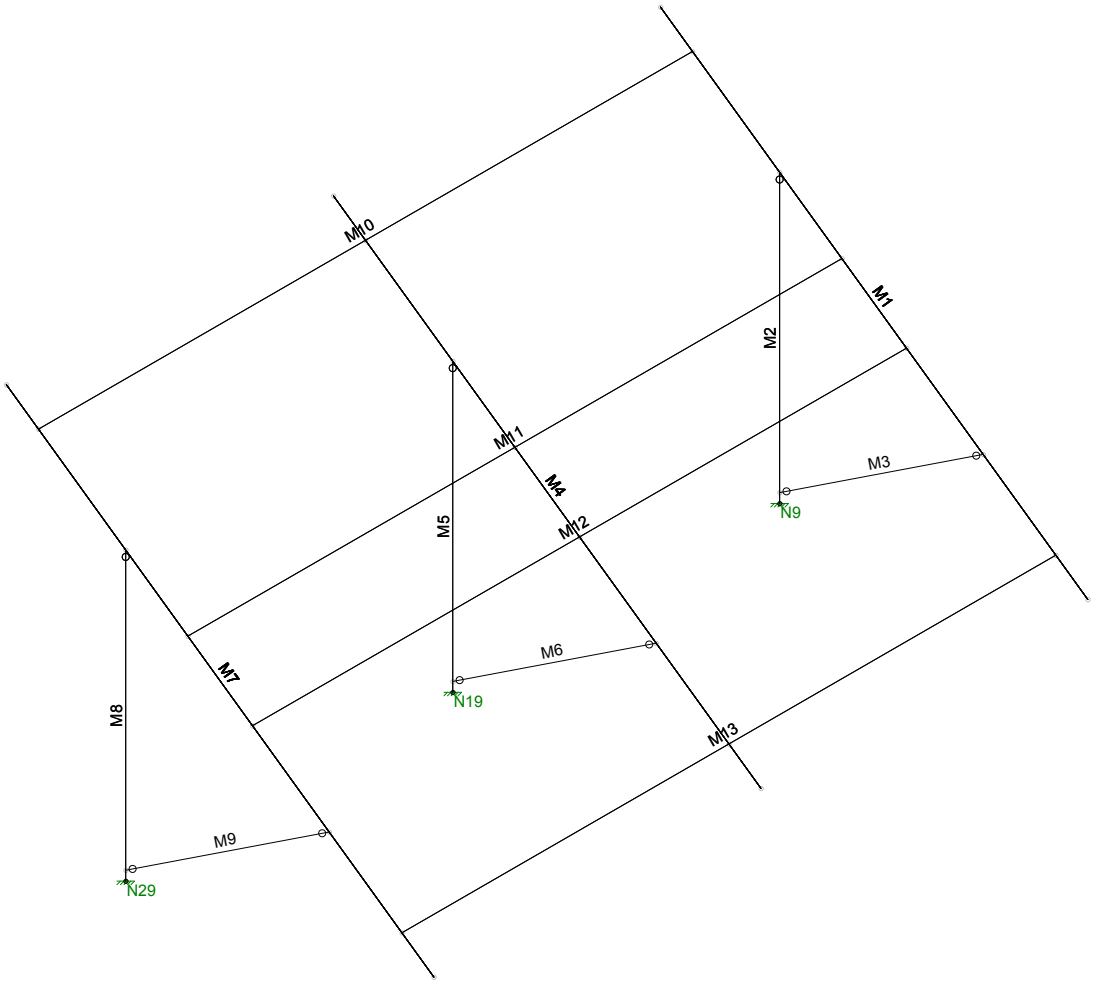


Schletter, Inc.		35° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

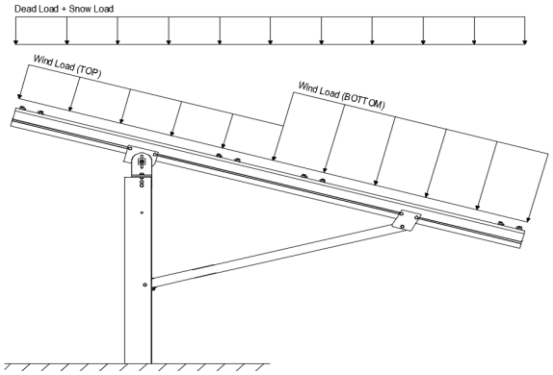
1.2 Construction

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 =	35°
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 =	14.43 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	0.64	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

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

Pressure Coefficients

$Cf+_{TOP}$ =	1.2	*(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.*
$Cf+_{BOTTOM}$ =	2		
$Cf-_{TOP}$ =	-2.4	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1.2		

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W	
1.2D + 1.0W + 0.5S	
0.9D + 1.0W [M]	
1.54D + 1.3E + 0.2S [R]	*(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)*
0.56D + 1.3E [R]	
1.54D + 1.25E + 0.2S [O]	
0.56D + 1.25E [O]	

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]	*(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)*
1.238D + 0.875E [O]	
1.1785D + 0.65625E + 0.75S [O]	
0.362D + 0.875E [O]	

[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

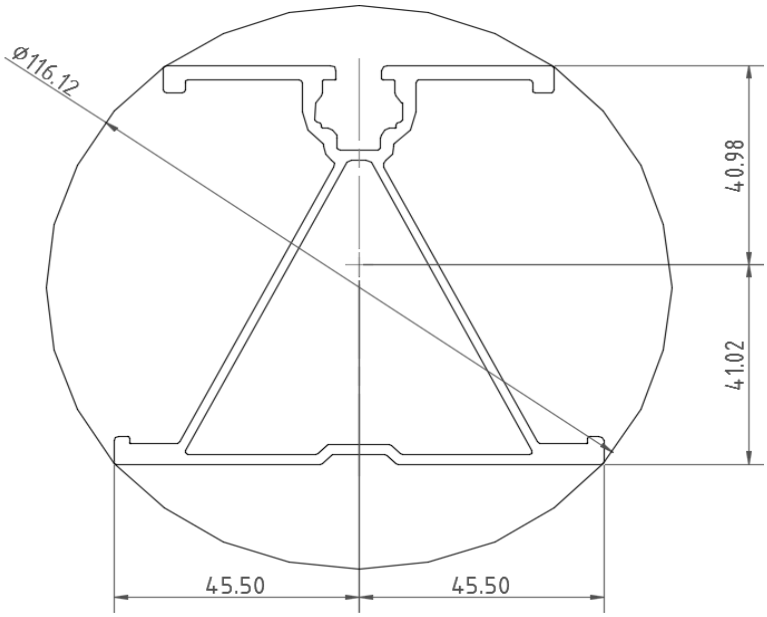
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	96	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 =	1.385	k-ft
M_z =	0.163	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	64%	

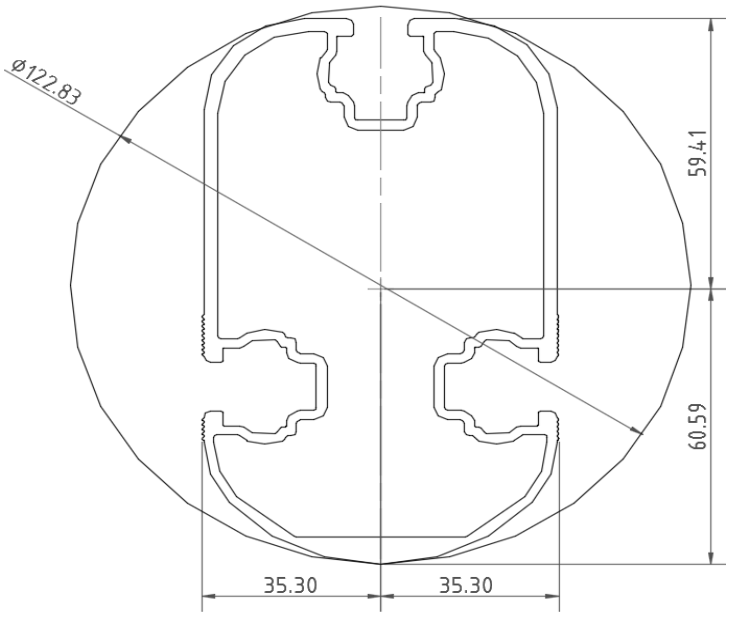


DETAIL VIEW

4.2 Girder Design

Loads from purlins are transferred to the posts using an inclined girder, which is connected to the steel post. Loads on the girder result from the support reactions of the purlins. See Appendix A.2 for detailed member calculations. Section units are in (mm).

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.996	k-ft
M_z =	0.000	k-ft
P_n =	0.028	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	80%	

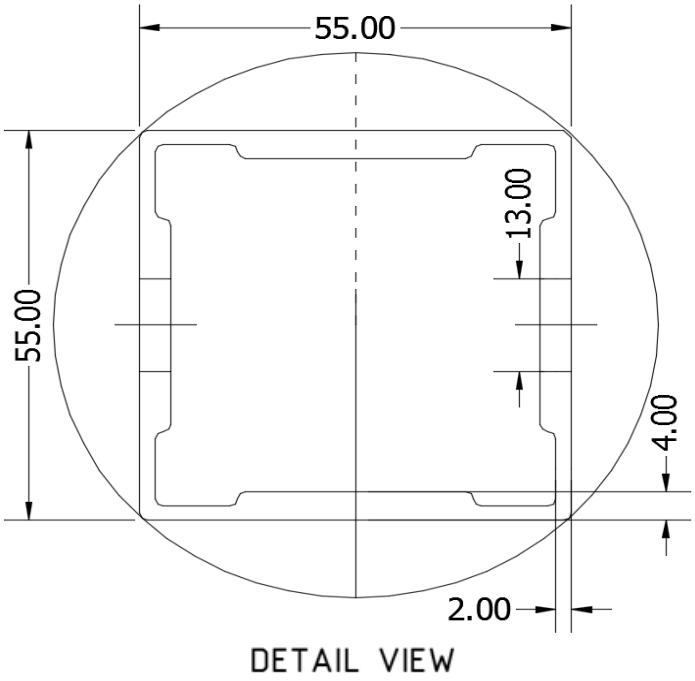


DETAIL VIEW

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).

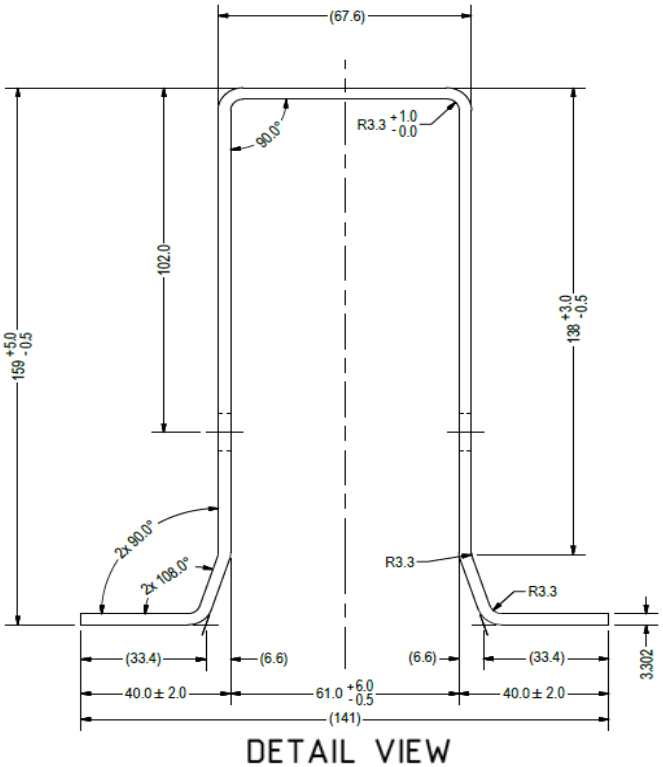
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	3.845	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	29%	



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 =	85.68	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 =	16.002	k-ft
M_z =	0.000	k-ft
P_r =	-4.696	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	28.060	k
Utilization =	96%	



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 =	6.06	k
Maximum Lateral Load =	4.05	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

Lateral Force @ Top of Pole, P =	1.02	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

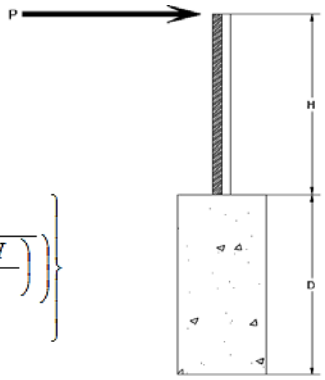
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	1.02	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf
Constant 2.34P/(S_1B), A =	5.48	
Required Footing Depth, D =	9.82	ft

2nd Trial @ D_2 =	6.54	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf
Lateral Soil Bearing @ D, S_3 =	1.31	ksf
Constant 2.34P/(S_1B), A =	2.73	
Required Footing Depth, D =	6.17	ft

3rd Trial @ D_3 =	6.35	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.27	ksf
Constant 2.34P/(S_1B), A =	2.81	
Required Footing Depth, D =	6.28	ft

4th Trial @ D_4 =	6.32	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.26	ksf
Constant 2.34P/(S_1B), A =	2.82	
Required Footing Depth, D =	6.30	ft

5th Trial @ D_5 =	6.31	ft
Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.26	ksf
Constant 2.34P/(S_1B), A =	2.82	
Required Footing Depth, D =	6.50	ft

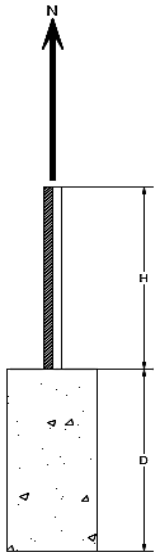
A 2ft diameter x 6.5ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	2.78	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	1.79	k
Required Concrete Volume, V =	12.32	ft^3
Required Footing Depth, D =	4.00	ft

A 2ft diameter x 4ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.00
2	0.4	0.2	118.10	5.89
3	0.6	0.2	118.10	5.79
4	0.8	0.2	118.10	5.68
5	1	0.2	118.10	5.58
6	1.2	0.2	118.10	5.48
7	1.4	0.2	118.10	5.37
8	1.6	0.2	118.10	5.27
9	1.8	0.2	118.10	5.17
10	2	0.2	118.10	5.06
11	2.2	0.2	118.10	4.96
12	2.4	0.2	118.10	4.85
13	2.6	0.2	118.10	4.75
14	2.8	0.2	118.10	4.65
15	3	0.2	118.10	4.54
16	3.2	0.2	118.10	4.44
17	3.4	0.2	118.10	4.34
18	3.6	0.2	118.10	4.23
19	3.8	0.2	118.10	4.13
20	4	0.2	118.10	4.02
21	4.2	0.2	118.10	3.92
22	0	0.0	0.00	3.92
23	0	0.0	0.00	3.92
24	0	0.0	0.00	3.92
25	0	0.0	0.00	3.92
26	0	0.0	0.00	3.92
27	0	0.0	0.00	3.92
28	0	0.0	0.00	3.92
29	0	0.0	0.00	3.92
30	0	0.0	0.00	3.92
31	0	0.0	0.00	3.92
32	0	0.0	0.00	3.92
33	0	0.0	0.00	3.92
34	0	0.0	0.00	3.92
Max	4.2	Sum	0.99	

