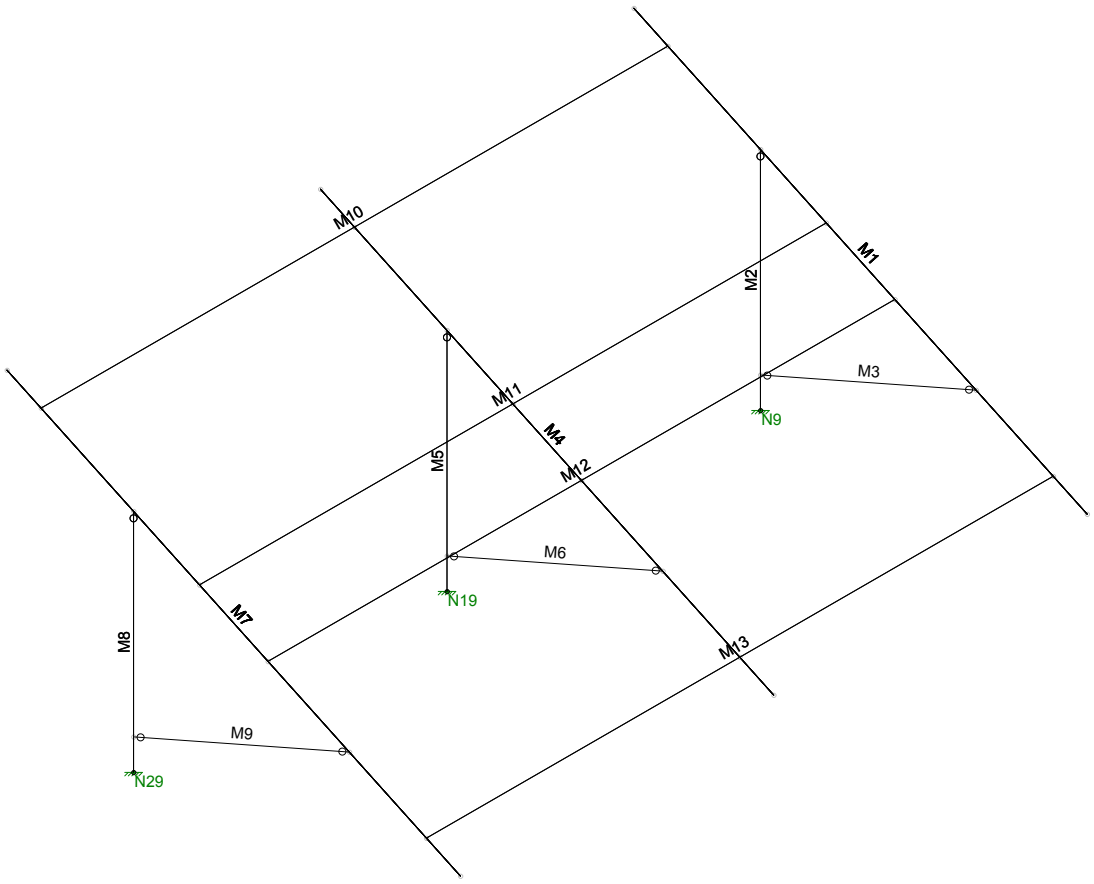


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

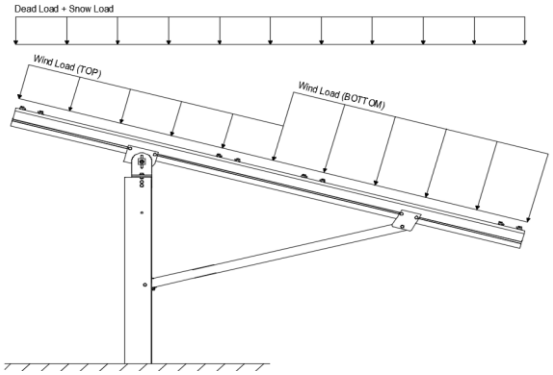
1.2 Construction

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 =	140 mph	Exposure Category = C
Height <	15 ft	Importance Category = II
Peak Velocity Pressure, q_z =	30.77 psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

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

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

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
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

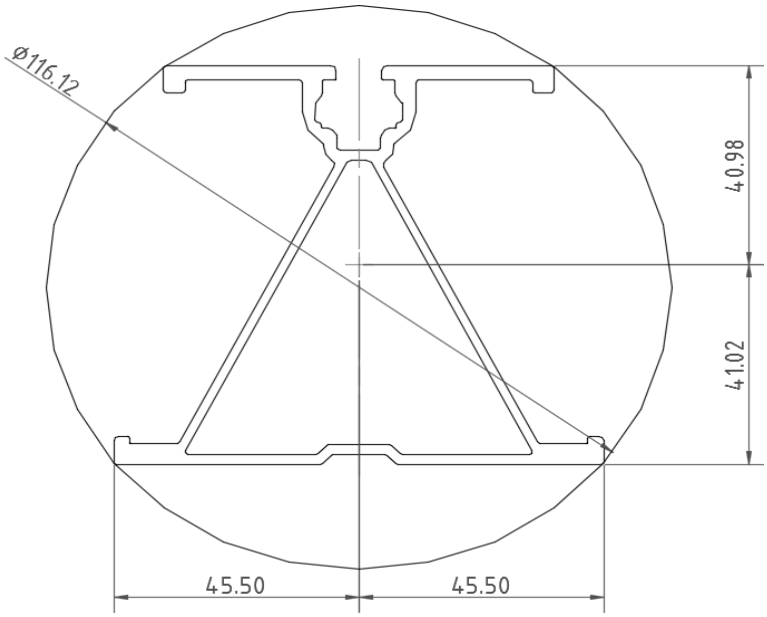
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	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 =	1.596	k-ft
M_z =	0.170	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	72%	

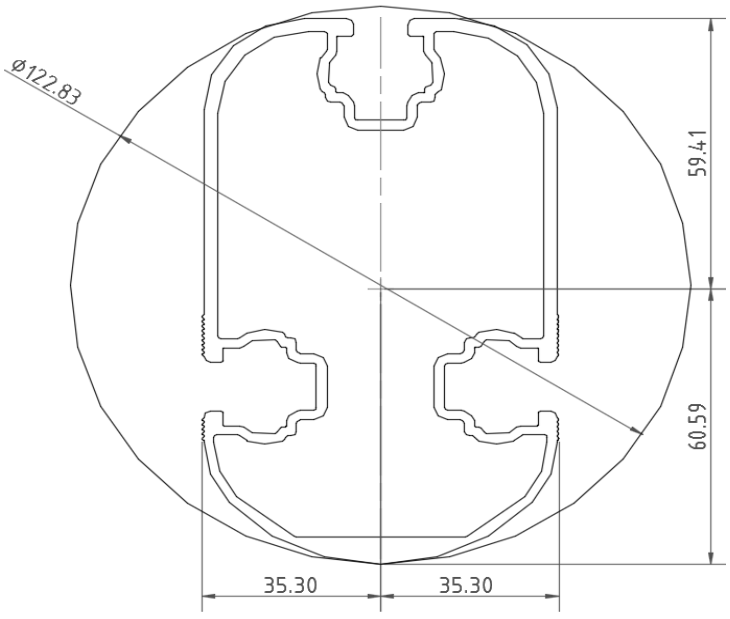


DETAIL VIEW

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 =	4.499	k-ft
M_z =	0.000	k-ft
P_n =	0.019	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	90%	

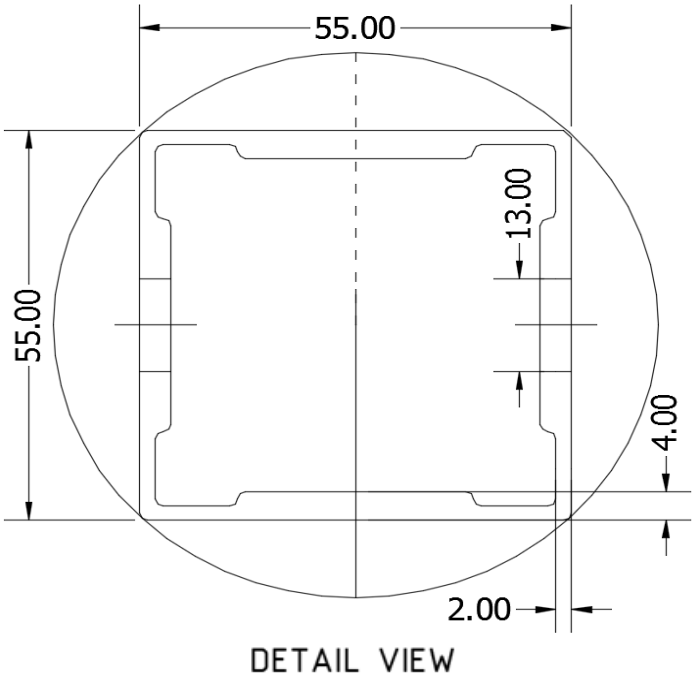


DETAIL VIEW

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).

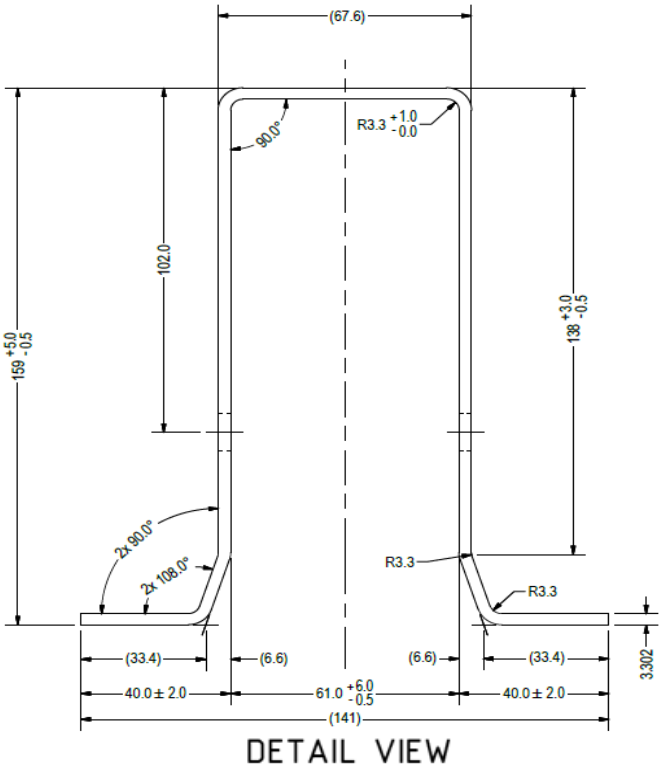
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.005	k-ft
M_z =	0.000	k-ft
P_n =	5.053	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	38%	



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 =	10.464	k-ft
M_z =	0.000	k-ft
P_r =	6.293	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	70%	



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 =	6.92	k
Maximum Lateral Load =	3.34	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)

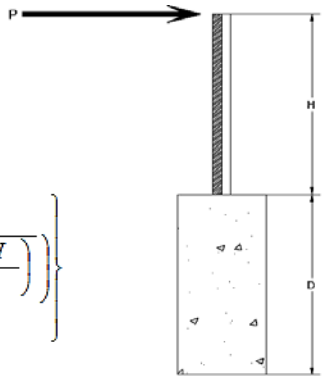
Lateral Force @ Top of Pole, P =	1.16	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.16	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 =	6.28		
Required Footing Depth, D =	9.81	ft	
2nd Trial @ D_2 =	6.53	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf	
Lateral Soil Bearing @ D, S_3 =	1.31	ksf	
Constant 2.34P/(S_1B), A =	3.13		
Required Footing Depth, D =	6.00	ft	
3rd Trial @ D_3 =	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 =	3.26		
Required Footing Depth, D =	6.17	ft	
4th Trial @ D_4 =	6.22	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf	
Lateral Soil Bearing @ D, S_3 =	1.24	ksf	
Constant 2.34P/(S_1B), A =	3.28		
Required Footing Depth, D =	6.20	ft	
5th Trial @ D_5 =	6.21	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf	
Lateral Soil Bearing @ D, S_3 =	1.24	ksf	
Constant 2.34P/(S_1B), A =	3.29		
Required Footing Depth, D =	6.25	ft	

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

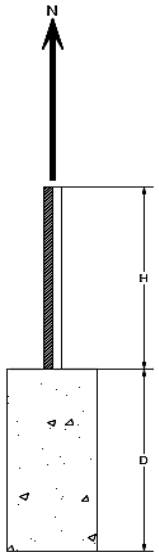
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.17	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 =	2.09	k
Required Concrete Volume, V =	14.40	ft^3
Required Footing Depth, D =	4.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.87
2	0.4	0.2	118.10	6.76
3	0.6	0.2	118.10	6.66
4	0.8	0.2	118.10	6.55
5	1	0.2	118.10	6.45
6	1.2	0.2	118.10	6.35
7	1.4	0.2	118.10	6.24
8	1.6	0.2	118.10	6.14
9	1.8	0.2	118.10	6.04
10	2	0.2	118.10	5.93
11	2.2	0.2	118.10	5.83
12	2.4	0.2	118.10	5.73
13	2.6	0.2	118.10	5.62
14	2.8	0.2	118.10	5.52
15	3	0.2	118.10	5.41
16	3.2	0.2	118.10	5.31
17	3.4	0.2	118.10	5.21
18	3.6	0.2	118.10	5.10
19	3.8	0.2	118.10	5.00
20	4	0.2	118.10	4.90
21	4.2	0.2	118.10	4.79
22	4.4	0.2	118.10	4.69
23	4.6	0.2	118.10	4.58
24	0	0.0	0.00	4.58
25	0	0.0	0.00	4.58
26	0	0.0	0.00	4.58
27	0	0.0	0.00	4.58
28	0	0.0	0.00	4.58
29	0	0.0	0.00	4.58
30	0	0.0	0.00	4.58
31	0	0.0	0.00	4.58
32	0	0.0	0.00	4.58
33	0	0.0	0.00	4.58
34	0	0.0	0.00	4.58
Max	4.6	Sum	1.09	

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 =	6.25	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.24	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	20.42	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

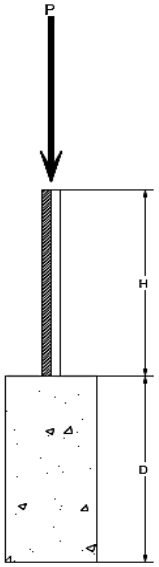
Weight of Concrete

Footing Volume	19.63	ft^3
Weight	2.85	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.06	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.37	k
Applied Force =	7.08	k
Utilization =	68%	

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



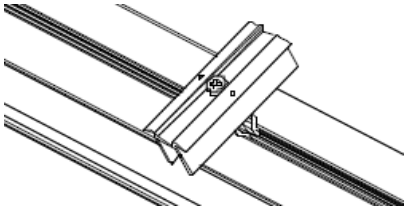
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

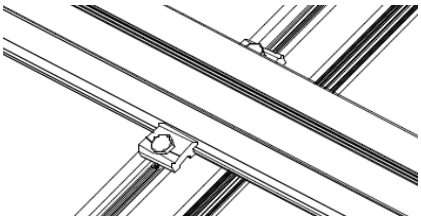
Fastening of Modules to Purlins

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



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.147 k
Allowable Uplift	=	2.180 k
Utilization	=	99%

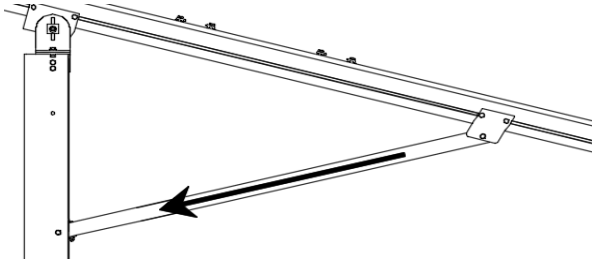


6.2 Strut Connections

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

Maximum Axial Load	=	5.053 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)

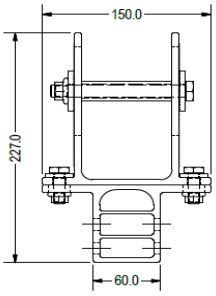


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

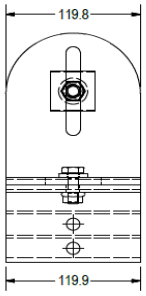
6.3 Girder to Post Connection

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.

