	15	-742.876	3	24.083	10	-.203	2	-.096	5	-.758	3
111		18	max	230.354	1	482.046	2	130.925	1	.429	3	.359	1	.168	2
112			min	6.348	15	-744.064	3	24.083	10	-.203	2	-.035	5	-.27	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	130.978	1	480.404	2	-6.082	15	.007	2	.403	1	.203	2
116			min	24.079	10	-745.172	3	-229.885	1	-.021	3	-.004	5	-.429	3
117		2	max	130.978	1	346.487	2	-3.914	15	.007	2	.185	1	.255	3
118			min	24.079	10	-550.801	3	-183.122	1	-.021	3	-.012	5	-.235	1
119		3	max	130.978	1	212.571	2	-1.746	15	.007	2	.04	2	.734	3
120			min	24.079	10	-356.43	3	-136.36	1	-.021	3	-.018	4	-.528	2
121		4	max	130.978	1	78.654	2	.422	15	.007	2	0	10	1.007	3
122			min	24.079	10	-162.059	3	-89.598	1	-.021	3	-.103	1	-.682	2
123		5	max	130.978	1	32.313	3	3.749	5	.007	2	-.01	12	1.076	3
124			min	24.079	10	-58.182	1	-42.836	1	-.021	3	-.173	1	-.694	2
125		6	max	130.978	1	226.684	3	10.236	14	.007	2	-.007	15	.939	3
126			min	18.848	15	-189.201	1	-11.762	2	-.021	3	-.194	1	-.565	2
127		7	max	130.978	1	421.055	3	50.689	1	.007	2	0	15	.597	3
128			min	10.464	15	-323.095	2	-2.734	10	-.021	3	-.165	1	-.295	2
129		8	max	130.978	1	615.426	3	97.451	1	.007	2	.012	5	.133	1
130			min	2.08	15	-457.012	2	.804	12	-.021	3	-.087	1	-.029	5
131		9	max	130.978	1	809.798	3	144.213	1	.007	2	.053	14	.679	1
132			min	-8.869	5	-590.928	2	3.008	12	-.021	3	-.035	2	-.702	3
133		10	max	130.978	1	724.845	2	-5.115	15	.007	2	.218	1	1.364	2
134			min	24.079	10	-1004.169	3	-190.976	1	-.021	3	-.018	3	-1.659	3
135		11	max	130.978	1	590.928	2	-2.947	15	.021	3	.05	9	.679	1
136			min	17.933	15	-809.798	3	-144.213	1	-.007	2	-.035	2	-.702	3
137		12	max	130.978	1	457.012	2	-.779	15	.021	3	-.014	15	.133	1
138			min	9.549	15	-615.426	3	-97.451	1	-.007	2	-.087	1	.028	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	130.978	1	323.095	2	2.734	10	.021	3	-.013	15	.597	3
140			min	1.165	15	-421.055	3	-50.689	1	-.007	2	-.165	1	-.295	2
141		14	max	130.978	1	189.201	1	11.762	2	.021	3	-.011	15	.939	3
142			min	-10.329	5	-226.684	3	-8.459	9	-.007	2	-.194	1	-.565	2
143		15	max	130.978	1	58.182	1	42.836	1	.021	3	-.006	15	1.076	3
144			min	-22.785	5	-32.313	3	5.724	15	-.007	2	-.173	1	-.694	2
145		16	max	130.978	1	162.059	3	89.598	1	.021	3	.002	5	1.007	3
146			min	-35.241	5	-78.654	2	7.892	15	-.007	2	-.103	1	-.682	2
147		17	max	130.978	1	356.43	3	136.36	1	.021	3	.04	2	.734	3
148			min	-47.697	5	-212.571	2	10.06	15	-.007	2	-.004	9	-.528	2
149		18	max	130.978	1	550.801	3	183.122	1	.021	3	.185	1	.255	3
150			min	-60.153	5	-346.487	2	12.228	15	-.007	2	.019	12	-.235	1
151		19	max	130.978	1	745.172	3	229.885	1	.021	3	.403	1	.203	2
152			min	-72.609	5	-480.404	2	14.396	15	-.007	2	.033	12	-.429	3
153	M11	1	max	232.496	1	463.926	2	31.436	5	0	12	.459	1	.145	4
154			min	-241.387	3	-720.765	3	-238.841	1	-.009	1	-.201	5	-.406	3
155		2	max	232.496	1	330.009	2	34.789	5	0	12	.232	1	.253	3
156			min	-241.387	3	-526.394	3	-192.079	1	-.009	1	-.166	5	-.338	2
157		3	max	232.496	1	196.093	2	38.143	5	0	12	.054	1	.706	3
158			min	-241.387	3	-332.022	3	-145.317	1	-.009	1	-.128	5	-.615	2
159		4	max	232.496	1	64.918	1	41.497	5	0	12	.02	3	.954	3
160			min	-241.387	3	-137.651	3	-98.555	1	-.009	1	-.106	4	-.752	2
161		5	max	232.496	1	56.72	3	44.851	5	0	12	.001	3	.996	3
162			min	-241.387	3	-71.74	2	-51.792	1	-.009	1	-.155	1	-.746	2
163		6	max	232.496	1	251.091	3	49.325	4	0	12	.009	5	.834	3
164			min	-241.387	3	-205.657	2	-15.089	2	-.009	1	-.185	1	-.6	2
165		7	max	232.496	1	445.463	3	63.495	4	0	12	.062	5	.466	3
166			min	-241.387	3	-339.573	2	-9.755	3	-.009	1	-.165	1	-.312	2
167		8	max	232.496	1	639.834	3	88.494	1	0	12	.118	5	.117	2
168			min	-241.387	3	-473.49	2	-6.45	3	-.009	1	-.096	1	-.107	3
169		9	max	232.496	1	834.205	3	135.257	1	0	12	.191	4	.687	2
170			min	-241.387	3	-607.406	2	-3.144	3	-.009	1	-.042	2	-.884	3
171		10	max	232.496	1	253.242	14	182.019	1	.009	1	.296	4	1.399	2
172			min	-241.387	3	-1028.576	3	-80.116	14	-.004	14	-.042	3	-1.868	3
173		11	max	232.496	1	607.406	2	37.554	5	.009	1	.037	9	.687	2
174			min	-241.387	3	-834.205	3	-135.257	1	0	5	-.169	5	-.884	3
175		12	max	232.496	1	473.49	2	40.908	5	.009	1	-.022	12	.117	2
176			min	-241.387	3	-639.834	3	-88.494	1	0	5	-.145	4	-.107	3
177		13	max	232.496	1	339.573	2	44.261	5	.009	1	-.017	12	.466	3
178			min	-241.387	3	-445.463	3	-41.732	1	0	5	-.165	1	-.312	2
179		14	max	232.496	1	205.657	2	47.615	5	.009	1	-.01	12	.834	3
180			min	-241.387	3	-251.091	3	-2.447	9	0	5	-.185	1	-.6	2
181		15	max	232.496	1	71.74	2	61.117	4	.009	1	.018	5	.996	3
182			min	-241.387	3	-56.72	3	10.471	12	0	5	-.155	1	-.746	2
183		16	max	232.496	1	137.651	3	98.555	1	.009	1	.073	5	.954	3
184			min	-241.387	3	-64.918	1	12.675	12	0	5	-.075	1	-.752	2
185		17	max	232.496	1	332.022	3	145.317	1	.009	1	.14	4	.706	3
186			min	-241.387	3	-196.093	2	14.879	12	0	5	.021	9	-.615	2
187		18	max	232.496	1	526.394	3	192.079	1	.009	1	.242	4	.253	3
188			min	-241.387	3	-330.009	2	17.082	12	0	5	.044	12	-.338	2
189		19	max	232.496	1	720.765	3	238.841	1	.009	1	.459	1	.109	1
190			min	-241.387	3	-463.926	2	19.286	12	0	5	.063	12	-.406	3
191	M12	1	max	42.43	5	695.625	2	31.728	5	0	15	.484	1	.209	2
192			min	-46.015	1	-293.274	3	-242.845	1	-.006	1	-.201	5	.038	12
193		2	max	29.974	5	500.809	2	35.082	5	0	15	.252	1	.323	3
194			min	-46.015	1	-203.3	3	-196.083	1	-.006	1	-.166	5	-.422	2
195		3	max	17.518	5	305.993	2	38.435	5	0	15	.071	2	.49	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-46.015	1	-113.325	3	-149.32	1	-.006	1	-.127	5	-.848	2
197		4	max	14.746	3	111.177	2	41.789	5	0	15	.01	10	.562	3
198			min	-46.015	1	-23.351	3	-102.558	1	-.006	1	-.104	4	-1.068	2
199		5	max	14.746	3	66.623	3	45.143	5	0	15	-.006	12	.539	3
200			min	-46.015	1	-83.639	2	-55.796	1	-.006	1	-.146	1	-1.083	2
201		6	max	14.746	3	156.597	3	49.196	4	0	15	.01	5	.421	3
202			min	-46.015	1	-278.455	2	-19.381	2	-.006	1	-.181	1	-.892	2
203		7	max	14.746	3	246.572	3	63.365	4	0	15	.063	5	.208	3
204			min	-46.015	1	-473.272	2	-5.91	10	-.006	1	-.165	1	-.495	2
205		8	max	14.746	3	336.546	3	84.491	1	0	15	.12	5	.108	2
206			min	-58.155	4	-668.088	2	-1.775	3	-.006	1	-.101	1	-.099	3
207		9	max	14.746	3	426.52	3	131.253	1	0	15	.193	4	.916	2
208			min	-70.611	4	-862.904	2	1.258	12	-.006	1	-.051	2	-.502	3
209		10	max	14.746	3	1057.72	2	178.015	1	.003	3	.297	4	1.929	2
210			min	-83.067	4	-878.232	1	-58.834	2	-.006	1	-.028	10	-1	3
211		11	max	47.783	5	862.904	2	38.201	5	.006	1	.033	9	.916	2
212			min	-46.015	1	-426.52	3	-131.253	1	0	5	-.173	5	-.502	3
213		12	max	35.327	5	668.088	2	41.555	5	.006	1	-.019	12	.108	2
214			min	-46.015	1	-336.546	3	-84.491	1	0	5	-.148	4	-.099	3
215		13	max	22.871	5	473.272	2	44.909	5	.006	1	-.017	12	.208	3
