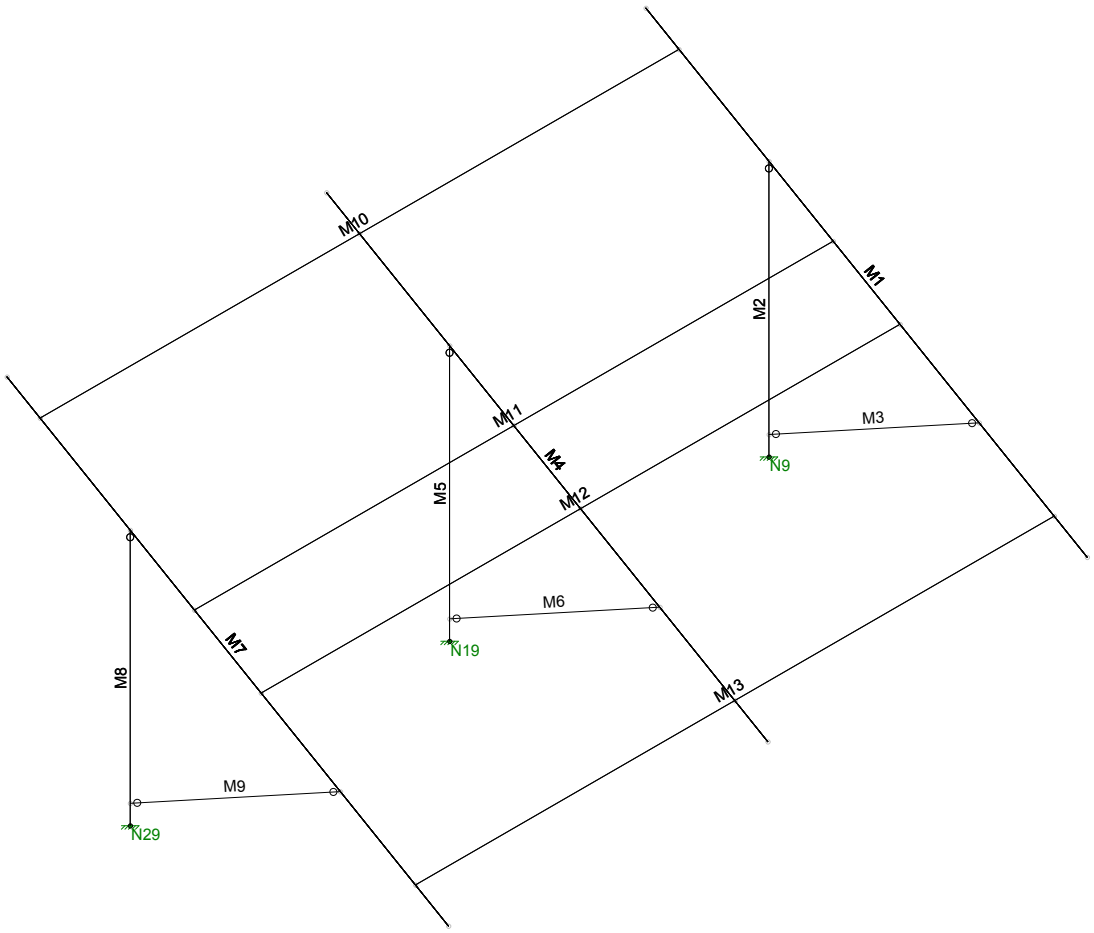


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

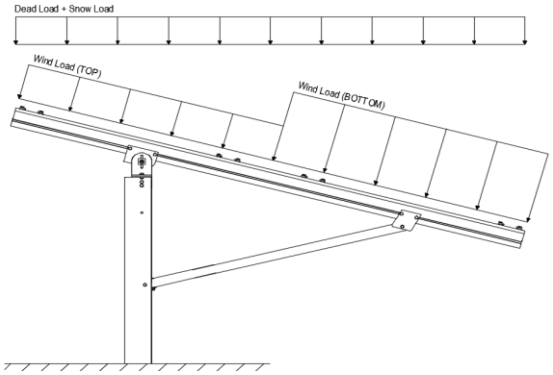
1.2 Construction

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

PV modules are required to meet the following specifications:

	Maximum		Minimum
Height =	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 =	30°
Maximum Height Above Grade =	3 ft



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	16.49	psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00		
C_s =	0.73		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	160	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	40.19	psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.15	*(Pressure)*	*Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.*
$Cf+_{BOTTOM}$ =	1.85		
$Cf-_{TOP}$ =	-2.3	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1.1		

2.4 Seismic Loads

S_S =	2.50	R =	1.25	*ASCE 7, Section 12.8.1.3: A maximum S_s of 1.5 may be used to calculate the base shear, C_s, of structures under five stories and with a period, T, of 0.5 or less. Therefore, a S_{ds} of 1.0 was used to calculate C_s.*
S_{DS} =	1.67	C_S =	0.8	
S_1 =	1.00	ρ =	1.3	
S_{D1} =	1.00	Ω =	1.25	
T_a =	0.08	C_d =	1.25	

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

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

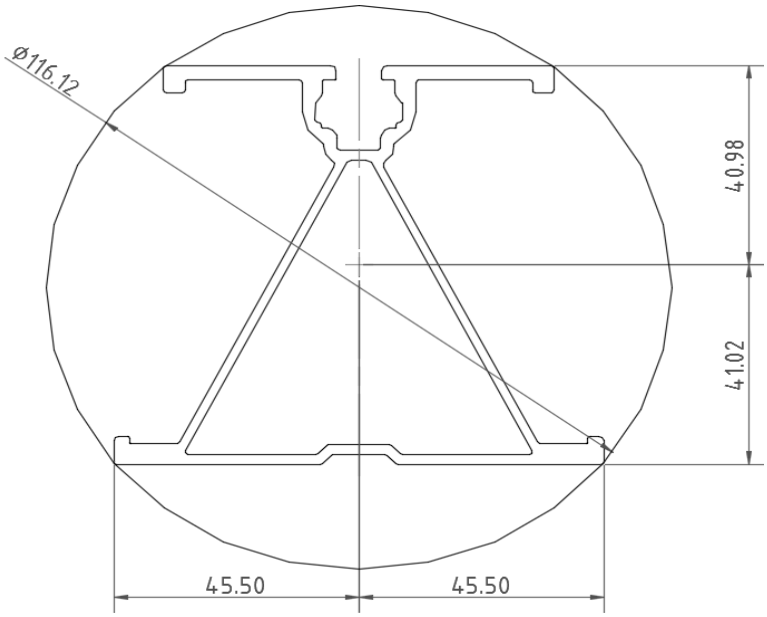
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	84	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 =	1.392	k-ft
M_z =	0.116	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	60%	

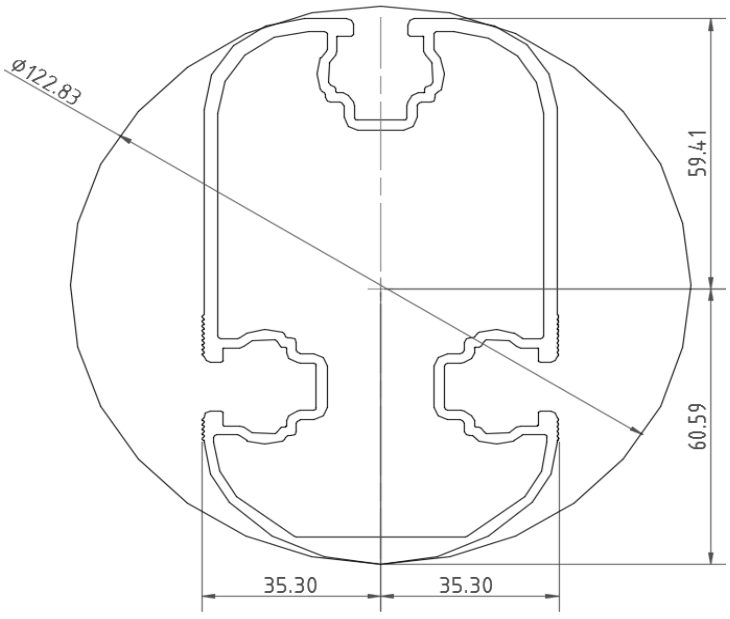


DETAIL VIEW

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 =	4.392	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 =	87%	

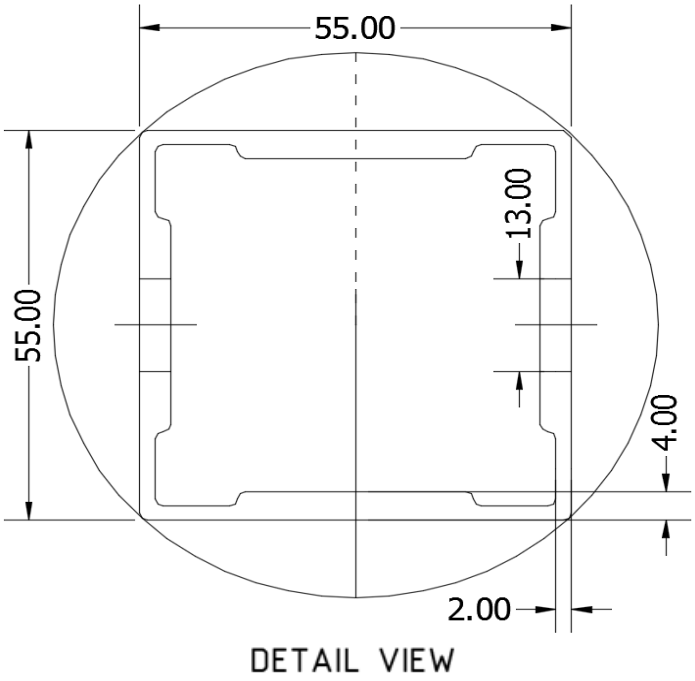


DETAIL VIEW

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).

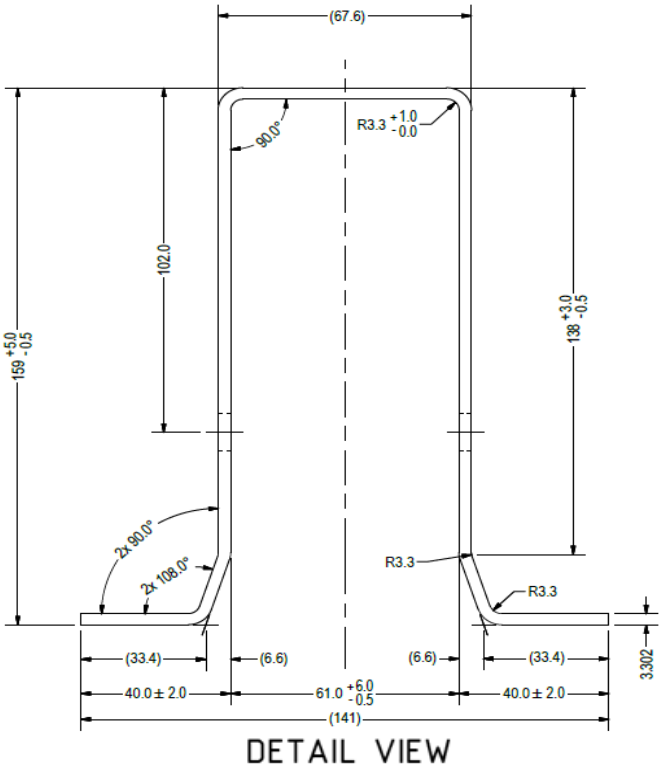
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	4.337	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	33%	



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 =	79.31	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	13.136	k-ft
M_z =	0.000	k-ft
P_r =	-5.348	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	81%	



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 =	6.91	k
Maximum Lateral Load =	3.89	k

5.2 Design of Drilled Shaft Foundations

The galvanized steel post is to be embedded into a cylindrical drilled shaft foundation. For the purpose of design, the post is considered to be fixed to the ground. The applicable lateral force, uplift, and compression resistance checks are seen below.

5.3 Lateral Force Resistance

The equivalent lateral force is applied at the top of the post to determine the required embedment depth. A lateral soil bearing capacity for clay is assumed. Footing is unrestrained at ground level. (IBC, Eq. 18-1)

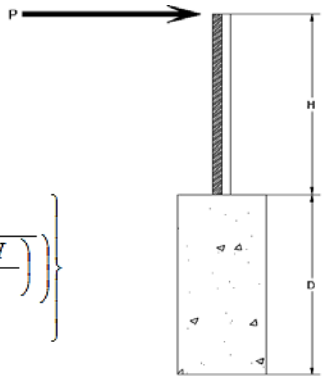
Lateral Force @ Top of Pole, P =	0.84	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.84	k
Height of Pole Above Grade, H =	6.61	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 =	4.54		
Required Footing Depth, D =	8.42	ft	
2nd Trial @ D_2 =	5.84	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf	
Lateral Soil Bearing @ D, S_3 =	1.17	ksf	
Constant 2.34P/(S_1B), A =	2.53		
Required Footing Depth, D =	5.71	ft	
3rd Trial @ D_3 =	5.77	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.38	ksf	
Lateral Soil Bearing @ D, S_3 =	1.15	ksf	
Constant 2.34P/(S_1B), A =	2.55		
Required Footing Depth, D =	5.75	ft	
4th Trial @ D_4 =	5.76	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.38	ksf	
Lateral Soil Bearing @ D, S_3 =	1.15	ksf	
Constant 2.34P/(S_1B), A =	2.56		
Required Footing Depth, D =	5.76	ft	
5th Trial @ D_5 =	5.76	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.38	ksf	
Lateral Soil Bearing @ D, S_3 =	1.15	ksf	
Constant 2.34P/(S_1B), A =	2.56		
Required Footing Depth, D =	6.00	ft	

A 2ft diameter x 6ft deep footing unrestrained at ground level is required for the racking structure.

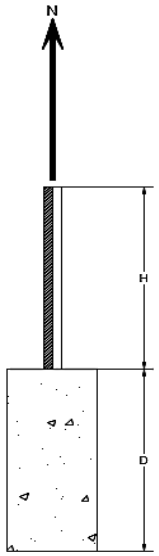
5.4 Uplifting Force Resistance

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 =	3.18	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	6.56
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	4.59
24	0	0.0	0.00	4.59
25	0	0.0	0.00	4.59
26	0	0.0	0.00	4.59
27	0	0.0	0.00	4.59
28	0	0.0	0.00	4.59
29	0	0.0	0.00	4.59
30	0	0.0	0.00	4.59
31	0	0.0	0.00	4.59
32	0	0.0	0.00	4.59
33	0	0.0	0.00	4.59
34	0	0.0	0.00	4.59
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 =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.50	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	18.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

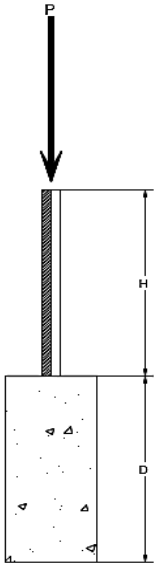
Weight of Concrete

Footing Volume	18.85	ft^3
Weight	2.73	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.83	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.05	k
Applied Force =	6.23	k
Utilization =	62%	

A 2ft diameter footing passes at a depth of 6ft.