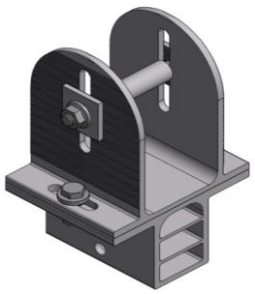
Maximum Tensile Load	=	4.555 k
Allowable Load	=	5.649 k
Utilization	=	81%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

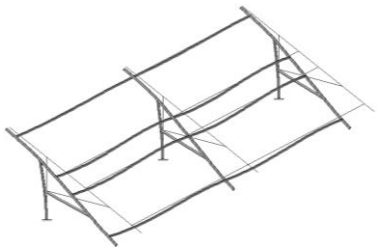
7.1 Seismic Drift

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}	=	0.492 in

0.492 ≤ 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 = 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 = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 30.5 ksi

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

S2 = 1701.56
φF_L = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L = 30.3

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L = φb[Bt-Dt*√(Rb/t)]

φF_L = 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L = 1.3φyFcy

φF_L = 43.2 ksi

$\varphi F_L St$ = 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

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

$\varphi F_L Wk$ = 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L = φyFcy

φF_L = 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L = φc[Bp-1.6Dp*b/t]

φF_L = 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L = φc[Bt-Dt*√(Rb/t)]

φF_L = 30.80 ksi

φF_L = 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:	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 =	6.29	k	(LRFD Factored Load)
Mr (Strong) =	10.46	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 =	0.1837	<	0.2	
Utilization =	0.70	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.184	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 70%