216			min	-46.015	1	-246.572	3	-37.729	1	0	5	-.165	1	-.495	2
217		14	max	14.746	3	278.455	2	48.263	4	.006	1	-.013	12	.421	3
218			min	-46.015	1	-156.597	3	-.9	9	0	5	-.181	1	-.892	2
219		15	max	14.746	3	83.639	2	62.433	4	.006	1	.017	5	.539	3
220			min	-46.015	1	-66.623	3	7.556	12	0	5	-.146	1	-1.083	2
221		16	max	14.746	3	23.351	3	102.558	1	.006	1	.073	5	.562	3
222			min	-46.015	1	-111.177	2	9.759	12	0	5	-.063	1	-1.068	2
223		17	max	14.746	3	113.325	3	149.32	1	.006	1	.144	4	.49	3
224			min	-46.015	1	-305.993	2	11.963	12	0	5	.015	12	-.848	2
225		18	max	14.746	3	203.3	3	196.083	1	.006	1	.252	1	.323	3
226			min	-52.873	4	-500.809	2	14.166	12	0	5	.029	12	-.422	2
227		19	max	14.746	3	293.274	3	242.845	1	.006	1	.484	1	.209	2
228			min	-65.329	4	-695.625	2	16.37	12	0	5	.045	12	-.052	5
229	M13	1	max	47.065	5	727.157	2	21.005	5	.007	3	.392	1	.235	2
230			min	-156.427	1	-312.916	3	-228.421	1	-.024	2	-.158	5	-.05	3
231		2	max	34.609	5	532.34	2	24.359	5	.007	3	.176	1	.233	3
232			min	-156.427	1	-222.942	3	-181.659	1	-.024	2	-.135	5	-.43	2
233		3	max	22.153	5	337.524	2	27.713	5	.007	3	.032	2	.421	3
234			min	-156.427	1	-132.968	3	-134.897	1	-.024	2	-.11	4	-.889	2
235		4	max	9.697	5	142.708	2	31.067	5	.007	3	.003	3	.514	3
236			min	-156.427	1	-42.994	3	-88.135	1	-.024	2	-.109	1	-1.143	2
237		5	max	-1.544	15	46.981	3	34.42	5	.007	3	-.007	12	.512	3
238			min	-156.427	1	-52.108	2	-41.372	1	-.024	2	-.177	1	-1.19	2
239		6	max	-9.928	15	136.955	3	41.16	4	.007	3	-.002	15	.415	3
240			min	-156.427	1	-246.924	2	-10.31	2	-.024	2	-.196	1	-1.033	2
241		7	max	-10.967	12	226.929	3	55.329	4	.007	3	.038	5	.223	3
242			min	-156.427	1	-441.74	2	-4.301	3	-.024	2	-.166	1	-.669	2
243		8	max	-10.967	12	316.903	3	98.914	1	.007	3	.083	5	-.01	15
244			min	-156.427	1	-636.556	2	-.996	3	-.024	2	-.086	1	-.124	1
245		9	max	-10.967	12	406.878	3	145.677	1	.007	3	.151	4	.675	2
246			min	-156.427	1	-831.373	2	1.797	12	-.024	2	-.033	2	-.446	3
247		10	max	-10.967	12	1026.189	2	128.754	14	.007	3	.246	4	1.655	2
248			min	-156.427	1	-496.852	3	-192.439	1	-.024	2	-.024	3	-.923	3
249		11	max	32.614	5	831.373	2	25.705	5	.024	2	.05	9	.675	2
250			min	-156.427	1	-406.878	3	-145.677	1	-.007	3	-.121	5	-.446	3
251		12	max	20.158	5	636.556	2	29.059	5	.024	2	-.018	12	.003	5
252			min	-156.427	1	-316.903	3	-98.914	1	-.007	3	-.106	4	-.124	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	7.702	5	441.74	2	32.413	5	.024	2	-.017	12	.223	3
254			min	-156.427	1	-226.929	3	-52.152	1	-.007	3	-.166	1	-.669	2
255		14	max	-2.868	15	246.924	2	35.766	5	.024	2	-.013	12	.415	3
256			min	-156.427	1	-136.955	3	-9.076	9	-.007	3	-.196	1	-1.033	2
257		15	max	-10.967	12	52.108	2	46.874	4	.024	2	.016	5	.512	3
258			min	-156.427	1	-46.981	3	7.017	12	-.007	3	-.177	1	-1.19	2
259		16	max	-10.967	12	42.994	3	88.135	1	.024	2	.059	5	.514	3
260			min	-156.427	1	-142.708	2	9.221	12	-.007	3	-.109	1	-1.143	2
261		17	max	-10.967	12	132.968	3	134.897	1	.024	2	.105	5	.421	3
262			min	-156.427	1	-337.524	2	11.424	12	-.007	3	-.007	9	-.889	2
263		18	max	-10.967	12	222.942	3	181.659	1	.024	2	.19	4	.233	3
264			min	-156.427	1	-532.34	2	13.628	12	-.007	3	.026	12	-.43	2
265		19	max	-10.967	12	312.916	3	228.421	1	.024	2	.392	1	.235	2
266			min	-156.427	1	-727.157	2	15.831	12	-.007	3	.042	12	-.05	3
267	M2	1	max	2398.595	1	1122.804	3	170.393	2	.023	5	1.843	5	6.668	1
268			min	-1667.831	3	-795.413	2	-374.2	5	-.014	2	-.27	1	.865	15
269		2	max	2395.323	1	1122.804	3	170.393	2	.023	5	1.709	5	6.754	1
270			min	-1670.284	3	-795.413	2	-371.365	5	-.014	2	-.212	1	.825	15
271		3	max	1811.823	1	1144.146	1	119.799	2	.002	2	1.57	5	6.577	1
272			min	-1389.927	3	135.833	15	-347.225	5	0	3	-.186	1	.781	15
273		4	max	1808.552	1	1144.146	1	119.799	2	.002	2	1.446	5	6.166	1
274			min	-1392.38	3	135.833	15	-344.39	5	0	3	-.144	1	.732	15
275		5	max	1805.28	1	1144.146	1	119.799	2	.002	2	1.324	4	5.755	1
276			min	-1394.834	3	135.833	15	-341.555	5	0	3	-.102	1	.683	15
277		6	max	1802.009	1	1144.146	1	119.799	2	.002	2	1.206	4	5.344	1
278			min	-1397.287	3	135.833	15	-338.719	5	0	3	-.06	1	.634	15
279		7	max	1798.737	1	1144.146	1	119.799	2	.002	2	1.089	4	4.933	1
280			min	-1399.741	3	135.833	15	-335.884	5	0	3	-.071	3	.586	15
281		8	max	1795.466	1	1144.146	1	119.799	2	.002	2	.973	4	4.522	1
282			min	-1402.194	3	135.833	15	-333.049	5	0	3	-.133	3	.537	15
283		9	max	1792.194	1	1144.146	1	119.799	2	.002	2	.858	4	4.111	1
284			min	-1404.648	3	135.833	15	-330.213	5	0	3	-.196	3	.488	15
285		10	max	1788.923	1	1144.146	1	119.799	2	.002	2	.744	4	3.7	1
286			min	-1407.102	3	135.833	15	-327.378	5	0	3	-.258	3	.439	15
287		11	max	1785.651	1	1144.146	1	119.799	2	.002	2	.632	4	3.288	1
288			min	-1409.555	3	135.833	15	-324.543	5	0	3	-.32	3	.39	15
289		12	max	1782.38	1	1144.146	1	119.799	2	.002	2	.52	4	2.877	1
290			min	-1412.009	3	135.833	15	-321.708	5	0	3	-.383	3	.342	15
291		13	max	1779.108	1	1144.146	1	119.799	2	.002	2	.409	4	2.466	1
292			min	-1414.462	3	135.833	15	-318.872	5	0	3	-.445	3	.293	15
293		14	max	1775.837	1	1144.146	1	119.799	2	.002	2	.31	2	2.055	1
294			min	-1416.916	3	135.833	15	-316.037	5	0	3	-.507	3	.244	15
295		15	max	1772.566	1	1144.146	1	119.799	2	.002	2	.353	2	1.644	1
296			min	-1419.37	3	135.833	15	-313.202	5	0	3	-.57	3	.195	15
297		16	max	1769.294	1	1144.146	1	119.799	2	.002	2	.396	2	1.233	1
298			min	-1421.823	3	135.833	15	-310.367	5	0	3	-.632	3	.146	15
299		17	max	1766.023	1	1144.146	1	119.799	2	.002	2	.439	2	.822	1
300			min	-1424.277	3	135.833	15	-307.531	5	0	3	-.694	3	.098	15
301		18	max	1762.751	1	1144.146	1	119.799	2	.002	2	.482	2	.411	1
302			min	-1426.73	3	135.833	15	-304.696	5	0	3	-.757	3	.049	15
303		19	max	1759.48	1	1144.146	1	119.799	2	.002	2	.525	2	0	1
304			min	-1429.184	3	135.833	15	-301.861	5	0	3	-.819	3	0	1
305	M5	1	max	6505.827	2	3073.263	3	0	1	.024	4	1.925	4	11.312	1
306			min	-5182.34	3	-3098.568	2	-398.849	5	0	1	0	1	.447	15
307		2	max	6502.555	2	3073.263	3	0	1	.024	4	1.784	4	11.98	1
308			min	-5184.793	3	-3098.568	2	-396.014	5	0	1	0	1	.454	15
309		3	max	4703.715	1	2070.296	1	0	1	0	1	1.638	4	11.901	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	-4215.285	3	76.95	15	-375.646	4	0	4	0	1	.442	15
311		4	max	4700.444	1	2070.296	1	0	1	0	1	1.504	4	11.157	1
312			min	-4217.739	3	76.95	15	-372.811	4	0	4	0	1	.415	15
313		5	max	4697.172	1	2070.296	1	0	1	0	1	1.37	4	10.413	1
314			min	-4220.192	3	76.95	15	-369.976	4	0	4	0	1	.387	15
315		6	max	4693.901	1	2070.296	1	0	1	0	1	1.238	4	9.669	1
316			min	-4222.646	3	76.95	15	-367.14	4	0	4	0	1	.359	15
317		7	max	4690.629	1	2070.296	1	0	1	0	1	1.106	4	8.926	1
318			min	-4225.1	3	76.95	15	-364.305	4	0	4	0	1	.332	15
319		8	max	4687.358	1	2070.296	1	0	1	0	1	.976	4	8.182	1
