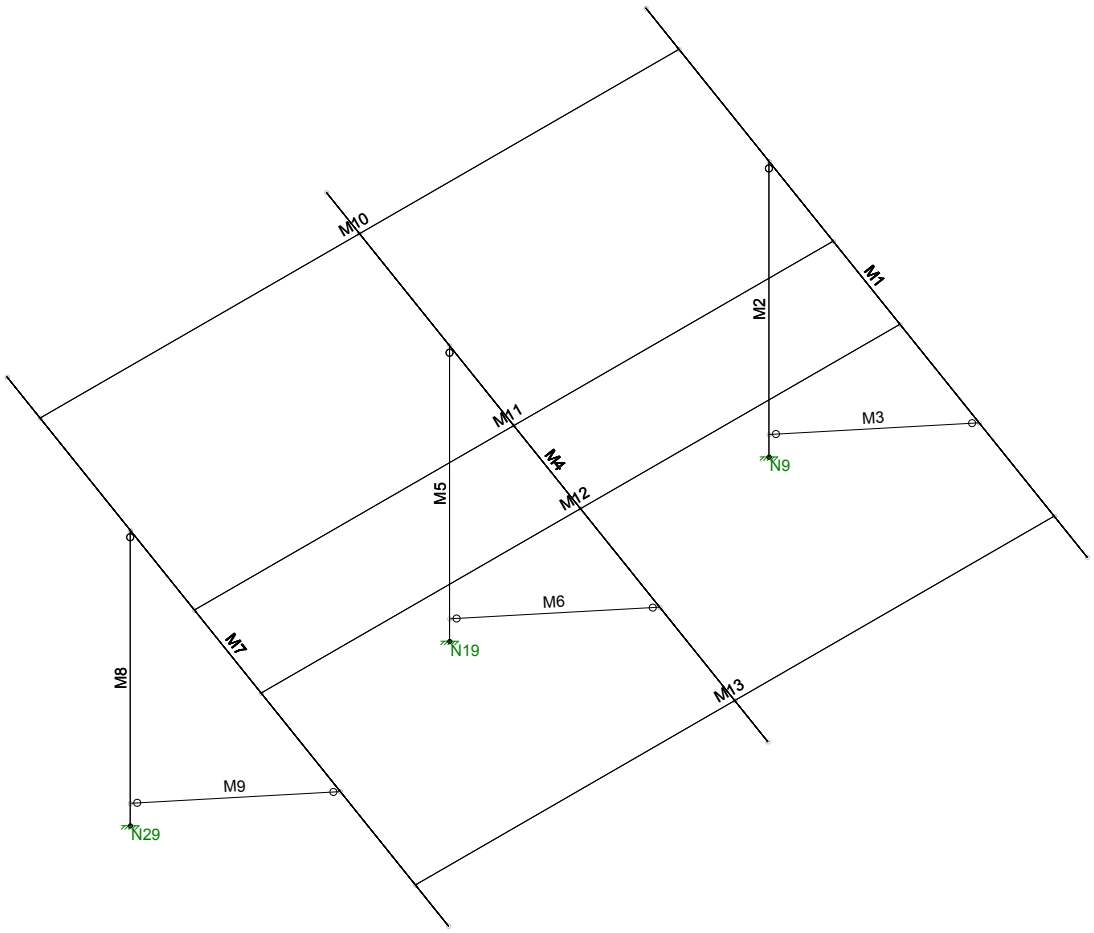


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

1.1 Project Description

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

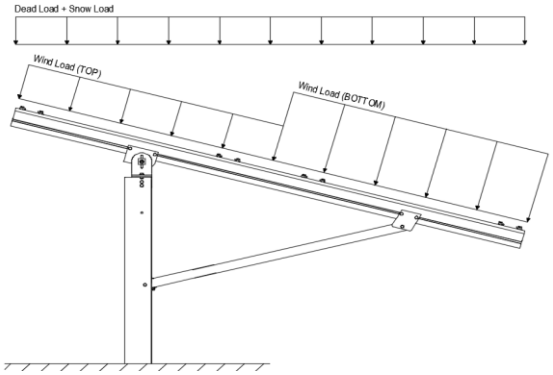
1.2 Construction

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

PV modules are required to meet the following specifications:

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

Modules Per Row =	2
Module Tilt =	30°
Maximum Height Above Grade =	3 ft



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

1.3 Technical Codes

- ASCE 7-05 - Chapter 6, Wind Loads
- ASCE 7-05 - Chapter 7, Snow Loads
- ASCE 7-05 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2003, 2006, 2009
- Aluminum Design Manual, Eighth Edition, 2005

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	16.49	psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.73		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	130	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	26.53	psf	*Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

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

2.4 Seismic Loads

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

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

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

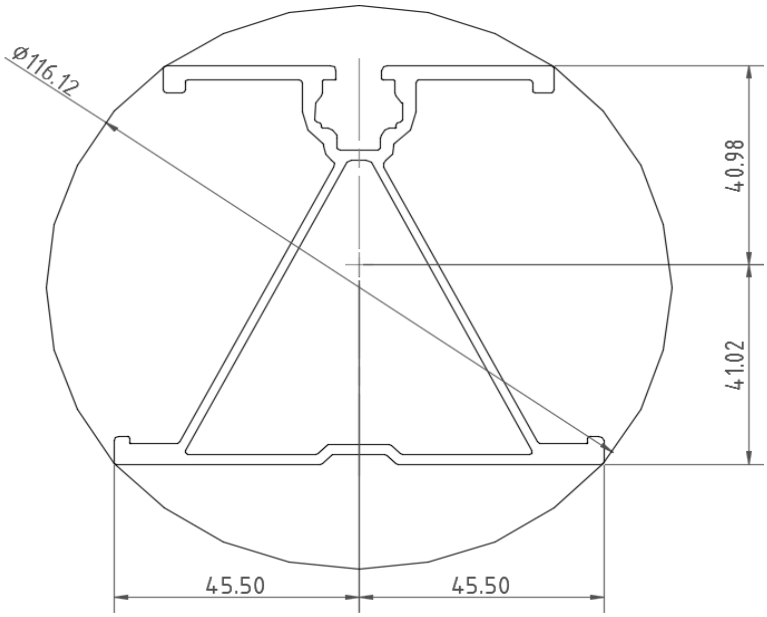
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	78	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 =	1.273	k-ft
M_z =	0.116	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	56%	

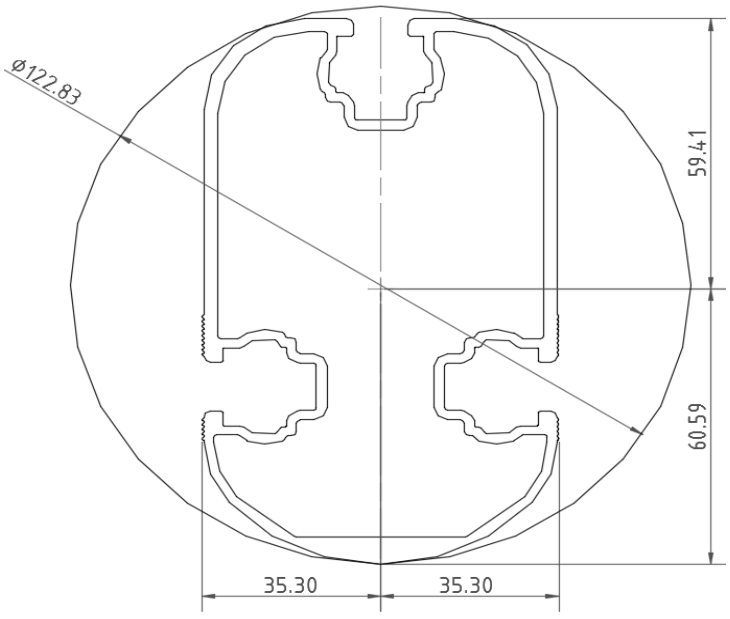


DETAIL VIEW

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 =	4.268	k-ft
M_z =	0.000	k-ft
P_n =	0.024	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	85%	

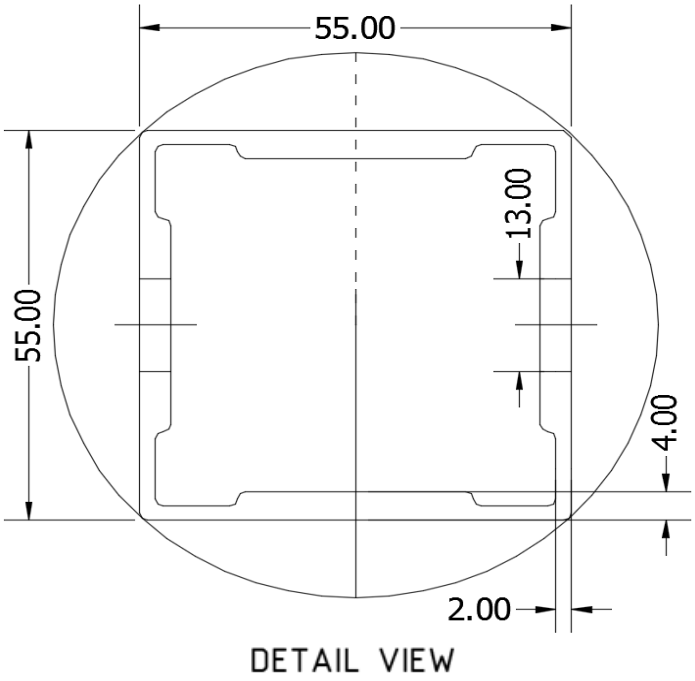


DETAIL VIEW

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).

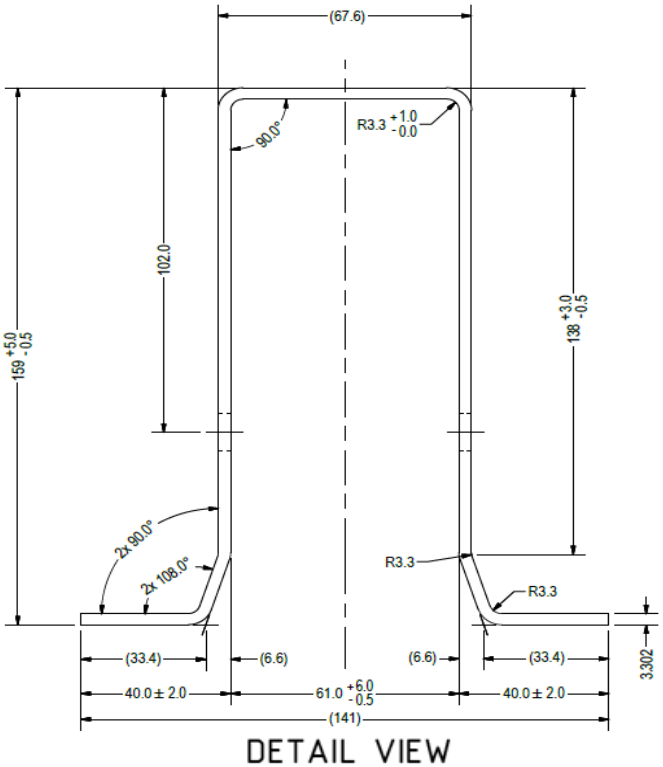
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	4.213	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	32%	



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 =	12.652	k-ft
M_z =	0.000	k-ft
P_r =	-5.246	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	78%	



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 =	6.78	k
Maximum Lateral Load =	3.82	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)

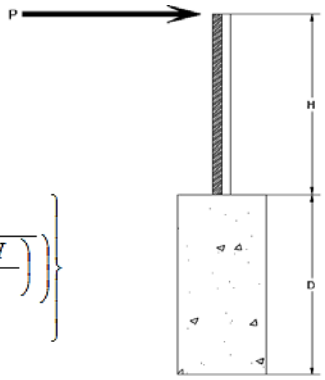
Lateral Force @ Top of Pole, P =	0.84	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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 =	4.52		
Required Footing Depth, D =	8.40	ft	
2nd Trial @ D_2 =	5.83	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 =	2.52		
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 =	2.55		
Required Footing Depth, D =	5.75	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.

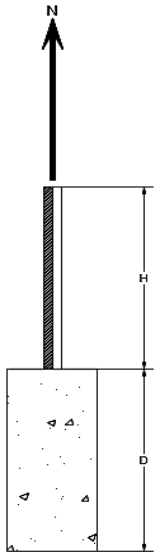
5.4 Uplifting Force Resistance

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 =	3.25	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 =	2.12	k
Required Concrete Volume, V =	14.61	ft^3
Required Footing Depth, D =	4.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	7.04
2	0.4	0.2	118.10	6.93
3	0.6	0.2	118.10	6.83
4	0.8	0.2	118.10	6.73
5	1	0.2	118.10	6.62
6	1.2	0.2	118.10	6.52
7	1.4	0.2	118.10	6.41
8	1.6	0.2	118.10	6.31
9	1.8	0.2	118.10	6.21
10	2	0.2	118.10	6.10
11	2.2	0.2	118.10	6.00
12	2.4	0.2	118.10	5.90
13	2.6	0.2	118.10	5.79
14	2.8	0.2	118.10	5.69
15	3	0.2	118.10	5.59
16	3.2	0.2	118.10	5.48
17	3.4	0.2	118.10	5.38
18	3.6	0.2	118.10	5.27
19	3.8	0.2	118.10	5.17
20	4	0.2	118.10	5.07
21	4.2	0.2	118.10	4.96
22	4.4	0.2	118.10	4.86
23	4.6	0.2	118.10	4.76
24	4.8	0.2	118.10	4.65
25	0	0.0	0.00	4.65
26	0	0.0	0.00	4.65
27	0	0.0	0.00	4.65
28	0	0.0	0.00	4.65
29	0	0.0	0.00	4.65
30	0	0.0	0.00	4.65
31	0	0.0	0.00	4.65
32	0	0.0	0.00	4.65
33	0	0.0	0.00	4.65
34	0	0.0	0.00	4.65
Max	4.8	Sum	1.13	

A 2ft diameter x 4.75ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.44	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

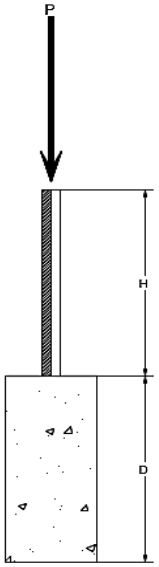
Weight of Concrete

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 =	6.18	k
Utilization =	61%	

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



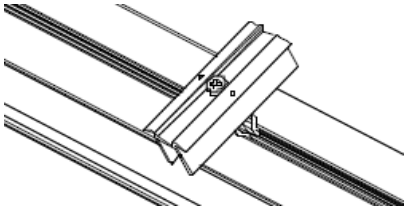
6. DESIGN OF JOINTS AND CONNECTIONS

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.