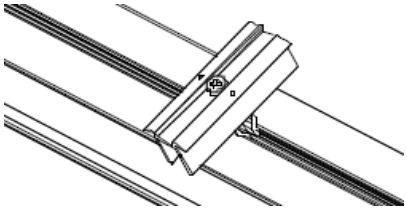
6. DESIGN OF JOINTS AND CONNECTIONS

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.

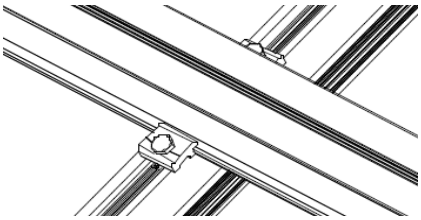
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.873 k
Allowable Uplift	=	1.214 k
Utilization	=	72%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.189 k
Allowable Uplift	=	2.180 k
Utilization	=	100%

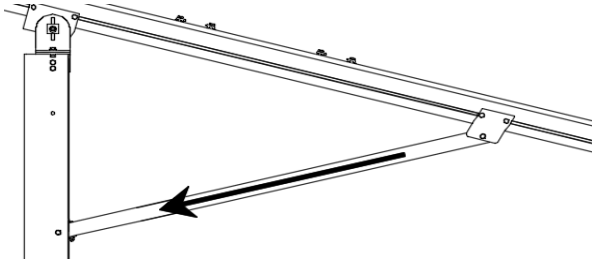


6.2 Strut Connections

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	=	4.337 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	49%

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

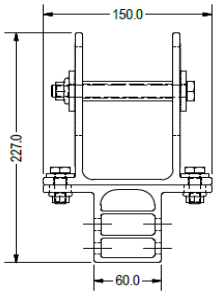


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

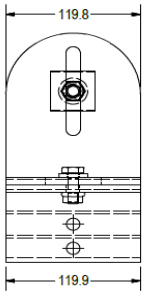
6.3 Girder to Post Connection

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.

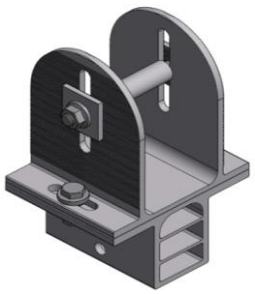
Maximum Tensile Load	=	4.612 k
Allowable Load	=	5.649 k
Utilization	=	82%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

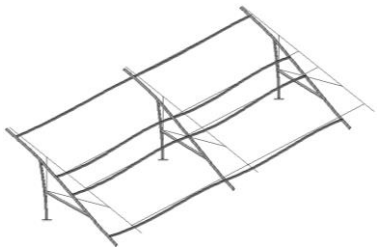
7.1 Seismic Drift

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}	=	74.11 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.482 in
Max Drift, Δ_{MAX}	=	0.454 in

0.454 ≤ 1.482, 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 =	84 in	L_b =	84
J =	0.432	J =	0.432
	232.383		147.782
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	28.4 ksi	φF_L=	29.4
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

b/t = 32.195
S1 = 12.21 (See 3.4.16 above for formula)
S2 = 32.70 (See 3.4.16 above for formula)
φF_L = φc[Bp-1.6Dp*b/t]
φF_L = 25.1 ksi

b/t = 37.0588
S1 = 12.21
S2 = 32.70
φF_L = (φck2*√(BpE))/(1.6b/t)
φF_L = 21.9 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87
S2 = 131.3
φF_L = φyFcy
φF_L = 33.25 ksi

φF_L = 21.94 ksi
A = 1215.13 mm^2
1.88 in^2
P_{max} = 41.32 kips

A.2 Design of Aluminum Girders - Aluminum Design Manual, 2005 Edition

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= φb[Bt-Dt*√(Rb/t)]

φF_L= 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

3.4.18

h/t = 4.5

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

S1 = 36.9

m = 0.65

C_0 = 35

Cc = 35

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

$\varphi F_L St$= 30.5 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

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

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 mm^4

1.833 in^4

x = 35 mm

Sy = 1.330 in^3

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

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

φF_L = 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	79.31 in	
Pr =	-5.35 k	(LRFD Factored Load)
Mr (Strong) =	13.14 k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00 k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	114.11		
4.71√(E/Fy) =	103.55 =>	kL/r	> 4.71√(E/Fy)
Fcr =	19.28 ksi		
Fe =	21.98 ksi		
Pn =	42.988 k		

Torsional/Flexural Torsional Buckling:

Fcr =	14.4957 ksi
Fey =	56.0686 ksi
Fez =	18.5443 ksi
Pn =	32.3254 k

Bending (Strong Axis):

Yielding:				
Mn =	21.95 k-ft			
Flange Local Buckling:				
Mn =	19.207 k-ft			
Pr/Pc =	0.1244 <	0.2		
Utilization =	0.81 <	1.0	OK	

Bending (Weak Axis):

Yielding:				
Mn =	14.65 k-ft			
Flange Local Buckling:				
Mn =	14.39 k-ft			
Pr/Pc =	0.124 <	0.2		
Utilization =	0.00 <	1.0	OK	

