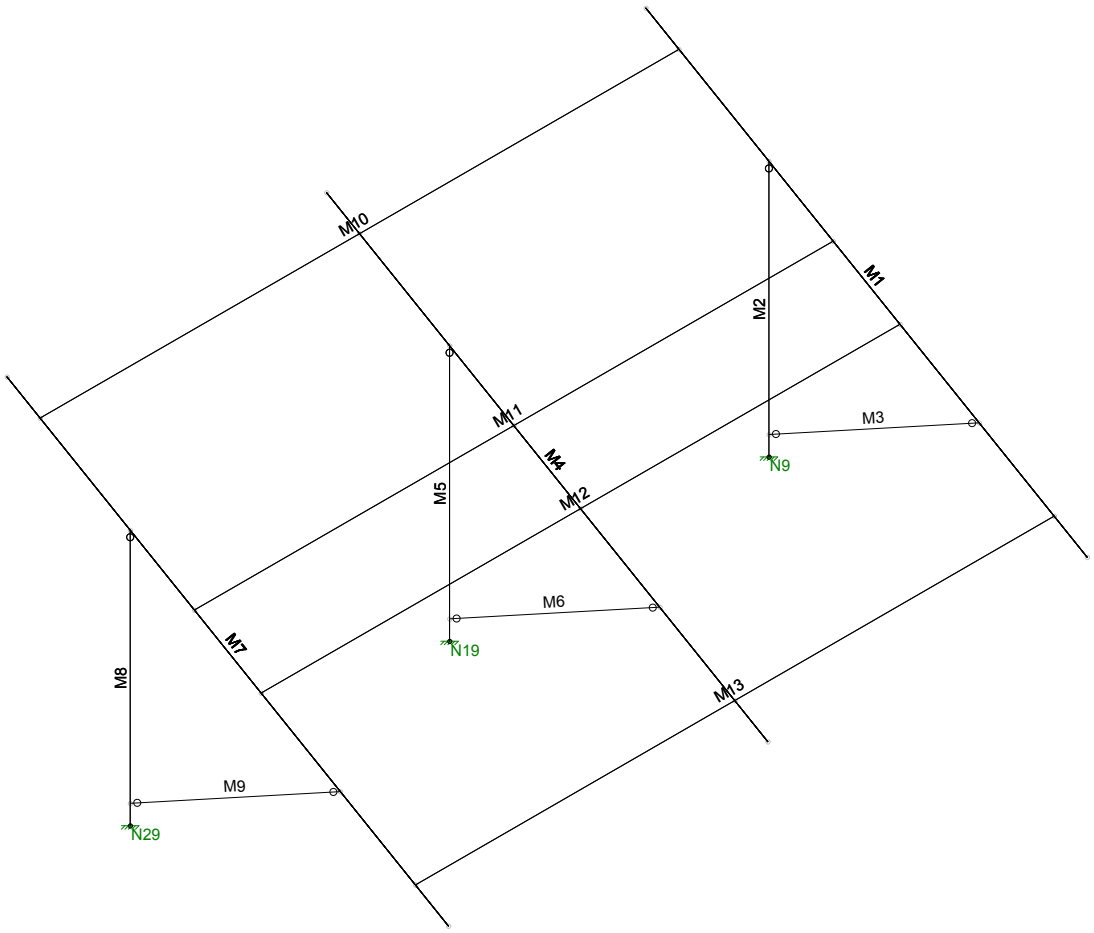


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

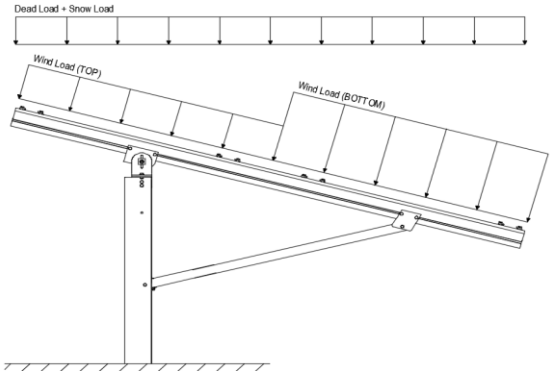
1.2 Construction

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

PV modules are required to meet the following specifications:

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

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



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

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

2.3 Wind Loads

Design Wind Speed, V =	115	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	20.76	psf	*Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

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

2.4 Seismic Loads

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

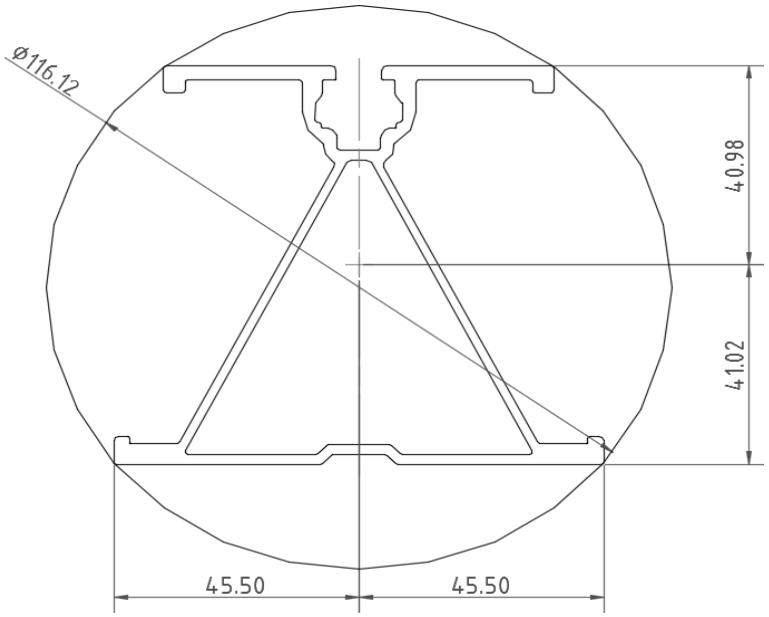
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	138	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.841	k-ft
M_z =	0.355	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	97%	

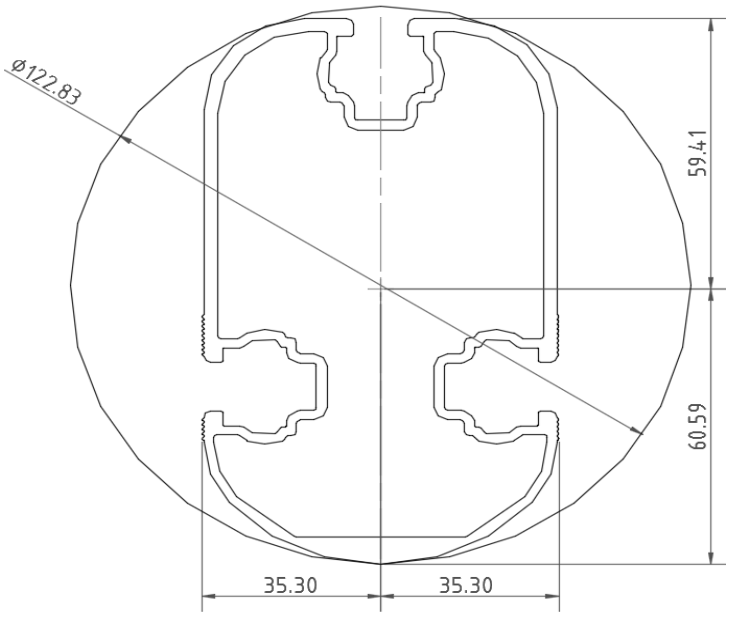


DETAIL VIEW

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 =	3.808	k-ft
M_z =	0.000	k-ft
P_n =	0.022	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	76%	

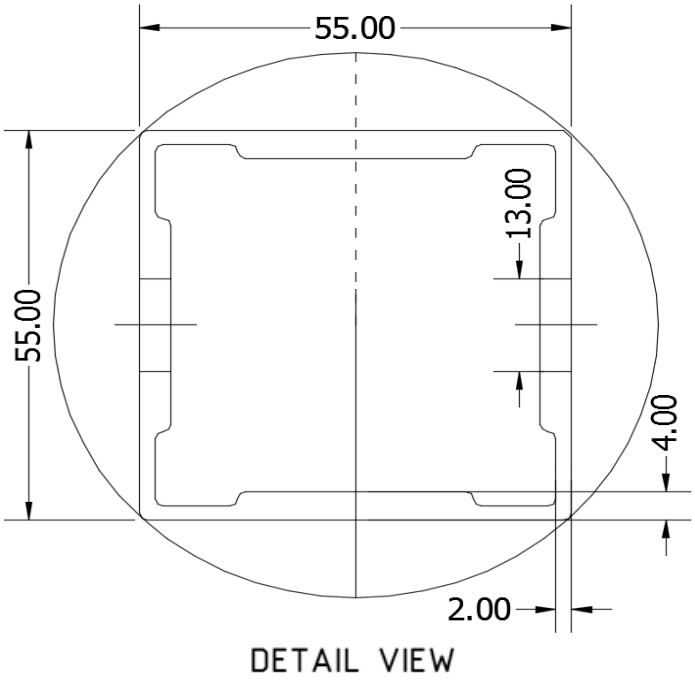


DETAIL VIEW

4.3 Strut Design

The aluminum strut connects a portion of the girder to the galvanized steel post. Girder forces are then transferred down through the strut into the post. The strut is attached with single M10 bolts at each end. See Appendix A.3 for detailed member calculations. Section units are in (mm).

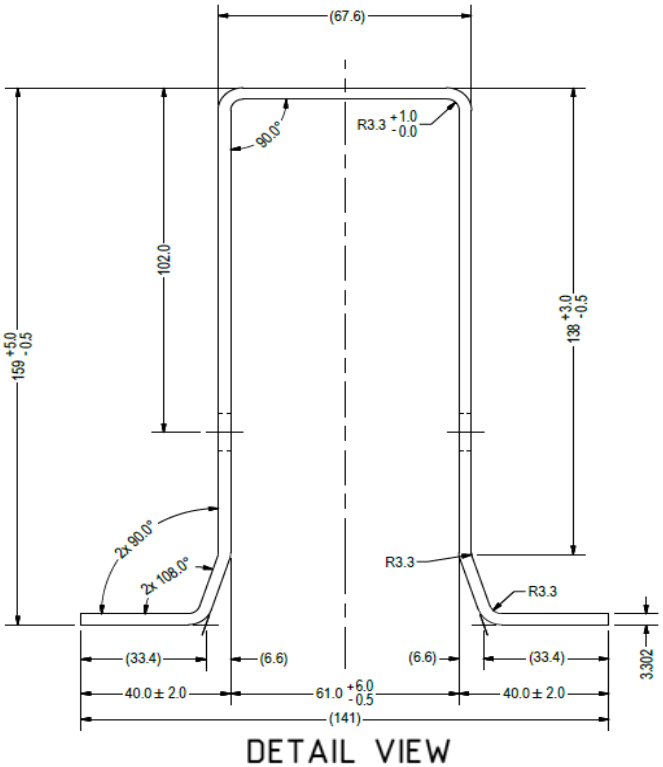
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.416	k-ft
P_n =	4.114	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	60%	



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 =	12.919	k-ft
M_z =	0.000	k-ft
P_r =	-4.339	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	77%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

The following LRFD loads include a safety factor of 1.3, and are to be used in conjunction with a Schletter, Inc. Geotechnical Investigation Report. The forces below should fall within the guidelines provided in the Geotechnical Investigation Report. If a Geotechnical Investigation Report is not present, please proceed to Section 5.2 for a concrete footing design.

Maximum Tensile Load =	5.62	k
Maximum Lateral Load =	3.38	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 =	0.83	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

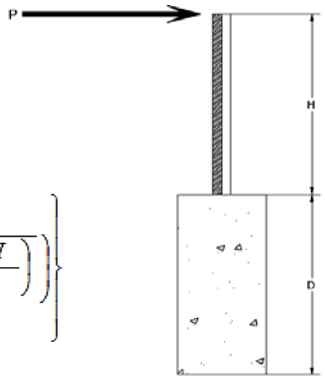
Lateral Bearing @ Bottom =	S_3
Lateral Bearing @ D/3 =	S_1
Required Depth =	D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P =	0.83	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 =	4.48	
Required Footing Depth, D =	8.34	ft

2nd Trial @ D_2 =	5.80	ft
Lateral Soil Bearing @ D/3, S_1 =	0.39	ksf
Lateral Soil Bearing @ D, S_3 =	1.16	ksf
Constant 2.34P/(S_1B), A =	2.51	
Required Footing Depth, D =	5.69	ft

3rd Trial @ D_3 =	5.74	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 =	2.53	
Required Footing Depth, D =	5.72	ft

4th Trial @ D_4 =	5.73	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 =	2.54	
Required Footing Depth, D =	5.73	ft

5th Trial @ D_5 =	5.73	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 =	2.54	
Required Footing Depth, D =	5.75	ft

A 2ft diameter x 5.75ft deep footing unrestrained at ground level is required for the racking structure.