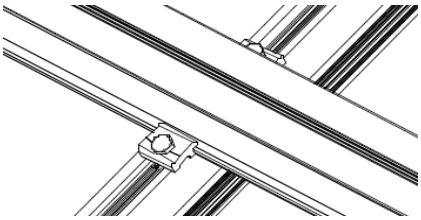
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.923 k
Allowable Uplift	=	1.214 k
Utilization	=	76%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.151 k
Allowable Uplift	=	2.180 k
Utilization	=	99%

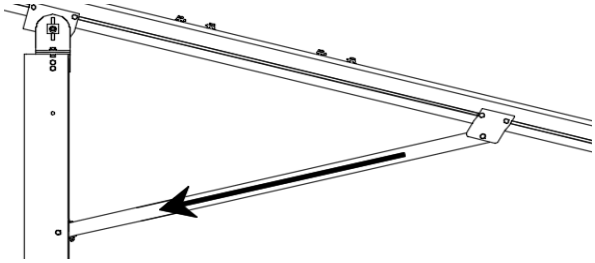


6.2 Strut Connections

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	=	4.213 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	47%

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

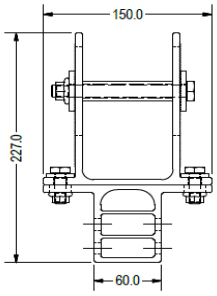


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

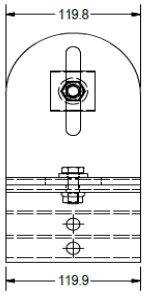
6.3 Girder to Post Connection

In order to connect the girder to the post, custom extruded sections are assembled to create a post head piece. The reliability of calculations is uncertain due to limited standards, therefore the strength of the head piece has been evaluated by load testing.

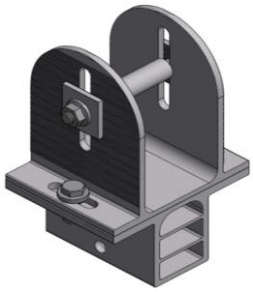
Maximum Tensile Load	=	4.528 k
Allowable Load	=	5.649 k
Utilization	=	80%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

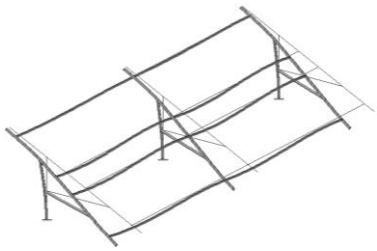
7.1 Seismic Drift

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}	=	0.424 in

0.424 ≤ 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 =	78 in	L_b =	78
J =	0.432	J =	0.432
	215.785		137.226
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	28.6 ksi	φF_L=	29.6
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 mm⁴	Iy =	446476 mm⁴
	2.155 in⁴		1.073 in⁴
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in³	Sy =	0.599 in³
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 =	79.31	in	
Pr =	-5.25	k	(LRFD Factored Load)
Mr (Strong) =	12.65	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 =	0.122	<	0.2	
Utilization =	0.78	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.122	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 78%

