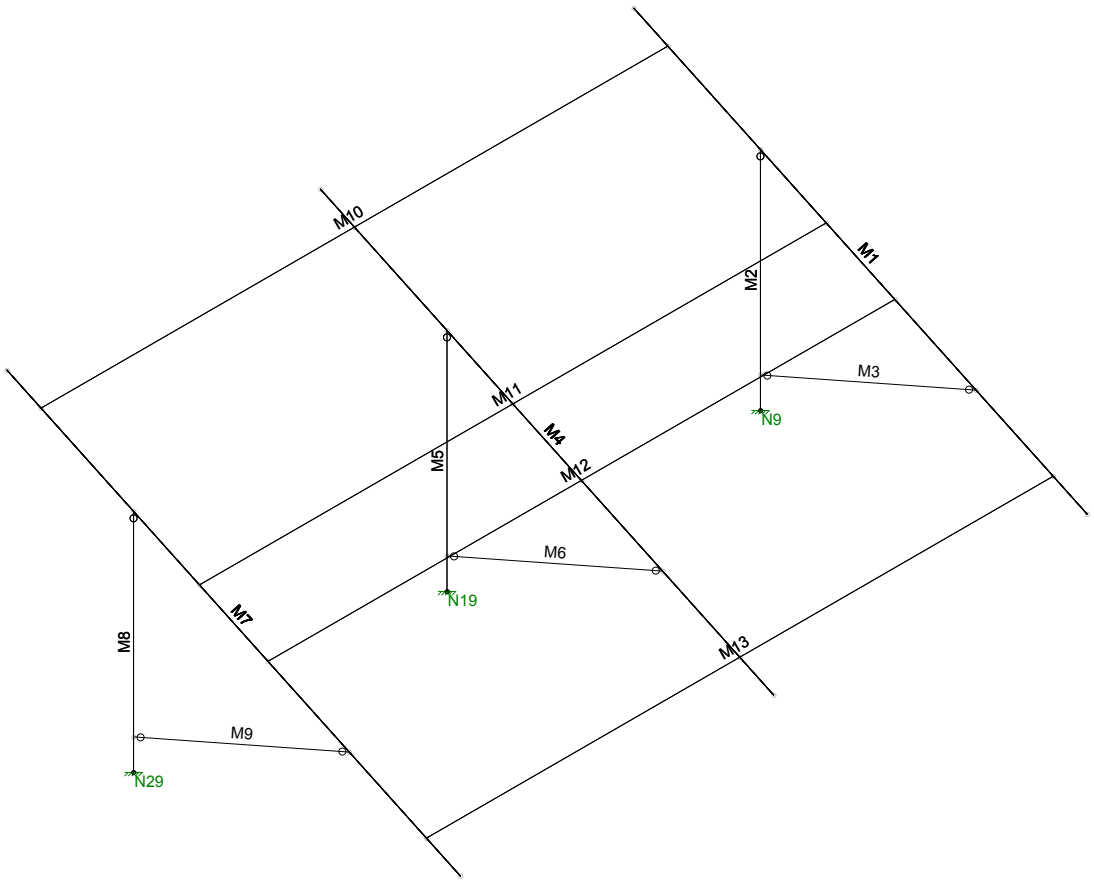


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

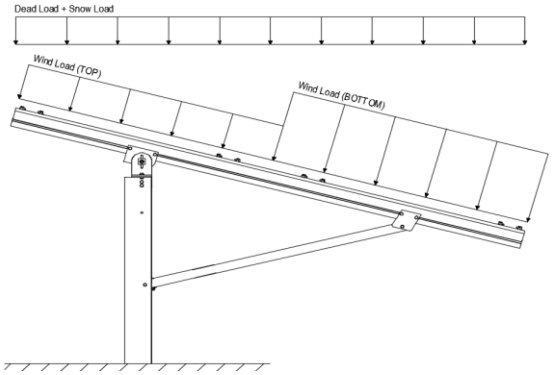
1.2 Construction

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

PV modules are required to meet the following specifications:

	Maximum		Minimum
Height =	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 =	25°
Maximum Height Above Grade =	3 ft



Typical loading conditions of the module dead loads, snow loads, and wind loads are shown on the left.

1.3 Technical Codes

- ASCE 7-10 - Chapter 26-31, Wind Loads
- ASCE 7-10 - Chapter 7, Snow Loads
- ASCE 7-10 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2012, 2015
- Aluminum Design Manual, Eighth Edition, 2005

2. LOAD ACTIONS

2.1 Permanent Loads

g_{MAX} =	3.00	psf	*Self-weight of the PV modules.*
g_{MIN} =	1.75	psf	

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	18.56	psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00		
C_s =	0.82		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	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

$Cf+_{TOP}$ =	1.1	*(Pressure)*	*Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.*
$Cf+_{BOTTOM}$ =	1.7		
$Cf-_{TOP}$ =	-2.2	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1		

2.4 Seismic Loads

S_S =	2.50	R =	1.25	*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]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W [M]
1.238D + 0.875E [O]
1.1785D + 0.65625E + 0.75S [O]
0.362D + 0.875E [O]

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

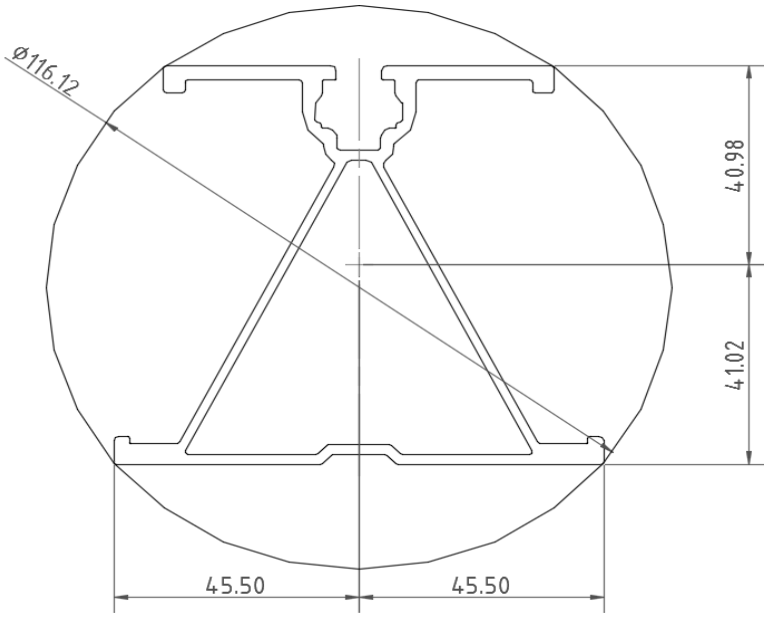
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	138	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 =	1.903	k-ft
M_z =	0.321	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	96%	

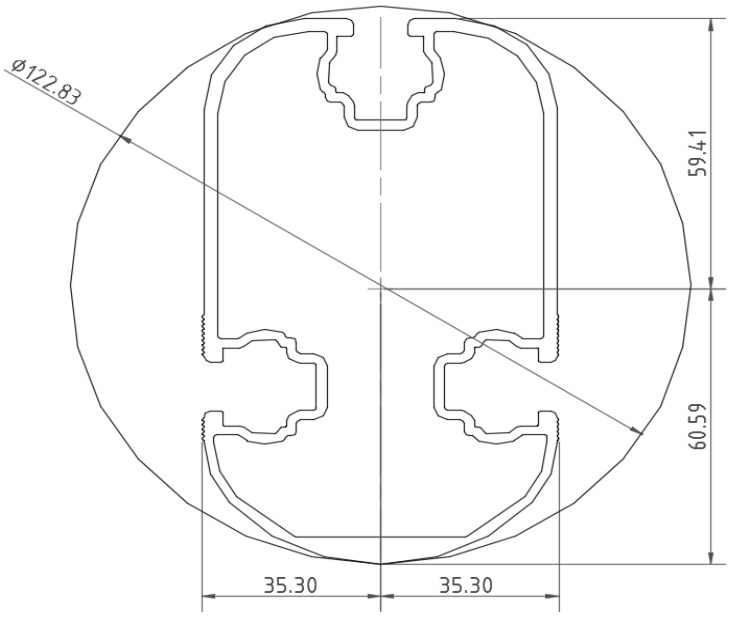


DETAIL VIEW

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 =	3.349	k-ft
M_z =	0.000	k-ft
P_n =	0.406	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	67%	

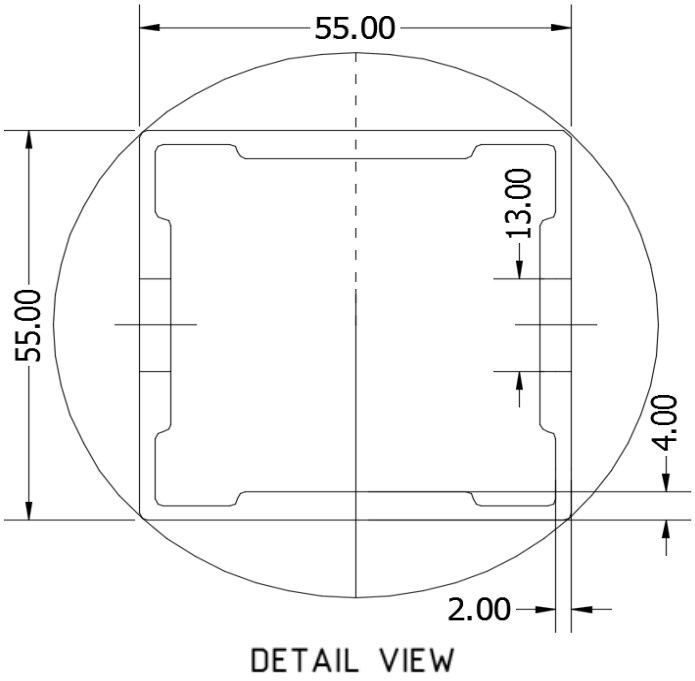


DETAIL VIEW

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).

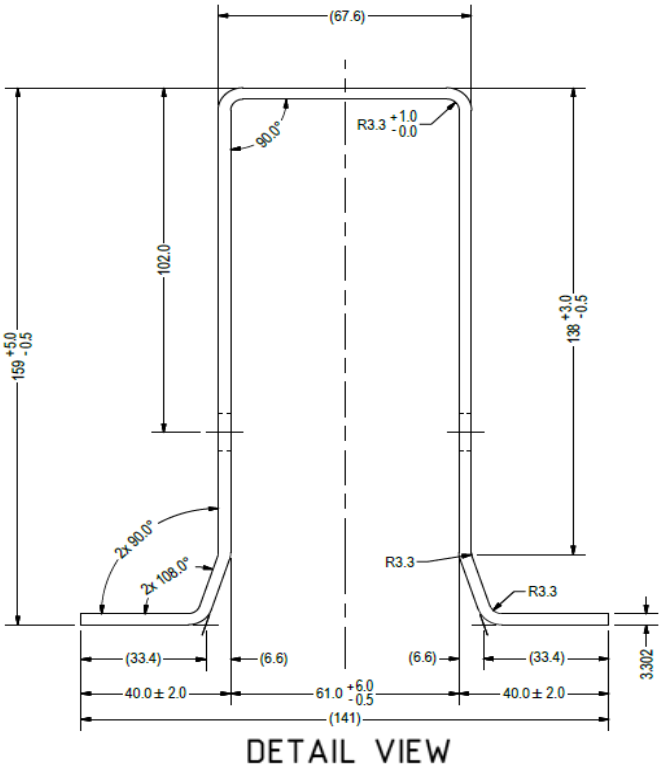
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.389	k-ft
P_n =	4.197	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	59%	



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 =	72.60	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 =	11.693	k-ft
M_z =	0.000	k-ft
P_r =	6.492	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	77%	



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 =	4.99	k
Maximum Lateral Load =	2.50	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)

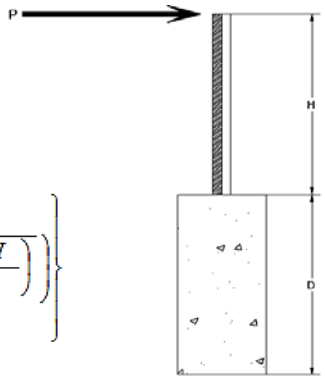
Lateral Force @ Top of Pole, P =	1.27	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft
Lateral Bearing @ Bottom =	S_3	
Lateral Bearing @ D/3 =	S_1	
Required Depth =	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 =	1.27	k
Height of Pole Above Grade, H =	5.05	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 =	6.84	
Required Footing Depth, D =	10.45	ft

2nd Trial @ D_2 =	6.85	ft
Lateral Soil Bearing @ D/3, S_1 =	0.46	ksf
Lateral Soil Bearing @ D, S_3 =	1.37	ksf
Constant 2.34P/(S_1B), A =	3.25	
Required Footing Depth, D =	6.15	ft

3rd Trial @ D_3 =	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 =	3.42	
Required Footing Depth, D =	6.37	ft

4th Trial @ D_4 =	6.44	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 =	3.45	
Required Footing Depth, D =	6.42	ft

5th Trial @ D_5 =	6.43	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 =	3.46	
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.

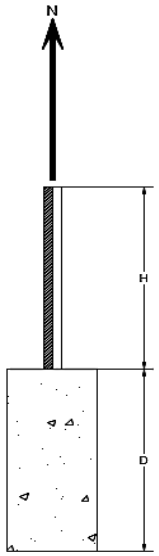
5.4 Uplifting Force Resistance

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 =	2.28	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 =	1.48	k
Required Concrete Volume, V =	10.18	ft^3
Required Footing Depth, D =	3.25	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	4.90
2	0.4	0.2	118.10	4.80
3	0.6	0.2	118.10	4.69
4	0.8	0.2	118.10	4.59
5	1	0.2	118.10	4.48
6	1.2	0.2	118.10	4.38
7	1.4	0.2	118.10	4.28
8	1.6	0.2	118.10	4.17
9	1.8	0.2	118.10	4.07
10	2	0.2	118.10	3.97
11	2.2	0.2	118.10	3.86
12	2.4	0.2	118.10	3.76
13	2.6	0.2	118.10	3.66
14	2.8	0.2	118.10	3.55
15	3	0.2	118.10	3.45
16	3.2	0.2	118.10	3.34
17	3.4	0.2	118.10	3.24
18	0	0.0	0.00	3.24
19	0	0.0	0.00	3.24
20	0	0.0	0.00	3.24
21	0	0.0	0.00	3.24
22	0	0.0	0.00	3.24
23	0	0.0	0.00	3.24
24	0	0.0	0.00	3.24
25	0	0.0	0.00	3.24
26	0	0.0	0.00	3.24
27	0	0.0	0.00	3.24
28	0	0.0	0.00	3.24
29	0	0.0	0.00	3.24
30	0	0.0	0.00	3.24
31	0	0.0	0.00	3.24
32	0	0.0	0.00	3.24
33	0	0.0	0.00	3.24
34	0	0.0	0.00	3.24
Max	3.4	Sum	0.80	

A 2ft diameter x 3.25ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.10	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

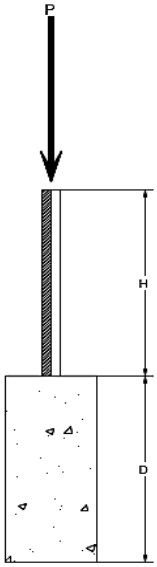
Weight of Concrete

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 =	7.06	k
Utilization =	66%	

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



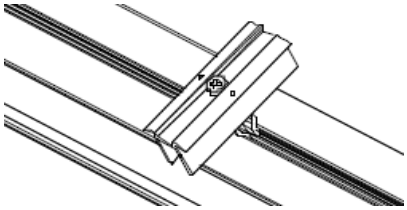
6. DESIGN OF JOINTS AND CONNECTIONS

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.