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	-94.402	-94.402	0	0
2	M11	y	-94.402	-94.402	0	0
3	M12	y	-145.893	-145.893	0	0
4	M13	y	-145.893	-145.893	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	188.803	188.803	0	0
2	M11	y	188.803	188.803	0	0
3	M12	y	85.82	85.82	0	0
4	M13	y	85.82	85.82	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	665.332	2	2347.565	2	240.716	2	.293	1	.01	5	4.982	1
2		min	-922.221	3	-1771.164	3	-319.013	5	-1.285	5	-.01	2	.5	15
3	N19	max	2528.353	2	6517.747	2	0	11	0	11	.01	4	9.657	1
4		min	-2565.864	3	-5317.217	3	-345.446	5	-1.346	4	0	1	.32	15
5	N29	max	665.332	2	2347.565	2	267.872	3	.34	3	.012	4	4.982	1
6		min	-922.221	3	-1771.164	3	-367.874	4	-1.361	4	-.004	3	-.185	5
7	Totals:	max	3859.016	2	11212.877	2	0	11						
8		min	-4410.306	3	-8859.545	3	-1001.011	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	2	.002	4	0	1	0	1	0	1
2			min	0	1	-.001	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	-10.049	12	301.456	3	-1.567	12	.066	3	.252	1	.307	2
6			min	-188.27	1	-701.411	2	-157.2	1	-.237	2	.02	12	-.13	3
7		4	max	-10.415	12	300.279	3	-1.567	12	.066	3	.154	1	.743	2
8			min	-189.002	1	-702.979	2	-157.2	1	-.237	2	.019	12	-.317	3
9		5	max	-10.781	12	299.103	3	-1.567	12	.066	3	.065	4	1.18	2
10			min	-189.733	1	-704.548	2	-157.2	1	-.237	2	-.004	10	-.503	3
11		6	max	398.141	3	614.49	2	25.556	3	.038	2	.11	2	1.133	2
12			min	-1259.127	2	-177.074	3	-211.756	1	-.056	3	-.043	3	-.514	3
13		7	max	397.593	3	612.922	2	25.556	3	.038	2	.01	10	.752	2
14			min	-1259.858	2	-178.251	3	-211.756	1	-.056	3	-.06	4	-.403	3
15		8	max	397.044	3	611.353	2	25.556	3	.038	2	-.007	12	.372	2
16			min	-1260.59	2	-179.427	3	-211.756	1	-.056	3	-.156	1	-.292	3
17		9	max	381.973	3	95.146	3	24.225	3	.016	5	.088	1	.154	1
18			min	-1386.318	1	-64.629	2	-221.196	1	-.189	2	.005	10	-.243	3
19		10	max	381.424	3	93.97	3	24.225	3	.016	5	.053	3	.192	1
20			min	-1387.05	1	-66.198	2	-221.196	1	-.189	2	-.052	2	-.301	3
21		11	max	380.876	3	92.794	3	24.225	3	.016	5	.068	3	.233	2
22			min	-1387.781	1	-67.766	2	-221.196	1	-.189	2	-.186	1	-.359	3
23		12	max	362.107	3	819.764	3	117.827	2	.365	3	.142	1	.469	2
24			min	-1580.747	1	-542.704	2	-275.194	3	-.334	2	-.017	5	-.703	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	361.558	3	818.588	3	117.827	2	.365	3	.176	1	.806	2
26			min	-1581.479	1	-544.272	2	-275.194	3	-.334	2	-.151	3	-1.212	3
27		14	max	190.417	1	497.091	2	69.646	5	.233	2	.052	3	1.13	2
28			min	10.303	15	-737.636	3	-121.699	1	-.43	3	-.19	4	-1.698	3
29		15	max	189.686	1	495.523	2	68.147	5	.233	2	.03	3	.822	2
30			min	10.083	15	-738.812	3	-121.699	1	-.43	3	-.163	4	-1.24	3
31		16	max	188.955	1	493.955	2	66.647	5	.233	2	.009	3	.515	2
32			min	9.862	15	-739.988	3	-121.699	1	-.43	3	-.195	1	-.781	3
33		17	max	188.224	1	492.386	2	65.147	5	.233	2	-.008	12	.209	2
34			min	9.53	12	-741.164	3	-121.699	1	-.43	3	-.271	1	-.322	3
35		18	max	.939	6	2.012	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	0	1	0	1	0	1	0	1
38			min	0	1	-.005	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.016	2	.002	4	0	1	0	1	0	1
40			min	0	1	-.004	3	0	1	0	1	0	1	0	1
41		2	max	-.221	15	-.473	15	0	1	0	1	0	1	0	4
42			min	-.939	4	-2.009	4	-1.499	5	0	1	0	5	0	15
43		3	max	-10.781	12	928.096	3	0	1	.027	4	.206	4	.757	2
44			min	-325.505	1	-1981.024	2	-99.327	5	0	1	0	1	-.358	3
45		4	max	-11.147	12	926.92	3	0	1	.027	4	.144	4	1.987	2
46			min	-326.236	1	-1982.593	2	-100.827	5	0	1	0	1	-.934	3
47		5	max	-11.513	12	925.743	3	0	1	.027	4	.081	4	3.218	2
48			min	-326.967	1	-1984.161	2	-102.326	5	0	1	0	1	-1.509	3
49		6	max	1418.214	3	1817.567	2	0	1	0	1	0	1	3.055	2
50			min	-3486.661	2	-703.141	3	-95.06	4	-.022	4	-.017	5	-1.486	3
51		7	max	1417.666	3	1815.998	2	0	1	0	1	0	1	1.927	2
52			min	-3487.392	2	-704.317	3	-96.56	4	-.022	4	-.076	4	-1.049	3
53		8	max	1417.117	3	1814.43	2	0	1	0	1	0	1	.8	2
54			min	-3488.123	2	-705.494	3	-98.06	4	-.022	4	-.136	4	-.611	3
55		9	max	1402.586	3	273.902	3	0	1	.013	4	.103	4	.144	1
56			min	-3587.927	2	-236.578	1	-205.492	4	0	1	0	1	-.393	3
57		10	max	1402.037	3	272.725	3	0	1	.013	4	0	1	.291	1
58			min	-3588.658	2	-238.146	1	-206.991	4	0	1	-.025	4	-.563	3
59		11	max	1401.489	3	271.549	3	0	1	.013	4	0	1	.44	1
60			min	-3589.389	2	-239.715	1	-208.491	4	0	1	-.154	4	-.731	3
61		12	max	1394.352	3	2298.372	3	0	1	.129	4	.009	5	1.153	1
62			min	-3791.67	1	-1713.201	2	-222.494	5	0	1	0	1	-1.707	3
63		13	max	1393.804	3	2297.195	3	0	1	.129	4	0	1	2.208	1
64			min	-3792.401	1	-1714.769	2	-223.994	5	0	1	-.13	4	-3.133	3
65		14	max	327.793	1	1432.083	2	63.516	5	0	1	0	1	3.222	2
66			min	12.916	12	-2002.89	3	0	1	-.091	4	-.165	5	-4.499	3
67		15	max	327.061	1	1430.514	2	62.016	5	0	1	0	1	2.333	2
68			min	12.55	12	-2004.067	3	0	1	-.091	4	-.126	5	-3.256	3
69		16	max	326.33	1	1428.946	2	60.517	5	0	1	0	1	1.446	2
70			min	12.185	12	-2005.243	3	0	1	-.091	4	-.088	5	-2.012	3
71		17	max	325.599	1	1427.378	2	59.017	5	0	1	0	1	.56	1
72			min	11.819	12	-2006.419	3	0	1	-.091	4	-.051	4	-.767	3
73		18	max	.939	6	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	.006	2	0	1	0	1	0	1	0	1
76			min	0	1	-.012	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	.002	4	0	1	0	1	0	1
78			min	0	1	-.001	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	15.032	5	301.456	3	157.2	1	.237	2	.098	5	.307	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	-188.27	1	-701.411	2	-43.773	5	-.066	3	-.252	1	-.13	3
83		4	max	14.691	5	300.279	3	157.2	1	.237	2	.071	5	.743	2
84			min	-189.002	1	-702.979	2	-45.273	5	-.066	3	-.154	1	-.317	3
85		5	max	14.349	5	299.103	3	157.2	1	.237	2	.042	5	1.18	2
86			min	-189.733	1	-704.548	2	-46.773	5	-.066	3	-.057	1	-.503	3
87		6	max	398.141	3	614.49	2	211.756	1	.056	3	.043	3	1.133	2
88			min	-1259.127	2	-177.074	3	-37.323	5	-.038	2	-.11	2	-.514	3
89		7	max	397.593	3	612.922	2	211.756	1	.056	3	.027	3	.752	2
90			min	-1259.858	2	-178.251	3	-38.822	5	-.038	2	-.047	5	-.403	3
91		8	max	397.044	3	611.353	2	211.756	1	.056	3	.156	1	.372	2
92			min	-1260.59	2	-179.427	3	-40.322	5	-.038	2	-.072	5	-.292	3
93		9	max	381.973	3	95.146	3	221.196	1	.189	2	.036	5	.154	1
94			min	-1386.318	1	-64.629	2	-84.188	5	.015	15	-.088	1	-.243	3
95		10	max	381.424	3	93.97	3	221.196	1	.189	2	.052	2	.192	1
96			min	-1387.05	1	-66.198	2	-85.688	5	.015	15	-.053	3	-.301	3
97		11	max	380.876	3	92.794	3	221.196	1	.189	2	.186	1	.233	2
98			min	-1387.781	1	-67.766	2	-87.188	5	.015	15	-.07	5	-.359	3
99		12	max	362.107	3	819.764	3	275.194	3	.334	2	-.013	12	.469	2
100			min	-1580.747	1	-542.704	2	-191.87	5	-.365	3	-.142	1	-.703	3
101		13	max	361.558	3	818.588	3	275.194	3	.334	2	.151	3	.806	2
102			min	-1581.479	1	-544.272	2	-193.369	5	-.365	3	-.182	4	-1.212	3
103		14	max	190.417	1	497.091	2	121.699	1	.43	3	.044	1	1.13	2
104			min	6.709	15	-737.636	3	21.094	12	-.233	2	-.18	5	-1.698	3
105		15	max	189.686	1	495.523	2	121.699	1	.43	3	.12	1	.822	2
106			min	6.489	15	-738.812	3	21.094	12	-.233	2	-.128	5	-1.24	3
107		16	max	188.955	1	493.955	2	121.699	1	.43	3	.195	1	.515	2
108			min	6.268	15	-739.988	3	21.094	12	-.233	2	-.077	5	-.781	3
109		17	max	188.224	1	492.386	2	121.699	1	.43	3	.271	1	.209	2
110			min	6.047	15	-741.164	3	21.094	12	-.233	2	-.027	5	-.322	3
111		18	max	.939	4	2.013	4	1.5	5	0	1	0	1	0	4
112			min	.221	15	.473	15	0	1	0	1	0	5	0	15
113		19	max	0	1	.002	2	0	15	0	1	0	1	0	1
114			min	0	1	-.005	3	0	1	0	1	0	1	0	1
115	M10	1	max	121.696	1	489.052	2	-5.609	15	.009	2	.32	1	.233	2
116			min	21.096	12	-743.485	3	-187.038	1	-.022	3	.004	15	-.43	3
117		2	max	121.696	1	355.641	2	-4.015	15	.009	2	.143	1	.253	3
118			min	21.096	12	-549.319	3	-148.279	1	-.022	3	-.002	5	-.214	1
119		3	max	121.696	1	222.23	2	-2.422	15	.009	2	.029	2	.73	3
120			min	21.096	12	-355.154	3	-109.52	1	-.022	3	-.01	4	-.518	2
121		4	max	121.696	1	88.819	2	-.828	15	.009	2	0	10	1.002	3
122			min	21.096	12	-160.988	3	-70.761	1	-.022	3	-.088	1	-.682	2
123		5	max	121.696	1	33.178	3	1.077	5	.009	2	-.007	12	1.07	3
124			min	21.096	12	-45.767	1	-32.003	1	-.022	3	-.142	1	-.705	2
125		6	max	121.696	1	227.343	3	8.931	9	.009	2	-.005	15	.932	3
126			min	15.022	15	-178.708	1	-7.971	2	-.022	3	-.156	1	-.588	2
127		7	max	121.696	1	421.509	3	45.515	1	.009	2	-.002	15	.59	3
128			min	7.729	15	-311.65	1	-1.99	10	-.022	3	-.128	1	-.329	2
129		8	max	121.696	1	615.674	3	84.274	1	.009	2	.005	5	.075	1
130			min	.436	15	-444.825	2	2.35	12	-.022	3	-.06	1	-.016	5
131		9	max	121.696	1	809.84	3	123.033	1	.009	2	.05	9	.615	1
132			min	-9.851	5	-578.236	2	3.944	12	-.022	3	-.022	10	-.71	3
133		10	max	121.696	1	711.647	2	-5.145	15	.009	2	.2	1	1.295	1
134			min	21.096	12	-1004.005	3	-161.791	1	-.022	3	-.012	10	-1.667	3
135		11	max	121.696	1	578.236	2	-3.551	15	.022	3	.05	9	.615	1
136			min	16.305	15	-809.84	3	-123.033	1	-.009	2	-.022	10	-.71	3
137		12	max	121.696	1	444.825	2	-1.957	15	.022	3	-.007	15	.075	1
138			min	9.012	15	-615.674	3	-84.274	1	-.009	2	-.06	1	.015	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	121.696	1	311.65	1	1.99	10	.022	3	-.008	15	.59	3
140			min	1.719	15	-421.509	3	-45.515	1	-.009	2	-.128	1	-.329	2
141		14	max	121.696	1	178.708	1	7.971	2	.022	3	-.007	15	.932	3
142			min	-7.986	5	-227.343	3	-8.931	9	-.009	2	-.156	1	-.588	2
143		15	max	121.696	1	45.767	1	32.003	1	.022	3	-.005	15	1.07	3
144			min	-18.821	5	-33.178	3	2.431	12	-.009	2	-.142	1	-.705	2
145		16	max	121.696	1	160.988	3	70.761	1	.022	3	0	10	1.002	3
146			min	-29.657	5	-88.819	2	4.024	12	-.009	2	-.088	1	-.682	2
147		17	max	121.696	1	355.154	3	109.52	1	.022	3	.029	2	.73	3
148			min	-40.492	5	-222.23	2	5.618	12	-.009	2	-.007	9	-.518	2
149		18	max	121.696	1	549.319	3	148.279	1	.022	3	.143	1	.253	3
150			min	-51.328	5	-355.641	2	7.212	12	-.009	2	.009	12	-.214	1
151		19	max	121.696	1	743.485	3	187.038	1	.022	3	.32	1	.233	2
152			min	-62.163	5	-489.052	2	8.805	12	-.009	2	.017	12	-.43	3
153	M11	1	max	275.208	1	474.175	1	19.763	5	0	15	.357	1	.175	1
154			min	-299.31	3	-729.241	3	-192.866	1	-.006	1	-.132	5	-.481	3
155		2	max	275.208	1	341.233	1	22.229	5	0	15	.174	1	.186	3