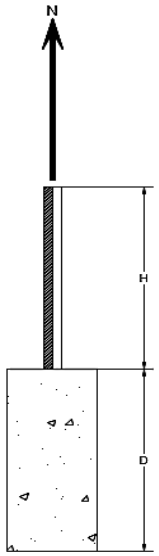
5.4 Uplifting Force Resistance

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 =	2.57	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 =	1.67	k
Required Concrete Volume, V =	11.52	ft^3
Required Footing Depth, D =	3.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	5.53
2	0.4	0.2	118.10	5.43
3	0.6	0.2	118.10	5.33
4	0.8	0.2	118.10	5.22
5	1	0.2	118.10	5.12
6	1.2	0.2	118.10	5.02
7	1.4	0.2	118.10	4.91
8	1.6	0.2	118.10	4.81
9	1.8	0.2	118.10	4.70
10	2	0.2	118.10	4.60
11	2.2	0.2	118.10	4.50
12	2.4	0.2	118.10	4.39
13	2.6	0.2	118.10	4.29
14	2.8	0.2	118.10	4.19
15	3	0.2	118.10	4.08
16	3.2	0.2	118.10	3.98
17	3.4	0.2	118.10	3.87
18	3.6	0.2	118.10	3.77
19	3.8	0.2	118.10	3.67
20	0	0.0	0.00	3.67
21	0	0.0	0.00	3.67
22	0	0.0	0.00	3.67
23	0	0.0	0.00	3.67
24	0	0.0	0.00	3.67
25	0	0.0	0.00	3.67
26	0	0.0	0.00	3.67
27	0	0.0	0.00	3.67
28	0	0.0	0.00	3.67
29	0	0.0	0.00	3.67
30	0	0.0	0.00	3.67
31	0	0.0	0.00	3.67
32	0	0.0	0.00	3.67
33	0	0.0	0.00	3.67
34	0	0.0	0.00	3.67
Max	3.8	Sum	0.90	

A 2ft diameter x 3.75ft 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 =	5.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.01	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	17.28	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

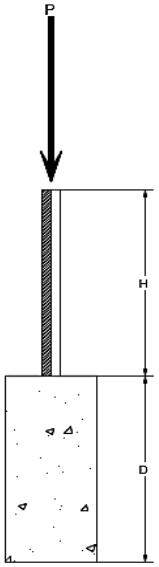
Weight of Concrete

Footing Volume	18.06	ft^3
Weight	2.62	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.59	k
1/3 Increase for Wind =	1.33	
Total Resistance =	9.74	k
Applied Force =	6.63	k
Utilization =	68%	

A 2ft diameter footing passes at a depth of 5.75ft.



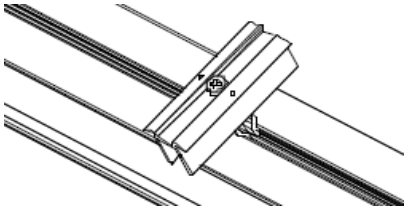
6. DESIGN OF JOINTS AND CONNECTIONS

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.

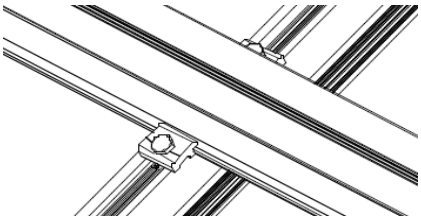
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.444 k
Allowable Uplift	=	1.214 k
Utilization	=	37%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	1.805 k
Allowable Uplift	=	2.180 k
Utilization	=	83%

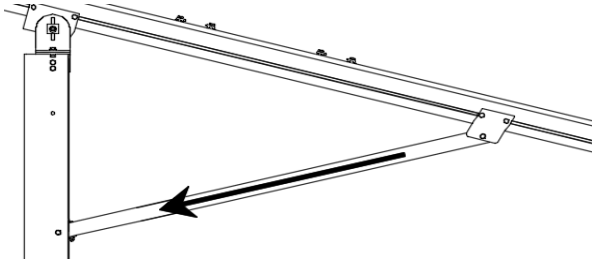


6.2 Strut Connections

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	=	4.114 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	46%

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

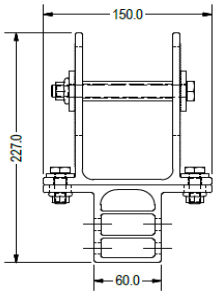


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

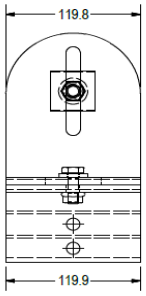
6.3 Girder to Post Connection

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

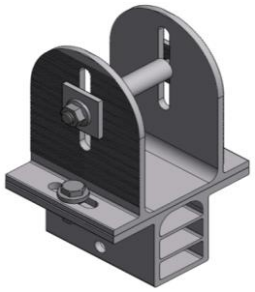
Maximum Tensile Load	=	3.851 k
Allowable Load	=	5.649 k
Utilization	=	68%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

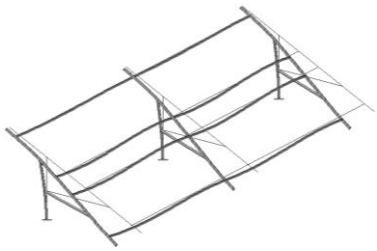
7.1 Seismic Drift

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}	=	0.79 in

0.79 ≤ 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 =	138 in	L_b =	138
J =	0.432	J =	0.432
	381.773		242.785
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L=	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L=	27.0 ksi	φF_L=	28.3
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L=	φb[Bp-1.6Dp*b/t]	φF_L=	φb[Bp-1.6Dp*b/t]
φF_L=	25.1 ksi	φF_L=	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L=	1.17φyFcy		
φF_L=	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L=	φb[Bbr-mDbr*h/t]	φF_L=	1.3φyFcy
φF_L=	43.2 ksi	φF_L=	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	M_{max}Wk =	1.152 k-ft

Compression

3.4.9

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

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

3.4.10

Rb/t = 0.0

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

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

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

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

Girder = **T5**

Strong Axis:

3.4.14

L_b = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

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

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

3.4.16

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
φF_L = φyFcy
φF_L = 33.3 ksi

Weak Axis:

3.4.14

L_b = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

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

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

3.4.16

b/t = 16.3333

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

S1 = 12.2

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

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

3.4.16.1 Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= φb[Bt-Dt*√(Rb/t)]

φF_L= 30.8 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 16.3333

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

S1 = 37.9

m = 0.63

C_0 = 61.046

Cc = 58.954

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

S2 = 79.4

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

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 =	-4.34 k	(LRFD Factored Load)
Mr (Strong) =	12.92 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 =	0.1009 <	0.2	
Utilization =	0.77 <	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65 k-ft

Flange Local Buckling:

Mn =	14.39 k-ft

Pr/Pc =	0.101 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 77%

APPENDIX B

B.1

The following pages will contain the results from RISA. Please refer back to Section 2 for load information and Section 4-5 for member and foundation design.

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead Load, Max	DL		-1				4		
2	Dead Load, Min	DL		-1				4		
3	Snow Load	SL						4		
4	Wind Load - Pressure	WL						4		
5	Wind Load - Suction	WL						4		
6	Seismic - Lateral	EL			.8			8		

Member Distributed Loads (BLC 1 : Dead Load, Max)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-8.366	-8.366	0	0
2	M11	Y	-8.366	-8.366	0	0
3	M12	Y	-8.366	-8.366	0	0
4	M13	Y	-8.366	-8.366	0	0

Member Distributed Loads (BLC 2 : Dead Load, Min)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-4.45	-4.45	0	0
2	M11	Y	-4.45	-4.45	0	0
3	M12	Y	-4.45	-4.45	0	0
4	M13	Y	-4.45	-4.45	0	0