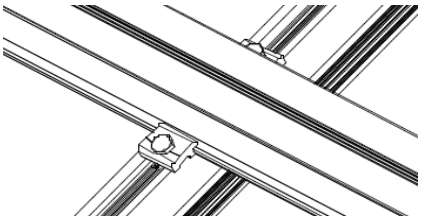
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.386 k
Allowable Uplift	=	1.214 k
Utilization	=	32%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.561 k
Allowable Uplift	=	2.180 k
Utilization	=	72%

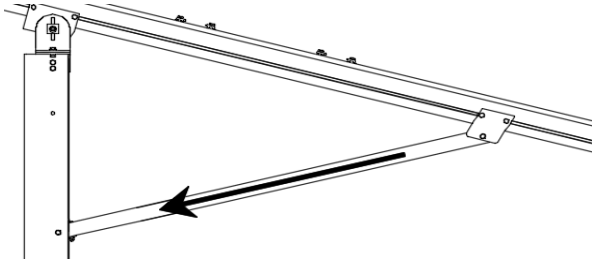


6.2 Strut Connections

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

Maximum Axial Load	=	4.197 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	47%

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

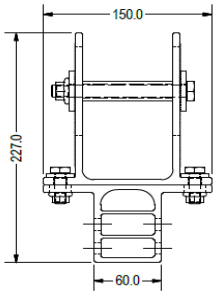


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

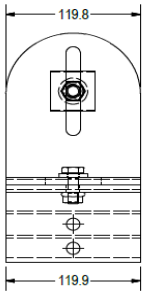
6.3 Girder to Post Connection

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.

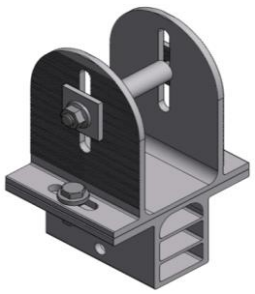
Maximum Tensile Load	=	3.354 k
Allowable Load	=	5.649 k
Utilization	=	59%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

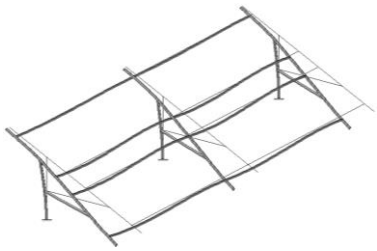
7.1 Seismic Drift

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}	=	58.15 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.163 in
Max Drift, Δ_{MAX}	=	0.641 in

0.641 ≤ 1.163, 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 =	138 in	L_b =	138
J =	0.432	J =	0.432
	381.773		242.785
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	27.0 ksi	φF_L=	28.3
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

$\varphi F_L St$= 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

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:	Weak Axis:
3.4.14	**3.4.14**
L_b = 61 in	L_b = 61
J = 0.942	J = 0.942
95.1963	95.1963
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$
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= 30.2 ksi	φF_L= 30.2
3.4.16	**3.4.16**
b/t = 24.5	b/t = 24.5
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$
S1 = 12.2	S1 = 12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$	$S2 = \frac{k_1 Bp}{1.6Dp}$
S2 = 46.7	S2 = 46.7
φF_L= φb[Bp-1.6Dp*b/t]	φF_L= φb[Bp-1.6Dp*b/t]
φF_L= 28.2 ksi	φF_L= 28.2 ksi
3.4.16.1 Not Used	**3.4.16.1**
Rb/t = 0.0	N/A for Weak Direction
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$	
S1 = 1.1	
$S2 = C_t$	
S2 = 141.0	
φF_L= 1.17φyFcy	
φF_L= 38.9 ksi	
3.4.18	**3.4.18**
h/t = 24.5	h/t = 24.5
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$
S1 = 36.9	S1 = 36.9
m = 0.65	m = 0.65
C_0 = 27.5	C_0 = 27.5
Cc = 27.5	Cc = 27.5
$S2 = \frac{k_1 Bbr}{mDbr}$	$S2 = \frac{k_1 Bbr}{mDbr}$
S2 = 77.3	S2 = 77.3
φF_L= 1.3φyFcy	φF_L= 1.3φyFcy
φF_L= 43.2 ksi	φF_L= 43.2 ksi
φF_LSt= 28.2 ksi	φF_LWk= 28.2 ksi
Ix = 279836 mm^4	Iy = 279836 mm^4
0.672 in^4	0.672 in^4
y = 27.5 mm	x = 27.5 mm
Sx = 0.621 in^3	Sy = 0.621 in^3
M_{max}St = 1.460 k-ft	M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.41113

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 =	72.60	in	
Pr =	6.49	k	(LRFD Factored Load)
Mr (Strong) =	11.69	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	104.47			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	23.00	ksi		
Fe =	26.23	ksi		
Pn =	51.291	k		

Torsional/Flexural Torsional Buckling:

Fcr =	17.0733	ksi
Fey =	66.8981	ksi
Fez =	21.7595	ksi
Pn =	38.0734	k

Bending (Strong Axis):

Yielding:				
Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.1895	<	0.2	
Utilization =	0.77	<	1.0	OK

Bending (Weak Axis):

Yielding:				
Mn =	14.65	k-ft		
Flange Local Buckling:				
Mn =	14.39	k-ft		
Pr/Pc =	0.189	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 77%