Combined Forces

Utilization = 81%

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	-39.836	-39.836	0	0
2	M11	Y	-39.836	-39.836	0	0
3	M12	Y	-39.836	-39.836	0	0
4	M13	Y	-39.836	-39.836	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	-128.904	-128.904	0	0
2	M11	y	-128.904	-128.904	0	0
3	M12	y	-207.368	-207.368	0	0
4	M13	y	-207.368	-207.368	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	257.809	257.809	0	0
2	M11	y	257.809	257.809	0	0
3	M12	y	123.3	123.3	0	0
4	M13	y	123.3	123.3	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	855.847	2	2150.882	2	136.719	2	.18	2	.013	5	3.954	3
2		min	-1181.119	3	-1721.022	3	-261.899	5	-1.099	5	-.01	2	.481	15
3	N19	max	2996.115	2	5901.104	2	0	3	0	12	.014	4	6.82	3
4		min	-2973.289	3	-5296.741	3	-277.93	5	-1.142	4	0	1	.208	15
5	N29	max	855.847	2	2150.882	2	178.046	3	.267	3	.014	4	3.954	3
6		min	-1181.119	3	-1721.022	3	-281.071	4	-1.136	4	-.004	3	-.265	5
7	Totals:	max	4707.808	2	10202.869	2	0	3						
8		min	-5335.526	3	-8738.784	3	-808.885	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.007	2	.001	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-.261	15	-.452	15	0	12	0	1	0	12	0	6
4			min	-1.11	4	-1.922	6	-1.499	5	0	1	0	5	0	15
5		3	max	-19.363	12	325.294	3	-17.191	12	.049	3	.149	1	.304	2
6			min	-146.494	1	-695.265	2	-86.024	1	-.172	2	.033	10	-.14	3
7		4	max	-19.795	12	324.17	3	-17.191	12	.049	3	.095	1	.736	2
8			min	-147.359	1	-696.763	2	-86.024	1	-.172	2	.018	10	-.342	3
9		5	max	-20.228	12	323.046	3	-17.191	12	.049	3	.046	4	1.169	2
10			min	-148.225	1	-698.262	2	-86.024	1	-.172	2	.003	10	-.543	3
11		6	max	268.83	3	588.504	2	-6.49	12	.015	2	.062	2	1.13	2
12			min	-863.322	2	-176.077	3	-116.846	1	-.034	3	-.022	3	-.56	3
13		7	max	268.181	3	587.006	2	-6.49	12	.015	2	.004	10	.766	2
14			min	-864.187	2	-177.201	3	-116.846	1	-.034	3	-.052	4	-.45	3
15		8	max	267.532	3	585.507	2	-6.49	12	.015	2	-.021	12	.402	2
16			min	-865.052	2	-178.325	3	-116.846	1	-.034	3	-.094	1	-.34	3
17		9	max	234.48	3	115.435	3	-13.286	12	.014	5	.061	1	.186	2
18			min	-942.65	2	-61.299	2	-134.375	1	-.11	2	.006	10	-.293	3
19		10	max	233.831	3	114.311	3	-13.286	12	.014	5	.034	3	.225	2
20			min	-943.515	2	-62.798	2	-134.375	1	-.11	2	-.028	2	-.364	3
21		11	max	233.182	3	113.187	3	-13.286	12	.014	5	.021	3	.264	2
22			min	-944.381	2	-64.296	2	-134.375	1	-.11	2	-.105	1	-.435	3
23		12	max	195.588	3	839.441	3	68.961	2	.212	3	.088	1	.474	2
24			min	-1034.052	1	-485.141	2	-226.335	3	-.161	2	-.019	5	-.79	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	194.939	3	838.317	3	68.961	2	.212	3	.095	1	.776	2
26			min	-1034.917	1	-486.64	2	-226.335	3	-.161	2	-.11	5	-1.31	3
27		14	max	148.684	1	466.211	2	52.424	5	.155	2	.073	3	1.065	2
28			min	6.036	15	-783.542	3	-66.211	3	-.337	3	-.119	4	-1.808	3
29		15	max	147.819	1	464.713	2	50.924	5	.155	2	.032	3	.776	2
30			min	5.775	15	-784.666	3	-66.211	3	-.337	3	-.096	4	-1.321	3
31		16	max	146.954	1	463.214	2	49.424	5	.155	2	-.006	12	.488	2
32			min	5.514	15	-785.79	3	-66.211	3	-.337	3	-.118	1	-.834	3
33		17	max	146.088	1	461.716	2	47.925	5	.155	2	-.014	15	.201	2
34			min	5.253	15	-786.914	3	-66.211	3	-.337	3	-.158	1	-.346	3
35		18	max	1.11	6	1.923	6	1.5	4	0	1	0	12	0	6
36			min	.261	15	.452	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.003	2	0	1	0	1	0	1	0	1
38			min	0	1	-.007	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.015	2	.001	4	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	4
42			min	-1.11	4	-1.921	4	-1.499	5	0	1	0	5	0	15
43		3	max	20.196	3	1003.919	3	0	1	.031	4	.149	4	.726	2
44			min	-241.269	1	-1903.372	2	-73.107	5	0	1	0	1	-.387	3
45		4	max	19.548	3	1002.795	3	0	1	.031	4	.103	4	1.908	2
46			min	-242.135	1	-1904.87	2	-74.606	5	0	1	0	1	-1.01	3
47		5	max	18.899	3	1001.671	3	0	1	.031	4	.057	4	3.09	2
48			min	-243	1	-1906.369	2	-76.106	5	0	1	0	1	-1.632	3
49		6	max	1134.453	3	1799.716	2	0	1	0	1	0	1	2.913	2
50			min	-2355.354	2	-822.286	3	-66.565	4	-.024	4	-.021	5	-1.585	3
51		7	max	1133.805	3	1798.218	2	0	1	0	1	0	1	1.797	2
52			min	-2356.22	2	-823.41	3	-68.064	4	-.024	4	-.062	4	-1.074	3
53		8	max	1133.156	3	1796.719	2	0	1	0	1	0	1	.681	2
54			min	-2357.085	2	-824.534	3	-69.564	4	-.024	4	-.105	4	-.563	3
55		9	max	1159.802	3	241.256	3	0	1	.01	4	.074	4	.033	1
56			min	-2426.818	2	-213.521	2	-151.564	4	0	1	0	1	-.295	3
57		10	max	1159.153	3	240.132	3	0	1	.01	4	0	1	.145	1
58			min	-2427.683	2	-215.02	2	-153.064	4	0	1	-.021	4	-.444	3
59		11	max	1158.504	3	239.008	3	0	1	.01	4	0	1	.279	2
60			min	-2428.548	2	-216.518	2	-154.564	4	0	1	-.116	4	-.593	3
61		12	max	1194.235	3	2319.6	3	0	1	.112	4	0	1	.947	2
62			min	-2506.029	2	-1580.213	2	-160.372	4	0	1	-.006	4	-1.572	3
63		13	max	1193.586	3	2318.476	3	0	1	.112	4	0	1	1.928	2
64			min	-2506.895	2	-1581.712	2	-161.872	4	0	1	-.106	4	-3.012	3
65		14	max	244.677	1	1281.319	2	51.921	5	0	1	0	1	2.871	2
66			min	-18.768	3	-1960.73	3	0	1	-.075	4	-.097	5	-4.392	3
67		15	max	243.812	1	1279.82	2	50.421	5	0	1	0	1	2.076	2
68			min	-19.417	3	-1961.854	3	0	1	-.075	4	-.065	5	-3.175	3
69		16	max	242.946	1	1278.322	2	48.922	5	0	1	0	1	1.283	2
70			min	-20.066	3	-1962.978	3	0	1	-.075	4	-.034	5	-1.957	3
71		17	max	242.081	1	1276.823	2	47.422	5	0	1	0	1	.49	2
72			min	-20.715	3	-1964.102	3	0	1	-.075	4	-.004	4	-.738	3
73		18	max	1.11	6	1.924	6	1.5	5	0	1	0	1	0	6
74			min	.261	15	.452	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.008	2	0	1	0	1	0	1	0	1
76			min	0	1	-.015	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.007	2	.002	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	4
80			min	-1.11	4	-1.922	4	-1.499	5	0	1	0	5	0	15
81		3	max	16.21	5	325.294	3	86.024	1	.172	2	.074	5	.304	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	-146.494	1	-695.265	2	-34.389	5	-.049	3	-.149	1	-.14	3
83		4	max	15.807	5	324.17	3	86.024	1	.172	2	.052	5	.736	2
84			min	-147.359	1	-696.763	2	-35.889	5	-.049	3	-.095	1	-.342	3
85		5	max	15.403	5	323.046	3	86.024	1	.172	2	.03	5	1.169	2
86			min	-148.225	1	-698.262	2	-37.389	5	-.049	3	-.042	1	-.543	3
87		6	max	268.83	3	588.504	2	116.846	1	.034	3	.022	3	1.13	2
88			min	-863.322	2	-176.077	3	-27.16	5	-.02	4	-.062	2	-.56	3
89		7	max	268.181	3	587.006	2	116.846	1	.034	3	.028	3	.766	2
90			min	-864.187	2	-177.201	3	-28.659	5	-.02	4	-.041	5	-.45	3
91		8	max	267.532	3	585.507	2	116.846	1	.034	3	.094	1	.402	2
92			min	-865.052	2	-178.325	3	-30.159	5	-.02	4	-.059	5	-.34	3
93		9	max	234.48	3	115.435	3	134.375	1	.11	2	.023	5	.186	2
94			min	-942.65	2	-61.299	2	-60.859	5	.011	15	-.061	1	-.293	3
95		10	max	233.831	3	114.311	3	134.375	1	.11	2	.028	2	.225	2
96			min	-943.515	2	-62.798	2	-62.359	5	.011	15	-.034	3	-.364	3
97		11	max	233.182	3	113.187	3	134.375	1	.11	2	.105	1	.264	2
98			min	-944.381	2	-64.296	2	-63.858	5	.011	15	-.054	5	-.435	3
99		12	max	195.588	3	839.441	3	226.335	3	.161	2	-.021	15	.474	2
100			min	-1034.052	1	-485.141	2	-141.585	5	-.212	3	-.088	1	-.79	3
101		13	max	194.939	3	838.317	3	226.335	3	.161	2	.105	3	.776	2
102			min	-1034.917	1	-486.64	2	-143.085	5	-.212	3	-.134	4	-1.31	3
103		14	max	148.684	1	466.211	2	76.804	4	.337	3	.046	2	1.065	2
104			min	9.673	15	-783.542	3	8.051	10	-.155	2	-.112	5	-1.808	3
105		15	max	147.819	1	464.713	2	75.305	4	.337	3	.078	1	.776	2
106			min	9.412	15	-784.666	3	8.051	10	-.155	2	-.074	5	-1.321	3
107		16	max	146.954	1	463.214	2	73.805	4	.337	3	.118	1	.488	2
108			min	9.151	15	-785.79	3	8.051	10	-.155	2	-.037	5	-.834	3
109		17	max	146.088	1	461.716	2	72.305	4	.337	3	.158	1	.201	2
110			min	8.89	15	-786.914	3	8.051	10	-.155	2	0	15	-.346	3
111		18	max	1.11	6	1.924	4	1.5	5	0	1	0	1	0	4
112			min	.261	15	.452	15	0	1	0	1	0	5	0	15
113		19	max	0	1	.003	2	0	15	0	1	0	1	0	1
114			min	0	1	-.007	3	0	1	0	1	0	1	0	1
115	M10	1	max	69.323	4	458.465	2	-8.371	15	.014	2	.183	1	.155	2
116			min	8.05	10	-789.09	3	-144.44	1	-.028	3	.015	15	-.337	3
117		2	max	66.22	3	336.812	2	-6.982	15	.014	2	.083	1	.2	3
118			min	8.05	10	-592.181	3	-115.048	1	-.028	3	.009	15	-.154	2
119		3	max	66.22	3	215.159	2	-5.592	15	.014	2	.034	3	.584	3
120			min	8.05	10	-395.272	3	-85.655	1	-.028	3	-.004	9	-.368	2
121		4	max	66.22	3	93.506	2	-4.203	15	.014	2	.015	3	.815	3
122			min	8.05	10	-198.364	3	-56.263	1	-.028	3	-.051	1	-.489	2
123		5	max	66.22	3	12.992	5	-2.813	15	.014	2	-.002	12	.893	3
124			min	8.05	10	-28.146	2	-26.87	1	-.028	3	-.083	1	-.514	2
125		6	max	66.22	3	195.453	3	5.491	9	.014	2	-.004	15	.818	3
126			min	8.05	10	-149.799	2	-19.433	3	-.028	3	-.092	1	-.445	2
127		7	max	66.22	3	392.362	3	31.915	1	.014	2	-.004	15	.589	3
128			min	4.198	15	-271.452	2	-17.349	3	-.028	3	-.079	1	-.281	2
129		8	max	66.22	3	589.271	3	61.308	1	.014	2	-.004	15	.207	3
130			min	-1.534	5	-393.104	2	-15.265	3	-.028	3	-.046	3	-.022	2
131		9	max	66.22	3	786.179	3	90.7	1	.014	2	.022	9	.331	2
132			min	-9.518	5	-514.757	2	-13.181	3	-.028	3	-.057	3	-.328	3
133		10	max	66.22	3	636.41	2	82.811	9	.014	2	.098	1	.778	2
134			min	8.05	10	-983.088	3	-120.093	1	-.028	3	-.066	3	-1.016	3
135		11	max	66.22	3	514.757	2	13.181	3	.028	3	.022	9	.331	2
136			min	8.05	10	-786.179	3	-90.7	1	-.014	2	-.057	3	-.328	3
137		12	max	66.22	3	393.104	2	15.265	3	.028	3	.001	5	.207	3
138			min	7.247	15	-589.271	3	-61.308	1	-.014	2	-.046	3	-.022	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
139		13	max	66.22	3	271.452	2	17.349	3	.028	3	-.002	15	.589	3
140			min	1.873	15	-392.362	3	-31.915	1	-.014	2	-.079	1	-.281	2
141		14	max	66.22	3	149.799	2	19.433	3	.028	3	-.005	15	.818	3
142			min	-5.008	5	-195.453	3	-5.946	14	-.014	2	-.092	1	-.445	2
143		15	max	66.22	3	28.146	2	26.87	1	.028	3	-.002	12	.893	3
144			min	-12.992	5	1.048	12	-1.163	5	-.014	2	-.083	1	-.514	2
145		16	max	66.22	3	198.364	3	56.263	1	.028	3	.015	3	.815	3
146			min	-20.976	5	-93.506	2	.563	15	-.014	2	-.051	1	-.489	2
147		17	max	66.22	3	395.272	3	85.655	1	.028	3	.034	3	.584	3
148			min	-28.96	5	-215.159	2	1.953	15	-.014	2	-.009	4	-.368	2
149		18	max	66.22	3	592.181	3	115.048	1	.028	3	.083	1	.2	3
150			min	-36.944	5	-336.812	2	3.342	15	-.014	2	-.004	5	-.154	2
151		19	max	66.22	3	789.09	3	144.44	1	.028	3	.183	1	.155	2