156			min	-299.31	3	-535.076	3	-154.107	1	-.006	1	-.109	5	-.283	2
157		3	max	275.208	1	208.291	1	24.694	5	0	15	.037	2	.648	3
158			min	-299.31	3	-340.91	3	-115.348	1	-.006	1	-.085	5	-.568	2
159		4	max	275.208	1	75.35	1	27.16	5	0	15	.01	3	.906	3
160			min	-299.31	3	-146.744	3	-76.589	1	-.006	1	-.075	4	-.714	2
161		5	max	275.208	1	47.421	3	29.626	5	0	15	0	3	.958	3
162			min	-299.31	3	-62.607	2	-37.83	1	-.006	1	-.13	1	-.718	2
163		6	max	275.208	1	241.587	3	33.875	4	0	15	.005	5	.805	3
164			min	-299.31	3	-196.018	2	-9.934	2	-.006	1	-.15	1	-.581	2
165		7	max	275.208	1	435.752	3	44.84	4	0	15	.04	5	.448	3
166			min	-299.31	3	-329.429	2	-3.737	3	-.006	1	-.128	1	-.304	2
167		8	max	275.208	1	629.918	3	78.446	1	0	15	.078	5	.114	2
168			min	-299.31	3	-462.84	2	-1.347	3	-.006	1	-.066	1	-.114	3
169		9	max	275.208	1	824.083	3	117.205	1	0	15	.133	4	.673	2
170			min	-299.31	3	-596.251	2	1.044	3	-.006	1	-.026	2	-.882	3
171		10	max	275.208	1	729.662	2	21.24	5	.006	1	.209	4	1.373	2
172			min	-299.31	3	-1018.249	3	-155.963	1	-.003	14	-.014	10	-1.854	3
173		11	max	275.208	1	596.251	2	23.706	5	.006	1	.042	9	.673	2
174			min	-299.31	3	-824.083	3	-117.205	1	0	5	-.11	5	-.882	3
175		12	max	275.208	1	462.84	2	26.171	5	.006	1	-.01	12	.114	2
176			min	-299.31	3	-629.918	3	-78.446	1	0	5	-.095	4	-.114	3
177		13	max	275.208	1	329.429	2	28.637	5	.006	1	-.008	12	.448	3
178			min	-299.31	3	-435.752	3	-39.687	1	0	5	-.128	1	-.304	2
179		14	max	275.208	1	196.018	2	31.103	5	.006	1	-.005	12	.805	3
180			min	-299.31	3	-241.587	3	-4.973	9	0	5	-.15	1	-.581	2
181		15	max	275.208	1	62.607	2	40.486	4	.006	1	.01	5	.958	3
182			min	-299.31	3	-47.421	3	5.274	12	0	5	-.13	1	-.718	2
183		16	max	275.208	1	146.744	3	76.589	1	.006	1	.047	5	.906	3
184			min	-299.31	3	-75.35	1	6.868	12	0	5	-.07	1	-.714	2
185		17	max	275.208	1	340.91	3	115.348	1	.006	1	.09	4	.648	3
186			min	-299.31	3	-208.291	1	8.462	12	0	5	.01	9	-.568	2
187		18	max	275.208	1	535.076	3	154.107	1	.006	1	.174	1	.186	3
188			min	-299.31	3	-341.233	1	10.055	12	0	5	.024	12	-.283	2
189		19	max	275.208	1	729.241	3	192.866	1	.006	1	.357	1	.175	1
190			min	-299.31	3	-474.175	1	11.649	12	0	5	.035	12	-.481	3
191	M12	1	max	42.271	5	672.349	2	22.428	5	0	3	.378	1	.227	2
192			min	-20.89	9	-276.397	3	-196.27	1	-.007	1	-.143	5	.028	15
193		2	max	33.638	2	484.587	2	24.894	5	0	3	.191	1	.307	3
194			min	-20.89	9	-190.936	3	-157.511	1	-.007	1	-.118	5	-.383	2
195		3	max	33.638	2	296.824	2	27.36	5	0	3	.052	2	.463	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	-20.89	9	-105.475	3	-118.753	1	-.007	1	-.091	5	-.796	2
197		4	max	33.638	2	109.062	2	29.826	5	0	3	.007	10	.529	3
198			min	-20.89	9	-20.013	3	-79.994	1	-.007	1	-.077	4	-1.01	2
199		5	max	33.638	2	65.448	3	32.291	5	0	3	-.005	12	.505	3
200			min	-20.89	9	-78.701	2	-41.235	1	-.007	1	-.123	1	-1.026	2
201		6	max	33.638	2	150.909	3	36.132	4	0	3	.008	5	.391	3
202			min	-22.138	14	-266.464	2	-13.515	2	-.007	1	-.146	1	-.844	2
203		7	max	33.638	2	236.371	3	47.097	4	0	3	.046	5	.187	3
204			min	-29.744	4	-454.226	2	-4.241	10	-.007	1	-.129	1	-.464	2
205		8	max	33.638	2	321.832	3	75.041	1	0	3	.086	5	.115	2
206			min	-40.579	4	-641.989	2	.162	10	-.007	1	-.07	1	-.108	3
207		9	max	33.638	2	407.293	3	113.8	1	0	3	.143	4	.892	2
208			min	-51.415	4	-829.751	2	3.227	12	-.007	1	-.033	2	-.493	3
209		10	max	33.638	2	1017.514	2	104.948	9	.007	1	.222	4	1.867	2
210			min	-62.25	4	-610.203	11	-152.559	1	-.003	14	-.02	10	-.968	3
211		11	max	39.901	5	829.751	2	26.635	5	.007	1	.039	9	.892	2
212			min	-20.89	9	-407.293	3	-113.8	1	0	5	-.122	5	-.493	3
213		12	max	33.638	2	641.989	2	29.1	5	.007	1	-.007	12	.115	2
214			min	-20.89	9	-321.832	3	-75.041	1	0	5	-.103	4	-.108	3
215		13	max	33.638	2	454.226	2	31.566	5	.007	1	-.008	12	.187	3
216			min	-20.89	9	-236.371	3	-36.283	1	0	5	-.129	1	-.464	2
217		14	max	33.638	2	266.464	2	34.032	5	.007	1	-.008	12	.391	3
218			min	-20.89	9	-150.909	3	-3.648	9	0	5	-.146	1	-.844	2
219		15	max	33.638	2	78.701	2	43.896	4	.007	1	.012	5	.505	3
220			min	-20.89	9	-65.448	3	3.147	12	0	5	-.123	1	-1.026	2
221		16	max	33.638	2	20.013	3	79.994	1	.007	1	.051	5	.529	3
222			min	-23.369	14	-109.062	2	4.741	12	0	5	-.059	1	-1.01	2
223		17	max	33.638	2	105.475	3	118.753	1	.007	1	.099	4	.463	3
224			min	-32.141	4	-296.824	2	6.335	12	0	5	.005	12	-.796	2
225		18	max	33.638	2	190.936	3	157.511	1	.007	1	.191	1	.307	3
226			min	-42.976	4	-484.587	2	7.928	12	0	5	.013	12	-.383	2
227		19	max	33.638	2	276.397	3	196.27	1	.007	1	.378	1	.227	2
228			min	-53.812	4	-672.349	2	9.522	12	0	5	.022	12	-.032	5
229	M13	1	max	40.714	5	698.756	2	15.717	5	.008	3	.315	1	.237	2
230			min	-157.078	1	-303.853	3	-186.441	1	-.023	2	-.117	5	-.066	3
231		2	max	29.879	5	510.994	2	18.182	5	.008	3	.139	1	.209	3
232			min	-157.078	1	-218.392	3	-147.683	1	-.023	2	-.099	5	-.402	2
233		3	max	19.043	5	323.231	2	20.648	5	.008	3	.026	2	.395	3
234			min	-157.078	1	-132.931	3	-108.924	1	-.023	2	-.081	4	-.842	2
235		4	max	8.208	5	135.468	2	23.114	5	.008	3	-.001	10	.49	3
236			min	-157.078	1	-47.469	3	-70.165	1	-.023	2	-.091	1	-1.084	2
237		5	max	-1.517	15	37.992	3	25.58	5	.008	3	-.005	12	.495	3
238			min	-157.078	1	-52.294	2	-31.406	1	-.023	2	-.144	1	-1.128	2
239		6	max	-1.567	12	123.453	3	31.203	4	.008	3	0	15	.41	3
240			min	-157.078	1	-240.057	2	-7.424	2	-.023	2	-.157	1	-.974	2
241		7	max	-1.567	12	208.915	3	46.111	1	.008	3	.03	5	.234	3
242			min	-157.078	1	-427.82	2	-1.712	10	-.023	2	-.129	1	-.621	2
243		8	max	-1.567	12	294.376	3	84.87	1	.008	3	.063	5	-.006	15
244			min	-157.078	1	-615.582	2	1.838	12	-.023	2	-.06	1	-.084	1
245		9	max	-1.567	12	379.837	3	123.629	1	.008	3	.116	4	.679	2
246			min	-157.078	1	-803.345	2	3.432	12	-.023	2	-.022	10	-.387	3
247		10	max	-1.567	12	991.107	2	110.498	9	.02	1	.201	1	1.626	2
248			min	-157.078	1	-591.451	11	-162.388	1	-.023	2	-.012	10	-.833	3
249		11	max	28.774	5	803.345	2	18.846	5	.023	2	.05	9	.679	2
250			min	-157.078	1	-379.837	3	-123.629	1	-.008	3	-.089	5	-.387	3
251		12	max	17.939	5	615.582	2	21.311	5	.023	2	-.007	12	0	5
252			min	-157.078	1	-294.376	3	-84.87	1	-.008	3	-.077	4	-.084	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	7.103	5	427.82	2	23.777	5	.023	2	-.008	12	.234	3
254			min	-157.078	1	-208.915	3	-46.111	1	-.008	3	-.129	1	-.621	2
255		14	max	-1.567	12	240.057	2	26.243	5	.023	2	-.008	12	.41	3
256			min	-157.078	1	-123.453	3	-9.198	9	-.008	3	-.157	1	-.974	2
257		15	max	-1.567	12	52.294	2	34.168	4	.023	2	.011	5	.495	3
258			min	-157.078	1	-37.992	3	2.943	12	-.008	3	-.144	1	-1.128	2
259		16	max	-1.567	12	47.469	3	70.165	1	.023	2	.043	5	.49	3
260			min	-157.078	1	-135.468	2	4.537	12	-.008	3	-.091	1	-1.084	2
261		17	max	-1.567	12	132.931	3	108.924	1	.023	2	.077	5	.395	3
262			min	-157.078	1	-323.231	2	6.13	12	-.008	3	-.008	9	-.842	2
263		18	max	-1.567	12	218.392	3	147.683	1	.023	2	.139	4	.209	3
264			min	-157.078	1	-510.994	2	7.724	12	-.008	3	.012	12	-.402	2
265		19	max	-1.567	12	303.853	3	186.441	1	.023	2	.315	1	.237	2
266			min	-157.078	1	-698.756	2	9.318	12	-.008	3	.021	12	-.066	3
267	M2	1	max	2347.565	2	921.625	3	240.948	2	.01	5	1.285	5	4.982	1
268			min	-1771.164	3	-663.981	2	-319.079	5	-.01	2	-.293	1	.5	15
269		2	max	2345.01	2	921.625	3	240.948	2	.01	5	1.195	5	5.04	1
270			min	-1773.08	3	-663.981	2	-316.865	5	-.01	2	-.228	1	.479	15
271		3	max	2342.455	2	921.625	3	240.948	2	.01	5	1.107	5	5.099	1
272			min	-1774.996	3	-663.981	2	-314.651	5	-.01	2	-.163	1	.458	15
273		4	max	1732.324	1	1174.532	1	178.637	2	.002	2	1.019	5	4.943	1
274			min	-1527.527	3	102.803	15	-298.832	5	-.001	3	-.141	1	.433	15
275		5	max	1729.769	1	1174.532	1	178.637	2	.002	2	.935	5	4.614	1
276			min	-1529.443	3	102.803	15	-296.617	5	-.001	3	-.092	1	.404	15
277		6	max	1727.215	1	1174.532	1	178.637	2	.002	2	.852	5	4.284	1
278			min	-1531.359	3	102.803	15	-294.403	5	-.001	3	-.042	1	.375	15
279		7	max	1724.66	1	1174.532	1	178.637	2	.002	2	.776	4	3.955	1
280			min	-1533.275	3	102.803	15	-292.189	5	-.001	3	-.065	3	.346	15
281		8	max	1722.105	1	1174.532	1	178.637	2	.002	2	.7	4	3.625	1
282			min	-1535.192	3	102.803	15	-289.975	5	-.001	3	-.133	3	.317	15
283		9	max	1719.55	1	1174.532	1	178.637	2	.002	2	.625	4	3.295	1
284			min	-1537.108	3	102.803	15	-287.761	5	-.001	3	-.2	3	.288	15
285		10	max	1716.995	1	1174.532	1	178.637	2	.002	2	.55	4	2.966	1
286			min	-1539.024	3	102.803	15	-285.546	5	-.001	3	-.268	3	.26	15
287		11	max	1714.44	1	1174.532	1	178.637	2	.002	2	.477	4	2.636	1
288			min	-1540.94	3	102.803	15	-283.332	5	-.001	3	-.336	3	.231	15
289		12	max	1711.885	1	1174.532	1	178.637	2	.002	2	.403	4	2.307	1
290			min	-1542.856	3	102.803	15	-281.118	5	-.001	3	-.403	3	.202	15
291		13	max	1709.33	1	1174.532	1	178.637	2	.002	2	.331	4	1.977	1
292			min	-1544.772	3	102.803	15	-278.904	5	-.001	3	-.471	3	.173	15
293		14	max	1706.775	1	1174.532	1	178.637	2	.002	2	.374	2	1.648	1
294			min	-1546.689	3	102.803	15	-276.689	5	-.001	3	-.539	3	.144	15
295		15	max	1704.221	1	1174.532	1	178.637	2	.002	2	.424	2	1.318	1
296			min	-1548.605	3	102.803	15	-274.475	5	-.001	3	-.606	3	.115	15
297		16	max	1701.666	1	1174.532	1	178.637	2	.002	2	.474	2	.989	1
298			min	-1550.521	3	102.803	15	-272.261	5	-.001	3	-.674	3	.087	15
299		17	max	1699.111	1	1174.532	1	178.637	2	.002	2	.524	2	.659	1
300			min	-1552.437	3	102.803	15	-270.047	5	-.001	3	-.741	3	.058	15
301		18	max	1696.556	1	1174.532	1	178.637	2	.002	2	.574	2	.33	1
302			min	-1554.353	3	102.803	15	-267.832	5	-.001	3	-.809	3	.029	15
303		19	max	1694.001	1	1174.532	1	178.637	2	.002	2	.625	2	0	1
304			min	-1556.269	3	102.803	15	-265.618	5	-.001	3	-.877	3	0	1
305	M5	1	max	6517.747	2	2562.304	3	0	1	.01	4	1.346	4	9.657	1
306			min	-5317.217	3	-2520.631	2	-345.589	5	0	1	0	1	.32	15
307		2	max	6515.192	2	2562.304	3	0	1	.01	4	1.25	4	10.077	1
308			min	-5319.133	3	-2520.631	2	-343.375	5	0	1	0	1	.323	15
309		3	max	6512.637	2	2562.304	3	0	1	.01	4	1.154	4	10.498	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	-5321.049	3	-2520.631	2	-341.161	5	0	1	0	1	.327	15
311		4	max	4639.635	1	2449.021	1	0	1	0	1	1.061	4	10.307	1