320			min	-4227.553	3	76.95	15	-361.47	4	0	4	0	1	.304	15
321		9	max	4684.087	1	2070.296	1	0	1	0	1	.847	4	7.438	1
322			min	-4230.007	3	76.95	15	-358.635	4	0	4	0	1	.276	15
323		10	max	4680.815	1	2070.296	1	0	1	0	1	.718	4	6.694	1
324			min	-4232.46	3	76.95	15	-355.799	4	0	4	0	1	.249	15
325		11	max	4677.544	1	2070.296	1	0	1	0	1	.591	4	5.95	1
326			min	-4234.914	3	76.95	15	-352.964	4	0	4	0	1	.221	15
327		12	max	4674.272	1	2070.296	1	0	1	0	1	.465	4	5.207	1
328			min	-4237.367	3	76.95	15	-350.129	4	0	4	0	1	.194	15
329		13	max	4671.001	1	2070.296	1	0	1	0	1	.339	4	4.463	1
330			min	-4239.821	3	76.95	15	-347.293	4	0	4	0	1	.166	15
331		14	max	4667.729	1	2070.296	1	0	1	0	1	.215	4	3.719	1
332			min	-4242.275	3	76.95	15	-344.458	4	0	4	0	1	.138	15
333		15	max	4664.458	1	2070.296	1	0	1	0	1	.092	4	2.975	1
334			min	-4244.728	3	76.95	15	-341.623	4	0	4	0	1	.111	15
335		16	max	4661.186	1	2070.296	1	0	1	0	1	0	1	2.231	1
336			min	-4247.182	3	76.95	15	-338.788	4	0	4	-.031	5	.083	15
337		17	max	4657.915	1	2070.296	1	0	1	0	1	0	1	1.488	1
338			min	-4249.635	3	76.95	15	-335.952	4	0	4	-.152	4	.055	15
339		18	max	4654.643	1	2070.296	1	0	1	0	1	0	1	.744	1
340			min	-4252.089	3	76.95	15	-333.117	4	0	4	-.272	4	.028	15
341		19	max	4651.372	1	2070.296	1	0	1	0	1	0	1	0	1
342			min	-4254.543	3	76.95	15	-330.282	4	0	4	-.391	4	0	1
343	M8	1	max	2398.595	1	1122.804	3	193.531	3	.025	4	1.936	4	6.668	1
344			min	-1667.831	3	-795.413	2	-411.609	4	-.006	3	-.3	3	-.421	5
345		2	max	2395.323	1	1122.804	3	193.531	3	.025	4	1.789	4	6.754	1
346			min	-1670.284	3	-795.413	2	-408.774	4	-.006	3	-.231	3	-.372	5
347		3	max	1811.823	1	1144.146	1	173.445	3	0	3	1.641	4	6.577	1
348			min	-1389.927	3	-58.732	5	-378.806	4	-.002	2	-.178	3	-.338	5
349		4	max	1808.552	1	1144.146	1	173.445	3	0	3	1.506	4	6.166	1
350			min	-1392.38	3	-58.732	5	-375.971	4	-.002	2	-.116	3	-.317	5
351		5	max	1805.28	1	1144.146	1	173.445	3	0	3	1.371	4	5.755	1
352			min	-1394.834	3	-58.732	5	-373.136	4	-.002	2	-.054	3	-.295	5
353		6	max	1802.009	1	1144.146	1	173.445	3	0	3	1.238	4	5.344	1
354			min	-1397.287	3	-58.732	5	-370.3	4	-.002	2	.006	12	-.274	5
355		7	max	1798.737	1	1144.146	1	173.445	3	0	3	1.105	4	4.933	1
356			min	-1399.741	3	-58.732	5	-367.465	4	-.002	2	-.009	10	-.253	5
357		8	max	1795.466	1	1144.146	1	173.445	3	0	3	.974	4	4.522	1
358			min	-1402.194	3	-58.732	5	-364.63	4	-.002	2	-.052	2	-.232	5
359		9	max	1792.194	1	1144.146	1	173.445	3	0	3	.843	4	4.111	1
360			min	-1404.648	3	-58.732	5	-361.795	4	-.002	2	-.095	2	-.211	5
361		10	max	1788.923	1	1144.146	1	173.445	3	0	3	.714	5	3.7	1
362			min	-1407.102	3	-58.732	5	-358.959	4	-.002	2	-.138	2	-.19	5
363		11	max	1785.651	1	1144.146	1	173.445	3	0	3	.593	5	3.288	1
364			min	-1409.555	3	-58.732	5	-356.124	4	-.002	2	-.181	2	-.169	5
365		12	max	1782.38	1	1144.146	1	173.445	3	0	3	.473	5	2.877	1
366			min	-1412.009	3	-58.732	5	-353.289	4	-.002	2	-.224	2	-.148	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	1779.108	1	1144.146	1	173.445	3	0	3	.445	3	2.466	1
368			min	-1414.462	3	-58.732	5	-350.453	4	-.002	2	-.267	2	-.127	5
369		14	max	1775.837	1	1144.146	1	173.445	3	0	3	.507	3	2.055	1
370			min	-1416.916	3	-58.732	5	-347.618	4	-.002	2	-.31	2	-.106	5
371		15	max	1772.566	1	1144.146	1	173.445	3	0	3	.57	3	1.644	1
372			min	-1419.37	3	-58.732	5	-344.783	4	-.002	2	-.353	2	-.084	5
373		16	max	1769.294	1	1144.146	1	173.445	3	0	3	.632	3	1.233	1
374			min	-1421.823	3	-58.732	5	-341.948	4	-.002	2	-.396	2	-.063	5
375		17	max	1766.023	1	1144.146	1	173.445	3	0	3	.694	3	.822	1
376			min	-1424.277	3	-58.732	5	-339.112	4	-.002	2	-.439	2	-.042	5
377		18	max	1762.751	1	1144.146	1	173.445	3	0	3	.757	3	.411	1
378			min	-1426.73	3	-58.732	5	-336.277	4	-.002	2	-.482	2	-.021	5
379		19	max	1759.48	1	1144.146	1	173.445	3	0	3	.819	3	0	1
380			min	-1429.184	3	-58.732	5	-333.442	4	-.002	2	-.525	2	0	1
381	M3	1	max	1776.408	2	5.617	6	49.953	2	.015	3	.026	5	0	1
382			min	-730.25	3	1.32	15	-22.252	5	-.031	2	-.003	2	0	1
383		2	max	1776.199	2	4.993	6	49.953	2	.015	3	.02	4	0	15
384			min	-730.406	3	1.174	15	-21.794	5	-.031	2	-.006	3	-.002	6
385		3	max	1775.99	2	4.369	6	49.953	2	.015	3	.032	2	0	15
386			min	-730.563	3	1.027	15	-21.335	5	-.031	2	-.014	3	-.004	6
387		4	max	1775.782	2	3.745	6	49.953	2	.015	3	.05	2	-.001	15
388			min	-730.719	3	.88	15	-20.876	5	-.031	2	-.021	3	-.005	6
389		5	max	1775.573	2	3.121	6	49.953	2	.015	3	.068	2	-.001	15
390			min	-730.876	3	.734	15	-20.654	3	-.031	2	-.028	3	-.006	6
391		6	max	1775.365	2	2.497	6	49.953	2	.015	3	.086	2	-.002	15
392			min	-731.032	3	.587	15	-20.654	3	-.031	2	-.036	3	-.007	6
393		7	max	1775.156	2	1.872	6	49.953	2	.015	3	.103	2	-.002	15
394			min	-731.188	3	.44	15	-20.654	3	-.031	2	-.043	3	-.008	6
395		8	max	1774.947	2	1.248	6	49.953	2	.015	3	.121	2	-.002	15
396			min	-731.345	3	.293	15	-20.654	3	-.031	2	-.05	3	-.009	6
397		9	max	1774.739	2	.624	6	49.953	2	.015	3	.139	2	-.002	15
398			min	-731.501	3	.147	15	-20.654	3	-.031	2	-.058	3	-.009	6
399		10	max	1774.53	2	0	1	49.953	2	.015	3	.157	2	-.002	15
400			min	-731.658	3	0	1	-20.654	3	-.031	2	-.065	3	-.009	6
401		11	max	1774.322	2	-.147	15	49.953	2	.015	3	.175	2	-.002	15
402			min	-731.814	3	-.624	4	-20.654	3	-.031	2	-.073	3	-.009	6
403		12	max	1774.113	2	-.293	15	49.953	2	.015	3	.193	2	-.002	15
404			min	-731.971	3	-1.248	4	-20.654	3	-.031	2	-.08	3	-.009	6
405		13	max	1773.904	2	-.44	15	49.953	2	.015	3	.21	2	-.002	15
406			min	-732.127	3	-1.872	4	-20.654	3	-.031	2	-.087	3	-.008	6
407		14	max	1773.696	2	-.587	15	49.953	2	.015	3	.228	2	-.002	15
408			min	-732.284	3	-2.497	4	-20.654	3	-.031	2	-.095	3	-.007	6
409		15	max	1773.487	2	-.734	15	49.953	2	.015	3	.246	2	-.001	15
410			min	-732.44	3	-3.121	4	-20.654	3	-.031	2	-.102	3	-.006	6
411		16	max	1773.279	2	-.88	15	49.953	2	.015	3	.264	2	-.001	15
412			min	-732.597	3	-3.745	4	-20.654	3	-.031	2	-.109	3	-.005	6
413		17	max	1773.07	2	-1.027	15	49.953	2	.015	3	.282	2	0	15
414			min	-732.753	3	-4.369	4	-20.654	3	-.031	2	-.117	3	-.004	6
415		18	max	1772.861	2	-1.174	15	49.953	2	.015	3	.299	2	0	15
416			min	-732.909	3	-4.993	4	-20.654	3	-.031	2	-.124	3	-.002	6
417		19	max	1772.653	2	-1.32	15	49.953	2	.015	3	.317	2	0	1
418			min	-733.066	3	-5.617	4	-20.654	3	-.031	2	-.131	3	0	1
419	M6	1	max	5094.68	2	5.617	4	0	1	.003	5	.026	4	0	1
420			min	-2502.393	3	1.32	15	-25.557	4	0	1	0	1	0	1
421		2	max	5094.471	2	4.993	4	0	1	.003	5	.017	4	0	15
422			min	-2502.549	3	1.174	15	-25.099	4	0	1	0	1	-.002	4
423		3	max	5094.262	2	4.369	4	0	1	.003	5	.008	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	-2502.706	3	1.027	15	-24.64	4	0	1	0	1	-.004	4
425		4	max	5094.054	2	3.745	4	0	1	.003	5	0	1	-.001	15
426			min	-2502.862	3	.88	15	-24.181	4	0	1	0	5	-.005	4