152			min	-44.928	5	-458.465	2	4.732	15	-.014	2	0	15	-.337	3
153	M11	1	max	151.217	2	417.537	2	19.662	5	0	15	.218	1	.089	4
154			min	-205.584	3	-727.891	3	-151.914	1	-.004	1	-.094	5	-.3	3
155		2	max	151.217	2	295.884	2	21.811	5	0	15	.111	1	.19	3
156			min	-205.584	3	-530.983	3	-122.522	1	-.004	1	-.078	5	-.226	2
157		3	max	151.217	2	174.232	2	23.961	5	0	15	.055	3	.526	3
158			min	-205.584	3	-334.074	3	-93.129	1	-.004	1	-.06	5	-.409	2
159		4	max	151.217	2	52.579	2	26.11	5	0	15	.031	3	.709	3
160			min	-205.584	3	-137.166	3	-63.737	1	-.004	1	-.05	4	-.497	2
161		5	max	151.217	2	59.743	3	28.26	5	0	15	.008	3	.739	3
162			min	-205.584	3	-69.074	2	-34.344	1	-.004	1	-.072	1	-.491	2
163		6	max	151.217	2	256.652	3	30.735	4	0	15	.004	5	.616	3
164			min	-205.584	3	-190.727	2	-26.245	3	-.004	1	-.087	1	-.39	2
165		7	max	151.217	2	453.56	3	39.745	4	0	15	.028	5	.34	3
166			min	-205.584	3	-312.379	2	-24.161	3	-.004	1	-.079	1	-.194	2
167		8	max	151.217	2	650.469	3	53.834	1	0	15	.054	5	.096	2
168			min	-205.584	3	-434.032	2	-22.077	3	-.004	1	-.051	3	-.089	3
169		9	max	151.217	2	847.377	3	83.226	1	0	15	.087	4	.481	2
170			min	-205.584	3	-555.685	2	-19.993	3	-.004	1	-.067	3	-.672	3
171		10	max	151.217	2	1044.286	3	21.642	5	.004	1	.136	4	.961	2
172			min	-205.584	3	25.699	15	-112.619	1	-.003	3	-.082	3	-1.407	3
173		11	max	151.217	2	555.685	2	23.791	5	.004	1	.015	9	.481	2
174			min	-205.584	3	-847.377	3	-83.226	1	0	5	-.079	5	-.672	3
175		12	max	151.217	2	434.032	2	25.941	5	.004	1	-.02	10	.096	2
176			min	-205.584	3	-650.469	3	-53.834	1	0	5	-.068	4	-.089	3
177		13	max	151.217	2	312.379	2	28.09	5	.004	1	-.019	10	.34	3
178			min	-205.584	3	-453.56	3	-24.441	1	0	5	-.079	1	-.194	2
179		14	max	151.217	2	190.727	2	30.24	5	.004	1	-.008	12	.616	3
180			min	-205.584	3	-256.652	3	-.689	9	0	5	-.087	1	-.39	2
181		15	max	151.217	2	69.074	2	39.067	4	.004	1	.009	5	.739	3
182			min	-205.584	3	-59.743	3	10.552	10	0	5	-.072	1	-.491	2
183		16	max	151.217	2	137.166	3	63.737	1	.004	1	.035	5	.709	3
184			min	-205.584	3	-52.579	2	14.39	10	0	5	-.034	1	-.497	2
185		17	max	151.217	2	334.074	3	93.129	1	.004	1	.067	4	.526	3
186			min	-205.584	3	-174.232	2	18.228	10	0	5	.011	9	-.409	2
187		18	max	151.217	2	530.983	3	122.522	1	.004	1	.114	4	.19	3
188			min	-205.584	3	-295.884	2	21.473	12	0	5	.03	10	-.226	2
189		19	max	151.217	2	727.891	3	151.914	1	.004	1	.218	1	.053	1
190			min	-205.584	3	-417.537	2	22.863	12	0	5	.048	10	-.3	3
191	M12	1	max	29.142	5	643.661	2	23.971	5	0	15	.231	1	.124	2
192			min	-20.534	9	-295.307	3	-154.838	1	-.003	1	-.108	5	.015	9
193		2	max	21.158	5	460.981	2	26.12	5	0	15	.122	1	.247	3
194			min	-20.534	9	-203.017	3	-125.445	1	-.003	1	-.089	5	-.305	2
195		3	max	14.938	2	278.301	2	28.27	5	0	15	.042	3	.369	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	-20.534	9	-110.726	3	-96.053	1	-.003	1	-.068	5	-.593	2
197		4	max	14.938	2	95.62	2	30.419	5	0	15	.021	3	.42	3
198			min	-20.534	9	-18.436	3	-66.66	1	-.003	1	-.053	4	-.738	2
199		5	max	14.938	2	73.855	3	32.569	5	0	15	.002	3	.398	3
200			min	-20.534	9	-87.06	2	-37.268	1	-.003	1	-.067	1	-.741	2
201		6	max	14.938	2	166.145	3	34.771	4	0	15	.006	5	.305	3
202			min	-21.376	14	-269.74	2	-21.969	3	-.003	1	-.085	1	-.603	2
203		7	max	14.938	2	258.436	3	43.781	4	0	15	.034	5	.14	3
204			min	-26.029	4	-452.42	2	-19.885	3	-.003	1	-.08	1	-.322	2
205		8	max	14.938	2	350.726	3	52.79	4	0	15	.063	5	.101	2
206			min	-34.013	4	-635.101	2	-17.801	3	-.003	1	-.051	1	-.097	3
207		9	max	14.938	2	443.017	3	80.303	1	0	15	.099	4	.666	2
208			min	-41.997	4	-817.781	2	-15.717	3	-.003	1	-.06	3	-.406	3
209		10	max	14.938	2	1000.461	2	82.059	14	.003	1	.151	4	1.373	2
210			min	-49.981	4	-150.446	14	-109.695	1	-.002	14	-.072	3	-.786	3
211		11	max	29.864	5	817.781	2	28.303	5	.003	1	.013	9	.666	2
212			min	-20.534	9	-443.017	3	-80.303	1	0	5	-.092	5	-.406	3
213		12	max	21.88	5	635.101	2	30.452	5	.003	1	-.021	10	.101	2
214			min	-20.534	9	-350.726	3	-50.91	1	0	5	-.078	4	-.097	3
215		13	max	14.938	2	452.42	2	32.602	5	.003	1	-.019	10	.14	3
216			min	-20.534	9	-258.436	3	-21.518	1	0	5	-.08	1	-.322	2
217		14	max	14.938	2	269.74	2	34.925	4	.003	1	-.01	12	.305	3
218			min	-20.534	9	-166.145	3	.198	9	0	5	-.085	1	-.603	2
219		15	max	14.938	2	87.06	2	43.935	4	.003	1	.01	5	.398	3
220			min	-20.534	9	-73.855	3	12.619	10	0	5	-.067	1	-.741	2
221		16	max	14.938	2	18.436	3	66.66	1	.003	1	.039	5	.42	3
222			min	-21.053	14	-95.62	2	16.134	12	0	5	-.027	1	-.738	2
223		17	max	14.938	2	110.726	3	96.053	1	.003	1	.076	4	.369	3
224			min	-25.343	4	-278.301	2	17.523	12	0	5	.014	9	-.593	2
225		18	max	14.938	2	203.017	3	125.445	1	.003	1	.127	4	.247	3
226			min	-33.327	4	-460.981	2	18.913	12	0	5	.037	10	-.305	2
227		19	max	14.938	2	295.307	3	154.838	1	.003	1	.231	1	.124	2
228			min	-41.311	4	-643.661	2	20.302	12	0	5	.055	12	-.034	5
229	M13	1	max	31.348	5	692.76	2	17.019	5	.009	3	.183	1	.172	2
230			min	-85.971	1	-327.575	3	-144.649	1	-.023	2	-.089	5	-.049	3
231		2	max	23.364	5	510.08	2	19.169	5	.009	3	.082	1	.17	3
232			min	-85.971	1	-235.285	3	-115.257	1	-.023	2	-.075	5	-.296	2
233		3	max	15.38	5	327.4	2	21.318	5	.009	3	.033	3	.317	3
234			min	-85.971	1	-142.994	3	-85.864	1	-.023	2	-.06	4	-.622	2
235		4	max	7.396	5	144.719	2	23.468	5	.009	3	.015	3	.392	3
236			min	-85.971	1	-50.704	3	-56.471	1	-.023	2	-.055	4	-.805	2
237		5	max	-.235	15	41.587	3	25.617	5	.009	3	-.002	12	.396	3
238			min	-85.971	1	-37.961	2	-27.079	1	-.023	2	-.084	1	-.847	2
239		6	max	-5.608	15	133.877	3	29.754	4	.009	3	0	15	.328	3
240			min	-85.971	1	-220.641	2	-19.046	3	-.023	2	-.093	1	-.746	2
241		7	max	-10.982	15	226.168	3	38.763	4	.009	3	.021	5	.188	3
242			min	-85.971	1	-403.321	2	-16.962	3	-.023	2	-.08	1	-.504	2
243		8	max	-16.356	15	318.458	3	61.099	1	.009	3	.045	5	-.007	15
244			min	-85.971	1	-586.002	2	-14.878	3	-.023	2	-.045	3	-.119	2
245		9	max	-17.191	12	410.749	3	90.492	1	.009	3	.079	4	.408	2
246			min	-85.971	1	-768.682	2	-12.794	3	-.023	2	-.055	3	-.308	3
247		10	max	-17.191	12	-7.889	15	119.884	1	.023	2	.126	4	1.077	2
248			min	-85.971	1	-951.362	2	5.98	12	-.004	14	-.065	3	-.663	3
249		11	max	21.664	5	768.682	2	20.102	5	.023	2	.022	9	.408	2
250			min	-85.971	1	-410.749	3	-90.492	1	-.009	3	-.066	5	-.308	3
251		12	max	13.68	5	586.002	2	22.251	5	.023	2	-.019	10	0	5
252			min	-85.971	1	-318.458	3	-61.099	1	-.009	3	-.057	4	-.119	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
253		13	max	5.696	5	403.321	2	24.401	5	.023	2	-.019	10	.188	3
254			min	-85.971	1	-226.168	3	-31.706	1	-.009	3	-.08	1	-.504	2
255		14	max	-1.375	15	220.641	2	26.55	5	.023	2	-.008	15	.328	3
256			min	-85.971	1	-133.877	3	-5.446	9	-.009	3	-.093	1	-.746	2
257		15	max	-6.748	15	37.961	2	33.664	4	.023	2	.01	5	.396	3
258			min	-85.971	1	-41.587	3	9.615	10	-.009	3	-.084	1	-.847	2
259		16	max	-12.122	15	50.704	3	56.471	1	.023	2	.033	5	.392	3
260			min	-85.971	1	-144.719	2	13.453	10	-.009	3	-.051	1	-.805	2
261		17	max	-17.191	12	142.994	3	85.864	1	.023	2	.058	5	.317	3
262			min	-85.971	1	-327.4	2	15.705	12	-.009	3	-.004	9	-.622	2
263		18	max	-17.191	12	235.285	3	115.257	1	.023	2	.101	4	.17	3
264			min	-85.971	1	-510.08	2	17.094	12	-.009	3	.026	10	-.296	2
265		19	max	-17.191	12	327.575	3	144.649	1	.023	2	.183	1	.172	2
266			min	-85.971	1	-692.76	2	18.483	12	-.009	3	.043	10	-.049	3
267	M2	1	max	2150.882	2	1180.408	3	136.815	2	.013	5	1.099	5	3.954	3
268			min	-1721.022	3	-855.462	2	-261.93	5	-.01	2	-.18	2	.481	15
269		2	max	2148.045	2	1180.408	3	136.815	2	.013	5	1.018	5	3.587	3
270			min	-1723.15	3	-855.462	2	-259.471	5	-.01	2	-.137	2	.458	15
271		3	max	1418.935	2	666.024	3	95.663	2	.001	2	.931	5	3.321	3
272			min	-1450.87	3	86.696	15	-240.587	5	0	3	-.112	2	.432	15
273		4	max	1416.097	2	666.024	3	95.663	2	.001	2	.857	5	3.113	3
274			min	-1452.998	3	86.696	15	-238.128	5	0	3	-.082	2	.405	15
275		5	max	1413.26	2	666.024	3	95.663	2	.001	2	.783	5	2.906	3
276			min	-1455.126	3	86.696	15	-235.669	5	0	3	-.053	2	.378	15
277		6	max	1410.422	2	666.024	3	95.663	2	.001	2	.71	5	2.698	3
278			min	-1457.254	3	86.696	15	-233.21	5	0	3	-.027	1	.351	15
279		7	max	1407.585	2	666.024	3	95.663	2	.001	2	.64	4	2.49	3
280			min	-1459.382	3	86.696	15	-230.751	5	0	3	-.034	3	.324	15
281		8	max	1404.747	2	666.024	3	95.663	2	.001	2	.57	4	2.283	3
282			min	-1461.51	3	86.696	15	-228.292	5	0	3	-.084	3	.297	15
283		9	max	1401.91	2	666.024	3	95.663	2	.001	2	.502	4	2.075	3
284			min	-1463.638	3	86.696	15	-225.833	5	0	3	-.134	3	.27	15
285		10	max	1399.072	2	666.024	3	95.663	2	.001	2	.434	4	1.868	3
286			min	-1465.766	3	86.696	15	-223.373	5	0	3	-.184	3	.243	15
287		11	max	1396.235	2	666.024	3	95.663	2	.001	2	.367	4	1.66	3
288			min	-1467.894	3	86.696	15	-220.914	5	0	3	-.234	3	.216	15
289		12	max	1393.398	2	666.024	3	95.663	2	.001	2	.301	4	1.453	3
290			min	-1470.022	3	86.696	15	-218.455	5	0	3	-.284	3	.189	15
291		13	max	1390.56	2	666.024	3	95.663	2	.001	2	.235	4	1.245	3
292			min	-1472.15	3	86.696	15	-215.996	5	0	3	-.334	3	.162	15
293		14	max	1387.723	2	666.024	3	95.663	2	.001	2	.216	2	1.038	3
294			min	-1474.278	3	86.696	15	-213.537	5	0	3	-.384	3	.135	15
295		15	max	1384.885	2	666.024	3	95.663	2	.001	2	.245	2	.83	3
296			min	-1476.407	3	86.696	15	-211.078	5	0	3	-.434	3	.108	15
297		16	max	1382.048	2	666.024	3	95.663	2	.001	2	.275	2	.623	3
298			min	-1478.535	3	86.696	15	-208.619	5	0	3	-.484	3	.081	15
299		17	max	1379.21	2	666.024	3	95.663	2	.001	2	.305	2	.415	3
300			min	-1480.663	3	86.696	15	-206.16	5	0	3	-.534	3	.054	15
301		18	max	1376.373	2	666.024	3	95.663	2	.001	2	.335	2	.208	3
302			min	-1482.791	3	86.696	15	-203.701	5	0	3	-.583	3	.027	15
303		19	max	1373.536	2	666.024	3	95.663	2	.001	2	.365	2	0	1
304			min	-1484.919	3	86.696	15	-201.241	5	0	3	-.633	3	0	1
305	M5	1	max	5901.104	2	2969.386	3	0	1	.014	4	1.142	4	6.82	3
306			min	-5296.741	3	-2994.861	2	-277.99	5	0	1	0	1	.208	15
307		2	max	5898.267	2	2969.386	3	0	1	.014	4	1.056	4	5.895	3
308			min	-5298.869	3	-2994.861	2	-275.531	5	0	1	0	1	.212	15
309		3	max	3825.368	2	1072.133	3	0	1	0	1	.965	4	5.345	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