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-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	-66.592	-66.592	0	0
2	M11	y	-66.592	-66.592	0	0
3	M12	y	-107.127	-107.127	0	0
4	M13	y	-107.127	-107.127	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	133.185	133.185	0	0
2	M11	y	133.185	133.185	0	0
3	M12	y	63.697	63.697	0	0
4	M13	y	63.697	63.697	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	728.336	2	2288.735	1	290.449	2	.409	1	.022	5	4.298	1
2		min	-963.227	3	-1418.073	3	-371.682	5	-1.629	5	-.019	2	.522	15
3	N19	max	2538.864	2	6106.327	1	0	10	0	2	.024	4	8.076	1
4		min	-2601.833	3	-4311.544	3	-408.91	5	-1.718	4	0	1	.361	15
5	N29	max	728.336	2	2288.735	1	298.42	3	.437	3	.026	4	4.298	1
6		min	-963.227	3	-1418.073	3	-441.079	4	-1.75	4	-.009	3	-.141	5
7	Totals:	max	3995.537	2	10683.798	1	0	3						
8		min	-4528.286	3	-7147.69	3	-1178.432	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	.007	1	.003	4	0	1	0	1	0	1
2			min	0	1	0	3	-.002	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	-1.921	6	-1.499	5	0	1	0	5	0	15
5		3	max	-15.029	12	261.852	3	-10.804	12	.072	3	.328	1	.271	2
6			min	-220.786	1	-629.254	2	-190.126	1	-.268	2	.036	12	-.11	3
7		4	max	-15.462	12	260.728	3	-10.804	12	.072	3	.21	1	.662	2
8			min	-221.651	1	-630.753	2	-190.126	1	-.268	2	.024	10	-.272	3
9		5	max	-15.895	12	259.604	3	-10.804	12	.072	3	.092	1	1.054	2
10			min	-222.517	1	-632.252	2	-190.126	1	-.268	2	0	10	-.434	3
11		6	max	229.782	3	559.429	2	20.418	3	.102	2	.126	1	1.009	2
12			min	-869.862	1	-163.794	3	-264.177	1	-.098	3	-.046	3	-.44	3
13		7	max	229.133	3	557.93	2	20.418	3	.102	2	.013	10	.663	2
14			min	-870.727	1	-164.918	3	-264.177	1	-.098	3	-.084	4	-.337	3
15		8	max	228.484	3	556.432	2	20.418	3	.102	2	-.014	12	.317	2
16			min	-871.592	1	-166.042	3	-264.177	1	-.098	3	-.202	1	-.235	3
17		9	max	205.324	3	82.049	3	4.052	3	.02	5	.107	1	.127	1
18			min	-1100.149	1	-67.627	2	-269.418	1	-.212	2	-.003	10	-.185	3
19		10	max	204.675	3	80.925	3	4.052	3	.02	5	.059	3	.167	1
20			min	-1101.015	1	-69.126	2	-269.418	1	-.212	2	-.062	2	-.236	3
21		11	max	204.026	3	79.801	3	4.052	3	.02	5	.062	3	.208	1
22			min	-1101.88	1	-70.624	2	-269.418	1	-.212	2	-.228	1	-.286	3
23		12	max	177.801	3	704.33	3	169.514	2	.427	3	.196	1	.435	1
24			min	-1327.049	1	-525.363	1	-340.164	3	-.408	2	-.056	5	-.58	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	177.152	3	703.206	3	169.514	2	.427	3	.245	1	.761	1
26			min	-1327.915	1	-526.862	1	-340.164	3	-.408	2	-.194	3	-1.016	3
27		14	max	223.262	1	473.136	1	80.56	5	.294	1	.116	3	1.075	1
28			min	12.32	15	-623.236	3	-133.485	1	-.471	3	-.23	4	-1.434	3
29		15	max	222.397	1	471.638	1	79.061	5	.294	1	.067	3	.782	1
30			min	12.059	15	-624.36	3	-133.485	1	-.471	3	-.201	4	-1.047	3
31		16	max	221.532	1	470.139	1	77.561	5	.294	1	.019	3	.49	1
32			min	11.798	15	-625.484	3	-133.485	1	-.471	3	-.272	1	-.659	3
33		17	max	220.667	1	468.64	1	76.061	5	.294	1	-.02	12	.198	1
34			min	11.537	15	-626.608	3	-133.485	1	-.471	3	-.355	1	-.271	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	.002	1	0	1	0	1	0	1
38			min	0	1	-.005	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.016	1	.003	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	6
42			min	-1.11	4	-1.919	6	-1.499	5	0	1	0	5	0	15
43		3	max	-13.62	12	827.703	3	0	1	.048	4	.238	4	.713	2
44			min	-432.809	1	-1841.033	2	-117.847	5	0	1	0	1	-.325	3
45		4	max	-14.053	12	826.579	3	0	1	.048	4	.164	4	1.856	2
46			min	-433.674	1	-1842.532	2	-119.347	5	0	1	0	1	-.839	3
47		5	max	-14.486	12	825.455	3	0	1	.048	4	.09	4	3	2
48			min	-434.54	1	-1844.03	2	-120.846	5	0	1	0	1	-1.351	3
49		6	max	865.209	3	1671.694	2	0	1	0	1	0	1	2.855	2
50			min	-2337.529	2	-623.758	3	-102.733	4	-.042	4	-.033	5	-1.332	3
51		7	max	864.56	3	1670.195	2	0	1	0	1	0	1	1.818	2
52			min	-2338.394	2	-624.882	3	-104.233	4	-.042	4	-.096	4	-.944	3
53		8	max	863.912	3	1668.697	2	0	1	0	1	0	1	.782	2
54			min	-2339.26	2	-626.006	3	-105.733	4	-.042	4	-.161	4	-.556	3
55		9	max	846.66	3	229.585	3	0	1	.018	4	.094	5	.182	1
56			min	-2741.844	1	-210.826	1	-224.32	4	0	1	0	1	-.363	3
57		10	max	846.011	3	228.461	3	0	1	.018	4	0	1	.314	1
58			min	-2742.709	1	-212.325	1	-225.819	4	0	1	-.046	4	-.505	3
59		11	max	845.362	3	227.338	3	0	1	.018	4	0	1	.446	1
60			min	-2743.574	1	-213.823	1	-227.319	4	0	1	-.186	4	-.647	3
61		12	max	834.241	3	1926.283	3	0	1	.175	4	0	1	1.114	1
62			min	-3165.021	1	-1584.172	1	-257.36	5	0	1	-.036	4	-1.468	3
63		13	max	833.592	3	1925.159	3	0	1	.175	4	0	1	2.098	1
64			min	-3165.886	1	-1585.67	1	-258.86	5	0	1	-.197	4	-2.663	3
65		14	max	435.643	1	1351.742	1	76.276	5	0	1	0	1	3.042	1
66			min	15.289	12	-1694.243	3	0	1	-.125	4	-.182	5	-3.808	3
67		15	max	434.778	1	1350.243	1	74.776	5	0	1	0	1	2.204	1
68			min	14.856	12	-1695.367	3	0	1	-.125	4	-.135	5	-2.756	3
69		16	max	433.913	1	1348.745	1	73.276	5	0	1	0	1	1.366	1
70			min	14.424	12	-1696.491	3	0	1	-.125	4	-.089	5	-1.704	3
71		17	max	433.048	1	1347.246	1	71.777	5	0	1	0	1	.53	1
72			min	13.991	12	-1697.615	3	0	1	-.125	4	-.044	4	-.651	3
73		18	max	1.11	6	1.925	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	-.013	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.007	1	.004	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	.002	1	0	1	0	1	0	4
80			min	-1.11	4	-1.922	4	-1.498	5	0	1	0	5	0	15
81		3	max	9.148	5	261.852	3	190.126	1	.268	2	.104	5	.271	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	-220.786	1	-629.254	2	-50.475	5	-.072	3	-.328	1	-.11	3
83		4	max	8.745	5	260.728	3	190.126	1	.268	2	.073	5	.662	2
84			min	-221.651	1	-630.753	2	-51.974	5	-.072	3	-.21	1	-.272	3
85		5	max	8.341	5	259.604	3	190.126	1	.268	2	.04	5	1.054	2
86			min	-222.517	1	-632.252	2	-53.474	5	-.072	3	-.092	1	-.434	3
87		6	max	229.782	3	559.429	2	264.177	1	.098	3	.046	3	1.009	2
88			min	-869.862	1	-163.794	3	-32.934	5	-.102	2	-.126	1	-.44	3
89		7	max	229.133	3	557.93	2	264.177	1	.098	3	.038	1	.663	2
90			min	-870.727	1	-164.918	3	-34.434	5	-.102	2	-.062	5	-.337	3
91		8	max	228.484	3	556.432	2	264.177	1	.098	3	.202	1	.317	2
92			min	-871.592	1	-166.042	3	-35.933	5	-.102	2	-.084	5	-.235	3
93		9	max	205.324	3	82.049	3	269.418	1	.212	2	.022	5	.127	1
94			min	-1100.149	1	-67.627	2	-93.894	5	.02	15	-.107	1	-.185	3
95		10	max	204.675	3	80.925	3	269.418	1	.212	2	.062	2	.167	1
96			min	-1101.015	1	-69.126	2	-95.394	5	.02	15	-.059	3	-.236	3
97		11	max	204.026	3	79.801	3	269.418	1	.212	2	.228	1	.208	1
98			min	-1101.88	1	-70.624	2	-96.893	5	.02	15	-.096	5	-.286	3
99		12	max	177.801	3	704.33	3	340.164	3	.408	2	-.011	12	.435	1
100			min	-1327.049	1	-525.363	1	-220.253	5	-.427	3	-.196	1	-.58	3
101		13	max	177.152	3	703.206	3	340.164	3	.408	2	.194	3	.761	1
102			min	-1327.915	1	-526.862	1	-221.752	5	-.427	3	-.264	4	-1.016	3
103		14	max	223.262	1	473.136	1	135.372	4	.471	3	.106	1	1.075	1
104			min	10.807	15	-623.236	3	6.139	10	-.294	1	-.202	5	-1.434	3
105		15	max	222.397	1	471.638	1	133.872	4	.471	3	.189	1	.782	1
106			min	10.546	15	-624.36	3	6.139	10	-.294	1	-.139	5	-1.047	3
107		16	max	221.532	1	470.139	1	133.485	1	.471	3	.272	1	.49	1
108			min	10.285	15	-625.484	3	6.139	10	-.294	1	-.077	5	-.659	3
109		17	max	220.667	1	468.64	1	133.485	1	.471	3	.355	1	.198	1
110			min	10.024	15	-626.608	3	6.139	10	-.294	1	-.017	5	-.271	3
111		18	max	1.11	6	1.924	4	1.5	5	0	1	0	1	0	4
112			min	.261	15	.452	15	-.002	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	-.005	3	-.002	1	0	1	0	1	0	1
115	M10	1	max	133.493	1	465.281	1	-9.506	15	.009	2	.409	1	.294	1
116			min	6.135	10	-628.898	3	-219.158	1	-.018	3	.015	15	-.471	3
117		2	max	133.493	1	339.098	1	-7.224	15	.009	2	.16	1	.227	3
118			min	6.135	10	-464.647	3	-170.87	1	-.018	3	.004	15	-.22	1
119		3	max	133.493	1	212.915	1	-4.941	15	.009	2	.015	3	.716	3
120			min	6.135	10	-300.396	3	-122.581	1	-.018	3	-.028	1	-.572	1
121		4	max	133.493	1	86.732	1	-2.658	15	.009	2	-.001	3	.995	3
122			min	6.135	10	-136.145	3	-74.293	1	-.018	3	-.153	1	-.764	1
123		5	max	133.493	1	28.105	3	-.375	15	.009	2	-.009	12	1.064	3
124			min	6.135	10	-39.45	1	-26.005	1	-.018	3	-.218	1	-.794	1
125		6	max	133.493	1	192.356	3	22.284	1	.009	2	-.009	15	.923	3
126			min	6.135	10	-165.633	1	-4.447	3	-.018	3	-.22	1	-.663	1
127		7	max	133.493	1	356.607	3	70.572	1	.009	2	-.005	15	.572	3
128			min	6.135	10	-291.816	1	-1.023	3	-.018	3	-.161	1	-.371	1
129		8	max	133.493	1	520.858	3	118.86	1	.009	2	.002	5	.083	1
130			min	1.292	15	-417.999	1	1.964	12	-.018	3	-.04	1	-.022	5
131		9	max	133.493	1	685.109	3	167.149	1	.009	2	.143	1	.697	1
132			min	-10.722	5	-544.181	1	4.247	12	-.018	3	-.019	3	-.759	3
133		10	max	133.493	1	670.364	1	-6.529	12	.009	2	.388	1	1.473	1
134			min	6.135	10	-849.36	3	-215.437	1	-.018	3	-.009	3	-1.739	3
135		11	max	133.493	1	544.181	1	-4.247	12	.018	3	.143	1	.697	1
136			min	6.135	10	-685.109	3	-167.149	1	-.009	2	-.019	3	-.759	3
137		12	max	133.493	1	417.999	1	-1.964	12	.018	3	-.004	15	.083	1
138			min	6.135	10	-520.858	3	-118.86	1	-.009	2	-.04	1	.008	12