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	-46.9	-46.9	0	0
2	M11	Y	-46.9	-46.9	0	0
3	M12	Y	-46.9	-46.9	0	0
4	M13	Y	-46.9	-46.9	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	-58.278	-58.278	0	0
2	M11	y	-58.278	-58.278	0	0
3	M12	y	-90.067	-90.067	0	0
4	M13	y	-90.067	-90.067	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	116.557	116.557	0	0
2	M11	y	116.557	116.557	0	0
3	M12	y	52.98	52.98	0	0
4	M13	y	52.98	52.98	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	492.109	2	2414.228	1	321.989	1	.408	1	.012	5	5.323	1
2		min	-691.028	3	-1273.832	3	-366.532	5	-1.501	5	-.011	1	.52	15
3	N19	max	1899.674	2	6511.985	1	0	2	0	2	.013	4	11.034	1
4		min	-1913.818	3	-3836.233	3	-403.406	5	-1.582	4	0	1	.394	15
5	N29	max	492.109	2	2414.228	1	261.474	3	.327	3	.015	4	5.323	1
6		min	-691.028	3	-1273.832	3	-446.553	4	-1.622	4	-.004	3	-.133	5
7	Totals:	max	2883.892	2	11340.44	1	0	2						
8		min	-3295.874	3	-6383.897	3	-1165.254	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	.002	4	0	1	0	1	0	1
2			min	0	1	0	3	-.001	1	0	1	0	1	0	1
3		2	max	-.221	15	-.473	15	0	12	0	1	0	12	0	6
4			min	-.939	4	-2.011	6	-1.499	5	0	1	0	5	0	15
5		3	max	-10.431	12	214.443	3	-1.4	3	.057	3	.331	1	.256	1
6			min	-218.217	1	-584.523	1	-206.136	1	-.248	1	.021	12	-.091	3
7		4	max	-10.797	12	213.267	3	-1.4	3	.057	3	.203	1	.619	1
8			min	-218.948	1	-586.091	1	-206.136	1	-.248	1	.02	12	-.224	3
9		5	max	-11.163	12	212.091	3	-1.4	3	.057	3	.08	4	.983	1
10			min	-219.679	1	-587.66	1	-206.136	1	-.248	1	-.005	10	-.356	3
11		6	max	278.928	3	509.135	2	26.217	3	.071	1	.141	1	.946	1
12			min	-1194.01	1	-129.623	3	-277.551	1	-.067	3	-.043	3	-.362	3
13		7	max	278.38	3	507.567	2	26.217	3	.071	1	.012	10	.632	1
14			min	-1194.741	1	-130.799	3	-277.551	1	-.067	3	-.072	4	-.282	3
15		8	max	277.831	3	505.999	2	26.217	3	.071	1	-.007	12	.318	1
16			min	-1195.473	1	-131.975	3	-277.551	1	-.067	3	-.204	1	-.2	3
17		9	max	262.338	3	67.546	3	20.457	3	.018	5	.107	1	.14	1
18			min	-1421.486	1	-65.497	1	-282.655	1	-.201	2	0	10	-.163	3
19		10	max	261.789	3	66.37	3	20.457	3	.018	5	.052	3	.181	1
20			min	-1422.218	1	-67.065	1	-282.655	1	-.201	2	-.069	1	-.204	3
21		11	max	261.241	3	65.194	3	20.457	3	.018	5	.065	3	.223	1
22			min	-1422.949	1	-68.633	1	-282.655	1	-.201	2	-.244	1	-.245	3
23		12	max	243.261	3	607.146	3	144.651	2	.375	3	.188	1	.472	1
24			min	-1644.938	1	-573.021	1	-267.479	3	-.455	1	-.032	5	-.499	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	242.713	3	605.97	3	144.651	2	.375	3	.245	1	.828	1
26			min	-1645.669	1	-574.589	1	-267.479	3	-.455	1	-.172	5	-.876	3
27		14	max	220.448	1	515.439	1	82.342	5	.322	1	.049	3	1.17	1
28			min	11.093	12	-537.111	3	-158.654	1	-.401	3	-.241	4	-1.236	3
29		15	max	219.717	1	513.871	1	80.843	5	.322	1	.028	3	.85	1
30			min	10.727	12	-538.287	3	-158.654	1	-.401	3	-.212	4	-.902	3
31		16	max	218.985	1	512.303	1	79.343	5	.322	1	.007	3	.532	1
32			min	10.361	12	-539.463	3	-158.654	1	-.401	3	-.259	1	-.568	3
33		17	max	218.254	1	510.734	1	77.843	5	.322	1	-.01	12	.215	1
34			min	9.996	12	-540.64	3	-158.654	1	-.401	3	-.358	1	-.232	3
35		18	max	.939	4	2.013	6	1.5	4	0	1	0	12	0	6
36			min	.221	15	.473	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.002	2	.001	1	0	1	0	1	0	1
38			min	0	1	-.004	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.015	1	.002	4	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.221	15	-.473	15	0	1	0	1	0	1	0	6
42			min	-.939	4	-2.009	6	-1.499	5	0	1	0	5	0	15
43		3	max	-16.056	12	670.676	3	0	1	.033	4	.248	4	.64	1
44			min	-412.488	1	-1670.197	1	-119.546	5	0	1	0	1	-.261	3
45		4	max	-16.422	12	669.5	3	0	1	.033	4	.173	4	1.677	1
46			min	-413.219	1	-1671.765	1	-121.046	5	0	1	0	1	-.676	3
47		5	max	-16.788	12	668.323	3	0	1	.033	4	.098	4	2.715	1
48			min	-413.95	1	-1673.334	1	-122.545	5	0	1	0	1	-1.092	3
49		6	max	995.336	3	1502.236	2	0	1	0	1	0	1	2.593	1
50			min	-3232.169	1	-492.831	3	-112.726	4	-.028	4	-.02	5	-1.08	3
51		7	max	994.787	3	1500.668	2	0	1	0	1	0	1	1.669	1
52			min	-3232.901	1	-494.008	3	-114.225	4	-.028	4	-.09	4	-.774	3
53		8	max	994.239	3	1499.1	2	0	1	0	1	0	1	.746	1
54			min	-3233.632	1	-495.184	3	-115.725	4	-.028	4	-.161	4	-.467	3
55		9	max	971.493	3	205.842	3	0	1	.017	4	.115	4	.197	1
56			min	-3628.332	1	-235.699	1	-239.295	4	0	1	0	1	-.317	3
57		10	max	970.944	3	204.666	3	0	1	.017	4	0	1	.344	1
58			min	-3629.063	1	-237.267	1	-240.794	4	0	1	-.034	4	-.445	3
59		11	max	970.396	3	203.49	3	0	1	.017	4	0	1	.491	1
60			min	-3629.795	1	-238.835	1	-242.294	4	0	1	-.184	4	-.571	3
61		12	max	952.621	3	1679.748	3	0	1	.155	4	0	1	1.22	1
62			min	-4032.544	1	-1732.439	1	-267.171	5	0	1	-.001	4	-1.285	3
63		13	max	952.073	3	1678.572	3	0	1	.155	4	0	1	2.295	1
64			min	-4033.275	1	-1734.007	1	-268.671	5	0	1	-.168	4	-2.328	3
65		14	max	414.607	1	1477.108	1	73.725	5	0	1	0	1	3.328	1
66			min	18.025	12	-1478.028	3	0	1	-.111	4	-.208	5	-3.326	3
67		15	max	413.875	1	1475.539	1	72.225	5	0	1	0	1	2.412	1
68			min	17.659	12	-1479.204	3	0	1	-.111	4	-.163	5	-2.408	3
69		16	max	413.144	1	1473.971	1	70.725	5	0	1	0	1	1.496	1
70			min	17.294	12	-1480.381	3	0	1	-.111	4	-.118	5	-1.49	3
71		17	max	412.413	1	1472.403	1	69.226	5	0	1	0	1	.582	1
72			min	16.928	12	-1481.557	3	0	1	-.111	4	-.075	4	-.571	3
73		18	max	.939	4	2.014	6	1.5	5	0	1	0	1	0	6
74			min	.221	15	.473	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.005	1	0	1	0	1	0	1	0	1
76			min	0	1	-.009	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.003	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.221	15	-.473	15	.001	1	0	1	0	1	0	4
80			min	-.939	4	-2.011	4	-1.499	5	0	1	0	5	0	15
81		3	max	12.53	5	214.443	3	206.136	1	.248	1	.114	5	.256	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
82			min	-218.217	1	-584.523	1	-50.687	5	-.057	3	-.331	1	-.091	3
83		4	max	12.189	5	213.267	3	206.136	1	.248	1	.082	5	.619	1
84			min	-218.948	1	-586.091	1	-52.187	5	-.057	3	-.203	1	-.224	3
85		5	max	11.848	5	212.091	3	206.136	1	.248	1	.049	5	.983	1
86			min	-219.679	1	-587.66	1	-53.686	5	-.057	3	-.076	1	-.356	3
87		6	max	278.928	3	509.135	2	277.551	1	.067	3	.043	3	.946	1
88			min	-1194.01	1	-129.623	3	-40.532	5	-.071	1	-.141	1	-.362	3
89		7	max	278.38	3	507.567	2	277.551	1	.067	3	.032	1	.632	1
90			min	-1194.741	1	-130.799	3	-42.031	5	-.071	1	-.056	5	-.282	3
91		8	max	277.831	3	505.999	2	277.551	1	.067	3	.204	1	.318	1
92			min	-1195.473	1	-131.975	3	-43.531	5	-.071	1	-.082	5	-.2	3
93		9	max	262.338	3	67.546	3	282.655	1	.201	2	.039	5	.14	1
94			min	-1421.486	1	-65.497	1	-99.895	5	.02	15	-.107	1	-.163	3
95		10	max	261.789	3	66.37	3	282.655	1	.201	2	.069	1	.181	1
96			min	-1422.218	1	-67.065	1	-101.395	5	.02	15	-.052	3	-.204	3
97		11	max	261.241	3	65.194	3	282.655	1	.201	2	.244	1	.223	1
98			min	-1422.949	1	-68.633	1	-102.895	5	.02	15	-.087	5	-.245	3
99		12	max	243.261	3	607.146	3	267.479	3	.455	1	-.011	12	.472	1
100			min	-1644.938	1	-573.021	1	-235.333	4	-.375	3	-.188	1	-.499	3
101		13	max	242.713	3	605.97	3	267.479	3	.455	1	.149	3	.828	1
102			min	-1645.669	1	-574.589	1	-236.832	4	-.375	3	-.245	1	-.876	3
103		14	max	220.448	1	515.439	1	158.654	1	.401	3	.062	1	1.17	1
104			min	7.164	15	-537.111	3	19.799	10	-.322	1	-.225	5	-1.236	3
105		15	max	219.717	1	513.871	1	158.654	1	.401	3	.161	1	.85	1
106			min	6.943	15	-538.287	3	19.799	10	-.322	1	-.161	5	-.902	3
107		16	max	218.985	1	512.303	1	158.654	1	.401	3	.259	1	.532	1
108			min	6.723	15	-539.463	3	19.799	10	-.322	1	-.099	5	-.568	3
109		17	max	218.254	1	510.734	1	158.654	1	.401	3	.358	1	.215	1
110			min	6.502	15	-540.64	3	19.799	10	-.322	1	-.038	5	-.232	3
111		18	max	.939	4	2.013	4	1.499	5	0	1	0	1	0	4
112			min	.221	15	.473	15	-.001	1	0	1	0	5	0	15
113		19	max	0	1	.002	2	0	12	0	1	0	1	0	1
114			min	0	1	-.004	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	158.642	1	507.312	1	-6.065	15	.007	1	.422	1	.322	1
116			min	19.795	10	-542.951	3	-217.14	1	-.014	3	0	15	-.401	3
117		2	max	158.642	1	369.462	1	-4.135	15	.007	1	.174	1	.202	3
118			min	19.795	10	-400.222	3	-170.221	1	-.014	3	-.008	5	-.238	1
119		3	max	158.642	1	231.612	1	-2.206	15	.007	1	.011	2	.622	3
120			min	19.795	10	-257.494	3	-123.303	1	-.014	3	-.02	4	-.622	1
121		4	max	158.642	1	93.761	1	-.276	15	.007	1	-.006	12	.86	3
122			min	19.795	10	-114.766	3	-76.384	1	-.014	3	-.141	1	-.83	1
123		5	max	158.642	1	27.962	3	2.394	5	.007	1	-.01	12	.916	3
124			min	19.795	10	-44.089	1	-29.466	1	-.014	3	-.208	1	-.862	1
125		6	max	158.642	1	170.691	3	17.453	1	.007	1	-.007	15	.789	3
126			min	19.46	15	-181.939	1	-1.526	10	-.014	3	-.216	1	-.717	1
127		7	max	158.642	1	313.419	3	64.371	1	.007	1	-.001	15	.479	3
128			min	10.632	15	-319.789	1	2.306	12	-.014	3	-.164	1	-.397	1
129		8	max	158.642	1	456.147	3	111.29	1	.007	1	.01	5	.1	1
130			min	1.803	15	-457.639	1	4.235	12	-.014	3	-.051	1	-.019	5
131		9	max	158.642	1	598.875	3	158.208	1	.007	1	.121	1	.773	1
132			min	-9.977	5	-595.49	1	6.164	12	-.014	3	-.002	10	-.686	3
133		10	max	158.642	1	733.34	1	-5.86	15	.007	1	.353	1	1.622	1
134			min	19.795	10	-741.603	3	-205.127	1	-.014	3	.011	12	-1.543	3
135		11	max	158.642	1	595.49	1	-3.931	15	.014	3	.121	1	.773	1
136			min	19.795	10	-598.875	3	-158.208	1	-.007	1	-.009	5	-.686	3
137		12	max	158.642	1	457.639	1	-2.001	15	.014	3	-.004	12	.1	1
138			min	11.136	15	-456.147	3	-111.29	1	-.007	1	-.051	1	-.012	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
139		13	max	158.642	1	319.789	1	-.072	15	.014	3	-.009	12	.479	3
140			min	2.308	15	-313.419	3	-64.371	1	-.007	1	-.164	1	-.397	1
141		14	max	158.642	1	181.939	1	2.714	5	.014	3	-.01	12	.789	3
142			min	-9.289	5	-170.691	3	-17.453	1	-.007	1	-.216	1	-.717	1
143		15	max	158.642	1	44.089	1	29.466	1	.014	3	-.007	15	.916	3
144			min	-22.406	5	-27.962	3	1.552	12	-.007	1	-.208	1	-.862	1
145		16	max	158.642	1	114.766	3	76.384	1	.014	3	0	15	.86	3
146			min	-35.523	5	-93.761	1	3.481	12	-.007	1	-.141	1	-.83	1
147		17	max	158.642	1	257.494	3	123.303	1	.014	3	.012	5	.622	3
148			min	-48.639	5	-231.612	1	5.411	12	-.007	1	-.016	9	-.622	1
149		18	max	158.642	1	400.222	3	170.221	1	.014	3	.174	1	.202	3
150			min	-61.756	5	-369.462	1	7.34	12	-.007	1	.008	12	-.238	1
151		19	max	158.642	1	542.951	3	217.14	1	.014	3	.422	1	.322	1
152			min	-74.873	5	-507.312	1	9.269	12	-.007	1	.018	12	-.401	3
153	M11	1	max	373.243	1	500.93	1	16.116	5	0	15	.46	1	.284	1
154			min	-287.871	3	-543.66	3	-222.083	1	-.006	1	-.147	5	-.482	3
155		2	max	373.243	1	363.079	1	19.101	5	0	15	.206	1	.121	3
156			min	-287.871	3	-400.932	3	-175.165	1	-.006	1	-.124	5	-.268	1
157		3	max	373.243	1	225.229	1	22.086	5	0	15	.017	2	.542	3