310			min	-4288.057	3	41.067	15	-256.625	4	0	4	0	1	.205	15
311		4	max	3822.531	2	1072.133	3	0	1	0	1	.886	4	5.011	3
312			min	-4290.185	3	41.067	15	-254.166	4	0	4	0	1	.192	15
313		5	max	3819.693	2	1072.133	3	0	1	0	1	.807	4	4.677	3
314			min	-4292.313	3	41.067	15	-251.706	4	0	4	0	1	.179	15
315		6	max	3816.856	2	1072.133	3	0	1	0	1	.729	4	4.343	3
316			min	-4294.441	3	41.067	15	-249.247	4	0	4	0	1	.166	15
317		7	max	3814.019	2	1072.133	3	0	1	0	1	.652	4	4.009	3
318			min	-4296.569	3	41.067	15	-246.788	4	0	4	0	1	.154	15
319		8	max	3811.181	2	1072.133	3	0	1	0	1	.575	4	3.675	3
320			min	-4298.697	3	41.067	15	-244.329	4	0	4	0	1	.141	15
321		9	max	3808.344	2	1072.133	3	0	1	0	1	.499	4	3.341	3
322			min	-4300.825	3	41.067	15	-241.87	4	0	4	0	1	.128	15
323		10	max	3805.506	2	1072.133	3	0	1	0	1	.424	4	3.007	3
324			min	-4302.953	3	41.067	15	-239.411	4	0	4	0	1	.115	15
325		11	max	3802.669	2	1072.133	3	0	1	0	1	.35	4	2.673	3
326			min	-4305.081	3	41.067	15	-236.952	4	0	4	0	1	.102	15
327		12	max	3799.831	2	1072.133	3	0	1	0	1	.277	4	2.339	3
328			min	-4307.209	3	41.067	15	-234.493	4	0	4	0	1	.09	15
329		13	max	3796.994	2	1072.133	3	0	1	0	1	.204	4	2.005	3
330			min	-4309.338	3	41.067	15	-232.034	4	0	4	0	1	.077	15
331		14	max	3794.157	2	1072.133	3	0	1	0	1	.132	4	1.67	3
332			min	-4311.466	3	41.067	15	-229.574	4	0	4	0	1	.064	15
333		15	max	3791.319	2	1072.133	3	0	1	0	1	.061	4	1.336	3
334			min	-4313.594	3	41.067	15	-227.115	4	0	4	0	1	.051	15
335		16	max	3788.482	2	1072.133	3	0	1	0	1	0	1	1.002	3
336			min	-4315.722	3	41.067	15	-224.656	4	0	4	-.01	5	.038	15
337		17	max	3785.644	2	1072.133	3	0	1	0	1	0	1	.668	3
338			min	-4317.85	3	41.067	15	-222.197	4	0	4	-.079	4	.026	15
339		18	max	3782.807	2	1072.133	3	0	1	0	1	0	1	.334	3
340			min	-4319.978	3	41.067	15	-219.738	4	0	4	-.148	4	.013	15
341		19	max	3779.969	2	1072.133	3	0	1	0	1	0	1	0	1
342			min	-4322.106	3	41.067	15	-217.279	4	0	4	-.216	4	0	1
343	M8	1	max	2150.882	2	1180.408	3	177.932	3	.014	4	1.136	4	3.954	3
344			min	-1721.022	3	-855.462	2	-281.181	4	-.004	3	-.267	3	-.265	5
345		2	max	2148.045	2	1180.408	3	177.932	3	.014	4	1.048	4	3.587	3
346			min	-1723.15	3	-855.462	2	-278.722	4	-.004	3	-.212	3	-.236	5
347		3	max	1418.935	2	666.024	3	160.233	3	0	3	.957	4	3.321	3
348			min	-1450.87	3	-43.592	5	-255.701	4	-.001	2	-.165	3	-.217	5
349		4	max	1416.097	2	666.024	3	160.233	3	0	3	.878	4	3.113	3
350			min	-1452.998	3	-43.592	5	-253.242	4	-.001	2	-.116	3	-.204	5
351		5	max	1413.26	2	666.024	3	160.233	3	0	3	.799	4	2.906	3
352			min	-1455.126	3	-43.592	5	-250.783	4	-.001	2	-.066	3	-.19	5
353		6	max	1410.422	2	666.024	3	160.233	3	0	3	.722	4	2.698	3
354			min	-1457.254	3	-43.592	5	-248.324	4	-.001	2	-.016	3	-.177	5
355		7	max	1407.585	2	666.024	3	160.233	3	0	3	.645	4	2.49	3
356			min	-1459.382	3	-43.592	5	-245.864	4	-.001	2	-.007	2	-.163	5
357		8	max	1404.747	2	666.024	3	160.233	3	0	3	.568	4	2.283	3
358			min	-1461.51	3	-43.592	5	-243.405	4	-.001	2	-.037	2	-.149	5
359		9	max	1401.91	2	666.024	3	160.233	3	0	3	.493	5	2.075	3
360			min	-1463.638	3	-43.592	5	-240.946	4	-.001	2	-.067	2	-.136	5
361		10	max	1399.072	2	666.024	3	160.233	3	0	3	.422	5	1.868	3
362			min	-1465.766	3	-43.592	5	-238.487	4	-.001	2	-.096	2	-.122	5
363		11	max	1396.235	2	666.024	3	160.233	3	0	3	.351	5	1.66	3
364			min	-1467.894	3	-43.592	5	-236.028	4	-.001	2	-.126	2	-.109	5
365		12	max	1393.398	2	666.024	3	160.233	3	0	3	.284	3	1.453	3
366			min	-1470.022	3	-43.592	5	-233.569	4	-.001	2	-.156	2	-.095	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	1390.56	2	666.024	3	160.233	3	0	3	.334	3	1.245	3
368			min	-1472.15	3	-43.592	5	-231.11	4	-.001	2	-.186	2	-.082	5
369		14	max	1387.723	2	666.024	3	160.233	3	0	3	.384	3	1.038	3
370			min	-1474.278	3	-43.592	5	-228.651	4	-.001	2	-.216	2	-.068	5
371		15	max	1384.885	2	666.024	3	160.233	3	0	3	.434	3	.83	3
372			min	-1476.407	3	-43.592	5	-226.192	4	-.001	2	-.245	2	-.054	5
373		16	max	1382.048	2	666.024	3	160.233	3	0	3	.484	3	.623	3
374			min	-1478.535	3	-43.592	5	-223.732	4	-.001	2	-.275	2	-.041	5
375		17	max	1379.21	2	666.024	3	160.233	3	0	3	.534	3	.415	3
376			min	-1480.663	3	-43.592	5	-221.273	4	-.001	2	-.305	2	-.027	5
377		18	max	1376.373	2	666.024	3	160.233	3	0	3	.583	3	.208	3
378			min	-1482.791	3	-43.592	5	-218.814	4	-.001	2	-.335	2	-.014	5
379		19	max	1373.536	2	666.024	3	160.233	3	0	3	.633	3	0	1
380			min	-1484.919	3	-43.592	5	-216.355	4	-.001	2	-.365	2	0	1
381	M3	1	max	1511.723	2	4.384	4	40.875	2	.007	3	.016	5	0	1
382			min	-579.15	3	1.031	15	-17.981	3	-.014	2	-.005	2	0	1
383		2	max	1511.515	2	3.897	4	40.875	2	.007	3	.012	4	0	15
384			min	-579.306	3	.916	15	-17.981	3	-.014	2	-.004	3	-.001	4
385		3	max	1511.307	2	3.41	4	40.875	2	.007	3	.019	2	0	15
386			min	-579.462	3	.802	15	-17.981	3	-.014	2	-.009	3	-.002	4
387		4	max	1511.098	2	2.923	4	40.875	2	.007	3	.031	2	0	15
388			min	-579.618	3	.687	15	-17.981	3	-.014	2	-.014	3	-.003	4
389		5	max	1510.89	2	2.436	4	40.875	2	.007	3	.043	2	0	15
390			min	-579.775	3	.573	15	-17.981	3	-.014	2	-.019	3	-.004	4
391		6	max	1510.682	2	1.949	4	40.875	2	.007	3	.055	2	-.001	15
392			min	-579.931	3	.458	15	-17.981	3	-.014	2	-.025	3	-.005	4
393		7	max	1510.474	2	1.461	4	40.875	2	.007	3	.067	2	-.001	15
394			min	-580.087	3	.344	15	-17.981	3	-.014	2	-.03	3	-.005	4
395		8	max	1510.266	2	.974	4	40.875	2	.007	3	.079	2	-.001	15
396			min	-580.243	3	.229	15	-17.981	3	-.014	2	-.035	3	-.005	4
397		9	max	1510.058	2	.487	4	40.875	2	.007	3	.091	2	-.001	15
398			min	-580.399	3	.115	15	-17.981	3	-.014	2	-.04	3	-.006	4
399		10	max	1509.85	2	0	1	40.875	2	.007	3	.103	2	-.001	15
400			min	-580.555	3	0	1	-17.981	3	-.014	2	-.046	3	-.006	4
401		11	max	1509.642	2	-.115	15	40.875	2	.007	3	.115	2	-.001	15
402			min	-580.711	3	-.487	6	-17.981	3	-.014	2	-.051	3	-.006	4
403		12	max	1509.434	2	-.229	15	40.875	2	.007	3	.126	2	-.001	15
404			min	-580.867	3	-.974	6	-17.981	3	-.014	2	-.056	3	-.005	4
405		13	max	1509.226	2	-.344	15	40.875	2	.007	3	.138	2	-.001	15
406			min	-581.023	3	-1.461	6	-17.981	3	-.014	2	-.061	3	-.005	4
407		14	max	1509.018	2	-.458	15	40.875	2	.007	3	.15	2	-.001	15
408			min	-581.179	3	-1.949	6	-17.981	3	-.014	2	-.067	3	-.005	4
409		15	max	1508.81	2	-.573	15	40.875	2	.007	3	.162	2	0	15
410			min	-581.335	3	-2.436	6	-17.981	3	-.014	2	-.072	3	-.004	4
411		16	max	1508.602	2	-.687	15	40.875	2	.007	3	.174	2	0	15
412			min	-581.491	3	-2.923	6	-17.981	3	-.014	2	-.077	3	-.003	4
413		17	max	1508.394	2	-.802	15	40.875	2	.007	3	.186	2	0	15
414			min	-581.647	3	-3.41	6	-17.981	3	-.014	2	-.082	3	-.002	4
415		18	max	1508.186	2	-.916	15	40.875	2	.007	3	.198	2	0	15
416			min	-581.803	3	-3.897	6	-17.981	3	-.014	2	-.088	3	-.001	4
417		19	max	1507.977	2	-1.031	15	40.875	2	.007	3	.21	2	0	1
418			min	-581.959	3	-4.384	6	-17.981	3	-.014	2	-.093	3	0	1
419	M6	1	max	4336.351	2	4.384	6	0	1	0	1	.017	4	0	1
420			min	-2132.901	3	1.031	15	-18.715	4	0	4	0	1	0	1
421		2	max	4336.142	2	3.897	6	0	1	0	1	.011	4	0	15
422			min	-2133.057	3	.916	15	-18.34	4	0	4	0	1	-.001	6
423		3	max	4335.934	2	3.41	6	0	1	0	1	.006	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	-2133.213	3	.802	15	-17.965	4	0	4	0	1	-.002	6
425		4	max	4335.726	2	2.923	6	0	1	0	1	0	4	0	15
426			min	-2133.369	3	.687	15	-17.59	4	0	4	0	1	-.003	6
427		5	max	4335.518	2	2.436	6	0	1	0	1	0	1	0	15
428			min	-2133.525	3	.573	15	-17.215	4	0	4	-.004	4	-.004	6
429		6	max	4335.31	2	1.949	6	0	1	0	1	0	1	-.001	15
430			min	-2133.681	3	.458	15	-16.839	4	0	4	-.009	4	-.005	6
431		7	max	4335.102	2	1.461	6	0	1	0	1	0	1	-.001	15
432			min	-2133.837	3	.344	15	-16.464	4	0	4	-.014	4	-.005	6
433		8	max	4334.894	2	.974	6	0	1	0	1	0	1	-.001	15
434			min	-2133.993	3	.229	15	-16.089	4	0	4	-.019	4	-.005	6
435		9	max	4334.686	2	.487	6	0	1	0	1	0	1	-.001	15
436			min	-2134.149	3	.115	15	-15.714	4	0	4	-.024	4	-.006	6
437		10	max	4334.478	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2134.306	3	0	1	-15.339	4	0	4	-.028	4	-.006	6
439		11	max	4334.27	2	-.115	15	0	1	0	1	0	1	-.001	15
440			min	-2134.462	3	-.487	4	-14.964	4	0	4	-.033	4	-.006	6
441		12	max	4334.062	2	-.229	15	0	1	0	1	0	1	-.001	15
442			min	-2134.618	3	-.974	4	-14.588	4	0	4	-.037	4	-.005	6
443		13	max	4333.854	2	-.344	15	0	1	0	1	0	1	-.001	15
444			min	-2134.774	3	-1.461	4	-14.213	4	0	4	-.041	4	-.005	6
445		14	max	4333.646	2	-.458	15	0	1	0	1	0	1	-.001	15
446			min	-2134.93	3	-1.949	4	-13.838	4	0	4	-.045	4	-.005	6
447		15	max	4333.438	2	-.573	15	0	1	0	1	0	1	0	15
448			min	-2135.086	3	-2.436	4	-13.463	4	0	4	-.049	4	-.004	6
449		16	max	4333.23	2	-.687	15	0	1	0	1	0	1	0	15
450			min	-2135.242	3	-2.923	4	-13.088	4	0	4	-.053	4	-.003	6
451		17	max	4333.021	2	-.802	15	0	1	0	1	0	1	0	15
452			min	-2135.398	3	-3.41	4	-12.713	4	0	4	-.057	4	-.002	6
453		18	max	4332.813	2	-.916	15	0	1	0	1	0	1	0	15
454			min	-2135.554	3	-3.897	4	-12.338	4	0	4	-.06	4	-.001	6
455		19	max	4332.605	2	-1.031	15	0	1	0	1	0	1	0	1
456			min	-2135.71	3	-4.384	4	-11.962	4	0	4	-.064	4	0	1
457	M9	1	max	1511.723	2	4.384	4	17.981	3	.014	2	.017	4	0	1
458			min	-579.15	3	1.031	15	-40.875	2	-.007	3	-.002	3	0	1
459		2	max	1511.515	2	3.897	4	17.981	3	.014	2	.011	5	0	15
460			min	-579.306	3	.916	15	-40.875	2	-.007	3	-.007	2	-.001	4
461		3	max	1511.307	2	3.41	4	17.981	3	.014	2	.009	3	0	15
462			min	-579.462	3	.802	15	-40.875	2	-.007	3	-.019	2	-.002	4
463		4	max	1511.098	2	2.923	4	17.981	3	.014	2	.014	3	0	15
464			min	-579.618	3	.687	15	-40.875	2	-.007	3	-.031	2	-.003	4
465		5	max	1510.89	2	2.436	4	17.981	3	.014	2	.019	3	0	15
466			min	-579.775	3	.573	15	-40.875	2	-.007	3	-.043	2	-.004	4
467		6	max	1510.682	2	1.949	4	17.981	3	.014	2	.025	3	-.001	15
468			min	-579.931	3	.458	15	-40.875	2	-.007	3	-.055	2	-.005	4
469		7	max	1510.474	2	1.461	4	17.981	3	.014	2	.03	3	-.001	15
470			min	-580.087	3	.344	15	-40.875	2	-.007	3	-.067	2	-.005	4
471		8	max	1510.266	2	.974	4	17.981	3	.014	2	.035	3	-.001	15
472			min	-580.243	3	.229	15	-40.875	2	-.007	3	-.079	2	-.005	4
473		9	max	1510.058	2	.487	4	17.981	3	.014	2	.04	3	-.001	15
474			min	-580.399	3	.115	15	-40.875	2	-.007	3	-.091	2	-.006	4