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	133.493	1	291.816	1	1.023	3	.018	3	-.009	15	.572	3
140			min	3.503	15	-356.607	3	-70.572	1	-.009	2	-.161	1	-.371	1
141		14	max	133.493	1	165.633	1	4.447	3	.018	3	-.011	15	.923	3
142			min	-7.495	5	-192.356	3	-22.284	1	-.009	2	-.22	1	-.663	1
143		15	max	133.493	1	39.45	1	26.005	1	.018	3	-.009	12	1.064	3
144			min	-20.612	5	-28.105	3	1.885	15	-.009	2	-.218	1	-.794	1
145		16	max	133.493	1	136.145	3	74.293	1	.018	3	-.001	3	.995	3
146			min	-33.728	5	-86.732	1	4.168	15	-.009	2	-.153	1	-.764	1
147		17	max	133.493	1	300.396	3	122.581	1	.018	3	.015	3	.716	3
148			min	-46.845	5	-212.915	1	6.45	15	-.009	2	-.028	1	-.572	1
149		18	max	133.493	1	464.647	3	170.87	1	.018	3	.16	1	.227	3
150			min	-59.962	5	-339.098	1	8.733	15	-.009	2	.01	15	-.22	1
151		19	max	133.493	1	628.898	3	219.158	1	.018	3	.409	1	.294	1
152			min	-73.078	5	-465.281	1	11.016	15	-.009	2	.023	15	-.471	3
153	M11	1	max	348.479	1	455.506	1	10.222	5	0	15	.453	1	.244	1
154			min	-344.178	3	-626.022	3	-224.887	1	-.004	1	-.122	5	-.552	3
155		2	max	348.479	1	329.323	1	13.753	5	0	15	.196	1	.143	3
156			min	-344.178	3	-461.771	3	-176.599	1	-.004	1	-.107	5	-.276	2
157		3	max	348.479	1	203.141	1	17.284	5	0	15	.034	3	.628	3
158			min	-344.178	3	-297.52	3	-128.311	1	-.004	1	-.088	4	-.598	1
159		4	max	348.479	1	76.958	1	20.816	5	0	15	.013	3	.903	3
160			min	-344.178	3	-133.269	3	-80.022	1	-.004	1	-.132	1	-.777	1
161		5	max	348.479	1	30.982	3	24.347	5	0	15	-.003	12	.968	3
162			min	-344.178	3	-51.276	2	-31.734	1	-.004	1	-.203	1	-.795	1
163		6	max	348.479	1	195.233	3	32.209	4	0	15	0	15	.824	3
164			min	-344.178	3	-175.408	1	-8.064	3	-.004	1	-.213	1	-.651	1
165		7	max	348.479	1	359.484	3	64.843	1	0	15	.038	5	.47	3
166			min	-344.178	3	-301.59	1	-4.64	3	-.004	1	-.161	1	-.346	1
167		8	max	348.479	1	523.734	3	113.131	1	0	15	.08	5	.12	1
168			min	-344.178	3	-427.773	1	-1.217	3	-.004	1	-.047	1	-.095	3
169		9	max	348.479	1	687.985	3	161.42	1	0	15	.159	4	.747	1
170			min	-344.178	3	-553.956	1	2.041	12	-.004	1	-.028	3	-.869	3
171		10	max	348.479	1	680.139	1	11.087	5	.004	1	.366	1	1.535	1
172			min	-344.178	3	-852.236	3	-209.708	1	-.003	3	-.023	3	-1.853	3
173		11	max	348.479	1	553.956	1	14.618	5	.004	1	.128	1	.747	1
174			min	-344.178	3	-687.985	3	-161.42	1	0	5	-.107	5	-.869	3
175		12	max	348.479	1	427.773	1	18.149	5	.004	1	-.012	10	.12	1
176			min	-344.178	3	-523.734	3	-113.131	1	0	5	-.096	4	-.095	3
177		13	max	348.479	1	301.59	1	21.68	5	.004	1	-.016	12	.47	3
178			min	-344.178	3	-359.484	3	-64.843	1	0	5	-.161	1	-.346	1
179		14	max	348.479	1	175.408	1	25.212	5	.004	1	-.011	12	.824	3
180			min	-344.178	3	-195.233	3	-16.554	1	0	5	-.213	1	-.651	1
181		15	max	348.479	1	51.276	2	35.871	4	.004	1	.004	5	.968	3
182			min	-344.178	3	-30.982	3	5.553	10	0	5	-.203	1	-.795	1
183		16	max	348.479	1	133.269	3	80.022	1	.004	1	.043	5	.903	3
184			min	-344.178	3	-76.958	1	9.371	12	0	5	-.132	1	-.777	1
185		17	max	348.479	1	297.52	3	128.311	1	.004	1	.086	5	.628	3
186			min	-344.178	3	-203.141	1	11.654	12	0	5	-.001	9	-.598	1
187		18	max	348.479	1	461.771	3	176.599	1	.004	1	.196	1	.143	3
188			min	-344.178	3	-329.323	1	13.936	12	0	5	.03	10	-.276	2
189		19	max	348.479	1	626.022	3	224.887	1	.004	1	.453	1	.244	1
190			min	-344.178	3	-455.506	1	16.219	12	0	5	.056	12	-.552	3
191	M12	1	max	56.382	5	621.431	2	13.868	5	0	15	.474	1	.314	2
192			min	-24.165	9	-249.47	3	-227.684	1	-.005	1	-.142	5	.017	12
193		2	max	49.142	2	449.399	2	17.399	5	0	15	.214	1	.298	3
194			min	-24.165	9	-174.009	3	-179.396	1	-.005	1	-.122	5	-.37	2
195		3	max	49.142	2	277.366	2	20.93	5	0	15	.02	3	.472	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	-24.165	9	-98.548	3	-131.108	1	-.005	1	-.098	5	-.834	2
197		4	max	49.142	2	105.334	2	24.462	5	0	15	.002	3	.55	3
198			min	-24.165	9	-23.087	3	-82.819	1	-.005	1	-.121	1	-1.079	2
199		5	max	49.142	2	52.373	3	27.993	5	0	15	-.008	12	.531	3
200			min	-24.165	9	-66.698	2	-34.531	1	-.005	1	-.196	1	-1.104	2
201		6	max	49.142	2	127.834	3	35.495	4	0	15	.003	5	.416	3
202			min	-24.165	9	-238.73	2	-5.374	3	-.005	1	-.209	1	-.908	2
203		7	max	49.142	2	203.295	3	62.046	1	0	15	.045	5	.204	3
204			min	-30.815	4	-410.762	2	-1.951	3	-.005	1	-.161	1	-.493	2
205		8	max	49.142	2	278.755	3	110.334	1	0	15	.092	5	.141	2
206			min	-43.931	4	-582.794	2	1.364	12	-.005	1	-.051	1	-.104	3
207		9	max	49.142	2	354.216	3	158.623	1	0	15	.175	4	.996	2
208			min	-57.048	4	-754.826	2	3.647	12	-.005	1	-.021	3	-.508	3
209		10	max	49.142	2	926.859	2	130.529	14	.005	1	.355	1	2.07	2
210			min	-70.164	4	-429.677	3	-206.911	1	-.002	14	-.013	3	-1.009	3
211		11	max	49.142	2	754.826	2	18.523	5	.005	1	.121	1	.996	2
212			min	-24.165	9	-354.216	3	-158.623	1	0	5	-.125	5	-.508	3
213		12	max	49.142	2	582.794	2	22.054	5	.005	1	-.014	10	.141	2
214			min	-24.165	9	-278.755	3	-110.334	1	0	5	-.109	4	-.104	3
215		13	max	49.142	2	410.762	2	25.585	5	.005	1	-.016	12	.204	3
216			min	-24.165	9	-203.295	3	-62.046	1	0	5	-.161	1	-.493	2
217		14	max	49.142	2	238.73	2	29.117	5	.005	1	-.013	12	.416	3
218			min	-24.165	9	-127.834	3	-13.757	1	0	5	-.209	1	-.908	2
219		15	max	49.142	2	66.698	2	40.23	4	.005	1	.006	5	.531	3
220			min	-24.165	9	-52.373	3	5.483	12	0	5	-.196	1	-1.104	2
221		16	max	49.142	2	23.087	3	82.819	1	.005	1	.05	5	.55	3
222			min	-31.579	4	-105.334	2	7.765	12	0	5	-.121	1	-1.079	2
223		17	max	49.142	2	98.548	3	131.108	1	.005	1	.101	4	.472	3
224			min	-44.696	4	-277.366	2	10.048	12	0	5	.004	9	-.834	2
225		18	max	49.142	2	174.009	3	179.396	1	.005	1	.214	1	.298	3
226			min	-57.813	4	-449.399	2	12.33	12	0	5	.027	12	-.37	2
227		19	max	49.142	2	249.47	3	227.684	1	.005	1	.474	1	.314	2
228			min	-70.929	4	-621.431	2	14.613	12	0	5	.044	12	-.049	5
229	M13	1	max	47.429	5	626.832	2	9.959	5	.005	3	.405	1	.268	2
230			min	-189.936	1	-264.124	3	-218.733	1	-.016	2	-.125	5	-.072	3
231		2	max	34.312	5	454.8	2	13.49	5	.005	3	.157	1	.217	3
232			min	-189.936	1	-188.663	3	-170.445	1	-.016	2	-.11	5	-.423	2
233		3	max	21.195	5	282.768	2	17.022	5	.005	3	.017	3	.41	3
234			min	-189.936	1	-113.202	3	-122.156	1	-.016	2	-.1	4	-.895	2
235		4	max	8.079	5	110.736	2	20.553	5	.005	3	0	3	.507	3
236			min	-189.936	1	-37.742	3	-73.868	1	-.016	2	-.156	1	-1.146	2
237		5	max	-3.014	15	37.719	3	24.084	5	.005	3	-.009	12	.507	3
238			min	-189.936	1	-61.297	2	-25.58	1	-.016	2	-.219	1	-1.178	2
239		6	max	-10.804	12	113.18	3	33.429	4	.005	3	-.003	15	.41	3
240			min	-189.936	1	-233.329	2	-4.688	3	-.016	2	-.221	1	-.989	2
241		7	max	-10.804	12	188.64	3	70.997	1	.005	3	.032	5	.217	3
242			min	-189.936	1	-405.361	2	-1.265	3	-.016	2	-.161	1	-.581	2
243		8	max	-10.804	12	264.101	3	119.285	1	.005	3	.074	5	.047	2
244			min	-189.936	1	-577.393	2	1.82	12	-.016	2	-.04	1	-.072	3
245		9	max	-10.804	12	339.562	3	167.574	1	.005	3	.157	4	.894	2
246			min	-189.936	1	-749.425	2	4.103	12	-.016	2	-.019	3	-.457	3
247		10	max	-10.804	12	921.457	2	132.699	14	.016	1	.389	1	1.962	2
248			min	-189.936	1	-415.023	3	-215.862	1	-.016	2	-.01	3	-.94	3
249		11	max	31.277	5	749.425	2	13.413	5	.016	2	.144	1	.894	2
250			min	-189.936	1	-339.562	3	-167.574	1	-.005	3	-.098	5	-.457	3
251		12	max	18.16	5	577.393	2	16.944	5	.016	2	-.012	10	.047	2
252			min	-189.936	1	-264.101	3	-119.285	1	-.005	3	-.087	4	-.072	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	5.044	5	405.361	2	20.476	5	.016	2	-.016	12	.217	3
254			min	-189.936	1	-188.64	3	-70.997	1	-.005	3	-.161	1	-.581	2
255		14	max	-5.045	15	233.329	2	24.007	5	.016	2	-.014	12	.41	3
256			min	-189.936	1	-113.18	3	-22.709	1	-.005	3	-.221	1	-.989	2
257		15	max	-10.804	12	61.297	2	33.119	4	.016	2	.006	5	.507	3
258			min	-189.936	1	-37.719	3	5.027	12	-.005	3	-.219	1	-1.178	2
259		16	max	-10.804	12	37.742	3	73.868	1	.016	2	.044	5	.507	3
260			min	-189.936	1	-110.736	2	7.309	12	-.005	3	-.156	1	-1.146	2
261		17	max	-10.804	12	113.202	3	122.156	1	.016	2	.086	5	.41	3
262			min	-189.936	1	-282.768	2	9.592	12	-.005	3	-.03	1	-.895	2
263		18	max	-10.804	12	188.663	3	170.445	1	.016	2	.167	4	.217	3
264			min	-189.936	1	-454.8	2	11.874	12	-.005	3	.024	12	-.423	2
265		19	max	-10.804	12	264.124	3	218.733	1	.016	2	.405	1	.268	2
266			min	-189.936	1	-626.832	2	14.157	12	-.005	3	.04	12	-.072	3
267	M2	1	max	2288.735	1	962.759	3	290.65	2	.022	5	1.629	5	4.298	1
268			min	-1418.073	3	-727.906	2	-371.744	5	-.019	2	-.409	1	.522	15
269		2	max	2285.898	1	962.759	3	290.65	2	.022	5	1.514	5	4.373	1
270			min	-1420.201	3	-727.906	2	-369.285	5	-.019	2	-.319	1	.5	15
271		3	max	1691.539	1	848.965	1	212.74	1	.002	2	1.388	5	4.233	1
272			min	-1190.109	3	94.905	15	-344.652	5	-.001	3	-.261	1	.473	15
273		4	max	1688.702	1	848.965	1	212.74	1	.002	2	1.281	5	3.968	1
274			min	-1192.237	3	94.905	15	-342.193	5	-.001	3	-.194	1	.444	15
275		5	max	1685.864	1	848.965	1	212.74	1	.002	2	1.175	5	3.704	1
276			min	-1194.365	3	94.905	15	-339.734	5	-.001	3	-.128	1	.414	15
277		6	max	1683.027	1	848.965	1	212.74	1	.002	2	1.07	5	3.439	1
278			min	-1196.493	3	94.905	15	-337.275	5	-.001	3	-.062	1	.384	15
279		7	max	1680.189	1	848.965	1	212.74	1	.002	2	.973	4	3.175	1
280			min	-1198.621	3	94.905	15	-334.816	5	-.001	3	-.058	3	.355	15
281		8	max	1677.352	1	848.965	1	212.74	1	.002	2	.878	4	2.91	1
282			min	-1200.75	3	94.905	15	-332.357	5	-.001	3	-.139	3	.325	15