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	-85.097	-85.097	0	0
2	M11	y	-85.097	-85.097	0	0
3	M12	y	-136.895	-136.895	0	0
4	M13	y	-136.895	-136.895	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	170.194	170.194	0	0
2	M11	y	170.194	170.194	0	0
3	M12	y	81.397	81.397	0	0
4	M13	y	81.397	81.397	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 + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 1.0W	Yes	Y		1	1			4	1														
11	ASD 1.0D + 0.75L + 0.75W + 0....	Yes	Y		1	1	3	.75	4	.75														
12	ASD 0.6D + 1.0W	Yes	Y		2	.6					5	1												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	838.86	2	2101.692	2	119.955	2	.158	2	.012	5	3.951	3
2		min	-1170.225	3	-1692.44	3	-249.192	5	-1.039	5	-.009	2	.477	15
3	N19	max	2939.714	2	5715.904	2	0	3	0	2	.013	4	6.522	3
4		min	-2892.644	3	-5197.92	3	-263.473	5	-1.078	4	0	3	.191	15
5	N29	max	838.86	2	2101.692	2	159.22	3	.239	3	.013	4	3.951	3
6		min	-1170.225	3	-1692.44	3	-265.208	4	-1.07	4	-.004	3	-.28	5
7	Totals:	max	4617.434	2	9919.288	2	0	3						
8		min	-5233.093	3	-8582.8	3	-767.824	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	6	-1.922	6	-1.499	5	0	1	0	5	0	15
5		3	max	-20.396	12	322.028	3	-17.704	12	.046	3	.133	1	.3	2
6			min	-138.384	1	-685.061	2	-76.891	1	-.158	2	.033	10	-.139	3
7		4	max	-20.829	12	320.904	3	-17.704	12	.046	3	.085	1	.726	2
8			min	-139.249	1	-686.56	2	-76.891	1	-.158	2	.018	10	-.339	3
9		5	max	-21.262	12	319.78	3	-17.704	12	.046	3	.043	4	1.153	2
10			min	-140.114	1	-688.058	2	-76.891	1	-.158	2	.003	10	-.538	3
11		6	max	261.382	3	573.415	2	-7.965	12	.007	2	.054	2	1.117	2
12			min	-845.261	2	-168.63	3	-103.795	1	-.027	3	-.019	3	-.557	3
13		7	max	260.733	3	571.916	2	-7.965	12	.007	2	.003	10	.761	2
14			min	-846.126	2	-169.754	3	-103.795	1	-.027	3	-.048	4	-.452	3
15		8	max	260.084	3	570.418	2	-7.965	12	.007	2	-.022	12	.407	2
16			min	-846.991	2	-170.878	3	-103.795	1	-.027	3	-.084	1	-.346	3
17		9	max	225.657	3	116.978	3	-15.288	12	.013	5	.057	1	.196	2
18			min	-922.335	2	-58.435	2	-122.209	1	-.096	2	.007	10	-.302	3
19		10	max	225.008	3	115.854	3	-15.288	12	.013	5	.03	3	.233	2
20			min	-923.2	2	-59.934	2	-122.209	1	-.096	2	-.024	2	-.374	3
21		11	max	224.359	3	114.73	3	-15.288	12	.013	5	.015	3	.271	2
22			min	-924.065	2	-61.432	2	-122.209	1	-.096	2	-.095	1	-.446	3
23		12	max	185.275	3	824.99	3	58.137	2	.182	3	.078	1	.473	2
24			min	-995.464	2	-468.672	2	-206.06	3	-.135	2	-.016	5	-.796	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	184.626	3	823.866	3	58.137	2	.182	3	.083	2	.765	2
26			min	-996.329	2	-470.171	2	-206.06	3	-.135	2	-.101	5	-1.308	3
27		14	max	140.477	1	456.874	2	49.251	5	.141	2	.066	3	1.044	2
28			min	5.233	15	-778.559	3	-62.46	3	-.31	3	-.108	4	-1.797	3
29		15	max	139.612	1	455.376	2	47.751	5	.141	2	.027	3	.761	2
30			min	4.972	15	-779.682	3	-62.46	3	-.31	3	-.087	4	-1.313	3
31		16	max	138.747	1	453.877	2	46.252	5	.141	2	-.008	12	.479	2
32			min	4.711	15	-780.806	3	-62.46	3	-.31	3	-.105	1	-.829	3
33		17	max	137.882	1	452.378	2	44.752	5	.141	2	-.011	15	.198	2
34			min	4.45	15	-781.93	3	-62.46	3	-.31	3	-.14	1	-.344	3
35		18	max	1.11	4	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	.014	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	6	-1.921	4	-1.499	5	0	1	0	5	0	15
43		3	max	24.687	3	981.97	3	0	1	.029	4	.139	4	.701	2
44			min	-219.7	1	-1840.915	2	-68.098	5	0	1	0	1	-.378	3
45		4	max	24.038	3	980.846	3	0	1	.029	4	.096	4	1.844	2
46			min	-220.565	1	-1842.413	2	-69.597	5	0	1	0	1	-.987	3
47		5	max	23.389	3	979.722	3	0	1	.029	4	.053	4	2.987	2
48			min	-221.43	1	-1843.912	2	-71.097	5	0	1	0	1	-1.595	3
49		6	max	1121.926	3	1755.432	2	0	1	0	1	0	1	2.811	2
50			min	-2278.577	2	-817.551	3	-62.401	4	-.022	4	-.02	5	-1.544	3
51		7	max	1121.277	3	1753.934	2	0	1	0	1	0	1	1.722	2
52			min	-2279.442	2	-818.675	3	-63.9	4	-.022	4	-.059	4	-1.036	3
53		8	max	1120.628	3	1752.435	2	0	1	0	1	0	1	.634	2
54			min	-2280.307	2	-819.799	3	-65.4	4	-.022	4	-.099	4	-.528	3
55		9	max	1152.704	3	229.567	3	0	1	.009	4	.071	4	.016	9
56			min	-2338.668	2	-209.687	2	-143.01	4	0	1	0	1	-.259	3
57		10	max	1152.055	3	228.443	3	0	1	.009	4	0	1	.116	1
58			min	-2339.533	2	-211.186	2	-144.51	4	0	1	-.018	4	-.401	3
59		11	max	1151.406	3	227.319	3	0	1	.009	4	0	1	.244	2
60			min	-2340.398	2	-212.684	2	-146.01	4	0	1	-.108	4	-.543	3
61		12	max	1192.797	3	2275.656	3	0	1	.106	4	0	1	.896	2
62			min	-2406.649	2	-1540.625	2	-149.709	4	0	1	-.003	4	-1.501	3
63		13	max	1192.148	3	2274.532	3	0	1	.106	4	0	1	1.852	2
64			min	-2407.514	2	-1542.124	2	-151.209	4	0	1	-.097	4	-2.913	3
65		14	max	223.299	1	1237.683	2	49.056	5	0	1	0	1	2.772	2
66			min	-23.618	3	-1905.966	3	0	1	-.07	4	-.088	5	-4.268	3
67		15	max	222.434	1	1236.185	2	47.557	5	0	1	0	1	2.004	2
68			min	-24.267	3	-1907.09	3	0	1	-.07	4	-.058	5	-3.084	3
69		16	max	221.569	1	1234.686	2	46.057	5	0	1	0	1	1.237	2
70			min	-24.916	3	-1908.214	3	0	1	-.07	4	-.029	5	-1.9	3
71		17	max	220.704	1	1233.188	2	44.557	5	0	1	0	1	.471	2
72			min	-25.565	3	-1909.338	3	0	1	-.07	4	0	4	-.716	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	-.014	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	6	-1.922	4	-1.499	5	0	1	0	5	0	15
81		3	max	17.07	5	322.028	3	76.891	1	.158	2	.07	5	.3	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	-138.384	1	-685.061	2	-32.402	5	-.046	3	-.133	1	-.139	3
83		4	max	16.666	5	320.904	3	76.891	1	.158	2	.05	5	.726	2
84			min	-139.249	1	-686.56	2	-33.901	5	-.046	3	-.085	1	-.339	3
85		5	max	16.262	5	319.78	3	76.891	1	.158	2	.028	5	1.153	2
86			min	-140.114	1	-688.058	2	-35.401	5	-.046	3	-.038	1	-.538	3
87		6	max	261.382	3	573.415	2	103.795	1	.027	3	.019	3	1.117	2
88			min	-845.261	2	-168.63	3	-26.128	5	-.018	5	-.054	2	-.557	3
89		7	max	260.733	3	571.916	2	103.795	1	.027	3	.027	3	.761	2
90			min	-846.126	2	-169.754	3	-27.627	5	-.018	5	-.039	5	-.452	3
91		8	max	260.084	3	570.418	2	103.795	1	.027	3	.084	1	.407	2
92			min	-846.991	2	-170.878	3	-29.127	5	-.018	5	-.057	5	-.346	3
93		9	max	225.657	3	116.978	3	122.209	1	.096	2	.023	5	.196	2
94			min	-922.335	2	-58.435	2	-57.007	5	.011	15	-.057	1	-.302	3
95		10	max	225.008	3	115.854	3	122.209	1	.096	2	.024	2	.233	2
96			min	-923.2	2	-59.934	2	-58.506	5	.011	15	-.03	3	-.374	3
97		11	max	224.359	3	114.73	3	122.209	1	.096	2	.095	1	.271	2
98			min	-924.065	2	-61.432	2	-60.006	5	.011	15	-.05	5	-.446	3
99		12	max	185.275	3	824.99	3	206.06	3	.135	2	-.017	15	.473	2
100			min	-995.464	2	-468.672	2	-132.865	5	-.182	3	-.078	1	-.796	3
101		13	max	184.626	3	823.866	3	206.06	3	.135	2	.092	3	.765	2
102			min	-996.329	2	-470.171	2	-134.365	5	-.182	3	-.122	4	-1.308	3
103		14	max	140.477	1	456.874	2	70.892	4	.31	3	.04	2	1.044	2
104			min	9.658	15	-778.559	3	8.266	10	-.141	2	-.102	5	-1.797	3
105		15	max	139.612	1	455.376	2	69.392	4	.31	3	.069	1	.761	2
106			min	9.397	15	-779.682	3	8.266	10	-.141	2	-.067	5	-1.313	3
107		16	max	138.747	1	453.877	2	67.892	4	.31	3	.105	1	.479	2
108			min	9.136	15	-780.806	3	8.266	10	-.141	2	-.033	5	-.829	3
109		17	max	137.882	1	452.378	2	66.393	4	.31	3	.14	1	.198	2
110			min	8.875	15	-781.93	3	8.266	10	-.141	2	0	15	-.344	3
111		18	max	1.11	4	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	63.409	4	449.139	2	-8.355	15	.014	2	.164	1	.141	2
116			min	8.265	10	-784.065	3	-136.22	1	-.028	3	.015	15	-.31	3
117		2	max	62.469	3	330.939	2	-7.065	15	.014	2	.075	1	.186	3
118			min	8.265	10	-590.748	3	-108.927	1	-.028	3	.01	15	-.141	2
119		3	max	62.469	3	212.739	2	-5.775	15	.014	2	.034	3	.543	3
120			min	8.265	10	-397.432	3	-81.634	1	-.028	3	-.002	9	-.337	2
121		4	max	62.469	3	94.539	2	-4.485	15	.014	2	.015	3	.761	3
122			min	8.265	10	-204.115	3	-54.341	1	-.028	3	-.043	1	-.448	2
123		5	max	62.469	3	13.212	5	-3.194	15	.014	2	-.002	15	.838	3
124			min	8.265	10	-23.874	1	-27.047	1	-.028	3	-.072	1	-.474	2
125		6	max	62.469	3	182.519	3	4.286	9	.014	2	-.003	15	.776	3
126			min	8.265	10	-141.862	2	-21.253	3	-.028	3	-.082	1	-.414	2
127		7	max	62.469	3	375.836	3	27.539	1	.014	2	-.004	15	.574	3
128			min	3.672	15	-260.062	2	-19.318	3	-.028	3	-.072	1	-.269	2
129		8	max	62.469	3	569.153	3	54.832	1	.014	2	-.004	15	.233	3
130			min	-1.768	5	-378.262	2	-17.383	3	-.028	3	-.046	3	-.039	2
131		9	max	62.469	3	762.47	3	82.125	1	.014	2	.016	9	.277	2
132			min	-9.182	5	-496.462	2	-15.447	3	-.028	3	-.058	3	-.248	3
133		10	max	62.469	3	955.787	3	-7.567	10	.028	3	.077	1	.679	2
134			min	8.265	10	21.521	15	-109.418	1	-.003	14	-.069	3	-.868	3
135		11	max	62.469	3	496.462	2	15.447	3	.028	3	.017	14	.277	2
136			min	8.265	10	-762.47	3	-82.125	1	-.014	2	-.058	3	-.248	3
137		12	max	62.469	3	378.262	2	17.383	3	.028	3	.002	5	.233	3
138			min	6.709	15	-569.153	3	-54.832	1	-.014	2	-.046	3	-.039	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	62.469	3	260.062	2	19.318	3	.028	3	-.002	15	.574	3
140			min	1.719	15	-375.836	3	-27.539	1	-.014	2	-.072	1	-.269	2
141		14	max	62.469	3	141.862	2	21.253	3	.028	3	-.004	15	.776	3
142			min	-4.686	5	-182.519	3	-5.284	4	-.014	2	-.082	1	-.414	2
143		15	max	62.469	3	23.874	1	27.047	1	.028	3	-.002	12	.838	3
144			min	-12.1	5	6.883	12	-1.767	5	-.014	2	-.072	1	-.474	2
145		16	max	62.469	3	204.115	3	54.341	1	.028	3	.015	3	.761	3
146			min	-19.514	5	-94.539	2	.059	15	-.014	2	-.043	1	-.448	2
147		17	max	62.469	3	397.432	3	81.634	1	.028	3	.034	3	.543	3
148			min	-26.927	5	-212.739	2	1.349	15	-.014	2	-.009	4	-.337	2
149		18	max	62.469	3	590.748	3	108.927	1	.028	3	.075	1	.186	3
150			min	-34.341	5	-330.939	2	2.639	15	-.014	2	-.006	5	-.141	2
151		19	max	62.469	3	784.065	3	136.22	1	.028	3	.164	1	.141	2
152			min	-41.755	5	-449.139	2	3.929	15	-.014	2	-.002	5	-.31	3
153	M11	1	max	135.206	2	403.969	2	20.914	5	0	15	.197	1	.082	4
154			min	-182.527	3	-711.86	3	-144.011	1	-.004	1	-.09	5	-.261	3
155		2	max	135.206	2	285.769	2	22.909	5	0	15	.103	1	.184	3
156			min	-182.527	3	-518.543	3	-116.718	1	-.004	1	-.074	5	-.21	2
157		3	max	135.206	2	167.568	2	24.905	5	0	15	.055	3	.488	3