475		10	max	1509.85	2	0	1	17.981	3	.014	2	.046	3	-.001	15
476			min	-580.555	3	0	1	-40.875	2	-.007	3	-.103	2	-.006	4
477		11	max	1509.642	2	-.115	15	17.981	3	.014	2	.051	3	-.001	15
478			min	-580.711	3	-.487	4	-40.875	2	-.007	3	-.115	2	-.006	4
479		12	max	1509.434	2	-.229	15	17.981	3	.014	2	.056	3	-.001	15
480			min	-580.867	3	-.974	4	-40.875	2	-.007	3	-.126	2	-.005	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1509.226	2	-.344	15	17.981	3	.014	2	.061	3	-.001	15
482			min	-581.023	3	-1.461	4	-40.875	2	-.007	3	-.138	2	-.005	4
483		14	max	1509.018	2	-.458	15	17.981	3	.014	2	.067	3	-.001	15
484			min	-581.179	3	-1.949	4	-40.875	2	-.007	3	-.15	2	-.005	4
485		15	max	1508.81	2	-.573	15	17.981	3	.014	2	.072	3	0	15
486			min	-581.335	3	-2.436	4	-40.875	2	-.007	3	-.162	2	-.004	4
487		16	max	1508.602	2	-.687	15	17.981	3	.014	2	.077	3	0	15
488			min	-581.491	3	-2.923	4	-40.875	2	-.007	3	-.174	2	-.003	4
489		17	max	1508.394	2	-.802	15	17.981	3	.014	2	.082	3	0	15
490			min	-581.647	3	-3.41	4	-40.875	2	-.007	3	-.186	2	-.002	4
491		18	max	1508.186	2	-.916	15	17.981	3	.014	2	.088	3	0	15
492			min	-581.803	3	-3.897	4	-40.875	2	-.007	3	-.198	2	-.001	4
493		19	max	1507.977	2	-1.031	15	17.981	3	.014	2	.093	3	0	1
494			min	-581.959	3	-4.384	4	-40.875	2	-.007	3	-.21	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	-.024	15	-.032	12	.014	1	5.945e-3	3	NC	3	NC	3
2			min	-.186	3	-.434	2	-.366	5	-1.549e-2	2	310.168	1	574.543	5
3		2	max	-.024	15	-.028	15	.004	1	5.945e-3	3	NC	12	NC	2
4			min	-.186	3	-.349	2	-.352	4	-1.549e-2	2	373.736	1	612.716	5
5		3	max	-.024	15	-.024	15	-.001	12	5.56e-3	3	7284.037	12	NC	1
6			min	-.186	3	-.272	1	-.338	4	-1.415e-2	2	470.204	1	658.992	5
7		4	max	-.024	15	-.02	15	-.002	12	4.97e-3	3	5052.901	12	NC	1
8			min	-.186	3	-.201	1	-.32	4	-1.208e-2	2	625.162	1	724.888	5
9		5	max	-.024	15	-.016	15	-.001	12	4.379e-3	3	NC	10	NC	1
10			min	-.186	3	-.138	1	-.299	4	-1.001e-2	2	886.555	1	816.924	5
11		6	max	-.024	15	-.013	15	0	12	4.381e-3	3	4468.522	2	NC	1
12			min	-.186	3	-.107	3	-.277	4	-9.268e-3	2	1243.218	14	943.028	5
13		7	max	-.024	15	-.009	15	0	3	4.792e-3	3	NC	11	NC	1
14			min	-.186	3	-.1	3	-.255	4	-9.446e-3	2	1466.879	14	1109.324	5
15		8	max	-.024	15	.004	10	0	3	5.204e-3	3	NC	11	NC	1
16			min	-.186	3	-.088	3	-.235	4	-9.623e-3	2	1422.108	2	1325.216	5
17		9	max	-.024	15	.024	2	0	10	5.848e-3	3	NC	1	NC	1
18			min	-.186	3	-.071	3	-.217	4	-9.26e-3	2	1158.354	2	1601.676	5
19		10	max	-.024	15	.043	2	0	2	6.904e-3	3	NC	3	NC	1
20			min	-.187	3	-.05	3	-.2	4	-7.941e-3	2	994.459	2	2028.086	5
21		11	max	-.024	15	.06	1	0	3	7.96e-3	3	7377.588	12	NC	1
22			min	-.187	3	-.024	3	-.183	4	-6.621e-3	2	889.176	2	2730.083	5
23		12	max	-.024	15	.08	1	.003	3	6.71e-3	3	NC	9	NC	1
24			min	-.187	3	.005	12	-.167	4	-4.908e-3	2	821.537	2	3987.756	5
25		13	max	-.024	15	.094	1	.007	3	4.156e-3	3	NC	9	NC	1
26			min	-.187	3	.011	15	-.153	4	-3.071e-3	4	792.499	2	7016.3	5
27		14	max	-.024	15	.111	3	.007	3	1.748e-3	3	NC	9	NC	2
28			min	-.187	3	.014	15	-.141	4	-3.96e-3	4	815.54	2	9556.047	1
29		15	max	-.024	15	.196	3	.005	1	5.802e-3	3	NC	9	NC	2
30			min	-.187	3	.017	15	-.136	5	-3.405e-3	4	545.027	3	7289.1	1
31		16	max	-.024	15	.3	3	.007	1	9.855e-3	3	NC	4	NC	2
32			min	-.187	3	.004	10	-.133	5	-4.861e-3	2	383.619	3	6721.048	1
33		17	max	-.024	15	.415	3	.004	1	1.391e-2	3	NC	4	NC	2
34			min	-.187	3	-.017	10	-.132	5	-6.733e-3	2	288.617	3	7762.477	1
35		18	max	-.024	15	.535	3	0	10	1.655e-2	3	NC	4	NC	1
36			min	-.187	3	-.052	2	-.134	4	-7.953e-3	2	229.532	3	NC	1
37		19	max	-.024	15	.654	3	-.003	10	1.655e-2	3	NC	1	NC	1
38			min	-.187	3	-.091	2	-.136	4	-7.953e-3	2	190.563	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	-.012	15	.056	3	0	1	2.68e-4	4	NC	3	NC	1
40			min	-.299	3	-.928	2	-.363	4	0	1	197.106	1	578.245	4
41		2	max	-.012	15	-.002	3	0	1	2.68e-4	4	6368.753	15	NC	1
42			min	-.299	3	-.741	2	-.352	4	0	1	253.968	1	607.798	4
43		3	max	-.012	15	-.016	15	0	1	2.775e-5	5	7776.898	15	NC	1
44			min	-.299	3	-.553	2	-.339	4	0	1	357.373	1	644.611	4
45		4	max	-.012	15	-.012	15	0	1	0	1	NC	10	NC	1
46			min	-.299	3	-.374	2	-.321	4	-3.42e-4	4	585.029	1	704.077	4
47		5	max	-.012	15	-.009	15	0	1	0	1	NC	15	NC	1
48			min	-.299	3	-.241	1	-.3	4	-7.113e-4	4	643.122	3	792.607	4
49		6	max	-.012	15	-.006	15	0	1	0	1	NC	1	NC	1
50			min	-.299	3	-.168	3	-.277	4	-6.929e-4	4	597.22	3	917.919	4
51		7	max	-.012	15	-.004	15	0	1	0	1	NC	5	NC	1
52			min	-.299	3	-.162	3	-.255	4	-4.066e-4	4	514.344	2	1084.634	4
53		8	max	-.012	15	.001	10	0	1	0	1	NC	5	NC	1
54			min	-.3	3	-.14	3	-.234	4	-1.203e-4	4	443.193	2	1296.603	4
55		9	max	-.012	15	.028	2	0	1	2.097e-5	4	NC	4	NC	1
56			min	-.3	3	-.112	3	-.217	4	0	1	399.575	2	1551.962	4
57		10	max	-.012	15	.061	2	0	1	0	1	NC	4	NC	1
58			min	-.301	3	-.079	3	-.2	4	-9.419e-5	4	363.401	2	1957.046	4
59		11	max	-.011	15	.094	1	0	1	0	1	NC	4	NC	1
60			min	-.301	3	-.04	3	-.182	4	-2.094e-4	4	334.902	2	2610.19	4
61		12	max	-.011	15	.131	1	0	1	0	1	NC	5	NC	1
62			min	-.302	3	.005	15	-.168	4	-1.114e-3	4	313.058	2	3637.272	4
63		13	max	-.011	15	.156	1	0	1	0	1	NC	5	NC	1
64			min	-.302	3	.006	15	-.154	4	-2.464e-3	4	302.309	2	5816.679	4
65		14	max	-.011	15	.183	3	0	1	0	1	NC	5	NC	1
66			min	-.302	3	.006	15	-.144	4	-3.765e-3	4	310.375	2	NC	1
67		15	max	-.011	15	.352	3	0	1	0	1	NC	5	NC	1
68			min	-.302	3	.006	15	-.139	4	-2.861e-3	4	351.242	2	NC	1
69		16	max	-.011	15	.564	3	0	1	0	1	NC	5	NC	1
70			min	-.302	3	-.016	10	-.136	4	-1.956e-3	4	263.998	3	NC	1
71		17	max	-.011	15	.804	3	0	1	0	1	NC	5	NC	1
72			min	-.302	3	-.102	2	-.134	4	-1.051e-3	4	179.367	3	NC	1
73		18	max	-.011	15	1.053	3	0	1	0	1	NC	4	NC	1
74			min	-.302	3	-.205	2	-.133	4	-4.612e-4	4	134.505	3	NC	1
75		19	max	-.011	15	1.302	3	0	1	0	1	NC	1	NC	1
76			min	-.302	3	-.308	2	-.131	4	-4.612e-4	4	107.654	3	NC	1
77	M7	1	max	.012	5	.005	5	-.003	12	1.549e-2	2	NC	3	NC	3
78			min	-.186	3	-.434	2	-.372	4	-5.945e-3	3	310.168	1	551.645	4
79		2	max	.012	5	.006	5	0	12	1.549e-2	2	NC	5	NC	2
80			min	-.186	3	-.349	2	-.354	4	-5.945e-3	3	373.736	1	595.369	4
81		3	max	.012	5	.006	5	.004	1	1.415e-2	2	NC	5	NC	1
82			min	-.186	3	-.272	1	-.336	4	-5.56e-3	3	470.204	1	647.755	4
83		4	max	.012	5	.007	5	.008	1	1.208e-2	2	NC	5	NC	1
84			min	-.186	3	-.201	1	-.316	5	-4.97e-3	3	625.162	1	715.68	4
85		5	max	.012	5	.007	5	.008	1	1.001e-2	2	NC	4	NC	1
86			min	-.186	3	-.138	1	-.296	5	-4.379e-3	3	886.555	1	804.971	4
87		6	max	.012	5	.007	5	.006	1	9.268e-3	2	NC	4	NC	1
88			min	-.186	3	-.107	3	-.274	4	-4.381e-3	3	1339.37	1	922.529	4
89		7	max	.012	5	.006	5	.003	2	9.446e-3	2	NC	4	NC	1
90			min	-.186	3	-.1	3	-.254	4	-4.792e-3	3	1681.02	9	1072.085	4
91		8	max	.012	5	.004	10	0	2	9.623e-3	2	NC	4	NC	1
92			min	-.186	3	-.088	3	-.235	4	-5.204e-3	3	1422.108	2	1264.39	4
93		9	max	.012	5	.024	2	0	3	9.26e-3	2	NC	1	NC	1
94			min	-.186	3	-.071	3	-.217	4	-5.848e-3	3	1158.354	2	1517.816	4
95		10	max	.012	5	.043	2	0	3	7.941e-3	2	NC	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
96			min	-.187	3	-.05	3	-.2	4	-6.904e-3	3	994.459	2	1894.291	4
97		11	max	.012	5	.06	1	0	2	6.621e-3	2	NC	5	NC	1
98			min	-.187	3	-.024	3	-.183	4	-7.96e-3	3	889.176	2	2497.327	4
99		12	max	.012	5	.08	1	.003	2	4.908e-3	2	NC	5	NC	1
100			min	-.187	3	-.002	5	-.166	4	-6.71e-3	3	821.537	2	3571.739	4
101		13	max	.012	5	.094	1	.004	2	2.971e-3	2	NC	5	NC	1
102			min	-.187	3	-.004	5	-.152	4	-4.156e-3	3	792.499	2	5767.364	4
103		14	max	.012	5	.111	3	.001	2	1.118e-3	2	NC	5	NC	2
104			min	-.187	3	-.007	5	-.143	4	-3.751e-3	5	815.54	2	9556.047	1
105		15	max	.012	5	.196	3	0	10	2.99e-3	2	NC	9	NC	2
106			min	-.187	3	-.011	5	-.138	4	-5.802e-3	3	545.027	3	7289.1	1
107		16	max	.012	5	.3	3	-.002	10	4.861e-3	2	NC	9	NC	2
108			min	-.187	3	-.015	5	-.136	4	-9.855e-3	3	383.619	3	6721.048	1
109		17	max	.012	5	.415	3	0	12	6.733e-3	2	NC	4	NC	2
110			min	-.187	3	-.02	5	-.135	4	-1.391e-2	3	288.617	3	7762.477	1
111		18	max	.012	5	.535	3	.004	1	7.953e-3	2	NC	4	NC	1
112			min	-.187	3	-.052	2	-.132	4	-1.655e-2	3	229.532	3	NC	1
113		19	max	.012	5	.654	3	.013	1	7.953e-3	2	NC	1	NC	1
114			min	-.187	3	-.091	2	-.131	5	-1.655e-2	3	190.563	3	NC	1
115	M10	1	max	0	3	.493	3	.187	3	1.604e-2	3	NC	1	NC	1
116			min	-.133	4	-.039	2	-.012	5	-5.27e-3	2	NC	1	NC	1
117		2	max	0	3	.651	3	.195	1	1.796e-2	3	NC	4	NC	2
118			min	-.133	4	-.114	2	-.01	5	-6.217e-3	2	1064.849	3	8916.489	1
119		3	max	0	3	.8	3	.222	1	1.989e-2	3	NC	4	NC	4
120			min	-.133	4	-.182	2	-.006	5	-7.164e-3	2	548.074	3	3665.792	1
121		4	max	0	3	.921	3	.25	1	2.182e-2	3	NC	4	NC	5
122			min	-.133	4	-.233	2	-.002	5	-8.112e-3	2	392.668	3	2287.76	1
123		5	max	0	3	1.004	3	.273	1	2.374e-2	3	NC	4	NC	5
124			min	-.133	4	-.26	2	.001	15	-9.059e-3	2	329.005	3	1743.942	1
125		6	max	0	3	1.044	3	.288	1	2.567e-2	3	NC	4	NC	5
126			min	-.133	4	-.264	2	.004	15	-1.001e-2	2	304.81	3	1507.966	1
127		7	max	0	3	1.046	3	.294	1	2.76e-2	3	NC	4	NC	5
128			min	-.133	4	-.246	2	.006	15	-1.095e-2	2	303.765	3	1426.805	1
129		8	max	0	3	1.02	3	.293	1	2.952e-2	3	NC	4	NC	5
130			min	-.133	4	-.216	2	.008	15	-1.19e-2	2	318.608	3	1440.366	1
131		9	max	0	3	.985	3	.299	3	3.145e-2	3	NC	6	NC	5
132			min	-.133	4	-.184	2	.01	15	-1.285e-2	2	341.329	3	1494.364	3
133		10	max	0	1	.966	3	.302	3	3.338e-2	3	NC	9	NC	5
134			min	-.133	4	-.169	2	.011	15	-1.38e-2	2	354.854	3	1454.349	3
135		11	max	0	10	.985	3	.299	3	3.145e-2	3	NC	14	NC	5
136			min	-.133	4	-.184	2	.013	15	-1.285e-2	2	341.329	3	1494.364	3
137		12	max	0	10	1.02	3	.293	1	2.952e-2	3	NC	14	NC	5
138			min	-.133	4	-.216	2	.016	15	-1.19e-2	2	318.608	3	1440.366	1
139		13	max	0	10	1.046	3	.294	1	2.76e-2	3	NC	13	NC	5
140			min	-.133	4	-.246	2	.018	15	-1.095e-2	2	303.765	3	1426.805	1
141		14	max	0	10	1.044	3	.288	1	2.567e-2	3	NC	4	NC	5
142			min	-.133	4	-.264	2	.02	15	-1.001e-2	2	304.81	3	1507.966	1
143		15	max	0	10	1.004	3	.273	1	2.374e-2	3	NC	6	NC	5
144			min	-.133	4	-.26	2	.022	15	-9.059e-3	2	329.005	3	1743.942	1
145		16	max	0	10	.921	3	.25	1	2.182e-2	3	NC	14	NC	5
146			min	-.133	4	-.233	2	.023	15	-8.112e-3	2	392.668	3	2287.76	1
147		17	max	0	10	.8	3	.222	1	1.989e-2	3	NC	14	NC	4
148			min	-.133	4	-.182	2	.024	15	-7.164e-3	2	548.074	3	3665.792	1