283		9	max	1674.514	1	848.965	1	212.74	1	.002	2	.784	4	2.645	1
284			min	-1202.878	3	94.905	15	-329.898	5	-.001	3	-.221	3	.296	15
285		10	max	1671.677	1	848.965	1	212.74	1	.002	2	.69	4	2.381	1
286			min	-1205.006	3	94.905	15	-327.438	5	-.001	3	-.303	3	.266	15
287		11	max	1668.84	1	848.965	1	212.74	1	.002	2	.598	4	2.116	1
288			min	-1207.134	3	94.905	15	-324.979	5	-.001	3	-.384	3	.237	15
289		12	max	1666.002	1	848.965	1	212.74	1	.002	2	.506	4	1.852	1
290			min	-1209.262	3	94.905	15	-322.52	5	-.001	3	-.466	3	.207	15
291		13	max	1663.165	1	848.965	1	212.74	1	.002	2	.415	2	1.587	1
292			min	-1211.39	3	94.905	15	-320.061	5	-.001	3	-.547	3	.177	15
293		14	max	1660.327	1	848.965	1	212.74	1	.002	2	.48	2	1.323	1
294			min	-1213.518	3	94.905	15	-317.602	5	-.001	3	-.629	3	.148	15
295		15	max	1657.49	1	848.965	1	212.74	1	.002	2	.545	2	1.058	1
296			min	-1215.646	3	94.905	15	-315.143	5	-.001	3	-.71	3	.118	15
297		16	max	1654.652	1	848.965	1	212.74	1	.002	2	.61	2	.794	1
298			min	-1217.774	3	94.905	15	-312.684	5	-.001	3	-.792	3	.089	15
299		17	max	1651.815	1	848.965	1	212.74	1	.002	2	.675	2	.529	1
300			min	-1219.902	3	94.905	15	-310.225	5	-.001	3	-.874	3	.059	15
301		18	max	1648.978	1	848.965	1	212.74	1	.002	2	.741	2	.265	1
302			min	-1222.03	3	94.905	15	-307.766	5	-.001	3	-.955	3	.03	15
303		19	max	1646.14	1	848.965	1	212.74	1	.002	2	.806	2	0	1
304			min	-1224.158	3	94.905	15	-305.306	5	-.001	3	-1.037	3	0	1
305	M5	1	max	6106.327	1	2598.723	3	0	1	.024	4	1.718	4	8.076	1
306			min	-4311.544	3	-2536.643	2	-409.049	5	0	1	0	1	.361	15
307		2	max	6103.49	1	2598.723	3	0	1	.024	4	1.591	4	8.547	1
308			min	-4313.672	3	-2536.643	2	-406.59	5	0	1	0	1	.365	15
309		3	max	4401.838	1	1681.813	1	0	1	0	1	1.457	4	8.385	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
310			min	-3512.075	3	70.813	15	-381.322	4	-.001	4	0	1	.353	15
311		4	max	4399.001	1	1681.813	1	0	1	0	1	1.338	4	7.861	1
312			min	-3514.203	3	70.813	15	-378.863	4	-.001	4	0	1	.331	15
313		5	max	4396.163	1	1681.813	1	0	1	0	1	1.221	4	7.337	1
314			min	-3516.331	3	70.813	15	-376.404	4	-.001	4	0	1	.309	15
315		6	max	4393.326	1	1681.813	1	0	1	0	1	1.104	4	6.813	1
316			min	-3518.459	3	70.813	15	-373.945	4	-.001	4	0	1	.287	15
317		7	max	4390.488	1	1681.813	1	0	1	0	1	.988	4	6.289	1
318			min	-3520.587	3	70.813	15	-371.486	4	-.001	4	0	1	.265	15
319		8	max	4387.651	1	1681.813	1	0	1	0	1	.872	4	5.765	1
320			min	-3522.715	3	70.813	15	-369.027	4	-.001	4	0	1	.243	15
321		9	max	4384.813	1	1681.813	1	0	1	0	1	.758	4	5.241	1
322			min	-3524.844	3	70.813	15	-366.567	4	-.001	4	0	1	.221	15
323		10	max	4381.976	1	1681.813	1	0	1	0	1	.644	4	4.717	1
324			min	-3526.972	3	70.813	15	-364.108	4	-.001	4	0	1	.199	15
325		11	max	4379.138	1	1681.813	1	0	1	0	1	.531	4	4.193	1
326			min	-3529.1	3	70.813	15	-361.649	4	-.001	4	0	1	.177	15
327		12	max	4376.301	1	1681.813	1	0	1	0	1	.418	4	3.668	1
328			min	-3531.228	3	70.813	15	-359.19	4	-.001	4	0	1	.154	15
329		13	max	4373.464	1	1681.813	1	0	1	0	1	.307	4	3.144	1
330			min	-3533.356	3	70.813	15	-356.731	4	-.001	4	0	1	.132	15
331		14	max	4370.626	1	1681.813	1	0	1	0	1	.196	4	2.62	1
332			min	-3535.484	3	70.813	15	-354.272	4	-.001	4	0	1	.11	15
333		15	max	4367.789	1	1681.813	1	0	1	0	1	.086	4	2.096	1
334			min	-3537.612	3	70.813	15	-351.813	4	-.001	4	0	1	.088	15
335		16	max	4364.951	1	1681.813	1	0	1	0	1	0	1	1.572	1
336			min	-3539.74	3	70.813	15	-349.354	4	-.001	4	-.023	5	.066	15
337		17	max	4362.114	1	1681.813	1	0	1	0	1	0	1	1.048	1
338			min	-3541.868	3	70.813	15	-346.895	4	-.001	4	-.132	4	.044	15
339		18	max	4359.276	1	1681.813	1	0	1	0	1	0	1	.524	1
340			min	-3543.996	3	70.813	15	-344.435	4	-.001	4	-.239	4	.022	15
341		19	max	4356.439	1	1681.813	1	0	1	0	1	0	1	0	1
342			min	-3546.124	3	70.813	15	-341.976	4	-.001	4	-.346	4	0	1
343	M8	1	max	2288.735	1	962.759	3	298.266	3	.026	4	1.75	4	4.298	1
344			min	-1418.073	3	-727.906	2	-441.324	4	-.009	3	-.437	3	-.141	5
345		2	max	2285.898	1	962.759	3	298.266	3	.026	4	1.613	4	4.373	1
346			min	-1420.201	3	-727.906	2	-438.865	4	-.009	3	-.344	3	-.115	5
347		3	max	1691.539	1	848.965	1	261.827	3	.001	3	1.471	4	4.233	1
348			min	-1190.109	3	-20.383	5	-400.126	4	-.002	2	-.269	3	-.102	5
349		4	max	1688.702	1	848.965	1	261.827	3	.001	3	1.347	4	3.968	1
350			min	-1192.237	3	-20.383	5	-397.667	4	-.002	2	-.187	3	-.095	5
351		5	max	1685.864	1	848.965	1	261.827	3	.001	3	1.224	4	3.704	1
352			min	-1194.365	3	-20.383	5	-395.208	4	-.002	2	-.105	3	-.089	5
353		6	max	1683.027	1	848.965	1	261.827	3	.001	3	1.101	4	3.439	1
354			min	-1196.493	3	-20.383	5	-392.749	4	-.002	2	-.024	3	-.083	5
355		7	max	1680.189	1	848.965	1	261.827	3	.001	3	.979	4	3.175	1
356			min	-1198.621	3	-20.383	5	-390.29	4	-.002	2	-.024	2	-.076	5
357		8	max	1677.352	1	848.965	1	261.827	3	.001	3	.858	4	2.91	1
358			min	-1200.75	3	-20.383	5	-387.831	4	-.002	2	-.089	2	-.07	5
359		9	max	1674.514	1	848.965	1	261.827	3	.001	3	.747	5	2.645	1
360			min	-1202.878	3	-20.383	5	-385.371	4	-.002	2	-.154	2	-.064	5
361		10	max	1671.677	1	848.965	1	261.827	3	.001	3	.638	5	2.381	1
362			min	-1205.006	3	-20.383	5	-382.912	4	-.002	2	-.219	2	-.057	5
363		11	max	1668.84	1	848.965	1	261.827	3	.001	3	.53	5	2.116	1
364			min	-1207.134	3	-20.383	5	-380.453	4	-.002	2	-.284	2	-.051	5
365		12	max	1666.002	1	848.965	1	261.827	3	.001	3	.466	3	1.852	1
366			min	-1209.262	3	-20.383	5	-377.994	4	-.002	2	-.35	2	-.044	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	1663.165	1	848.965	1	261.827	3	.001	3	.547	3	1.587	1
368			min	-1211.39	3	-20.383	5	-375.535	4	-.002	2	-.415	2	-.038	5
369		14	max	1660.327	1	848.965	1	261.827	3	.001	3	.629	3	1.323	1
370			min	-1213.518	3	-20.383	5	-373.076	4	-.002	2	-.48	2	-.032	5
371		15	max	1657.49	1	848.965	1	261.827	3	.001	3	.71	3	1.058	1
372			min	-1215.646	3	-20.383	5	-370.617	4	-.002	2	-.545	2	-.025	5
373		16	max	1654.652	1	848.965	1	261.827	3	.001	3	.792	3	.794	1
374			min	-1217.774	3	-20.383	5	-368.158	4	-.002	2	-.61	2	-.019	5
375		17	max	1651.815	1	848.965	1	261.827	3	.001	3	.874	3	.529	1
376			min	-1219.902	3	-20.383	5	-365.699	4	-.002	2	-.675	2	-.013	5
377		18	max	1648.978	1	848.965	1	261.827	3	.001	3	.955	3	.265	1
378			min	-1222.03	3	-20.383	5	-363.239	4	-.002	2	-.741	2	-.006	5
379		19	max	1646.14	1	848.965	1	261.827	3	.001	3	1.037	3	0	1
380			min	-1224.158	3	-20.383	5	-360.78	4	-.002	2	-.806	2	0	1
381	M3	1	max	1401.021	2	4.384	4	80.998	2	.014	3	.027	5	0	1
382			min	-490.2	3	1.031	15	-36.841	3	-.027	2	-.009	2	0	1
383		2	max	1400.813	2	3.897	4	80.998	2	.014	3	.023	4	0	15
384			min	-490.356	3	.916	15	-36.841	3	-.027	2	-.007	3	-.001	4
385		3	max	1400.605	2	3.41	4	80.998	2	.014	3	.038	2	0	15
386			min	-490.512	3	.802	15	-36.841	3	-.027	2	-.018	3	-.002	4
387		4	max	1400.397	2	2.923	4	80.998	2	.014	3	.062	2	0	15
388			min	-490.668	3	.687	15	-36.841	3	-.027	2	-.029	3	-.003	4
389		5	max	1400.189	2	2.436	4	80.998	2	.014	3	.085	2	0	15
390			min	-490.824	3	.573	15	-36.841	3	-.027	2	-.039	3	-.004	4
391		6	max	1399.981	2	1.949	4	80.998	2	.014	3	.109	2	-.001	15
392			min	-490.98	3	.458	15	-36.841	3	-.027	2	-.05	3	-.005	4
393		7	max	1399.772	2	1.461	4	80.998	2	.014	3	.133	2	-.001	15
394			min	-491.136	3	.344	15	-36.841	3	-.027	2	-.061	3	-.005	4
395		8	max	1399.564	2	.974	4	80.998	2	.014	3	.156	2	-.001	15
396			min	-491.292	3	.229	15	-36.841	3	-.027	2	-.072	3	-.005	4
397		9	max	1399.356	2	.487	4	80.998	2	.014	3	.18	2	-.001	15
398			min	-491.448	3	.115	15	-36.841	3	-.027	2	-.082	3	-.006	4
399		10	max	1399.148	2	0	1	80.998	2	.014	3	.204	2	-.001	15
400			min	-491.604	3	0	1	-36.841	3	-.027	2	-.093	3	-.006	4
401		11	max	1398.94	2	-.115	15	80.998	2	.014	3	.227	2	-.001	15
402			min	-491.76	3	-.487	6	-36.841	3	-.027	2	-.104	3	-.006	4
403		12	max	1398.732	2	-.229	15	80.998	2	.014	3	.251	2	-.001	15
404			min	-491.916	3	-.974	6	-36.841	3	-.027	2	-.115	3	-.005	4
405		13	max	1398.524	2	-.344	15	80.998	2	.014	3	.274	2	-.001	15
406			min	-492.073	3	-1.461	6	-36.841	3	-.027	2	-.125	3	-.005	4
407		14	max	1398.316	2	-.458	15	80.998	2	.014	3	.298	2	-.001	15
408			min	-492.229	3	-1.949	6	-36.841	3	-.027	2	-.136	3	-.005	4
409		15	max	1398.108	2	-.573	15	80.998	2	.014	3	.322	2	0	15
410			min	-492.385	3	-2.436	6	-36.841	3	-.027	2	-.147	3	-.004	4
411		16	max	1397.9	2	-.687	15	80.998	2	.014	3	.345	2	0	15
412			min	-492.541	3	-2.923	6	-36.841	3	-.027	2	-.158	3	-.003	4
413		17	max	1397.692	2	-.802	15	80.998	2	.014	3	.369	2	0	15
414			min	-492.697	3	-3.41	6	-36.841	3	-.027	2	-.168	3	-.002	4
415		18	max	1397.484	2	-.916	15	80.998	2	.014	3	.393	2	0	15
416			min	-492.853	3	-3.897	6	-36.841	3	-.027	2	-.179	3	-.001	4
417		19	max	1397.276	2	-1.031	15	80.998	2	.014	3	.416	2	0	1
418			min	-493.009	3	-4.384	6	-36.841	3	-.027	2	-.19	3	0	1
419	M6	1	max	4114.234	2	4.384	4	0	1	0	5	.028	4	0	1
420			min	-1693.756	3	1.031	15	-28.803	4	0	1	0	1	0	1
421		2	max	4114.026	2	3.897	4	0	1	0	5	.02	4	0	15
422			min	-1693.912	3	.916	15	-28.428	4	0	1	0	1	-.001	4
423		3	max	4113.818	2	3.41	4	0	1	0	5	.011	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	-1694.068	3	.802	15	-28.053	4	0	1	0	1	-.002	4
425		4	max	4113.61	2	2.923	4	0	1	0	5	.003	4	0	15
426			min	-1694.224	3	.687	15	-27.678	4	0	1	0	1	-.003	4
427		5	max	4113.402	2	2.436	4	0	1	0	5	0	1	0	15
428			min	-1694.38	3	.573	15	-27.303	4	0	1	-.005	4	-.004	4
429		6	max	4113.194	2	1.949	4	0	1	0	5	0	1	-.001	15