158			min	-182.527	3	-325.226	3	-89.425	1	-.004	1	-.057	5	-.374	2
159		4	max	135.206	2	49.368	2	26.901	5	0	15	.031	3	.653	3
160			min	-182.527	3	-131.909	3	-62.132	1	-.004	1	-.046	4	-.452	2
161		5	max	135.206	2	61.408	3	28.897	5	0	15	.008	3	.679	3
162			min	-182.527	3	-68.832	2	-34.839	1	-.004	1	-.061	1	-.445	2
163		6	max	135.206	2	254.725	3	30.893	5	0	15	.004	5	.565	3
164			min	-182.527	3	-187.032	2	-28.526	3	-.004	1	-.076	1	-.352	2
165		7	max	135.206	2	448.042	3	39.117	4	0	15	.027	5	.311	3
166			min	-182.527	3	-305.232	2	-26.591	3	-.004	1	-.072	1	-.175	2
167		8	max	135.206	2	641.359	3	47.483	4	0	15	.051	5	.088	2
168			min	-182.527	3	-423.433	2	-24.655	3	-.004	1	-.051	3	-.083	3
169		9	max	135.206	2	834.676	3	74.334	1	0	15	.08	4	.437	2
170			min	-182.527	3	-541.633	2	-22.72	3	-.004	1	-.068	3	-.616	3
171		10	max	135.206	2	659.833	2	71.177	9	.004	1	.124	4	.871	2
172			min	-182.527	3	-1027.993	3	-101.627	1	-.002	14	-.084	3	-1.288	3
173		11	max	135.206	2	541.633	2	25.028	5	.004	1	.009	9	.437	2
174			min	-182.527	3	-834.676	3	-74.334	1	0	5	-.075	5	-.616	3
175		12	max	135.206	2	423.433	2	27.024	5	.004	1	-.02	10	.088	2
176			min	-182.527	3	-641.359	3	-47.041	1	0	5	-.064	4	-.083	3
177		13	max	135.206	2	305.232	2	29.02	5	.004	1	-.018	10	.311	3
178			min	-182.527	3	-448.042	3	-19.748	1	0	5	-.072	1	-.175	2
179		14	max	135.206	2	187.032	2	31.296	4	.004	1	-.008	12	.565	3
180			min	-182.527	3	-254.725	3	.62	9	0	5	-.076	1	-.352	2
181		15	max	135.206	2	68.832	2	39.662	4	.004	1	.009	5	.679	3
182			min	-182.527	3	-61.408	3	11.59	10	0	5	-.061	1	-.445	2
183		16	max	135.206	2	131.909	3	62.132	1	.004	1	.033	5	.653	3
184			min	-182.527	3	-49.368	2	15.155	10	0	5	-.026	1	-.452	2
185		17	max	135.206	2	325.226	3	89.425	1	.004	1	.064	4	.488	3
186			min	-182.527	3	-167.568	2	18.719	10	0	5	.012	9	-.374	2
187		18	max	135.206	2	518.543	3	116.718	1	.004	1	.107	4	.184	3
188			min	-182.527	3	-285.769	2	22.283	10	0	5	.03	10	-.21	2
189		19	max	135.206	2	711.86	3	144.011	1	.004	1	.197	1	.04	1
190			min	-182.527	3	-403.969	2	24.458	12	0	5	.047	10	-.261	3
191	M12	1	max	26.325	5	625.714	2	25.333	5	0	15	.21	1	.103	2
192			min	-19.606	9	-289.394	3	-146.957	1	-.003	1	-.104	5	.012	9
193		2	max	18.911	5	447.658	2	27.329	5	0	15	.113	1	.228	3
194			min	-19.606	9	-198.686	3	-119.664	1	-.003	1	-.085	5	-.285	2
195		3	max	11.497	5	269.602	2	29.325	5	0	15	.043	3	.339	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-19.606	9	-107.979	3	-92.371	1	-.003	1	-.064	5	-.544	2
197		4	max	10.859	2	91.547	2	31.321	5	0	15	.022	3	.384	3
198			min	-19.606	9	-17.272	3	-65.078	1	-.003	1	-.049	4	-.674	2
199		5	max	10.859	2	73.435	3	33.316	5	0	15	.002	3	.364	3
200			min	-19.606	9	-86.509	2	-37.785	1	-.003	1	-.057	1	-.676	2
201		6	max	10.859	2	164.142	3	35.312	5	0	15	.006	5	.278	3
202			min	-20.642	14	-264.565	2	-24.088	3	-.003	1	-.075	1	-.549	2
203		7	max	10.859	2	254.849	3	43.269	4	0	15	.032	5	.127	3
204			min	-25.1	4	-442.62	2	-22.153	3	-.003	1	-.072	1	-.294	2
205		8	max	10.859	2	345.556	3	51.635	4	0	15	.06	5	.09	2
206			min	-32.513	4	-620.676	2	-20.218	3	-.003	1	-.05	1	-.09	3
207		9	max	10.859	2	436.263	3	71.388	1	0	15	.092	4	.603	2
208			min	-39.927	4	-798.732	2	-18.283	3	-.003	1	-.062	3	-.372	3
209		10	max	10.859	2	976.787	2	98.681	1	.003	1	.138	4	1.244	2
210			min	-47.341	4	-694.429	1	-28.736	2	-.002	14	-.074	3	-.72	3
211		11	max	28.343	5	798.732	2	29.646	5	.003	1	.008	9	.603	2
212			min	-19.606	9	-436.263	3	-71.388	1	0	5	-.087	5	-.372	3
213		12	max	20.929	5	620.676	2	31.641	5	.003	1	-.022	10	.09	2
214			min	-19.606	9	-345.556	3	-44.095	1	0	5	-.074	4	-.09	3
215		13	max	13.515	5	442.62	2	33.637	5	.003	1	-.019	10	.127	3
216			min	-19.606	9	-254.849	3	-16.801	1	0	5	-.072	1	-.294	2
217		14	max	10.859	2	264.565	2	36.262	4	.003	1	-.01	12	.278	3
218			min	-19.606	9	-164.142	3	1.487	9	0	5	-.075	1	-.549	2
219		15	max	10.859	2	86.509	2	44.628	4	.003	1	.01	5	.364	3
220			min	-19.606	9	-73.435	3	13.799	10	0	5	-.057	1	-.676	2
221		16	max	10.859	2	17.272	3	65.078	1	.003	1	.038	5	.384	3
222			min	-19.656	14	-91.547	2	17.364	10	0	5	-.02	1	-.674	2
223		17	max	10.859	2	107.979	3	92.371	1	.003	1	.072	4	.339	3
224			min	-23.397	14	-269.602	2	19.108	12	0	5	.014	9	-.544	2
225		18	max	10.859	2	198.686	3	119.664	1	.003	1	.12	4	.228	3
226			min	-30.522	4	-447.658	2	20.398	12	0	5	.038	10	-.285	2
227		19	max	10.859	2	289.394	3	146.957	1	.003	1	.21	1	.103	2
228			min	-37.936	4	-625.714	2	21.688	12	0	5	.057	10	-.032	5
229	M13	1	max	29.362	5	682.546	2	17.879	5	.009	3	.164	1	.158	2
230			min	-76.847	1	-324.308	3	-136.559	1	-.022	2	-.084	5	-.046	3
231		2	max	21.949	5	504.49	2	19.875	5	.009	3	.075	1	.155	3
232			min	-76.847	1	-233.601	3	-109.265	1	-.022	2	-.07	5	-.27	2
233		3	max	14.535	5	326.435	2	21.871	5	.009	3	.033	3	.291	3
234			min	-76.847	1	-142.894	3	-81.972	1	-.022	2	-.056	4	-.571	2
235		4	max	7.121	5	148.379	2	23.867	5	.009	3	.015	3	.362	3
236			min	-76.847	1	-52.187	3	-54.679	1	-.022	2	-.05	4	-.742	2
237		5	max	-.054	15	38.52	3	25.863	5	.009	3	-.002	12	.367	3
238			min	-76.847	1	-29.677	2	-27.386	1	-.022	2	-.073	1	-.785	2
239		6	max	-5.044	15	129.227	3	29.402	4	.009	3	0	15	.306	3
240			min	-76.847	1	-207.732	2	-20.698	3	-.022	2	-.083	1	-.699	2
241		7	max	-10.034	15	219.934	3	37.768	4	.009	3	.019	5	.18	3
242			min	-76.847	1	-385.788	2	-18.763	3	-.022	2	-.073	1	-.485	2
243		8	max	-15.024	15	310.641	3	54.493	1	.009	3	.042	5	-.007	15
244			min	-76.847	1	-563.844	2	-16.828	3	-.022	2	-.045	3	-.142	2
245		9	max	-17.703	12	401.349	3	81.786	1	.009	3	.071	4	.33	2
246			min	-76.847	1	-741.899	2	-14.893	3	-.022	2	-.056	3	-.269	3
247		10	max	-17.703	12	919.955	2	77.346	14	.009	3	.114	4	.93	2
248			min	-76.847	1	-492.056	3	-109.08	1	-.022	2	-.067	3	-.591	3
249		11	max	20.364	5	741.899	2	20.931	5	.022	2	.016	9	.33	2
250			min	-76.847	1	-401.349	3	-81.786	1	-.009	3	-.062	5	-.269	3
251		12	max	12.951	5	563.844	2	22.927	5	.022	2	-.02	9	0	15
252			min	-76.847	1	-310.641	3	-54.493	1	-.009	3	-.053	4	-.142	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	5.537	5	385.788	2	24.923	5	.022	2	-.019	10	.18	3
254			min	-76.847	1	-219.934	3	-27.2	1	-.009	3	-.073	1	-.485	2
255		14	max	-1.116	15	207.732	2	26.919	5	.022	2	-.007	15	.306	3
256			min	-76.847	1	-129.227	3	-4.206	9	-.009	3	-.083	1	-.699	2
257		15	max	-6.106	15	29.677	2	33.828	4	.022	2	.01	5	.367	3
258			min	-76.847	1	-38.52	3	10.539	10	-.009	3	-.073	1	-.785	2
259		16	max	-11.096	15	52.187	3	54.679	1	.022	2	.032	5	.362	3
260			min	-76.847	1	-148.379	2	14.103	10	-.009	3	-.043	1	-.742	2
261		17	max	-16.086	15	142.894	3	81.972	1	.022	2	.055	5	.291	3
262			min	-76.847	1	-326.435	2	16.937	12	-.009	3	-.002	9	-.571	2
263		18	max	-17.703	12	233.601	3	109.265	1	.022	2	.094	4	.155	3
264			min	-76.847	1	-504.49	2	18.227	12	-.009	3	.025	10	-.27	2
265		19	max	-17.703	12	324.308	3	136.559	1	.022	2	.164	1	.158	2
266			min	-76.847	1	-682.546	2	19.517	12	-.009	3	.042	10	-.046	3
267	M2	1	max	2101.692	2	1169.526	3	120.038	2	.012	5	1.039	5	3.951	3
268			min	-1692.44	3	-838.491	2	-249.22	5	-.009	2	-.158	2	.477	15
269		2	max	2098.855	2	1169.526	3	120.038	2	.012	5	.962	5	3.586	3
270			min	-1694.568	3	-838.491	2	-246.761	5	-.009	2	-.12	2	.454	15
271		3	max	1383.841	2	666.219	3	83.647	2	0	2	.88	5	3.322	3
272			min	-1428.277	3	85.916	15	-228.523	5	0	3	-.099	2	.428	15
273		4	max	1381.003	2	666.219	3	83.647	2	0	2	.809	5	3.114	3
274			min	-1430.405	3	85.916	15	-226.064	5	0	3	-.073	2	.402	15
275		5	max	1378.166	2	666.219	3	83.647	2	0	2	.739	5	2.906	3
276			min	-1432.533	3	85.916	15	-223.605	5	0	3	-.047	2	.375	15
277		6	max	1375.329	2	666.219	3	83.647	2	0	2	.669	5	2.699	3
278			min	-1434.661	3	85.916	15	-221.145	5	0	3	-.024	1	.348	15
279		7	max	1372.491	2	666.219	3	83.647	2	0	2	.603	4	2.491	3
280			min	-1436.789	3	85.916	15	-218.686	5	0	3	-.031	3	.321	15
281		8	max	1369.654	2	666.219	3	83.647	2	0	2	.537	4	2.284	3
282			min	-1438.917	3	85.916	15	-216.227	5	0	3	-.076	3	.294	15
283		9	max	1366.816	2	666.219	3	83.647	2	0	2	.472	4	2.076	3
284			min	-1441.045	3	85.916	15	-213.768	5	0	3	-.12	3	.268	15
285		10	max	1363.979	2	666.219	3	83.647	2	0	2	.407	4	1.868	3
286			min	-1443.173	3	85.916	15	-211.309	5	0	3	-.165	3	.241	15
287		11	max	1361.141	2	666.219	3	83.647	2	0	2	.343	4	1.661	3
288			min	-1445.301	3	85.916	15	-208.85	5	0	3	-.21	3	.214	15
289		12	max	1358.304	2	666.219	3	83.647	2	0	2	.281	4	1.453	3
290			min	-1447.429	3	85.916	15	-206.391	5	0	3	-.255	3	.187	15
291		13	max	1355.466	2	666.219	3	83.647	2	0	2	.219	4	1.246	3
292			min	-1449.557	3	85.916	15	-203.932	5	0	3	-.299	3	.161	15
293		14	max	1352.629	2	666.219	3	83.647	2	0	2	.188	2	1.038	3
294			min	-1451.685	3	85.916	15	-201.473	5	0	3	-.344	3	.134	15
295		15	max	1349.792	2	666.219	3	83.647	2	0	2	.214	2	.83	3
296			min	-1453.813	3	85.916	15	-199.013	5	0	3	-.389	3	.107	15
297		16	max	1346.954	2	666.219	3	83.647	2	0	2	.24	2	.623	3
298			min	-1455.942	3	85.916	15	-196.554	5	0	3	-.434	3	.08	15
299		17	max	1344.117	2	666.219	3	83.647	2	0	2	.266	2	.415	3
300			min	-1458.07	3	85.916	15	-194.095	5	0	3	-.479	3	.054	15
301		18	max	1341.279	2	666.219	3	83.647	2	0	2	.292	2	.208	3
302			min	-1460.198	3	85.916	15	-191.636	5	0	3	-.523	3	.027	15
303		19	max	1338.442	2	666.219	3	83.647	2	0	2	.318	2	0	1
304			min	-1462.326	3	85.916	15	-189.177	5	0	3	-.568	3	0	1
305	M5	1	max	5715.904	2	2888.974	3	0	1	.013	4	1.078	4	6.522	3
306			min	-5197.92	3	-2938.634	2	-263.526	5	0	1	0	1	.191	15
307		2	max	5713.066	2	2888.974	3	0	1	.013	4	.996	4	5.621	3
308			min	-5200.049	3	-2938.634	2	-261.067	5	0	1	0	1	.195	15
309		3	max	3698.326	2	1021.13	3	0	1	0	1	.911	4	5.091	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
310			min	-4203.799	3	37.802	15	-242.837	4	0	4	0	1	.188	15
311		4	max	3695.488	2	1021.13	3	0	1	0	1	.835	4	4.773	3
312			min	-4205.927	3	37.802	15	-240.378	4	0	4	0	1	.177	15
313		5	max	3692.651	2	1021.13	3	0	1	0	1	.761	4	4.455	3