427		5	max	5093.845	2	3.121	4	0	1	.003	5	0	1	-.001	15
428			min	-2503.018	3	.734	15	-23.723	4	0	1	-.009	4	-.006	4
429		6	max	5093.637	2	2.497	4	0	1	.003	5	0	1	-.002	15
430			min	-2503.175	3	.587	15	-23.264	4	0	1	-.018	4	-.007	4
431		7	max	5093.428	2	1.872	4	0	1	.003	5	0	1	-.002	15
432			min	-2503.331	3	.44	15	-22.805	4	0	1	-.026	4	-.008	4
433		8	max	5093.219	2	1.248	4	0	1	.003	5	0	1	-.002	15
434			min	-2503.488	3	.293	15	-22.347	4	0	1	-.034	4	-.009	4
435		9	max	5093.011	2	.624	4	0	1	.003	5	0	1	-.002	15
436			min	-2503.644	3	.147	15	-21.888	4	0	1	-.042	4	-.009	4
437		10	max	5092.802	2	0	1	0	1	.003	5	0	1	-.002	15
438			min	-2503.801	3	0	1	-21.43	4	0	1	-.049	4	-.009	4
439		11	max	5092.594	2	-.147	15	0	1	.003	5	0	1	-.002	15
440			min	-2503.957	3	-.624	6	-20.971	4	0	1	-.057	4	-.009	4
441		12	max	5092.385	2	-.293	15	0	1	.003	5	0	1	-.002	15
442			min	-2504.114	3	-1.248	6	-20.512	4	0	1	-.064	4	-.009	4
443		13	max	5092.176	2	-.44	15	0	1	.003	5	0	1	-.002	15
444			min	-2504.27	3	-1.872	6	-20.054	4	0	1	-.072	4	-.008	4
445		14	max	5091.968	2	-.587	15	0	1	.003	5	0	1	-.002	15
446			min	-2504.427	3	-2.497	6	-19.595	4	0	1	-.079	4	-.007	4
447		15	max	5091.759	2	-.734	15	0	1	.003	5	0	1	-.001	15
448			min	-2504.583	3	-3.121	6	-19.136	4	0	1	-.086	4	-.006	4
449		16	max	5091.551	2	-.88	15	0	1	.003	5	0	1	-.001	15
450			min	-2504.739	3	-3.745	6	-18.678	4	0	1	-.092	4	-.005	4
451		17	max	5091.342	2	-1.027	15	0	1	.003	5	0	1	0	15
452			min	-2504.896	3	-4.369	6	-18.219	4	0	1	-.099	4	-.004	4
453		18	max	5091.133	2	-1.174	15	0	1	.003	5	0	1	0	15
454			min	-2505.052	3	-4.993	6	-17.76	4	0	1	-.105	4	-.002	4
455		19	max	5090.925	2	-1.32	15	0	1	.003	5	0	1	0	1
456			min	-2505.209	3	-5.617	6	-17.302	4	0	1	-.112	4	0	1
457	M9	1	max	1776.408	2	5.617	6	20.654	3	.031	2	.027	4	0	1
458			min	-730.25	3	1.32	15	-49.953	2	-.015	3	-.001	3	0	1
459		2	max	1776.199	2	4.993	6	20.654	3	.031	2	.017	5	0	15
460			min	-730.406	3	1.174	15	-49.953	2	-.015	3	-.014	2	-.002	6
461		3	max	1775.99	2	4.369	6	20.654	3	.031	2	.014	3	0	15
462			min	-730.563	3	1.027	15	-49.953	2	-.015	3	-.032	2	-.004	6
463		4	max	1775.782	2	3.745	6	20.654	3	.031	2	.021	3	-.001	15
464			min	-730.719	3	.88	15	-49.953	2	-.015	3	-.05	2	-.005	6
465		5	max	1775.573	2	3.121	6	20.654	3	.031	2	.028	3	-.001	15
466			min	-730.876	3	.734	15	-49.953	2	-.015	3	-.068	2	-.006	6
467		6	max	1775.365	2	2.497	6	20.654	3	.031	2	.036	3	-.002	15
468			min	-731.032	3	.587	15	-49.953	2	-.015	3	-.086	2	-.007	6
469		7	max	1775.156	2	1.872	6	20.654	3	.031	2	.043	3	-.002	15
470			min	-731.188	3	.44	15	-49.953	2	-.015	3	-.103	2	-.008	6
471		8	max	1774.947	2	1.248	6	20.654	3	.031	2	.05	3	-.002	15
472			min	-731.345	3	.293	15	-49.953	2	-.015	3	-.121	2	-.009	6
473		9	max	1774.739	2	.624	6	20.654	3	.031	2	.058	3	-.002	15
474			min	-731.501	3	.147	15	-49.953	2	-.015	3	-.139	2	-.009	6
475		10	max	1774.53	2	0	1	20.654	3	.031	2	.065	3	-.002	15
476			min	-731.658	3	0	1	-49.953	2	-.015	3	-.157	2	-.009	6
477		11	max	1774.322	2	-.147	15	20.654	3	.031	2	.073	3	-.002	15
478			min	-731.814	3	-.624	4	-49.953	2	-.015	3	-.175	2	-.009	6
479		12	max	1774.113	2	-.293	15	20.654	3	.031	2	.08	3	-.002	15
480			min	-731.971	3	-1.248	4	-49.953	2	-.015	3	-.193	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	1773.904	2	-.44	15	20.654	3	.031	2	.087	3	-.002	15
482			min	-732.127	3	-1.872	4	-49.953	2	-.015	3	-.21	2	-.008	6
483		14	max	1773.696	2	-.587	15	20.654	3	.031	2	.095	3	-.002	15
484			min	-732.284	3	-2.497	4	-49.953	2	-.015	3	-.228	2	-.007	6
485		15	max	1773.487	2	-.734	15	20.654	3	.031	2	.102	3	-.001	15
486			min	-732.44	3	-3.121	4	-49.953	2	-.015	3	-.246	2	-.006	6
487		16	max	1773.279	2	-.88	15	20.654	3	.031	2	.109	3	-.001	15
488			min	-732.597	3	-3.745	4	-49.953	2	-.015	3	-.264	2	-.005	6
489		17	max	1773.07	2	-1.027	15	20.654	3	.031	2	.117	3	0	15
490			min	-732.753	3	-4.369	4	-49.953	2	-.015	3	-.282	2	-.004	6
491		18	max	1772.861	2	-1.174	15	20.654	3	.031	2	.124	3	0	15
492			min	-732.909	3	-4.993	4	-49.953	2	-.015	3	-.299	2	-.002	6
493		19	max	1772.653	2	-1.32	15	20.654	3	.031	2	.131	3	0	1
494			min	-733.066	3	-5.617	4	-49.953	2	-.015	3	-.317	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	-.059	15	-.065	12	.014	1	9.719e-3	3	NC	3	NC	1
2			min	-.491	1	-.82	1	-.964	4	-2.784e-2	2	122.219	1	203.45	5
3		2	max	-.059	15	-.065	15	0	12	9.398e-3	3	NC	3	NC	2
4			min	-.491	1	-.691	1	-.932	4	-2.632e-2	2	137.542	1	213.828	4
5		3	max	-.059	15	-.057	15	-.002	12	8.767e-3	3	9118.558	12	NC	3
6			min	-.491	1	-.565	1	-.891	4	-2.333e-2	2	156.693	1	227.984	4
7		4	max	-.058	15	-.049	15	-.001	12	8.137e-3	3	7162.62	12	NC	3
8			min	-.491	1	-.449	1	-.842	4	-2.035e-2	2	179.804	1	247.447	4
9		5	max	-.058	15	-.041	15	0	3	7.913e-3	3	7479.121	12	NC	3
10			min	-.49	1	-.349	1	-.788	4	-1.833e-2	2	205.946	1	273.155	4
11		6	max	-.058	15	-.033	15	.002	3	8.735e-3	3	NC	12	NC	3
12			min	-.49	1	-.268	1	-.733	4	-1.882e-2	2	233.477	1	305.687	4
13		7	max	-.058	15	-.026	15	.002	3	9.556e-3	3	NC	3	NC	1
14			min	-.489	1	-.2	1	-.679	4	-1.931e-2	2	263.036	1	345.62	4
15		8	max	-.058	15	-.019	15	0	3	1.038e-2	3	NC	12	NC	1
16			min	-.489	1	-.139	1	-.63	4	-1.979e-2	2	296.66	1	391.612	5
17		9	max	-.058	15	-.012	15	0	2	1.16e-2	3	5514.389	12	NC	1
18			min	-.488	1	-.079	1	-.585	4	-1.891e-2	2	339.167	1	446.304	5
19		10	max	-.058	15	-.003	10	.002	2	1.319e-2	3	3629.027	12	NC	1
20			min	-.488	1	-.041	3	-.539	4	-1.673e-2	2	397.547	1	522.31	5
21		11	max	-.058	15	.045	1	.001	1	1.478e-2	3	2718.689	12	NC	1
22			min	-.487	1	-.021	3	-.492	4	-1.456e-2	2	482.165	1	629.505	5
23		12	max	-.058	15	.109	1	.005	3	1.387e-2	3	3543.181	10	NC	1
24			min	-.487	1	0	3	-.449	4	-1.188e-2	2	615.829	1	783.684	5
25		13	max	-.058	15	.172	1	.014	3	1.03e-2	3	8085.864	10	NC	1
26			min	-.486	1	.014	12	-.403	4	-8.663e-3	2	845.664	1	1049.711	5
27		14	max	-.058	15	.228	1	.021	3	6.734e-3	3	NC	10	NC	1
28			min	-.485	1	.025	15	-.359	4	-7.196e-3	4	917.981	3	1540.991	5
29		15	max	-.058	15	.273	1	.021	3	3.165e-3	3	NC	2	NC	1
30			min	-.485	1	.033	15	-.322	4	-8.502e-3	4	688.981	3	2465.865	5
31		16	max	-.058	15	.303	1	.014	3	7.68e-3	3	NC	11	NC	2
32			min	-.485	1	.04	15	-.297	4	-7.494e-3	4	502.797	3	4131.784	5
33		17	max	-.058	15	.321	1	.017	1	1.314e-2	3	NC	11	NC	2
34			min	-.485	1	.048	15	-.281	4	-6.8e-3	2	375.466	3	5449.634	1
35		18	max	-.058	15	.386	3	.008	1	1.861e-2	3	NC	1	NC	2
36			min	-.485	1	.055	15	-.272	4	-9.386e-3	2	292.349	3	7369.995	1
37		19	max	-.058	15	.497	3	-.002	10	2.139e-2	3	NC	1	NC	1
38			min	-.485	1	.063	15	-.269	4	-1.071e-2	2	237.797	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	-.033	15	-.036	12	0	1	5.184e-4	4	NC	3	NC	1
40			min	-.886	1	-1.619	1	-.963	4	0	1	68.328	1	203.213	4
41		2	max	-.033	15	-.045	15	0	1	1.75e-4	5	3961.436	12	NC	1