430			min	-1694.536	3	.458	15	-26.928	4	0	1	-.013	4	-.005	4
431		7	max	4112.986	2	1.461	4	0	1	0	5	0	1	-.001	15
432			min	-1694.692	3	.344	15	-26.552	4	0	1	-.021	4	-.005	4
433		8	max	4112.778	2	.974	4	0	1	0	5	0	1	-.001	15
434			min	-1694.848	3	.229	15	-26.177	4	0	1	-.028	4	-.005	4
435		9	max	4112.57	2	.487	4	0	1	0	5	0	1	-.001	15
436			min	-1695.004	3	.115	15	-25.802	4	0	1	-.036	4	-.006	4
437		10	max	4112.362	2	0	1	0	1	0	5	0	1	-.001	15
438			min	-1695.16	3	0	1	-25.427	4	0	1	-.043	4	-.006	4
439		11	max	4112.154	2	-.115	15	0	1	0	5	0	1	-.001	15
440			min	-1695.316	3	-.487	6	-25.052	4	0	1	-.051	4	-.006	4
441		12	max	4111.946	2	-.229	15	0	1	0	5	0	1	-.001	15
442			min	-1695.472	3	-.974	6	-24.677	4	0	1	-.058	4	-.005	4
443		13	max	4111.738	2	-.344	15	0	1	0	5	0	1	-.001	15
444			min	-1695.628	3	-1.461	6	-24.302	4	0	1	-.065	4	-.005	4
445		14	max	4111.53	2	-.458	15	0	1	0	5	0	1	-.001	15
446			min	-1695.784	3	-1.949	6	-23.926	4	0	1	-.072	4	-.005	4
447		15	max	4111.322	2	-.573	15	0	1	0	5	0	1	0	15
448			min	-1695.941	3	-2.436	6	-23.551	4	0	1	-.079	4	-.004	4
449		16	max	4111.114	2	-.687	15	0	1	0	5	0	1	0	15
450			min	-1696.097	3	-2.923	6	-23.176	4	0	1	-.086	4	-.003	4
451		17	max	4110.905	2	-.802	15	0	1	0	5	0	1	0	15
452			min	-1696.253	3	-3.41	6	-22.801	4	0	1	-.093	4	-.002	4
453		18	max	4110.697	2	-.916	15	0	1	0	5	0	1	0	15
454			min	-1696.409	3	-3.897	6	-22.426	4	0	1	-.099	4	-.001	4
455		19	max	4110.489	2	-1.031	15	0	1	0	5	0	1	0	1
456			min	-1696.565	3	-4.384	6	-22.051	4	0	1	-.106	4	0	1
457	M9	1	max	1401.021	2	4.384	6	36.841	3	.027	2	.03	4	0	1
458			min	-490.2	3	1.031	15	-80.998	2	-.014	3	-.004	3	0	1
459		2	max	1400.813	2	3.897	6	36.841	3	.027	2	.02	5	0	15
460			min	-490.356	3	.916	15	-80.998	2	-.014	3	-.014	2	-.001	6
461		3	max	1400.605	2	3.41	6	36.841	3	.027	2	.018	3	0	15
462			min	-490.512	3	.802	15	-80.998	2	-.014	3	-.038	2	-.002	6
463		4	max	1400.397	2	2.923	6	36.841	3	.027	2	.029	3	0	15
464			min	-490.668	3	.687	15	-80.998	2	-.014	3	-.062	2	-.003	6
465		5	max	1400.189	2	2.436	6	36.841	3	.027	2	.039	3	0	15
466			min	-490.824	3	.573	15	-80.998	2	-.014	3	-.085	2	-.004	6
467		6	max	1399.981	2	1.949	6	36.841	3	.027	2	.05	3	-.001	15
468			min	-490.98	3	.458	15	-80.998	2	-.014	3	-.109	2	-.005	6
469		7	max	1399.772	2	1.461	6	36.841	3	.027	2	.061	3	-.001	15
470			min	-491.136	3	.344	15	-80.998	2	-.014	3	-.133	2	-.005	6
471		8	max	1399.564	2	.974	6	36.841	3	.027	2	.072	3	-.001	15
472			min	-491.292	3	.229	15	-80.998	2	-.014	3	-.156	2	-.005	6
473		9	max	1399.356	2	.487	6	36.841	3	.027	2	.082	3	-.001	15
474			min	-491.448	3	.115	15	-80.998	2	-.014	3	-.18	2	-.006	6
475		10	max	1399.148	2	0	1	36.841	3	.027	2	.093	3	-.001	15
476			min	-491.604	3	0	1	-80.998	2	-.014	3	-.204	2	-.006	6
477		11	max	1398.94	2	-.115	15	36.841	3	.027	2	.104	3	-.001	15
478			min	-491.76	3	-.487	4	-80.998	2	-.014	3	-.227	2	-.006	6
479		12	max	1398.732	2	-.229	15	36.841	3	.027	2	.115	3	-.001	15
480			min	-491.916	3	-.974	4	-80.998	2	-.014	3	-.251	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	1398.524	2	-.344	15	36.841	3	.027	2	.125	3	-.001	15
482			min	-492.073	3	-1.461	4	-80.998	2	-.014	3	-.274	2	-.005	6
483		14	max	1398.316	2	-.458	15	36.841	3	.027	2	.136	3	-.001	15
484			min	-492.229	3	-1.949	4	-80.998	2	-.014	3	-.298	2	-.005	6
485		15	max	1398.108	2	-.573	15	36.841	3	.027	2	.147	3	0	15
486			min	-492.385	3	-2.436	4	-80.998	2	-.014	3	-.322	2	-.004	6
487		16	max	1397.9	2	-.687	15	36.841	3	.027	2	.158	3	0	15
488			min	-492.541	3	-2.923	4	-80.998	2	-.014	3	-.345	2	-.003	6
489		17	max	1397.692	2	-.802	15	36.841	3	.027	2	.168	3	0	15
490			min	-492.697	3	-3.41	4	-80.998	2	-.014	3	-.369	2	-.002	6
491		18	max	1397.484	2	-.916	15	36.841	3	.027	2	.179	3	0	15
492			min	-492.853	3	-3.897	4	-80.998	2	-.014	3	-.393	2	-.001	6
493		19	max	1397.276	2	-1.031	15	36.841	3	.027	2	.19	3	0	1
494			min	-493.009	3	-4.384	4	-80.998	2	-.014	3	-.416	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	-.027	15	-.031	12	.032	1	1.104e-2	3	NC	3	NC	3
2			min	-.239	1	-.505	1	-.669	5	-2.806e-2	2	239.546	1	278.294	5
3		2	max	-.027	15	-.032	15	.01	1	1.104e-2	3	NC	3	NC	3
4			min	-.239	1	-.42	1	-.64	4	-2.806e-2	2	282.519	1	297.603	5
5		3	max	-.027	15	-.027	15	0	12	1.047e-2	3	NC	12	NC	2
6			min	-.239	1	-.335	1	-.611	4	-2.596e-2	2	344.366	1	320.828	5
7		4	max	-.027	15	-.023	15	-.001	12	9.605e-3	3	7615.815	12	NC	1
8			min	-.239	1	-.253	1	-.575	4	-2.274e-2	2	436.313	1	352.613	5
9		5	max	-.027	15	-.018	15	0	12	8.739e-3	3	NC	10	NC	1
10			min	-.239	1	-.179	1	-.533	4	-1.952e-2	2	574.428	1	395.684	5
11		6	max	-.027	15	-.014	15	.001	3	9.08e-3	3	NC	2	NC	2
12			min	-.239	1	-.118	1	-.489	4	-1.893e-2	2	775.779	1	453.359	5
13		7	max	-.027	15	-.01	15	.002	3	1.026e-2	3	8450.208	12	NC	2
14			min	-.239	1	-.077	3	-.445	4	-2.016e-2	2	1072.093	1	528.73	5
15		8	max	-.027	15	0	10	.001	3	1.143e-2	3	NC	12	NC	2
16			min	-.238	1	-.065	3	-.404	4	-2.139e-2	2	1343.868	14	626.643	5
17		9	max	-.027	15	.015	2	0	12	1.273e-2	3	NC	3	NC	2
18			min	-.238	1	-.051	3	-.368	4	-2.125e-2	2	1660.75	14	753.796	5
19		10	max	-.027	15	.038	1	0	2	1.423e-2	3	NC	3	NC	2
20			min	-.238	1	-.034	3	-.332	4	-1.87e-2	2	1421.58	2	944.973	5
21		11	max	-.027	15	.07	1	.002	3	1.574e-2	3	8737.439	1	NC	2
22			min	-.237	1	-.014	3	-.297	4	-1.615e-2	2	1192.267	2	1248.311	5
23		12	max	-.027	15	.099	1	.007	3	1.3e-2	3	8328.049	9	NC	2
24			min	-.237	1	.007	12	-.267	4	-1.21e-2	2	1048.033	2	1762.478	5
25		13	max	-.027	15	.122	1	.013	3	7.858e-3	3	NC	9	NC	2
26			min	-.236	1	.012	15	-.238	4	-7.241e-3	1	973.355	2	2843.158	5
27		14	max	-.027	15	.134	1	.012	3	2.954e-3	3	NC	9	NC	2
28			min	-.236	1	.015	15	-.214	4	-6.733e-3	4	975.698	2	4577.951	1
29		15	max	-.027	15	.154	3	.011	1	8.63e-3	3	NC	4	NC	3
30			min	-.236	1	.018	15	-.199	5	-6.255e-3	4	669.324	3	3343.995	1
31		16	max	-.027	15	.233	3	.015	1	1.431e-2	3	NC	4	NC	3
32			min	-.236	1	.009	10	-.192	5	-9.699e-3	1	478.548	3	3039.99	1
33		17	max	-.027	15	.322	3	.009	1	1.998e-2	3	NC	4	NC	3
34			min	-.236	1	-.009	10	-.189	4	-1.324e-2	1	363.199	3	3496.3	1
35		18	max	-.027	15	.415	3	-.001	10	2.368e-2	3	NC	4	NC	2
36			min	-.236	1	-.029	10	-.192	4	-1.555e-2	1	290.405	3	6473.979	1
37		19	max	-.027	15	.507	3	-.004	12	2.368e-2	3	NC	1	NC	1
38			min	-.236	1	-.059	2	-.196	4	-1.555e-2	1	241.971	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
39	M4	1	max	-.02	15	0	3	0	1	1.184e-4	4	NC	3	NC	1
40			min	-.474	1	-1.153	1	-.666	4	0	1	123.385	1	279.494	4
41		2	max	-.02	15	-.032	12	0	1	1.184e-4	4	5105.554	12	NC	1
42			min	-.474	1	-.948	1	-.64	4	0	1	152.032	1	295.607	4
43		3	max	-.02	15	-.027	15	0	1	0	1	4390.117	15	NC	1
44			min	-.474	1	-.743	1	-.612	4	-2.601e-4	4	198.156	1	315.255	4
45		4	max	-.02	15	-.021	15	0	1	0	1	5554.25	15	NC	1
46			min	-.474	1	-.546	1	-.576	4	-8.405e-4	4	279.612	1	344.583	4
47		5	max	-.02	15	-.015	15	0	1	0	1	7311.26	15	NC	1
48			min	-.474	1	-.371	1	-.533	4	-1.421e-3	4	439.793	1	386.387	4
49		6	max	-.02	15	-.01	15	0	1	0	1	9905.324	15	NC	1
50			min	-.473	1	-.234	1	-.488	4	-1.356e-3	4	773.162	9	443.966	4
51		7	max	-.02	15	-.006	15	0	1	0	1	NC	15	NC	1
52			min	-.472	1	-.164	3	-.444	4	-8.442e-4	4	780.766	2	519.714	4
53		8	max	-.02	15	0	10	0	1	0	1	NC	5	NC	1
54			min	-.471	1	-.142	3	-.404	4	-3.326e-4	4	588.459	2	616.676	4
55		9	max	-.02	15	.034	2	0	1	0	1	NC	5	NC	1
56			min	-.471	1	-.114	3	-.368	4	-8.476e-5	4	489.852	2	737.46	4
57		10	max	-.02	15	.085	1	0	1	0	1	NC	4	NC	1
58			min	-.469	1	-.08	3	-.332	4	-3.035e-4	4	421.768	2	922.078	4
59		11	max	-.02	15	.149	1	0	1	0	1	NC	5	NC	1
60			min	-.468	1	-.039	3	-.297	4	-5.222e-4	4	374.292	2	1211.754	4
61		12	max	-.02	15	.206	1	0	1	0	1	NC	3	NC	1
62			min	-.467	1	.007	12	-.267	4	-1.947e-3	4	340.847	2	1668.34	4
63		13	max	-.02	15	.249	1	0	1	0	1	NC	5	NC	1
64			min	-.466	1	.01	15	-.239	4	-4.053e-3	4	323.464	2	2573.564	4
65		14	max	-.02	15	.263	1	0	1	0	1	NC	5	NC	1
66			min	-.465	1	.011	15	-.217	4	-6.079e-3	4	328.477	2	4339.872	4
67		15	max	-.02	15	.342	3	0	1	0	1	NC	5	NC	1
68			min	-.465	1	.011	15	-.205	4	-4.569e-3	4	369.414	2	7326.999	4
69		16	max	-.02	15	.537	3	0	1	0	1	NC	5	NC	1
70			min	-.465	1	.005	10	-.197	4	-3.059e-3	4	249.566	3	NC	1
71		17	max	-.02	15	.756	3	0	1	0	1	NC	5	NC	1
72			min	-.465	1	-.046	10	-.192	4	-1.549e-3	4	177.275	3	NC	1
73		18	max	-.02	15	.984	3	0	1	0	1	NC	5	NC	1
74			min	-.465	1	-.142	2	-.189	4	-5.646e-4	4	136.264	3	NC	1
75		19	max	-.02	15	1.211	3	0	1	0	1	NC	1	NC	1
76			min	-.465	1	-.24	2	-.187	4	-5.646e-4	4	110.715	3	NC	1
77	M7	1	max	.006	5	-.003	15	-.003	12	2.806e-2	2	NC	3	NC	3
78			min	-.239	1	-.505	1	-.685	4	-1.104e-2	3	239.546	1	264.863	4
79		2	max	.006	5	-.001	15	0	12	2.806e-2	2	NC	3	NC	3
80			min	-.239	1	-.42	1	-.645	4	-1.104e-2	3	282.519	1	287.234	4
81		3	max	.006	5	0	15	.009	1	2.596e-2	2	NC	5	NC	2
82			min	-.239	1	-.335	1	-.606	4	-1.047e-2	3	344.366	1	313.907	4
83		4	max	.006	5	.001	15	.018	1	2.274e-2	2	NC	5	NC	1
84			min	-.239	1	-.253	1	-.565	5	-9.605e-3	3	436.313	1	346.92	4
85		5	max	.006	5	.002	5	.018	1	1.952e-2	2	NC	5	NC	1
86			min	-.239	1	-.179	1	-.524	5	-8.739e-3	3	574.428	1	388.634	4
87		6	max	.006	5	.003	5	.015	1	1.893e-2	2	NC	2	NC	2
88			min	-.239	1	-.118	1	-.482	4	-9.08e-3	3	775.779	1	441.881	4
89		7	max	.006	5	.003	5	.007	1	2.016e-2	2	NC	5	NC	2
90			min	-.239	1	-.077	3	-.442	4	-1.026e-2	3	1072.093	1	508.282	4
91		8	max	.006	5	.003	5	.002	2	2.139e-2	2	NC	4	NC	2