158			min	-287.871	3	-258.204	3	-128.246	1	-.006	1	-.098	5	-.643	1
159		4	max	373.243	1	87.379	1	25.071	5	0	15	.003	3	.781	3
160			min	-287.871	3	-115.476	3	-81.328	1	-.006	1	-.122	1	-.843	1
161		5	max	373.243	1	27.252	3	28.055	5	0	15	-.004	12	.837	3
162			min	-287.871	3	-50.471	1	-34.409	1	-.006	1	-.196	1	-.867	1
163		6	max	373.243	1	169.981	3	34.566	4	0	15	.004	5	.711	3
164			min	-287.871	3	-188.322	1	-2.858	3	-.006	1	-.21	1	-.714	1
165		7	max	373.243	1	312.709	3	59.428	1	0	15	.046	5	.403	3
166			min	-287.871	3	-326.172	1	.036	3	-.006	1	-.164	1	-.385	1
167		8	max	373.243	1	455.437	3	106.346	1	0	15	.091	5	.119	1
168			min	-287.871	3	-464.022	1	2.194	12	-.006	1	-.058	1	-.088	3
169		9	max	373.243	1	598.165	3	153.265	1	0	15	.168	4	.8	1
170			min	-287.871	3	-601.872	1	4.123	12	-.006	1	-.006	3	-.761	3
171		10	max	373.243	1	739.723	1	17.108	5	.006	1	.334	1	1.657	1
172			min	-287.871	3	-740.893	3	-200.183	1	-.003	14	.004	12	-1.616	3
173		11	max	373.243	1	601.872	1	20.093	5	.006	1	.108	1	.8	1
174			min	-287.871	3	-598.165	3	-153.265	1	0	5	-.124	5	-.761	3
175		12	max	373.243	1	464.022	1	23.077	5	.006	1	-.007	12	.119	1
176			min	-287.871	3	-455.437	3	-106.346	1	0	5	-.108	4	-.088	3
177		13	max	373.243	1	326.172	1	26.062	5	.006	1	-.009	12	.403	3
178			min	-287.871	3	-312.709	3	-59.428	1	0	5	-.164	1	-.385	1
179		14	max	373.243	1	188.322	1	29.047	5	.006	1	-.008	12	.711	3
180			min	-287.871	3	-169.981	3	-12.509	1	0	5	-.21	1	-.714	1
181		15	max	373.243	1	50.471	1	39.019	4	.006	1	.009	5	.837	3
182			min	-287.871	3	-27.252	3	3.594	12	0	5	-.196	1	-.867	1
183		16	max	373.243	1	115.476	3	81.328	1	.006	1	.052	5	.781	3
184			min	-287.871	3	-87.379	1	5.523	12	0	5	-.122	1	-.843	1
185		17	max	373.243	1	258.204	3	128.246	1	.006	1	.099	4	.542	3
186			min	-287.871	3	-225.229	1	7.452	12	0	5	.002	9	-.643	1
187		18	max	373.243	1	400.932	3	175.165	1	.006	1	.206	1	.121	3
188			min	-287.871	3	-363.079	1	9.381	12	0	5	.021	12	-.268	1
189		19	max	373.243	1	543.66	3	222.083	1	.006	1	.46	1	.284	1
190			min	-287.871	3	-500.93	1	11.31	12	0	5	.034	12	-.482	3
191	M12	1	max	54.752	5	567.307	1	18.701	5	0	12	.484	1	.266	2
192			min	-19.54	9	-201.002	3	-225.273	1	-.007	1	-.161	5	.025	12
193		2	max	41.635	5	409.147	1	21.686	5	0	12	.226	1	.258	3
194			min	-19.54	9	-139.511	3	-178.355	1	-.007	1	-.135	5	-.382	1
195		3	max	39.452	2	250.987	1	24.671	5	0	12	.031	2	.397	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	-19.54	9	-78.02	3	-131.436	1	-.007	1	-.105	5	-.803	1
197		4	max	39.452	2	94.686	2	27.656	5	0	12	-.004	12	.457	3
198			min	-19.54	9	-16.529	3	-84.518	1	-.007	1	-.11	1	-1.023	1
199		5	max	39.452	2	44.961	3	30.64	5	0	12	-.008	12	.439	3
200			min	-19.54	9	-65.333	1	-37.599	1	-.007	1	-.188	1	-1.041	1
201		6	max	39.452	2	106.452	3	36.698	4	0	12	.007	5	.342	3
202			min	-20.524	14	-223.492	1	-2.951	10	-.007	1	-.206	1	-.856	1
203		7	max	39.452	2	167.943	3	56.238	1	0	12	.051	5	.167	3
204			min	-30.492	4	-381.652	1	1.686	12	-.007	1	-.164	1	-.47	1
205		8	max	39.452	2	229.434	3	103.156	1	0	12	.1	5	.119	1
206			min	-43.608	4	-539.812	1	3.615	12	-.007	1	-.062	1	-.087	3
207		9	max	39.452	2	290.925	3	150.075	1	0	12	.179	4	.91	1
208			min	-56.725	4	-697.972	1	5.544	12	-.007	1	-.006	10	-.419	3
209		10	max	39.452	2	856.132	1	124.973	14	.007	1	.321	1	1.903	1
210			min	-69.841	4	-352.416	3	-196.993	1	-.003	14	.009	12	-.83	3
211		11	max	45.808	5	697.972	1	22.968	5	.007	1	.1	1	.91	1
212			min	-19.54	9	-290.925	3	-150.075	1	0	5	-.138	5	-.419	3
213		12	max	39.452	2	539.812	1	25.953	5	.007	1	-.005	12	.119	1
214			min	-19.54	9	-229.434	3	-103.156	1	0	5	-.118	4	-.087	3
215		13	max	39.452	2	381.652	1	28.938	5	.007	1	-.008	12	.167	3
216			min	-19.54	9	-167.943	3	-56.238	1	0	5	-.164	1	-.47	1
217		14	max	39.452	2	223.492	1	31.923	5	.007	1	-.009	12	.342	3
218			min	-19.54	9	-106.452	3	-9.319	1	0	5	-.206	1	-.856	1
219		15	max	39.452	2	65.333	1	42.425	4	.007	1	.01	5	.439	3
220			min	-19.54	9	-44.961	3	2.173	12	0	5	-.188	1	-1.041	1
221		16	max	39.452	2	16.529	3	84.518	1	.007	1	.057	5	.457	3
222			min	-26.374	4	-94.686	2	4.102	12	0	5	-.11	1	-1.023	1
223		17	max	39.452	2	78.02	3	131.436	1	.007	1	.111	4	.397	3
224			min	-39.491	4	-250.987	1	6.031	12	0	5	.003	12	-.803	1
225		18	max	39.452	2	139.511	3	178.355	1	.007	1	.226	1	.258	3
226			min	-52.608	4	-409.147	1	7.96	12	0	5	.012	12	-.382	1
227		19	max	39.452	2	201.002	3	225.273	1	.007	1	.484	1	.266	2
228			min	-65.724	4	-567.307	1	9.889	12	0	5	.023	12	-.036	5
229	M13	1	max	47.621	5	582.971	1	13.216	5	.005	3	.415	1	.248	1
230			min	-205.947	1	-216.826	3	-216.291	1	-.018	1	-.135	5	-.057	3
231		2	max	34.504	5	424.811	1	16.201	5	.005	3	.168	1	.18	3
232			min	-205.947	1	-155.335	3	-169.373	1	-.018	1	-.116	5	-.396	1
233		3	max	21.387	5	266.651	1	19.185	5	.005	3	.007	10	.34	3
234			min	-205.947	1	-93.844	3	-122.454	1	-.018	1	-.1	4	-.837	1
235		4	max	8.271	5	108.491	1	22.17	5	.005	3	-.005	12	.42	3
236			min	-205.947	1	-32.353	3	-75.536	1	-.018	1	-.145	1	-1.077	1
237		5	max	-1.4	3	29.138	3	25.155	5	.005	3	-.008	12	.422	3
238			min	-205.947	1	-51.99	2	-28.617	1	-.018	1	-.211	1	-1.115	1
239		6	max	-1.4	3	90.629	3	32.944	4	.005	3	-.001	15	.346	3
240			min	-205.947	1	-207.949	2	-1.192	10	-.018	1	-.218	1	-.95	1
241		7	max	-1.4	3	152.12	3	65.22	1	.005	3	.035	5	.191	3
242			min	-205.947	1	-365.988	1	1.875	12	-.018	1	-.164	1	-.583	1
243		8	max	-1.4	3	213.611	3	112.138	1	.005	3	.077	5	.007	10
244			min	-205.947	1	-524.148	1	3.805	12	-.018	1	-.051	1	-.043	3
245		9	max	-1.4	3	275.102	3	159.057	1	.005	3	.153	4	.769	2
246			min	-205.947	1	-682.308	1	5.734	12	-.018	1	-.002	10	-.355	3
247		10	max	-1.4	3	831.782	2	205.975	1	.018	1	.355	1	1.733	2
248			min	-205.947	1	-840.468	1	-105.696	11	-.007	14	.01	12	-.746	3
249		11	max	33.145	5	682.308	1	16.432	5	.018	1	.122	1	.769	2
250			min	-205.947	1	-275.102	3	-159.057	1	-.005	3	-.105	5	-.355	3
251		12	max	20.029	5	524.148	1	19.417	5	.018	1	-.005	12	.007	10
252			min	-205.947	1	-213.611	3	-112.138	1	-.005	3	-.091	4	-.043	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	6.912	5	365.988	1	22.402	5	.018	1	-.008	12	.191	3
254			min	-205.947	1	-152.12	3	-65.22	1	-.005	3	-.164	1	-.583	1
255		14	max	-1.4	3	207.949	2	25.386	5	.018	1	-.01	12	.346	3
256			min	-205.947	1	-90.629	3	-18.301	1	-.005	3	-.218	1	-.95	1
257		15	max	-1.4	3	51.99	2	33.99	4	.018	1	.01	5	.422	3
258			min	-205.947	1	-29.138	3	1.983	12	-.005	3	-.211	1	-1.115	1
259		16	max	-1.4	3	32.353	3	75.536	1	.018	1	.048	5	.42	3
260			min	-205.947	1	-108.491	1	3.912	12	-.005	3	-.145	1	-1.077	1
261		17	max	-1.4	3	93.844	3	122.454	1	.018	1	.09	5	.34	3
262			min	-205.947	1	-266.651	1	5.841	12	-.005	3	-.018	1	-.837	1
263		18	max	-1.4	3	155.335	3	169.373	1	.018	1	.17	4	.18	3
264			min	-205.947	1	-424.811	1	7.771	12	-.005	3	.01	12	-.396	1
265		19	max	-1.4	3	216.826	3	216.291	1	.018	1	.415	1	.248	1
266			min	-205.947	1	-582.971	1	9.7	12	-.005	3	.022	12	-.057	3
267	M2	1	max	2414.228	1	690.689	3	322.339	1	.012	5	1.501	5	5.323	1
268			min	-1273.832	3	-491.053	2	-366.62	5	-.011	1	-.408	1	.52	15
269		2	max	2411.673	1	690.689	3	322.339	1	.012	5	1.399	5	5.355	1
270			min	-1275.748	3	-491.053	2	-364.405	5	-.011	1	-.318	1	.499	15
271		3	max	2409.118	1	690.689	3	322.339	1	.012	5	1.297	5	5.387	1
272			min	-1277.664	3	-491.053	2	-362.191	5	-.011	1	-.227	1	.478	15
273		4	max	1821.784	1	1237.731	1	249.366	1	.002	1	1.194	5	5.209	1
274			min	-1101.998	3	107.481	15	-344.999	5	-.001	3	-.193	1	.452	15
275		5	max	1819.229	1	1237.731	1	249.366	1	.002	1	1.098	5	4.862	1
276			min	-1103.914	3	107.481	15	-342.785	5	-.001	3	-.123	1	.422	15
277		6	max	1816.674	1	1237.731	1	249.366	1	.002	1	1.003	4	4.515	1
278			min	-1105.83	3	107.481	15	-340.571	5	-.001	3	-.053	1	.392	15
279		7	max	1814.12	1	1237.731	1	249.366	1	.002	1	.918	4	4.167	1
280			min	-1107.746	3	107.481	15	-338.357	5	-.001	3	-.067	3	.362	15
281		8	max	1811.565	1	1237.731	1	249.366	1	.002	1	.833	4	3.82	1
282			min	-1109.662	3	107.481	15	-336.142	5	-.001	3	-.132	3	.332	15
283		9	max	1809.01	1	1237.731	1	249.366	1	.002	1	.749	4	3.473	1
284			min	-1111.578	3	107.481	15	-333.928	5	-.001	3	-.198	3	.302	15
285		10	max	1806.455	1	1237.731	1	249.366	1	.002	1	.666	4	3.126	1
286			min	-1113.495	3	107.481	15	-331.714	5	-.001	3	-.264	3	.271	15
287		11	max	1803.9	1	1237.731	1	249.366	1	.002	1	.583	4	2.778	1
288			min	-1115.411	3	107.481	15	-329.5	5	-.001	3	-.33	3	.241	15
289		12	max	1801.345	1	1237.731	1	249.366	1	.002	1	.501	4	2.431	1
290			min	-1117.327	3	107.481	15	-327.286	5	-.001	3	-.395	3	.211	15
291		13	max	1798.79	1	1237.731	1	249.366	1	.002	1	.437	1	2.084	1
292			min	-1119.243	3	107.481	15	-325.071	5	-.001	3	-.461	3	.181	15
293		14	max	1796.235	1	1237.731	1	249.366	1	.002	1	.507	1	1.736	1
294			min	-1121.159	3	107.481	15	-322.857	5	-.001	3	-.527	3	.151	15
295		15	max	1793.68	1	1237.731	1	249.366	1	.002	1	.577	1	1.389	1
296			min	-1123.075	3	107.481	15	-320.643	5	-.001	3	-.592	3	.121	15
297		16	max	1791.126	1	1237.731	1	249.366	1	.002	1	.647	1	1.042	1
298			min	-1124.992	3	107.481	15	-318.429	5	-.001	3	-.658	3	.09	15
299		17	max	1788.571	1	1237.731	1	249.366	1	.002	1	.717	1	.695	1
300			min	-1126.908	3	107.481	15	-316.214	5	-.001	3	-.724	3	.06	15
301		18	max	1786.016	1	1237.731	1	249.366	1	.002	1	.787	1	.347	1
302			min	-1128.824	3	107.481	15	-314	5	-.001	3	-.789	3	.03	15
303		19	max	1783.461	1	1237.731	1	249.366	1	.002	1	.857	1	0	1
304			min	-1130.74	3	107.481	15	-311.786	5	-.001	3	-.855	3	0	1
305	M5	1	max	6511.985	1	1911.718	3	0	1	.013	4	1.582	4	11.034	1
306			min	-3836.233	3	-1893.206	2	-403.604	5	0	1	0	1	.394	15
307		2	max	6509.43	1	1911.718	3	0	1	.013	4	1.47	4	11.371	1
308			min	-3838.149	3	-1893.206	2	-401.39	5	0	1	0	1	.398	15
309		3	max	6506.875	1	1911.718	3	0	1	.013	4	1.358	4	11.708	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	-3840.065	3	-1893.206	2	-399.176	5	0	1	0	1	.402	15
311		4	max	4855.601	1	2717.796	1	0	1	0	1	1.25	4	11.438	1
312			min	-3226.86	3	92.442	15	-383.154	4	0	4	0	1	.389	15
313		5	max	4853.046	1	2717.796	1	0	1	0	1	1.143	4	10.676	1
314			min	-3228.776	3	92.442	15	-380.939	4	0	4	0	1	.363	15
315		6	max	4850.491	1	2717.796	1	0	1	0	1	1.036	4	9.913	1
316			min	-3230.692	3	92.442	15	-378.725	4	0	4	0	1	.337	15
317		7	max	4847.936	1	2717.796	1	0	1	0	1	.93	4	9.151	1
318			min	-3232.608	3	92.442	15	-376.511	4	0	4	0	1	.311	15
319		8	max	4845.381	1	2717.796	1	0	1	0	1	.825	4	8.388	1
320			min	-3234.524	3	92.442	15	-374.297	4	0	4	0	1	.285	15
321		9	max	4842.826	1	2717.796	1	0	1	0	1	.72	4	7.626	1
322			min	-3236.44	3	92.442	15	-372.082	4	0	4	0	1	.259	15
323		10	max	4840.271	1	2717.796	1	0	1	0	1	.616	4	6.863	1