5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.27	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	21.99	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

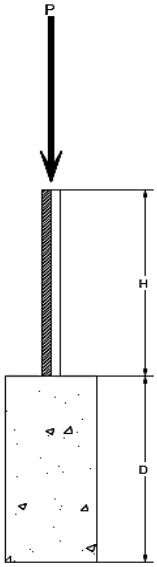
Weight of Concrete

Footing Volume	20.42	ft^3
Weight	2.96	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.30	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.68	k
Applied Force =	6.23	k
Utilization =	58%	

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



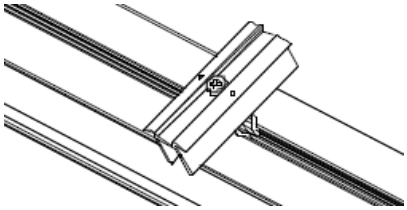
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

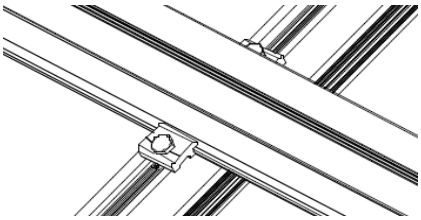
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.694 k
Allowable Uplift	=	1.214 k
Utilization	=	57%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.988 k
Allowable Uplift	=	2.180 k
Utilization	=	91%

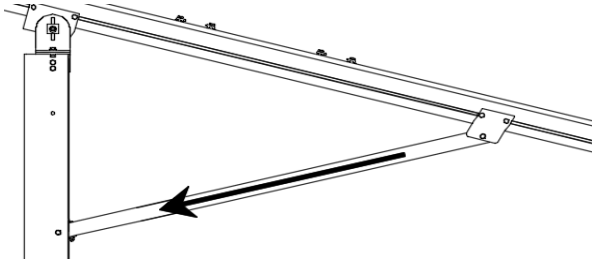


6.2 Strut Connections

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	=	3.845 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	43%

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

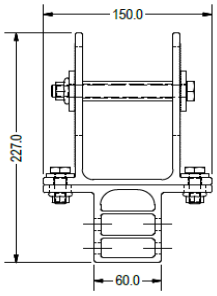


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

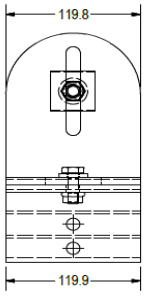
6.3 Girder to Post Connection

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.

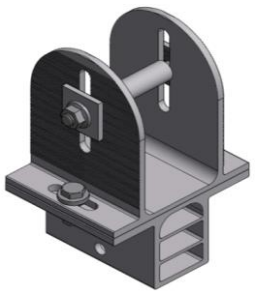
Maximum Tensile Load	=	4.193 k
Allowable Load	=	5.649 k
Utilization	=	74%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

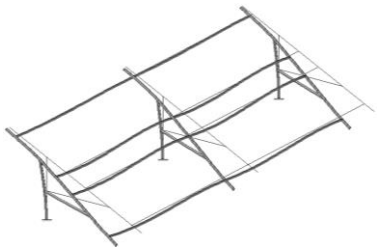
7.1 Seismic Drift

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}	=	77.78 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.556 in
Max Drift, Δ_{MAX}	=	0.55 in

0.55 ≤ 1.556, 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 =	96 in	L_b =	96
J =	0.432	J =	0.432
	265.581		168.894
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	28.0 ksi	φF_L=	29.1
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 =	85.68	in
Pr =	-4.70	k (LRFD Factored Load)
Mr (Strong) =	16.00	k-ft (LRFD Factored Load)
Mr (Weak) =	0.00	k-ft (LRFD Factored Load)

Flexural Buckling:

kL/r =	123.28		
4.71√(E/Fy) =	103.55	=> kL/r	> 4.71√(E/Fy)
Fcr =	16.52	ksi	
Fe =	18.83	ksi	
Pn =	36.831	k	

Torsional/Flexural Torsional Buckling:

Fcr =	12.5831	ksi
Fey =	48.0382	ksi
Fez =	16.1601	ksi
Pn =	28.0602	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1275	<	0.2	
Utilization =	0.96	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.128	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 96%