312			min	-4457.931	3	75.218	15	-326.243	4	0	4	0	1	.317	15
313		5	max	4637.08	1	2449.021	1	0	1	0	1	.97	4	9.62	1
314			min	-4459.847	3	75.218	15	-324.029	4	0	4	0	1	.295	15
315		6	max	4634.525	1	2449.021	1	0	1	0	1	.879	4	8.933	1
316			min	-4461.763	3	75.218	15	-321.815	4	0	4	0	1	.274	15
317		7	max	4631.97	1	2449.021	1	0	1	0	1	.789	4	8.246	1
318			min	-4463.68	3	75.218	15	-319.6	4	0	4	0	1	.253	15
319		8	max	4629.415	1	2449.021	1	0	1	0	1	.7	4	7.559	1
320			min	-4465.596	3	75.218	15	-317.386	4	0	4	0	1	.232	15
321		9	max	4626.86	1	2449.021	1	0	1	0	1	.611	4	6.871	1
322			min	-4467.512	3	75.218	15	-315.172	4	0	4	0	1	.211	15
323		10	max	4624.306	1	2449.021	1	0	1	0	1	.523	4	6.184	1
324			min	-4469.428	3	75.218	15	-312.958	4	0	4	0	1	.19	15
325		11	max	4621.751	1	2449.021	1	0	1	0	1	.436	4	5.497	1
326			min	-4471.344	3	75.218	15	-310.743	4	0	4	0	1	.169	15
327		12	max	4619.196	1	2449.021	1	0	1	0	1	.349	4	4.81	1
328			min	-4473.26	3	75.218	15	-308.529	4	0	4	0	1	.148	15
329		13	max	4616.641	1	2449.021	1	0	1	0	1	.262	4	4.123	1
330			min	-4475.177	3	75.218	15	-306.315	4	0	4	0	1	.127	15
331		14	max	4614.086	1	2449.021	1	0	1	0	1	.177	4	3.436	1
332			min	-4477.093	3	75.218	15	-304.101	4	0	4	0	1	.106	15
333		15	max	4611.531	1	2449.021	1	0	1	0	1	.092	4	2.749	1
334			min	-4479.009	3	75.218	15	-301.886	4	0	4	0	1	.084	15
335		16	max	4608.976	1	2449.021	1	0	1	0	1	.007	4	2.061	1
336			min	-4480.925	3	75.218	15	-299.672	4	0	4	0	1	.063	15
337		17	max	4606.421	1	2449.021	1	0	1	0	1	0	1	1.374	1
338			min	-4482.841	3	75.218	15	-297.458	4	0	4	-.076	4	.042	15
339		18	max	4603.866	1	2449.021	1	0	1	0	1	0	1	.687	1
340			min	-4484.757	3	75.218	15	-295.244	4	0	4	-.16	4	.021	15
341		19	max	4601.312	1	2449.021	1	0	1	0	1	0	1	0	1
342			min	-4486.674	3	75.218	15	-293.03	4	0	4	-.242	4	0	1
343	M8	1	max	2347.565	2	921.625	3	267.657	3	.012	4	1.361	4	4.982	1
344			min	-1771.164	3	-663.981	2	-368.132	4	-.004	3	-.34	3	-.185	5
345		2	max	2345.01	2	921.625	3	267.657	3	.012	4	1.258	4	5.04	1
346			min	-1773.08	3	-663.981	2	-365.918	4	-.004	3	-.265	3	-.159	5
347		3	max	2342.455	2	921.625	3	267.657	3	.012	4	1.156	4	5.099	1
348			min	-1774.996	3	-663.981	2	-363.704	4	-.004	3	-.19	3	-.133	5
349		4	max	1732.324	1	1174.532	1	241.097	3	.001	3	1.061	4	4.943	1
350			min	-1527.527	3	-27.814	5	-338.998	4	-.002	2	-.138	3	-.117	5
351		5	max	1729.769	1	1174.532	1	241.097	3	.001	3	.966	4	4.614	1
352			min	-1529.443	3	-27.814	5	-336.783	4	-.002	2	-.07	3	-.109	5
353		6	max	1727.215	1	1174.532	1	241.097	3	.001	3	.872	4	4.284	1
354			min	-1531.359	3	-27.814	5	-334.569	4	-.002	2	-.003	3	-.101	5
355		7	max	1724.66	1	1174.532	1	241.097	3	.001	3	.779	4	3.955	1
356			min	-1533.275	3	-27.814	5	-332.355	4	-.002	2	-.023	2	-.094	5
357		8	max	1722.105	1	1174.532	1	241.097	3	.001	3	.686	4	3.625	1
358			min	-1535.192	3	-27.814	5	-330.141	4	-.002	2	-.073	2	-.086	5
359		9	max	1719.55	1	1174.532	1	241.097	3	.001	3	.6	5	3.295	1
360			min	-1537.108	3	-27.814	5	-327.926	4	-.002	2	-.123	2	-.078	5
361		10	max	1716.995	1	1174.532	1	241.097	3	.001	3	.516	5	2.966	1
362			min	-1539.024	3	-27.814	5	-325.712	4	-.002	2	-.174	2	-.07	5
363		11	max	1714.44	1	1174.532	1	241.097	3	.001	3	.432	5	2.636	1
364			min	-1540.94	3	-27.814	5	-323.498	4	-.002	2	-.224	2	-.062	5
365		12	max	1711.885	1	1174.532	1	241.097	3	.001	3	.403	3	2.307	1
366			min	-1542.856	3	-27.814	5	-321.284	4	-.002	2	-.274	2	-.055	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	1709.33	1	1174.532	1	241.097	3	.001	3	.471	3	1.977	1
368			min	-1544.772	3	-27.814	5	-319.069	4	-.002	2	-.324	2	-.047	5
369		14	max	1706.775	1	1174.532	1	241.097	3	.001	3	.539	3	1.648	1
370			min	-1546.689	3	-27.814	5	-316.855	4	-.002	2	-.374	2	-.039	5
371		15	max	1704.221	1	1174.532	1	241.097	3	.001	3	.606	3	1.318	1
372			min	-1548.605	3	-27.814	5	-314.641	4	-.002	2	-.424	2	-.031	5
373		16	max	1701.666	1	1174.532	1	241.097	3	.001	3	.674	3	.989	1
374			min	-1550.521	3	-27.814	5	-312.427	4	-.002	2	-.474	2	-.023	5
375		17	max	1699.111	1	1174.532	1	241.097	3	.001	3	.741	3	.659	1
376			min	-1552.437	3	-27.814	5	-310.212	4	-.002	2	-.524	2	-.016	5
377		18	max	1696.556	1	1174.532	1	241.097	3	.001	3	.809	3	.33	1
378			min	-1554.353	3	-27.814	5	-307.998	4	-.002	2	-.574	2	-.008	5
379		19	max	1694.001	1	1174.532	1	241.097	3	.001	3	.877	3	0	1
380			min	-1556.269	3	-27.814	5	-305.784	4	-.002	2	-.625	2	0	1
381	M3	1	max	1761.91	2	4.588	4	61.634	2	.02	3	.011	4	0	1
382			min	-628.639	3	1.079	15	-27.153	3	-.041	2	-.003	3	0	1
383		2	max	1761.736	2	4.078	4	61.634	2	.02	3	.023	2	0	15
384			min	-628.77	3	.959	15	-27.153	3	-.041	2	-.011	3	-.001	4
385		3	max	1761.562	2	3.569	4	61.634	2	.02	3	.041	2	0	15
386			min	-628.9	3	.839	15	-27.153	3	-.041	2	-.019	3	-.002	4
387		4	max	1761.387	2	3.059	4	61.634	2	.02	3	.059	2	0	15
388			min	-629.031	3	.719	15	-27.153	3	-.041	2	-.027	3	-.003	4
389		5	max	1761.213	2	2.549	4	61.634	2	.02	3	.077	2	0	15
390			min	-629.162	3	.599	15	-27.153	3	-.041	2	-.035	3	-.004	4
391		6	max	1761.038	2	2.039	4	61.634	2	.02	3	.095	2	-.001	15
392			min	-629.293	3	.479	15	-27.153	3	-.041	2	-.043	3	-.005	4
393		7	max	1760.864	2	1.529	4	61.634	2	.02	3	.113	2	-.001	15
394			min	-629.424	3	.36	15	-27.153	3	-.041	2	-.05	3	-.005	4
395		8	max	1760.69	2	1.02	4	61.634	2	.02	3	.131	2	-.001	15
396			min	-629.554	3	.24	15	-27.153	3	-.041	2	-.058	3	-.006	4
397		9	max	1760.515	2	.51	4	61.634	2	.02	3	.149	2	-.001	15
398			min	-629.685	3	.12	15	-27.153	3	-.041	2	-.066	3	-.006	4
399		10	max	1760.341	2	0	1	61.634	2	.02	3	.167	2	-.001	15
400			min	-629.816	3	0	1	-27.153	3	-.041	2	-.074	3	-.006	4
401		11	max	1760.166	2	-.12	15	61.634	2	.02	3	.185	2	-.001	15
402			min	-629.947	3	-.51	6	-27.153	3	-.041	2	-.082	3	-.006	4
403		12	max	1759.992	2	-.24	15	61.634	2	.02	3	.204	2	-.001	15
404			min	-630.078	3	-1.02	6	-27.153	3	-.041	2	-.09	3	-.006	4
405		13	max	1759.818	2	-.36	15	61.634	2	.02	3	.222	2	-.001	15
406			min	-630.208	3	-1.529	6	-27.153	3	-.041	2	-.098	3	-.005	4
407		14	max	1759.643	2	-.479	15	61.634	2	.02	3	.24	2	-.001	15
408			min	-630.339	3	-2.039	6	-27.153	3	-.041	2	-.106	3	-.005	4
409		15	max	1759.469	2	-.599	15	61.634	2	.02	3	.258	2	0	15
410			min	-630.47	3	-2.549	6	-27.153	3	-.041	2	-.114	3	-.004	4
411		16	max	1759.295	2	-.719	15	61.634	2	.02	3	.276	2	0	15
412			min	-630.601	3	-3.059	6	-27.153	3	-.041	2	-.122	3	-.003	4
413		17	max	1759.12	2	-.839	15	61.634	2	.02	3	.294	2	0	15
414			min	-630.732	3	-3.569	6	-27.153	3	-.041	2	-.13	3	-.002	4
415		18	max	1758.946	2	-.959	15	61.634	2	.02	3	.312	2	0	15
416			min	-630.862	3	-4.078	6	-27.153	3	-.041	2	-.138	3	-.001	4
417		19	max	1758.771	2	-1.079	15	61.634	2	.02	3	.33	2	0	1
418			min	-630.993	3	-4.588	6	-27.153	3	-.041	2	-.146	3	0	1
419	M6	1	max	5053.172	2	4.588	4	0	1	.005	5	.01	4	0	1
420			min	-2169.86	3	1.079	15	-17.046	4	0	1	0	1	0	1
421		2	max	5052.998	2	4.078	4	0	1	.005	5	.005	4	0	15
422			min	-2169.991	3	.959	15	-16.67	4	0	1	0	1	-.001	4
423		3	max	5052.824	2	3.569	4	0	1	.005	5	0	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	-2170.122	3	.839	15	-16.294	4	0	1	0	1	-.002	4
425		4	max	5052.649	2	3.059	4	0	1	.005	5	0	1	0	15
426			min	-2170.253	3	.719	15	-15.918	4	0	1	-.004	4	-.003	4
427		5	max	5052.475	2	2.549	4	0	1	.005	5	0	1	0	15
428			min	-2170.384	3	.599	15	-15.542	4	0	1	-.009	4	-.004	4
429		6	max	5052.301	2	2.039	4	0	1	.005	5	0	1	-.001	15
430			min	-2170.514	3	.479	15	-15.166	4	0	1	-.013	4	-.005	4
431		7	max	5052.126	2	1.529	4	0	1	.005	5	0	1	-.001	15
432			min	-2170.645	3	.36	15	-14.79	4	0	1	-.018	4	-.005	4
433		8	max	5051.952	2	1.02	4	0	1	.005	5	0	1	-.001	15
434			min	-2170.776	3	.24	15	-14.414	4	0	1	-.022	4	-.006	4
435		9	max	5051.777	2	.51	4	0	1	.005	5	0	1	-.001	15
436			min	-2170.907	3	.12	15	-14.038	4	0	1	-.026	4	-.006	4
437		10	max	5051.603	2	0	1	0	1	.005	5	0	1	-.001	15
438			min	-2171.037	3	0	1	-13.662	4	0	1	-.03	4	-.006	4
439		11	max	5051.429	2	-.12	15	0	1	.005	5	0	1	-.001	15
440			min	-2171.168	3	-.51	6	-13.286	4	0	1	-.034	4	-.006	4
441		12	max	5051.254	2	-.24	15	0	1	.005	5	0	1	-.001	15
442			min	-2171.299	3	-1.02	6	-12.91	4	0	1	-.038	4	-.006	4
443		13	max	5051.08	2	-.36	15	0	1	.005	5	0	1	-.001	15
444			min	-2171.43	3	-1.529	6	-12.534	4	0	1	-.042	4	-.005	4
445		14	max	5050.905	2	-.479	15	0	1	.005	5	0	1	-.001	15
446			min	-2171.561	3	-2.039	6	-12.158	4	0	1	-.045	4	-.005	4
447		15	max	5050.731	2	-.599	15	0	1	.005	5	0	1	0	15
448			min	-2171.691	3	-2.549	6	-11.782	4	0	1	-.049	4	-.004	4
449		16	max	5050.557	2	-.719	15	0	1	.005	5	0	1	0	15
450			min	-2171.822	3	-3.059	6	-11.406	4	0	1	-.052	4	-.003	4
451		17	max	5050.382	2	-.839	15	0	1	.005	5	0	1	0	15
452			min	-2171.953	3	-3.569	6	-11.03	4	0	1	-.056	4	-.002	4
453		18	max	5050.208	2	-.959	15	0	1	.005	5	0	1	0	15
454			min	-2172.084	3	-4.078	6	-10.654	4	0	1	-.059	4	-.001	4
455		19	max	5050.034	2	-1.079	15	0	1	.005	5	0	1	0	1
456			min	-2172.215	3	-4.588	6	-10.278	4	0	1	-.062	4	0	1
457	M9	1	max	1761.91	2	4.588	6	27.153	3	.041	2	.01	5	0	1
458			min	-628.639	3	1.079	15	-61.634	2	-.02	3	-.005	2	0	1
459		2	max	1761.736	2	4.078	6	27.153	3	.041	2	.011	3	0	15
460			min	-628.77	3	.959	15	-61.634	2	-.02	3	-.023	2	-.001	6
461		3	max	1761.562	2	3.569	6	27.153	3	.041	2	.019	3	0	15
462			min	-628.9	3	.839	15	-61.634	2	-.02	3	-.041	2	-.002	6
463		4	max	1761.387	2	3.059	6	27.153	3	.041	2	.027	3	0	15
464			min	-629.031	3	.719	15	-61.634	2	-.02	3	-.059	2	-.003	6
465		5	max	1761.213	2	2.549	6	27.153	3	.041	2	.035	3	0	15
466			min	-629.162	3	.599	15	-61.634	2	-.02	3	-.077	2	-.004	6
467		6	max	1761.038	2	2.039	6	27.153	3	.041	2	.043	3	-.001	15
468			min	-629.293	3	.479	15	-61.634	2	-.02	3	-.095	2	-.005	6
469		7	max	1760.864	2	1.529	6	27.153	3	.041	2	.05	3	-.001	15
470			min	-629.424	3	.36	15	-61.634	2	-.02	3	-.113	2	-.005	6
471		8	max	1760.69	2	1.02	6	27.153	3	.041	2	.058	3	-.001	15
472			min	-629.554	3	.24	15	-61.634	2	-.02	3	-.131	2	-.006	6
473		9	max	1760.515	2	.51	6	27.153	3	.041	2	.066	3	-.001	15
474			min	-629.685	3	.12	15	-61.634	2	-.02	3	-.149	2	-.006	6
475		10	max	1760.341	2	0	1	27.153	3	.041	2	.074	3	-.001	15