149		18	max	0	10	.651	3	.195	1	1.796e-2	3	NC	14	NC	2
150			min	-.133	4	-.114	2	.024	15	-6.217e-3	2	1064.849	3	8916.489	1
151		19	max	0	10	.493	3	.187	3	1.604e-2	3	NC	1	NC	1
152			min	-.133	4	-.039	2	.024	15	-5.27e-3	2	2753.817	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	.001	2	.067	1	.187	3	4.195e-3	3	NC	1	NC	1
154			min	-.177	4	-.013	3	-.012	5	-2.411e-4	5	NC	1	NC	1
155		2	max	0	2	.067	3	.19	1	4.413e-3	3	NC	4	NC	1
156			min	-.177	4	.002	15	.001	15	-1.796e-4	5	2086.447	3	NC	1
157		3	max	0	2	.14	3	.214	1	4.631e-3	3	NC	4	NC	3
158			min	-.177	4	-.037	2	.006	15	-1.181e-4	5	1101.307	3	4528.584	1
159		4	max	0	2	.187	3	.241	1	4.848e-3	3	NC	4	NC	5
160			min	-.177	4	-.063	2	.008	15	-5.655e-5	5	840.295	3	2627.276	1
161		5	max	0	2	.201	3	.265	1	5.066e-3	3	NC	4	NC	5
162			min	-.177	4	-.066	2	.006	15	-3.298e-6	15	785.511	3	1914.687	1
163		6	max	0	2	.18	3	.282	1	5.284e-3	3	NC	4	NC	5
164			min	-.177	4	-.046	2	.003	15	3.777e-5	15	870.773	3	1602.85	1
165		7	max	0	2	.13	3	.291	1	5.501e-3	3	NC	4	NC	5
166			min	-.177	4	-.007	2	0	15	7.883e-5	15	1174.729	3	1477.807	1
167		8	max	0	2	.064	3	.292	1	5.719e-3	3	NC	1	NC	4
168			min	-.177	4	.002	15	0	15	1.199e-4	15	2171.348	3	1459.854	1
169		9	max	0	2	.092	1	.297	3	5.937e-3	3	NC	3	NC	4
170			min	-.177	4	.003	15	.003	15	1.61e-4	15	6925.015	1	1500.756	1
171		10	max	0	1	.108	1	.301	3	6.154e-3	3	NC	3	NC	5
172			min	-.177	4	-.024	3	.011	15	2.02e-4	15	4167.632	1	1466.074	3
173		11	max	0	3	.092	1	.297	3	5.937e-3	3	NC	3	NC	5
174			min	-.177	4	.003	12	.02	15	2.274e-4	15	6925.015	1	1500.756	1
175		12	max	0	3	.064	3	.292	1	5.719e-3	3	NC	1	NC	15
176			min	-.177	4	.003	15	.024	15	2.527e-4	15	2171.348	3	1459.854	1
177		13	max	0	3	.13	3	.291	1	5.501e-3	3	NC	4	NC	5
178			min	-.177	4	-.007	2	.023	15	2.781e-4	15	1174.729	3	1477.807	1
179		14	max	0	3	.18	3	.282	1	5.284e-3	3	NC	4	NC	5
180			min	-.177	4	-.046	2	.02	15	3.034e-4	15	870.773	3	1602.85	1
181		15	max	0	3	.201	3	.265	1	5.066e-3	3	NC	5	NC	4
182			min	-.177	4	-.066	2	.016	15	3.287e-4	15	785.511	3	1914.687	1
183		16	max	0	3	.187	3	.241	1	4.848e-3	3	NC	5	NC	4
184			min	-.177	4	-.063	2	.013	15	3.541e-4	15	840.295	3	2627.276	1
185		17	max	.001	3	.14	3	.214	1	4.631e-3	3	NC	5	NC	3
186			min	-.177	4	-.037	2	.012	15	3.794e-4	15	1101.307	3	4528.584	1
187		18	max	.001	3	.067	3	.19	1	4.413e-3	3	NC	4	NC	1
188			min	-.177	4	0	15	.015	15	4.048e-4	15	2086.447	3	NC	1
189		19	max	.001	3	.067	1	.187	3	4.195e-3	3	NC	1	NC	1
190			min	-.177	4	-.013	3	.024	15	4.301e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.017	2	.186	3	3.653e-3	1	NC	1	NC	1
192			min	-.223	4	-.077	3	-.012	5	-2.024e-4	5	NC	1	NC	1
193		2	max	0	2	.004	5	.192	3	3.878e-3	1	NC	4	NC	1
194			min	-.223	4	-.073	2	.002	15	-1.408e-4	5	1871.092	2	NC	1
195		3	max	0	2	.007	3	.212	1	4.103e-3	1	NC	4	NC	10
196			min	-.223	4	-.149	2	.007	15	-7.913e-5	5	1015.172	2	4941.243	1
197		4	max	0	2	.025	3	.239	1	4.328e-3	1	NC	4	NC	7
198			min	-.223	4	-.197	2	.008	15	-1.913e-5	15	787.605	2	2768.686	1
199		5	max	0	2	.024	3	.263	1	4.553e-3	1	NC	4	NC	5
200			min	-.223	4	-.21	2	.006	15	2.202e-5	15	742.529	2	1977.926	1
201		6	max	0	2	.004	3	.281	1	4.778e-3	1	NC	4	NC	5
202			min	-.223	4	-.187	2	.003	15	6.317e-5	15	822.82	2	1633.007	1
203		7	max	0	2	0	15	.291	1	5.003e-3	1	NC	4	NC	4
204			min	-.223	4	-.137	2	0	15	1.043e-4	15	1092.81	2	1489.283	1
205		8	max	0	2	0	15	.293	1	5.228e-3	1	NC	3	NC	4
206			min	-.223	4	-.072	2	-.001	15	1.455e-4	15	1900.36	2	1457.903	1
207		9	max	0	2	0	15	.297	3	5.453e-3	1	NC	4	NC	4
208			min	-.223	4	-.106	3	.002	15	1.866e-4	15	5834.063	3	1488.324	1
209		10	max	0	1	.016	2	.3	3	5.678e-3	1	NC	1	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	-.223	4	-.122	3	.012	15	2.278e-4	15	3756.596	3	1478.466	3
211		11	max	0	9	-.002	15	.297	3	5.453e-3	1	NC	4	NC	15
212			min	-.223	4	-.106	3	.021	15	2.532e-4	15	5834.063	3	1488.324	1
213		12	max	0	9	-.004	15	.293	1	5.228e-3	1	NC	3	NC	15
214			min	-.223	4	-.072	2	.025	15	2.785e-4	15	1900.36	2	1457.903	1
215		13	max	0	9	-.006	15	.291	1	5.003e-3	1	NC	5	NC	7
216			min	-.223	4	-.137	2	.025	15	3.039e-4	15	1092.81	2	1489.283	1
217		14	max	0	9	.004	3	.281	1	4.778e-3	1	NC	5	NC	5
218			min	-.223	4	-.187	2	.021	15	3.293e-4	15	822.82	2	1633.007	1
219		15	max	0	9	.024	3	.263	1	4.553e-3	1	NC	5	NC	4
220			min	-.223	4	-.21	2	.017	15	3.547e-4	15	742.529	2	1977.926	1
221		16	max	0	9	.025	3	.239	1	4.328e-3	1	NC	5	NC	4
222			min	-.223	4	-.197	2	.013	15	3.801e-4	15	787.605	2	2768.686	1
223		17	max	0	9	.007	3	.212	1	4.103e-3	1	NC	5	NC	4
224			min	-.223	4	-.149	2	.011	15	4.054e-4	15	1015.172	2	4941.243	1
225		18	max	0	9	-.006	15	.192	3	3.878e-3	1	NC	4	NC	1
226			min	-.223	4	-.073	2	.014	15	4.308e-4	15	1871.092	2	NC	1
227		19	max	0	9	.017	2	.186	3	3.653e-3	1	NC	1	NC	1
228			min	-.223	4	-.077	3	.024	15	4.562e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.006	5	.186	3	1.13e-2	2	NC	1	NC	1
230			min	-.348	4	-.32	2	-.012	5	-2.135e-3	3	NC	1	NC	1
231		2	max	0	12	.003	5	.199	1	1.284e-2	2	NC	4	NC	2
232			min	-.348	4	-.465	2	.002	15	-2.761e-3	3	1163.001	2	8618.758	1
233		3	max	0	12	.03	3	.226	1	1.438e-2	2	NC	5	NC	10
234			min	-.348	4	-.595	2	.008	15	-3.388e-3	3	610.314	2	3565.897	1
235		4	max	0	12	.062	3	.254	1	1.592e-2	2	NC	5	NC	15
236			min	-.348	4	-.697	2	.009	15	-4.015e-3	3	445.85	2	2230.555	1
237		5	max	0	12	.075	3	.278	1	1.746e-2	2	NC	5	NC	5
238			min	-.348	4	-.76	2	.009	15	-4.642e-3	3	381.592	2	1700.973	1
239		6	max	0	12	.07	3	.293	1	1.9e-2	2	NC	5	NC	5
240			min	-.348	4	-.784	2	.006	15	-5.268e-3	3	362.356	2	1469.466	1
241		7	max	0	12	.049	3	.3	1	2.054e-2	2	NC	5	NC	5
242			min	-.348	4	-.772	2	.004	15	-5.895e-3	3	371.886	2	1387.634	1
243		8	max	0	12	.02	3	.299	1	2.208e-2	2	NC	5	NC	5
244			min	-.348	4	-.736	2	.003	15	-6.522e-3	3	403.589	2	1396.863	1
245		9	max	0	12	-.009	3	.296	3	2.362e-2	2	NC	5	NC	5
246			min	-.348	4	-.696	2	.005	15	-7.149e-3	3	447.232	2	1455.695	1
247		10	max	0	1	-.017	12	.299	3	2.516e-2	2	NC	5	NC	5
248			min	-.348	4	-.675	2	.012	15	-7.775e-3	3	473.004	2	1493.257	3
249		11	max	0	1	-.009	3	.296	3	2.362e-2	2	NC	5	NC	5
250			min	-.348	4	-.696	2	.019	15	-7.149e-3	3	447.232	2	1455.695	1
251		12	max	0	1	.02	3	.299	1	2.208e-2	2	NC	5	NC	5
252			min	-.348	4	-.736	2	.021	15	-6.522e-3	3	403.589	2	1396.863	1
253		13	max	0	1	.049	3	.3	1	2.054e-2	2	NC	5	NC	5
254			min	-.348	4	-.772	2	.021	15	-5.895e-3	3	371.886	2	1387.634	1
255		14	max	0	1	.07	3	.293	1	1.9e-2	2	NC	5	NC	5
256			min	-.348	4	-.784	2	.018	15	-5.268e-3	3	362.356	2	1469.466	1
257		15	max	0	1	.075	3	.278	1	1.746e-2	2	NC	5	NC	4
258			min	-.348	4	-.76	2	.015	15	-4.642e-3	3	381.592	2	1700.973	1
259		16	max	0	1	.062	3	.254	1	1.592e-2	2	NC	5	NC	4
260			min	-.348	4	-.697	2	.013	15	-4.015e-3	3	445.85	2	2230.555	1
261		17	max	0	1	.03	3	.226	1	1.438e-2	2	NC	5	NC	4
262			min	-.348	4	-.595	2	.012	15	-3.388e-3	3	610.314	2	3565.897	1
263		18	max	0	1	-.012	12	.199	1	1.284e-2	2	NC	5	NC	2
264			min	-.348	4	-.465	2	.016	15	-2.761e-3	3	1163.001	2	8618.758	1
265		19	max	0	1	-.027	15	.186	3	1.13e-2	2	NC	1	NC	1
266			min	-.348	4	-.32	2	.024	15	-2.135e-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	2.993e-3	2	NC	1	NC	1
270			min	0	2	-.001	3	0	2	-4.043e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.003	5	3.887e-3	2	NC	1	NC	1
272			min	0	2	-.004	3	0	2	-5.413e-3	5	NC	1	NC	1
273		4	max	0	3	-.001	15	.006	5	3.577e-3	2	NC	2	NC	1
274			min	0	2	-.009	3	0	2	-5.249e-3	5	7472.814	3	NC	1
275		5	max	0	3	-.002	15	.011	5	3.267e-3	2	NC	4	NC	1
276			min	0	2	-.015	3	-.001	2	-5.085e-3	5	4363.421	3	6251.221	5
277		6	max	0	3	-.003	15	.016	5	2.957e-3	2	NC	5	NC	1
278			min	0	2	-.023	3	-.002	2	-4.921e-3	5	2878.917	3	4120.146	5
279		7	max	0	3	-.004	15	.023	5	2.647e-3	2	NC	5	NC	1
280			min	0	2	-.033	3	-.003	2	-4.758e-3	5	2054.802	3	2944.925	5
281		8	max	0	3	-.006	15	.03	5	2.337e-3	2	NC	15	NC	1
282			min	0	2	-.043	3	-.003	2	-4.594e-3	5	1548.817	3	2226.126	5
283		9	max	0	3	-.007	15	.038	5	2.027e-3	2	9483.98	15	NC	1
284			min	0	2	-.055	3	-.004	2	-4.43e-3	5	1215.838	3	1754.142	5
285		10	max	0	3	-.009	15	.047	5	1.717e-3	2	7668.21	15	NC	1
286			min	0	2	-.068	3	-.005	2	-4.266e-3	5	984.555	3	1426.79	5
287		11	max	0	3	-.011	15	.057	5	1.407e-3	2	6358.014	15	NC	1
288			min	0	2	-.082	3	-.005	2	-4.102e-3	5	817.302	3	1190.291	5
289		12	max	0	3	-.013	15	.066	5	1.097e-3	2	5380.646	15	NC	1
290			min	0	2	-.097	3	-.005	2	-3.938e-3	5	692.32	3	1013.702	5
291		13	max	.001	3	-.015	15	.077	5	7.866e-4	2	4631.511	15	NC	1
292			min	-.001	2	-.113	3	-.005	2	-3.788e-3	4	596.389	3	878.275	5
293		14	max	.001	3	-.017	15	.087	5	4.766e-4	2	4044.657	15	NC	1
294			min	-.001	2	-.129	3	-.005	1	-3.65e-3	4	521.152	3	772.158	5
295		15	max	.001	3	-.019	15	.098	5	5.105e-4	3	3576.083	15	NC	1
296			min	-.001	2	-.146	3	-.005	1	-3.512e-3	4	461.02	3	687.464	5
297		16	max	.001	3	-.021	15	.109	5	6.969e-4	3	3196.148	15	NC	1
298			min	-.001	2	-.163	3	-.004	1	-3.374e-3	4	412.223	3	618.851	5
299		17	max	.001	3	-.023	15	.12	4	8.833e-4	3	2883.881	15	NC	1
300			min	-.001	2	-.181	3	-.003	1	-3.236e-3	4	372.088	3	562.275	4
301		18	max	.001	3	-.026	15	.131	4	1.07e-3	3	2624.268	15	NC	1
302			min	-.001	2	-.199	3	-.003	3	-3.098e-3	4	338.7	3	515.034	4
303		19	max	.002	3	-.028	15	.142	4	1.256e-3	3	2406.312	15	NC	1
304			min	-.002	2	-.217	3	-.007	3	-2.96e-3	4	310.653	3	475.475	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	3	0	1	-4.237e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	1	NC	1
310			min	0	2	-.007	3	0	1	-5.664e-3	4	9222.36	3	NC	1
311		4	max	0	3	0	15	.006	4	0	1	NC	4	NC	1
312			min	0	2	-.015	3	0	1	-5.478e-3	4	4446.889	3	NC	1
313		5	max	.001	3	0	15	.011	4	0	1	NC	4	NC	1
314			min	-.001	2	-.026	3	0	1	-5.293e-3	4	2625.921	3	6025.751	4
315		6	max	.001	3	-.001	15	.017	4	0	1	NC	5	NC	1
316			min	-.001	2	-.039	3	0	1	-5.107e-3	4	1743.715	3	3974.057	4
317		7	max	.002	3	-.002	15	.024	4	0	1	NC	5	NC	1
318			min	-.001	2	-.054	3	0	1	-4.922e-3	4	1249.714	3	2842.494	4
319		8	max	.002	3	-.003	15	.031	4	0	1	NC	5	NC	1
320			min	-.002	2	-.071	3	0	1	-4.736e-3	4	944.685	3	2150.34	4
321		9	max	.002	3	-.003	15	.04	4	0	1	NC	5	NC	1