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	-32.97	-32.97	0	0
2	M11	Y	-32.97	-32.97	0	0
3	M12	Y	-32.97	-32.97	0	0
4	M13	Y	-32.97	-32.97	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	-102.983	-102.983	0	0
2	M11	y	-102.983	-102.983	0	0
3	M12	y	-171.639	-171.639	0	0
4	M13	y	-171.639	-171.639	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	205.967	205.967	0	0
2	M11	y	205.967	205.967	0	0
3	M12	y	102.983	102.983	0	0
4	M13	y	102.983	102.983	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	979.042	2	1937.758	2	159.795	2	.233	2	.032	5	5.291	3
2		min	-1278.181	3	-1453.939	3	-291.52	5	-1.298	5	-.021	2	-.029	10
3	N19	max	3082.451	2	5420.613	2	0	3	0	9	.034	4	9.582	3
4		min	-3114.245	3	-4634.305	3	-311.482	5	-1.352	4	0	3	-.329	10
5	N29	max	979.042	2	1937.758	2	201.709	3	.339	3	.035	4	5.291	3
6		min	-1278.181	3	-1453.939	3	-314.416	4	-1.346	4	-.01	3	-.219	5
7	Totals:	max	5040.535	2	9296.129	2	0	3						
8		min	-5670.606	3	-7542.182	3	-903.481	4						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	2	.002	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-.299	15	-.427	15	0	10	0	1	0	10	0	6
4			min	-1.274	4	-1.817	6	-1.499	5	0	1	0	5	0	15
5		3	max	-22.564	10	301.555	3	-10.99	10	.046	3	.151	1	.277	2
6			min	-150.019	1	-639.451	2	-80.256	1	-.174	2	.017	10	-.127	3
7		4	max	-23.391	10	300.492	3	-10.99	10	.046	3	.101	1	.675	2
8			min	-151.012	1	-640.869	2	-80.256	1	-.174	2	.01	10	-.314	3
9		5	max	-24.218	10	299.429	3	-10.99	10	.046	3	.052	1	1.073	2
10			min	-152.004	1	-642.286	2	-80.256	1	-.174	2	.003	10	-.5	3
11		6	max	142.629	3	551.871	2	-15.713	12	.052	2	.059	2	1.033	2
12			min	-541.37	2	-176.095	3	-117.373	1	-.064	3	-.029	5	-.512	3
13		7	max	141.885	3	550.454	2	-15.713	12	.052	2	.008	10	.691	2
14			min	-542.362	2	-177.158	3	-117.373	1	-.064	3	-.062	4	-.402	3
15		8	max	141.14	3	549.036	2	-15.713	12	.052	2	-.016	10	.35	2
16			min	-543.355	2	-178.221	3	-117.373	1	-.064	3	-.102	4	-.292	3
17		9	max	96.689	3	107.764	3	-20.217	10	.015	5	.067	3	.147	2
18			min	-653.664	1	-67.412	2	-131.398	1	-.114	2	-.006	10	-.241	3
19		10	max	95.945	3	106.701	3	-20.217	10	.015	5	.039	3	.19	2
20			min	-654.657	1	-68.829	2	-131.398	1	-.114	2	-.032	2	-.307	3
21		11	max	95.2	3	105.638	3	-20.217	10	.015	5	.01	3	.233	2
22			min	-655.649	1	-70.247	2	-131.398	1	-.114	2	-.106	4	-.373	3
23		12	max	46.572	3	778.935	3	113.642	2	.252	3	.093	1	.433	2
24			min	-810.457	1	-463.804	2	-287.193	3	-.189	2	-.047	5	-.7	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	45.828	3	777.872	3	113.642	2	.252	3	.113	1	.721	2
26			min	-811.449	1	-465.221	2	-287.193	3	-.189	2	-.145	5	-1.183	3
27		14	max	152.755	1	436.457	2	57.261	5	.185	2	.125	3	.998	2
28			min	6.116	15	-712.714	3	-109.806	3	-.369	3	-.125	4	-1.645	3
29		15	max	151.762	1	435.039	2	55.762	5	.185	2	.056	3	.727	2
30			min	5.817	15	-713.778	3	-109.806	3	-.369	3	-.101	4	-1.202	3
31		16	max	150.77	1	433.622	2	54.262	5	.185	2	-.008	12	.458	2
32			min	5.518	15	-714.841	3	-109.806	3	-.369	3	-.13	1	-.759	3
33		17	max	149.777	1	432.204	2	52.762	5	.185	2	-.009	15	.189	2
34			min	5.218	15	-715.904	3	-109.806	3	-.369	3	-.162	1	-.315	3
35		18	max	1.274	6	1.819	6	1.5	4	0	1	0	10	0	6
36			min	.299	15	.428	15	0	10	0	1	0	4	0	15
37		19	max	0	1	.004	2	0	1	0	1	0	1	0	1
38			min	0	1	-.008	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.014	2	.002	4	0	1	0	1	0	1
40			min	0	1	-.002	3	0	1	0	1	0	1	0	1
41		2	max	-.299	15	-.427	15	0	1	0	1	0	1	0	6
42			min	-1.274	4	-1.816	6	-1.499	5	0	1	0	5	0	15
43		3	max	29.518	3	968.123	3	0	1	.047	4	.156	4	.711	2
44			min	-298.73	1	-1843.632	2	-81.276	5	0	1	0	1	-.38	3
45		4	max	28.773	3	967.06	3	0	1	.047	4	.105	4	1.856	2
46			min	-299.723	1	-1845.049	2	-82.776	5	0	1	0	1	-.98	3
47		5	max	28.029	3	965.997	3	0	1	.047	4	.054	4	3.001	2
48			min	-300.715	1	-1846.467	2	-84.276	5	0	1	0	1	-1.58	3
49		6	max	727.786	3	1721.976	2	0	1	0	1	0	1	2.838	2
50			min	-1549.307	2	-782.408	3	-63.625	4	-.04	4	-.03	5	-1.538	3
51		7	max	727.042	3	1720.558	2	0	1	0	1	0	1	1.769	2
52			min	-1550.299	2	-783.471	3	-65.124	4	-.04	4	-.07	4	-1.052	3
53		8	max	726.297	3	1719.141	2	0	1	0	1	0	1	.702	2
54			min	-1551.292	2	-784.535	3	-66.624	4	-.04	4	-.111	4	-.566	3
55		9	max	763.788	3	215.152	3	0	1	.011	4	.063	5	.068	1
56			min	-1678.578	2	-177.092	2	-151.345	4	0	1	0	1	-.312	3
57		10	max	763.044	3	214.089	3	0	1	.011	4	0	1	.171	2
58			min	-1679.571	2	-178.509	2	-152.845	4	0	1	-.032	4	-.446	3
59		11	max	762.299	3	213.026	3	0	1	.011	4	0	1	.282	2
60			min	-1680.563	2	-179.927	2	-154.345	4	0	1	-.127	4	-.578	3
61		12	max	808.144	3	2084.038	3	0	1	.135	4	0	1	.886	2
62			min	-1871.516	1	-1423.752	2	-170.257	4	0	1	-.041	4	-1.463	3
63		13	max	807.399	3	2082.974	3	0	1	.135	4	0	1	1.77	2
64			min	-1872.508	1	-1425.169	2	-171.756	4	0	1	-.147	4	-2.757	3
65		14	max	302.192	1	1169.918	2	60.193	5	0	1	0	1	2.62	2
66			min	-28.322	3	-1784.212	3	0	1	-.093	4	-.092	5	-3.996	3
67		15	max	301.199	1	1168.501	2	58.693	5	0	1	0	1	1.894	2
68			min	-29.066	3	-1785.275	3	0	1	-.093	4	-.055	5	-2.888	3
69		16	max	300.207	1	1167.084	2	57.193	5	0	1	0	1	1.169	2
70			min	-29.81	3	-1786.338	3	0	1	-.093	4	-.019	5	-1.78	3
71		17	max	299.214	1	1165.666	2	55.694	5	0	1	.016	4	.445	2
72			min	-30.555	3	-1787.401	3	0	1	-.093	4	0	1	-.671	3
73		18	max	1.274	6	1.82	6	1.5	5	0	1	0	1	0	6
74			min	.299	15	.428	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.011	2	0	1	0	1	0	1	0	1
76			min	0	1	-.017	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	.002	4	0	1	0	1	0	1
78			min	0	1	0	3	0	10	0	1	0	1	0	1
79		2	max	-.299	15	-.428	15	0	1	0	1	0	1	0	4
80			min	-1.274	4	-1.818	4	-1.499	5	0	1	0	5	0	15
81		3	max	11.297	5	301.555	3	80.256	1	.174	2	.073	5	.277	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	-150.019	1	-639.451	2	-38.933	5	-.046	3	-.151	1	-.127	3
83		4	max	10.834	5	300.492	3	80.256	1	.174	2	.048	5	.675	2
84			min	-151.012	1	-640.869	2	-40.432	5	-.046	3	-.101	1	-.314	3
85		5	max	10.371	5	299.429	3	80.256	1	.174	2	.023	5	1.073	2
86			min	-152.004	1	-642.286	2	-41.932	5	-.046	3	-.052	1	-.5	3
87		6	max	142.629	3	551.871	2	117.373	1	.064	3	.021	3	1.033	2
88			min	-541.37	2	-176.095	3	-21.209	5	-.052	2	-.059	2	-.512	3
89		7	max	141.885	3	550.454	2	117.373	1	.064	3	.037	3	.691	2
90			min	-542.362	2	-177.158	3	-22.709	5	-.052	2	-.047	5	-.402	3
91		8	max	141.14	3	549.036	2	117.373	1	.064	3	.095	1	.35	2
92			min	-543.355	2	-178.221	3	-24.209	5	-.052	2	-.062	5	-.292	3
93		9	max	96.689	3	107.764	3	131.398	1	.114	2	.013	5	.147	2
94			min	-653.664	1	-67.412	2	-63.089	5	.012	9	-.067	3	-.241	3
95		10	max	95.945	3	106.701	3	131.398	1	.114	2	.032	2	.19	2
96			min	-654.657	1	-68.829	2	-64.589	5	.012	9	-.039	3	-.307	3
97		11	max	95.2	3	105.638	3	131.398	1	.114	2	.106	1	.233	2
98			min	-655.649	1	-70.247	2	-66.088	5	.012	9	-.067	5	-.373	3
99		12	max	46.572	3	778.935	3	287.193	3	.189	2	-.015	10	.433	2
100			min	-810.457	1	-463.804	2	-150.884	5	-.252	3	-.093	1	-.7	3
101		13	max	45.828	3	777.872	3	287.193	3	.189	2	.134	3	.721	2
102			min	-811.449	1	-465.221	2	-152.383	5	-.252	3	-.176	4	-1.183	3
103		14	max	152.755	1	436.457	2	109.806	3	.369	3	.08	2	.998	2
104			min	13.393	15	-712.714	3	-10.315	10	-.185	2	-.125	3	-1.645	3
105		15	max	151.762	1	435.039	2	109.806	3	.369	3	.097	1	.727	2
106			min	13.094	15	-713.778	3	-10.315	10	-.185	2	-.069	5	-1.202	3
107		16	max	150.77	1	433.622	2	109.806	3	.369	3	.13	1	.458	2
108			min	12.795	15	-714.841	3	-10.315	10	-.185	2	-.027	5	-.759	3
109		17	max	149.777	1	432.204	2	109.806	3	.369	3	.162	1	.189	2
110			min	12.495	15	-715.904	3	-10.315	10	-.185	2	.009	15	-.315	3
111		18	max	1.274	6	1.82	4	1.5	5	0	1	0	1	0	4
112			min	.299	15	.428	15	0	1	0	1	0	5	0	15
113		19	max	0	1	.004	2	0	5	0	1	0	1	0	1
114			min	0	1	-.008	3	0	1	0	1	0	1	0	1
115	M10	1	max	109.82	3	429.005	2	-11.899	15	.013	2	.184	1	.185	2
116			min	-10.316	10	-718.087	3	-147.826	1	-.026	3	.021	10	-.369	3
117		2	max	109.82	3	316.837	2	-10.078	15	.013	2	.089	3	.189	3
118			min	-10.316	10	-538.907	3	-114.892	1	-.026	3	.005	10	-.146	2
119		3	max	109.82	3	204.669	2	-8.256	15	.013	2	.056	3	.589	3
120			min	-10.316	10	-359.727	3	-81.958	1	-.026	3	-.021	1	-.378	2
121		4	max	109.82	3	92.501	2	-5.701	10	.013	2	.026	3	.829	3
122			min	-10.316	10	-180.548	3	-49.024	1	-.026	3	-.079	1	-.51	2
123		5	max	109.82	3	13.901	5	-.668	10	.013	2	-.002	12	.91	3
124			min	-10.316	10	-23.157	1	-29.943	3	-.026	3	-.108	1	-.542	2
125		6	max	109.82	3	177.812	3	16.845	1	.013	2	-.006	15	.831	3
126			min	-10.316	10	-131.835	2	-27.211	3	-.026	3	-.108	1	-.475	2
127		7	max	109.82	3	356.992	3	49.779	1	.013	2	-.008	15	.594	3
128			min	-10.316	10	-244.002	2	-24.479	3	-.026	3	-.078	1	-.308	2
129		8	max	109.82	3	536.172	3	82.713	1	.013	2	.001	10	.197	3
130			min	-10.316	10	-356.17	2	-21.747	3	-.026	3	-.071	3	-.041	2
131		9	max	109.82	3	715.352	3	115.647	1	.013	2	.069	1	.325	2
132			min	-11.211	5	-468.338	2	-19.014	3	-.026	3	-.089	3	-.36	3
133		10	max	109.82	3	894.532	3	67.823	2	.026	3	.187	1	.791	2
134			min	-10.316	10	-580.506	2	-148.581	1	-.013	2	-.104	3	-1.075	3
135		11	max	109.82	3	468.338	2	19.014	3	.026	3	.069	1	.325	2
136			min	-10.316	10	-715.352	3	-115.647	1	-.013	2	-.089	3	-.36	3
137		12	max	109.82	3	356.17	2	21.747	3	.026	3	.008	5	.197	3
138			min	-10.316	10	-536.172	3	-82.713	1	-.013	2	-.071	3	-.041	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	109.82	3	244.002	2	24.479	3	.026	3	-.001	15	.594	3
140			min	-10.316	10	-356.992	3	-49.779	1	-.013	2	-.078	1	-.308	2
141		14	max	109.82	3	131.835	2	27.211	3	.026	3	-.006	15	.831	3
142			min	-10.316	10	-177.812	3	-16.845	1	-.013	2	-.108	1	-.475	2
143		15	max	109.82	3	23.157	1	29.943	3	.026	3	-.002	12	.91	3
144			min	-13.264	5	1.09	12	-3.902	5	-.013	2	-.108	1	-.542	2
145		16	max	109.82	3	180.548	3	49.024	1	.026	3	.026	3	.829	3
146			min	-22.389	5	-92.501	2	-1.084	5	-.013	2	-.079	1	-.51	2
147		17	max	109.82	3	359.727	3	81.958	1	.026	3	.056	3	.589	3
148			min	-31.513	5	-204.669	2	.977	15	-.013	2	-.021	1	-.378	2
149		18	max	109.82	3	538.907	3	114.892	1	.026	3	.089	3	.189	3