314			min	-4208.055	3	37.802	15	-237.919	4	0	4	0	1	.165	15
315		6	max	3689.813	2	1021.13	3	0	1	0	1	.687	4	4.136	3
316			min	-4210.184	3	37.802	15	-235.459	4	0	4	0	1	.153	15
317		7	max	3686.976	2	1021.13	3	0	1	0	1	.614	4	3.818	3
318			min	-4212.312	3	37.802	15	-233	4	0	4	0	1	.141	15
319		8	max	3684.138	2	1021.13	3	0	1	0	1	.542	4	3.5	3
320			min	-4214.44	3	37.802	15	-230.541	4	0	4	0	1	.13	15
321		9	max	3681.301	2	1021.13	3	0	1	0	1	.47	4	3.182	3
322			min	-4216.568	3	37.802	15	-228.082	4	0	4	0	1	.118	15
323		10	max	3678.464	2	1021.13	3	0	1	0	1	.4	4	2.864	3
324			min	-4218.696	3	37.802	15	-225.623	4	0	4	0	1	.106	15
325		11	max	3675.626	2	1021.13	3	0	1	0	1	.33	4	2.546	3
326			min	-4220.824	3	37.802	15	-223.164	4	0	4	0	1	.094	15
327		12	max	3672.789	2	1021.13	3	0	1	0	1	.261	4	2.227	3
328			min	-4222.952	3	37.802	15	-220.705	4	0	4	0	1	.082	15
329		13	max	3669.951	2	1021.13	3	0	1	0	1	.192	4	1.909	3
330			min	-4225.08	3	37.802	15	-218.246	4	0	4	0	1	.071	15
331		14	max	3667.114	2	1021.13	3	0	1	0	1	.125	4	1.591	3
332			min	-4227.208	3	37.802	15	-215.787	4	0	4	0	1	.059	15
333		15	max	3664.276	2	1021.13	3	0	1	0	1	.058	4	1.273	3
334			min	-4229.336	3	37.802	15	-213.327	4	0	4	0	1	.047	15
335		16	max	3661.439	2	1021.13	3	0	1	0	1	0	1	.955	3
336			min	-4231.464	3	37.802	15	-210.868	4	0	4	-.008	5	.035	15
337		17	max	3658.602	2	1021.13	3	0	1	0	1	0	1	.636	3
338			min	-4233.592	3	37.802	15	-208.409	4	0	4	-.074	4	.024	15
339		18	max	3655.764	2	1021.13	3	0	1	0	1	0	1	.318	3
340			min	-4235.721	3	37.802	15	-205.95	4	0	4	-.138	4	.012	15
341		19	max	3652.927	2	1021.13	3	0	1	0	1	0	1	0	1
342			min	-4237.849	3	37.802	15	-203.491	4	0	4	-.202	4	0	1
343	M8	1	max	2101.692	2	1169.526	3	159.119	3	.013	4	1.07	4	3.951	3
344			min	-1692.44	3	-838.491	2	-265.306	4	-.004	3	-.239	3	-.28	5
345		2	max	2098.855	2	1169.526	3	159.119	3	.013	4	.988	4	3.586	3
346			min	-1694.568	3	-838.491	2	-262.847	4	-.004	3	-.19	3	-.251	5
347		3	max	1383.841	2	666.219	3	143.696	3	0	3	.902	4	3.322	3
348			min	-1428.277	3	-46.426	5	-241.129	4	0	2	-.148	3	-.231	5
349		4	max	1381.003	2	666.219	3	143.696	3	0	3	.827	4	3.114	3
350			min	-1430.405	3	-46.426	5	-238.67	4	0	2	-.104	3	-.217	5
351		5	max	1378.166	2	666.219	3	143.696	3	0	3	.753	4	2.906	3
352			min	-1432.533	3	-46.426	5	-236.211	4	0	2	-.059	3	-.203	5
353		6	max	1375.329	2	666.219	3	143.696	3	0	3	.68	4	2.699	3
354			min	-1434.661	3	-46.426	5	-233.752	4	0	2	-.014	3	-.188	5
355		7	max	1372.491	2	666.219	3	143.696	3	0	3	.607	4	2.491	3
356			min	-1436.789	3	-46.426	5	-231.293	4	0	2	-.006	2	-.174	5
357		8	max	1369.654	2	666.219	3	143.696	3	0	3	.536	4	2.284	3
358			min	-1438.917	3	-46.426	5	-228.834	4	0	2	-.032	2	-.159	5
359		9	max	1366.816	2	666.219	3	143.696	3	0	3	.465	4	2.076	3
360			min	-1441.045	3	-46.426	5	-226.374	4	0	2	-.058	2	-.145	5
361		10	max	1363.979	2	666.219	3	143.696	3	0	3	.397	5	1.868	3
362			min	-1443.173	3	-46.426	5	-223.915	4	0	2	-.084	2	-.13	5
363		11	max	1361.141	2	666.219	3	143.696	3	0	3	.33	5	1.661	3
364			min	-1445.301	3	-46.426	5	-221.456	4	0	2	-.11	2	-.116	5
365		12	max	1358.304	2	666.219	3	143.696	3	0	3	.264	5	1.453	3
366			min	-1447.429	3	-46.426	5	-218.997	4	0	2	-.136	2	-.101	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	1355.466	2	666.219	3	143.696	3	0	3	.299	3	1.246	3
368			min	-1449.557	3	-46.426	5	-216.538	4	0	2	-.162	2	-.087	5
369		14	max	1352.629	2	666.219	3	143.696	3	0	3	.344	3	1.038	3
370			min	-1451.685	3	-46.426	5	-214.079	4	0	2	-.188	2	-.072	5
371		15	max	1349.792	2	666.219	3	143.696	3	0	3	.389	3	.83	3
372			min	-1453.813	3	-46.426	5	-211.62	4	0	2	-.214	2	-.058	5
373		16	max	1346.954	2	666.219	3	143.696	3	0	3	.434	3	.623	3
374			min	-1455.942	3	-46.426	5	-209.161	4	0	2	-.24	2	-.043	5
375		17	max	1344.117	2	666.219	3	143.696	3	0	3	.479	3	.415	3
376			min	-1458.07	3	-46.426	5	-206.702	4	0	2	-.266	2	-.029	5
377		18	max	1341.279	2	666.219	3	143.696	3	0	3	.523	3	.208	3
378			min	-1460.198	3	-46.426	5	-204.242	4	0	2	-.292	2	-.014	5
379		19	max	1338.442	2	666.219	3	143.696	3	0	3	.568	3	0	1
380			min	-1462.326	3	-46.426	5	-201.783	4	0	2	-.318	2	0	1
381	M3	1	max	1482.125	2	4.384	6	36.152	2	.007	3	.015	5	0	1
382			min	-566.615	3	1.031	15	-16.021	5	-.012	2	-.004	2	0	1
383		2	max	1481.917	2	3.897	6	36.152	2	.007	3	.011	4	0	15
384			min	-566.771	3	.916	15	-15.671	3	-.012	2	-.003	3	-.001	6
385		3	max	1481.709	2	3.41	6	36.152	2	.007	3	.017	2	0	15
386			min	-566.927	3	.802	15	-15.671	3	-.012	2	-.008	3	-.002	6
387		4	max	1481.501	2	2.923	6	36.152	2	.007	3	.027	2	0	15
388			min	-567.083	3	.687	15	-15.671	3	-.012	2	-.012	3	-.003	6
389		5	max	1481.293	2	2.436	6	36.152	2	.007	3	.038	2	0	15
390			min	-567.239	3	.573	15	-15.671	3	-.012	2	-.017	3	-.004	6
391		6	max	1481.085	2	1.949	6	36.152	2	.007	3	.049	2	-.001	15
392			min	-567.395	3	.458	15	-15.671	3	-.012	2	-.021	3	-.005	6
393		7	max	1480.877	2	1.461	6	36.152	2	.007	3	.059	2	-.001	15
394			min	-567.551	3	.344	15	-15.671	3	-.012	2	-.026	3	-.005	6
395		8	max	1480.669	2	.974	6	36.152	2	.007	3	.07	2	-.001	15
396			min	-567.707	3	.229	15	-15.671	3	-.012	2	-.031	3	-.005	6
397		9	max	1480.461	2	.487	6	36.152	2	.007	3	.08	2	-.001	15
398			min	-567.863	3	.115	15	-15.671	3	-.012	2	-.035	3	-.006	6
399		10	max	1480.253	2	0	1	36.152	2	.007	3	.091	2	-.001	15
400			min	-568.02	3	0	1	-15.671	3	-.012	2	-.04	3	-.006	6
401		11	max	1480.045	2	-.115	15	36.152	2	.007	3	.101	2	-.001	15
402			min	-568.176	3	-.487	4	-15.671	3	-.012	2	-.044	3	-.006	6
403		12	max	1479.837	2	-.229	15	36.152	2	.007	3	.112	2	-.001	15
404			min	-568.332	3	-.974	4	-15.671	3	-.012	2	-.049	3	-.005	6
405		13	max	1479.629	2	-.344	15	36.152	2	.007	3	.122	2	-.001	15
406			min	-568.488	3	-1.461	4	-15.671	3	-.012	2	-.054	3	-.005	6
407		14	max	1479.42	2	-.458	15	36.152	2	.007	3	.133	2	-.001	15
408			min	-568.644	3	-1.949	4	-15.671	3	-.012	2	-.058	3	-.005	6
409		15	max	1479.212	2	-.573	15	36.152	2	.007	3	.144	2	0	15
410			min	-568.8	3	-2.436	4	-15.671	3	-.012	2	-.063	3	-.004	6
411		16	max	1479.004	2	-.687	15	36.152	2	.007	3	.154	2	0	15
412			min	-568.956	3	-2.923	4	-15.671	3	-.012	2	-.067	3	-.003	6
413		17	max	1478.796	2	-.802	15	36.152	2	.007	3	.165	2	0	15
414			min	-569.112	3	-3.41	4	-15.671	3	-.012	2	-.072	3	-.002	6
415		18	max	1478.588	2	-.916	15	36.152	2	.007	3	.175	2	0	15
416			min	-569.268	3	-3.897	4	-15.671	3	-.012	2	-.076	3	-.001	6
417		19	max	1478.38	2	-1.031	15	36.152	2	.007	3	.186	2	0	1
418			min	-569.424	3	-4.384	4	-15.671	3	-.012	2	-.081	3	0	1
419	M6	1	max	4212.085	2	4.384	4	0	1	0	1	.015	4	0	1
420			min	-2101.296	3	1.031	15	-17.751	4	0	4	0	1	0	1
421		2	max	4211.877	2	3.897	4	0	1	0	1	.01	4	0	15
422			min	-2101.452	3	.916	15	-17.376	4	0	4	0	1	-.001	4
423		3	max	4211.669	2	3.41	4	0	1	0	1	.005	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	-2101.608	3	.802	15	-17.001	4	0	4	0	1	-.002	4
425		4	max	4211.461	2	2.923	4	0	1	0	1	0	4	0	15
426			min	-2101.764	3	.687	15	-16.626	4	0	4	0	1	-.003	4
427		5	max	4211.253	2	2.436	4	0	1	0	1	0	1	0	15
428			min	-2101.92	3	.573	15	-16.25	4	0	4	-.004	4	-.004	4
429		6	max	4211.045	2	1.949	4	0	1	0	1	0	1	-.001	15
430			min	-2102.076	3	.458	15	-15.875	4	0	4	-.009	4	-.005	4
431		7	max	4210.837	2	1.461	4	0	1	0	1	0	1	-.001	15
432			min	-2102.232	3	.344	15	-15.5	4	0	4	-.014	4	-.005	4
433		8	max	4210.629	2	.974	4	0	1	0	1	0	1	-.001	15
434			min	-2102.388	3	.229	15	-15.125	4	0	4	-.018	4	-.005	4
435		9	max	4210.421	2	.487	4	0	1	0	1	0	1	-.001	15
436			min	-2102.545	3	.115	15	-14.75	4	0	4	-.022	4	-.006	4
437		10	max	4210.212	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2102.701	3	0	1	-14.375	4	0	4	-.027	4	-.006	4
439		11	max	4210.004	2	-.115	15	0	1	0	1	0	1	-.001	15
440			min	-2102.857	3	-.487	6	-14	4	0	4	-.031	4	-.006	4
441		12	max	4209.796	2	-.229	15	0	1	0	1	0	1	-.001	15
442			min	-2103.013	3	-.974	6	-13.624	4	0	4	-.035	4	-.005	4
443		13	max	4209.588	2	-.344	15	0	1	0	1	0	1	-.001	15
444			min	-2103.169	3	-1.461	6	-13.249	4	0	4	-.039	4	-.005	4
445		14	max	4209.38	2	-.458	15	0	1	0	1	0	1	-.001	15
446			min	-2103.325	3	-1.949	6	-12.874	4	0	4	-.043	4	-.005	4
447		15	max	4209.172	2	-.573	15	0	1	0	1	0	1	0	15
448			min	-2103.481	3	-2.436	6	-12.499	4	0	4	-.046	4	-.004	4
449		16	max	4208.964	2	-.687	15	0	1	0	1	0	1	0	15
450			min	-2103.637	3	-2.923	6	-12.124	4	0	4	-.05	4	-.003	4
451		17	max	4208.756	2	-.802	15	0	1	0	1	0	1	0	15
452			min	-2103.793	3	-3.41	6	-11.749	4	0	4	-.053	4	-.002	4
453		18	max	4208.548	2	-.916	15	0	1	0	1	0	1	0	15
454			min	-2103.949	3	-3.897	6	-11.373	4	0	4	-.057	4	-.001	4
455		19	max	4208.34	2	-1.031	15	0	1	0	1	0	1	0	1
456			min	-2104.105	3	-4.384	6	-10.998	4	0	4	-.06	4	0	1
457	M9	1	max	1482.125	2	4.384	4	15.671	3	.012	2	.016	4	0	1
458			min	-566.615	3	1.031	15	-36.152	2	-.007	3	-.001	3	0	1
459		2	max	1481.917	2	3.897	4	15.671	3	.012	2	.011	5	0	15
460			min	-566.771	3	.916	15	-36.152	2	-.007	3	-.006	2	-.001	4
461		3	max	1481.709	2	3.41	4	15.671	3	.012	2	.008	3	0	15
462			min	-566.927	3	.802	15	-36.152	2	-.007	3	-.017	2	-.002	4
463		4	max	1481.501	2	2.923	4	15.671	3	.012	2	.012	3	0	15
464			min	-567.083	3	.687	15	-36.152	2	-.007	3	-.027	2	-.003	4
465		5	max	1481.293	2	2.436	4	15.671	3	.012	2	.017	3	0	15
466			min	-567.239	3	.573	15	-36.152	2	-.007	3	-.038	2	-.004	4
467		6	max	1481.085	2	1.949	4	15.671	3	.012	2	.021	3	-.001	15
468			min	-567.395	3	.458	15	-36.152	2	-.007	3	-.049	2	-.005	4
469		7	max	1480.877	2	1.461	4	15.671	3	.012	2	.026	3	-.001	15
470			min	-567.551	3	.344	15	-36.152	2	-.007	3	-.059	2	-.005	4
471		8	max	1480.669	2	.974	4	15.671	3	.012	2	.031	3	-.001	15
472			min	-567.707	3	.229	15	-36.152	2	-.007	3	-.07	2	-.005	4
473		9	max	1480.461	2	.487	4	15.671	3	.012	2	.035	3	-.001	15
474			min	-567.863	3	.115	15	-36.152	2	-.007	3	-.08	2	-.006	4
475		10	max	1480.253	2	0	1	15.671	3	.012	2	.04	3	-.001	15
476			min	-568.02	3	0	1	-36.152	2	-.007	3	-.091	2	-.006	4
477		11	max	1480.045	2	-.115	15	15.671	3	.012	2	.044	3	-.001	15
478			min	-568.176	3	-.487	6	-36.152	2	-.007	3	-.101	2	-.006	4