42			min	-.886	1	-1.346	1	-.933	4	0	1	78.685	1	212.397	4
43		3	max	-.033	15	-.037	15	0	1	0	1	2449.089	15	NC	1
44			min	-.886	1	-1.08	1	-.893	4	-5.006e-4	4	92.288	1	226.084	4
45		4	max	-.033	15	-.03	15	0	1	0	1	2793.988	15	NC	1
46			min	-.886	1	-.84	1	-.843	4	-1.175e-3	4	109.426	1	245.381	4
47		5	max	-.033	15	-.024	15	0	1	0	1	3178.148	15	NC	1
48			min	-.885	1	-.642	1	-.788	4	-1.525e-3	4	129.128	1	271.268	4
49		6	max	-.033	15	-.019	15	0	1	0	1	3575.194	15	NC	1
50			min	-.884	1	-.494	1	-.732	4	-1.04e-3	4	149.196	1	303.976	4
51		7	max	-.033	15	-.015	15	0	1	0	1	3998.498	15	NC	1
52			min	-.883	1	-.379	1	-.678	4	-5.541e-4	4	169.75	1	343.726	4
53		8	max	-.033	15	-.011	15	0	1	0	1	4485.625	15	NC	1
54			min	-.882	1	-.28	1	-.629	4	-6.84e-5	4	192.666	1	389.938	4
55		9	max	-.033	15	-.007	15	0	1	6.485e-5	5	NC	12	NC	1
56			min	-.88	1	-.179	1	-.586	4	0	1	223.352	1	442.886	4
57		10	max	-.033	15	-.003	15	0	1	0	1	NC	3	NC	1
58			min	-.879	1	-.068	1	-.539	4	-1.34e-4	4	270.536	1	519.563	4
59		11	max	-.033	15	.05	1	0	1	0	1	7424.56	15	NC	1
60			min	-.878	1	-.01	3	-.492	4	-3.328e-4	4	349.853	1	627.356	4
61		12	max	-.033	15	.177	1	0	1	0	1	9794.831	15	NC	1
62			min	-.876	1	.006	15	-.449	4	-1.488e-3	4	508.527	1	771.913	4
63		13	max	-.033	15	.303	1	0	1	0	1	NC	15	NC	1
64			min	-.875	1	.011	15	-.405	4	-3.66e-3	4	929.176	1	1021.009	4
65		14	max	-.033	15	.413	1	0	1	0	1	NC	5	NC	1
66			min	-.873	1	.015	15	-.362	4	-5.832e-3	4	1061.083	3	1479.96	4
67		15	max	-.033	15	.491	1	0	1	0	1	NC	4	NC	1
68			min	-.872	1	.018	15	-.327	4	-8.004e-3	4	619.229	3	2318.311	4
69		16	max	-.033	15	.522	1	0	1	0	1	NC	4	NC	1
70			min	-.872	1	.02	15	-.304	4	-6.313e-3	4	363.717	3	3750.239	4
71		17	max	-.033	15	.554	3	0	1	0	1	NC	4	NC	1
72			min	-.872	1	.021	15	-.287	4	-4.17e-3	4	235.672	3	6743.285	4
73		18	max	-.033	15	.796	3	0	1	0	1	NC	4	NC	1
74			min	-.872	1	.021	15	-.275	4	-2.026e-3	4	168.081	3	NC	1
75		19	max	-.033	15	1.047	3	0	1	0	1	NC	1	NC	1
76			min	-.872	1	.021	15	-.266	4	-9.326e-4	4	129.526	3	NC	1
77	M7	1	max	.025	5	.018	5	-.001	12	2.784e-2	2	NC	3	NC	1
78			min	-.491	1	-.82	1	-.972	4	-9.719e-3	3	122.219	1	199.726	4
79		2	max	.025	5	.019	5	.01	1	2.632e-2	2	NC	3	NC	2
80			min	-.491	1	-.691	1	-.926	4	-9.398e-3	3	137.542	1	213.313	4
81		3	max	.025	5	.019	5	.022	1	2.333e-2	2	NC	5	NC	3
82			min	-.491	1	-.565	1	-.879	4	-8.767e-3	3	156.693	1	229.811	4
83		4	max	.025	5	.019	5	.025	1	2.035e-2	2	NC	5	NC	3
84			min	-.491	1	-.449	1	-.829	4	-8.137e-3	3	179.804	1	250.127	4
85		5	max	.025	5	.017	5	.023	1	1.833e-2	2	NC	5	NC	3
86			min	-.49	1	-.349	1	-.777	4	-7.913e-3	3	205.946	1	275.312	4
87		6	max	.025	5	.015	5	.015	1	1.882e-2	2	NC	5	NC	3
88			min	-.49	1	-.268	1	-.726	4	-8.735e-3	3	233.477	1	305.458	4
89		7	max	.025	5	.012	5	.005	2	1.931e-2	2	NC	3	NC	1
90			min	-.489	1	-.2	1	-.677	4	-9.556e-3	3	263.036	1	341.389	4
91		8	max	.025	5	.009	5	0	2	1.979e-2	2	NC	5	NC	1
92			min	-.489	1	-.139	1	-.63	4	-1.038e-2	3	296.66	1	384.745	4
93		9	max	.025	5	.006	5	.001	3	1.891e-2	2	NC	5	NC	1
94			min	-.488	1	-.079	1	-.585	4	-1.16e-2	3	339.167	1	438.506	4
95		10	max	.025	5	.003	5	.002	3	1.673e-2	2	NC	7	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	-.488	1	-.041	3	-.539	4	-1.319e-2	3	397.547	1	511.405	4
97		11	max	.025	5	.045	1	0	12	1.456e-2	2	NC	13	NC	1
98			min	-.487	1	-.021	3	-.493	4	-1.478e-2	3	482.165	1	614.512	4
99		12	max	.025	5	.109	1	.006	1	1.188e-2	2	NC	13	NC	1
100			min	-.487	1	-.003	5	-.446	4	-1.387e-2	3	615.829	1	769.375	4
101		13	max	.025	5	.172	1	.009	2	8.663e-3	2	NC	4	NC	1
102			min	-.486	1	-.006	5	-.4	4	-1.03e-2	3	845.664	1	1028.673	4
103		14	max	.025	5	.228	1	.009	2	5.449e-3	2	NC	4	NC	1
104			min	-.485	1	-.01	5	-.358	4	-6.734e-3	3	917.981	3	1475.719	4
105		15	max	.025	5	.273	1	.004	2	2.236e-3	2	NC	2	NC	1
106			min	-.485	1	-.014	5	-.326	4	-7.914e-3	5	688.981	3	2203.64	4
107		16	max	.025	5	.303	1	0	10	4.213e-3	2	NC	4	NC	2
108			min	-.485	1	-.02	5	-.306	4	-7.68e-3	3	502.797	3	3222.019	4
109		17	max	.025	5	.321	1	-.002	10	6.8e-3	2	NC	4	NC	2
110			min	-.485	1	-.028	5	-.291	4	-1.314e-2	3	375.466	3	4950.442	4
111		18	max	.025	5	.386	3	-.002	10	9.386e-3	2	NC	1	NC	2
112			min	-.485	1	-.035	5	-.277	4	-1.861e-2	3	292.349	3	7369.995	1
113		19	max	.025	5	.497	3	.012	1	1.071e-2	2	NC	1	NC	1
114			min	-.485	1	-.043	5	-.262	4	-2.139e-2	3	237.797	3	NC	1
115	M10	1	max	.001	1	.443	3	.485	1	1.41e-2	3	NC	1	NC	1
116			min	-.269	4	-.04	5	-.025	5	-1.236e-3	2	NC	1	NC	1
117		2	max	.001	1	.721	3	.551	1	1.606e-2	3	NC	4	NC	3
118			min	-.27	4	-.019	5	-.009	5	-1.902e-3	2	817.855	3	3470.817	1
119		3	max	0	1	.979	3	.65	1	1.803e-2	3	NC	4	NC	5
120			min	-.27	4	-.055	10	.002	15	-2.568e-3	2	424.942	3	1382.494	1
121		4	max	0	1	1.173	3	.753	1	1.999e-2	3	NC	5	NC	5
122			min	-.27	4	-.126	2	.009	15	-3.233e-3	2	311.918	3	851.603	1
123		5	max	0	1	1.28	3	.838	1	2.196e-2	3	NC	5	NC	15
124			min	-.27	4	-.138	2	.015	15	-3.899e-3	2	272.129	3	646.008	1
125		6	max	0	1	1.294	3	.893	1	2.392e-2	3	NC	4	NC	5
126			min	-.27	4	-.091	2	.018	15	-4.565e-3	2	267.883	3	558.658	1
127		7	max	0	1	1.225	3	.915	1	2.589e-2	3	NC	4	NC	5
128			min	-.27	4	-.03	10	.02	15	-5.23e-3	2	291.231	3	530.682	1
129		8	max	0	1	1.106	3	.908	1	2.785e-2	3	NC	4	NC	5
130			min	-.27	4	.009	15	.022	15	-5.896e-3	2	343.701	3	539.517	1
131		9	max	0	1	.983	3	.886	1	2.982e-2	3	NC	4	NC	5
132			min	-.27	4	.014	15	.026	15	-6.562e-3	2	421.494	3	568.711	1
133		10	max	0	1	.925	3	.872	1	3.178e-2	3	NC	5	NC	5
134			min	-.27	4	.021	15	.033	15	-7.228e-3	2	472.943	3	588.824	1
135		11	max	0	10	.983	3	.886	1	2.982e-2	3	NC	5	NC	15
136			min	-.27	4	.025	15	.041	15	-6.562e-3	2	421.494	3	568.711	1
137		12	max	0	10	1.106	3	.908	1	2.785e-2	3	NC	4	NC	15
138			min	-.27	4	.024	15	.048	15	-5.896e-3	2	343.701	3	539.517	1
139		13	max	0	10	1.225	3	.915	1	2.589e-2	3	NC	5	NC	15
140			min	-.27	4	-.03	10	.052	15	-5.23e-3	2	291.231	3	530.682	1
141		14	max	0	10	1.294	3	.893	1	2.392e-2	3	NC	15	NC	15
142			min	-.27	4	-.091	2	.054	15	-4.565e-3	2	267.883	3	558.658	1
143		15	max	0	10	1.28	3	.838	1	2.196e-2	3	9125.466	15	NC	5
144			min	-.27	4	-.138	2	.053	15	-3.899e-3	2	272.129	3	646.008	1
145		16	max	0	10	1.173	3	.753	1	1.999e-2	3	8265.875	15	NC	5
146			min	-.27	4	-.126	2	.052	15	-3.233e-3	2	311.918	3	851.603	1
147		17	max	0	10	.979	3	.65	1	1.803e-2	3	9144.202	15	NC	5
148			min	-.27	4	-.055	10	.052	15	-2.568e-3	2	424.942	3	1382.494	1
149		18	max	0	10	.721	3	.551	1	1.606e-2	3	NC	15	NC	3
150			min	-.27	4	.011	10	.053	15	-1.902e-3	2	817.855	3	3470.817	1
151		19	max	0	10	.443	3	.485	1	1.41e-2	3	NC	1	NC	1
152			min	-.27	4	.059	15	.058	15	-1.236e-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	.078	1	.487	1	8.087e-3	1	NC	1	NC	1
154			min	-.469	4	-.01	3	-.025	5	-3.669e-4	5	NC	1	NC	1