150			min	-40.638	5	-316.837	2	2.799	15	-.013	2	-.013	5	-.146	2
151		19	max	109.82	3	718.087	3	147.826	1	.026	3	.184	1	.185	2
152			min	-49.762	5	-429.005	2	4.62	15	-.013	2	-.008	5	-.369	3
153	M11	1	max	171.481	2	390.979	2	10.605	5	0	10	.216	1	.109	4
154			min	-240.88	3	-674.14	3	-153.921	1	-.006	3	-.078	5	-.352	3
155		2	max	171.481	2	278.811	2	13.423	5	0	10	.118	3	.167	3
156			min	-240.88	3	-494.96	3	-120.987	1	-.006	3	-.068	5	-.222	2
157		3	max	171.481	2	166.643	2	16.241	5	0	10	.079	3	.528	3
158			min	-240.88	3	-315.78	3	-88.052	1	-.006	3	-.054	5	-.42	2
159		4	max	171.481	2	54.475	2	19.059	5	0	10	.044	3	.729	3
160			min	-240.88	3	-136.601	3	-55.118	1	-.006	3	-.063	1	-.518	2
161		5	max	171.481	2	42.579	3	21.877	5	0	10	.01	3	.771	3
162			min	-240.88	3	-57.692	2	-36.385	3	-.006	3	-.097	1	-.517	2
163		6	max	171.481	2	221.759	3	26.902	4	0	10	0	15	.653	3
164			min	-240.88	3	-169.86	2	-33.653	3	-.006	3	-.102	1	-.416	2
165		7	max	171.481	2	400.939	3	43.684	1	0	10	.023	5	.376	3
166			min	-240.88	3	-282.028	2	-30.921	3	-.006	3	-.078	1	-.215	2
167		8	max	171.481	2	580.119	3	76.618	1	0	10	.049	5	.086	2
168			min	-240.88	3	-394.196	2	-28.189	3	-.006	3	-.076	3	-.06	3
169		9	max	171.481	2	759.299	3	109.552	1	0	10	.091	4	.486	2
170			min	-240.88	3	-506.364	2	-25.457	3	-.006	3	-.1	3	-.655	3
171		10	max	171.481	2	618.532	2	22.725	3	.006	3	.17	1	.986	2
172			min	-240.88	3	-938.479	3	-142.486	1	-.001	1	-.121	3	-1.409	3
173		11	max	171.481	2	506.364	2	25.457	3	.006	3	.058	1	.486	2
174			min	-240.88	3	-759.299	3	-109.552	1	0	5	-.1	3	-.655	3
175		12	max	171.481	2	394.196	2	28.189	3	.006	3	0	10	.086	2
176			min	-240.88	3	-580.119	3	-76.618	1	0	5	-.076	3	-.06	3
177		13	max	171.481	2	282.028	2	30.921	3	.006	3	-.01	10	.376	3
178			min	-240.88	3	-400.939	3	-43.684	1	0	5	-.078	1	-.215	2
179		14	max	171.481	2	169.86	2	33.653	3	.006	3	-.012	15	.653	3
180			min	-240.88	3	-221.759	3	-10.75	1	0	5	-.102	1	-.416	2
181		15	max	171.481	2	57.692	2	36.385	3	.006	3	.01	3	.771	3
182			min	-240.88	3	-42.579	3	.846	10	0	5	-.097	1	-.517	2
183		16	max	171.481	2	136.601	3	55.118	1	.006	3	.044	3	.729	3
184			min	-240.88	3	-54.475	2	5.878	10	0	5	-.063	1	-.518	2
185		17	max	171.481	2	315.78	3	88.052	1	.006	3	.079	3	.528	3
186			min	-240.88	3	-166.643	2	10.91	10	0	5	-.01	2	-.42	2
187		18	max	171.481	2	494.96	3	120.987	1	.006	3	.118	3	.167	3
188			min	-240.88	3	-278.811	2	15.943	10	0	5	.005	10	-.222	2
189		19	max	171.481	2	674.14	3	153.921	1	.006	3	.216	1	.076	2
190			min	-240.88	3	-390.979	2	20.975	10	0	5	.022	10	-.352	3
191	M12	1	max	37.34	5	614.058	2	15.97	5	0	10	.228	1	.165	2
192			min	-22.675	9	-287.074	3	-156.315	1	-.005	3	-.099	5	.019	9
193		2	max	28.215	5	440.863	2	18.788	5	0	10	.104	1	.252	3
194			min	-22.675	9	-199.435	3	-123.381	1	-.005	3	-.084	5	-.304	2
195		3	max	25.889	2	267.667	2	21.606	5	0	10	.067	3	.39	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	-22.675	9	-111.797	3	-90.447	1	-.005	3	-.066	5	-.618	2
197		4	max	25.889	2	94.472	2	24.424	5	0	10	.034	3	.451	3
198			min	-22.675	9	-24.158	3	-57.512	1	-.005	3	-.06	4	-.779	2
199		5	max	25.889	2	63.48	3	27.242	5	0	10	.004	3	.433	3
200			min	-22.675	9	-78.724	2	-32.727	3	-.005	3	-.093	1	-.786	2
201		6	max	25.889	2	151.119	3	32.047	4	0	10	.003	5	.338	3
202			min	-22.675	9	-251.919	2	-29.995	3	-.005	3	-.1	1	-.639	2
203		7	max	25.889	2	238.757	3	43.159	4	0	10	.031	5	.165	3
204			min	-26.463	14	-425.114	2	-27.263	3	-.005	3	-.078	1	-.339	2
205		8	max	25.889	2	326.396	3	74.224	1	0	10	.062	5	.116	2
206			min	-35.088	4	-598.31	2	-24.531	3	-.005	3	-.073	3	-.087	3
207		9	max	25.889	2	414.035	3	107.158	1	0	10	.108	4	.725	2
208			min	-44.213	4	-771.505	2	-21.799	3	-.005	3	-.093	3	-.416	3
209		10	max	25.889	2	944.701	2	93.303	14	.005	3	.171	4	1.488	2
210			min	-53.337	4	-501.673	3	-140.092	1	-.002	1	-.112	3	-.823	3
211		11	max	29.499	5	771.505	2	21.799	3	.005	3	.054	1	.725	2
212			min	-22.675	9	-414.035	3	-107.158	1	0	5	-.093	3	-.416	3
213		12	max	25.889	2	598.31	2	24.531	3	.005	3	0	10	.116	2
214			min	-22.675	9	-326.396	3	-74.224	1	0	5	-.074	4	-.087	3
215		13	max	25.889	2	425.114	2	27.263	3	.005	3	-.01	10	.165	3
216			min	-22.675	9	-238.757	3	-41.29	1	0	5	-.078	1	-.339	2
217		14	max	25.889	2	251.919	2	29.995	3	.005	3	-.014	15	.338	3
218			min	-22.675	9	-151.119	3	-8.356	1	0	5	-.1	1	-.639	2
219		15	max	25.889	2	78.724	2	38.103	4	.005	3	.006	5	.433	3
220			min	-22.675	9	-63.48	3	2.606	10	0	5	-.093	1	-.786	2
221		16	max	25.889	2	24.158	3	57.512	1	.005	3	.036	5	.451	3
222			min	-25.918	14	-94.472	2	7.639	10	0	5	-.057	1	-.779	2
223		17	max	25.889	2	111.797	3	90.447	1	.005	3	.07	4	.39	3
224			min	-33.907	4	-267.667	2	12.671	10	0	5	0	10	-.618	2
225		18	max	25.889	2	199.435	3	123.381	1	.005	3	.129	4	.252	3
226			min	-43.032	4	-440.863	2	17.703	10	0	5	.013	10	-.304	2
227		19	max	25.889	2	287.074	3	156.315	1	.005	3	.228	1	.165	2
228			min	-52.157	4	-614.058	2	22.735	10	0	5	.031	10	-.048	5
229	M13	1	max	35.901	5	637.012	2	12.225	5	.006	3	.184	1	.174	2
230			min	-80.198	1	-303.663	3	-147.98	1	-.018	2	-.089	5	-.046	3
231		2	max	26.777	5	463.816	2	15.043	5	.006	3	.086	3	.185	3
232			min	-80.198	1	-216.024	3	-115.046	1	-.018	2	-.077	5	-.315	2
233		3	max	17.652	5	290.621	2	17.861	5	.006	3	.054	3	.338	3
234			min	-80.198	1	-128.386	3	-82.112	1	-.018	2	-.067	4	-.651	2
235		4	max	8.527	5	117.425	2	20.679	5	.006	3	.024	3	.413	3
236			min	-80.198	1	-40.747	3	-49.178	1	-.018	2	-.079	1	-.832	2
237		5	max	-.196	15	46.891	3	23.497	5	.006	3	-.002	12	.411	3
238			min	-80.198	1	-55.77	2	-29.049	3	-.018	2	-.108	1	-.859	2
239		6	max	-6.338	15	134.53	3	30.201	4	.006	3	-.002	15	.33	3
240			min	-80.198	1	-228.966	2	-26.317	3	-.018	2	-.108	1	-.733	2
241		7	max	-10.988	10	222.169	3	49.624	1	.006	3	.021	5	.172	3
242			min	-80.198	1	-402.161	2	-23.584	3	-.018	2	-.079	1	-.452	2
243		8	max	-10.988	10	309.807	3	82.558	1	.006	3	.048	5	-.007	10
244			min	-80.198	1	-575.357	2	-20.852	3	-.018	2	-.069	3	-.065	3
245		9	max	-10.988	10	397.446	3	115.492	1	.006	3	.094	4	.571	2
246			min	-80.198	1	-748.552	2	-18.12	3	-.018	2	-.087	3	-.379	3
247		10	max	-10.988	10	921.747	2	148.427	1	.018	2	.186	1	1.313	2
248			min	-80.198	1	-651.584	1	-67.623	2	-.006	3	-.102	3	-.771	3
249		11	max	23.006	5	748.552	2	18.12	3	.018	2	.068	1	.571	2
250			min	-80.198	1	-397.446	3	-115.492	1	-.006	3	-.087	3	-.379	3
251		12	max	13.881	5	575.357	2	20.852	3	.018	2	0	10	.006	5
252			min	-80.198	1	-309.807	3	-82.558	1	-.006	3	-.069	3	-.065	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	4.756	5	402.161	2	23.584	3	.018	2	-.01	10	.172	3
254			min	-80.198	1	-222.169	3	-49.624	1	-.006	3	-.079	1	-.452	2
255		14	max	-2.727	15	228.966	2	26.317	3	.018	2	-.01	15	.33	3
256			min	-80.198	1	-134.53	3	-16.69	1	-.006	3	-.108	1	-.733	2
257		15	max	-8.868	15	55.77	2	31.013	4	.018	2	.007	5	.411	3
258			min	-80.198	1	-46.891	3	.781	10	-.006	3	-.108	1	-.859	2
259		16	max	-10.988	10	40.747	3	49.178	1	.018	2	.032	5	.413	3
260			min	-80.198	1	-117.425	2	5.813	10	-.006	3	-.079	1	-.832	2
261		17	max	-10.988	10	128.386	3	82.112	1	.018	2	.059	5	.338	3
262			min	-80.198	1	-290.621	2	10.845	10	-.006	3	-.021	1	-.651	2
263		18	max	-10.988	10	216.024	3	115.046	1	.018	2	.107	4	.185	3
264			min	-80.198	1	-463.816	2	15.877	10	-.006	3	.005	10	-.315	2
265		19	max	-10.988	10	303.663	3	147.98	1	.018	2	.184	1	.174	2
266			min	-80.198	1	-637.012	2	20.91	10	-.006	3	.021	10	-.046	3
267	M2	1	max	1937.758	2	1277.76	3	159.858	2	.032	5	1.298	5	5.291	3
268			min	-1453.939	3	-979.08	2	-291.539	5	-.021	2	-.233	2	-.029	10
269		2	max	1220.081	2	847.549	3	109.345	2	0	2	1.175	5	4.915	3
270			min	-1180.748	3	15.424	10	-262.656	5	0	3	-.177	2	.089	10
271		3	max	1216.975	2	847.549	3	109.345	2	0	2	1.086	5	4.626	3
272			min	-1183.078	3	15.424	10	-259.964	5	0	3	-.14	2	.084	10
273		4	max	1213.869	2	847.549	3	109.345	2	0	2	.997	5	4.337	3
274			min	-1185.407	3	15.424	10	-257.272	5	0	3	-.103	2	.079	10
275		5	max	1210.763	2	847.549	3	109.345	2	0	2	.91	5	4.048	3
276			min	-1187.737	3	15.424	10	-254.58	5	0	3	-.065	2	.074	10
277		6	max	1207.657	2	847.549	3	109.345	2	0	2	.824	5	3.758	3
278			min	-1190.066	3	15.424	10	-251.888	5	0	3	-.032	1	.068	10
279		7	max	1204.551	2	847.549	3	109.345	2	0	2	.741	4	3.469	3
280			min	-1192.396	3	15.424	10	-249.196	5	0	3	-.032	3	.063	10
281		8	max	1201.445	2	847.549	3	109.345	2	0	2	.659	4	3.18	3
282			min	-1194.725	3	15.424	10	-246.505	5	0	3	-.092	3	.058	10
283		9	max	1198.338	2	847.549	3	109.345	2	0	2	.578	4	2.891	3
284			min	-1197.055	3	15.424	10	-243.813	5	0	3	-.153	3	.053	10
285		10	max	1195.232	2	847.549	3	109.345	2	0	2	.498	4	2.602	3
286			min	-1199.384	3	15.424	10	-241.121	5	0	3	-.213	3	.047	10
287		11	max	1192.126	2	847.549	3	109.345	2	0	2	.419	4	2.313	3
288			min	-1201.714	3	15.424	10	-238.429	5	0	3	-.274	3	.042	10
289		12	max	1189.02	2	847.549	3	109.345	2	0	2	.341	4	2.024	3
290			min	-1204.044	3	15.424	10	-235.737	5	0	3	-.334	3	.037	10
291		13	max	1185.914	2	847.549	3	109.345	2	0	2	.264	4	1.735	3
292			min	-1206.373	3	15.424	10	-233.045	5	0	3	-.395	3	.032	10
293		14	max	1182.808	2	847.549	3	109.345	2	0	2	.27	2	1.446	3
294			min	-1208.703	3	15.424	10	-230.353	5	0	3	-.456	3	.026	10
295		15	max	1179.702	2	847.549	3	109.345	2	0	2	.308	2	1.156	3
296			min	-1211.032	3	15.424	10	-227.661	5	0	3	-.516	3	.021	10
297		16	max	1176.596	2	847.549	3	109.345	2	0	2	.345	2	.867	3
298			min	-1213.362	3	15.424	10	-224.969	5	0	3	-.577	3	.016	10
299		17	max	1173.49	2	847.549	3	109.345	2	0	2	.382	2	.578	3
300			min	-1215.691	3	15.424	10	-222.277	5	0	3	-.637	3	.011	10
301		18	max	1170.384	2	847.549	3	109.345	2	0	2	.419	2	.289	3
302			min	-1218.021	3	15.424	10	-219.585	5	0	3	-.698	3	.005	10
303		19	max	1167.278	2	847.549	3	109.345	2	0	2	.457	2	0	1
304			min	-1220.351	3	15.424	10	-216.893	5	0	3	-.758	3	0	1
305	M5	1	max	5420.613	2	3111.677	3	0	1	.034	4	1.352	4	9.582	3
306			min	-4634.305	3	-3083.05	2	-311.522	5	0	1	0	1	-.329	10
307		2	max	3297.015	2	1507.857	3	0	1	0	1	1.222	4	8.744	3