479		12	max	1479.837	2	-.229	15	15.671	3	.012	2	.049	3	-.001	15
480			min	-568.332	3	-.974	6	-36.152	2	-.007	3	-.112	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	1479.629	2	-.344	15	15.671	3	.012	2	.054	3	-.001	15
482			min	-568.488	3	-1.461	6	-36.152	2	-.007	3	-.122	2	-.005	4
483		14	max	1479.42	2	-.458	15	15.671	3	.012	2	.058	3	-.001	15
484			min	-568.644	3	-1.949	6	-36.152	2	-.007	3	-.133	2	-.005	4
485		15	max	1479.212	2	-.573	15	15.671	3	.012	2	.063	3	0	15
486			min	-568.8	3	-2.436	6	-36.152	2	-.007	3	-.144	2	-.004	4
487		16	max	1479.004	2	-.687	15	15.671	3	.012	2	.067	3	0	15
488			min	-568.956	3	-2.923	6	-36.152	2	-.007	3	-.154	2	-.003	4
489		17	max	1478.796	2	-.802	15	15.671	3	.012	2	.072	3	0	15
490			min	-569.112	3	-3.41	6	-36.152	2	-.007	3	-.165	2	-.002	4
491		18	max	1478.588	2	-.916	15	15.671	3	.012	2	.076	3	0	15
492			min	-569.268	3	-3.897	6	-36.152	2	-.007	3	-.175	2	-.001	4
493		19	max	1478.38	2	-1.031	15	15.671	3	.012	2	.081	3	0	1
494			min	-569.424	3	-4.384	6	-36.152	2	-.007	3	-.186	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	15	.012	1	5.311e-3	3	NC	3	NC	3
2			min	-.186	3	-.428	2	-.339	5	-1.393e-2	2	323.038	1	626.485	5
3		2	max	-.024	15	-.028	15	.004	1	5.311e-3	3	NC	12	NC	2
4			min	-.186	3	-.345	2	-.326	4	-1.393e-2	2	390.191	1	667.725	5
5		3	max	-.024	15	-.024	15	-.001	12	4.95e-3	3	6863.93	12	NC	1
6			min	-.186	3	-.262	1	-.313	4	-1.269e-2	2	492.729	1	717.728	5
7		4	max	-.024	15	-.02	15	-.002	12	4.395e-3	3	4757.178	12	NC	1
8			min	-.186	3	-.194	1	-.297	4	-1.078e-2	2	659.029	1	789.172	5
9		5	max	-.024	15	-.016	15	-.001	12	3.841e-3	3	NC	10	NC	1
10			min	-.186	3	-.132	1	-.278	4	-8.878e-3	2	944.075	1	889.156	5
11		6	max	-.024	15	-.012	15	0	12	3.803e-3	3	4468.382	11	NC	1
12			min	-.186	3	-.107	3	-.257	4	-8.148e-3	2	1295.024	14	1026.255	5
13		7	max	-.024	15	-.009	15	0	3	4.123e-3	3	NC	11	NC	1
14			min	-.186	3	-.101	3	-.237	4	-8.229e-3	2	1527.029	14	1206.763	5
15		8	max	-.024	15	.005	10	0	3	4.442e-3	3	8691.881	11	NC	1
16			min	-.186	3	-.089	3	-.219	4	-8.311e-3	2	1393.43	2	1440.25	5
17		9	max	-.024	15	.025	2	0	10	4.988e-3	3	NC	1	NC	1
18			min	-.187	3	-.072	3	-.203	4	-7.944e-3	2	1141.433	2	1737.284	5
19		10	max	-.024	15	.044	2	0	2	5.933e-3	3	NC	3	NC	1
20			min	-.187	3	-.051	3	-.187	4	-6.786e-3	2	984.605	2	2193.916	5
21		11	max	-.024	15	.059	2	0	3	6.878e-3	3	7790.36	12	NC	1
22			min	-.187	3	-.025	3	-.171	4	-5.628e-3	2	884.07	2	2941.891	5
23		12	max	-.024	15	.077	1	.003	3	5.818e-3	3	NC	9	NC	1
24			min	-.187	3	.005	12	-.157	4	-4.168e-3	2	820.022	2	4270.404	5
25		13	max	-.024	15	.091	1	.006	3	3.624e-3	3	NC	9	NC	1
26			min	-.187	3	.011	15	-.144	4	-2.826e-3	4	793.721	2	7424.359	5
27		14	max	-.024	15	.111	3	.006	3	1.56e-3	3	NC	9	NC	1
28			min	-.187	3	.014	15	-.133	4	-3.7e-3	4	818.874	2	NC	1
29		15	max	-.024	15	.197	3	.005	1	5.292e-3	3	NC	9	NC	2
30			min	-.187	3	.017	15	-.128	5	-3.166e-3	4	545.632	3	8162.107	1
31		16	max	-.024	15	.3	3	.006	1	9.024e-3	3	NC	4	NC	2
32			min	-.187	3	.004	10	-.126	5	-4.366e-3	2	383.855	3	7537.013	1
33		17	max	-.024	15	.415	3	.004	1	1.276e-2	3	NC	4	NC	2
34			min	-.187	3	-.019	10	-.125	5	-6.058e-3	2	288.757	3	8707.1	1
35		18	max	-.024	15	.535	3	0	10	1.519e-2	3	NC	4	NC	1
36			min	-.187	3	-.053	2	-.126	4	-7.162e-3	2	229.636	3	NC	1
37		19	max	-.024	15	.654	3	-.003	10	1.519e-2	3	NC	1	NC	1
38			min	-.187	3	-.092	2	-.128	4	-7.162e-3	2	190.644	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	-.011	15	.059	3	0	1	2.933e-4	4	NC	3	NC	1
40			min	-.284	3	-.883	2	-.336	4	0	1	213.965	1	630.49	4
41		2	max	-.011	15	.002	3	0	1	2.933e-4	4	6936.464	15	NC	1
42			min	-.284	3	-.704	2	-.326	4	0	1	277.158	1	662.209	4
43		3	max	-.011	15	-.014	15	0	1	6.453e-5	5	8468.687	15	NC	1
44			min	-.284	3	-.525	2	-.314	4	0	1	393.826	1	701.792	4
45		4	max	-.011	15	-.011	15	0	1	0	1	NC	10	NC	1
46			min	-.284	3	-.354	2	-.298	4	-2.872e-4	4	658.629	1	766.18	4
47		5	max	-.011	15	-.008	15	0	1	0	1	NC	11	NC	1
48			min	-.284	3	-.223	1	-.279	4	-6.385e-4	4	660.202	3	862.318	4
49		6	max	-.011	15	-.005	15	0	1	0	1	NC	1	NC	1
50			min	-.285	3	-.16	3	-.257	4	-6.267e-4	4	613.402	3	998.517	4
51		7	max	-.011	15	-.003	15	0	1	0	1	NC	5	NC	1
52			min	-.285	3	-.153	3	-.237	4	-3.638e-4	4	522.648	2	1179.419	4
53		8	max	-.011	15	0	10	0	1	0	1	NC	5	NC	1
54			min	-.285	3	-.132	3	-.218	4	-1.009e-4	4	454.3	2	1408.378	4
55		9	max	-.011	15	.025	2	0	1	2.796e-5	4	NC	4	NC	1
56			min	-.286	3	-.105	3	-.203	4	0	1	411.862	2	1681.793	4
57		10	max	-.011	15	.056	2	0	1	0	1	NC	4	NC	1
58			min	-.286	3	-.074	3	-.187	4	-8.031e-5	4	375.851	2	2115.061	4
59		11	max	-.011	15	.086	1	0	1	0	1	NC	4	NC	1
60			min	-.287	3	-.037	3	-.171	4	-1.886e-4	4	347.024	2	2809.837	4
61		12	max	-.011	15	.12	1	0	1	0	1	NC	5	NC	1
62			min	-.287	3	.004	15	-.158	4	-1.04e-3	4	324.638	2	3887.504	4
63		13	max	-.011	15	.144	1	0	1	0	1	NC	3	NC	1
64			min	-.288	3	.005	15	-.145	4	-2.311e-3	4	313.525	2	6139.7	4
65		14	max	-.011	15	.174	3	0	1	0	1	NC	5	NC	1
66			min	-.288	3	.006	15	-.136	4	-3.536e-3	4	321.852	2	NC	1
67		15	max	-.011	15	.336	3	0	1	0	1	NC	5	NC	1
68			min	-.288	3	.006	15	-.131	4	-2.698e-3	4	364.212	2	NC	1
69		16	max	-.011	15	.541	3	0	1	0	1	NC	5	NC	1
70			min	-.288	3	-.018	10	-.128	4	-1.86e-3	4	278.233	3	NC	1
71		17	max	-.011	15	.771	3	0	1	0	1	NC	5	NC	1
72			min	-.288	3	-.102	2	-.127	4	-1.021e-3	4	188.135	3	NC	1
73		18	max	-.011	15	1.012	3	0	1	0	1	NC	4	NC	1
74			min	-.288	3	-.202	2	-.125	4	-4.748e-4	4	140.713	3	NC	1
75		19	max	-.011	15	1.251	3	0	1	0	1	NC	1	NC	1
76			min	-.288	3	-.301	2	-.123	4	-4.748e-4	4	112.449	3	NC	1
77	M7	1	max	.013	5	.007	5	-.003	12	1.393e-2	2	NC	3	NC	3
78			min	-.186	3	-.428	2	-.344	4	-5.311e-3	3	323.038	1	602.581	4
79		2	max	.013	5	.007	5	0	12	1.393e-2	2	NC	5	NC	2
80			min	-.186	3	-.345	2	-.328	4	-5.311e-3	3	390.191	1	649.666	4
81		3	max	.013	5	.007	5	.004	1	1.269e-2	2	NC	5	NC	1
82			min	-.186	3	-.262	1	-.311	4	-4.95e-3	3	492.729	1	706.076	4
83		4	max	.013	5	.008	5	.007	1	1.078e-2	2	NC	4	NC	1
84			min	-.186	3	-.194	1	-.294	5	-4.395e-3	3	659.029	1	779.627	4
85		5	max	.013	5	.008	5	.007	1	8.878e-3	2	NC	4	NC	1
86			min	-.186	3	-.132	1	-.275	5	-3.841e-3	3	944.075	1	876.709	4
87		6	max	.013	5	.007	5	.006	1	8.148e-3	2	NC	4	NC	1
88			min	-.186	3	-.107	3	-.255	4	-3.803e-3	3	1451.709	1	1004.832	4
89		7	max	.013	5	.006	5	.003	2	8.229e-3	2	NC	4	NC	1
90			min	-.186	3	-.101	3	-.236	4	-4.123e-3	3	1781.737	9	1167.878	4
91		8	max	.013	5	.005	10	0	2	8.311e-3	2	NC	4	NC	1
92			min	-.186	3	-.089	3	-.219	4	-4.442e-3	3	1393.43	2	1376.957	4
93		9	max	.013	5	.025	2	0	3	7.944e-3	2	NC	1	NC	1
94			min	-.187	3	-.072	3	-.203	4	-4.988e-3	3	1141.433	2	1650.58	4
95		10	max	.013	5	.044	2	0	3	6.786e-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	-.051	3	-.187	4	-5.933e-3	3	984.605	2	2056.044	4
97		11	max	.013	5	.059	2	0	2	5.628e-3	2	NC	5	NC	1
98			min	-.187	3	-.025	3	-.171	4	-6.878e-3	3	884.07	2	2702.948	4
99		12	max	.013	5	.077	1	.002	2	4.168e-3	2	NC	5	NC	1
100			min	-.187	3	-.003	5	-.156	4	-5.818e-3	3	820.022	2	3847.044	4
101		13	max	.013	5	.091	1	.003	2	2.537e-3	2	NC	5	NC	1
102			min	-.187	3	-.005	5	-.143	4	-3.624e-3	3	793.721	2	6173.213	4
103		14	max	.013	5	.111	3	0	2	9.797e-4	2	NC	7	NC	1
104			min	-.187	3	-.008	5	-.134	4	-3.524e-3	5	818.874	2	NC	1
105		15	max	.013	5	.197	3	0	10	2.673e-3	2	NC	9	NC	2
106			min	-.187	3	-.011	5	-.13	4	-5.292e-3	3	545.632	3	8162.107	1
107		16	max	.013	5	.3	3	-.002	10	4.366e-3	2	NC	9	NC	2
108			min	-.187	3	-.016	5	-.128	4	-9.024e-3	3	383.855	3	7537.013	1
109		17	max	.013	5	.415	3	0	12	6.058e-3	2	NC	4	NC	2
110			min	-.187	3	-.021	5	-.127	4	-1.276e-2	3	288.757	3	8707.1	1
111		18	max	.013	5	.535	3	.003	1	7.162e-3	2	NC	4	NC	1
112			min	-.187	3	-.053	2	-.124	4	-1.519e-2	3	229.636	3	NC	1
113		19	max	.013	5	.654	3	.012	1	7.162e-3	2	NC	1	NC	1
114			min	-.187	3	-.092	2	-.123	5	-1.519e-2	3	190.644	3	NC	1
115	M10	1	max	0	3	.493	3	.187	3	1.603e-2	3	NC	1	NC	1
116			min	-.125	4	-.04	2	-.013	5	-5.236e-3	2	NC	1	NC	1
117		2	max	0	3	.627	3	.194	3	1.782e-2	3	NC	4	NC	1
118			min	-.125	4	-.102	2	-.011	5	-6.132e-3	2	1162.152	3	NC	1
119		3	max	0	3	.754	3	.206	3	1.961e-2	3	NC	4	NC	4
120			min	-.125	4	-.16	2	-.007	5	-7.029e-3	2	597.172	3	4238.622	1
121		4	max	0	3	.859	3	.228	1	2.141e-2	3	NC	4	NC	4
122			min	-.125	4	-.203	2	-.003	5	-7.925e-3	2	425.971	3	2641.166	1
123		5	max	0	3	.933	3	.247	1	2.32e-2	3	NC	4	NC	5
124			min	-.125	4	-.228	2	0	15	-8.822e-3	2	354.373	3	2002.417	1
125		6	max	0	3	.973	3	.26	1	2.499e-2	3	NC	4	NC	5
126			min	-.125	4	-.234	2	.003	15	-9.718e-3	2	325.002	3	1716.49	1
127		7	max	0	3	.981	3	.266	3	2.678e-2	3	NC	4	NC	5
128			min	-.125	4	-.223	2	.005	15	-1.061e-2	2	319.584	3	1605.074	1
129		8	max	0	3	.966	3	.278	3	2.857e-2	3	NC	4	NC	5
130			min	-.125	4	-.202	2	.007	15	-1.151e-2	2	329.827	3	1597.277	1
131		9	max	0	3	.942	3	.285	3	3.036e-2	3	NC	13	NC	5
132			min	-.126	4	-.179	2	.009	15	-1.241e-2	2	347.715	3	1585.135	3
133		10	max	0	1	.928	3	.288	3	3.215e-2	3	NC	14	NC	5
134			min	-.126	4	-.167	2	.011	15	-1.33e-2	2	358.587	3	1541.973	3
135		11	max	0	10	.942	3	.285	3	3.036e-2	3	NC	14	NC	5
136			min	-.126	4	-.179	2	.012	15	-1.241e-2	2	347.715	3	1585.135	3
137		12	max	0	10	.966	3	.278	3	2.857e-2	3	NC	14	NC	5
138			min	-.126	4	-.202	2	.014	15	-1.151e-2	2	329.827	3	1597.277	1
139		13	max	0	10	.981	3	.266	3	2.678e-2	3	NC	14	NC	5
140			min	-.126	4	-.223	2	.017	15	-1.061e-2	2	319.584	3	1605.074	1
141		14	max	0	10	.973	3	.26	1	2.499e-2	3	NC	14	NC	5
142			min	-.126	4	-.234	2	.019	15	-9.718e-3	2	325.002	3	1716.49	1
143		15	max	0	10	.933	3	.247	1	2.32e-2	3	NC	14	NC	5
144			min	-.126	4	-.228	2	.021	15	-8.822e-3	2	354.373	3	2002.417	1
145		16	max	0	10	.859	3	.228	1	2.141e-2	3	NC	14	NC	5
146			min	-.126	4	-.203	2	.022	15	-7.925e-3	2	425.971	3	2641.166	1
147		17	max	0	10	.754	3	.206	3	1.961e-2	3	NC	14	NC	4
148			min	-.126	4	-.16	2	.023	15	-7.029e-3	2	597.172	3	4238.622	1
149		18	max	0	10	.627	3	.194	3	1.782e-2	3	NC	9	NC	1
150			min	-.126	4	-.102	2	.024	15	-6.132e-3	2	1162.152	3	NC	1