155		2	max	.002	1	.194	3	.535	1	8.965e-3	1	NC	4	NC	3
156			min	-.469	4	-.104	2	.018	15	-2.255e-4	5	1113.941	3	3968.446	4
157		3	max	.002	1	.378	3	.626	1	9.844e-3	1	NC	5	NC	3
158			min	-.469	4	-.242	2	.034	15	-8.416e-5	5	586.836	3	1645.774	1
159		4	max	.001	1	.501	3	.726	1	1.072e-2	1	NC	5	NC	12
160			min	-.469	4	-.326	2	.035	15	2.147e-5	15	445.766	3	954.055	1
161		5	max	.001	1	.541	3	.814	1	1.16e-2	1	NC	5	8403.082	15
162			min	-.469	4	-.345	2	.026	15	1.154e-4	15	413.323	3	697.685	1
163		6	max	0	1	.495	3	.875	1	1.248e-2	1	NC	5	NC	5
164			min	-.469	4	-.299	2	.012	15	2.093e-4	15	451.317	3	587.804	1
165		7	max	0	1	.376	3	.904	1	1.336e-2	1	NC	5	NC	5
166			min	-.469	4	-.202	2	0	15	3.032e-4	15	589.863	3	546.867	1
167		8	max	0	1	.218	3	.904	1	1.424e-2	1	NC	4	NC	13
168			min	-.47	4	-.077	2	-.007	5	3.971e-4	15	999.314	3	546.311	1
169		9	max	0	1	.07	3	.888	1	1.512e-2	1	NC	1	NC	5
170			min	-.47	4	.001	15	.003	15	4.91e-4	15	2824.901	3	568.058	1
171		10	max	0	1	.114	1	.877	1	1.599e-2	1	NC	3	NC	5
172			min	-.47	4	.002	12	.033	15	5.849e-4	15	6243.118	1	584.662	1
173		11	max	0	3	.07	3	.888	1	1.512e-2	1	NC	1	5732.276	15
174			min	-.47	4	.004	15	.064	15	6.238e-4	15	2824.901	3	568.058	1
175		12	max	0	3	.218	3	.904	1	1.424e-2	1	NC	4	4879.542	15
176			min	-.47	4	-.077	2	.075	15	6.626e-4	15	999.314	3	546.311	1
177		13	max	0	3	.376	3	.904	1	1.336e-2	1	NC	5	5928.727	15
178			min	-.47	4	-.202	2	.071	15	7.014e-4	15	589.863	3	546.867	1
179		14	max	0	3	.495	3	.875	1	1.248e-2	1	NC	15	NC	15
180			min	-.47	4	-.299	2	.057	15	7.403e-4	15	451.317	3	587.804	1
181		15	max	.001	3	.541	3	.814	1	1.16e-2	1	9177.814	15	NC	5
182			min	-.47	4	-.345	2	.04	15	7.791e-4	15	413.323	3	697.685	1
183		16	max	.001	3	.501	3	.726	1	1.072e-2	1	8511.537	15	NC	4
184			min	-.47	4	-.326	2	.024	15	8.18e-4	15	445.766	3	954.055	1
185		17	max	.002	3	.378	3	.626	1	9.844e-3	1	9559.924	15	NC	3
186			min	-.47	4	-.242	2	.017	15	8.568e-4	15	586.836	3	1645.774	1
187		18	max	.002	3	.194	3	.535	1	8.965e-3	1	NC	5	NC	3
188			min	-.47	4	-.104	2	.026	15	8.957e-4	15	1113.941	3	4717.423	1
189		19	max	.002	3	.078	1	.487	1	8.087e-3	1	NC	1	NC	1
190			min	-.47	4	-.01	3	.058	15	9.345e-4	15	NC	1	NC	1
191	M12	1	max	0	3	.008	5	.489	1	7.627e-3	1	NC	1	NC	1
192			min	-.608	4	-.11	1	-.025	5	-4.055e-4	5	NC	1	NC	1
193		2	max	0	3	.056	3	.53	1	8.21e-3	1	NC	5	NC	2
194			min	-.608	4	-.327	2	.018	15	-2.746e-4	5	903.28	2	4094.294	4
195		3	max	0	3	.158	3	.616	1	8.794e-3	1	NC	5	NC	12
196			min	-.608	4	-.544	2	.033	15	-1.438e-4	5	486.127	2	1792.661	1
197		4	max	0	3	.216	3	.715	1	9.378e-3	1	NC	5	7384.659	12
198			min	-.608	4	-.687	2	.034	15	-2.402e-5	15	372.457	2	1005.516	1
199		5	max	0	3	.226	3	.805	1	9.961e-3	1	NC	5	8938.892	15
200			min	-.608	4	-.737	2	.025	15	6.313e-5	15	344.225	2	721.789	1
201		6	max	0	3	.189	3	.868	1	1.055e-2	1	NC	5	NC	5
202			min	-.608	4	-.693	2	.01	15	1.503e-4	15	368.722	2	600.419	1
203		7	max	0	3	.116	3	.901	1	1.113e-2	1	NC	5	NC	5
204			min	-.608	4	-.572	2	-.002	15	2.374e-4	15	458.728	2	553.09	1
205		8	max	0	3	.024	3	.905	1	1.171e-2	1	NC	5	NC	13
206			min	-.608	4	-.416	1	-.009	5	3.246e-4	15	683.734	2	548.002	1
207		9	max	0	3	-.008	15	.891	1	1.23e-2	1	NC	3	NC	5
208			min	-.608	4	-.29	1	.002	15	4.117e-4	15	1260.215	2	566.212	1
209		10	max	0	1	-.009	15	.881	1	1.288e-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	-.608	4	-.233	1	.033	15	4.989e-4	15	1857.186	1	581.163	1
211		11	max	0	1	-.012	15	.891	1	1.23e-2	1	NC	3	5609.864	15
212			min	-.608	4	-.29	1	.065	15	5.456e-4	15	1260.215	2	566.212	1
213		12	max	0	1	.024	3	.905	1	1.171e-2	1	NC	5	4748.905	15
214			min	-.608	4	-.416	1	.077	15	5.923e-4	15	683.734	2	548.002	1
215		13	max	0	1	.116	3	.901	1	1.113e-2	1	NC	15	5721.192	15
216			min	-.608	4	-.572	2	.073	15	6.39e-4	15	458.728	2	553.09	1
217		14	max	0	1	.189	3	.868	1	1.055e-2	1	NC	15	NC	15
218			min	-.608	4	-.693	2	.059	15	6.857e-4	15	368.722	2	600.419	1
219		15	max	0	1	.226	3	.805	1	9.961e-3	1	9574.05	15	NC	5
220			min	-.608	4	-.737	2	.041	15	7.324e-4	15	344.225	2	721.789	1
221		16	max	0	1	.216	3	.715	1	9.378e-3	1	9784.627	15	NC	4
222			min	-.608	4	-.687	2	.025	15	7.791e-4	15	372.457	2	1005.516	1
223		17	max	0	1	.158	3	.616	1	8.794e-3	1	NC	15	NC	4
224			min	-.608	4	-.544	2	.017	15	8.258e-4	15	486.127	2	1792.661	1
225		18	max	0	1	.056	3	.53	1	8.21e-3	1	NC	5	NC	2
226			min	-.608	4	-.327	2	.026	15	8.725e-4	15	903.28	2	5505.122	5
227		19	max	0	1	-.015	15	.489	1	7.627e-3	1	NC	1	NC	1
228			min	-.608	4	-.11	1	.058	15	9.192e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.019	5	.491	1	1.639e-2	1	NC	1	NC	1
230			min	-.95	4	-.757	1	-.025	5	-1.751e-3	3	NC	1	NC	1
231		2	max	0	12	.015	3	.561	1	1.841e-2	1	NC	5	NC	3
232			min	-.95	4	-1.066	1	.015	15	-2.378e-3	3	647.54	2	3242.747	1
233		3	max	0	12	.115	3	.663	1	2.044e-2	2	NC	5	NC	12
234			min	-.95	4	-1.346	1	.032	15	-3.005e-3	3	341.474	2	1321.065	1
235		4	max	0	12	.179	3	.768	1	2.27e-2	2	NC	5	7097.818	12
236			min	-.95	4	-1.561	1	.037	15	-3.632e-3	3	251.605	2	822.658	1
237		5	max	0	12	.199	3	.854	1	2.497e-2	2	NC	15	6911.557	15
238			min	-.95	4	-1.694	1	.032	15	-4.258e-3	3	218.149	2	627.951	1
239		6	max	0	12	.173	3	.909	1	2.723e-2	2	NC	15	NC	15
240			min	-.949	4	-1.738	1	.023	15	-4.885e-3	3	211.034	2	545.128	1
241		7	max	0	12	.112	3	.93	1	2.95e-2	2	NC	15	NC	5
242			min	-.949	4	-1.706	1	.013	15	-5.512e-3	3	222.256	2	519.042	1
243		8	max	0	12	.032	3	.922	1	3.176e-2	2	NC	15	NC	5
244			min	-.949	4	-1.624	1	.008	15	-6.139e-3	3	249.55	2	528.338	1
245		9	max	0	12	-.032	12	.9	1	3.403e-2	2	NC	15	NC	5
246			min	-.949	4	-1.531	1	.012	15	-6.765e-3	3	287.113	2	557.145	1
247		10	max	0	1	-.049	15	.886	1	3.629e-2	2	NC	12	NC	5
248			min	-.949	4	-1.485	1	.033	15	-7.392e-3	3	309.888	2	576.828	1
249		11	max	0	1	-.032	12	.9	1	3.403e-2	2	NC	15	7399.223	15
250			min	-.949	4	-1.531	1	.055	15	-6.765e-3	3	287.113	2	557.145	1
251		12	max	0	1	.032	3	.922	1	3.176e-2	2	8859.21	15	6625.486	15
252			min	-.949	4	-1.624	1	.063	15	-6.139e-3	3	249.55	2	528.338	1
253		13	max	0	1	.112	3	.93	1	2.95e-2	2	7753.106	15	8428.152	15
254			min	-.949	4	-1.706	1	.06	15	-5.512e-3	3	222.256	2	519.042	1
255		14	max	0	1	.173	3	.909	1	2.723e-2	2	7158	15	NC	5
256			min	-.949	4	-1.738	1	.05	15	-4.885e-3	3	211.034	2	545.128	1
257		15	max	0	1	.199	3	.854	1	2.497e-2	2	7127.985	15	NC	5
258			min	-.949	4	-1.694	1	.037	15	-4.258e-3	3	218.149	2	627.951	1
259		16	max	0	1	.179	3	.768	1	2.27e-2	2	7841.426	15	NC	13
260			min	-.949	4	-1.561	1	.026	15	-3.632e-3	3	251.605	2	822.658	1
261		17	max	.001	1	.115	3	.663	1	2.044e-2	2	NC	15	NC	4
262			min	-.949	4	-1.346	1	.022	15	-3.005e-3	3	341.474	2	1321.065	1
263		18	max	.001	1	.015	3	.561	1	1.841e-2	1	NC	5	NC	3
264			min	-.949	4	-1.066	1	.031	15	-2.378e-3	3	647.54	2	3242.747	1