308			min	-3616.045	3	6.596	10	-281.518	4	0	4	0	1	.038	10
309		3	max	3293.909	2	1507.857	3	0	1	0	1	1.126	4	8.23	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	-3618.375	3	6.596	10	-278.826	4	0	4	0	1	.036	10
311		4	max	3290.803	2	1507.857	3	0	1	0	1	1.032	4	7.715	3
312			min	-3620.705	3	6.596	10	-276.134	4	0	4	0	1	.034	10
313		5	max	3287.697	2	1507.857	3	0	1	0	1	.938	4	7.201	3
314			min	-3623.034	3	6.596	10	-273.442	4	0	4	0	1	.032	10
315		6	max	3284.591	2	1507.857	3	0	1	0	1	.845	4	6.686	3
316			min	-3625.364	3	6.596	10	-270.75	4	0	4	0	1	.029	10
317		7	max	3281.485	2	1507.857	3	0	1	0	1	.753	4	6.172	3
318			min	-3627.693	3	6.596	10	-268.058	4	0	4	0	1	.027	10
319		8	max	3278.379	2	1507.857	3	0	1	0	1	.662	4	5.658	3
320			min	-3630.023	3	6.596	10	-265.366	4	0	4	0	1	.025	10
321		9	max	3275.273	2	1507.857	3	0	1	0	1	.572	4	5.143	3
322			min	-3632.352	3	6.596	10	-262.674	4	0	4	0	1	.023	10
323		10	max	3272.167	2	1507.857	3	0	1	0	1	.483	4	4.629	3
324			min	-3634.682	3	6.596	10	-259.982	4	0	4	0	1	.02	10
325		11	max	3269.061	2	1507.857	3	0	1	0	1	.395	4	4.115	3
326			min	-3637.012	3	6.596	10	-257.29	4	0	4	0	1	.018	10
327		12	max	3265.955	2	1507.857	3	0	1	0	1	.308	4	3.6	3
328			min	-3639.341	3	6.596	10	-254.598	4	0	4	0	1	.016	10
329		13	max	3262.848	2	1507.857	3	0	1	0	1	.221	4	3.086	3
330			min	-3641.671	3	6.596	10	-251.906	4	0	4	0	1	.014	10
331		14	max	3259.742	2	1507.857	3	0	1	0	1	.136	4	2.572	3
332			min	-3644	3	6.596	10	-249.214	4	0	4	0	1	.011	10
333		15	max	3256.636	2	1507.857	3	0	1	0	1	.051	4	2.057	3
334			min	-3646.33	3	6.596	10	-246.522	4	0	4	0	1	.009	10
335		16	max	3253.53	2	1507.857	3	0	1	0	1	0	1	1.543	3
336			min	-3648.659	3	6.596	10	-243.83	4	0	4	-.032	5	.007	10
337		17	max	3250.424	2	1507.857	3	0	1	0	1	0	1	1.029	3
338			min	-3650.989	3	6.596	10	-241.138	4	0	4	-.115	4	.005	10
339		18	max	3247.318	2	1507.857	3	0	1	0	1	0	1	.514	3
340			min	-3653.319	3	6.596	10	-238.446	4	0	4	-.197	4	.002	10
341		19	max	3244.212	2	1507.857	3	0	1	0	1	0	1	0	1
342			min	-3655.648	3	6.596	10	-235.754	4	0	4	-.278	4	0	1
343	M8	1	max	1937.758	2	1277.76	3	201.642	3	.035	4	1.346	4	5.291	3
344			min	-1453.939	3	-979.08	2	-314.487	4	-.01	3	-.339	3	-.219	5
345		2	max	1220.081	2	847.549	3	177.49	3	0	3	1.214	4	4.915	3
346			min	-1180.748	3	-34.095	5	-280.206	4	0	2	-.271	3	-.198	5
347		3	max	1216.975	2	847.549	3	177.49	3	0	3	1.118	4	4.626	3
348			min	-1183.078	3	-34.095	5	-277.514	4	0	2	-.21	3	-.186	5
349		4	max	1213.869	2	847.549	3	177.49	3	0	3	1.024	4	4.337	3
350			min	-1185.407	3	-34.095	5	-274.822	4	0	2	-.15	3	-.174	5
351		5	max	1210.763	2	847.549	3	177.49	3	0	3	.931	4	4.048	3
352			min	-1187.737	3	-34.095	5	-272.13	4	0	2	-.089	3	-.163	5
353		6	max	1207.657	2	847.549	3	177.49	3	0	3	.839	4	3.758	3
354			min	-1190.066	3	-34.095	5	-269.438	4	0	2	-.029	3	-.151	5
355		7	max	1204.551	2	847.549	3	177.49	3	0	3	.747	4	3.469	3
356			min	-1192.396	3	-34.095	5	-266.746	4	0	2	-.009	2	-.14	5
357		8	max	1201.445	2	847.549	3	177.49	3	0	3	.657	4	3.18	3
358			min	-1194.725	3	-34.095	5	-264.054	4	0	2	-.046	2	-.128	5
359		9	max	1198.338	2	847.549	3	177.49	3	0	3	.567	5	2.891	3
360			min	-1197.055	3	-34.095	5	-261.362	4	0	2	-.084	2	-.116	5
361		10	max	1195.232	2	847.549	3	177.49	3	0	3	.482	5	2.602	3
362			min	-1199.384	3	-34.095	5	-258.67	4	0	2	-.121	2	-.105	5
363		11	max	1192.126	2	847.549	3	177.49	3	0	3	.398	5	2.313	3
364			min	-1201.714	3	-34.095	5	-255.978	4	0	2	-.158	2	-.093	5
365		12	max	1189.02	2	847.549	3	177.49	3	0	3	.334	3	2.024	3
366			min	-1204.044	3	-34.095	5	-253.286	4	0	2	-.196	2	-.081	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	1185.914	2	847.549	3	177.49	3	0	3	.395	3	1.735	3
368			min	-1206.373	3	-34.095	5	-250.595	4	0	2	-.233	2	-.07	5
369		14	max	1182.808	2	847.549	3	177.49	3	0	3	.456	3	1.446	3
370			min	-1208.703	3	-34.095	5	-247.903	4	0	2	-.27	2	-.058	5
371		15	max	1179.702	2	847.549	3	177.49	3	0	3	.516	3	1.156	3
372			min	-1211.032	3	-34.095	5	-245.211	4	0	2	-.308	2	-.047	5
373		16	max	1176.596	2	847.549	3	177.49	3	0	3	.577	3	.867	3
374			min	-1213.362	3	-34.095	5	-242.519	4	0	2	-.345	2	-.035	5
375		17	max	1173.49	2	847.549	3	177.49	3	0	3	.637	3	.578	3
376			min	-1215.691	3	-34.095	5	-239.827	4	0	2	-.382	2	-.023	5
377		18	max	1170.384	2	847.549	3	177.49	3	0	3	.698	3	.289	3
378			min	-1218.021	3	-34.095	5	-237.135	4	0	2	-.419	2	-.012	5
379		19	max	1167.278	2	847.549	3	177.49	3	0	3	.758	3	0	1
380			min	-1220.351	3	-34.095	5	-234.443	4	0	2	-.457	2	0	1
381	M3	1	max	1289.667	2	4.147	4	50.303	2	.004	3	.043	5	0	1
382			min	-506.133	3	.975	15	-26.536	5	-.006	2	-.023	2	0	1
383		2	max	1289.429	2	3.686	4	50.303	2	.004	3	.035	5	0	15
384			min	-506.312	3	.866	15	-26.162	5	-.006	2	-.008	2	-.001	4
385		3	max	1289.191	2	3.225	4	50.303	2	.004	3	.028	4	0	15
386			min	-506.49	3	.758	15	-25.789	5	-.006	2	-.003	3	-.002	4
387		4	max	1288.953	2	2.765	4	50.303	2	.004	3	.022	4	0	15
388			min	-506.669	3	.65	15	-25.416	5	-.006	2	-.011	3	-.003	4
389		5	max	1288.715	2	2.304	4	50.303	2	.004	3	.036	2	0	15
390			min	-506.847	3	.542	15	-25.042	5	-.006	2	-.018	3	-.004	4
391		6	max	1288.477	2	1.843	4	50.303	2	.004	3	.051	2	-.001	15
392			min	-507.026	3	.433	15	-24.669	5	-.006	2	-.025	3	-.004	4
393		7	max	1288.239	2	1.382	4	50.303	2	.004	3	.065	2	-.001	15
394			min	-507.204	3	.325	15	-24.334	3	-.006	2	-.032	3	-.005	4
395		8	max	1288.001	2	.922	4	50.303	2	.004	3	.08	2	-.001	15
396			min	-507.383	3	.217	15	-24.334	3	-.006	2	-.039	3	-.005	4
397		9	max	1287.763	2	.461	4	50.303	2	.004	3	.094	2	-.001	15
398			min	-507.561	3	.108	15	-24.334	3	-.006	2	-.046	3	-.005	4
399		10	max	1287.525	2	0	1	50.303	2	.004	3	.109	2	-.001	15
400			min	-507.74	3	0	1	-24.334	3	-.006	2	-.053	3	-.005	4
401		11	max	1287.287	2	-.108	15	50.303	2	.004	3	.124	2	-.001	15
402			min	-507.918	3	-.461	6	-24.334	3	-.006	2	-.06	3	-.005	4
403		12	max	1287.049	2	-.217	15	50.303	2	.004	3	.138	2	-.001	15
404			min	-508.097	3	-.922	6	-24.334	3	-.006	2	-.067	3	-.005	4
405		13	max	1286.811	2	-.325	15	50.303	2	.004	3	.153	2	-.001	15
406			min	-508.275	3	-1.382	6	-24.334	3	-.006	2	-.074	3	-.005	4
407		14	max	1286.573	2	-.433	15	50.303	2	.004	3	.167	2	-.001	15
408			min	-508.454	3	-1.843	6	-24.334	3	-.006	2	-.081	3	-.004	4
409		15	max	1286.335	2	-.542	15	50.303	2	.004	3	.182	2	0	15
410			min	-508.632	3	-2.304	6	-24.334	3	-.006	2	-.088	3	-.004	4
411		16	max	1286.097	2	-.65	15	50.303	2	.004	3	.197	2	0	15
412			min	-508.811	3	-2.765	6	-24.334	3	-.006	2	-.095	3	-.003	4
413		17	max	1285.859	2	-.758	15	50.303	2	.004	3	.211	2	0	15
414			min	-508.989	3	-3.225	6	-24.334	3	-.006	2	-.102	3	-.002	4
415		18	max	1285.621	2	-.866	15	50.303	2	.004	3	.226	2	0	15
416			min	-509.168	3	-3.686	6	-24.334	3	-.006	2	-.109	3	-.001	4
417		19	max	1285.383	2	-.975	15	50.303	2	.004	3	.24	2	0	1
418			min	-509.346	3	-4.147	6	-24.334	3	-.006	2	-.117	3	0	1
419	M6	1	max	3838.443	2	4.147	6	0	1	0	1	.044	4	0	1
420			min	-1875.7	3	.975	15	-30.11	4	-.004	4	0	1	0	1
421		2	max	3838.205	2	3.686	6	0	1	0	1	.036	4	0	15
422			min	-1875.878	3	.866	15	-29.737	4	-.004	4	0	1	-.001	6
423		3	max	3837.967	2	3.225	6	0	1	0	1	.027	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	-1876.057	3	.758	15	-29.364	4	-.004	4	0	1	-.002	6
425		4	max	3837.729	2	2.765	6	0	1	0	1	.019	4	0	15
426			min	-1876.235	3	.65	15	-28.99	4	-.004	4	0	1	-.003	6
427		5	max	3837.491	2	2.304	6	0	1	0	1	.01	4	0	15
428			min	-1876.414	3	.542	15	-28.617	4	-.004	4	0	1	-.004	6
429		6	max	3837.253	2	1.843	6	0	1	0	1	.002	4	-.001	15
430			min	-1876.592	3	.433	15	-28.244	4	-.004	4	0	1	-.004	6
431		7	max	3837.015	2	1.382	6	0	1	0	1	0	1	-.001	15
432			min	-1876.771	3	.325	15	-27.87	4	-.004	4	-.006	4	-.005	6
433		8	max	3836.777	2	.922	6	0	1	0	1	0	1	-.001	15
434			min	-1876.949	3	.217	15	-27.497	4	-.004	4	-.014	4	-.005	6
435		9	max	3836.539	2	.461	6	0	1	0	1	0	1	-.001	15
436			min	-1877.128	3	.108	15	-27.124	4	-.004	4	-.022	4	-.005	6
437		10	max	3836.301	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1877.306	3	0	1	-26.75	4	-.004	4	-.03	4	-.005	6
439		11	max	3836.063	2	-.108	15	0	1	0	1	0	1	-.001	15
440			min	-1877.485	3	-.461	4	-26.377	4	-.004	4	-.038	4	-.005	6
441		12	max	3835.825	2	-.217	15	0	1	0	1	0	1	-.001	15
442			min	-1877.663	3	-.922	4	-26.004	4	-.004	4	-.045	4	-.005	6
443		13	max	3835.587	2	-.325	15	0	1	0	1	0	1	-.001	15
444			min	-1877.842	3	-1.382	4	-25.63	4	-.004	4	-.053	4	-.005	6
445		14	max	3835.349	2	-.433	15	0	1	0	1	0	1	-.001	15
446			min	-1878.02	3	-1.843	4	-25.257	4	-.004	4	-.06	4	-.004	6
447		15	max	3835.111	2	-.542	15	0	1	0	1	0	1	0	15
448			min	-1878.199	3	-2.304	4	-24.884	4	-.004	4	-.067	4	-.004	6
449		16	max	3834.873	2	-.65	15	0	1	0	1	0	1	0	15
450			min	-1878.377	3	-2.765	4	-24.51	4	-.004	4	-.074	4	-.003	6
451		17	max	3834.635	2	-.758	15	0	1	0	1	0	1	0	15
452			min	-1878.556	3	-3.225	4	-24.137	4	-.004	4	-.082	4	-.002	6
453		18	max	3834.397	2	-.866	15	0	1	0	1	0	1	0	15
454			min	-1878.734	3	-3.686	4	-23.764	4	-.004	4	-.088	4	-.001	6
455		19	max	3834.159	2	-.975	15	0	1	0	1	0	1	0	1
456			min	-1878.913	3	-4.147	4	-23.39	4	-.004	4	-.095	4	0	1
457	M9	1	max	1289.667	2	4.147	6	24.334	3	.006	2	.046	4	0	1
458			min	-506.133	3	.975	15	-50.303	2	-.005	5	-.011	3	0	1
459		2	max	1289.429	2	3.686	6	24.334	3	.006	2	.036	4	0	15
460			min	-506.312	3	.866	15	-50.303	2	-.005	5	-.004	3	-.001	6
461		3	max	1289.191	2	3.225	6	24.334	3	.006	2	.027	5	0	15
462			min	-506.49	3	.758	15	-50.303	2	-.005	5	-.007	2	-.002	6
463		4	max	1288.953	2	2.765	6	24.334	3	.006	2	.019	5	0	15
464			min	-506.669	3	.65	15	-50.303	2	-.005	5	-.021	2	-.003	6
465		5	max	1288.715	2	2.304	6	24.334	3	.006	2	.018	3	0	15
466			min	-506.847	3	.542	15	-50.303	2	-.005	5	-.036	2	-.004	6
467		6	max	1288.477	2	1.843	6	24.334	3	.006	2	.025	3	-.001	15
468			min	-507.026	3	.433	15	-50.303	2	-.005	5	-.051	2	-.004	6
469		7	max	1288.239	2	1.382	6	24.334	3	.006	2	.032	3	-.001	15
470			min	-507.204	3	.325	15	-50.303	2	-.005	5	-.065	2	-.005	6
471		8	max	1288.001	2	.922	6	24.334	3	.006	2	.039	3	-.001	15
472			min	-507.383	3	.217	15	-50.303	2	-.005	5	-.08	2	-.005	6