476			min	-629.816	3	0	1	-61.634	2	-.02	3	-.167	2	-.006	6
477		11	max	1760.166	2	-.12	15	27.153	3	.041	2	.082	3	-.001	15
478			min	-629.947	3	-.51	4	-61.634	2	-.02	3	-.185	2	-.006	6
479		12	max	1759.992	2	-.24	15	27.153	3	.041	2	.09	3	-.001	15
480			min	-630.078	3	-1.02	4	-61.634	2	-.02	3	-.204	2	-.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	1759.818	2	-.36	15	27.153	3	.041	2	.098	3	-.001	15
482			min	-630.208	3	-1.529	4	-61.634	2	-.02	3	-.222	2	-.005	6
483		14	max	1759.643	2	-.479	15	27.153	3	.041	2	.106	3	-.001	15
484			min	-630.339	3	-2.039	4	-61.634	2	-.02	3	-.24	2	-.005	6
485		15	max	1759.469	2	-.599	15	27.153	3	.041	2	.114	3	0	15
486			min	-630.47	3	-2.549	4	-61.634	2	-.02	3	-.258	2	-.004	6
487		16	max	1759.295	2	-.719	15	27.153	3	.041	2	.122	3	0	15
488			min	-630.601	3	-3.059	4	-61.634	2	-.02	3	-.276	2	-.003	6
489		17	max	1759.12	2	-.839	15	27.153	3	.041	2	.13	3	0	15
490			min	-630.732	3	-3.569	4	-61.634	2	-.02	3	-.294	2	-.002	6
491		18	max	1758.946	2	-.959	15	27.153	3	.041	2	.138	3	0	15
492			min	-630.862	3	-4.078	4	-61.634	2	-.02	3	-.312	2	-.001	6
493		19	max	1758.771	2	-1.079	15	27.153	3	.041	2	.146	3	0	1
494			min	-630.993	3	-4.588	4	-61.634	2	-.02	3	-.33	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	-.022	15	.045	3	.024	1	9.999e-3	3	NC	3	NC	3
2			min	-.249	1	-.62	1	-.501	5	-2.554e-2	2	201.26	1	339.67	5
3		2	max	-.022	15	.019	3	.007	1	9.999e-3	3	8831.667	12	NC	3
4			min	-.249	1	-.524	1	-.479	4	-2.554e-2	2	234.959	1	361.084	5
5		3	max	-.022	15	-.006	12	0	12	9.478e-3	3	4410.585	12	NC	2
6			min	-.249	1	-.429	1	-.457	4	-2.368e-2	2	282.269	1	386.634	5
7		4	max	-.022	15	-.02	12	0	12	8.68e-3	3	3005.924	12	NC	1
8			min	-.249	1	-.336	1	-.43	4	-2.083e-2	2	350.228	1	421.657	5
9		5	max	-.022	15	-.021	15	0	3	7.882e-3	3	3063.975	15	NC	1
10			min	-.249	1	-.253	1	-.397	4	-1.797e-2	2	447.669	1	468.868	5
11		6	max	-.022	15	-.017	15	.001	3	7.955e-3	3	3373.487	15	NC	1
12			min	-.248	1	-.184	1	-.363	4	-1.708e-2	2	581.545	1	531.407	5
13		7	max	-.022	15	-.013	15	.002	3	8.631e-3	3	4728.611	10	NC	2
14			min	-.248	1	-.129	1	-.329	4	-1.753e-2	2	764.001	1	611.874	5
15		8	max	-.022	15	-.009	15	0	3	9.307e-3	3	NC	10	NC	2
16			min	-.247	1	-.083	1	-.296	4	-1.798e-2	2	1035.088	1	713.879	5
17		9	max	-.022	15	-.006	15	0	10	1.024e-2	3	NC	2	NC	2
18			min	-.247	1	-.065	3	-.268	4	-1.745e-2	2	1218.477	3	841.82	5
19		10	max	-.022	15	.005	2	0	2	1.164e-2	3	9096.481	11	NC	2
20			min	-.246	1	-.058	3	-.239	4	-1.517e-2	2	1305.488	3	1028.387	5
21		11	max	-.022	15	.035	2	.001	3	1.304e-2	3	NC	1	NC	2
22			min	-.246	1	-.046	3	-.211	4	-1.289e-2	2	1470.135	3	1311.862	5
23		12	max	-.022	15	.068	1	.006	3	1.074e-2	3	NC	9	NC	2
24			min	-.245	1	-.03	3	-.185	4	-9.497e-3	2	1749.287	2	1764.371	5
25		13	max	-.022	15	.096	1	.011	3	6.337e-3	3	NC	9	NC	2
26			min	-.245	1	-.004	3	-.16	4	-5.479e-3	2	1388.993	2	2639.481	5
27		14	max	-.022	15	.112	1	.011	3	2.15e-3	3	NC	3	NC	2
28			min	-.244	1	.01	15	-.138	4	-4.709e-3	4	1274.198	2	4391.03	5
29		15	max	-.022	15	.113	1	.007	3	7.323e-3	3	NC	4	NC	2
30			min	-.244	1	.013	15	-.124	5	-4.418e-3	2	1359.188	2	4815.735	1
31		16	max	-.022	15	.187	3	.01	1	1.25e-2	3	NC	4	NC	3
32			min	-.244	1	.016	15	-.116	5	-7.224e-3	2	945.85	3	4288.406	1
33		17	max	-.022	15	.28	3	.006	1	1.767e-2	3	NC	4	NC	3
34			min	-.244	1	.013	10	-.112	5	-1.003e-2	2	569.827	3	4844.124	1
35		18	max	-.022	15	.378	3	0	12	2.104e-2	3	NC	4	NC	2
36			min	-.244	1	-.003	10	-.111	4	-1.186e-2	2	402.571	3	8915.738	1
37		19	max	-.022	15	.476	3	-.003	12	2.104e-2	3	NC	1	NC	1
38			min	-.244	1	-.018	10	-.112	4	-1.186e-2	2	311.319	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	-.016	15	.226	3	0	1	2.142e-4	4	NC	3	NC	1
40			min	-.515	1	-1.394	1	-.498	4	0	1	100.072	1	342.622	4
41		2	max	-.016	15	.148	3	0	1	2.142e-4	4	3991.795	15	NC	1
42			min	-.515	1	-1.171	1	-.479	4	0	1	120.064	1	359.897	4
43		3	max	-.016	15	.069	3	0	1	6.918e-7	5	4816.503	15	NC	1
44			min	-.515	1	-.947	1	-.458	4	-6.47e-7	14	150.131	1	380.975	4
45		4	max	-.016	15	-.005	3	0	1	0	1	6020.368	15	NC	1
46			min	-.515	1	-.732	1	-.431	4	-3.291e-4	4	197.816	1	413.241	4
47		5	max	-.016	15	-.016	15	0	1	0	1	7788.453	15	NC	1
48			min	-.514	1	-.54	1	-.398	4	-6.58e-4	4	276.047	1	459.462	4
49		6	max	-.016	15	-.012	15	0	1	0	1	NC	15	NC	1
50			min	-.514	1	-.387	1	-.363	4	-6.331e-4	4	402.672	3	522.731	4
51		7	max	-.016	15	-.009	15	0	1	0	1	NC	15	NC	1
52			min	-.512	1	-.27	1	-.328	4	-3.635e-4	4	381.109	3	604.873	4
53		8	max	-.016	15	-.006	15	0	1	0	1	NC	2	NC	1
54			min	-.511	1	-.176	1	-.296	4	-9.384e-5	4	376.481	3	707.292	4
55		9	max	-.016	15	-.003	15	0	1	2.224e-5	5	NC	5	NC	1
56			min	-.51	1	-.126	3	-.268	4	0	1	380.59	3	829.765	4
57		10	max	-.016	15	.003	10	0	1	0	1	NC	4	NC	1
58			min	-.509	1	-.117	3	-.239	4	-1.337e-4	4	390.584	3	1013.382	4
59		11	max	-.016	15	.071	1	0	1	0	1	NC	4	NC	1
60			min	-.507	1	-.1	3	-.21	4	-2.896e-4	4	410.684	3	1290.275	4
61		12	max	-.016	15	.144	1	0	1	0	1	NC	5	NC	1
62			min	-.506	1	-.074	3	-.185	4	-1.339e-3	4	446.777	3	1700.15	4
63		13	max	-.016	15	.202	1	0	1	0	1	NC	5	NC	1
64			min	-.504	1	-.024	3	-.161	4	-2.894e-3	4	423.557	2	2473.689	4
65		14	max	-.016	15	.23	1	0	1	0	1	NC	5	NC	1
66			min	-.503	1	.007	15	-.141	4	-4.39e-3	4	401.483	2	3918.492	4
67		15	max	-.016	15	.222	3	0	1	0	1	NC	3	NC	1
68			min	-.503	1	.007	15	-.128	4	-3.299e-3	4	435.498	2	6342.386	4
69		16	max	-.016	15	.421	3	0	1	0	1	NC	5	NC	1
70			min	-.503	1	.006	15	-.119	4	-2.208e-3	4	537.432	2	NC	1
71		17	max	-.016	15	.647	3	0	1	0	1	NC	5	NC	1
72			min	-.503	1	.005	15	-.114	4	-1.117e-3	4	318.459	3	NC	1
73		18	max	-.016	15	.884	3	0	1	0	1	NC	4	NC	1
74			min	-.504	1	-.05	2	-.11	4	-4.06e-4	4	203.88	3	NC	1
75		19	max	-.016	15	1.12	3	0	1	0	1	NC	1	NC	1
76			min	-.504	1	-.136	2	-.106	4	-4.06e-4	4	150.047	3	NC	1
77	M7	1	max	.006	5	.045	3	-.001	12	2.554e-2	2	NC	3	NC	3
78			min	-.249	1	-.62	1	-.511	4	-9.999e-3	3	201.26	1	326.687	4
79		2	max	.006	5	.019	3	0	12	2.554e-2	2	NC	5	NC	3
80			min	-.249	1	-.524	1	-.483	4	-9.999e-3	3	234.959	1	351.243	4
81		3	max	.006	5	.002	5	.007	1	2.368e-2	2	NC	5	NC	2
82			min	-.249	1	-.429	1	-.454	4	-9.478e-3	3	282.269	1	380.217	4
83		4	max	.006	5	.003	5	.013	1	2.083e-2	2	NC	5	NC	1
84			min	-.249	1	-.336	1	-.423	5	-8.68e-3	3	350.228	1	416.471	4
85		5	max	.006	5	.004	5	.014	1	1.797e-2	2	NC	5	NC	1
86			min	-.249	1	-.253	1	-.391	5	-7.882e-3	3	447.669	1	462.567	4
87		6	max	.006	5	.005	5	.011	1	1.708e-2	2	NC	5	NC	1
88			min	-.248	1	-.184	1	-.358	4	-7.955e-3	3	581.545	1	521.425	4
89		7	max	.006	5	.005	5	.005	1	1.753e-2	2	NC	4	NC	2
90			min	-.248	1	-.129	1	-.327	4	-8.631e-3	3	764.001	1	594.331	4
91		8	max	.006	5	.004	5	.001	2	1.798e-2	2	NC	4	NC	2
92			min	-.247	1	-.083	1	-.297	4	-9.307e-3	3	1035.088	1	685.934	4
93		9	max	.006	5	.003	5	0	3	1.745e-2	2	NC	2	NC	2
94			min	-.247	1	-.065	3	-.268	4	-1.024e-2	3	1218.477	3	804.424	4
95		10	max	.006	5	.005	2	0	3	1.517e-2	2	NC	4	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.246	1	-.058	3	-.239	4	-1.164e-2	3	1305.488	3	972.876	4
97		11	max	.006	5	.035	2	0	2	1.289e-2	2	NC	1	NC	2
98			min	-.246	1	-.046	3	-.21	4	-1.304e-2	3	1470.135	3	1226.549	4
99		12	max	.006	5	.068	1	.006	1	9.497e-3	2	NC	5	NC	2
100			min	-.245	1	-.03	3	-.183	4	-1.074e-2	3	1749.287	2	1640.221	4
101		13	max	.006	5	.096	1	.007	2	5.479e-3	2	NC	5	NC	2
102			min	-.245	1	-.004	3	-.158	4	-6.337e-3	3	1388.993	2	2371.824	4
103		14	max	.006	5	.112	1	.004	2	1.625e-3	1	NC	3	NC	2
104			min	-.244	1	-.003	5	-.139	4	-4.317e-3	5	1274.198	2	3542.604	4
105		15	max	.006	5	.113	1	0	10	4.418e-3	2	NC	5	NC	2
106			min	-.244	1	-.006	5	-.128	4	-7.323e-3	3	1359.188	2	4815.735	1
107		16	max	.006	5	.187	3	-.001	10	7.224e-3	2	NC	5	NC	3
108			min	-.244	1	-.01	5	-.121	4	-1.25e-2	3	945.85	3	4288.406	1
109		17	max	.006	5	.28	3	0	12	1.003e-2	2	NC	4	NC	3
110			min	-.244	1	-.015	5	-.115	4	-1.767e-2	3	569.827	3	4844.124	1
111		18	max	.006	5	.378	3	.006	1	1.186e-2	2	NC	4	NC	2
112			min	-.244	1	-.019	5	-.108	5	-2.104e-2	3	402.571	3	8915.738	1
113		19	max	.006	5	.476	3	.021	1	1.186e-2	2	NC	1	NC	1
114			min	-.244	1	-.024	5	-.104	5	-2.104e-2	3	311.319	3	NC	1
115	M10	1	max	.001	1	.344	3	.244	1	1.311e-2	3	NC	1	NC	1
116			min	-.111	4	-.018	5	-.006	5	-3.724e-3	2	NC	1	NC	1
117		2	max	0	1	.618	3	.293	1	1.517e-2	3	NC	4	NC	3
118			min	-.111	4	-.131	2	0	15	-4.583e-3	2	830.942	3	4701.065	1
119		3	max	0	1	.872	3	.367	1	1.723e-2	3	NC	5	NC	3
120			min	-.111	4	-.267	2	.005	15	-5.442e-3	2	431.857	3	1853.106	1
121		4	max	0	1	1.062	3	.444	1	1.93e-2	3	NC	5	NC	5
122			min	-.111	4	-.357	2	.008	15	-6.3e-3	2	317.333	3	1143.207	1
123		5	max	0	1	1.166	3	.505	1	2.136e-2	3	NC	5	NC	5
124			min	-.111	4	-.389	2	.011	15	-7.159e-3	2	277.403	3	874.225	1
125		6	max	0	1	1.176	3	.542	1	2.342e-2	3	NC	5	NC	5
126			min	-.111	4	-.359	2	.012	15	-8.018e-3	2	273.956	3	766.408	1
127		7	max	0	1	1.106	3	.551	1	2.549e-2	3	NC	5	NC	5
128			min	-.111	4	-.278	2	.012	15	-8.877e-3	2	299.342	3	742.334	1
129		8	max	0	1	.984	3	.539	1	2.755e-2	3	NC	4	NC	5
130			min	-.111	4	-.169	2	.012	15	-9.736e-3	2	356.001	3	773.808	1
131		9	max	0	1	.861	3	.517	1	2.961e-2	3	NC	4	NC	5
132			min	-.111	4	-.067	2	.013	15	-1.06e-2	2	441.023	3	837.67	1
133		10	max	0	1	.802	3	.504	1	3.168e-2	3	NC	4	NC	5
134			min	-.111	4	-.024	10	.016	15	-1.145e-2	2	498.045	3	879.673	1
135		11	max	0	12	.861	3	.517	1	2.961e-2	3	NC	4	NC	5
136			min	-.111	4	-.067	2	.019	15	-1.06e-2	2	441.023	3	837.67	1
137		12	max	0	12	.984	3	.539	1	2.755e-2	3	NC	4	NC	5
138			min	-.111	4	-.169	2	.023	15	-9.736e-3	2	356.001	3	773.808	1
139		13	max	0	12	1.106	3	.551	1	2.549e-2	3	NC	4	NC	5
140			min	-.111	4	-.278	2	.025	15	-8.877e-3	2	299.342	3	742.334	1
141		14	max	0	12	1.176	3	.542	1	2.342e-2	3	NC	5	NC	5
142			min	-.111	4	-.359	2	.025	15	-8.018e-3	2	273.956	3	766.408	1
143		15	max	0	12	1.166	3	.505	1	2.136e-2	3	NC	5	NC	5
144			min	-.111	4	-.389	2	.025	15	-7.159e-3	2	277.403	3	874.225	1
145		16	max	0	12	1.062	3	.444	1	1.93e-2	3	NC	5	NC	5
146			min	-.111	4	-.357	2	.023	15	-6.3e-3	2	317.333	3	1143.207	1
147		17	max	0	12	.872	3	.367	1	1.723e-2	3	NC	4	NC	3