322			min	-.002	2	-.091	3	0	1	-4.551e-3	4	743.144	3	1695.821	4
323		10	max	.002	3	-.004	15	.049	4	0	1	NC	5	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	2	-.112	3	0	1	-4.365e-3	4	602.74	3	1380.579	4
325		11	max	.003	3	-.005	15	.058	4	0	1	NC	15	NC	1
326			min	-.002	2	-.134	3	0	1	-4.18e-3	4	500.973	3	1152.837	4
327		12	max	.003	3	-.006	15	.068	4	0	1	NC	15	NC	1
328			min	-.003	2	-.158	3	0	1	-3.994e-3	4	424.788	3	982.808	4
329		13	max	.003	3	-.007	15	.079	4	0	1	9909.848	15	NC	1
330			min	-.003	2	-.184	3	0	1	-3.809e-3	4	366.225	3	852.442	4
331		14	max	.003	3	-.008	15	.09	4	0	1	8647.284	15	NC	1
332			min	-.003	2	-.21	3	0	1	-3.624e-3	4	320.239	3	750.325	4
333		15	max	.004	3	-.009	15	.101	4	0	1	7640.422	15	NC	1
334			min	-.003	2	-.237	3	0	1	-3.438e-3	4	283.448	3	668.868	4
335		16	max	.004	3	-.01	15	.112	4	0	1	6824.877	15	NC	1
336			min	-.003	2	-.265	3	0	1	-3.253e-3	4	253.565	3	602.925	4
337		17	max	.004	3	-.011	15	.123	4	0	1	6155.186	15	NC	1
338			min	-.004	2	-.294	3	0	1	-3.067e-3	4	228.969	3	548.873	4
339		18	max	.004	3	-.012	15	.134	4	0	1	5598.855	15	NC	1
340			min	-.004	2	-.323	3	0	1	-2.882e-3	4	208.493	3	504.116	4
341		19	max	.005	3	-.013	15	.144	4	0	1	5132.115	15	NC	1
342			min	-.004	2	-.352	3	0	1	-2.696e-3	4	191.283	3	466.746	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	1.352e-3	3	NC	1	NC	1
346			min	0	2	-.001	3	0	3	-4.405e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	1.726e-3	3	NC	1	NC	1
348			min	0	2	-.004	3	0	3	-5.878e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.006	4	1.54e-3	3	NC	2	NC	1
350			min	0	2	-.009	3	-.001	3	-5.67e-3	4	7472.814	3	NC	1
351		5	max	0	3	.001	5	.011	4	1.354e-3	3	NC	4	NC	1
352			min	0	2	-.015	3	-.002	3	-5.462e-3	4	4363.421	3	6069.095	4
353		6	max	0	3	.002	5	.017	4	1.167e-3	3	NC	4	NC	1
354			min	0	2	-.023	3	-.003	3	-5.254e-3	4	2878.917	3	4003.794	4
355		7	max	0	3	.002	5	.023	4	9.808e-4	3	NC	4	NC	1
356			min	0	2	-.033	3	-.004	3	-5.046e-3	4	2054.802	3	2864.446	4
357		8	max	0	3	.003	5	.031	4	7.944e-4	3	NC	4	NC	1
358			min	0	2	-.043	3	-.005	3	-4.837e-3	4	1548.817	3	2167.408	4
359		9	max	0	3	.004	5	.039	4	6.08e-4	3	NC	4	NC	1
360			min	0	2	-.055	3	-.006	3	-4.629e-3	4	1215.838	3	1709.622	4
361		10	max	0	3	.004	5	.048	4	4.216e-4	3	NC	5	NC	1
362			min	0	2	-.068	3	-.006	3	-4.421e-3	4	984.555	3	1392.081	4
363		11	max	0	3	.005	5	.058	4	2.352e-4	3	NC	5	NC	1
364			min	0	2	-.082	3	-.007	3	-4.213e-3	4	817.302	3	1162.663	4
365		12	max	0	3	.006	5	.068	4	4.874e-5	3	NC	5	NC	1
366			min	0	2	-.097	3	-.007	3	-4.005e-3	4	692.32	3	991.374	4
367		13	max	.001	3	.007	5	.078	4	-9.186e-6	9	NC	13	NC	1
368			min	-.001	2	-.113	3	-.007	3	-3.796e-3	4	596.389	3	860.039	4
369		14	max	.001	3	.008	5	.089	4	6.623e-5	9	NC	15	NC	1
370			min	-.001	2	-.129	3	-.006	3	-3.596e-3	5	521.152	3	757.163	4
371		15	max	.001	3	.01	5	.1	4	1.416e-4	9	NC	15	NC	1
372			min	-.001	2	-.146	3	-.005	3	-3.415e-3	5	461.02	3	675.103	4
373		16	max	.001	3	.011	5	.111	4	3.327e-4	1	8986.772	15	NC	1
374			min	-.001	2	-.163	3	-.003	3	-3.234e-3	5	412.223	3	608.677	4
375		17	max	.001	3	.012	5	.121	4	5.784e-4	1	8112.648	15	NC	1
376			min	-.001	2	-.181	3	0	3	-3.054e-3	5	372.088	3	554.235	4
377		18	max	.001	3	.013	5	.132	4	8.241e-4	1	7385.337	15	NC	1
378			min	-.001	2	-.199	3	0	10	-2.873e-3	5	338.7	3	509.162	4
379		19	max	.002	3	.014	5	.143	4	1.074e-3	2	6774.291	15	NC	1
380			min	-.002	2	-.217	3	-.001	2	-2.692e-3	5	310.653	3	471.536	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	.002	3	0	15	.001	5	1.898e-3	2	NC	1	NC	1
382			min	0	15	0	3	0	2	-2.204e-3	5	NC	1	NC	1
383		2	max	.002	3	-.002	15	.019	5	2.058e-3	2	NC	1	NC	3
384			min	0	10	-.013	1	-.013	2	-2.183e-3	5	NC	1	4829.333	2
385		3	max	.002	3	-.004	15	.038	5	2.218e-3	2	NC	1	NC	4
386			min	0	2	-.026	1	-.025	2	-2.162e-3	5	NC	1	2429.232	2
387		4	max	.002	3	-.005	15	.056	5	2.378e-3	2	NC	1	NC	4
388			min	0	2	-.038	1	-.038	2	-2.141e-3	5	NC	1	1640.279	2
389		5	max	.003	3	-.007	15	.074	5	2.538e-3	2	NC	1	NC	4
390			min	-.001	2	-.05	1	-.049	2	-2.12e-3	5	NC	1	1254.76	2
391		6	max	.003	3	-.009	15	.093	5	2.698e-3	2	NC	1	NC	13
392			min	-.002	2	-.062	1	-.06	2	-2.1e-3	5	NC	1	1031.472	2
393		7	max	.003	3	-.01	15	.111	5	2.858e-3	2	NC	1	8959.745	13
394			min	-.002	2	-.074	1	-.069	2	-2.079e-3	5	NC	1	890.377	2
395		8	max	.003	3	-.012	15	.129	5	3.018e-3	2	NC	1	7727.036	13
396			min	-.003	2	-.086	1	-.077	2	-2.058e-3	5	NC	1	797.602	2
397		9	max	.003	3	-.014	15	.147	5	3.177e-3	2	NC	1	6909.159	13
398			min	-.003	2	-.098	1	-.083	2	-2.037e-3	5	NC	1	736.757	2
399		10	max	.004	3	-.015	15	.164	5	3.337e-3	2	NC	1	6378.384	13
400			min	-.004	2	-.11	3	-.087	2	-2.016e-3	5	NC	1	699.474	2
401		11	max	.004	3	-.017	15	.181	5	3.497e-3	2	NC	1	6068.565	13
402			min	-.004	2	-.122	3	-.089	2	-1.995e-3	5	NC	1	681.807	2
403		12	max	.004	3	-.018	15	.197	5	3.657e-3	2	NC	1	5952.08	13
404			min	-.005	2	-.134	3	-.089	2	-1.975e-3	5	NC	1	682.905	2
405		13	max	.004	3	-.02	15	.212	5	3.817e-3	2	NC	1	6033.531	13
406			min	-.005	2	-.145	3	-.086	2	-1.954e-3	5	NC	1	665.587	14
407		14	max	.004	3	-.021	15	.227	5	3.977e-3	2	NC	1	6357.646	13
408			min	-.006	2	-.157	3	-.079	2	-1.933e-3	5	NC	1	609.756	14
409		15	max	.005	3	-.023	15	.241	5	4.137e-3	2	NC	1	7042.407	13
410			min	-.006	2	-.169	3	-.07	2	-2.007e-3	3	NC	1	561.941	14
411		16	max	.005	3	-.024	15	.254	5	4.297e-3	2	NC	1	8387.816	13
412			min	-.007	2	-.18	3	-.057	2	-2.094e-3	3	NC	1	520.517	14
413		17	max	.005	3	-.026	15	.266	5	4.457e-3	2	NC	1	NC	13
414			min	-.007	2	-.192	3	-.04	2	-2.181e-3	3	NC	1	484.27	14
415		18	max	.005	3	-.027	15	.278	4	4.616e-3	2	NC	1	NC	4
416			min	-.008	2	-.203	3	-.019	2	-2.268e-3	3	NC	1	452.271	14
417		19	max	.005	3	-.029	15	.29	4	4.776e-3	2	NC	1	NC	1
418			min	-.008	2	-.214	3	0	12	-2.355e-3	3	NC	1	423.798	14
419	M6	1	max	.003	3	0	15	.001	4	0	1	NC	1	NC	1
420			min	0	15	-.001	3	0	1	-2.314e-3	4	NC	1	NC	1
421		2	max	.004	3	0	15	.02	4	0	1	NC	1	NC	1
422			min	0	2	-.021	1	0	1	-2.308e-3	4	NC	1	NC	1
423		3	max	.005	3	-.002	15	.039	4	0	1	NC	1	NC	1
424			min	-.002	2	-.041	1	0	1	-2.303e-3	4	NC	1	NC	1
425		4	max	.006	3	-.003	15	.059	4	0	1	NC	1	NC	1
426			min	-.004	2	-.061	1	0	1	-2.297e-3	4	NC	1	7125.609	4
427		5	max	.006	3	-.004	15	.078	4	0	1	NC	1	NC	1
428			min	-.005	2	-.081	1	0	1	-2.291e-3	4	NC	1	5263.779	4
429		6	max	.007	3	-.005	15	.097	4	0	1	NC	1	NC	1
430			min	-.007	2	-.101	1	0	1	-2.286e-3	4	NC	1	4199.851	4
431		7	max	.008	3	-.005	15	.116	4	0	1	NC	1	NC	1
432			min	-.008	2	-.121	1	0	1	-2.28e-3	4	NC	1	3533.462	4
433		8	max	.009	3	-.006	15	.134	4	0	1	NC	1	NC	1
434			min	-.009	2	-.14	1	0	1	-2.274e-3	4	NC	1	3095.775	4
435		9	max	.009	3	-.007	15	.152	4	0	1	NC	1	NC	1
436			min	-.011	2	-.16	1	0	1	-2.269e-3	4	NC	1	2804.991	4
437		10	max	.01	3	-.008	15	.17	4	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	-.012	2	-.179	1	0	1	-2.263e-3	4	NC	1	2618.678	4
439		11	max	.011	3	-.009	15	.187	4	0	1	NC	1	NC	1
440			min	-.014	2	-.199	1	0	1	-2.257e-3	4	NC	1	2515.364	4
441		12	max	.011	3	-.009	15	.204	4	0	1	NC	1	NC	1
442			min	-.015	2	-.218	1	0	1	-2.252e-3	4	NC	1	2487.308	4
443		13	max	.012	3	-.01	15	.219	4	0	1	NC	1	NC	1
444			min	-.017	2	-.237	1	0	1	-2.246e-3	4	NC	1	2539.089	4
445		14	max	.013	3	-.011	15	.234	4	0	1	NC	1	NC	1
446			min	-.018	2	-.256	1	0	1	-2.241e-3	4	NC	1	2691.686	4
447		15	max	.014	3	-.011	15	.248	4	0	1	NC	1	NC	1
448			min	-.02	2	-.275	1	0	1	-2.235e-3	4	NC	1	2997.147	4
449		16	max	.014	3	-.012	15	.26	4	0	1	NC	1	NC	1
450			min	-.021	2	-.294	1	0	1	-2.229e-3	4	NC	1	3585.762	4
451		17	max	.015	3	-.013	15	.272	4	0	1	NC	1	NC	1
452			min	-.023	2	-.313	1	0	1	-2.224e-3	4	NC	1	4857.376	4
453		18	max	.016	3	-.013	15	.282	4	0	1	NC	1	NC	1
454			min	-.024	2	-.332	1	0	1	-2.218e-3	4	NC	1	8823.693	4
455		19	max	.016	3	-.014	15	.291	4	0	1	NC	1	NC	1
456			min	-.026	2	-.351	1	0	1	-2.212e-3	4	NC	1	NC	1
457	M9	1	max	.002	3	0	5	.001	4	7.883e-4	3	NC	1	NC	1
458			min	0	5	0	3	0	3	-2.427e-3	4	NC	1	NC	1
459		2	max	.002	3	0	5	.021	4	8.754e-4	3	NC	1	NC	3
460			min	0	5	-.013	1	-.006	3	-2.421e-3	4	NC	1	4829.333	2
461		3	max	.002	3	.001	5	.041	4	9.624e-4	3	NC	1	NC	5
462			min	0	2	-.026	1	-.012	3	-2.416e-3	4	NC	1	2429.232	2
463		4	max	.002	3	.002	5	.061	4	1.049e-3	3	NC	1	NC	15
464			min	0	2	-.038	1	-.018	3	-2.41e-3	4	NC	1	1640.279	2
465		5	max	.003	3	.002	5	.08	4	1.136e-3	3	NC	1	7989.485	15
466			min	-.001	2	-.05	1	-.023	3	-2.538e-3	2	NC	1	1254.76	2
467		6	max	.003	3	.003	5	.1	4	1.223e-3	3	NC	1	6367.87	15
468			min	-.002	2	-.062	1	-.028	3	-2.698e-3	2	NC	1	1031.472	2
469		7	max	.003	3	.003	5	.119	4	1.31e-3	3	NC	1	5352.673	15
470			min	-.002	2	-.074	1	-.032	3	-2.858e-3	2	NC	1	890.377	2
471		8	max	.003	3	.004	5	.138	4	1.397e-3	3	NC	1	4686.036	15
472			min	-.003	2	-.086	1	-.036	3	-3.018e-3	2	NC	1	797.602	2
473		9	max	.003	3	.005	5	.157	4	1.485e-3	3	NC	1	4243.059	15
474			min	-.003	2	-.098	1	-.039	3	-3.177e-3	2	NC	1	736.757	2
475		10	max	.004	3	.006	5	.175	4	1.572e-3	3	NC	1	3958.934	15
476			min	-.004	2	-.11	3	-.041	3	-3.337e-3	2	NC	1	699.474	2
477		11	max	.004	3	.006	5	.192	4	1.659e-3	3	NC	1	3800.812	15
478			min	-.004	2	-.122	3	-.042	3	-3.497e-3	2	NC	1	681.807	2
479		12	max	.004	3	.007	5	.208	4	1.746e-3	3	NC	1	3756.735	15
480			min	-.005	2	-.134	3	-.042	3	-3.657e-3	2	8823.945	5	682.905	2
481		13	max	.004	3	.008	5	.223	4	1.833e-3	3	NC	1	3833.419	15
482			min	-.005	2	-.145	3	-.041	3	-3.817e-3	2	7845.506	5	704.984	2
483		14	max	.004	3	.009	5	.237	4	1.92e-3	3	NC	1	4062.366	15
484			min	-.006	2	-.157	3	-.038	3	-3.977e-3	2	7030.693	5	754.715	2
485		15	max	.005	3	.01	5	.25	4	2.007e-3	3	NC	1	4521.945	15
486			min	-.006	2	-.169	3	-.034	3	-4.137e-3	2	6345.912	5	847.581	2
487		16	max	.005	3	.011	5	.261	4	2.094e-3	3	NC	1	5408.481	15
488			min	-.007	2	-.18	3	-.028	3	-4.297e-3	2	5766.138	5	1021.616	2
489		17	max	.005	3	.012	5	.271	4	2.181e-3	3	NC	1	7324.61	15
490			min	-.007	2	-.192	3	-.021	3	-4.457e-3	2	5272.333	5	1392.868	2
491		18	max	.005	3	.013	5	.28	4	2.268e-3	3	NC	1	NC	9
492			min	-.008	2	-.203	3	-.012	3	-4.616e-3	2	4849.77	5	2544.335	2
493		19	max	.005	3	.014	5	.287	5	2.355e-3	3	NC	1	NC	1
494			min	-.008	2	-.214	3	-.008	1	-4.776e-3	2	4486.901	5	NC	1