265		19	max	.001	1	-.069	12	.491	1	1.639e-2	1	NC	1	NC	1
266			min	-.949	4	-.757	1	.059	15	-1.751e-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	5.002e-3	2	NC	1	NC	1
270			min	0	1	-.002	1	0	1	-8.127e-3	5	NC	1	NC	1
271		3	max	0	3	-.001	15	.006	5	7.06e-3	2	NC	2	NC	1
272			min	0	1	-.009	1	0	1	-1.18e-2	5	8169.391	1	NC	1
273		4	max	0	3	-.003	15	.014	5	6.493e-3	2	NC	5	NC	1
274			min	0	1	-.021	1	-.002	1	-1.15e-2	5	3623.556	1	5583.26	5
275		5	max	0	3	-.005	15	.024	5	5.927e-3	2	NC	5	NC	1
276			min	0	1	-.038	1	-.003	1	-1.121e-2	5	2060.814	1	3235.327	5
277		6	max	0	3	-.007	15	.036	5	5.36e-3	2	NC	15	NC	1
278			min	0	1	-.058	1	-.004	1	-1.091e-2	5	1339.255	1	2129.975	5
279		7	max	0	3	-.01	15	.051	5	4.794e-3	2	7776.848	15	NC	1
280			min	0	1	-.082	1	-.006	1	-1.061e-2	5	946.446	1	1520.884	5
281		8	max	0	3	-.013	15	.068	5	4.228e-3	2	5842.627	15	NC	1
282			min	0	1	-.109	1	-.007	1	-1.032e-2	5	708.7	1	1149.073	5
283		9	max	0	3	-.017	15	.086	5	3.661e-3	2	4574.327	15	NC	1
284			min	-.001	1	-.14	1	-.009	1	-1.002e-2	5	553.513	1	904.838	5
285		10	max	0	3	-.021	15	.105	5	3.095e-3	2	3697.418	15	NC	9
286			min	-.001	1	-.174	1	-.01	1	-9.724e-3	5	446.579	1	735.697	5
287		11	max	0	3	-.025	15	.126	5	2.529e-3	2	3064.496	15	NC	9
288			min	-.001	1	-.21	1	-.012	1	-9.428e-3	5	369.598	1	613.473	5
289		12	max	.001	3	-.03	15	.149	5	1.962e-3	2	2592.756	15	NC	9
290			min	-.001	1	-.248	1	-.012	1	-9.131e-3	5	312.342	1	522.282	5
291		13	max	.001	3	-.035	15	.172	4	1.396e-3	2	2231.293	15	NC	3
292			min	-.001	1	-.289	1	-.013	1	-8.87e-3	4	268.543	1	451.989	4
293		14	max	.001	3	-.04	15	.196	4	8.294e-4	2	1948.194	15	NC	3
294			min	-.002	1	-.331	1	-.013	1	-8.638e-3	4	234.289	1	396.821	4
295		15	max	.001	3	-.045	15	.22	4	9.476e-4	3	1722.256	15	NC	3
296			min	-.002	1	-.375	1	-.013	1	-8.407e-3	4	206.983	1	352.796	4
297		16	max	.001	3	-.05	15	.245	4	1.272e-3	3	1539.074	15	NC	1
298			min	-.002	1	-.42	1	-.012	1	-8.176e-3	4	184.867	1	317.123	4
299		17	max	.002	3	-.056	15	.27	4	1.595e-3	3	1388.558	15	NC	1
300			min	-.002	1	-.465	1	-.01	1	-7.944e-3	4	166.71	1	287.843	4
301		18	max	.002	3	-.061	15	.294	4	1.919e-3	3	1263.439	15	NC	1
302			min	-.002	1	-.512	1	-.013	3	-7.713e-3	4	151.629	1	263.552	4
303		19	max	.002	3	-.067	15	.319	4	2.243e-3	3	1158.415	15	NC	1
304			min	-.002	1	-.558	1	-.02	3	-7.481e-3	4	138.978	1	243.216	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	-.004	1	0	1	-8.581e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.007	4	0	1	NC	4	NC	1
310			min	0	2	-.016	1	0	1	-1.244e-2	4	4779.127	1	NC	1
311		4	max	0	3	-.001	15	.015	4	0	1	NC	5	NC	1
312			min	-.001	2	-.037	1	0	1	-1.21e-2	4	2074.272	1	5346.331	4
313		5	max	.001	3	-.003	15	.025	4	0	1	NC	5	NC	1
314			min	-.001	1	-.066	1	0	1	-1.176e-2	4	1168.56	1	3099.602	4
315		6	max	.002	3	-.004	15	.038	4	0	1	NC	5	NC	1
316			min	-.002	1	-.103	1	0	1	-1.143e-2	4	755.399	1	2041.984	4
317		7	max	.002	3	-.006	15	.053	4	0	1	NC	15	NC	1
318			min	-.002	1	-.146	1	0	1	-1.109e-2	4	532.044	1	1459.207	4
319		8	max	.002	3	-.007	15	.07	4	0	1	NC	15	NC	1
320			min	-.002	1	-.195	1	0	1	-1.075e-2	4	397.473	1	1103.453	4
321		9	max	.002	3	-.009	15	.089	4	0	1	8234.13	15	NC	1
322			min	-.003	1	-.25	1	0	1	-1.041e-2	4	309.912	1	869.766	4
323		10	max	.003	3	-.012	15	.11	4	0	1	6643.037	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	-.311	1	0	1	-1.007e-2	4	249.72	1	707.934	4
325		11	max	.003	3	-.014	15	.131	4	0	1	5497.712	15	NC	1
326			min	-.003	1	-.376	1	0	1	-9.726e-3	4	206.467	1	591.003	4
327		12	max	.003	3	-.017	15	.154	4	0	1	4645.883	15	NC	1
328			min	-.004	1	-.445	1	0	1	-9.386e-3	4	174.342	1	503.776	4
329		13	max	.003	3	-.019	15	.178	4	0	1	3994.315	15	NC	1
330			min	-.004	1	-.518	1	0	1	-9.047e-3	4	149.797	1	436.927	4
331		14	max	.004	3	-.022	15	.202	4	0	1	3484.738	15	NC	1
332			min	-.004	1	-.594	1	0	1	-8.707e-3	4	130.62	1	384.587	4
333		15	max	.004	3	-.025	15	.226	4	0	1	3078.546	15	NC	1
334			min	-.005	1	-.673	1	0	1	-8.367e-3	4	115.344	1	342.862	4
335		16	max	.004	3	-.028	15	.251	4	0	1	2749.561	15	NC	1
336			min	-.005	1	-.754	1	0	1	-8.027e-3	4	102.981	1	309.103	4
337		17	max	.005	3	-.031	15	.276	4	0	1	2479.485	15	NC	1
338			min	-.005	1	-.836	1	0	1	-7.688e-3	4	92.837	1	281.45	4
339		18	max	.005	3	-.034	15	.3	4	0	1	2255.159	15	NC	1
340			min	-.005	1	-.919	1	0	1	-7.348e-3	4	84.416	1	258.573	4
341		19	max	.005	3	-.038	15	.324	4	0	1	2066.991	15	NC	1
342			min	-.006	1	-1.003	1	0	1	-7.008e-3	4	77.356	1	239.49	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	2.114e-3	3	NC	1	NC	1
346			min	0	1	-.002	1	0	3	-9.049e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.007	4	2.939e-3	3	NC	2	NC	1
348			min	0	1	-.009	1	0	3	-1.309e-2	4	8169.391	1	NC	1
349		4	max	0	3	.001	5	.015	4	2.615e-3	3	NC	4	NC	1
350			min	0	1	-.021	1	-.002	3	-1.268e-2	4	3623.556	1	5326.971	4
351		5	max	0	3	.002	5	.025	4	2.291e-3	3	NC	4	NC	1
352			min	0	1	-.038	1	-.003	3	-1.227e-2	4	2060.814	1	3089.716	4
353		6	max	0	3	.003	5	.038	4	1.968e-3	3	NC	5	NC	1
354			min	0	1	-.058	1	-.005	3	-1.186e-2	4	1339.255	1	2036.131	4
355		7	max	0	3	.004	5	.053	4	1.644e-3	3	NC	5	NC	1
356			min	0	1	-.082	1	-.006	3	-1.145e-2	4	946.446	1	1455.425	4
357		8	max	0	3	.006	5	.07	4	1.32e-3	3	NC	5	NC	1
358			min	0	1	-.109	1	-.007	3	-1.104e-2	4	708.7	1	1100.872	4
359		9	max	0	3	.008	5	.089	4	9.958e-4	3	NC	5	NC	1
360			min	-.001	1	-.14	1	-.008	3	-1.063e-2	4	553.513	1	867.944	4
361		10	max	0	3	.009	5	.11	4	6.719e-4	3	NC	15	NC	9
362			min	-.001	1	-.174	1	-.008	3	-1.022e-2	4	446.579	1	706.622	4
363		11	max	0	3	.011	5	.132	4	3.48e-4	3	9842.195	15	NC	9
364			min	-.001	1	-.21	1	-.009	3	-9.806e-3	4	369.598	1	590.055	4
365		12	max	.001	3	.013	5	.154	4	2.412e-5	3	8339.995	15	NC	9
366			min	-.001	1	-.248	1	-.008	3	-9.395e-3	4	312.342	1	503.095	4
367		13	max	.001	3	.015	5	.178	4	-1.246e-4	9	7186.37	15	NC	3
368			min	-.001	1	-.289	1	-.007	3	-8.984e-3	4	268.543	1	436.451	4
369		14	max	.001	3	.018	5	.202	4	7.033e-5	9	6281.149	15	NC	3
370			min	-.002	1	-.331	1	-.005	3	-8.572e-3	4	234.289	1	384.274	4
371		15	max	.001	3	.02	5	.226	4	2.653e-4	9	5557.562	15	NC	3
372			min	-.002	1	-.375	1	-.002	3	-8.184e-3	5	206.983	1	342.683	4
373		16	max	.001	3	.022	5	.251	4	7.044e-4	1	4970.108	15	NC	1
374			min	-.002	1	-.42	1	.001	12	-7.845e-3	5	184.867	1	309.036	4
375		17	max	.002	3	.025	5	.276	4	1.223e-3	1	4486.843	15	NC	1
376			min	-.002	1	-.465	1	.001	10	-7.506e-3	5	166.71	1	281.481	4
377		18	max	.002	3	.027	5	.3	4	1.741e-3	1	4084.707	15	NC	1
378			min	-.002	1	-.512	1	0	10	-7.167e-3	5	151.629	1	258.692	4
379		19	max	.002	3	.029	5	.324	4	2.26e-3	1	3746.844	15	NC	1
380			min	-.002	1	-.558	1	-.003	10	-6.828e-3	5	138.978	1	239.689	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	.005	1	0	15	.004	5	2.787e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	1	-3.737e-3	5	NC	1	NC	1