324			min	-3238.357	3	92.442	15	-369.868	4	0	4	0	1	.233	15
325		11	max	4837.716	1	2717.796	1	0	1	0	1	.512	4	6.1	1
326			min	-3240.273	3	92.442	15	-367.654	4	0	4	0	1	.207	15
327		12	max	4835.162	1	2717.796	1	0	1	0	1	.41	4	5.338	1
328			min	-3242.189	3	92.442	15	-365.44	4	0	4	0	1	.182	15
329		13	max	4832.607	1	2717.796	1	0	1	0	1	.307	4	4.575	1
330			min	-3244.105	3	92.442	15	-363.226	4	0	4	0	1	.156	15
331		14	max	4830.052	1	2717.796	1	0	1	0	1	.206	4	3.813	1
332			min	-3246.021	3	92.442	15	-361.011	4	0	4	0	1	.13	15
333		15	max	4827.497	1	2717.796	1	0	1	0	1	.105	4	3.05	1
334			min	-3247.937	3	92.442	15	-358.797	4	0	4	0	1	.104	15
335		16	max	4824.942	1	2717.796	1	0	1	0	1	.004	4	2.288	1
336			min	-3249.854	3	92.442	15	-356.583	4	0	4	0	1	.078	15
337		17	max	4822.387	1	2717.796	1	0	1	0	1	0	1	1.525	1
338			min	-3251.77	3	92.442	15	-354.369	4	0	4	-.095	4	.052	15
339		18	max	4819.832	1	2717.796	1	0	1	0	1	0	1	.763	1
340			min	-3253.686	3	92.442	15	-352.154	4	0	4	-.194	4	.026	15
341		19	max	4817.277	1	2717.796	1	0	1	0	1	0	1	0	1
342			min	-3255.602	3	92.442	15	-349.94	4	0	4	-.293	4	0	1
343	M8	1	max	2414.228	1	690.689	3	261.326	3	.015	4	1.622	4	5.323	1
344			min	-1273.832	3	-491.053	2	-446.912	4	-.004	3	-.327	3	-.133	5
345		2	max	2411.673	1	690.689	3	261.326	3	.015	4	1.497	4	5.355	1
346			min	-1275.748	3	-491.053	2	-444.698	4	-.004	3	-.253	3	-.108	5
347		3	max	2409.118	1	690.689	3	261.326	3	.015	4	1.373	4	5.387	1
348			min	-1277.664	3	-491.053	2	-442.484	4	-.004	3	-.18	3	-.083	5
349		4	max	1821.784	1	1237.731	1	234.131	3	.001	3	1.26	4	5.209	1
350			min	-1101.998	3	-16.396	5	-411.16	4	-.002	1	-.13	3	-.069	5
351		5	max	1819.229	1	1237.731	1	234.131	3	.001	3	1.145	4	4.862	1
352			min	-1103.914	3	-16.396	5	-408.946	4	-.002	1	-.065	3	-.064	5
353		6	max	1816.674	1	1237.731	1	234.131	3	.001	3	1.03	4	4.515	1
354			min	-1105.83	3	-16.396	5	-406.732	4	-.002	1	0	12	-.06	5
355		7	max	1814.12	1	1237.731	1	234.131	3	.001	3	.917	4	4.167	1
356			min	-1107.746	3	-16.396	5	-404.517	4	-.002	1	-.032	2	-.055	5
357		8	max	1811.565	1	1237.731	1	234.131	3	.001	3	.805	5	3.82	1
358			min	-1109.662	3	-16.396	5	-402.303	4	-.002	1	-.091	2	-.051	5
359		9	max	1809.01	1	1237.731	1	234.131	3	.001	3	.705	5	3.473	1
360			min	-1111.578	3	-16.396	5	-400.089	4	-.002	1	-.157	1	-.046	5
361		10	max	1806.455	1	1237.731	1	234.131	3	.001	3	.605	5	3.126	1
362			min	-1113.495	3	-16.396	5	-397.875	4	-.002	1	-.227	1	-.041	5
363		11	max	1803.9	1	1237.731	1	234.131	3	.001	3	.506	5	2.778	1
364			min	-1115.411	3	-16.396	5	-395.66	4	-.002	1	-.297	1	-.037	5
365		12	max	1801.345	1	1237.731	1	234.131	3	.001	3	.407	5	2.431	1
366			min	-1117.327	3	-16.396	5	-393.446	4	-.002	1	-.367	1	-.032	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	1798.79	1	1237.731	1	234.131	3	.001	3	.461	3	2.084	1
368			min	-1119.243	3	-16.396	5	-391.232	4	-.002	1	-.437	1	-.028	5
369		14	max	1796.235	1	1237.731	1	234.131	3	.001	3	.527	3	1.736	1
370			min	-1121.159	3	-16.396	5	-389.018	4	-.002	1	-.507	1	-.023	5
371		15	max	1793.68	1	1237.731	1	234.131	3	.001	3	.592	3	1.389	1
372			min	-1123.075	3	-16.396	5	-386.803	4	-.002	1	-.577	1	-.018	5
373		16	max	1791.126	1	1237.731	1	234.131	3	.001	3	.658	3	1.042	1
374			min	-1124.992	3	-16.396	5	-384.589	4	-.002	1	-.647	1	-.014	5
375		17	max	1788.571	1	1237.731	1	234.131	3	.001	3	.724	3	.695	1
376			min	-1126.908	3	-16.396	5	-382.375	4	-.002	1	-.717	1	-.009	5
377		18	max	1786.016	1	1237.731	1	234.131	3	.001	3	.789	3	.347	1
378			min	-1128.824	3	-16.396	5	-380.161	4	-.002	1	-.787	1	-.005	5
379		19	max	1783.461	1	1237.731	1	234.131	3	.001	3	.855	3	0	1
380			min	-1130.74	3	-16.396	5	-377.947	4	-.002	1	-.857	1	0	1
381	M3	1	max	1465.054	1	4.588	6	72.039	1	.02	3	.014	4	0	1
382			min	-449.12	3	1.079	15	-27.623	3	-.046	1	-.003	3	0	1
383		2	max	1464.88	1	4.078	6	72.039	1	.02	3	.027	1	0	15
384			min	-449.251	3	.959	15	-27.623	3	-.046	1	-.011	3	-.001	6
385		3	max	1464.705	1	3.569	6	72.039	1	.02	3	.048	1	0	15
386			min	-449.382	3	.839	15	-27.623	3	-.046	1	-.019	3	-.002	6
387		4	max	1464.531	1	3.059	6	72.039	1	.02	3	.069	1	0	15
388			min	-449.513	3	.719	15	-27.623	3	-.046	1	-.027	3	-.003	6
389		5	max	1464.356	1	2.549	6	72.039	1	.02	3	.09	1	0	15
390			min	-449.643	3	.599	15	-27.623	3	-.046	1	-.035	3	-.004	6
391		6	max	1464.182	1	2.039	6	72.039	1	.02	3	.111	1	-.001	15
392			min	-449.774	3	.479	15	-27.623	3	-.046	1	-.043	3	-.005	6
393		7	max	1464.008	1	1.529	6	72.039	1	.02	3	.132	1	-.001	15
394			min	-449.905	3	.36	15	-27.623	3	-.046	1	-.051	3	-.005	6
395		8	max	1463.833	1	1.02	6	72.039	1	.02	3	.153	1	-.001	15
396			min	-450.036	3	.24	15	-27.623	3	-.046	1	-.059	3	-.006	6
397		9	max	1463.659	1	.51	6	72.039	1	.02	3	.174	1	-.001	15
398			min	-450.167	3	.12	15	-27.623	3	-.046	1	-.067	3	-.006	6
399		10	max	1463.485	1	0	1	72.039	1	.02	3	.195	1	-.001	15
400			min	-450.297	3	0	1	-27.623	3	-.046	1	-.076	3	-.006	6
401		11	max	1463.31	1	-.12	15	72.039	1	.02	3	.216	1	-.001	15
402			min	-450.428	3	-.51	4	-27.623	3	-.046	1	-.084	3	-.006	6
403		12	max	1463.136	1	-.24	15	72.039	1	.02	3	.237	1	-.001	15
404			min	-450.559	3	-1.02	4	-27.623	3	-.046	1	-.092	3	-.006	6
405		13	max	1462.961	1	-.36	15	72.039	1	.02	3	.258	1	-.001	15
406			min	-450.69	3	-1.529	4	-27.623	3	-.046	1	-.1	3	-.005	6
407		14	max	1462.787	1	-.479	15	72.039	1	.02	3	.279	1	-.001	15
408			min	-450.821	3	-2.039	4	-27.623	3	-.046	1	-.108	3	-.005	6
409		15	max	1462.613	1	-.599	15	72.039	1	.02	3	.301	1	0	15
410			min	-450.951	3	-2.549	4	-27.623	3	-.046	1	-.116	3	-.004	6
411		16	max	1462.438	1	-.719	15	72.039	1	.02	3	.322	1	0	15
412			min	-451.082	3	-3.059	4	-27.623	3	-.046	1	-.124	3	-.003	6
413		17	max	1462.264	1	-.839	15	72.039	1	.02	3	.343	1	0	15
414			min	-451.213	3	-3.569	4	-27.623	3	-.046	1	-.132	3	-.002	6
415		18	max	1462.089	1	-.959	15	72.039	1	.02	3	.364	1	0	15
416			min	-451.344	3	-4.078	4	-27.623	3	-.046	1	-.14	3	-.001	6
417		19	max	1461.915	1	-1.079	15	72.039	1	.02	3	.385	1	0	1
418			min	-451.475	3	-4.588	4	-27.623	3	-.046	1	-.148	3	0	1
419	M6	1	max	4213.447	2	4.588	6	0	1	.007	5	.013	4	0	1
420			min	-1543.722	3	1.079	15	-20.314	4	0	1	0	1	0	1
421		2	max	4213.273	2	4.078	6	0	1	.007	5	.007	4	0	15
422			min	-1543.853	3	.959	15	-19.938	4	0	1	0	1	-.001	6
423		3	max	4213.098	2	3.569	6	0	1	.007	5	.001	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	-1543.983	3	.839	15	-19.562	4	0	1	0	1	-.002	6
425		4	max	4212.924	2	3.059	6	0	1	.007	5	0	1	0	15
426			min	-1544.114	3	.719	15	-19.186	4	0	1	-.005	4	-.003	6
427		5	max	4212.75	2	2.549	6	0	1	.007	5	0	1	0	15
428			min	-1544.245	3	.599	15	-18.81	4	0	1	-.01	4	-.004	6
429		6	max	4212.575	2	2.039	6	0	1	.007	5	0	1	-.001	15
430			min	-1544.376	3	.479	15	-18.434	4	0	1	-.016	4	-.005	6
431		7	max	4212.401	2	1.529	6	0	1	.007	5	0	1	-.001	15
432			min	-1544.507	3	.36	15	-18.058	4	0	1	-.021	4	-.005	6
433		8	max	4212.226	2	1.02	6	0	1	.007	5	0	1	-.001	15
434			min	-1544.637	3	.24	15	-17.682	4	0	1	-.026	4	-.006	6
435		9	max	4212.052	2	.51	6	0	1	.007	5	0	1	-.001	15
436			min	-1544.768	3	.12	15	-17.306	4	0	1	-.031	4	-.006	6
437		10	max	4211.878	2	0	1	0	1	.007	5	0	1	-.001	15
438			min	-1544.899	3	0	1	-16.93	4	0	1	-.036	4	-.006	6
439		11	max	4211.703	2	-.12	15	0	1	.007	5	0	1	-.001	15
440			min	-1545.03	3	-.51	4	-16.554	4	0	1	-.041	4	-.006	6
441		12	max	4211.529	2	-.24	15	0	1	.007	5	0	1	-.001	15
442			min	-1545.161	3	-1.02	4	-16.178	4	0	1	-.046	4	-.006	6
443		13	max	4211.354	2	-.36	15	0	1	.007	5	0	1	-.001	15
444			min	-1545.291	3	-1.529	4	-15.802	4	0	1	-.051	4	-.005	6
445		14	max	4211.18	2	-.479	15	0	1	.007	5	0	1	-.001	15
446			min	-1545.422	3	-2.039	4	-15.426	4	0	1	-.055	4	-.005	6
447		15	max	4211.006	2	-.599	15	0	1	.007	5	0	1	0	15
448			min	-1545.553	3	-2.549	4	-15.05	4	0	1	-.06	4	-.004	6
449		16	max	4210.831	2	-.719	15	0	1	.007	5	0	1	0	15
450			min	-1545.684	3	-3.059	4	-14.674	4	0	1	-.064	4	-.003	6
451		17	max	4210.657	2	-.839	15	0	1	.007	5	0	1	0	15
452			min	-1545.814	3	-3.569	4	-14.298	4	0	1	-.068	4	-.002	6
453		18	max	4210.483	2	-.959	15	0	1	.007	5	0	1	0	15
454			min	-1545.945	3	-4.078	4	-13.922	4	0	1	-.072	4	-.001	6
455		19	max	4210.308	2	-1.079	15	0	1	.007	5	0	1	0	1
456			min	-1546.076	3	-4.588	4	-13.546	4	0	1	-.076	4	0	1
457	M9	1	max	1465.054	1	4.588	6	27.623	3	.046	1	.013	5	0	1
458			min	-449.12	3	1.079	15	-72.039	1	-.02	3	-.006	2	0	1
459		2	max	1464.88	1	4.078	6	27.623	3	.046	1	.011	3	0	15
460			min	-449.251	3	.959	15	-72.039	1	-.02	3	-.027	1	-.001	6
461		3	max	1464.705	1	3.569	6	27.623	3	.046	1	.019	3	0	15
462			min	-449.382	3	.839	15	-72.039	1	-.02	3	-.048	1	-.002	6
463		4	max	1464.531	1	3.059	6	27.623	3	.046	1	.027	3	0	15
464			min	-449.513	3	.719	15	-72.039	1	-.02	3	-.069	1	-.003	6
465		5	max	1464.356	1	2.549	6	27.623	3	.046	1	.035	3	0	15
466			min	-449.643	3	.599	15	-72.039	1	-.02	3	-.09	1	-.004	6
467		6	max	1464.182	1	2.039	6	27.623	3	.046	1	.043	3	-.001	15
468			min	-449.774	3	.479	15	-72.039	1	-.02	3	-.111	1	-.005	6
469		7	max	1464.008	1	1.529	6	27.623	3	.046	1	.051	3	-.001	15
470			min	-449.905	3	.36	15	-72.039	1	-.02	3	-.132	1	-.005	6
471		8	max	1463.833	1	1.02	6	27.623	3	.046	1	.059	3	-.001	15
472			min	-450.036	3	.24	15	-72.039	1	-.02	3	-.153	1	-.006	6
473		9	max	1463.659	1	.51	6	27.623	3	.046	1	.067	3	-.001	15
474			min	-450.167	3	.12	15	-72.039	1	-.02	3	-.174	1	-.006	6
475		10	max	1463.485	1	0	1	27.623	3	.046	1	.076	3	-.001	15
476			min	-450.297	3	0	1	-72.039	1	-.02	3	-.195	1	-.006	6
477		11	max	1463.31	1	-.12	15	27.623	3	.046	1	.084	3	-.001	15
478			min	-450.428	3	-.51	4	-72.039	1	-.02	3	-.216	1	-.006	6
479		12	max	1463.136	1	-.24	15	27.623	3	.046	1	.092	3	-.001	15
480			min	-450.559	3	-1.02	4	-72.039	1	-.02	3	-.237	1	-.006	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	1462.961	1	-.36	15	27.623	3	.046	1	.1	3	-.001	15
482			min	-450.69	3	-1.529	4	-72.039	1	-.02	3	-.258	1	-.005	6
483		14	max	1462.787	1	-.479	15	27.623	3	.046	1	.108	3	-.001	15
484			min	-450.821	3	-2.039	4	-72.039	1	-.02	3	-.279	1	-.005	6
485		15	max	1462.613	1	-.599	15	27.623	3	.046	1	.116	3	0	15
486			min	-450.951	3	-2.549	4	-72.039	1	-.02	3	-.301	1	-.004	6
487		16	max	1462.438	1	-.719	15	27.623	3	.046	1	.124	3	0	15
488			min	-451.082	3	-3.059	4	-72.039	1	-.02	3	-.322	1	-.003	6
489		17	max	1462.264	1	-.839	15	27.623	3	.046	1	.132	3	0	15
490			min	-451.213	3	-3.569	4	-72.039	1	-.02	3	-.343	1	-.002	6
491		18	max	1462.089	1	-.959	15	27.623	3	.046	1	.14	3	0	15
492			min	-451.344	3	-4.078	4	-72.039	1	-.02	3	-.364	1	-.001	6
493		19	max	1461.915	1	-1.079	15	27.623	3	.046	1	.148	3	0	1
494			min	-451.475	3	-4.588	4	-72.039	1	-.02	3	-.385	1	0	1