92			min	-.238	1	-.065	3	-.404	4	-1.143e-2	3	1438.165	9	593.427	4
93		9	max	.006	5	.015	2	0	1	2.125e-2	2	NC	3	NC	2
94			min	-.238	1	-.051	3	-.368	4	-1.273e-2	3	1811.912	2	707.776	4
95		10	max	.006	5	.038	1	0	3	1.87e-2	2	NC	3	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	-.238	1	-.034	3	-.332	4	-1.423e-2	3	1421.58	2	873.905	4
97		11	max	.006	5	.07	1	.002	2	1.615e-2	2	NC	5	NC	2
98			min	-.237	1	-.014	3	-.297	4	-1.574e-2	3	1192.267	2	1132.336	4
99		12	max	.006	5	.099	1	.008	1	1.21e-2	2	NC	5	NC	2
100			min	-.237	1	0	15	-.264	4	-1.3e-2	3	1048.033	2	1575.134	4
101		13	max	.006	5	.122	1	.009	2	7.241e-3	1	NC	5	NC	2
102			min	-.236	1	-.001	5	-.235	4	-7.858e-3	3	973.355	2	2376.869	4
103		14	max	.006	5	.134	1	.004	2	2.615e-3	1	NC	5	NC	2
104			min	-.236	1	-.004	5	-.216	4	-6.008e-3	5	975.698	2	3605.468	4
105		15	max	.006	5	.154	3	0	10	6.157e-3	1	NC	5	NC	3
106			min	-.236	1	-.007	5	-.206	4	-8.63e-3	3	669.324	3	3343.995	1
107		16	max	.006	5	.233	3	-.002	10	9.699e-3	1	NC	5	NC	3
108			min	-.236	1	-.011	5	-.2	4	-1.431e-2	3	478.548	3	3039.99	1
109		17	max	.006	5	.322	3	0	12	1.324e-2	1	NC	4	NC	3
110			min	-.236	1	-.016	5	-.194	4	-1.998e-2	3	363.199	3	3496.3	1
111		18	max	.006	5	.415	3	.009	1	1.555e-2	1	NC	4	NC	2
112			min	-.236	1	-.029	10	-.187	4	-2.368e-2	3	290.405	3	6473.979	1
113		19	max	.006	5	.507	3	.029	1	1.555e-2	1	NC	1	NC	1
114			min	-.236	1	-.059	2	-.183	5	-2.368e-2	3	241.971	3	NC	1
115	M10	1	max	.001	1	.383	3	.236	1	1.241e-2	3	NC	1	NC	1
116			min	-.19	4	-.022	10	-.006	5	-4.51e-3	2	NC	1	NC	1
117		2	max	.001	1	.76	3	.32	1	1.442e-2	3	NC	5	NC	3
118			min	-.19	4	-.255	2	.002	15	-5.474e-3	2	731.943	3	3270.365	1
119		3	max	.001	1	1.11	3	.448	1	1.642e-2	3	NC	5	NC	5
120			min	-.19	4	-.471	2	.009	15	-6.437e-3	2	379.65	3	1303.546	1
121		4	max	0	1	1.369	3	.569	1	1.843e-2	3	NC	5	NC	5
122			min	-.19	4	-.618	2	.016	15	-7.401e-3	2	279.808	3	828.333	1
123		5	max	0	1	1.502	3	.652	1	2.044e-2	3	NC	5	NC	15
124			min	-.19	4	-.673	2	.02	15	-8.365e-3	2	246.614	3	663.372	1
125		6	max	0	1	1.499	3	.68	1	2.245e-2	3	NC	5	NC	15
126			min	-.19	4	-.631	2	.022	15	-9.329e-3	2	247.235	3	622.155	1
127		7	max	0	1	1.379	3	.651	1	2.446e-2	3	NC	5	NC	5
128			min	-.19	4	-.508	2	.022	15	-1.029e-2	2	277.052	3	664.629	1
129		8	max	0	1	1.187	3	.582	1	2.647e-2	3	NC	5	NC	5
130			min	-.19	4	-.339	2	.02	15	-1.126e-2	2	343.21	3	796.651	1
131		9	max	0	1	.996	3	.505	1	2.848e-2	3	NC	4	NC	5
132			min	-.19	4	-.181	2	.018	15	-1.222e-2	2	450.329	3	1027.282	1
133		10	max	0	1	.905	3	.465	1	3.048e-2	3	NC	4	NC	5
134			min	-.19	4	-.107	2	.02	15	-1.318e-2	2	528.564	3	1202.62	1
135		11	max	0	10	.996	3	.505	1	2.848e-2	3	NC	4	NC	5
136			min	-.19	4	-.181	2	.025	15	-1.222e-2	2	450.329	3	1027.282	1
137		12	max	0	10	1.187	3	.582	1	2.647e-2	3	NC	5	NC	5
138			min	-.19	4	-.339	2	.031	15	-1.126e-2	2	343.21	3	796.651	1
139		13	max	0	10	1.379	3	.651	1	2.446e-2	3	NC	15	NC	15
140			min	-.191	4	-.508	2	.036	15	-1.029e-2	2	277.052	3	664.629	1
141		14	max	0	10	1.499	3	.68	1	2.245e-2	3	9023.139	15	NC	15
142			min	-.191	4	-.631	2	.039	15	-9.329e-3	2	247.235	3	622.155	1
143		15	max	0	10	1.502	3	.652	1	2.044e-2	3	7350.568	15	NC	15
144			min	-.191	4	-.673	2	.039	15	-8.365e-3	2	246.614	3	663.372	1
145		16	max	0	10	1.369	3	.569	1	1.843e-2	3	7064.344	15	NC	5
146			min	-.191	4	-.618	2	.036	15	-7.401e-3	2	279.808	3	828.333	1
147		17	max	0	10	1.11	3	.448	1	1.642e-2	3	8183.93	15	NC	5
148			min	-.191	4	-.471	2	.032	15	-6.437e-3	2	379.65	3	1303.546	1
149		18	max	0	10	.76	3	.32	1	1.442e-2	3	NC	15	NC	3
150			min	-.191	4	-.255	2	.028	15	-5.474e-3	2	731.943	3	3270.365	1
151		19	max	0	10	.383	3	.236	1	1.241e-2	3	NC	1	NC	1
152			min	-.191	4	-.022	10	.027	15	-4.51e-3	2	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	.004	1	.081	1	.237	1	3.906e-3	1	NC	1	NC	1
154			min	-.285	4	-.005	3	-.006	5	-1.256e-4	5	NC	1	NC	1
155		2	max	.003	1	.264	3	.301	1	4.34e-3	1	NC	4	NC	3
156			min	-.285	4	-.176	2	.029	15	-5.361e-5	5	1026.245	3	4287.594	1
157		3	max	.003	1	.516	3	.418	1	4.775e-3	1	NC	5	NC	3
158			min	-.285	4	-.377	2	.044	15	3.323e-6	15	529.092	3	1523.344	1
159		4	max	.003	1	.69	3	.537	1	5.209e-3	1	NC	5	9705.858	12
160			min	-.285	4	-.502	2	.044	15	5.109e-5	15	396.97	3	920.886	1
161		5	max	.002	1	.749	3	.622	1	5.644e-3	1	NC	5	9141.381	15
162			min	-.285	4	-.531	2	.033	15	9.885e-5	15	365.98	3	716.299	1
163		6	max	.002	1	.685	3	.656	1	6.078e-3	1	NC	5	NC	5
164			min	-.285	4	-.461	2	.016	15	1.466e-4	15	400.117	3	658.082	1
165		7	max	.001	1	.516	3	.636	1	6.512e-3	1	NC	5	NC	5
166			min	-.286	4	-.312	2	0	15	1.944e-4	15	529.783	3	690.957	1
167		8	max	0	1	.288	3	.576	1	6.947e-3	1	NC	5	NC	5
168			min	-.286	4	-.121	2	-.014	5	2.422e-4	15	940.157	3	814.187	1
169		9	max	0	1	.088	1	.505	1	7.381e-3	1	NC	1	NC	5
170			min	-.286	4	0	15	-.008	5	2.899e-4	15	3419.78	3	1031.275	1
171		10	max	0	1	.17	1	.468	1	7.816e-3	1	NC	3	NC	5
172			min	-.286	4	-.023	3	.02	15	3.377e-4	15	3086.819	1	1194.623	1
173		11	max	0	3	.088	1	.505	1	7.381e-3	1	NC	1	7481.604	15
174			min	-.286	4	.007	15	.05	15	3.526e-4	15	3419.78	3	1031.275	1
175		12	max	0	3	.288	3	.576	1	6.947e-3	1	NC	5	5947.516	15
176			min	-.286	4	-.121	2	.061	15	3.675e-4	15	940.157	3	814.187	1
177		13	max	.001	3	.516	3	.636	1	6.512e-3	1	NC	5	6738.911	15
178			min	-.286	4	-.312	2	.057	15	3.824e-4	15	529.783	3	690.957	1
179		14	max	.002	3	.685	3	.656	1	6.078e-3	1	NC	15	NC	15
180			min	-.286	4	-.461	2	.043	15	3.973e-4	15	400.117	3	658.082	1
181		15	max	.002	3	.749	3	.622	1	5.644e-3	1	7717.889	15	NC	5
182			min	-.286	4	-.531	2	.024	15	4.122e-4	15	365.98	3	716.299	1
183		16	max	.003	3	.69	3	.537	1	5.209e-3	1	7153.946	15	NC	5
184			min	-.286	4	-.502	2	.005	15	4.272e-4	15	396.97	3	920.886	1
185		17	max	.003	3	.516	3	.418	1	4.775e-3	1	8077.194	15	NC	3
186			min	-.286	4	-.377	2	-.007	5	4.421e-4	15	529.092	3	1523.344	1
187		18	max	.003	3	.264	3	.301	1	4.34e-3	1	NC	15	NC	3
188			min	-.286	4	-.176	2	-.001	15	4.57e-4	15	1026.245	3	4287.594	1
189		19	max	.004	3	.081	1	.237	1	3.906e-3	1	NC	1	NC	1
190			min	-.286	4	-.005	3	.027	15	4.719e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.007	2	.238	1	4.751e-3	1	NC	1	NC	1
192			min	-.381	4	-.056	3	-.006	5	-7.568e-5	5	NC	1	NC	1
193		2	max	0	2	.122	3	.293	1	5.268e-3	1	NC	5	NC	2
194			min	-.381	4	-.337	2	.033	15	-9.169e-6	15	802.532	2	4226.583	4
195		3	max	0	2	.263	3	.405	1	5.785e-3	1	NC	5	NC	10
196			min	-.381	4	-.635	2	.048	15	4.151e-5	15	429.739	2	1656.24	1
197		4	max	0	2	.344	3	.522	1	6.302e-3	1	NC	5	7293.031	12
198			min	-.381	4	-.828	2	.046	15	9.219e-5	15	330.596	2	972.199	1
199		5	max	0	2	.354	3	.609	1	6.819e-3	1	NC	5	9100.606	15
200			min	-.381	4	-.883	2	.033	15	1.429e-4	15	310.095	2	744.005	1
201		6	max	0	2	.297	3	.646	1	7.336e-3	1	NC	5	NC	5
202			min	-.381	4	-.798	2	.013	15	1.936e-4	15	343.013	2	675.904	1
203		7	max	0	2	.187	3	.631	1	7.853e-3	1	NC	5	NC	5
204			min	-.381	4	-.597	2	-.006	5	2.442e-4	15	457.035	2	703.062	1
205		8	max	0	2	.051	3	.574	1	8.37e-3	1	NC	5	NC	13
206			min	-.381	4	-.335	2	-.023	5	2.949e-4	15	807.997	2	820.812	1
207		9	max	0	2	-.002	15	.506	1	8.888e-3	1	NC	3	NC	4
208			min	-.381	4	-.106	1	-.015	5	3.456e-4	15	2761.164	2	1029.604	1
209		10	max	0	1	.017	2	.471	1	9.405e-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	-.381	4	-.124	3	.02	15	3.963e-4	15	4046.118	3	1185.876	1
211		11	max	0	9	-.005	15	.506	1	8.888e-3	1	NC	3	6701.826	15
212			min	-.381	4	-.106	1	.054	15	4.078e-4	15	2761.164	2	1029.604	1
213		12	max	0	9	.051	3	.574	1	8.37e-3	1	NC	5	5323.851	15
214			min	-.381	4	-.335	2	.066	15	4.194e-4	15	807.997	2	820.812	1
215		13	max	0	9	.187	3	.631	1	7.853e-3	1	NC	15	6091.028	15
216			min	-.381	4	-.597	2	.062	15	4.31e-4	15	457.035	2	703.062	1
217		14	max	0	9	.297	3	.646	1	7.336e-3	1	9234.266	15	NC	15
218			min	-.381	4	-.798	2	.045	15	4.425e-4	15	343.013	2	675.904	1
219		15	max	0	9	.354	3	.609	1	6.819e-3	1	7943.377	15	NC	5
220			min	-.381	4	-.883	2	.023	15	4.541e-4	15	310.095	2	744.005	1
221		16	max	0	9	.344	3	.522	1	6.302e-3	1	7961.26	15	NC	7
222			min	-.381	4	-.828	2	.002	15	4.656e-4	15	330.596	2	972.199	1
223		17	max	0	9	.263	3	.405	1	5.785e-3	1	9568.364	15	NC	4
224			min	-.381	4	-.635	2	-.014	5	4.772e-4	15	429.739	2	1656.24	1
225		18	max	0	9	.122	3	.293	1	5.268e-3	1	NC	5	NC	2
226			min	-.381	4	-.337	2	-.007	5	4.888e-4	15	802.532	2	5036.79	1
227		19	max	0	9	.007	2	.238	1	4.751e-3	1	NC	1	NC	1
228			min	-.381	4	-.056	3	.027	15	5.003e-4	15	NC	1	NC	1
229	M13	1	max	0	12	-.001	15	.239	1	1.143e-2	1	NC	1	NC	1
230			min	-.632	4	-.39	1	-.006	5	-1.459e-3	3	NC	1	NC	1
231		2	max	0	12	.106	3	.326	1	1.321e-2	1	NC	5	NC	3
232			min	-.631	4	-.784	1	.032	15	-1.973e-3	3	640.281	2	3171.96	1
233		3	max	0	12	.245	3	.456	1	1.5e-2	1	NC	5	NC	12
234			min	-.631	4	-1.132	1	.05	15	-2.487e-3	3	340.89	2	1277.017	1
235		4	max	0	12	.333	3	.578	1	1.678e-2	1	NC	5	6845.339	12
236			min	-.631	4	-1.38	2	.051	15	-3.001e-3	3	256.815	2	814.925	1
237		5	max	0	12	.356	3	.662	1	1.857e-2	1	NC	15	7112.876	15
238			min	-.631	4	-1.499	2	.041	15	-3.515e-3	3	231.222	2	653.924	1
239		6	max	0	12	.314	3	.689	1	2.035e-2	1	NC	15	NC	15
240			min	-.631	4	-1.482	1	.025	15	-4.029e-3	3	237.436	2	613.68	1
241		7	max	0	12	.221	3	.661	1	2.214e-2	1	NC	15	NC	5
242			min	-.631	4	-1.353	1	.007	15	-4.543e-3	3	274.525	2	655.21	1
243		8	max	0	12	.1	3	.592	1	2.392e-2	1	NC	15	NC	5