148			min	-.111	4	-.267	2	.022	15	-5.442e-3	2	431.857	3	1853.106	1
149		18	max	0	12	.618	3	.293	1	1.517e-2	3	NC	4	NC	3
150			min	-.111	4	-.131	2	.021	15	-4.583e-3	2	830.942	3	4701.065	1
151		19	max	0	12	.344	3	.244	1	1.311e-2	3	NC	1	NC	1
152			min	-.111	4	.003	10	.022	15	-3.724e-3	2	4772.772	4	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	.047	1	.246	1	4.576e-3	1	NC	1	NC	1
154			min	-.2	4	-.041	3	-.006	5	-1.44e-4	5	NC	1	NC	1
155		2	max	.002	1	.141	3	.283	1	5.169e-3	1	NC	4	NC	3
156			min	-.2	4	-.107	2	.018	15	-7.502e-5	5	1253.619	3	5938.469	4
157		3	max	.002	1	.308	3	.352	1	5.763e-3	1	NC	5	NC	3
158			min	-.201	4	-.236	2	.027	15	-1.212e-5	15	653.622	3	2151.816	1
159		4	max	.002	1	.419	3	.427	1	6.356e-3	1	NC	5	NC	3
160			min	-.201	4	-.314	2	.026	15	3.363e-5	15	495.675	3	1260.686	1
161		5	max	.001	1	.452	3	.49	1	6.949e-3	1	NC	5	NC	3
162			min	-.201	4	-.331	2	.019	15	7.938e-5	15	462.872	3	934.639	1
163		6	max	.001	1	.401	3	.53	1	7.543e-3	1	NC	5	NC	5
164			min	-.201	4	-.286	2	.008	15	1.251e-4	15	515.855	3	801.405	1
165		7	max	0	1	.281	3	.545	1	8.136e-3	1	NC	5	NC	5
166			min	-.201	4	-.19	2	-.002	15	1.709e-4	15	708.759	3	762.385	1
167		8	max	0	1	.122	3	.537	1	8.729e-3	1	NC	4	NC	5
168			min	-.201	4	-.068	2	-.009	5	2.166e-4	15	1396.221	3	782.332	1
169		9	max	0	1	.049	1	.518	1	9.323e-3	1	NC	1	NC	5
170			min	-.201	4	-.024	3	-.003	5	2.624e-4	15	NC	1	836.081	1
171		10	max	0	1	.098	1	.507	1	9.916e-3	1	NC	4	NC	5
172			min	-.201	4	-.092	3	.016	15	3.081e-4	15	4466.966	1	872.892	1
173		11	max	0	3	.049	1	.518	1	9.323e-3	1	NC	1	9041.356	15
174			min	-.201	4	-.024	3	.035	15	3.222e-4	15	NC	1	836.081	1
175		12	max	0	3	.122	3	.537	1	8.729e-3	1	NC	4	7575.302	12
176			min	-.201	4	-.068	2	.042	15	3.362e-4	15	1396.221	3	782.332	1
177		13	max	0	3	.281	3	.545	1	8.136e-3	1	NC	5	9079.337	15
178			min	-.201	4	-.19	2	.038	15	3.503e-4	15	708.759	3	762.385	1
179		14	max	.001	3	.401	3	.53	1	7.543e-3	1	NC	5	NC	5
180			min	-.201	4	-.286	2	.028	15	3.643e-4	15	515.855	3	801.405	1
181		15	max	.001	3	.452	3	.49	1	6.949e-3	1	NC	15	NC	3
182			min	-.201	4	-.331	2	.015	15	3.784e-4	15	462.872	3	934.639	1
183		16	max	.002	3	.419	3	.427	1	6.356e-3	1	NC	15	NC	3
184			min	-.201	4	-.314	2	.004	15	3.925e-4	15	495.675	3	1260.686	1
185		17	max	.002	3	.308	3	.352	1	5.763e-3	1	NC	15	NC	3
186			min	-.201	4	-.236	2	-.003	5	4.065e-4	15	653.622	3	2151.816	1
187		18	max	.002	3	.141	3	.283	1	5.169e-3	1	NC	5	NC	3
188			min	-.201	4	-.107	2	.002	15	4.206e-4	15	1253.619	3	6120.699	1
189		19	max	.003	3	.047	1	.246	1	4.576e-3	1	NC	1	NC	1
190			min	-.201	4	-.041	3	.022	15	4.346e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.004	5	.247	1	5.548e-3	1	NC	1	NC	1
192			min	-.278	4	-.067	3	-.006	5	-9.754e-5	5	NC	1	NC	1
193		2	max	0	2	.05	3	.278	1	6.197e-3	1	NC	5	NC	2
194			min	-.278	4	-.27	2	.019	15	-2.592e-5	15	985.65	2	5798.371	4
195		3	max	0	2	.14	3	.343	1	6.846e-3	1	NC	5	NC	3
196			min	-.278	4	-.469	2	.029	15	2.17e-5	15	529.99	2	2365.833	1
197		4	max	0	2	.189	3	.418	1	7.496e-3	1	NC	5	NC	3
198			min	-.278	4	-.599	2	.027	15	6.933e-5	15	407.021	2	1336.86	1
199		5	max	0	2	.193	3	.482	1	8.145e-3	1	NC	5	NC	12
200			min	-.278	4	-.641	2	.019	15	1.17e-4	15	378.555	2	971.108	1
201		6	max	0	2	.152	3	.525	1	8.794e-3	1	NC	5	NC	5
202			min	-.278	4	-.594	2	.007	15	1.646e-4	15	410.699	2	821.005	1
203		7	max	0	2	.078	3	.542	1	9.443e-3	1	NC	5	NC	5
204			min	-.278	4	-.473	2	-.005	5	2.122e-4	15	524.313	2	772.29	1
205		8	max	0	2	-.005	15	.538	1	1.009e-2	1	NC	5	NC	5
206			min	-.278	4	-.314	2	-.013	5	2.598e-4	15	828.994	2	784.84	1
207		9	max	0	2	-.004	15	.521	1	1.074e-2	1	NC	4	NC	5
208			min	-.278	4	-.18	1	-.006	5	3.075e-4	15	1797.568	2	832.165	1
209		10	max	0	1	-.004	15	.51	1	1.139e-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	-.278	4	-.128	3	.016	15	3.551e-4	15	3487.228	1	865.702	1
211		11	max	0	9	-.006	15	.521	1	1.074e-2	1	NC	4	8386.504	15
212			min	-.278	4	-.18	1	.037	15	3.67e-4	15	1797.568	2	832.165	1
213		12	max	0	9	-.008	12	.538	1	1.009e-2	1	NC	5	7268.344	12
214			min	-.278	4	-.314	2	.044	15	3.79e-4	15	828.994	2	784.84	1
215		13	max	0	9	.078	3	.542	1	9.443e-3	1	NC	5	8363.227	15
216			min	-.278	4	-.473	2	.04	15	3.91e-4	15	524.313	2	772.29	1
217		14	max	0	9	.152	3	.525	1	8.794e-3	1	NC	15	NC	5
218			min	-.278	4	-.594	2	.029	15	3.978e-4	12	410.699	2	821.005	1
219		15	max	0	9	.193	3	.482	1	8.145e-3	1	NC	15	NC	5
220			min	-.278	4	-.641	2	.015	15	3.953e-4	12	378.555	2	971.108	1
221		16	max	0	9	.189	3	.418	1	7.496e-3	1	NC	15	NC	3
222			min	-.278	4	-.599	2	.003	15	3.927e-4	12	407.021	2	1336.86	1
223		17	max	0	9	.14	3	.343	1	6.846e-3	1	NC	5	NC	3
224			min	-.278	4	-.469	2	-.005	5	3.901e-4	12	529.99	2	2365.833	1
225		18	max	0	9	.05	3	.278	1	6.197e-3	1	NC	5	NC	2
226			min	-.278	4	-.27	2	0	15	3.876e-4	12	985.65	2	7381.555	1
227		19	max	0	9	-.007	15	.247	1	5.548e-3	1	NC	1	NC	1
228			min	-.278	4	-.067	3	.022	15	3.85e-4	12	NC	1	NC	1
229	M13	1	max	0	12	.01	3	.249	1	1.292e-2	2	NC	1	NC	1
230			min	-.473	4	-.491	1	-.006	5	-3.475e-3	3	NC	1	NC	1
231		2	max	0	12	.135	3	.3	1	1.501e-2	2	NC	5	NC	3
232			min	-.473	4	-.777	1	.018	15	-4.262e-3	3	704.923	2	4460.332	1
233		3	max	0	12	.242	3	.376	1	1.71e-2	2	NC	5	NC	3
234			min	-.473	4	-1.064	2	.028	15	-5.049e-3	3	372.04	2	1787.604	1
235		4	max	0	12	.315	3	.454	1	1.92e-2	2	NC	5	NC	3
236			min	-.473	4	-1.28	2	.029	15	-5.835e-3	3	274.942	2	1110.987	1
237		5	max	0	12	.345	3	.516	1	2.129e-2	2	NC	15	NC	12
238			min	-.473	4	-1.402	2	.023	15	-6.622e-3	3	239.668	2	852.787	1
239		6	max	0	12	.332	3	.553	1	2.338e-2	2	NC	15	NC	5
240			min	-.473	4	-1.426	2	.014	15	-7.409e-3	3	233.819	2	748.943	1
241		7	max	0	12	.284	3	.563	1	2.547e-2	2	NC	15	NC	5
242			min	-.473	4	-1.365	2	.005	15	-8.195e-3	3	249.373	2	725.703	1
243		8	max	0	12	.216	3	.55	1	2.756e-2	2	NC	15	NC	5
244			min	-.472	4	-1.251	2	0	15	-8.982e-3	3	284.991	2	755.921	1
245		9	max	0	12	.15	3	.528	1	2.966e-2	2	NC	15	NC	5
246			min	-.472	4	-1.141	1	.002	15	-9.768e-3	3	334.801	2	817.108	1
247		10	max	0	1	.12	3	.515	1	3.175e-2	2	NC	15	NC	5
248			min	-.472	4	-1.093	1	.016	15	-1.055e-2	3	365.718	2	857.24	1
249		11	max	0	1	.15	3	.528	1	2.966e-2	2	NC	15	NC	15
250			min	-.472	4	-1.141	1	.031	15	-9.768e-3	3	334.801	2	817.108	1
251		12	max	0	1	.216	3	.55	1	2.756e-2	2	NC	15	9475.889	15
252			min	-.472	4	-1.251	2	.036	15	-8.982e-3	3	284.991	2	755.921	1
253		13	max	0	1	.284	3	.563	1	2.547e-2	2	NC	15	NC	15
254			min	-.472	4	-1.365	2	.032	15	-8.195e-3	3	249.373	2	725.703	1
255		14	max	0	1	.332	3	.553	1	2.338e-2	2	9564.644	15	NC	5
256			min	-.472	4	-1.426	2	.024	15	-7.409e-3	3	233.819	2	748.943	1
257		15	max	0	1	.345	3	.516	1	2.129e-2	2	9568.97	15	NC	5
258			min	-.472	4	-1.402	2	.013	15	-6.622e-3	3	239.668	2	852.787	1
259		16	max	0	1	.315	3	.454	1	1.92e-2	2	NC	15	NC	3
260			min	-.472	4	-1.28	2	.003	15	-5.835e-3	3	274.942	2	1110.987	1
261		17	max	.001	1	.242	3	.376	1	1.71e-2	2	NC	15	NC	3
262			min	-.472	4	-1.064	2	-.001	15	-5.049e-3	3	372.04	2	1787.604	1
263		18	max	.001	1	.135	3	.3	1	1.501e-2	2	NC	5	NC	3
264			min	-.472	4	-.777	1	.004	15	-4.262e-3	3	704.923	2	4460.332	1
265		19	max	.001	1	.01	3	.249	1	1.292e-2	2	NC	1	NC	1
266			min	-.472	4	-.491	1	.022	15	-3.475e-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	2.717e-3	2	NC	1	NC	1
270			min	0	2	-.001	1	0	1	-2.756e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.003	5	5.435e-3	2	NC	1	NC	1
272			min	0	2	-.004	1	0	1	-5.512e-3	5	NC	1	NC	1
273		4	max	0	3	0	15	.006	5	6.364e-3	2	NC	3	NC	1
274			min	0	1	-.01	1	-.001	1	-6.646e-3	5	6219.587	1	NC	1
275		5	max	0	3	-.002	15	.01	5	5.842e-3	2	NC	4	NC	1
276			min	0	1	-.017	1	-.002	1	-6.461e-3	5	3476.868	1	5875.39	5
277		6	max	0	3	-.003	15	.016	5	5.319e-3	2	NC	5	NC	1
278			min	0	1	-.027	1	-.003	1	-6.277e-3	5	2235.968	1	3867.732	5
279		7	max	0	3	-.004	15	.022	5	4.797e-3	2	NC	5	NC	1
280			min	0	1	-.039	1	-.004	1	-6.092e-3	5	1569.581	1	2761.128	5
281		8	max	0	3	-.005	15	.029	5	4.275e-3	2	NC	15	NC	1
282			min	0	1	-.052	1	-.005	1	-5.908e-3	5	1169.685	1	2085.096	5
283		9	max	0	3	-.006	15	.037	5	3.752e-3	2	9935.979	15	NC	9
284			min	0	1	-.067	1	-.005	1	-5.723e-3	5	910.443	1	1641.068	5
285		10	max	0	3	-.008	15	.045	5	3.23e-3	2	8028.817	15	NC	9
286			min	0	1	-.083	1	-.006	1	-5.539e-3	5	732.52	1	1333.261	5
287		11	max	0	3	-.009	15	.055	5	2.708e-3	2	6653.39	15	NC	9
288			min	0	1	-.1	1	-.007	1	-5.354e-3	5	604.973	1	1110.865	5
289		12	max	0	3	-.011	15	.064	5	2.185e-3	2	5628.187	15	NC	9
290			min	-.001	1	-.119	1	-.007	1	-5.17e-3	5	510.36	1	944.852	5
291		13	max	0	3	-.013	15	.074	5	1.663e-3	2	4843.048	15	NC	9
292			min	-.001	1	-.138	1	-.007	1	-4.986e-3	5	438.186	1	817.576	5
293		14	max	.001	3	-.014	15	.084	5	1.141e-3	2	4228.163	15	NC	9
294			min	-.001	1	-.159	1	-.007	1	-4.801e-3	5	381.847	1	717.836	5
295		15	max	.001	3	-.016	15	.095	5	6.184e-4	2	3737.467	15	NC	9
296			min	-.001	1	-.18	1	-.006	1	-4.673e-3	4	337.011	1	638.231	5
297		16	max	.001	3	-.018	15	.106	5	6.069e-4	3	3339.694	15	NC	9
298			min	-.001	1	-.202	1	-.005	1	-4.549e-3	4	300.752	1	573.728	5
299		17	max	.001	3	-.02	15	.117	4	8.905e-4	3	3012.889	15	NC	1
300			min	-.002	1	-.224	1	-.003	1	-4.425e-3	4	271.024	1	519.619	4
301		18	max	.001	3	-.022	15	.128	4	1.174e-3	3	2741.273	15	NC	1
302			min	-.002	1	-.246	1	-.007	3	-4.301e-3	4	246.361	1	474.595	4
303		19	max	.001	3	-.024	15	.139	4	1.458e-3	3	2513.288	15	NC	1
304			min	-.002	1	-.269	1	-.011	3	-4.177e-3	4	225.693	1	436.828	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	2	-.002	1	0	1	-2.925e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	3	NC	1
310			min	0	2	-.008	1	0	1	-5.849e-3	4	7467.193	1	NC	1
311		4	max	0	3	0	15	.006	4	0	1	NC	4	NC	1
312			min	0	2	-.019	1	0	1	-7.041e-3	4	3168.508	1	9683.812	4
313		5	max	.001	3	-.001	15	.011	4	0	1	NC	5	NC	1
314			min	-.001	2	-.035	1	0	1	-6.826e-3	4	1742.962	1	5620.553	4
315		6	max	.001	3	-.002	15	.016	4	0	1	NC	5	NC	1
316			min	-.001	2	-.055	1	0	1	-6.61e-3	4	1110.831	1	3702.857	4
317		7	max	.002	3	-.002	15	.023	4	0	1	NC	5	NC	1
318			min	-.002	2	-.078	1	0	1	-6.395e-3	4	775.305	1	2645.75	4