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	-.023	15	.019	3	.032	1	9.79e-3	3	NC	3	NC	3
2			min	-.263	1	-.633	1	-.652	5	-2.856e-2	1	194.381	1	249.13	5
3		2	max	-.023	15	.003	3	.01	1	9.79e-3	3	NC	12	NC	3
4			min	-.263	1	-.537	1	-.622	4	-2.856e-2	1	225.697	1	265.097	5
5		3	max	-.023	15	-.011	12	0	12	9.34e-3	3	6842.468	12	NC	2
6			min	-.263	1	-.441	1	-.592	4	-2.661e-2	1	269.093	1	284.073	5
7		4	max	-.023	15	-.02	12	0	12	8.65e-3	3	4671.965	12	NC	1
8			min	-.263	1	-.349	1	-.554	4	-2.362e-2	1	330.397	1	309.615	5
9		5	max	-.023	15	-.022	15	0	3	7.961e-3	3	3727.759	12	NC	1
10			min	-.262	1	-.265	1	-.511	4	-2.063e-2	1	416.493	1	343.569	5
11		6	max	-.023	15	-.017	15	.001	3	8.157e-3	3	3330.497	12	NC	1
12			min	-.262	1	-.195	1	-.465	4	-1.991e-2	1	532.105	1	388.07	5
13		7	max	-.023	15	-.013	15	.002	3	8.966e-3	3	5144.654	10	NC	2
14			min	-.262	1	-.138	1	-.42	4	-2.077e-2	1	685.931	1	445.023	5
15		8	max	-.023	15	-.01	15	0	3	9.775e-3	3	NC	10	NC	2
16			min	-.261	1	-.091	1	-.376	4	-2.163e-2	1	907.755	1	517.113	5
17		9	max	-.023	15	-.006	15	0	10	1.076e-2	3	NC	10	NC	2
18			min	-.261	1	-.048	3	-.337	4	-2.144e-2	1	1287.031	1	607.825	5
19		10	max	-.023	15	.002	10	0	1	1.205e-2	3	NC	2	NC	2
20			min	-.26	1	-.041	3	-.298	4	-1.938e-2	1	2148.411	1	738.306	5
21		11	max	-.023	15	.034	1	.002	3	1.335e-2	3	NC	11	NC	2
22			min	-.26	1	-.032	3	-.26	4	-1.732e-2	1	2603.684	3	933.014	5
23		12	max	-.023	15	.07	1	.007	3	1.093e-2	3	NC	1	NC	2
24			min	-.259	1	-.02	3	-.226	4	-1.308e-2	1	2310.619	2	1236.172	5
25		13	max	-.023	15	.1	1	.012	3	6.419e-3	3	NC	9	NC	2
26			min	-.258	1	0	3	-.192	4	-7.597e-3	1	1753.441	2	1792.177	5
27		14	max	-.023	15	.119	1	.012	3	2.112e-3	3	NC	3	NC	2
28			min	-.258	1	.011	15	-.163	4	-5.902e-3	4	1572.757	2	2832.113	5
29		15	max	-.023	15	.121	1	.008	1	6.935e-3	3	NC	4	NC	2
30			min	-.258	1	.013	15	-.143	5	-6.202e-3	1	1660.306	2	3747.137	1
31		16	max	-.023	15	.139	3	.012	1	1.176e-2	3	NC	4	NC	3
32			min	-.258	1	.016	15	-.131	5	-1.008e-2	1	1120.251	3	3303.615	1
33		17	max	-.023	15	.207	3	.008	1	1.658e-2	3	NC	4	NC	3
34			min	-.258	1	.012	10	-.123	5	-1.396e-2	1	713.189	3	3715.774	1
35		18	max	-.023	15	.279	3	0	12	1.972e-2	3	NC	4	NC	2
36			min	-.258	1	0	10	-.122	4	-1.649e-2	1	516.962	3	6832.812	1
37		19	max	-.023	15	.35	3	-.003	12	1.972e-2	3	NC	1	NC	1
38			min	-.258	1	-.013	10	-.122	4	-1.649e-2	1	405.547	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	.143	3	0	1	1.664e-4	4	NC	3	NC	1
40			min	-.573	1	-1.491	1	-.649	4	0	1	90.76	1	250.958	4
41		2	max	-.02	15	.087	3	0	1	1.664e-4	4	4119.916	12	NC	1
42			min	-.573	1	-1.257	1	-.622	4	0	1	107.845	1	264.256	4
43		3	max	-.02	15	.032	3	0	1	0	1	3874.675	15	NC	1
44			min	-.573	1	-1.022	1	-.593	4	-9.466e-5	4	132.927	1	280.326	4
45		4	max	-.02	15	-.016	12	0	1	0	1	4831.999	15	NC	1
46			min	-.573	1	-.796	1	-.555	4	-4.951e-4	4	171.35	1	304.07	4
47		5	max	-.02	15	-.02	15	0	1	0	1	6230.941	15	NC	1
48			min	-.573	1	-.593	1	-.512	4	-8.956e-4	4	231.368	1	337.405	4
49		6	max	-.02	15	-.015	15	0	1	0	1	8210.329	15	NC	1
50			min	-.572	1	-.429	1	-.465	4	-8.568e-4	4	323.023	1	382.448	4
51		7	max	-.02	15	-.01	15	0	1	0	1	NC	15	NC	1
52			min	-.571	1	-.301	1	-.419	4	-5.143e-4	4	466.31	1	440.546	4
53		8	max	-.02	15	-.007	15	0	1	0	1	NC	5	NC	1
54			min	-.569	1	-.197	1	-.376	4	-1.718e-4	4	539.594	3	513.031	4
55		9	max	-.019	15	-.004	15	0	1	0	1	NC	5	NC	1
56			min	-.568	1	-.102	1	-.338	4	-2.811e-5	4	549.96	3	600.618	4
57		10	max	-.019	15	.003	10	0	1	0	1	NC	1	NC	1
58			min	-.567	1	-.092	3	-.298	4	-2.36e-4	4	570.752	3	729.497	4
59		11	max	-.019	15	.078	1	0	1	0	1	NC	4	NC	1
60			min	-.565	1	-.077	3	-.26	4	-4.439e-4	4	609.775	3	920.934	4
61		12	max	-.019	15	.159	1	0	1	0	1	NC	5	NC	1
62			min	-.564	1	-.054	3	-.226	4	-1.71e-3	4	642.854	2	1202.577	4
63		13	max	-.019	15	.224	1	0	1	0	1	NC	5	NC	1
64			min	-.562	1	-.014	3	-.193	4	-3.576e-3	4	529.086	2	1713.48	4
65		14	max	-.019	15	.257	1	0	1	0	1	NC	5	NC	1
66			min	-.561	1	.009	15	-.165	4	-5.371e-3	4	493.392	2	2627.375	4
67		15	max	-.019	15	.245	1	0	1	0	1	NC	5	NC	1
68			min	-.561	1	.009	15	-.147	4	-4.035e-3	4	518.713	1	4125.493	4
69		16	max	-.019	15	.325	3	0	1	0	1	NC	5	NC	1
70			min	-.561	1	.008	15	-.134	4	-2.699e-3	4	629.166	1	6773.493	4
71		17	max	-.019	15	.496	3	0	1	0	1	NC	5	NC	1
72			min	-.561	1	.006	15	-.126	4	-1.363e-3	4	379.439	3	NC	1
73		18	max	-.019	15	.675	3	0	1	0	1	NC	5	NC	1
74			min	-.561	1	-.022	10	-.12	4	-4.915e-4	4	252.067	3	NC	1
75		19	max	-.019	15	.853	3	0	1	0	1	NC	1	NC	1
76			min	-.561	1	-.086	2	-.114	4	-4.915e-4	4	188.845	3	NC	1
77	M7	1	max	.004	5	.019	3	-.001	12	2.856e-2	1	NC	3	NC	3
78			min	-.263	1	-.633	1	-.667	4	-9.79e-3	3	194.381	1	239.223	4
79		2	max	.004	5	.003	3	0	12	2.856e-2	1	NC	5	NC	3
80			min	-.263	1	-.537	1	-.627	4	-9.79e-3	3	225.697	1	257.528	4
81		3	max	.004	5	0	15	.009	1	2.661e-2	1	NC	5	NC	2
82			min	-.263	1	-.441	1	-.587	4	-9.34e-3	3	269.093	1	279.069	4
83		4	max	.004	5	0	15	.017	1	2.362e-2	1	NC	5	NC	1
84			min	-.263	1	-.349	1	-.545	5	-8.65e-3	3	330.397	1	305.559	4
85		5	max	.004	5	.002	5	.018	1	2.063e-2	1	NC	5	NC	1
86			min	-.262	1	-.265	1	-.502	5	-7.961e-3	3	416.493	1	338.749	4
87		6	max	.004	5	.003	5	.015	1	1.991e-2	1	NC	5	NC	1
88			min	-.262	1	-.195	1	-.458	4	-8.157e-3	3	532.105	1	380.641	4
89		7	max	.004	5	.003	5	.007	1	2.077e-2	1	NC	5	NC	2
90			min	-.262	1	-.138	1	-.417	4	-8.966e-3	3	685.931	1	432.093	4
91		8	max	.004	5	.003	5	.002	2	2.163e-2	1	NC	4	NC	2
92			min	-.261	1	-.091	1	-.376	4	-9.775e-3	3	907.755	1	496.58	4
93		9	max	.004	5	.003	5	0	1	2.144e-2	1	NC	4	NC	2
94			min	-.261	1	-.048	3	-.337	4	-1.076e-2	3	1287.031	1	580.381	4
95		10	max	.004	5	.002	5	0	3	1.938e-2	1	NC	2	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	-.26	1	-.041	3	-.298	4	-1.205e-2	3	2148.411	1	698.268	4
97		11	max	.004	5	.034	1	.002	1	1.732e-2	1	NC	4	NC	2
98			min	-.26	1	-.032	3	-.26	4	-1.335e-2	3	2603.684	3	873.496	4
99		12	max	.004	5	.07	1	.009	1	1.308e-2	1	NC	1	NC	2
100			min	-.259	1	-.02	3	-.222	4	-1.093e-2	3	2310.619	2	1154.462	4
101		13	max	.004	5	.1	1	.01	1	7.597e-3	1	NC	5	NC	2
102			min	-.258	1	0	3	-.189	4	-6.419e-3	3	1753.441	2	1630.245	4
103		14	max	.004	5	.119	1	.006	2	2.323e-3	1	NC	3	NC	2
104			min	-.258	1	-.002	5	-.163	4	-5.258e-3	5	1572.757	2	2352.334	4
105		15	max	.004	5	.121	1	0	10	6.202e-3	1	NC	5	NC	2
106			min	-.258	1	-.005	5	-.148	4	-6.935e-3	3	1660.306	2	3237.335	4
107		16	max	.004	5	.139	3	-.001	10	1.008e-2	1	NC	5	NC	3
108			min	-.258	1	-.009	5	-.137	4	-1.176e-2	3	1120.251	3	3303.615	1
109		17	max	.004	5	.207	3	0	10	1.396e-2	1	NC	5	NC	3
110			min	-.258	1	-.014	5	-.128	4	-1.658e-2	3	713.189	3	3715.774	1
111		18	max	.004	5	.279	3	.009	1	1.649e-2	1	NC	4	NC	2
112			min	-.258	1	-.018	5	-.117	5	-1.972e-2	3	516.962	3	6832.812	1
113		19	max	.004	5	.35	3	.028	1	1.649e-2	1	NC	1	NC	1
114			min	-.258	1	-.023	5	-.111	5	-1.972e-2	3	405.547	3	NC	1
115	M10	1	max	.002	1	.254	3	.258	1	9.566e-3	3	NC	1	NC	1
116			min	-.121	4	-.017	5	-.004	5	-3.067e-3	2	NC	1	NC	1
117		2	max	.002	1	.568	3	.342	1	1.116e-2	3	NC	5	NC	3
118			min	-.121	4	-.195	2	.006	15	-3.776e-3	2	878.841	3	3287.62	1
119		3	max	.001	1	.858	3	.473	1	1.275e-2	3	NC	5	NC	3
120			min	-.121	4	-.409	1	.014	15	-4.485e-3	2	457.034	3	1285.94	1
121		4	max	.001	1	1.069	3	.601	1	1.435e-2	3	NC	5	NC	5
122			min	-.121	4	-.562	1	.019	15	-5.194e-3	2	338.614	3	804.166	1
123		5	max	0	1	1.171	3	.695	1	1.594e-2	3	NC	5	NC	15
124			min	-.121	4	-.609	1	.021	15	-5.903e-3	2	301.042	3	632.318	1
125		6	max	0	1	1.156	3	.735	1	1.753e-2	3	NC	5	NC	5
126			min	-.121	4	-.546	1	.021	15	-6.612e-3	1	306.022	3	578.795	1
127		7	max	0	1	1.041	3	.72	1	1.913e-2	3	NC	5	NC	5
128			min	-.122	4	-.393	1	.018	15	-7.419e-3	1	350.802	3	597.008	1
129		8	max	0	1	.865	3	.665	1	2.072e-2	3	NC	5	NC	5
130			min	-.122	4	-.219	2	.016	15	-8.226e-3	1	451.342	3	679.039	1
131		9	max	0	1	.694	3	.597	1	2.231e-2	3	NC	4	NC	5
132			min	-.122	4	-.063	2	.015	15	-9.032e-3	1	627.531	3	815.306	1
133		10	max	0	1	.613	3	.561	1	2.391e-2	3	NC	1	NC	5
134			min	-.122	4	-.009	10	.019	15	-9.839e-3	1	768.74	3	909.902	1
135		11	max	0	10	.694	3	.597	1	2.231e-2	3	NC	4	NC	5
136			min	-.122	4	-.063	2	.026	15	-9.032e-3	1	627.531	3	815.306	1
137		12	max	0	10	.865	3	.665	1	2.072e-2	3	NC	5	NC	15
138			min	-.122	4	-.219	2	.032	15	-8.226e-3	1	451.342	3	679.039	1
139		13	max	0	10	1.041	3	.72	1	1.913e-2	3	NC	15	NC	15
140			min	-.122	4	-.393	1	.035	15	-7.419e-3	1	350.802	3	597.008	1
141		14	max	0	10	1.156	3	.735	1	1.753e-2	3	9314.05	15	NC	15
142			min	-.122	4	-.546	1	.035	15	-6.612e-3	1	306.022	3	578.795	1
143		15	max	0	10	1.171	3	.695	1	1.594e-2	3	7657.266	15	NC	5
144			min	-.122	4	-.609	1	.032	15	-5.903e-3	2	301.042	3	632.318	1
145		16	max	0	10	1.069	3	.601	1	1.435e-2	3	7424.09	15	NC	5
146			min	-.122	4	-.562	1	.028	15	-5.194e-3	2	338.614	3	804.166	1
147		17	max	0	10	.858	3	.473	1	1.275e-2	3	8680.119	15	NC	3
148			min	-.122	4	-.409	1	.023	15	-4.485e-3	2	457.034	3	1285.94	1
149		18	max	0	10	.568	3	.342	1	1.116e-2	3	NC	15	NC	3
150			min	-.122	4	-.195	2	.02	15	-3.776e-3	2	878.841	3	3287.62	1
151		19	max	0	10	.254	3	.258	1	9.566e-3	3	NC	1	NC	1
152			min	-.122	4	.004	10	.023	15	-3.067e-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	.047	1	.259	1	4.913e-3	1	NC	1	NC	1
154			min	-.246	4	-.028	3	-.004	5	-9.585e-5	5	NC	1	NC	1
155		2	max	.004	1	.201	3	.326	1	5.585e-3	1	NC	5	NC	3
156			min	-.246	4	-.212	1	.034	15	-2.248e-5	15	1064.063	1	4129.297	1
157		3	max	.003	1	.416	3	.448	1	6.258e-3	1	NC	5	NC	3
158			min	-.246	4	-.439	1	.041	12	2.728e-5	15	567.903	1	1463.578	1
159		4	max	.003	1	.562	3	.574	1	6.931e-3	1	NC	5	NC	3
160			min	-.247	4	-.584	1	.047	15	7.703e-5	15	437.298	1	876.877	1
161		5	max	.002	1	.61	3	.67	1	7.604e-3	1	NC	5	NC	3