383		2	max	.004	1	-.005	15	.053	5	3.238e-3	2	NC	1	NC	4
384			min	0	15	-.038	1	-.03	2	-3.735e-3	5	NC	1	2558.284	2
385		3	max	.003	1	-.009	15	.103	5	3.69e-3	2	NC	1	NC	4
386			min	0	10	-.073	1	-.058	2	-3.733e-3	5	NC	1	1289.074	2
387		4	max	.003	3	-.014	15	.153	5	4.141e-3	2	NC	1	NC	6
388			min	0	10	-.109	1	-.086	2	-3.731e-3	5	NC	1	871.766	2
389		5	max	.004	3	-.018	15	.203	5	4.592e-3	2	NC	1	7390.646	13
390			min	0	10	-.144	1	-.112	2	-3.729e-3	5	NC	1	667.809	2
391		6	max	.004	3	-.022	15	.253	5	5.044e-3	2	NC	1	5752.941	13
392			min	0	10	-.179	1	-.136	2	-3.727e-3	5	NC	1	549.671	2
393		7	max	.004	3	-.026	15	.303	5	5.495e-3	2	NC	1	4742.833	13
394			min	-.001	2	-.214	1	-.157	2	-3.725e-3	5	8990.605	6	475.035	2
395		8	max	.005	3	-.031	15	.352	5	5.946e-3	2	NC	1	4085.619	13
396			min	-.002	2	-.249	1	-.175	2	-3.723e-3	5	8301.976	6	425.993	2
397		9	max	.005	3	-.035	15	.4	5	6.398e-3	2	NC	1	3649.451	13
398			min	-.003	2	-.283	1	-.189	2	-3.721e-3	5	7931.316	6	393.883	2
399		10	max	.005	3	-.039	15	.447	5	6.849e-3	2	NC	1	3365.987	13
400			min	-.004	2	-.317	1	-.198	2	-3.719e-3	5	7814.056	6	374.291	2
401		11	max	.005	3	-.043	15	.493	5	7.3e-3	2	NC	1	3199.783	13
402			min	-.004	2	-.351	1	-.202	2	-3.717e-3	5	7931.316	6	365.145	2
403		12	max	.006	3	-.047	15	.538	5	7.752e-3	2	NC	1	3135.9	13
404			min	-.005	2	-.385	1	-.201	2	-3.715e-3	5	8301.976	6	335.626	14
405		13	max	.006	3	-.051	15	.58	5	8.203e-3	2	NC	1	3176.475	13
406			min	-.006	2	-.419	1	-.193	2	-3.713e-3	5	8990.605	6	303.633	14
407		14	max	.006	3	-.054	15	.621	5	8.654e-3	2	NC	1	3344.781	13
408			min	-.006	2	-.452	1	-.178	2	-3.815e-3	3	NC	1	276.515	14
409		15	max	.007	3	-.058	15	.66	5	9.106e-3	2	NC	1	3702.578	13
410			min	-.007	2	-.486	1	-.157	2	-4.025e-3	3	NC	1	253.228	14
411		16	max	.007	3	-.062	15	.697	5	9.557e-3	2	NC	1	4407.124	13
412			min	-.008	2	-.519	1	-.127	2	-4.234e-3	3	NC	1	233.005	14
413		17	max	.007	3	-.065	15	.731	5	1.001e-2	2	NC	1	5943.403	13
414			min	-.009	2	-.552	1	-.088	2	-4.444e-3	3	NC	1	215.272	14
415		18	max	.008	3	-.069	15	.768	4	1.046e-2	2	NC	1	NC	13
416			min	-.009	2	-.584	1	-.041	2	-4.654e-3	3	NC	1	199.59	14
417		19	max	.008	3	-.073	15	.803	4	1.091e-2	2	NC	1	NC	1
418			min	-.01	2	-.617	1	0	3	-4.864e-3	3	NC	1	185.619	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	-3.957e-3	4	NC	1	NC	1
421		2	max	.006	3	-.003	15	.056	4	0	1	NC	1	NC	1
422			min	0	15	-.067	1	0	1	-3.999e-3	4	NC	1	NC	1
423		3	max	.007	3	-.006	15	.108	4	0	1	NC	1	NC	1
424			min	0	10	-.131	1	0	1	-4.041e-3	4	NC	1	4976.338	4
425		4	max	.008	3	-.008	15	.161	4	0	1	NC	1	NC	1
426			min	-.001	10	-.194	1	0	1	-4.083e-3	4	NC	1	3242.828	4
427		5	max	.009	3	-.011	15	.214	4	0	1	NC	1	NC	1
428			min	-.003	2	-.258	1	0	1	-4.125e-3	4	NC	1	2406.622	4
429		6	max	.01	3	-.013	15	.266	4	0	1	NC	1	NC	1
430			min	-.005	2	-.321	1	0	1	-4.168e-3	4	NC	1	1927.523	4
431		7	max	.011	3	-.016	15	.318	4	0	1	NC	1	NC	1
432			min	-.007	2	-.384	1	0	1	-4.21e-3	4	8990.605	4	1626.837	4
433		8	max	.012	3	-.018	15	.369	4	0	1	NC	1	NC	1
434			min	-.01	2	-.446	1	0	1	-4.252e-3	4	8301.976	4	1429.118	4
435		9	max	.013	3	-.021	15	.419	4	0	1	NC	1	NC	1
436			min	-.012	2	-.509	1	0	1	-4.294e-3	4	7931.316	4	1297.787	4
437		10	max	.014	3	-.023	15	.467	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	-.571	1	0	1	-4.336e-3	4	7814.056	4	1213.885	4
439		11	max	.015	3	-.025	15	.514	4	0	1	NC	1	NC	1
440			min	-.016	2	-.633	1	0	1	-4.378e-3	4	7931.316	4	1167.868	4
441		12	max	.016	3	-.028	15	.559	4	0	1	NC	1	NC	1
442			min	-.018	2	-.695	1	0	1	-4.42e-3	4	8301.976	4	1156.415	4
443		13	max	.017	3	-.03	15	.602	4	0	1	NC	1	NC	1
444			min	-.02	2	-.757	1	0	1	-4.462e-3	4	8990.605	4	1181.85	4
445		14	max	.018	3	-.032	15	.643	4	0	1	NC	1	NC	1
446			min	-.022	2	-.818	1	0	1	-4.504e-3	4	NC	1	1254.096	4
447		15	max	.019	3	-.034	15	.681	4	0	1	NC	1	NC	1
448			min	-.024	2	-.88	1	0	1	-4.546e-3	4	NC	1	1397.552	4
449		16	max	.02	3	-.036	15	.717	4	0	1	NC	1	NC	1
450			min	-.026	2	-.941	1	0	1	-4.588e-3	4	NC	1	1673.152	4
451		17	max	.021	3	-.038	15	.749	4	0	1	NC	1	NC	1
452			min	-.028	2	-1.002	1	0	1	-4.63e-3	4	NC	1	2267.758	4
453		18	max	.022	3	-.04	15	.778	4	0	1	NC	1	NC	1
454			min	-.031	2	-1.062	1	0	1	-4.672e-3	4	NC	1	4121.351	4
455		19	max	.023	3	-.042	15	.804	4	0	1	NC	1	NC	1
456			min	-.033	2	-1.123	1	0	1	-4.714e-3	4	NC	1	NC	1
457	M9	1	max	.005	1	0	5	.004	4	1.087e-3	3	NC	1	NC	1
458			min	0	5	-.002	1	0	3	-4.225e-3	4	NC	1	NC	1
459		2	max	.004	1	.001	5	.058	4	1.297e-3	3	NC	1	NC	5
460			min	0	5	-.038	1	-.013	3	-4.294e-3	4	NC	1	2558.284	2
461		3	max	.003	1	.002	5	.114	4	1.506e-3	3	NC	1	7390.488	15
462			min	0	5	-.073	1	-.025	3	-4.364e-3	4	NC	1	1289.074	2
463		4	max	.003	3	.003	5	.169	4	1.716e-3	3	NC	1	4815.686	15
464			min	0	5	-.109	1	-.037	3	-4.433e-3	4	NC	1	871.766	2
465		5	max	.004	3	.005	5	.224	4	1.926e-3	3	NC	1	3573.693	15
466			min	0	5	-.144	1	-.048	3	-4.592e-3	2	NC	1	667.809	2
467		6	max	.004	3	.006	5	.279	4	2.136e-3	3	NC	1	2862.118	15
468			min	0	10	-.179	1	-.059	3	-5.044e-3	2	NC	1	549.671	2
469		7	max	.004	3	.007	5	.332	4	2.346e-3	3	NC	1	2415.535	15
470			min	-.001	2	-.214	1	-.068	3	-5.495e-3	2	8990.605	6	475.035	2
471		8	max	.005	3	.009	5	.385	4	2.556e-3	3	NC	1	2121.879	15
472			min	-.002	2	-.249	1	-.075	3	-5.946e-3	2	8301.976	6	425.993	2
473		9	max	.005	3	.01	5	.436	4	2.765e-3	3	NC	1	1926.82	15
474			min	-.003	2	-.283	1	-.082	3	-6.398e-3	2	7555.41	5	393.883	2
475		10	max	.005	3	.012	5	.485	4	2.975e-3	3	NC	1	1802.194	15
476			min	-.004	2	-.317	1	-.086	3	-6.849e-3	2	6495.913	5	374.291	2
477		11	max	.005	3	.014	5	.532	4	3.185e-3	3	NC	1	1733.826	15
478			min	-.004	2	-.351	1	-.088	3	-7.3e-3	2	5652.706	5	365.145	2
479		12	max	.006	3	.016	5	.576	4	3.395e-3	3	NC	1	1716.778	15
480			min	-.005	2	-.385	1	-.088	3	-7.752e-3	2	4969.466	5	366.018	2
481		13	max	.006	3	.018	5	.617	4	3.605e-3	3	NC	1	1754.496	15
482			min	-.006	2	-.419	1	-.085	3	-8.203e-3	2	4408.02	5	378.127	2
483		14	max	.006	3	.02	5	.656	4	3.815e-3	3	NC	1	1861.705	15
484			min	-.006	2	-.452	1	-.079	3	-8.654e-3	2	3941.47	5	405.076	2
485		15	max	.007	3	.022	5	.691	4	4.025e-3	3	NC	1	2074.622	15
486			min	-.007	2	-.486	1	-.07	3	-9.106e-3	2	3550.263	5	455.21	2
487		16	max	.007	3	.024	5	.722	4	4.234e-3	3	NC	1	2483.692	15
488			min	-.008	2	-.519	1	-.058	3	-9.557e-3	2	3219.818	5	549.005	2
489		17	max	.007	3	.026	5	.75	4	4.444e-3	3	NC	1	3366.285	15
490			min	-.009	2	-.552	1	-.043	3	-1.001e-2	2	2939.041	5	748.932	2
491		18	max	.008	3	.029	5	.773	4	4.654e-3	3	NC	1	6117.671	15
492			min	-.009	2	-.584	1	-.023	3	-1.046e-2	2	2699.351	5	1368.786	2
493		19	max	.008	3	.031	5	.791	4	4.864e-3	3	NC	1	NC	1
494			min	-.01	2	-.617	1	-.024	1	-1.091e-2	2	2494.025	5	NC	1