319		8	max	.002	3	-.003	15	.03	4	0	1	NC	5	NC	1
320			min	-.002	1	-.105	1	0	1	-6.179e-3	4	575.487	1	1999.927	4
321		9	max	.002	3	-.004	15	.038	4	0	1	NC	15	NC	1
322			min	-.002	1	-.136	1	0	1	-5.964e-3	4	446.644	1	1575.735	4
323		10	max	.002	3	-.005	15	.047	4	0	1	NC	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	-.169	1	0	1	-5.748e-3	4	358.57	1	1281.689	4
325		11	max	.002	3	-.006	15	.057	4	0	1	9442.369	15	NC	1
326			min	-.003	1	-.205	1	0	1	-5.533e-3	4	295.626	1	1069.257	4
327		12	max	.003	3	-.008	15	.067	4	0	1	7965.915	15	NC	1
328			min	-.003	1	-.243	1	0	1	-5.317e-3	4	249.049	1	910.711	4
329		13	max	.003	3	-.009	15	.077	4	0	1	6839.577	15	NC	1
330			min	-.003	1	-.284	1	0	1	-5.102e-3	4	213.589	1	789.198	4
331		14	max	.003	3	-.01	15	.087	4	0	1	5960.328	15	NC	1
332			min	-.003	1	-.326	1	0	1	-4.886e-3	4	185.955	1	694.018	4
333		15	max	.003	3	-.012	15	.098	4	0	1	5260.578	15	NC	1
334			min	-.004	1	-.37	1	0	1	-4.671e-3	4	163.994	1	618.105	4
335		16	max	.004	3	-.013	15	.109	4	0	1	4694.67	15	NC	1
336			min	-.004	1	-.414	1	0	1	-4.456e-3	4	146.255	1	556.652	4
337		17	max	.004	3	-.014	15	.12	4	0	1	4230.674	15	NC	1
338			min	-.004	1	-.46	1	0	1	-4.24e-3	4	131.726	1	506.28	4
339		18	max	.004	3	-.016	15	.13	4	0	1	3845.728	15	NC	1
340			min	-.004	1	-.506	1	0	1	-4.025e-3	4	119.684	1	464.563	4
341		19	max	.004	3	-.017	15	.141	4	0	1	3523.133	15	NC	1
342			min	-.005	1	-.553	1	0	1	-3.809e-3	4	109.6	1	429.724	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	1.206e-3	3	NC	1	NC	1
346			min	0	2	-.001	1	0	3	-3.212e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	2.413e-3	3	NC	1	NC	1
348			min	0	2	-.004	1	0	3	-6.425e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.006	4	2.797e-3	3	NC	3	NC	1
350			min	0	1	-.01	1	-.001	3	-7.708e-3	4	6219.587	1	9604.637	4
351		5	max	0	3	0	5	.011	4	2.513e-3	3	NC	4	NC	1
352			min	0	1	-.017	1	-.002	3	-7.425e-3	4	3476.868	1	5583.105	4
353		6	max	0	3	0	5	.016	4	2.23e-3	3	NC	4	NC	1
354			min	0	1	-.027	1	-.003	3	-7.142e-3	4	2235.968	1	3682.775	4
355		7	max	0	3	.001	5	.023	4	1.946e-3	3	NC	4	NC	1
356			min	0	1	-.039	1	-.004	3	-6.859e-3	4	1569.581	1	2634.425	4
357		8	max	0	3	.001	5	.03	4	1.662e-3	3	NC	5	NC	1
358			min	0	1	-.052	1	-.005	3	-6.576e-3	4	1169.685	1	1993.602	4
359		9	max	0	3	.002	5	.039	4	1.379e-3	3	NC	5	NC	9
360			min	0	1	-.067	1	-.006	3	-6.293e-3	4	910.443	1	1572.53	4
361		10	max	0	3	.002	5	.047	4	1.095e-3	3	NC	5	NC	9
362			min	0	1	-.083	1	-.006	3	-6.01e-3	4	732.52	1	1280.572	4
363		11	max	0	3	.003	5	.057	4	8.113e-4	3	NC	5	NC	9
364			min	0	1	-.1	1	-.006	3	-5.727e-3	4	604.973	1	1069.62	4
365		12	max	0	3	.003	5	.066	4	5.277e-4	3	NC	5	NC	9
366			min	-.001	1	-.119	1	-.006	3	-5.444e-3	4	510.36	1	912.176	4
367		13	max	0	3	.004	5	.077	4	2.44e-4	3	NC	5	NC	9
368			min	-.001	1	-.138	1	-.006	3	-5.161e-3	4	438.186	1	791.522	4
369		14	max	.001	3	.004	5	.087	4	-2.458e-5	12	NC	5	NC	9
370			min	-.001	1	-.159	1	-.005	3	-4.878e-3	4	381.847	1	697.043	4
371		15	max	.001	3	.005	5	.097	4	8.963e-5	9	NC	5	NC	9
372			min	-.001	1	-.18	1	-.003	3	-4.6e-3	5	337.011	1	621.729	4
373		16	max	.001	3	.005	5	.108	4	2.854e-4	1	NC	5	NC	9
374			min	-.001	1	-.202	1	0	3	-4.379e-3	5	300.752	1	560.807	4
375		17	max	.001	3	.006	5	.119	4	7.71e-4	1	NC	5	NC	1
376			min	-.002	1	-.224	1	0	10	-4.159e-3	5	271.024	1	510.926	4
377		18	max	.001	3	.006	5	.129	4	1.257e-3	1	NC	7	NC	1
378			min	-.002	1	-.246	1	-.001	2	-3.939e-3	5	246.361	1	469.678	4
379		19	max	.001	3	.007	5	.139	4	1.742e-3	1	NC	15	NC	1
380			min	-.002	1	-.269	1	-.004	2	-3.719e-3	5	225.693	1	435.302	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	.004	5	2.53e-3	2	NC	1	NC	1
382			min	0	15	-.003	1	0	1	-1.86e-3	5	NC	1	NC	1
383		2	max	.005	1	-.002	15	.027	5	3.011e-3	2	NC	1	NC	4
384			min	0	15	-.022	1	-.022	2	-1.884e-3	5	NC	1	2858.678	2
385		3	max	.005	1	-.004	15	.05	5	3.492e-3	2	NC	1	NC	4
386			min	0	15	-.041	1	-.043	2	-1.907e-3	5	NC	1	1445.911	2
387		4	max	.004	1	-.006	15	.074	5	3.973e-3	2	NC	1	NC	4
388			min	0	15	-.06	1	-.063	2	-1.93e-3	5	NC	1	981.193	2
389		5	max	.004	1	-.007	15	.097	5	4.453e-3	2	NC	1	NC	4
390			min	0	15	-.079	1	-.082	2	-1.953e-3	5	NC	1	753.986	2
391		6	max	.004	3	-.009	15	.12	5	4.934e-3	2	NC	1	NC	4
392			min	0	10	-.097	1	-.099	2	-2.165e-3	3	NC	1	622.377	2
393		7	max	.004	3	-.011	15	.143	5	5.415e-3	2	NC	1	NC	4
394			min	0	10	-.116	1	-.115	2	-2.397e-3	3	NC	1	539.277	2
395		8	max	.004	3	-.012	15	.166	5	5.896e-3	2	NC	1	NC	4
396			min	0	10	-.135	1	-.127	2	-2.628e-3	3	NC	1	484.769	2
397		9	max	.004	3	-.014	15	.188	5	6.376e-3	2	NC	1	NC	4
398			min	0	10	-.153	1	-.137	2	-2.86e-3	3	NC	1	449.227	2
399		10	max	.005	3	-.016	15	.21	5	6.857e-3	2	NC	1	NC	4
400			min	-.001	2	-.172	1	-.143	2	-3.091e-3	3	NC	1	427.762	2
401		11	max	.005	3	-.017	15	.232	5	7.338e-3	2	NC	1	NC	4
402			min	-.002	2	-.19	1	-.146	2	-3.323e-3	3	NC	1	418.108	2
403		12	max	.005	3	-.019	15	.253	5	7.818e-3	2	NC	1	NC	4
404			min	-.002	2	-.208	1	-.145	2	-3.554e-3	3	NC	1	419.856	2
405		13	max	.005	3	-.02	15	.273	5	8.299e-3	2	NC	1	NC	4
406			min	-.003	2	-.227	1	-.139	2	-3.786e-3	3	NC	1	434.468	2
407		14	max	.005	3	-.022	15	.293	5	8.78e-3	2	NC	1	NC	4
408			min	-.003	2	-.245	1	-.129	2	-4.017e-3	3	NC	1	466.157	2
409		15	max	.006	3	-.023	15	.312	5	9.261e-3	2	NC	1	NC	4
410			min	-.004	2	-.263	1	-.113	2	-4.249e-3	3	NC	1	479.554	14
411		16	max	.006	3	-.025	15	.33	5	9.741e-3	2	NC	1	NC	4
412			min	-.005	2	-.28	1	-.092	2	-4.48e-3	3	NC	1	431.403	14
413		17	max	.006	3	-.026	15	.347	5	1.022e-2	2	NC	1	NC	4
414			min	-.005	2	-.298	1	-.065	2	-4.712e-3	3	NC	1	389.49	14
415		18	max	.006	3	-.028	15	.364	5	1.07e-2	2	NC	1	NC	4
416			min	-.006	2	-.316	1	-.031	2	-4.943e-3	3	NC	1	352.768	14
417		19	max	.006	3	-.029	15	.384	4	1.118e-2	2	NC	1	NC	1
418			min	-.006	2	-.334	1	0	3	-5.175e-3	3	NC	1	320.417	14
419	M6	1	max	.011	1	0	15	.004	4	0	1	NC	1	NC	1
420			min	0	15	-.006	1	0	1	-1.988e-3	4	NC	1	NC	1
421		2	max	.01	1	-.002	15	.029	4	0	1	NC	1	NC	1
422			min	0	15	-.045	1	0	1	-2.047e-3	4	NC	1	NC	1
423		3	max	.008	1	-.003	15	.053	4	0	1	NC	1	NC	1
424			min	0	15	-.084	1	0	1	-2.106e-3	4	NC	1	9167.504	4
425		4	max	.008	3	-.004	15	.078	4	0	1	NC	1	NC	1
426			min	0	15	-.123	1	0	1	-2.164e-3	4	NC	1	6073.58	4
427		5	max	.008	3	-.006	15	.102	4	0	1	NC	1	NC	1
428			min	0	15	-.162	1	0	1	-2.223e-3	4	NC	1	4572.036	4
429		6	max	.009	3	-.007	15	.127	4	0	1	NC	1	NC	1
430			min	0	10	-.201	1	0	1	-2.282e-3	4	NC	1	3707.611	4
431		7	max	.01	3	-.008	15	.151	4	0	1	NC	1	NC	1
432			min	-.002	2	-.239	1	0	1	-2.34e-3	4	NC	1	3163.721	4
433		8	max	.01	3	-.009	15	.174	4	0	1	NC	1	NC	1
434			min	-.003	2	-.278	1	0	1	-2.399e-3	4	NC	1	2806.504	4
435		9	max	.011	3	-.011	15	.198	4	0	1	NC	1	NC	1
436			min	-.005	2	-.317	1	0	1	-2.458e-3	4	NC	1	2571.1	4
437		10	max	.012	3	-.012	15	.22	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	-.007	2	-.355	1	0	1	-2.516e-3	4	NC	1	2424.126	4
439		11	max	.013	3	-.013	15	.242	4	0	1	NC	1	NC	1
440			min	-.008	2	-.394	1	0	1	-2.575e-3	4	NC	1	2349.278	4
441		12	max	.013	3	-.014	15	.263	4	0	1	NC	1	NC	1
442			min	-.01	2	-.432	1	0	1	-2.634e-3	4	NC	1	2341.871	4
443		13	max	.014	3	-.015	15	.284	4	0	1	NC	1	NC	1
444			min	-.012	2	-.47	1	0	1	-2.692e-3	4	NC	1	2408.255	4
445		14	max	.015	3	-.016	15	.303	4	0	1	NC	1	NC	1
446			min	-.014	2	-.508	1	0	1	-2.751e-3	4	NC	1	2570.24	4
447		15	max	.016	3	-.017	15	.321	4	0	1	NC	1	NC	1
448			min	-.015	2	-.546	1	0	1	-2.81e-3	4	NC	1	2879.727	4
449		16	max	.016	3	-.018	15	.339	4	0	1	NC	1	NC	1
450			min	-.017	2	-.584	1	0	1	-2.868e-3	4	NC	1	3465.109	4
451		17	max	.017	3	-.019	15	.355	4	0	1	NC	1	NC	1
452			min	-.019	2	-.622	1	0	1	-2.927e-3	4	NC	1	4719.022	4
453		18	max	.018	3	-.02	15	.37	4	0	1	NC	1	NC	1
454			min	-.02	2	-.66	1	0	1	-2.986e-3	4	NC	1	8615.081	4
455		19	max	.019	3	-.021	15	.384	4	0	1	NC	1	NC	1
456			min	-.022	2	-.698	1	0	1	-3.044e-3	4	NC	1	NC	1
457	M9	1	max	.006	1	0	5	.004	4	1.007e-3	3	NC	1	NC	1
458			min	0	5	-.003	1	0	3	-2.53e-3	2	NC	1	NC	1
459		2	max	.005	1	0	5	.031	4	1.239e-3	3	NC	1	NC	4
460			min	0	5	-.022	1	-.011	3	-3.011e-3	2	NC	1	2858.678	2
461		3	max	.005	1	0	5	.058	4	1.47e-3	3	NC	1	NC	15
462			min	0	5	-.041	1	-.02	3	-3.492e-3	2	NC	1	1445.911	2
463		4	max	.004	1	0	5	.085	4	1.702e-3	3	NC	1	8481.754	15
464			min	0	5	-.06	1	-.029	3	-3.973e-3	2	NC	1	981.193	2
465		5	max	.004	1	0	5	.111	4	1.934e-3	3	NC	1	6388.4	15
466			min	0	5	-.079	1	-.038	3	-4.453e-3	2	NC	1	753.986	2
467		6	max	.004	3	0	5	.137	4	2.165e-3	3	NC	1	5182.866	15
468			min	0	5	-.097	1	-.046	3	-4.934e-3	2	NC	1	622.377	2
469		7	max	.004	3	.001	5	.163	4	2.397e-3	3	NC	1	4424.128	15
470			min	0	5	-.116	1	-.052	3	-5.415e-3	2	NC	1	539.277	2
471		8	max	.004	3	.002	5	.188	4	2.628e-3	3	NC	1	3925.687	15
472			min	0	5	-.135	1	-.058	3	-5.896e-3	2	NC	1	484.769	2
473		9	max	.004	3	.002	5	.212	4	2.86e-3	3	NC	1	3597.172	15
474			min	0	10	-.153	1	-.063	3	-6.376e-3	2	NC	1	449.227	2
475		10	max	.005	3	.002	5	.235	4	3.091e-3	3	NC	1	3392.076	15
476			min	-.001	2	-.172	1	-.066	3	-6.857e-3	2	NC	1	427.762	2
477		11	max	.005	3	.003	5	.257	4	3.323e-3	3	NC	1	3287.699	15
478			min	-.002	2	-.19	1	-.067	3	-7.338e-3	2	NC	1	418.108	2
479		12	max	.005	3	.003	5	.277	4	3.554e-3	3	NC	1	3277.553	15
480			min	-.002	2	-.208	1	-.067	3	-7.818e-3	2	NC	1	419.856	2
481		13	max	.005	3	.004	5	.297	4	3.786e-3	3	NC	1	3370.561	15
482			min	-.003	2	-.227	1	-.064	3	-8.299e-3	2	NC	1	434.468	2
483		14	max	.005	3	.004	5	.315	4	4.017e-3	3	NC	1	3597.263	15
484			min	-.003	2	-.245	1	-.06	3	-8.78e-3	2	NC	1	466.157	2
485		15	max	.006	3	.005	5	.331	4	4.249e-3	3	NC	1	4030.286	15
486			min	-.004	2	-.263	1	-.053	3	-9.261e-3	2	NC	1	524.615	2
487		16	max	.006	3	.006	5	.346	4	4.48e-3	3	NC	1	4849.265	15
488			min	-.005	2	-.28	1	-.044	3	-9.741e-3	2	NC	1	633.581	2
489		17	max	.006	3	.006	5	.358	4	4.712e-3	3	NC	1	6603.517	15
490			min	-.005	2	-.298	1	-.032	3	-1.022e-2	2	NC	1	865.423	2
491		18	max	.006	3	.007	5	.369	4	4.943e-3	3	NC	1	NC	15
492			min	-.006	2	-.316	1	-.017	3	-1.07e-2	2	9077.607	5	1583.619	2
493		19	max	.006	3	.008	5	.378	5	5.175e-3	3	NC	1	NC	1
494			min	-.006	2	-.334	1	-.013	1	-1.118e-2	2	8235.848	5	NC	1