151		19	max	0	10	.493	3	.187	3	1.603e-2	3	NC	1	NC	1
152			min	-.126	4	-.04	2	.024	15	-5.236e-3	2	2539.365	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	0	2	.066	1	.187	3	4.227e-3	3	NC	1	NC	1
154			min	-.166	4	-.014	3	-.013	5	-2.553e-4	5	NC	1	NC	1
155		2	max	0	2	.05	3	.189	3	4.401e-3	3	NC	4	NC	1
156			min	-.166	4	.002	15	0	15	-1.947e-4	5	2423.553	3	NC	1
157		3	max	0	2	.108	3	.199	1	4.574e-3	3	NC	4	NC	3
158			min	-.166	4	-.015	2	.004	15	-1.342e-4	5	1282.68	3	5277.601	1
159		4	max	0	2	.145	3	.221	1	4.748e-3	3	NC	4	NC	5
160			min	-.166	4	-.035	2	.005	15	-7.359e-5	5	980.243	3	3046.648	1
161		5	max	0	2	.156	3	.24	1	4.921e-3	3	NC	4	NC	5
162			min	-.166	4	-.037	2	.004	15	-1.499e-5	15	917.07	3	2203.071	1
163		6	max	0	2	.14	3	.255	1	5.095e-3	3	NC	4	NC	5
164			min	-.166	4	-.021	2	.002	15	2.547e-5	15	1016.585	3	1825.291	1
165		7	max	0	2	.1	3	.264	1	5.269e-3	3	NC	4	NC	4
166			min	-.166	4	.002	15	0	15	6.592e-5	15	1369.46	3	1661.384	1
167		8	max	0	2	.058	1	.275	3	5.442e-3	3	NC	1	NC	4
168			min	-.166	4	.002	15	0	15	1.064e-4	15	2516.665	3	1617.048	1
169		9	max	0	2	.086	1	.284	3	5.616e-3	3	NC	3	NC	4
170			min	-.166	4	0	3	.003	15	1.468e-4	15	7651.917	1	1609.789	3
171		10	max	0	1	.098	1	.287	3	5.79e-3	3	NC	3	NC	5
172			min	-.166	4	-.022	3	.011	15	1.873e-4	15	4759.472	1	1556.192	3
173		11	max	0	3	.086	1	.284	3	5.616e-3	3	NC	3	NC	5
174			min	-.166	4	0	3	.018	15	2.138e-4	15	7651.917	1	1609.789	3
175		12	max	0	3	.058	1	.275	3	5.442e-3	3	NC	1	NC	5
176			min	-.166	4	.003	15	.021	15	2.403e-4	15	2516.665	3	1617.048	1
177		13	max	0	3	.1	3	.264	1	5.269e-3	3	NC	4	NC	5
178			min	-.166	4	.001	15	.021	15	2.669e-4	15	1369.46	3	1661.384	1
179		14	max	0	3	.14	3	.255	1	5.095e-3	3	NC	4	NC	5
180			min	-.166	4	-.021	2	.019	15	2.934e-4	15	1016.585	3	1825.291	1
181		15	max	0	3	.156	3	.24	1	4.921e-3	3	NC	5	NC	4
182			min	-.166	4	-.037	2	.016	15	3.199e-4	15	917.07	3	2203.071	1
183		16	max	0	3	.145	3	.221	1	4.748e-3	3	NC	5	NC	4
184			min	-.166	4	-.035	2	.014	15	3.464e-4	15	980.243	3	3046.648	1
185		17	max	0	3	.108	3	.199	1	4.574e-3	3	NC	4	NC	3
186			min	-.166	4	-.015	2	.013	15	3.73e-4	15	1282.68	3	5277.601	1
187		18	max	.001	3	.05	3	.189	3	4.401e-3	3	NC	4	NC	1
188			min	-.166	4	.001	15	.016	15	3.995e-4	15	2423.553	3	NC	1
189		19	max	.001	3	.066	1	.187	3	4.227e-3	3	NC	1	NC	1
190			min	-.166	4	-.014	3	.024	15	4.26e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.018	2	.186	3	3.516e-3	1	NC	1	NC	1
192			min	-.208	4	-.078	3	-.013	5	-2.179e-4	5	NC	1	NC	1
193		2	max	0	2	.004	5	.192	3	3.702e-3	1	NC	4	NC	1
194			min	-.208	4	-.054	2	0	15	-1.578e-4	5	2185.125	2	NC	1
195		3	max	0	2	.004	5	.202	3	3.888e-3	1	NC	4	NC	3
196			min	-.208	4	-.114	2	.005	15	-9.762e-5	5	1186.803	2	5752.048	1
197		4	max	0	2	.003	5	.219	1	4.073e-3	1	NC	4	NC	5
198			min	-.208	4	-.152	2	.006	15	-3.747e-5	5	920.678	2	3206.212	1
199		5	max	0	2	.002	5	.239	1	4.259e-3	1	NC	4	NC	5
200			min	-.208	4	-.162	2	.004	15	8.065e-6	15	866.772	2	2272.226	1
201		6	max	0	2	0	5	.255	1	4.445e-3	1	NC	4	NC	5
202			min	-.208	4	-.145	2	.002	15	4.827e-5	15	957.153	2	1856.475	1
203		7	max	0	2	0	15	.264	1	4.63e-3	1	NC	4	NC	4
204			min	-.208	4	-.106	2	0	15	8.847e-5	15	1261.077	2	1671.473	1
205		8	max	0	2	0	15	.275	3	4.816e-3	1	NC	3	NC	4
206			min	-.208	4	-.074	3	0	15	1.287e-4	15	2145.52	2	1612.461	1
207		9	max	0	2	0	15	.283	3	5.002e-3	1	NC	4	NC	4
208			min	-.208	4	-.102	3	.003	15	1.689e-4	15	6024.517	2	1619.614	3
209		10	max	0	1	.013	2	.286	3	5.187e-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	-.208	4	-.115	3	.011	15	2.091e-4	15	4277.366	3	1571.275	3
211		11	max	0	9	-.002	15	.283	3	5.002e-3	1	NC	4	NC	5
212			min	-.208	4	-.102	3	.019	15	2.361e-4	15	6024.517	2	1619.614	3
213		12	max	0	9	-.003	15	.275	3	4.816e-3	1	NC	3	NC	15
214			min	-.208	4	-.074	3	.022	15	2.631e-4	15	2145.52	2	1612.461	1
215		13	max	0	9	-.005	15	.264	1	4.63e-3	1	NC	4	NC	5
216			min	-.208	4	-.106	2	.022	15	2.901e-4	15	1261.077	2	1671.473	1
217		14	max	0	9	-.006	15	.255	1	4.445e-3	1	NC	5	NC	5
218			min	-.208	4	-.145	2	.02	15	3.171e-4	15	957.153	2	1856.475	1
219		15	max	0	9	.001	3	.239	1	4.259e-3	1	NC	5	NC	4
220			min	-.208	4	-.162	2	.016	15	3.442e-4	15	866.772	2	2272.226	1
221		16	max	0	9	.002	3	.219	1	4.073e-3	1	NC	5	NC	4
222			min	-.208	4	-.152	2	.013	15	3.712e-4	15	920.678	2	3206.212	1
223		17	max	0	9	-.007	15	.202	3	3.888e-3	1	NC	4	NC	3
224			min	-.208	4	-.114	2	.013	15	3.982e-4	15	1186.803	2	5752.048	1
225		18	max	0	9	-.006	15	.192	3	3.702e-3	1	NC	4	NC	1
226			min	-.208	4	-.054	2	.016	15	4.252e-4	15	2185.125	2	NC	1
227		19	max	0	9	.018	2	.186	3	3.516e-3	1	NC	1	NC	1
228			min	-.208	4	-.078	3	.024	15	4.522e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.007	5	.186	3	1.118e-2	2	NC	1	NC	1
230			min	-.322	4	-.316	2	-.013	5	-2.149e-3	3	NC	1	NC	1
231		2	max	0	12	.004	5	.193	3	1.261e-2	2	NC	4	NC	2
232			min	-.322	4	-.437	2	0	15	-2.752e-3	3	1293.606	2	9900.732	1
233		3	max	0	12	.014	3	.209	1	1.404e-2	2	NC	5	NC	5
234			min	-.322	4	-.547	2	.005	15	-3.355e-3	3	676.981	2	4114.771	1
235		4	max	0	12	.041	3	.232	1	1.547e-2	2	NC	5	NC	5
236			min	-.322	4	-.633	2	.007	15	-3.958e-3	3	491.951	2	2569.008	1
237		5	max	0	12	.054	3	.252	1	1.689e-2	2	NC	5	NC	5
238			min	-.322	4	-.69	2	.006	15	-4.561e-3	3	417.663	2	1947.877	1
239		6	max	0	12	.051	3	.265	1	1.832e-2	2	NC	5	NC	5
240			min	-.322	4	-.714	2	.005	15	-5.164e-3	3	392.092	2	1667.779	1
241		7	max	0	12	.036	3	.272	1	1.975e-2	2	NC	5	NC	5
242			min	-.322	4	-.71	2	.003	15	-5.767e-3	3	396.21	2	1556.114	1
243		8	max	0	12	.014	3	.274	3	2.118e-2	2	NC	5	NC	5
244			min	-.322	4	-.686	2	.003	15	-6.37e-3	3	421.652	2	1543.978	1
245		9	max	0	12	-.007	12	.282	3	2.261e-2	2	NC	5	NC	4
246			min	-.322	4	-.657	2	.005	15	-6.973e-3	3	457.764	2	1586.089	1
247		10	max	0	1	-.013	12	.284	3	2.403e-2	2	NC	5	NC	5
248			min	-.322	4	-.642	2	.011	15	-7.575e-3	3	478.984	2	1589.292	3
249		11	max	0	1	-.007	12	.282	3	2.261e-2	2	NC	5	NC	5
250			min	-.322	4	-.657	2	.017	15	-6.973e-3	3	457.764	2	1586.089	1
251		12	max	0	1	.014	3	.274	3	2.118e-2	2	NC	5	NC	5
252			min	-.322	4	-.686	2	.019	15	-6.37e-3	3	421.652	2	1543.978	1
253		13	max	0	1	.036	3	.272	1	1.975e-2	2	NC	5	NC	5
254			min	-.322	4	-.71	2	.019	15	-5.767e-3	3	396.21	2	1556.114	1
255		14	max	0	1	.051	3	.265	1	1.832e-2	2	NC	5	NC	5
256			min	-.322	4	-.714	2	.017	15	-5.164e-3	3	392.092	2	1667.779	1
257		15	max	0	1	.054	3	.252	1	1.689e-2	2	NC	5	NC	4
258			min	-.322	4	-.69	2	.015	15	-4.561e-3	3	417.663	2	1947.877	1
259		16	max	0	1	.041	3	.232	1	1.547e-2	2	NC	5	NC	4
260			min	-.322	4	-.633	2	.013	15	-3.958e-3	3	491.951	2	2569.008	1
261		17	max	0	1	.014	3	.209	1	1.404e-2	2	NC	5	NC	4
262			min	-.322	4	-.547	2	.013	15	-3.355e-3	3	676.981	2	4114.771	1
263		18	max	0	1	-.017	12	.193	3	1.261e-2	2	NC	4	NC	2
264			min	-.322	4	-.437	2	.017	15	-2.752e-3	3	1293.606	2	9900.732	1
265		19	max	0	1	-.026	15	.186	3	1.118e-2	2	NC	1	NC	1
266			min	-.322	4	-.316	2	.024	15	-2.149e-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	2.645e-3	2	NC	1	NC	1
270			min	0	2	-.001	3	0	2	-3.779e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.003	5	3.435e-3	2	NC	1	NC	1
272			min	0	2	-.004	3	0	2	-5.058e-3	5	NC	1	NC	1
273		4	max	0	3	-.001	15	.006	5	3.161e-3	2	NC	2	NC	1
274			min	0	2	-.009	3	0	2	-4.905e-3	5	7476.174	3	NC	1
275		5	max	0	3	-.002	15	.01	5	2.888e-3	2	NC	4	NC	1
276			min	0	2	-.015	3	-.001	2	-4.751e-3	5	4364.522	3	6616.467	5
277		6	max	0	3	-.003	15	.015	5	2.614e-3	2	NC	5	NC	1
278			min	0	2	-.023	3	-.002	2	-4.597e-3	5	2879.321	3	4361.523	5
279		7	max	0	3	-.004	15	.022	5	2.34e-3	2	NC	5	NC	1
280			min	0	2	-.033	3	-.002	2	-4.443e-3	5	2054.944	3	3117.895	5
281		8	max	0	3	-.006	15	.029	5	2.066e-3	2	NC	15	NC	1
282			min	0	2	-.043	3	-.003	2	-4.289e-3	5	1548.847	3	2357.205	5
283		9	max	0	3	-.007	15	.036	5	1.792e-3	2	9567.727	15	NC	1
284			min	0	2	-.055	3	-.004	2	-4.135e-3	5	1215.818	3	1857.684	5
285		10	max	0	3	-.009	15	.045	5	1.518e-3	2	7736.112	15	NC	1
286			min	0	2	-.068	3	-.004	2	-3.982e-3	5	984.511	3	1511.213	5
287		11	max	0	3	-.01	15	.053	5	1.244e-3	2	6414.436	15	NC	1
288			min	0	2	-.082	3	-.004	2	-3.828e-3	5	817.249	3	1260.888	5
289		12	max	0	3	-.012	15	.063	5	9.7e-4	2	5428.477	15	NC	1
290			min	0	2	-.097	3	-.005	2	-3.674e-3	5	692.263	3	1073.967	5
291		13	max	.001	3	-.014	15	.072	5	6.961e-4	2	4672.74	15	NC	1
292			min	-.001	2	-.113	3	-.005	2	-3.533e-3	4	596.332	3	930.609	5
293		14	max	.001	3	-.016	15	.082	5	4.221e-4	2	4080.703	15	NC	1
294			min	-.001	2	-.129	3	-.004	2	-3.401e-3	4	521.096	3	818.273	5
295		15	max	.001	3	-.019	15	.092	5	4.528e-4	3	3607.984	15	NC	1
296			min	-.001	2	-.146	3	-.004	1	-3.269e-3	4	460.966	3	728.612	5
297		16	max	.001	3	-.021	15	.103	5	6.162e-4	3	3224.682	15	NC	1
298			min	-.001	2	-.163	3	-.004	1	-3.138e-3	4	412.171	3	655.973	5
299		17	max	.001	3	-.023	15	.113	4	7.797e-4	3	2909.645	15	NC	1
300			min	-.001	2	-.181	3	-.003	1	-3.006e-3	4	372.039	3	596.093	4
301		18	max	.001	3	-.025	15	.123	4	9.431e-4	3	2647.726	15	NC	1
302			min	-.001	2	-.199	3	-.003	3	-2.874e-3	4	338.653	3	546.154	4
303		19	max	.002	3	-.028	15	.133	4	1.107e-3	3	2427.832	15	NC	1
304			min	-.001	2	-.217	3	-.006	3	-2.742e-3	4	310.609	3	504.339	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	-3.947e-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	-5.276e-3	4	9645.658	3	NC	1
311		4	max	0	3	0	15	.006	4	0	1	NC	4	NC	1
312			min	0	2	-.014	3	0	1	-5.104e-3	4	4657.292	3	NC	1
313		5	max	.001	3	0	15	.011	4	0	1	NC	4	NC	1
314			min	-.001	2	-.024	3	0	1	-4.931e-3	4	2751.942	3	6386.793	4
315		6	max	.001	3	-.001	15	.016	4	0	1	NC	5	NC	1
316			min	-.001	2	-.037	3	0	1	-4.758e-3	4	1828.079	3	4212.546	4
317		7	max	.002	3	-.002	15	.022	4	0	1	NC	5	NC	1
318			min	-.001	2	-.051	3	0	1	-4.585e-3	4	1310.493	3	3013.318	4
319		8	max	.002	3	-.002	15	.03	4	0	1	NC	5	NC	1
320			min	-.002	2	-.068	3	0	1	-4.413e-3	4	990.795	3	2279.737	4
321		9	max	.002	3	-.003	15	.037	4	0	1	NC	5	NC	1
322			min	-.002	2	-.086	3	0	1	-4.24e-3	4	779.514	3	1797.99	4