162			min	-.247	4	-.622	1	.033	15	1.268e-4	15	412.584	1	672.342	1
163		6	max	.002	1	.551	3	.716	1	8.277e-3	1	NC	5	NC	5
164			min	-.247	4	-.549	1	.013	15	1.766e-4	15	462.805	1	604.488	1
165		7	max	.001	1	.402	3	.709	1	8.95e-3	1	NC	5	NC	5
166			min	-.247	4	-.386	1	-.006	5	2.263e-4	15	637.207	1	614.222	1
167		8	max	0	1	.202	3	.66	1	9.623e-3	1	NC	5	NC	13
168			min	-.247	4	-.175	1	-.022	5	2.761e-4	15	1198.864	3	688.685	1
169		9	max	0	1	.019	1	.598	1	1.03e-2	1	NC	2	NC	7
170			min	-.247	4	-.002	5	-.014	5	3.258e-4	15	6260.363	3	815.602	1
171		10	max	0	1	.108	1	.565	1	1.097e-2	1	NC	4	NC	5
172			min	-.248	4	-.069	3	.019	15	3.756e-4	15	4575.15	1	903.616	1
173		11	max	0	3	.019	1	.598	1	1.03e-2	1	NC	2	8782.043	12
174			min	-.248	4	.003	15	.052	15	3.843e-4	15	6260.363	3	815.602	1
175		12	max	0	3	.202	3	.66	1	9.623e-3	1	NC	5	8938.363	12
176			min	-.248	4	-.175	1	.063	15	3.931e-4	15	1198.864	3	688.685	1
177		13	max	.001	3	.402	3	.709	1	8.95e-3	1	NC	5	9658.241	12
178			min	-.248	4	-.386	1	.057	15	4.019e-4	15	637.207	1	614.222	1
179		14	max	.001	3	.551	3	.716	1	8.277e-3	1	NC	15	NC	12
180			min	-.248	4	-.549	1	.04	15	4.106e-4	15	462.805	1	604.488	1
181		15	max	.002	3	.61	3	.67	1	7.604e-3	1	7950.442	15	NC	3
182			min	-.248	4	-.622	1	.018	15	4.194e-4	15	412.584	1	672.342	1
183		16	max	.002	3	.562	3	.574	1	6.931e-3	1	7490.661	15	NC	3
184			min	-.248	4	-.584	1	-.003	5	4.282e-4	15	437.298	1	876.877	1
185		17	max	.002	3	.416	3	.448	1	6.258e-3	1	8574.628	15	NC	3
186			min	-.248	4	-.439	1	-.02	5	4.369e-4	15	567.903	1	1463.578	1
187		18	max	.003	3	.201	3	.326	1	5.585e-3	1	NC	15	NC	3
188			min	-.248	4	-.212	1	-.012	5	4.457e-4	15	1064.063	1	4129.297	1
189		19	max	.003	3	.047	1	.259	1	4.913e-3	1	NC	1	NC	1
190			min	-.248	4	-.028	3	.023	15	4.545e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.003	5	.261	1	5.83e-3	1	NC	1	NC	1
192			min	-.351	4	-.063	1	-.004	5	-4.418e-5	5	NC	1	NC	1
193		2	max	0	2	.101	3	.317	1	6.594e-3	1	NC	5	NC	2
194			min	-.351	4	-.403	1	.036	15	1.408e-5	15	810.022	1	4061.739	4
195		3	max	0	2	.218	3	.433	1	7.358e-3	1	NC	5	NC	3
196			min	-.351	4	-.697	1	.049	12	6.694e-5	15	435.203	1	1603.395	1
197		4	max	0	2	.285	3	.558	1	8.123e-3	1	NC	5	NC	12
198			min	-.351	4	-.888	1	.048	15	1.198e-4	15	334.253	1	929.595	1
199		5	max	0	2	.293	3	.655	1	8.887e-3	1	NC	5	NC	12
200			min	-.351	4	-.95	1	.033	15	1.727e-4	15	311.205	1	699.834	1
201		6	max	0	2	.245	3	.705	1	9.651e-3	1	NC	5	NC	5
202			min	-.351	4	-.878	1	.011	15	2.255e-4	15	338.495	1	621.271	1
203		7	max	0	2	.154	3	.703	1	1.042e-2	1	NC	5	NC	5
204			min	-.351	4	-.698	1	-.012	5	2.784e-4	15	434.561	1	624.697	1
205		8	max	0	2	.042	3	.659	1	1.118e-2	1	NC	5	NC	13
206			min	-.351	4	-.459	1	-.029	5	3.313e-4	15	696.588	1	693.515	1
207		9	max	0	2	-.006	15	.6	1	1.194e-2	1	NC	3	NC	4
208			min	-.351	4	-.238	1	-.019	5	3.841e-4	15	1577.766	1	813.586	1
209		10	max	0	1	-.005	15	.569	1	1.271e-2	1	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	-.351	4	-.136	1	.019	15	4.37e-4	15	3743.664	1	896.89	1
211		11	max	0	9	-.009	15	.6	1	1.194e-2	1	NC	3	8725.148	12
212			min	-.351	4	-.238	1	.056	15	4.423e-4	15	1577.766	1	813.586	1
213		12	max	0	9	.042	3	.659	1	1.118e-2	1	NC	5	8446.042	12
214			min	-.351	4	-.459	1	.067	15	4.476e-4	15	696.588	1	693.515	1
215		13	max	0	9	.154	3	.703	1	1.042e-2	1	NC	15	8504.362	12
216			min	-.351	4	-.698	1	.061	15	4.398e-4	12	434.561	1	624.697	1
217		14	max	0	9	.245	3	.705	1	9.651e-3	1	9063.434	15	NC	15
218			min	-.351	4	-.878	1	.042	15	4.297e-4	12	338.495	1	621.271	1
219		15	max	0	9	.293	3	.655	1	8.887e-3	1	7994.733	15	NC	5
220			min	-.351	4	-.95	1	.017	15	4.195e-4	12	311.205	1	699.834	1
221		16	max	0	9	.285	3	.558	1	8.123e-3	1	8170.285	15	NC	4
222			min	-.351	4	-.888	1	-.006	5	4.093e-4	12	334.253	1	929.595	1
223		17	max	0	9	.218	3	.433	1	7.358e-3	1	9994.166	15	NC	3
224			min	-.351	4	-.697	1	-.025	5	3.992e-4	12	435.203	1	1603.395	1
225		18	max	0	9	.101	3	.317	1	6.594e-3	1	NC	5	NC	2
226			min	-.351	4	-.403	1	-.016	5	3.89e-4	12	810.022	1	4929.322	1
227		19	max	0	9	-.007	15	.261	1	5.83e-3	1	NC	1	NC	1
228			min	-.351	4	-.063	1	.023	15	3.789e-4	12	NC	1	NC	1
229	M13	1	max	0	3	-.002	15	.263	1	1.285e-2	1	NC	1	NC	1
230			min	-.613	4	-.504	1	-.004	5	-2.271e-3	3	NC	1	NC	1
231		2	max	0	3	.145	3	.351	1	1.491e-2	1	NC	5	NC	3
232			min	-.613	4	-.942	1	.034	15	-2.849e-3	3	629.339	1	3119.934	1
233		3	max	0	3	.27	3	.485	1	1.697e-2	1	NC	5	NC	3
234			min	-.613	4	-1.332	1	.049	12	-3.427e-3	3	333.316	1	1242.881	1
235		4	max	0	3	.353	3	.615	1	1.904e-2	1	NC	15	NC	12
236			min	-.613	4	-1.615	1	.051	15	-4.004e-3	3	248.374	1	783.5	1
237		5	max	0	3	.381	3	.709	1	2.11e-2	1	NC	15	NC	12
238			min	-.613	4	-1.761	1	.04	15	-4.582e-3	3	219.561	1	618.646	1
239		6	max	0	3	.356	3	.749	1	2.316e-2	1	9730.079	15	NC	15
240			min	-.613	4	-1.764	1	.023	15	-5.16e-3	3	218.934	1	567.491	1
241		7	max	0	3	.287	3	.734	1	2.523e-2	1	NC	15	NC	5
242			min	-.613	4	-1.647	1	.005	15	-5.737e-3	3	241.398	1	585.743	1
243		8	max	0	3	.194	3	.677	1	2.729e-2	1	NC	15	NC	5
244			min	-.613	4	-1.456	1	-.008	5	-6.315e-3	3	289.729	1	665.761	1
245		9	max	0	3	.108	3	.609	1	2.936e-2	1	NC	15	NC	5
246			min	-.612	4	-1.266	1	-.005	5	-6.893e-3	3	362.13	1	797.8	1
247		10	max	0	1	.068	3	.573	1	3.142e-2	1	NC	15	NC	5
248			min	-.612	4	-1.176	1	.02	15	-7.471e-3	3	410.813	1	888.984	1
249		11	max	0	1	.108	3	.609	1	2.936e-2	1	NC	15	8843.854	12
250			min	-.612	4	-1.266	1	.046	15	-6.893e-3	3	362.13	1	797.8	1
251		12	max	0	1	.194	3	.677	1	2.729e-2	1	9555.429	15	8496.736	12
252			min	-.612	4	-1.456	1	.055	15	-6.315e-3	3	289.729	1	665.761	1
253		13	max	0	1	.287	3	.734	1	2.523e-2	1	7730.612	15	8475.561	12
254			min	-.612	4	-1.647	1	.049	15	-5.737e-3	3	241.398	1	585.743	1
255		14	max	0	1	.356	3	.749	1	2.316e-2	1	6803.319	15	NC	5
256			min	-.612	4	-1.764	1	.033	15	-5.16e-3	3	218.934	1	567.491	1
257		15	max	.001	1	.381	3	.709	1	2.11e-2	1	6606.033	15	NC	5
258			min	-.612	4	-1.761	1	.014	15	-4.582e-3	3	219.561	1	618.646	1
259		16	max	.001	1	.353	3	.615	1	1.904e-2	1	7202.666	15	NC	12
260			min	-.612	4	-1.615	1	-.005	5	-4.004e-3	3	248.374	1	783.5	1
261		17	max	.002	1	.27	3	.485	1	1.697e-2	1	9245.251	15	NC	3
262			min	-.612	4	-1.332	1	-.019	5	-3.427e-3	3	333.316	1	1242.881	1
263		18	max	.002	1	.145	3	.351	1	1.491e-2	1	NC	5	NC	3
264			min	-.612	4	-.942	1	-.01	5	-2.849e-3	3	629.339	1	3119.934	1
265		19	max	.002	1	-.003	3	.263	1	1.285e-2	1	NC	1	NC	1
266			min	-.612	4	-.504	1	.023	15	-2.271e-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	0	5	3.106e-3	1	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-3.479e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.003	5	6.212e-3	1	NC	1	NC	1
272			min	0	1	-.005	1	0	1	-6.957e-3	5	NC	1	NC	1
273		4	max	0	3	0	15	.007	5	7.248e-3	1	NC	3	NC	1
274			min	0	1	-.01	1	-.002	1	-8.394e-3	5	5834.146	1	8661.32	5
275		5	max	0	3	-.002	15	.012	5	6.603e-3	1	NC	3	NC	1
276			min	0	1	-.019	1	-.003	1	-8.174e-3	5	3271.211	1	5021.13	5
277		6	max	0	3	-.003	15	.018	5	5.958e-3	1	NC	5	NC	1
278			min	0	1	-.029	1	-.004	1	-7.953e-3	5	2107.306	1	3304.018	5
279		7	max	0	3	-.004	15	.026	5	5.313e-3	1	NC	5	NC	2
280			min	0	1	-.041	1	-.005	1	-7.733e-3	5	1480.887	1	2357.782	5
281		8	max	0	3	-.005	15	.034	5	4.688e-3	2	NC	15	NC	9
282			min	0	1	-.055	1	-.006	1	-7.512e-3	5	1104.43	1	1779.826	5
283		9	max	0	3	-.006	15	.043	5	4.104e-3	2	9522.825	15	NC	9
284			min	0	1	-.07	1	-.007	1	-7.292e-3	5	860.131	1	1400.275	5
285		10	max	0	3	-.008	15	.053	5	3.519e-3	2	7693.527	15	NC	9
286			min	0	1	-.088	1	-.008	1	-7.071e-3	5	692.335	1	1137.199	5
287		11	max	0	3	-.01	15	.064	5	2.935e-3	2	6374.597	15	NC	9
288			min	-.001	1	-.106	1	-.009	1	-6.851e-3	5	571.976	1	947.144	5
289		12	max	0	3	-.011	15	.075	5	2.35e-3	2	5391.71	15	NC	9
290			min	-.001	1	-.126	1	-.01	1	-6.63e-3	5	482.652	1	805.286	5
291		13	max	0	3	-.013	15	.087	5	1.766e-3	2	4639.108	15	NC	9
292			min	-.001	1	-.146	1	-.01	1	-6.41e-3	5	414.487	1	696.537	5
293		14	max	0	3	-.015	15	.099	5	1.181e-3	2	4049.788	15	NC	9
294			min	-.001	1	-.168	1	-.009	1	-6.189e-3	5	361.26	1	611.32	5
295		15	max	0	3	-.017	15	.112	5	5.966e-4	2	3579.551	15	NC	9
296			min	-.001	1	-.19	1	-.008	1	-6.048e-3	4	318.89	1	543.308	5
297		16	max	0	3	-.019	15	.124	4	5.801e-4	3	3198.402	15	NC	9
298			min	-.001	1	-.213	1	-.006	1	-5.923e-3	4	284.617	1	487.77	4
299		17	max	0	3	-.021	15	.137	4	8.662e-4	3	2885.283	15	NC	9
300			min	-.002	1	-.236	1	-.004	1	-5.798e-3	4	256.511	1	441.061	4
301		18	max	.001	3	-.023	15	.151	4	1.152e-3	3	2625.063	15	NC	1
302			min	-.002	1	-.26	1	-.007	3	-5.673e-3	4	233.19	1	402.226	4
303		19	max	.001	3	-.025	15	.164	4	1.438e-3	3	2406.659	15	NC	1
304			min	-.002	1	-.284	1	-.012	3	-5.547e-3	4	213.643	1	369.623	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	0	4	0	1	NC	1	NC	1
308			min	0	1	-.002	1	0	1	-3.734e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	3	NC	1
310			min	0	1	-.009	1	0	1	-7.467e-3	4	6495.197	1	NC	1
311		4	max	0	3	0	15	.007	4	0	1	NC	4	NC	1
312			min	0	1	-.022	1	0	1	-8.993e-3	4	2787.141	1	8233.111	4
313		5	max	0	3	-.001	15	.013	4	0	1	NC	5	NC	1
314			min	-.001	1	-.039	1	0	1	-8.726e-3	4	1543.2	1	4777.376	4
315		6	max	0	3	-.002	15	.019	4	0	1	NC	5	NC	1
316			min	-.001	1	-.061	1	0	1	-8.459e-3	4	987.087	1	3146.798	4
317		7	max	.001	3	-.003	15	.027	4	0	1	NC	5	NC	1
318			min	-.002	1	-.088	1	0	1	-8.191e-3	4	690.522	1	2248.124	4
319		8	max	.001	3	-.004	15	.036	4	0	1	NC	15	NC	1
320			min	-.002	1	-.118	1	0	1	-7.924e-3	4	513.366	1	1699.173	4
321		9	max	.001	3	-.005	15	.045	4	0	1	NC	15	NC	1
322			min	-.002	1	-.152	1	0	1	-7.657e-3	4	398.89	1	1338.654	4
323		10	max	.002	3	-.007	15	.056	4	0	1	9293.406	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	-.189	1	0	1	-7.39e-3	4	320.512	1	1088.776	4