473		9	max	1287.763	2	.461	6	24.334	3	.006	2	.046	3	-.001	15
474			min	-507.561	3	.108	15	-50.303	2	-.005	5	-.094	2	-.005	6
475		10	max	1287.525	2	0	1	24.334	3	.006	2	.053	3	-.001	15
476			min	-507.74	3	0	1	-50.303	2	-.005	5	-.109	2	-.005	6
477		11	max	1287.287	2	-.108	15	24.334	3	.006	2	.06	3	-.001	15
478			min	-507.918	3	-.461	4	-50.303	2	-.005	5	-.124	2	-.005	6
479		12	max	1287.049	2	-.217	15	24.334	3	.006	2	.067	3	-.001	15
480			min	-508.097	3	-.922	4	-50.303	2	-.005	5	-.138	2	-.005	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1286.811	2	-.325	15	24.334	3	.006	2	.074	3	-.001	15
482			min	-508.275	3	-1.382	4	-50.303	2	-.005	5	-.153	2	-.005	6
483		14	max	1286.573	2	-.433	15	24.334	3	.006	2	.081	3	-.001	15
484			min	-508.454	3	-1.843	4	-50.303	2	-.005	5	-.167	2	-.004	6
485		15	max	1286.335	2	-.542	15	24.334	3	.006	2	.088	3	0	15
486			min	-508.632	3	-2.304	4	-50.303	2	-.005	5	-.182	2	-.004	6
487		16	max	1286.097	2	-.65	15	24.334	3	.006	2	.095	3	0	15
488			min	-508.811	3	-2.765	4	-50.303	2	-.005	5	-.197	2	-.003	6
489		17	max	1285.859	2	-.758	15	24.334	3	.006	2	.102	3	0	15
490			min	-508.989	3	-3.225	4	-50.303	2	-.005	5	-.211	2	-.002	6
491		18	max	1285.621	2	-.866	15	24.334	3	.006	2	.109	3	0	15
492			min	-509.168	3	-3.686	4	-50.303	2	-.005	5	-.226	2	-.001	6
493		19	max	1285.383	2	-.975	15	24.334	3	.006	2	.117	3	0	1
494			min	-509.346	3	-4.147	4	-50.303	2	-.005	5	-.24	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	-.006	10	-.028	15	.014	1	6.2e-3	3	NC	3	NC	2
2			min	-.293	3	-.305	1	-.434	5	-1.564e-2	2	469.614	1	574.26	5
3		2	max	-.006	10	-.024	15	.004	1	6.2e-3	3	NC	3	NC	2
4			min	-.293	3	-.245	1	-.419	4	-1.564e-2	2	595.542	1	618.056	5
5		3	max	-.006	10	-.02	15	0	10	5.84e-3	3	NC	3	NC	1
6			min	-.293	3	-.184	1	-.403	4	-1.428e-2	2	802.525	14	672.078	5
7		4	max	-.006	10	-.016	15	-.002	10	5.289e-3	3	NC	3	NC	1
8			min	-.293	3	-.126	1	-.383	4	-1.218e-2	2	922.834	14	750.124	5
9		5	max	-.006	10	-.012	15	-.002	12	4.737e-3	3	NC	3	NC	1
10			min	-.293	3	-.116	3	-.36	4	-1.009e-2	2	872.68	2	861.645	5
11		6	max	-.006	10	.002	10	0	12	4.968e-3	3	NC	5	NC	1
12			min	-.293	3	-.102	3	-.335	4	-9.601e-3	2	707.259	2	1019.395	5
13		7	max	-.006	10	.018	2	0	3	5.74e-3	3	NC	5	NC	1
14			min	-.293	3	-.082	3	-.311	4	-1.022e-2	2	635.942	2	1236.844	5
15		8	max	-.006	10	.03	2	0	3	6.512e-3	3	NC	5	NC	2
16			min	-.293	3	-.055	3	-.289	4	-1.085e-2	2	602.523	2	1537.763	5
17		9	max	-.006	10	.037	2	0	10	7.439e-3	3	NC	5	NC	2
18			min	-.293	3	-.025	3	-.271	4	-1.075e-2	2	584.055	2	1959.017	5
19		10	max	-.006	10	.053	1	0	2	8.642e-3	3	NC	5	NC	2
20			min	-.293	3	.005	12	-.252	4	-9.385e-3	2	571.198	2	2691.764	5
21		11	max	-.006	10	.068	1	.001	3	9.844e-3	3	NC	5	NC	2
22			min	-.293	3	.009	15	-.234	4	-8.018e-3	2	565.082	2	4164.845	5
23		12	max	-.006	10	.088	3	.004	3	8.339e-3	3	NC	5	NC	1
24			min	-.293	3	.012	15	-.219	4	-6.069e-3	2	566.451	2	8025.489	5
25		13	max	-.006	10	.14	3	.008	3	5.303e-3	3	NC	5	NC	1
26			min	-.293	3	.013	10	-.205	4	-3.885e-3	4	506.036	3	NC	1
27		14	max	-.005	10	.209	3	.008	3	2.431e-3	3	NC	5	NC	2
28			min	-.293	3	.003	10	-.196	4	-4.939e-3	4	402.085	3	8860.237	1
29		15	max	-.005	10	.3	3	.006	1	6.877e-3	3	NC	5	NC	2
30			min	-.293	3	-.016	10	-.193	5	-4.249e-3	4	316.068	3	6660.477	1
31		16	max	-.005	10	.407	3	.008	1	1.132e-2	3	NC	5	NC	2
32			min	-.293	3	-.049	2	-.193	5	-6.077e-3	2	252.215	3	6193.45	1
33		17	max	-.005	10	.525	3	.005	1	1.577e-2	3	NC	4	NC	2
34			min	-.293	3	-.095	2	-.196	4	-8.309e-3	2	206.433	3	7240.924	1
35		18	max	-.005	10	.647	3	0	10	1.867e-2	3	NC	4	NC	1
36			min	-.293	3	-.144	2	-.2	4	-9.765e-3	2	173.782	3	NC	1
37		19	max	-.005	10	.769	3	-.002	10	1.867e-2	3	NC	1	NC	1
38			min	-.293	3	-.193	2	-.206	4	-9.765e-3	2	150.07	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	-.005	10	-.023	15	0	1	1.599e-4	4	NC	3	NC	1
40			min	-.519	3	-.671	2	-.432	4	0	1	317.067	1	575.266	4
41		2	max	-.005	10	-.019	15	0	1	1.599e-4	4	8982.355	2	NC	1
42			min	-.519	3	-.513	2	-.418	4	0	1	463.287	1	609.706	4
43		3	max	-.005	10	-.015	15	0	1	0	1	7466.855	15	NC	1
44			min	-.519	3	-.368	1	-.404	4	-2.087e-4	4	691.266	9	652.958	4
45		4	max	-.005	10	-.011	15	0	1	0	1	9612.75	15	NC	1
46			min	-.519	3	-.24	1	-.384	4	-7.739e-4	4	458.663	2	722.538	4
47		5	max	-.005	10	-.007	15	0	1	0	1	NC	15	NC	1
48			min	-.519	3	-.192	3	-.361	4	-1.339e-3	4	322.608	2	827.596	4
49		6	max	-.005	10	.005	10	0	1	0	1	NC	5	NC	1
50			min	-.519	3	-.181	3	-.335	4	-1.284e-3	4	270.18	2	980.379	4
51		7	max	-.005	10	.038	2	0	1	0	1	NC	5	NC	1
52			min	-.519	3	-.148	3	-.311	4	-8.006e-4	4	249.911	2	1192.157	4
53		8	max	-.004	10	.054	2	0	1	0	1	NC	3	NC	1
54			min	-.52	3	-.101	3	-.289	4	-3.169e-4	4	242.781	2	1478.675	4
55		9	max	-.004	10	.06	2	0	1	0	1	NC	4	NC	1
56			min	-.52	3	-.046	3	-.271	4	-5.484e-5	4	239.911	2	1854.799	4
57		10	max	-.004	10	.085	1	0	1	0	1	NC	4	NC	1
58			min	-.52	3	.004	15	-.252	4	-1.845e-4	4	237.237	2	2511.3	4
59		11	max	-.003	10	.108	1	0	1	0	1	NC	5	NC	1
60			min	-.52	3	.006	15	-.234	4	-3.142e-4	4	235.597	2	3762.359	4
61		12	max	-.003	10	.151	3	0	1	0	1	NC	5	NC	1
62			min	-.521	3	.007	15	-.22	4	-1.4e-3	4	235.44	2	6363.146	4
63		13	max	-.003	10	.243	3	0	1	0	1	NC	5	NC	1
64			min	-.521	3	.008	15	-.207	4	-3.026e-3	4	240.298	2	NC	1
65		14	max	-.002	10	.374	3	0	1	0	1	NC	5	NC	1
66			min	-.521	3	-.002	10	-.2	4	-4.591e-3	4	256.91	2	NC	1
67		15	max	-.002	10	.558	3	0	1	0	1	NC	5	NC	1
68			min	-.521	3	-.048	2	-.198	4	-3.473e-3	4	205.121	3	NC	1
69		16	max	-.002	10	.783	3	0	1	0	1	NC	5	NC	1
70			min	-.521	3	-.146	2	-.198	4	-2.354e-3	4	152.685	3	NC	1
71		17	max	-.002	10	1.032	3	0	1	0	1	NC	5	NC	1
72			min	-.521	3	-.26	2	-.198	4	-1.235e-3	4	118.943	3	NC	1
73		18	max	-.002	10	1.29	3	0	1	0	1	NC	4	NC	1
74			min	-.521	3	-.379	2	-.199	4	-5.058e-4	4	96.795	3	NC	1
75		19	max	-.002	10	1.547	3	0	1	0	1	NC	1	NC	1
76			min	-.521	3	-.499	2	-.199	4	-5.058e-4	4	81.632	3	NC	1
77	M7	1	max	.012	5	.001	15	-.002	10	1.564e-2	2	NC	3	NC	2
78			min	-.293	3	-.305	1	-.442	4	-6.2e-3	3	469.614	1	544.943	4
79		2	max	.012	5	.002	5	0	10	1.564e-2	2	NC	3	NC	2
80			min	-.293	3	-.245	1	-.421	4	-6.2e-3	3	595.542	1	595.435	4
81		3	max	.012	5	.003	5	.005	1	1.428e-2	2	NC	3	NC	1
82			min	-.293	3	-.184	1	-.4	4	-5.84e-3	3	814.123	1	657.188	4
83		4	max	.012	5	.004	5	.009	1	1.218e-2	2	NC	3	NC	1
84			min	-.293	3	-.126	1	-.378	5	-5.289e-3	3	986.167	9	737.727	4
85		5	max	.012	5	.004	5	.009	1	1.009e-2	2	NC	3	NC	1
86			min	-.293	3	-.116	3	-.355	5	-4.737e-3	3	872.68	2	844.861	4
87		6	max	.012	5	.004	5	.007	1	9.601e-3	2	NC	4	NC	1
88			min	-.293	3	-.102	3	-.332	4	-4.968e-3	3	707.259	2	988.672	4
89		7	max	.012	5	.018	2	.003	2	1.022e-2	2	NC	4	NC	1
90			min	-.293	3	-.082	3	-.31	4	-5.74e-3	3	635.942	2	1177.642	4
91		8	max	.012	5	.03	2	0	2	1.085e-2	2	NC	4	NC	2
92			min	-.293	3	-.055	3	-.29	4	-6.512e-3	3	602.523	2	1433.988	4
93		9	max	.012	5	.037	2	0	3	1.075e-2	2	NC	4	NC	2
94			min	-.293	3	-.025	3	-.271	4	-7.439e-3	3	584.055	2	1801.214	4
95		10	max	.012	5	.053	1	0	3	9.385e-3	2	NC	5	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.293	3	0	5	-.252	4	-8.642e-3	3	571.198	2	2400.866	4
97		11	max	.012	5	.068	1	0	2	8.018e-3	2	NC	5	NC	2
98			min	-.293	3	-.002	5	-.234	4	-9.844e-3	3	565.082	2	3518.293	4
99		12	max	.012	5	.088	3	.003	2	6.069e-3	2	NC	5	NC	1
100			min	-.293	3	-.004	5	-.218	4	-8.339e-3	3	566.451	2	6142.88	4
101		13	max	.012	5	.14	3	.004	2	3.791e-3	2	NC	5	NC	1
102			min	-.293	3	-.006	5	-.205	4	-5.303e-3	3	506.036	3	NC	1
103		14	max	.012	5	.209	3	.002	2	1.612e-3	2	NC	5	NC	2
104			min	-.293	3	-.008	5	-.198	4	-4.616e-3	5	402.085	3	8860.237	1
105		15	max	.012	5	.3	3	0	10	3.844e-3	2	NC	5	NC	2
106			min	-.293	3	-.016	10	-.197	4	-6.877e-3	3	316.068	3	6660.477	1
107		16	max	.012	5	.407	3	-.001	10	6.077e-3	2	NC	9	NC	2
108			min	-.293	3	-.049	2	-.198	4	-1.132e-2	3	252.215	3	6193.45	1
109		17	max	.012	5	.525	3	0	10	8.309e-3	2	NC	4	NC	2
110			min	-.293	3	-.095	2	-.199	4	-1.577e-2	3	206.433	3	7240.924	1
111		18	max	.012	5	.647	3	.004	1	9.765e-3	2	NC	4	NC	1
112			min	-.293	3	-.144	2	-.198	4	-1.867e-2	3	173.782	3	NC	1
113		19	max	.012	5	.769	3	.014	1	9.765e-3	2	NC	1	NC	1
114			min	-.293	3	-.193	2	-.198	5	-1.867e-2	3	150.07	3	NC	1
115	M10	1	max	0	3	.604	3	.293	3	1.637e-2	3	NC	1	NC	1
116			min	-.198	4	-.127	2	-.012	5	-6.543e-3	2	NC	1	NC	1
117		2	max	0	3	.809	3	.308	3	1.839e-2	3	NC	4	NC	2
118			min	-.198	4	-.233	2	-.011	5	-7.595e-3	2	940.008	3	8275.29	1
119		3	max	0	3	1.002	3	.334	3	2.041e-2	3	NC	4	NC	4
120			min	-.198	4	-.331	2	-.007	5	-8.648e-3	2	483.059	3	3483.178	1
121		4	max	0	3	1.159	3	.366	3	2.243e-2	3	NC	4	NC	5
122			min	-.198	4	-.405	2	-.001	15	-9.7e-3	2	346.196	3	2265.776	1
123		5	max	0	3	1.265	3	.403	3	2.444e-2	3	NC	4	NC	5
124			min	-.198	4	-.448	2	.003	15	-1.075e-2	2	290.648	3	1758.079	3
125		6	max	0	3	1.315	3	.439	3	2.646e-2	3	NC	4	NC	5
126			min	-.199	4	-.457	2	.007	15	-1.181e-2	2	270.278	3	1322.273	3
127		7	max	0	3	1.313	3	.471	3	2.848e-2	3	NC	4	NC	5
128			min	-.199	4	-.437	2	.01	15	-1.286e-2	2	270.852	3	1079.766	3
129		8	max	0	3	1.275	3	.498	3	3.05e-2	3	NC	4	NC	5
130			min	-.199	4	-.398	2	.008	10	-1.391e-2	2	286.147	3	940.479	3
131		9	max	0	3	1.226	3	.515	3	3.252e-2	3	NC	13	NC	2
132			min	-.199	4	-.358	2	.004	10	-1.496e-2	2	308.882	3	866.343	3
133		10	max	0	1	1.2	3	.521	3	3.454e-2	3	NC	9	NC	2
134			min	-.199	4	-.338	2	.002	10	-1.601e-2	2	322.371	3	842.314	3
135		11	max	0	10	1.226	3	.515	3	3.252e-2	3	NC	14	NC	2
136			min	-.199	4	-.358	2	.004	10	-1.496e-2	2	308.882	3	866.343	3
137		12	max	0	10	1.275	3	.498	3	3.05e-2	3	NC	13	NC	5
138			min	-.199	4	-.398	2	.008	10	-1.391e-2	2	286.147	3	940.479	3
139		13	max	0	10	1.313	3	.471	3	2.848e-2	3	NC	4	NC	5
140			min	-.199	4	-.437	2	.012	10	-1.286e-2	2	270.852	3	1079.766	3
141		14	max	0	10	1.315	3	.439	3	2.646e-2	3	NC	4	NC	5
142			min	-.199	4	-.457	2	.015	10	-1.181e-2	2	270.278	3	1322.273	3
143		15	max	0	10	1.265	3	.403	3	2.444e-2	3	NC	4	NC	5
144			min	-.199	4	-.448	2	.016	10	-1.075e-2	2	290.648	3	1758.079	3
145		16	max	0	10	1.159	3	.366	3	2.243e-2	3	NC	4	NC	5