323		10	max	.002	3	-.004	15	.046	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	-.106	3	0	1	-4.067e-3	4	632.297	3	1463.846	4
325		11	max	.003	3	-.005	15	.055	4	0	1	NC	15	NC	1
326			min	-.002	2	-.128	3	0	1	-3.894e-3	4	525.578	3	1222.438	4
327		12	max	.003	3	-.005	15	.065	4	0	1	NC	15	NC	1
328			min	-.002	2	-.151	3	0	1	-3.722e-3	4	445.678	3	1042.196	4
329		13	max	.003	3	-.006	15	.074	4	0	1	NC	15	NC	1
330			min	-.003	2	-.175	3	0	1	-3.549e-3	4	384.253	3	903.992	4
331		14	max	.003	3	-.007	15	.085	4	0	1	9395.745	15	NC	1
332			min	-.003	2	-.2	3	0	1	-3.376e-3	4	336.017	3	795.729	4
333		15	max	.003	3	-.008	15	.095	4	0	1	8301.668	15	NC	1
334			min	-.003	2	-.226	3	0	1	-3.203e-3	4	297.423	3	709.363	4
335		16	max	.004	3	-.009	15	.105	4	0	1	7415.491	15	NC	1
336			min	-.003	2	-.253	3	0	1	-3.031e-3	4	266.074	3	639.44	4
337		17	max	.004	3	-.01	15	.116	4	0	1	6687.808	15	NC	1
338			min	-.004	2	-.28	3	0	1	-2.858e-3	4	240.27	3	582.121	4
339		18	max	.004	3	-.011	15	.126	4	0	1	6083.308	15	NC	1
340			min	-.004	2	-.308	3	0	1	-2.685e-3	4	218.788	3	534.653	4
341		19	max	.004	3	-.012	15	.136	4	0	1	5576.159	15	NC	1
342			min	-.004	2	-.335	3	0	1	-2.512e-3	4	200.732	3	495.013	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	1.181e-3	3	NC	1	NC	1
346			min	0	2	-.001	3	0	3	-4.086e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	1.508e-3	3	NC	1	NC	1
348			min	0	2	-.004	3	0	3	-5.453e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.006	4	1.345e-3	3	NC	2	NC	1
350			min	0	2	-.009	3	-.001	3	-5.262e-3	4	7476.174	3	NC	1
351		5	max	0	3	.001	5	.01	4	1.181e-3	3	NC	4	NC	1
352			min	0	2	-.015	3	-.002	3	-5.07e-3	4	4364.522	3	6442.856	4
353		6	max	0	3	.002	5	.016	4	1.018e-3	3	NC	4	NC	1
354			min	0	2	-.023	3	-.003	3	-4.879e-3	4	2879.321	3	4250.481	4
355		7	max	0	3	.002	5	.022	4	8.546e-4	3	NC	4	NC	1
356			min	0	2	-.033	3	-.004	3	-4.687e-3	4	2054.944	3	3040.992	4
357		8	max	0	3	.003	5	.029	4	6.911e-4	3	NC	4	NC	1
358			min	0	2	-.043	3	-.005	3	-4.496e-3	4	1548.847	3	2301.02	4
359		9	max	0	3	.004	5	.037	4	5.277e-4	3	NC	4	NC	1
360			min	0	2	-.055	3	-.005	3	-4.304e-3	4	1215.818	3	1815.019	4
361		10	max	0	3	.005	5	.046	4	3.643e-4	3	NC	5	NC	1
362			min	0	2	-.068	3	-.006	3	-4.113e-3	4	984.511	3	1477.894	4
363		11	max	0	3	.006	5	.055	4	2.009e-4	3	NC	5	NC	1
364			min	0	2	-.082	3	-.006	3	-3.921e-3	4	817.249	3	1234.315	4
365		12	max	0	3	.007	5	.064	4	3.745e-5	3	NC	7	NC	1
366			min	0	2	-.097	3	-.006	3	-3.73e-3	4	692.263	3	1052.442	4
367		13	max	.001	3	.008	5	.074	4	-5.139e-6	9	NC	13	NC	1
368			min	-.001	2	-.113	3	-.006	3	-3.538e-3	4	596.332	3	912.984	4
369		14	max	.001	3	.009	5	.084	4	5.901e-5	9	NC	13	NC	1
370			min	-.001	2	-.129	3	-.005	3	-3.353e-3	5	521.096	3	803.735	4
371		15	max	.001	3	.01	5	.094	4	1.232e-4	9	9783.326	13	NC	1
372			min	-.001	2	-.146	3	-.004	3	-3.185e-3	5	460.966	3	716.582	4
373		16	max	.001	3	.011	5	.104	4	2.881e-4	1	8733.596	13	NC	1
374			min	-.001	2	-.163	3	-.002	3	-3.017e-3	5	412.171	3	646.024	4
375		17	max	.001	3	.013	5	.114	4	5.022e-4	1	7872.471	13	NC	1
376			min	-.001	2	-.181	3	0	3	-2.849e-3	5	372.039	3	588.186	4
377		18	max	.001	3	.014	5	.125	4	7.163e-4	1	7157.74	13	NC	1
378			min	-.001	2	-.199	3	0	10	-2.681e-3	5	338.653	3	540.291	4
379		19	max	.002	3	.015	5	.135	4	9.476e-4	2	6558.574	13	NC	1
380			min	-.001	2	-.217	3	0	2	-2.513e-3	5	310.609	3	500.297	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	1.678e-3	2	NC	1	NC	1
382			min	0	15	0	3	0	2	-2.055e-3	5	NC	1	NC	1
383		2	max	.002	3	-.002	15	.018	5	1.819e-3	2	NC	1	NC	3
384			min	0	10	-.013	3	-.011	2	-2.035e-3	5	NC	1	5461.675	2
385		3	max	.002	3	-.004	15	.035	5	1.96e-3	2	NC	1	NC	4
386			min	0	2	-.025	3	-.023	2	-2.015e-3	5	NC	1	2747.27	2
387		4	max	.002	3	-.005	15	.052	5	2.101e-3	2	NC	1	NC	4
388			min	0	2	-.038	3	-.033	2	-1.995e-3	5	NC	1	1855.002	2
389		5	max	.003	3	-.007	15	.07	5	2.242e-3	2	NC	1	NC	4
390			min	-.001	2	-.05	3	-.043	2	-1.975e-3	5	NC	1	1419	2
391		6	max	.003	3	-.009	15	.087	5	2.382e-3	2	NC	1	NC	13
392			min	-.002	2	-.062	3	-.053	2	-1.955e-3	5	NC	1	1166.473	2
393		7	max	.003	3	-.01	15	.104	5	2.523e-3	2	NC	1	8826.817	13
394			min	-.002	2	-.074	3	-.061	2	-1.935e-3	5	NC	1	1006.901	2
395		8	max	.003	3	-.012	15	.121	5	2.664e-3	2	NC	1	7638.775	13
396			min	-.003	2	-.086	3	-.068	2	-1.915e-3	5	NC	1	901.977	2
397		9	max	.003	3	-.014	15	.137	5	2.805e-3	2	NC	1	6850.489	13
398			min	-.003	2	-.098	3	-.073	2	-1.896e-3	5	NC	1	833.162	2
399		10	max	.004	3	-.015	15	.153	5	2.946e-3	2	NC	1	6340.483	13
400			min	-.004	2	-.11	3	-.077	2	-1.876e-3	5	NC	1	790.995	2
401		11	max	.004	3	-.017	15	.169	5	3.087e-3	2	NC	1	6046.125	13
402			min	-.004	2	-.122	3	-.079	2	-1.856e-3	5	NC	1	771.012	2
403		12	max	.004	3	-.018	15	.184	5	3.228e-3	2	NC	1	5941.949	13
404			min	-.005	2	-.134	3	-.078	2	-1.836e-3	5	NC	1	772.248	2
405		13	max	.004	3	-.02	15	.198	5	3.368e-3	2	NC	1	6034.068	13
406			min	-.005	2	-.145	3	-.076	2	-1.816e-3	5	NC	1	705.561	14
407		14	max	.004	3	-.021	15	.212	5	3.509e-3	2	NC	1	6368.514	13
408			min	-.006	2	-.157	3	-.07	2	-1.796e-3	5	NC	1	647.997	14
409		15	max	.005	3	-.023	15	.225	5	3.65e-3	2	NC	1	7064.849	13
410			min	-.006	2	-.169	3	-.062	2	-1.776e-3	5	NC	1	598.772	14
411		16	max	.005	3	-.024	15	.237	5	3.791e-3	2	NC	1	8425.915	13
412			min	-.007	2	-.18	3	-.05	2	-1.84e-3	3	NC	1	556.192	14
413		17	max	.005	3	-.025	15	.248	5	3.932e-3	2	NC	1	NC	13
414			min	-.007	2	-.192	3	-.035	2	-1.917e-3	3	NC	1	518.989	14
415		18	max	.005	3	-.027	15	.259	4	4.073e-3	2	NC	1	NC	4
416			min	-.008	2	-.203	3	-.017	2	-1.993e-3	3	NC	1	486.195	14
417		19	max	.005	3	-.028	15	.269	4	4.214e-3	2	NC	1	NC	1
418			min	-.008	2	-.215	3	0	12	-2.07e-3	3	NC	1	457.055	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	-2.15e-3	4	NC	1	NC	1
421		2	max	.004	3	0	15	.019	4	0	1	NC	1	NC	1
422			min	0	2	-.02	1	0	1	-2.144e-3	4	NC	1	NC	1
423		3	max	.005	3	-.002	15	.037	4	0	1	NC	1	NC	1
424			min	-.002	2	-.038	1	0	1	-2.137e-3	4	NC	1	NC	1
425		4	max	.005	3	-.003	15	.055	4	0	1	NC	1	NC	1
426			min	-.004	2	-.057	1	0	1	-2.131e-3	4	NC	1	7490.554	4
427		5	max	.006	3	-.003	15	.072	4	0	1	NC	1	NC	1
428			min	-.005	2	-.075	1	0	1	-2.125e-3	4	NC	1	5538.149	4
429		6	max	.007	3	-.004	15	.09	4	0	1	NC	1	NC	1
430			min	-.006	2	-.093	1	0	1	-2.119e-3	4	NC	1	4422.214	4
431		7	max	.008	3	-.005	15	.108	4	0	1	NC	1	NC	1
432			min	-.008	2	-.111	1	0	1	-2.112e-3	4	NC	1	3723.209	4
433		8	max	.008	3	-.006	15	.125	4	0	1	NC	1	NC	1
434			min	-.009	2	-.129	1	0	1	-2.106e-3	4	NC	1	3264.192	4
435		9	max	.009	3	-.007	15	.142	4	0	1	NC	1	NC	1
436			min	-.011	2	-.147	1	0	1	-2.1e-3	4	NC	1	2959.442	4
437		10	max	.01	3	-.007	15	.158	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	-.165	1	0	1	-2.094e-3	4	NC	1	2764.512	4
439		11	max	.01	3	-.008	15	.174	4	0	1	NC	1	NC	1
440			min	-.014	2	-.183	1	0	1	-2.087e-3	4	NC	1	2656.954	4
441		12	max	.011	3	-.009	15	.19	4	0	1	NC	1	NC	1
442			min	-.015	2	-.201	1	0	1	-2.081e-3	4	NC	1	2628.757	4
443		13	max	.012	3	-.009	15	.204	4	0	1	NC	1	NC	1
444			min	-.016	2	-.219	1	0	1	-2.075e-3	4	NC	1	2684.906	4
445		14	max	.013	3	-.01	15	.218	4	0	1	NC	1	NC	1
446			min	-.018	2	-.236	1	0	1	-2.068e-3	4	NC	1	2847.735	4
447		15	max	.013	3	-.01	15	.23	4	0	1	NC	1	NC	1
448			min	-.019	2	-.254	1	0	1	-2.062e-3	4	NC	1	3172.506	4
449		16	max	.014	3	-.011	15	.242	4	0	1	NC	1	NC	1
450			min	-.021	2	-.271	1	0	1	-2.056e-3	4	NC	1	3797.44	4
451		17	max	.015	3	-.012	15	.252	4	0	1	NC	1	NC	1
452			min	-.022	2	-.288	1	0	1	-2.05e-3	4	NC	1	5146.629	4
453		18	max	.015	3	-.012	15	.262	4	0	1	NC	1	NC	1
454			min	-.023	2	-.306	1	0	1	-2.043e-3	4	NC	1	9353.64	4
455		19	max	.016	3	-.013	15	.27	4	0	1	NC	1	NC	1
456			min	-.025	2	-.323	1	0	1	-2.037e-3	4	NC	1	NC	1
457	M9	1	max	.002	3	0	5	.001	4	6.866e-4	3	NC	1	NC	1
458			min	0	5	0	3	0	3	-2.244e-3	4	NC	1	NC	1
459		2	max	.002	3	0	5	.019	4	7.635e-4	3	NC	1	NC	3
460			min	0	5	-.013	3	-.005	3	-2.237e-3	4	NC	1	5461.675	2
461		3	max	.002	3	.001	5	.038	4	8.404e-4	3	NC	1	NC	5
462			min	0	2	-.025	3	-.01	3	-2.23e-3	4	NC	1	2747.27	2
463		4	max	.002	3	.002	5	.056	4	9.172e-4	3	NC	1	NC	15
464			min	0	2	-.038	3	-.015	3	-2.222e-3	4	NC	1	1855.002	2
465		5	max	.003	3	.002	5	.075	4	9.941e-4	3	NC	1	8412.679	15
466			min	-.001	2	-.05	3	-.02	3	-2.242e-3	2	NC	1	1419	2
467		6	max	.003	3	.003	5	.093	4	1.071e-3	3	NC	1	6710.283	15
468			min	-.002	2	-.062	3	-.024	3	-2.382e-3	2	NC	1	1166.473	2
469		7	max	.003	3	.004	5	.111	4	1.148e-3	3	NC	1	5644.452	15
470			min	-.002	2	-.074	3	-.028	3	-2.523e-3	2	NC	1	1006.901	2
471		8	max	.003	3	.004	5	.129	4	1.225e-3	3	NC	1	4944.703	15
472			min	-.003	2	-.086	3	-.031	3	-2.664e-3	2	NC	1	901.977	2
473		9	max	.003	3	.005	5	.146	4	1.302e-3	3	NC	1	4480.029	15
474			min	-.003	2	-.098	3	-.034	3	-2.805e-3	2	NC	1	833.162	2
475		10	max	.004	3	.006	5	.162	4	1.378e-3	3	NC	1	4182.481	15
476			min	-.004	2	-.11	3	-.036	3	-2.946e-3	2	NC	1	790.995	2
477		11	max	.004	3	.007	5	.178	4	1.455e-3	3	NC	1	4017.682	15
478			min	-.004	2	-.122	3	-.037	3	-3.087e-3	2	9249.46	5	771.012	2
479		12	max	.004	3	.008	5	.193	4	1.532e-3	3	NC	1	3973.237	15
480			min	-.005	2	-.134	3	-.037	3	-3.228e-3	2	8170.69	5	772.248	2
481		13	max	.004	3	.009	5	.207	4	1.609e-3	3	NC	1	4056.469	15
482			min	-.005	2	-.145	3	-.035	3	-3.368e-3	2	7280.888	5	797.211	2
483		14	max	.004	3	.01	5	.22	4	1.686e-3	3	NC	1	4300.936	15
484			min	-.006	2	-.157	3	-.033	3	-3.509e-3	2	6538.444	5	853.442	2
485		15	max	.005	3	.011	5	.232	4	1.763e-3	3	NC	1	4789.904	15
486			min	-.006	2	-.169	3	-.03	3	-3.65e-3	2	5913.187	5	958.452	2
487		16	max	.005	3	.012	5	.243	4	1.84e-3	3	NC	1	5731.796	15
488			min	-.007	2	-.18	3	-.025	3	-3.791e-3	2	5382.659	5	1155.246	2
489		17	max	.005	3	.013	5	.252	4	1.917e-3	3	NC	1	7766.242	15
490			min	-.007	2	-.192	3	-.019	3	-3.932e-3	2	4929.787	5	1575.052	2
491		18	max	.005	3	.014	5	.26	4	1.993e-3	3	NC	1	NC	9
492			min	-.008	2	-.203	3	-.011	3	-4.073e-3	2	4541.363	5	2877.116	2
493		19	max	.005	3	.015	5	.266	5	2.07e-3	3	NC	1	NC	1
494			min	-.008	2	-.215	3	-.007	1	-4.214e-3	2	4207.027	5	NC	1