325		11	max	.002	3	-.008	15	.067	4	0	1	7676.175	15	NC	1
326			min	-.003	1	-.229	1	0	1	-7.122e-3	4	264.43	1	908.274	4
327		12	max	.002	3	-.009	15	.078	4	0	1	6476.314	15	NC	1
328			min	-.003	1	-.272	1	0	1	-6.855e-3	4	222.889	1	773.575	4
329		13	max	.002	3	-.011	15	.09	4	0	1	5560.893	15	NC	1
330			min	-.003	1	-.317	1	0	1	-6.588e-3	4	191.239	1	670.352	4
331		14	max	.002	3	-.013	15	.103	4	0	1	4846.236	15	NC	1
332			min	-.003	1	-.364	1	0	1	-6.321e-3	4	166.558	1	589.509	4
333		15	max	.002	3	-.014	15	.115	4	0	1	4277.439	15	NC	1
334			min	-.004	1	-.412	1	0	1	-6.054e-3	4	146.933	1	525.043	4
335		16	max	.003	3	-.016	15	.128	4	0	1	3817.409	15	NC	1
336			min	-.004	1	-.462	1	0	1	-5.786e-3	4	131.073	1	472.866	4
337		17	max	.003	3	-.018	15	.141	4	0	1	3440.207	15	NC	1
338			min	-.004	1	-.513	1	0	1	-5.519e-3	4	118.078	1	430.108	4
339		18	max	.003	3	-.019	15	.154	4	0	1	3127.254	15	NC	1
340			min	-.004	1	-.565	1	0	1	-5.252e-3	4	107.302	1	394.707	4
341		19	max	.003	3	-.021	15	.166	4	0	1	2864.982	15	NC	1
342			min	-.005	1	-.617	1	0	1	-4.985e-3	4	98.277	1	365.154	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	0	4	1.23e-3	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-4.199e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	2.46e-3	3	NC	1	NC	1
348			min	0	1	-.005	1	0	3	-8.399e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.008	4	2.853e-3	3	NC	3	NC	1
350			min	0	1	-.01	1	-.001	3	-1.007e-2	4	5834.146	1	8066.79	4
351		5	max	0	3	0	5	.013	4	2.567e-3	3	NC	3	NC	1
352			min	0	1	-.019	1	-.002	3	-9.698e-3	4	3271.211	1	4691.531	4
353		6	max	0	3	0	5	.02	4	2.281e-3	3	NC	4	NC	1
354			min	0	1	-.029	1	-.003	3	-9.323e-3	4	2107.306	1	3096.165	4
355		7	max	0	3	0	5	.027	4	1.995e-3	3	NC	5	NC	2
356			min	0	1	-.041	1	-.004	3	-8.948e-3	4	1480.887	1	2215.928	4
357		8	max	0	3	0	5	.036	4	1.709e-3	3	NC	5	NC	9
358			min	0	1	-.055	1	-.005	3	-8.572e-3	4	1104.43	1	1677.826	4
359		9	max	0	3	.001	5	.046	4	1.423e-3	3	NC	5	NC	9
360			min	0	1	-.07	1	-.005	3	-8.197e-3	4	860.131	1	1324.24	4
361		10	max	0	3	.001	5	.056	4	1.136e-3	3	NC	5	NC	9
362			min	0	1	-.088	1	-.006	3	-7.822e-3	4	692.335	1	1079.083	4
363		11	max	0	3	.002	5	.067	4	8.503e-4	3	NC	5	NC	9
364			min	-.001	1	-.106	1	-.006	3	-7.446e-3	4	571.976	1	901.963	4
365		12	max	0	3	.002	5	.079	4	5.643e-4	3	NC	5	NC	9
366			min	-.001	1	-.126	1	-.006	3	-7.071e-3	4	482.652	1	769.793	4
367		13	max	0	3	.002	5	.091	4	2.782e-4	3	NC	5	NC	9
368			min	-.001	1	-.146	1	-.005	3	-6.696e-3	4	414.487	1	668.535	4
369		14	max	0	3	.003	5	.103	4	-5.952e-6	12	NC	5	NC	9
370			min	-.001	1	-.168	1	-.004	3	-6.32e-3	4	361.26	1	589.277	4
371		15	max	0	3	.003	5	.115	4	1.197e-4	9	NC	5	NC	9
372			min	-.001	1	-.19	1	-.002	3	-5.946e-3	5	318.89	1	526.133	4
373		16	max	0	3	.003	5	.128	4	4.919e-4	1	NC	5	NC	9
374			min	-.001	1	-.213	1	0	3	-5.669e-3	5	284.617	1	475.098	4
375		17	max	0	3	.004	5	.14	4	1.137e-3	1	NC	5	NC	9
376			min	-.002	1	-.236	1	0	10	-5.392e-3	5	256.511	1	433.357	4
377		18	max	.001	3	.004	5	.152	4	1.782e-3	1	NC	5	NC	1
378			min	-.002	1	-.26	1	-.002	2	-5.115e-3	5	233.19	1	398.892	4
379		19	max	.001	3	.004	5	.164	4	2.427e-3	1	NC	5	NC	1
380			min	-.002	1	-.284	1	-.006	2	-4.839e-3	5	213.643	1	370.225	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	.006	1	0	15	.005	5	2.841e-3	1	NC	1	NC	1
382			min	0	15	-.003	1	-.001	1	-2.426e-3	5	NC	1	NC	1
383		2	max	.006	1	-.002	15	.034	5	3.385e-3	1	NC	1	NC	5
384			min	0	15	-.023	1	-.026	1	-2.454e-3	5	NC	1	2454.626	4
385		3	max	.005	1	-.004	15	.063	5	3.928e-3	1	NC	1	NC	5
386			min	0	15	-.043	1	-.05	1	-2.481e-3	5	NC	1	1220.694	4
387		4	max	.005	1	-.006	15	.092	5	4.472e-3	1	NC	1	NC	13
388			min	0	15	-.063	1	-.073	1	-2.508e-3	5	NC	1	809.749	4
389		5	max	.004	1	-.008	15	.122	5	5.015e-3	1	NC	1	NC	13
390			min	0	15	-.083	1	-.095	1	-2.535e-3	5	NC	1	604.53	4
391		6	max	.004	1	-.009	15	.151	5	5.559e-3	1	NC	1	NC	13
392			min	0	10	-.103	1	-.114	1	-2.562e-3	5	NC	1	481.585	4
393		7	max	.003	1	-.011	15	.18	5	6.103e-3	1	NC	1	NC	13
394			min	0	10	-.122	1	-.131	1	-2.59e-3	5	NC	1	399.765	4
395		8	max	.003	3	-.013	15	.209	5	6.646e-3	1	NC	1	NC	13
396			min	0	10	-.142	1	-.146	1	-2.68e-3	3	NC	1	341.433	4
397		9	max	.003	3	-.015	15	.237	5	7.19e-3	1	NC	1	NC	13
398			min	0	10	-.161	1	-.157	1	-2.914e-3	3	NC	1	297.773	4
399		10	max	.003	3	-.016	15	.265	5	7.733e-3	1	NC	1	NC	13
400			min	0	10	-.181	1	-.164	1	-3.149e-3	3	NC	1	263.887	4
401		11	max	.004	3	-.018	15	.293	5	8.277e-3	1	NC	1	NC	13
402			min	-.001	2	-.2	1	-.167	1	-3.383e-3	3	NC	1	236.836	4
403		12	max	.004	3	-.02	15	.32	5	8.821e-3	1	NC	1	NC	13
404			min	-.002	2	-.219	1	-.165	1	-3.618e-3	3	NC	1	214.751	4
405		13	max	.004	3	-.021	15	.346	5	9.364e-3	1	NC	1	NC	13
406			min	-.002	2	-.239	1	-.158	1	-3.852e-3	3	NC	1	196.385	4
407		14	max	.004	3	-.023	15	.372	5	9.908e-3	1	NC	1	NC	13
408			min	-.003	2	-.258	1	-.146	1	-4.087e-3	3	NC	1	180.875	4
409		15	max	.004	3	-.024	15	.396	5	1.045e-2	1	NC	1	NC	13
410			min	-.003	2	-.276	1	-.127	1	-4.321e-3	3	NC	1	167.606	4
411		16	max	.004	3	-.026	15	.42	5	1.099e-2	1	NC	1	NC	13
412			min	-.004	2	-.295	1	-.102	1	-4.556e-3	3	NC	1	156.125	4
413		17	max	.005	3	-.027	15	.443	5	1.154e-2	1	NC	1	NC	13
414			min	-.004	2	-.314	1	-.072	2	-4.79e-3	3	NC	1	146.093	4
415		18	max	.005	3	-.029	15	.465	5	1.208e-2	1	NC	1	NC	5
416			min	-.005	2	-.333	1	-.034	2	-5.025e-3	3	NC	1	137.252	4
417		19	max	.005	3	-.03	15	.493	4	1.263e-2	1	NC	1	NC	1
418			min	-.005	2	-.352	1	0	3	-5.259e-3	3	NC	1	129.4	4
419	M6	1	max	.013	1	0	15	.005	4	0	1	NC	1	NC	1
420			min	0	15	-.006	1	0	1	-2.627e-3	4	NC	1	NC	1
421		2	max	.011	1	-.002	15	.036	4	0	1	NC	1	NC	1
422			min	0	15	-.05	1	0	1	-2.705e-3	4	NC	1	NC	1
423		3	max	.01	1	-.003	15	.067	4	0	1	NC	1	NC	1
424			min	0	15	-.093	1	0	1	-2.783e-3	4	NC	1	7719.088	4
425		4	max	.008	1	-.005	15	.099	4	0	1	NC	1	NC	1
426			min	0	15	-.136	1	0	1	-2.861e-3	4	NC	1	5104.603	4
427		5	max	.007	1	-.007	15	.13	4	0	1	NC	1	NC	1
428			min	0	15	-.179	1	0	1	-2.939e-3	4	NC	1	3835.978	4
429		6	max	.007	3	-.008	15	.161	4	0	1	NC	1	NC	1
430			min	0	10	-.222	1	0	1	-3.016e-3	4	NC	1	3105.606	4
431		7	max	.007	3	-.01	15	.191	4	0	1	NC	1	NC	1
432			min	0	10	-.265	1	0	1	-3.094e-3	4	NC	1	2645.851	4
433		8	max	.008	3	-.011	15	.222	4	0	1	NC	1	NC	1
434			min	-.002	2	-.308	1	0	1	-3.172e-3	4	NC	1	2343.533	4
435		9	max	.008	3	-.013	15	.251	4	0	1	NC	1	NC	1
436			min	-.003	2	-.351	1	0	1	-3.25e-3	4	NC	1	2143.784	4
437		10	max	.009	3	-.014	15	.28	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	-.004	2	-.394	1	0	1	-3.328e-3	4	NC	1	2018.315	4
439		11	max	.01	3	-.016	15	.308	4	0	1	NC	1	NC	1
440			min	-.006	2	-.436	1	0	1	-3.405e-3	4	NC	1	1953.223	4
441		12	max	.01	3	-.017	15	.336	4	0	1	NC	1	NC	1
442			min	-.007	2	-.479	1	0	1	-3.483e-3	4	NC	1	1944.346	4
443		13	max	.011	3	-.019	15	.362	4	0	1	NC	1	NC	1
444			min	-.009	2	-.521	1	0	1	-3.561e-3	4	NC	1	1996.703	4
445		14	max	.011	3	-.02	15	.387	4	0	1	NC	1	NC	1
446			min	-.01	2	-.563	1	0	1	-3.639e-3	4	NC	1	2128.094	4
447		15	max	.012	3	-.021	15	.411	4	0	1	NC	1	NC	1
448			min	-.011	2	-.605	1	0	1	-3.717e-3	4	NC	1	2381.107	4
449		16	max	.012	3	-.022	15	.434	4	0	1	NC	1	NC	1
450			min	-.013	2	-.648	1	0	1	-3.794e-3	4	NC	1	2861.264	4
451		17	max	.013	3	-.024	15	.455	4	0	1	NC	1	NC	1
452			min	-.014	2	-.69	1	0	1	-3.872e-3	4	NC	1	3891.424	4
453		18	max	.013	3	-.025	15	.475	4	0	1	NC	1	NC	1
454			min	-.016	2	-.732	1	0	1	-3.95e-3	4	NC	1	7094.673	4
455		19	max	.014	3	-.026	15	.493	4	0	1	NC	1	NC	1
456			min	-.017	2	-.774	1	0	1	-4.028e-3	4	NC	1	NC	1
457	M9	1	max	.006	1	0	5	.005	4	1.039e-3	3	NC	1	NC	1
458			min	0	5	-.003	1	0	3	-3.068e-3	4	NC	1	NC	1
459		2	max	.006	1	0	15	.04	4	1.273e-3	3	NC	1	NC	5
460			min	0	5	-.023	1	-.011	3	-3.385e-3	1	NC	1	2455.344	1
461		3	max	.005	1	0	15	.075	4	1.508e-3	3	NC	1	NC	15
462			min	0	5	-.043	1	-.021	3	-3.928e-3	1	NC	1	1241.673	1
463		4	max	.005	1	0	15	.11	4	1.742e-3	3	NC	1	6942.887	15
464			min	0	5	-.063	1	-.03	3	-4.472e-3	1	NC	1	842.455	1
465		5	max	.004	1	0	15	.144	4	1.976e-3	3	NC	1	5224.035	15
466			min	0	5	-.083	1	-.038	3	-5.015e-3	1	NC	1	647.274	1
467		6	max	.004	1	0	15	.178	4	2.211e-3	3	NC	1	4233.883	15
468			min	0	5	-.103	1	-.046	3	-5.559e-3	1	NC	1	534.215	1
469		7	max	.003	1	0	15	.211	4	2.445e-3	3	NC	1	3610.33	15
470			min	0	5	-.122	1	-.053	3	-6.103e-3	1	NC	1	462.827	1
471		8	max	.003	3	0	15	.243	4	2.68e-3	3	NC	1	3200.224	15
472			min	0	5	-.142	1	-.059	3	-6.646e-3	1	NC	1	415.995	1
473		9	max	.003	3	0	15	.274	4	2.914e-3	3	NC	1	2929.32	15
474			min	0	10	-.161	1	-.064	3	-7.19e-3	1	NC	1	385.452	1
475		10	max	.003	3	0	15	.304	4	3.149e-3	3	NC	1	2759.353	15
476			min	0	10	-.181	1	-.067	3	-7.733e-3	1	NC	1	366.997	1
477		11	max	.004	3	0	15	.332	4	3.383e-3	3	NC	1	2671.56	15
478			min	-.001	2	-.2	1	-.068	3	-8.277e-3	1	NC	1	358.68	1
479		12	max	.004	3	.001	5	.359	4	3.618e-3	3	NC	1	2660.41	15
480			min	-.002	2	-.219	1	-.068	3	-8.821e-3	1	NC	1	360.147	1
481		13	max	.004	3	.002	5	.384	4	3.852e-3	3	NC	1	2732.891	15
482			min	-.002	2	-.239	1	-.065	3	-9.364e-3	1	NC	1	372.65	1
483		14	max	.004	3	.002	5	.407	4	4.087e-3	3	NC	1	2913.455	15
484			min	-.003	2	-.258	1	-.061	3	-9.908e-3	1	NC	1	399.799	1
485		15	max	.004	3	.002	5	.427	4	4.321e-3	3	NC	1	3260.489	15
486			min	-.003	2	-.276	1	-.054	3	-1.045e-2	1	NC	1	449.902	1
487		16	max	.004	3	.003	5	.445	4	4.556e-3	3	NC	1	3918.576	15
488			min	-.004	2	-.295	1	-.045	3	-1.099e-2	1	NC	1	543.311	1
489		17	max	.005	3	.003	5	.461	4	4.79e-3	3	NC	1	5330.006	15
490			min	-.004	2	-.314	1	-.032	3	-1.154e-2	1	NC	1	742.072	1
491		18	max	.005	3	.004	5	.474	4	5.025e-3	3	NC	1	9718.166	15
492			min	-.005	2	-.333	1	-.017	3	-1.208e-2	1	NC	1	1357.818	1
493		19	max	.005	3	.005	5	.484	5	5.259e-3	3	NC	1	NC	1
494			min	-.005	2	-.352	1	-.017	1	-1.263e-2	1	NC	1	NC	1