146			min	-.199	4	-.405	2	.015	10	-9.7e-3	2	346.196	3	2265.776	1
147		17	max	0	10	1.002	3	.334	3	2.041e-2	3	NC	14	NC	5
148			min	-.199	4	-.331	2	.012	10	-8.648e-3	2	483.059	3	3483.178	1
149		18	max	0	10	.809	3	.308	3	1.839e-2	3	NC	14	NC	2
150			min	-.199	4	-.233	2	.009	10	-7.595e-3	2	940.008	3	8275.29	1
151		19	max	0	10	.604	3	.293	3	1.637e-2	3	NC	1	NC	1
152			min	-.199	4	-.127	2	.005	10	-6.543e-3	2	2757.054	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	.073	1	.293	3	5.652e-3	3	NC	1	NC	1
154			min	-.228	4	-.003	5	-.012	5	-2.469e-4	10	NC	1	NC	1
155		2	max	.001	2	.175	3	.3	3	6.098e-3	3	NC	4	NC	1
156			min	-.228	4	-.034	2	.004	15	-2.559e-4	10	1676.334	3	NC	1
157		3	max	.001	2	.28	3	.321	3	6.544e-3	3	NC	4	NC	10
158			min	-.228	4	-.1	2	.01	15	-2.649e-4	10	875.107	3	4335.231	1
159		4	max	0	2	.352	3	.353	3	6.99e-3	3	NC	4	NC	10
160			min	-.228	4	-.14	2	.011	15	-2.739e-4	10	657.522	3	2633.815	1
161		5	max	0	2	.38	3	.39	3	7.436e-3	3	NC	4	NC	5
162			min	-.228	4	-.148	2	.009	15	-2.829e-4	10	600.486	3	1985.55	3
163		6	max	0	2	.36	3	.428	3	7.882e-3	3	NC	4	NC	5
164			min	-.229	4	-.124	2	.006	15	-2.919e-4	10	640.027	3	1421.961	3
165		7	max	0	2	.301	3	.464	3	8.328e-3	3	NC	4	NC	5
166			min	-.229	4	-.074	2	.002	15	-3.01e-4	10	799.63	3	1124.719	3
167		8	max	0	2	.218	3	.493	3	8.774e-3	3	NC	4	NC	4
168			min	-.229	4	-.013	10	.001	15	-3.1e-4	10	1219.316	3	959.346	3
169		9	max	0	2	.14	3	.513	3	9.22e-3	3	NC	2	NC	2
170			min	-.229	4	.004	15	.004	15	-3.19e-4	10	2418.49	3	872.742	3
171		10	max	0	1	.116	1	.521	3	9.666e-3	3	NC	4	NC	2
172			min	-.229	4	.006	15	.003	10	-3.28e-4	10	4443.863	3	844.753	3
173		11	max	0	3	.14	3	.513	3	9.22e-3	3	NC	2	NC	2
174			min	-.229	4	.007	15	.005	10	-3.19e-4	10	2418.49	3	872.742	3
175		12	max	0	3	.218	3	.493	3	8.774e-3	3	NC	4	NC	10
176			min	-.229	4	-.013	10	.009	10	-3.1e-4	10	1219.316	3	959.346	3
177		13	max	0	3	.301	3	.464	3	8.328e-3	3	NC	4	NC	5
178			min	-.229	4	-.074	2	.013	10	-3.01e-4	10	799.63	3	1124.719	3
179		14	max	0	3	.36	3	.428	3	7.882e-3	3	NC	5	NC	5
180			min	-.229	4	-.124	2	.016	10	-2.919e-4	10	640.027	3	1421.961	3
181		15	max	.001	3	.38	3	.39	3	7.436e-3	3	NC	5	NC	5
182			min	-.229	4	-.148	2	.017	10	-2.829e-4	10	600.486	3	1985.55	3
183		16	max	.001	3	.352	3	.353	3	6.99e-3	3	NC	7	NC	4
184			min	-.229	4	-.14	2	.015	10	-2.739e-4	10	657.522	3	2633.815	1
185		17	max	.001	3	.28	3	.321	3	6.544e-3	3	NC	5	NC	4
186			min	-.229	4	-.1	2	.012	10	-2.649e-4	10	875.107	3	4335.231	1
187		18	max	.002	3	.175	3	.3	3	6.098e-3	3	NC	4	NC	1
188			min	-.229	4	-.034	2	.009	10	-2.559e-4	10	1676.334	3	NC	1
189		19	max	.002	3	.073	1	.293	3	5.652e-3	3	NC	1	NC	1
190			min	-.229	4	.01	15	.006	10	-2.469e-4	10	NC	1	NC	1
191	M12	1	max	0	2	.034	2	.293	3	4.1e-3	3	NC	1	NC	1
192			min	-.277	4	-.037	3	-.012	5	-1.793e-4	5	NC	1	NC	1
193		2	max	0	2	.034	3	.304	3	4.468e-3	3	NC	4	NC	1
194			min	-.277	4	-.085	2	.005	15	-1.179e-4	5	1607.202	2	9178.62	4
195		3	max	0	2	.09	3	.328	3	4.836e-3	3	NC	4	NC	2
196			min	-.277	4	-.186	2	.01	10	-5.652e-5	5	869.97	2	4766.376	1
197		4	max	0	2	.121	3	.36	3	5.205e-3	3	NC	4	NC	10
198			min	-.277	4	-.25	2	.012	15	-4.559e-6	15	676.151	2	2798.932	1
199		5	max	0	2	.125	3	.396	3	5.573e-3	3	NC	4	NC	5
200			min	-.277	4	-.265	2	.01	15	3.64e-5	15	641.797	2	1862.889	3
201		6	max	0	2	.102	3	.433	3	5.941e-3	3	NC	4	NC	5
202			min	-.277	4	-.232	2	.005	15	7.735e-5	15	722.191	2	1371.924	3
203		7	max	0	2	.058	3	.467	3	6.309e-3	3	NC	4	NC	5
204			min	-.277	4	-.159	2	0	15	1.183e-4	15	993.444	2	1104.736	3
205		8	max	0	2	.004	3	.495	3	6.677e-3	3	NC	4	NC	4
206			min	-.277	4	-.066	2	-.002	15	1.593e-4	15	1915.122	2	953.314	3
207		9	max	0	2	.021	1	.513	3	7.045e-3	3	NC	1	NC	2
208			min	-.277	4	-.044	3	.002	15	1.659e-4	10	NC	1	873.259	3
209		10	max	0	1	.058	2	.52	3	7.414e-3	3	NC	4	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.277	4	-.066	3	.004	10	1.501e-4	10	6567.955	3	847.334	3
211		11	max	0	9	.021	1	.513	3	7.045e-3	3	NC	1	NC	2
212			min	-.277	4	-.044	3	.006	10	1.659e-4	10	NC	1	873.259	3
213		12	max	0	9	.004	3	.495	3	6.677e-3	3	NC	4	NC	10
214			min	-.277	4	-.066	2	.009	10	1.817e-4	10	1915.122	2	953.314	3
215		13	max	0	9	.058	3	.467	3	6.309e-3	3	NC	5	NC	10
216			min	-.277	4	-.159	2	.012	10	1.975e-4	10	993.444	2	1104.736	3
217		14	max	0	9	.102	3	.433	3	5.941e-3	3	NC	5	NC	5
218			min	-.277	4	-.232	2	.014	10	2.133e-4	10	722.191	2	1371.924	3
219		15	max	0	9	.125	3	.396	3	5.573e-3	3	NC	5	NC	5
220			min	-.277	4	-.265	2	.014	10	2.291e-4	10	641.797	2	1862.889	3
221		16	max	0	9	.121	3	.36	3	5.205e-3	3	NC	5	NC	4
222			min	-.277	4	-.25	2	.012	10	2.449e-4	10	676.151	2	2798.932	1
223		17	max	0	9	.09	3	.328	3	4.836e-3	3	NC	5	NC	2
224			min	-.277	4	-.186	2	.01	10	2.607e-4	10	869.97	2	4766.376	1
225		18	max	0	9	.034	3	.304	3	4.468e-3	3	NC	4	NC	1
226			min	-.277	4	-.085	2	.007	10	2.765e-4	10	1607.202	2	NC	1
227		19	max	0	9	.034	2	.293	3	4.1e-3	3	NC	1	NC	1
228			min	-.277	4	-.037	3	.006	10	2.923e-4	10	NC	1	NC	1
229	M13	1	max	0	10	.002	5	.293	3	8.592e-3	2	NC	1	NC	1
230			min	-.414	4	-.224	1	-.012	5	4.813e-5	3	NC	1	NC	1
231		2	max	0	10	0	15	.308	3	9.99e-3	2	NC	4	NC	2
232			min	-.414	4	-.359	2	.006	15	-4.006e-4	3	1153.236	2	8050.97	4
233		3	max	0	10	-.002	15	.334	3	1.139e-2	2	NC	5	NC	10
234			min	-.414	4	-.507	2	.013	15	-8.492e-4	3	611.439	2	3427.554	1
235		4	max	0	10	.027	3	.367	3	1.279e-2	2	NC	5	NC	10
236			min	-.414	4	-.614	2	.015	15	-1.298e-3	3	455.46	2	2230.404	1
237		5	max	0	10	.034	3	.402	3	1.418e-2	2	NC	5	NC	10
238			min	-.414	4	-.67	2	.013	15	-1.747e-3	3	401.897	2	1755.117	3
239		6	max	0	10	.016	3	.438	3	1.558e-2	2	NC	5	NC	5
240			min	-.414	4	-.673	2	.009	15	-2.195e-3	3	399.301	2	1325.823	3
241		7	max	0	10	-.013	15	.47	3	1.698e-2	2	NC	5	NC	5
242			min	-.414	4	-.631	2	.005	15	-2.644e-3	3	437.552	2	1085.93	3
243		8	max	0	10	-.015	15	.496	3	1.838e-2	2	NC	5	NC	5
244			min	-.414	4	-.562	2	.003	15	-3.093e-3	3	520.019	2	947.801	3
245		9	max	0	10	-.016	15	.513	3	1.977e-2	2	NC	3	NC	2
246			min	-.414	4	-.492	2	.005	15	-3.541e-3	3	641.461	2	874.202	3
247		10	max	0	1	-.017	15	.519	3	2.117e-2	2	NC	3	NC	2
248			min	-.414	4	-.459	2	.005	10	-3.99e-3	3	721.817	2	850.35	3
249		11	max	0	1	-.019	15	.513	3	1.977e-2	2	NC	3	NC	2
250			min	-.414	4	-.492	2	.007	10	-3.541e-3	3	641.461	2	874.202	3
251		12	max	0	1	-.022	15	.496	3	1.838e-2	2	NC	5	NC	10
252			min	-.414	4	-.562	2	.011	10	-3.093e-3	3	520.019	2	947.801	3
253		13	max	0	1	-.017	12	.47	3	1.698e-2	2	NC	5	NC	5
254			min	-.414	4	-.631	2	.015	10	-2.644e-3	3	437.552	2	1085.93	3
255		14	max	0	1	.016	3	.438	3	1.558e-2	2	NC	15	NC	5
256			min	-.414	4	-.673	2	.018	10	-2.195e-3	3	399.301	2	1325.823	3
257		15	max	0	1	.034	3	.402	3	1.418e-2	2	NC	15	NC	5
258			min	-.414	4	-.67	2	.017	15	-1.747e-3	3	401.897	2	1755.117	3
259		16	max	0	1	.027	3	.367	3	1.279e-2	2	NC	15	NC	4
260			min	-.414	4	-.614	2	.013	15	-1.298e-3	3	455.46	2	2230.404	1
261		17	max	0	1	-.006	3	.334	3	1.139e-2	2	NC	5	NC	4
262			min	-.414	4	-.507	2	.012	15	-8.492e-4	3	611.439	2	3427.554	1
263		18	max	0	1	-.027	15	.308	3	9.99e-3	2	NC	5	NC	2
264			min	-.414	4	-.359	2	.01	10	-4.006e-4	3	1153.236	2	8120.995	1
265		19	max	0	1	-.023	15	.293	3	8.592e-3	2	NC	1	NC	1
266			min	-.414	4	-.224	1	.006	10	4.813e-5	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	10	.001	5	4.042e-3	2	NC	1	NC	1
270			min	0	2	-.002	3	0	2	-6.377e-3	5	NC	1	NC	1
271		3	max	0	3	0	10	.004	5	3.716e-3	2	NC	1	NC	1
272			min	0	2	-.007	3	0	2	-6.192e-3	5	NC	1	NC	1
273		4	max	0	3	0	10	.009	5	3.389e-3	2	NC	1	NC	1
274			min	0	2	-.015	3	-.001	2	-6.007e-3	5	5069.113	3	8455.995	5
275		5	max	0	3	0	10	.015	5	3.063e-3	2	NC	2	NC	1
276			min	0	2	-.025	3	-.002	2	-5.822e-3	5	2935.165	3	4907.601	5
277		6	max	0	3	0	10	.023	5	2.737e-3	2	NC	2	NC	1
278			min	0	2	-.038	3	-.003	2	-5.637e-3	5	1927.154	3	3234.993	5
279		7	max	0	3	0	10	.032	5	2.41e-3	2	NC	2	NC	1
280			min	0	2	-.054	3	-.004	2	-5.452e-3	5	1370.981	3	2312.449	5
281		8	max	0	3	-.001	10	.042	5	2.084e-3	2	NC	10	NC	1
282			min	0	2	-.071	3	-.005	2	-5.267e-3	5	1031.068	3	1748.424	5
283		9	max	0	3	-.001	10	.053	5	1.757e-3	2	NC	10	NC	1
284			min	0	2	-.091	3	-.006	2	-5.082e-3	5	807.959	3	1377.953	5
285		10	max	0	3	-.002	10	.066	5	1.431e-3	2	NC	10	NC	1
286			min	0	2	-.113	3	-.007	2	-4.897e-3	5	653.45	3	1121.187	5
287		11	max	0	3	-.002	10	.079	5	1.105e-3	2	NC	10	NC	1
288			min	0	2	-.136	3	-.008	2	-4.721e-3	4	541.903	3	935.684	5
289		12	max	0	3	-.003	10	.092	5	7.782e-4	2	NC	10	NC	1
290			min	0	2	-.161	3	-.008	2	-4.565e-3	4	458.666	3	797.188	5
291		13	max	0	3	-.003	10	.107	5	5.338e-4	3	NC	10	NC	1
292			min	0	2	-.187	3	-.008	2	-4.409e-3	4	394.864	3	691.004	5
293		14	max	0	3	-.004	10	.121	5	7.639e-4	3	NC	10	NC	1
294			min	-.001	2	-.214	3	-.008	2	-4.253e-3	4	344.853	3	607.793	5
295		15	max	.001	3	-.004	10	.136	5	9.94e-4	3	NC	10	NC	1
296			min	-.001	2	-.242	3	-.007	2	-4.097e-3	4	304.926	3	541.407	5
297		16	max	.001	3	-.005	10	.151	5	1.224e-3	3	NC	10	NC	1
298			min	-.001	2	-.27	3	-.006	1	-3.94e-3	4	272.546	3	487.642	5
299		17	max	.001	3	-.005	10	.166	4	1.454e-3	3	NC	10	NC	1
300			min	-.001	2	-.3	3	-.005	1	-3.784e-3	4	245.931	3	443.259	4
301		18	max	.001	3	-.006	10	.181	4	1.684e-3	3	NC	10	NC	1
302			min	-.001	2	-.329	3	-.003	1	-3.628e-3	4	223.802	3	406.248	4
303		19	max	.001	3	-.006	10	.196	4	1.914e-3	3	NC	10	NC	1
304			min	-.001	2	-.359	3	-.008	3	-3.472e-3	4	205.222	3	375.274	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	10	.001	4	0	1	NC	1	NC	1
308			min	0	2	-.003	3	0	1	-6.728e-3	4	NC	1	NC	1
309		3	max	0	3	0	10	.004	4	0	1	NC	1	NC	1
310			min	0	2	-.012	3	0	1	-6.511e-3	4	6098.565	3	NC	1
311		4	max	0	3	0	10	.009	4	0	1	NC	2	NC	1
312			min	0	2	-.026	3	0	1	-6.293e-3	4	2830.642	3	8127.913	4
313		5	max	0	3	0	10	.016	4	0	1	NC	2	NC	1
314			min	0	2	-.045	3	0	1	-6.076e-3	4	1642.393	3	4721.12	4
315		6	max	.001	3	0	10	.024	4	0	1	NC	2	NC	1
316			min	-.001	2	-.068	3	0	1	-5.859e-3	4	1079.522	3	3114.764	4
317		7	max	.001	3	0	10	.033	4	0	1	NC	2	NC	1
318			min	-.001	2	-.096	3	0	1	-5.641e-3	4	768.48	3	2228.533	4
319		8	max	.002	3	0	10	.044	4	0	1	NC	5	NC	1
320			min	-.002	2	-.127	3	0	1	-5.424e-3	4	578.2	3	1686.601	4
321		9	max	.002	3	0	10	.055	4	0	1	NC	5	NC	1
322			min	-.002	2	-.163	3	0	1	-5.207e-3	4	453.226	3	1330.588	4
323		10	max	.002	3	0	10	.068	4	0	1	NC	10	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	-.201	3	0	1	-4.989e-3	4	366.638	3	1083.823	4
325		11	max	.002	3	0	10	.081	4	0	1	NC	10	NC	1
326			min	-.002	2	-.242	3	0	1	-4.772e-3	4	304.105	3	905.546	4
327		12	max	.003	3	0	10	.095	4	0	1	NC	10	NC	1
328			min	-.002	2	-.286	3	0	1	-4.555e-3	4	257.429	3	772.46	4
329		13	max	.003	3	0	10	.11	4	0	1	NC	10	NC	1
330			min	-.003	2	-.332	3	0	1	-4.337e-3	4	221.645	3	670.447	4
331		14	max	.003	3	0	10	.125	4	0	1	NC	10	NC	1
332			min	-.003	2	-.381	3	0	1	-4.12e-3	4	193.59	3	590.539	4
333		15	max	.003	3	0	10	.14	4	0	1	NC	10	NC	1
334			min	-.003	2	-.43	3	0	1	-3.903e-3	4	171.189	3	526.829	4
335		16	max	.003	3	0	10	.155	4	0	1	NC	10	NC	1
336			min	-.003	2	-.482	3	0	1	-3.685e-3	4	153.02	3	475.275	4
337		17	max	.004	3	-.001	10	.17	4	0	1	NC	10	NC	1
338			min	-.003	2	-.534	3	0	1	-3.468e-3	4	138.084	3	433.044	4
339		18	max	.004	3	-.001	10	.185	4	0	1	NC	10	NC	1
340			min	-.004	2	-.586	3	0	1	-3.251e-3	4	125.665	3	398.103	4
341		19	max	.004	3	-.001	10	.2	4	0	1	NC	10	NC	1
342			min	-.004	2	-.639	3	0	1	-3.033e-3	4	115.236	3	368.962	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	.001	4	1.997e-3	3	NC	1	NC	1
346			min	0	2	-.002	3	0	3	-6.884e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	1.767e-3	3	NC	1	NC	1
348			min	0	2	-.007	3	-.001	3	-6.648e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.009	4	1.537e-3	3	NC	1	NC	1
350			min	0	2	-.015	3	-.002	3	-6.412e-3	4	5069.113	3	8178.316	4
351		5	max	0	3	.001	5	.016	4	1.307e-3	3	NC	2	NC	1
352			min	0	2	-.025	3	-.003	3	-6.176e-3	4	2935.165	3	4751.429	4
353		6	max	0	3	.002	5	.024	4	1.077e-3	3	NC	2	NC	1
354			min	0	2	-.038	3	-.005	3	-5.939e-3	4	1927.154	3	3135.25	4
355		7	max	0	3	.002	5	.033	4	8.467e-4	3	NC	2	NC	1
356			min	0	2	-.054	3	-.006	3	-5.703e-3	4	1370.981	3	2243.475	4
357		8	max	0	3	.003	5	.043	4	6.166e-4	3	NC	4	NC	1
358			min	0	2	-.071	3	-.008	3	-5.467e-3	4	1031.068	3	1698.098	4
359		9	max	0	3	.004	5	.055	4	3.865e-4	3	NC	5	NC	1
360			min	0	2	-.091	3	-.009	3	-5.231e-3	4	807.959	3	1339.796	4
361		10	max	0	3	.005	5	.068	4	1.564e-4	3	NC	5	NC	1
362			min	0	2	-.113	3	-.01	3	-4.995e-3	4	653.45	3	1091.429	4
363		11	max	0	3	.005	5	.081	4	-3.673e-5	9	NC	5	NC	1
364			min	0	2	-.136	3	-.011	3	-4.759e-3	4	541.903	3	911.988	4
365		12	max	0	3	.006	5	.095	4	4.182e-5	9	NC	5	NC	1
366			min	0	2	-.161	3	-.011	3	-4.523e-3	4	458.666	3	778.028	4
367		13	max	0	3	.008	5	.109	4	1.204e-4	9	NC	7	NC	1
368			min	0	2	-.187	3	-.011	3	-4.311e-3	5	394.864	3	675.345	4
369		14	max	0	3	.009	5	.124	4	1.989e-4	9	NC	10	NC	1
370			min	-.001	2	-.214	3	-.01	3	-4.105e-3	5	344.853	3	594.911	4
371		15	max	.001	3	.01	5	.139	4	4.271e-4	1	NC	10	NC	1
372			min	-.001	2	-.242	3	-.008	3	-3.9e-3	5	304.926	3	530.782	4
373		16	max	.001	3	.011	5	.154	4	6.828e-4	1	NC	10	NC	1
374			min	-.001	2	-.27	3	-.006	3	-3.695e-3	5	272.546	3	478.891	4
375		17	max	.001	3	.012	5	.169	4	9.386e-4	1	NC	10	NC	1
376			min	-.001	2	-.3	3	-.002	3	-3.489e-3	5	245.931	3	436.386	4
377		18	max	.001	3	.013	5	.184	4	1.194e-3	1	NC	10	NC	1
378			min	-.001	2	-.329	3	0	10	-3.284e-3	5	223.802	3	401.22	4
379		19	max	.001	3	.014	5	.198	4	1.507e-3	2	NC	10	NC	1
380			min	-.001	2	-.359	3	-.002	2	-3.079e-3	5	205.222	3	371.895	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	0	3	0	10	0	5	2.265e-3	2	NC	1	NC	1
382			min	0	2	0	3	0	2	-3.32e-3	5	NC	1	NC	1
383		2	max	0	3	0	10	.02	5	2.33e-3	2	NC	1	NC	3
384			min	0	2	-.018	3	-.013	2	-3.259e-3	5	NC	1	4910.648	2
385		3	max	0	3	-.002	10	.041	5	2.394e-3	2	NC	1	NC	4
386			min	0	2	-.036	3	-.025	2	-3.198e-3	5	NC	1	2439.125	2
387		4	max	.001	3	-.003	10	.062	5	2.459e-3	2	NC	1	NC	4
388			min	-.001	2	-.054	3	-.038	2	-3.136e-3	5	NC	1	1628.577	2
389		5	max	.001	3	-.004	10	.083	5	2.523e-3	2	NC	1	NC	4
390			min	-.002	2	-.071	3	-.05	2	-3.075e-3	5	NC	1	1233.366	2
391		6	max	.001	3	-.004	10	.105	5	2.588e-3	2	NC	1	NC	4
392			min	-.002	2	-.089	3	-.061	2	-3.014e-3	5	NC	1	1004.77	2
393		7	max	.002	3	-.005	10	.127	5	2.652e-3	2	NC	1	NC	4
394			min	-.003	2	-.107	3	-.071	2	-2.953e-3	5	NC	1	860.271	2
395		8	max	.002	3	-.006	10	.149	5	2.717e-3	2	NC	1	NC	13
396			min	-.003	2	-.124	3	-.08	2	-2.892e-3	5	NC	1	764.933	2
397		9	max	.002	3	-.006	10	.171	5	2.781e-3	2	NC	1	8330.423	13
398			min	-.004	2	-.142	3	-.087	2	-2.831e-3	5	NC	1	701.806	2
399		10	max	.002	3	-.007	10	.192	5	2.846e-3	2	NC	1	7148.826	13
400			min	-.004	2	-.159	3	-.092	2	-2.77e-3	5	NC	1	662.166	2
401		11	max	.002	3	-.007	10	.213	5	2.91e-3	2	NC	1	6405.989	13
402			min	-.004	2	-.177	3	-.095	2	-2.709e-3	5	NC	1	641.763	2
403		12	max	.002	3	-.008	10	.233	5	2.975e-3	2	NC	1	5974.983	13
404			min	-.005	2	-.194	3	-.095	2	-2.647e-3	5	NC	1	596.244	14
405		13	max	.003	3	-.008	10	.253	5	3.039e-3	2	NC	1	5802.148	13
406			min	-.005	2	-.211	3	-.092	2	-2.586e-3	5	NC	1	541.861	14
407		14	max	.003	3	-.008	10	.271	5	3.104e-3	2	NC	1	5890.307	13
408			min	-.006	2	-.228	3	-.086	2	-2.525e-3	5	NC	1	496.32	14
409		15	max	.003	3	-.008	10	.289	5	3.169e-3	2	NC	1	6314.684	13
410			min	-.006	2	-.245	3	-.076	2	-2.464e-3	5	NC	1	457.693	14
411		16	max	.003	3	-.009	10	.306	5	3.233e-3	2	NC	1	7305.574	13
412			min	-.007	2	-.262	3	-.062	2	-2.403e-3	5	NC	1	424.571	14
413		17	max	.003	3	-.009	10	.321	5	3.298e-3	2	NC	1	9604.516	13
414			min	-.007	2	-.279	3	-.044	2	-2.342e-3	5	NC	1	395.898	14
415		18	max	.004	3	-.009	10	.336	4	3.362e-3	2	NC	1	NC	4
416			min	-.007	2	-.296	3	-.022	2	-2.281e-3	5	NC	1	370.869	14
417		19	max	.004	3	-.009	10	.35	4	3.427e-3	2	NC	1	NC	1
418			min	-.008	2	-.313	3	.001	12	-2.22e-3	5	NC	1	348.86	14
419	M6	1	max	.001	3	0	10	0	4	0	1	NC	1	NC	1
420			min	0	2	0	3	0	1	-3.511e-3	4	NC	1	NC	1
421		2	max	.002	3	0	15	.021	4	0	1	NC	1	NC	1
422			min	-.002	2	-.032	3	0	1	-3.46e-3	4	NC	1	NC	1
423		3	max	.002	3	-.002	15	.043	4	0	1	NC	1	NC	1
424			min	-.003	2	-.063	3	0	1	-3.409e-3	4	NC	1	NC	1
425		4	max	.003	3	-.003	15	.065	4	0	1	NC	1	NC	1
426			min	-.004	2	-.094	3	0	1	-3.359e-3	4	NC	1	9824.104	4
427		5	max	.004	3	-.004	15	.088	4	0	1	NC	1	NC	1
428			min	-.005	2	-.125	3	0	1	-3.308e-3	4	NC	1	6560.058	4
429		6	max	.004	3	-.005	15	.111	4	0	1	NC	1	NC	1
430			min	-.007	2	-.156	3	0	1	-3.257e-3	4	NC	1	4839.298	4
431		7	max	.005	3	-.006	15	.133	4	0	1	NC	1	NC	1
432			min	-.008	2	-.187	3	0	1	-3.206e-3	4	NC	1	3822.973	4
433		8	max	.006	3	-.006	15	.156	4	0	1	NC	1	NC	1
434			min	-.009	2	-.217	3	0	1	-3.155e-3	4	NC	1	3180.111	4
435		9	max	.006	3	-.007	15	.179	4	0	1	NC	1	NC	1
436			min	-.011	2	-.248	3	0	1	-3.105e-3	4	NC	1	2758.44	4
437		10	max	.007	3	-.008	10	.201	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	-.279	3	0	1	-3.054e-3	4	NC	1	2480.956	4
439		11	max	.008	3	-.009	10	.222	4	0	1	NC	1	NC	1
440			min	-.013	2	-.31	3	0	1	-3.003e-3	4	NC	1	2307.244	4
441		12	max	.008	3	-.009	10	.243	4	0	1	NC	1	NC	1
442			min	-.014	2	-.34	3	0	1	-2.952e-3	4	NC	1	2217.665	4
443		13	max	.009	3	-.01	10	.262	4	0	1	NC	1	NC	1
444			min	-.016	2	-.371	3	0	1	-2.902e-3	4	NC	1	2207.556	4
445		14	max	.009	3	-.01	10	.281	4	0	1	NC	1	NC	1
446			min	-.017	2	-.401	3	0	1	-2.851e-3	4	NC	1	2288.088	4
447		15	max	.01	3	-.01	10	.298	4	0	1	NC	1	NC	1
448			min	-.018	2	-.431	3	0	1	-2.8e-3	4	NC	1	2496.469	4
449		16	max	.011	3	-.01	10	.313	4	0	1	NC	1	NC	1
450			min	-.02	2	-.462	3	0	1	-2.749e-3	4	NC	1	2932.063	4
451		17	max	.011	3	-.011	10	.327	4	0	1	NC	1	NC	1
452			min	-.021	2	-.492	3	0	1	-2.698e-3	4	NC	1	3905.259	4
453		18	max	.012	3	-.011	10	.34	4	0	1	NC	1	NC	1
454			min	-.022	2	-.522	3	0	1	-2.648e-3	4	NC	1	6984.569	4
455		19	max	.013	3	-.011	10	.35	4	0	1	NC	1	NC	1
456			min	-.023	2	-.553	3	0	1	-2.597e-3	4	NC	1	NC	1
457	M9	1	max	0	3	0	5	0	4	1.094e-3	3	NC	1	NC	1
458			min	0	2	0	3	0	3	-3.602e-3	4	NC	1	NC	1
459		2	max	0	3	0	5	.022	4	1.141e-3	3	NC	1	NC	3
460			min	0	2	-.018	3	-.006	3	-3.543e-3	4	NC	1	4910.648	2
461		3	max	0	3	0	5	.044	4	1.188e-3	3	NC	1	NC	4
462			min	0	2	-.036	3	-.013	3	-3.484e-3	4	NC	1	2439.125	2
463		4	max	.001	3	.001	5	.067	4	1.235e-3	3	NC	1	NC	5
464			min	-.001	2	-.054	3	-.019	3	-3.425e-3	4	NC	1	1628.577	2
465		5	max	.001	3	.002	5	.09	4	1.282e-3	3	NC	1	NC	15
466			min	-.002	2	-.071	3	-.025	3	-3.366e-3	4	NC	1	1233.366	2
467		6	max	.001	3	.002	5	.113	4	1.329e-3	3	NC	1	7902.284	15
468			min	-.002	2	-.089	3	-.031	3	-3.307e-3	4	NC	1	1004.77	2
469		7	max	.002	3	.003	5	.136	4	1.376e-3	3	NC	1	6196.994	15
470			min	-.003	2	-.107	3	-.036	3	-3.247e-3	4	NC	1	860.271	2
471		8	max	.002	3	.004	5	.159	4	1.423e-3	3	NC	1	5126.07	15
472			min	-.003	2	-.124	3	-.041	3	-3.188e-3	4	NC	1	764.933	2
473		9	max	.002	3	.004	5	.182	4	1.471e-3	3	NC	1	4426.764	15
474			min	-.004	2	-.142	3	-.044	3	-3.129e-3	4	NC	1	701.806	2
475		10	max	.002	3	.005	5	.204	4	1.518e-3	3	NC	1	3967.295	15
476			min	-.004	2	-.159	3	-.047	3	-3.07e-3	4	NC	1	662.166	2
477		11	max	.002	3	.006	5	.225	4	1.565e-3	3	NC	1	3678.729	15
478			min	-.004	2	-.177	3	-.049	3	-3.011e-3	4	NC	1	641.763	2
479		12	max	.002	3	.006	5	.245	4	1.612e-3	3	NC	1	3527.277	15
480			min	-.005	2	-.194	3	-.049	3	-2.975e-3	2	9943.681	5	639.415	2
481		13	max	.003	3	.007	5	.265	4	1.659e-3	3	NC	1	3503.962	15
482			min	-.005	2	-.211	3	-.048	3	-3.039e-3	2	8826.343	5	656.872	2
483		14	max	.003	3	.008	5	.282	4	1.706e-3	3	NC	1	3625.392	15
484			min	-.006	2	-.228	3	-.045	3	-3.104e-3	2	7897.265	5	700.026	2
485		15	max	.003	3	.009	5	.299	4	1.753e-3	3	NC	1	3949.561	15
486			min	-.006	2	-.245	3	-.041	3	-3.169e-3	2	7117.701	5	782.851	2
487		16	max	.003	3	.01	5	.313	4	1.8e-3	3	NC	1	4632.581	15
488			min	-.007	2	-.262	3	-.034	3	-3.233e-3	2	6458.765	5	939.883	2
489		17	max	.003	3	.011	5	.326	4	1.847e-3	3	NC	1	6290.721	9
490			min	-.007	2	-.279	3	-.026	3	-3.298e-3	2	5898.48	5	1276.719	2
491		18	max	.004	3	.012	5	.337	4	1.894e-3	3	NC	1	NC	9
492			min	-.007	2	-.296	3	-.015	3	-3.362e-3	2	5419.847	5	2324.122	2
493		19	max	.004	3	.013	5	.345	4	1.941e-3	3	NC	1	NC	1
494			min	-.008	2	-.313	3	-.008	1	-3.427e-3	2	5009.541	5	NC	1