244			min	-.631	4	-1.157	1	-.005	5	-5.057e-3	3	355.949	2	783.797	1
245		9	max	0	12	-.011	3	.514	1	2.57e-2	1	NC	5	NC	5
246			min	-.631	4	-.966	1	-.003	15	-5.571e-3	3	478.972	1	1007.023	1
247		10	max	0	1	-.031	15	.474	1	2.749e-2	1	NC	3	NC	5
248			min	-.631	4	-.877	1	.02	15	-6.085e-3	3	567.061	1	1175.572	1
249		11	max	0	1	-.011	3	.514	1	2.57e-2	1	NC	12	8230.253	15
250			min	-.631	4	-.966	1	.047	15	-5.571e-3	3	478.972	1	1007.023	1
251		12	max	0	1	.1	3	.592	1	2.392e-2	1	NC	15	6721.627	15
252			min	-.631	4	-1.157	1	.056	15	-5.057e-3	3	355.949	2	783.797	1
253		13	max	0	1	.221	3	.661	1	2.214e-2	1	8469.8	15	7921.692	15
254			min	-.631	4	-1.353	1	.051	15	-4.543e-3	3	274.525	2	655.21	1
255		14	max	0	1	.314	3	.689	1	2.035e-2	1	7188.041	15	NC	15
256			min	-.631	4	-1.482	1	.037	15	-4.029e-3	3	237.436	2	613.68	1
257		15	max	.001	1	.356	3	.662	1	1.857e-2	1	6790.209	15	NC	5
258			min	-.631	4	-1.499	2	.019	15	-3.515e-3	3	231.222	2	653.924	1
259		16	max	.001	1	.333	3	.578	1	1.678e-2	1	7235.992	15	NC	7
260			min	-.631	4	-1.38	2	.002	15	-3.001e-3	3	256.815	2	814.925	1
261		17	max	.002	1	.245	3	.456	1	1.5e-2	1	9094.881	15	NC	4
262			min	-.63	4	-1.132	1	-.01	5	-2.487e-3	3	340.89	2	1277.017	1
263		18	max	.002	1	.106	3	.326	1	1.321e-2	1	NC	5	NC	3
264			min	-.63	4	-.784	1	-.002	5	-1.973e-3	3	640.281	2	3171.96	1
265		19	max	.002	1	-.03	15	.239	1	1.143e-2	1	NC	1	NC	1
266			min	-.63	4	-.39	1	.027	15	-1.459e-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	.001	5	5.941e-3	2	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-6.859e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.004	5	7.709e-3	2	NC	1	NC	1
272			min	0	1	-.005	1	-.001	1	-9.197e-3	5	NC	1	NC	1
273		4	max	0	3	-.001	15	.009	5	7.083e-3	2	NC	2	NC	1
274			min	0	1	-.01	1	-.002	1	-8.942e-3	5	6446.258	1	7250.603	5
275		5	max	0	3	-.002	15	.016	5	6.458e-3	2	NC	5	NC	1
276			min	0	1	-.018	1	-.003	1	-8.686e-3	5	3666.999	1	4203.119	5
277		6	max	0	3	-.003	15	.024	5	5.832e-3	2	NC	5	NC	1
278			min	0	1	-.028	1	-.005	1	-8.431e-3	5	2384.595	1	2767.498	5
279		7	max	0	3	-.005	15	.034	5	5.206e-3	2	NC	15	NC	1
280			min	0	1	-.04	1	-.007	1	-8.175e-3	5	1686.462	1	1976.182	5
281		8	max	0	3	-.006	15	.045	5	4.581e-3	2	NC	15	NC	9
282			min	0	1	-.053	1	-.008	1	-7.92e-3	5	1263.203	1	1492.39	5
283		9	max	0	3	-.008	15	.057	5	3.955e-3	2	8678.41	15	NC	9
284			min	0	1	-.068	1	-.01	1	-7.664e-3	5	987.116	1	1174.842	5
285		10	max	0	3	-.01	15	.071	5	3.329e-3	2	7015.671	15	NC	9
286			min	0	1	-.084	1	-.011	1	-7.409e-3	5	796.588	1	954.675	5
287		11	max	0	3	-.012	15	.085	5	2.704e-3	2	5816.192	15	NC	9
288			min	-.001	1	-.102	1	-.012	1	-7.153e-3	5	659.493	1	795.662	5
289		12	max	0	3	-.014	15	.099	5	2.078e-3	2	4921.591	15	NC	9
290			min	-.001	1	-.121	1	-.013	1	-6.898e-3	5	557.448	1	676.963	5
291		13	max	0	3	-.016	15	.115	5	1.452e-3	2	4236.003	15	NC	9
292			min	-.001	1	-.14	1	-.013	1	-6.656e-3	4	479.371	1	585.952	5
293		14	max	0	3	-.018	15	.131	5	8.268e-4	2	3699.001	15	NC	9
294			min	-.001	1	-.161	1	-.012	1	-6.485e-3	4	418.297	1	514.652	5
295		15	max	0	3	-.021	15	.147	5	8.256e-4	3	3270.277	15	NC	9
296			min	-.001	1	-.182	1	-.012	1	-6.314e-3	4	369.592	1	457.752	5
297		16	max	.001	3	-.023	15	.164	5	1.187e-3	3	2922.687	15	NC	9
298			min	-.001	1	-.204	1	-.01	1	-6.143e-3	4	330.141	1	411.66	5
299		17	max	.001	3	-.026	15	.18	4	1.548e-3	3	2637.026	15	NC	9
300			min	-.002	1	-.226	1	-.007	1	-5.972e-3	4	297.746	1	373.233	4
301		18	max	.001	3	-.028	15	.197	4	1.909e-3	3	2399.551	15	NC	1
302			min	-.002	1	-.249	1	-.005	3	-5.801e-3	4	270.835	1	340.897	4
303		19	max	.001	3	-.031	15	.215	4	2.271e-3	3	2200.192	15	NC	1
304			min	-.002	1	-.271	1	-.012	3	-5.63e-3	4	248.257	1	313.775	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	.001	4	0	1	NC	1	NC	1
308			min	0	1	-.002	3	0	1	-7.387e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.005	4	0	1	NC	2	NC	1
310			min	0	1	-.009	1	0	1	-9.881e-3	4	7717.714	1	NC	1
311		4	max	0	3	0	15	.01	4	0	1	NC	4	NC	1
312			min	0	1	-.02	1	0	1	-9.569e-3	4	3353.743	1	6889.049	4
313		5	max	0	3	-.002	15	.017	4	0	1	NC	5	NC	1
314			min	-.001	1	-.036	1	0	1	-9.258e-3	4	1891.303	1	3997.956	4
315		6	max	.001	3	-.002	15	.026	4	0	1	NC	5	NC	1
316			min	-.001	1	-.055	1	0	1	-8.946e-3	4	1224.125	1	2635.58	4
317		7	max	.001	3	-.003	15	.036	4	0	1	NC	5	NC	1
318			min	-.002	1	-.078	1	0	1	-8.634e-3	4	863.216	1	1884.426	4
319		8	max	.001	3	-.004	15	.047	4	0	1	NC	15	NC	1
320			min	-.002	1	-.104	1	0	1	-8.322e-3	4	645.288	1	1425.086	4
321		9	max	.002	3	-.006	15	.06	4	0	1	NC	15	NC	1
322			min	-.002	1	-.134	1	0	1	-8.01e-3	4	503.533	1	1123.53	4
323		10	max	.002	3	-.007	15	.074	4	0	1	9538.858	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	1	-.166	1	0	1	-7.698e-3	4	405.908	1	914.432	4
325		11	max	.002	3	-.009	15	.088	4	0	1	7898.013	15	NC	1
326			min	-.003	1	-.2	1	0	1	-7.386e-3	4	335.77	1	763.415	4
327		12	max	.002	3	-.01	15	.103	4	0	1	6676.488	15	NC	1
328			min	-.003	1	-.237	1	0	1	-7.074e-3	4	283.627	1	650.7	4
329		13	max	.003	3	-.012	15	.119	4	0	1	5741.753	15	NC	1
330			min	-.003	1	-.276	1	0	1	-6.762e-3	4	243.771	1	564.308	4
331		14	max	.003	3	-.013	15	.136	4	0	1	5010.502	15	NC	1
332			min	-.003	1	-.317	1	0	1	-6.45e-3	4	212.62	1	496.66	4
333		15	max	.003	3	-.015	15	.152	4	0	1	4427.299	15	NC	1
334			min	-.004	1	-.358	1	0	1	-6.138e-3	4	187.794	1	442.722	4
335		16	max	.003	3	-.017	15	.169	4	0	1	3954.877	15	NC	1
336			min	-.004	1	-.401	1	0	1	-5.826e-3	4	167.697	1	399.08	4
337		17	max	.003	3	-.019	15	.185	4	0	1	3566.921	15	NC	1
338			min	-.004	1	-.445	1	0	1	-5.514e-3	4	151.203	1	363.33	4
339		18	max	.004	3	-.021	15	.202	4	0	1	3244.618	15	NC	1
340			min	-.004	1	-.489	1	0	1	-5.202e-3	4	137.506	1	333.752	4
341		19	max	.004	3	-.023	15	.218	4	0	1	2974.204	15	NC	1
342			min	-.005	1	-.534	1	0	1	-4.89e-3	4	126.02	1	309.079	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	2.74e-3	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-8.043e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.005	4	3.51e-3	3	NC	1	NC	1
348			min	0	1	-.005	1	-.001	3	-1.072e-2	4	NC	1	NC	1
349		4	max	0	3	0	5	.01	4	3.149e-3	3	NC	2	NC	1
350			min	0	1	-.01	1	-.002	3	-1.032e-2	4	6446.258	1	6786.773	4
351		5	max	0	3	0	5	.017	4	2.787e-3	3	NC	4	NC	1
352			min	0	1	-.018	1	-.004	3	-9.925e-3	4	3666.999	1	3944.145	4
353		6	max	0	3	0	5	.026	4	2.426e-3	3	NC	4	NC	1
354			min	0	1	-.028	1	-.005	3	-9.527e-3	4	2384.595	1	2603.373	4
355		7	max	0	3	.001	5	.036	4	2.065e-3	3	NC	5	NC	1
356			min	0	1	-.04	1	-.007	3	-9.129e-3	4	1686.462	1	1863.651	4
357		8	max	0	3	.001	5	.048	4	1.703e-3	3	NC	5	NC	9
358			min	0	1	-.053	1	-.008	3	-8.731e-3	4	1263.203	1	1411.092	4
359		9	max	0	3	.002	5	.06	4	1.342e-3	3	NC	5	NC	9
360			min	0	1	-.068	1	-.009	3	-8.333e-3	4	987.116	1	1113.88	4
361		10	max	0	3	.002	5	.074	4	9.808e-4	3	NC	5	NC	9
362			min	0	1	-.084	1	-.01	3	-7.935e-3	4	796.588	1	907.751	4
363		11	max	0	3	.003	5	.089	4	6.195e-4	3	NC	5	NC	9
364			min	-.001	1	-.102	1	-.011	3	-7.536e-3	4	659.493	1	758.861	4
365		12	max	0	3	.003	5	.104	4	2.583e-4	3	NC	5	NC	9
366			min	-.001	1	-.121	1	-.011	3	-7.138e-3	4	557.448	1	647.738	4
367		13	max	0	3	.004	5	.12	4	-6.301e-5	12	NC	5	NC	9
368			min	-.001	1	-.14	1	-.011	3	-6.74e-3	4	479.371	1	562.582	4
369		14	max	0	3	.004	5	.136	4	1.531e-4	9	NC	5	NC	9
370			min	-.001	1	-.161	1	-.009	3	-6.353e-3	5	418.297	1	495.93	4
371		15	max	0	3	.005	5	.152	4	3.969e-4	9	NC	5	NC	9
372			min	-.001	1	-.182	1	-.007	3	-6.043e-3	5	369.592	1	442.821	4
373		16	max	.001	3	.005	5	.168	4	9.813e-4	1	NC	5	NC	9
374			min	-.001	1	-.204	1	-.004	3	-5.733e-3	5	330.141	1	399.891	4
375		17	max	.001	3	.006	5	.185	4	1.587e-3	1	NC	5	NC	9
376			min	-.002	1	-.226	1	0	3	-5.424e-3	5	297.746	1	364.773	4
377		18	max	.001	3	.006	5	.2	4	2.193e-3	1	NC	5	NC	1
378			min	-.002	1	-.249	1	0	10	-5.114e-3	5	270.835	1	335.774	4
379		19	max	.001	3	.007	5	.216	4	2.799e-3	1	NC	7	NC	1
380			min	-.002	1	-.271	1	-.005	2	-4.804e-3	5	248.257	1	311.646	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	1	0	15	.002	5	3.759e-3	2	NC	1	NC	1
382			min	0	15	-.001	1	0	1	-3.833e-3	5	NC	1	NC	1
383		2	max	.002	3	-.002	15	.032	5	4.08e-3	2	NC	1	NC	4
384			min	0	10	-.017	1	-.026	2	-3.809e-3	5	NC	1	2434.694	2
385		3	max	.002	3	-.004	15	.063	5	4.402e-3	2	NC	1	NC	4
386			min	0	10	-.034	1	-.051	2	-3.785e-3	5	NC	1	1224.754	2
387		4	max	.002	3	-.006	15	.094	5	4.723e-3	2	NC	1	NC	4
388			min	0	2	-.05	1	-.075	2	-3.761e-3	5	NC	1	827.024	2
389		5	max	.002	3	-.008	15	.125	5	5.045e-3	2	NC	1	NC	4
390			min	-.001	2	-.066	1	-.098	2	-3.737e-3	5	NC	1	632.673	2
391		6	max	.002	3	-.01	15	.157	5	5.366e-3	2	NC	1	NC	4
392			min	-.002	2	-.082	1	-.118	2	-3.713e-3	5	NC	1	520.107	2
393		7	max	.003	3	-.011	15	.188	5	5.688e-3	2	NC	1	NC	4
394			min	-.002	2	-.098	1	-.137	2	-3.689e-3	5	NC	1	448.978	2
395		8	max	.003	3	-.013	15	.219	5	6.009e-3	2	NC	1	NC	4
396			min	-.002	2	-.114	1	-.153	2	-3.664e-3	5	NC	1	402.208	2
397		9	max	.003	3	-.015	15	.249	5	6.33e-3	2	NC	1	NC	4
398			min	-.003	2	-.13	1	-.165	2	-3.64e-3	5	NC	1	371.537	2
399		10	max	.003	3	-.017	15	.279	5	6.652e-3	2	NC	1	NC	4
400			min	-.003	2	-.146	1	-.173	2	-3.616e-3	5	NC	1	352.745	2
401		11	max	.003	3	-.018	15	.309	5	6.973e-3	2	NC	1	NC	4
402			min	-.004	2	-.161	1	-.177	2	-3.592e-3	5	NC	1	343.844	2
403		12	max	.003	3	-.02	15	.338	5	7.295e-3	2	NC	1	NC	4
404			min	-.004	2	-.177	1	-.176	2	-3.568e-3	5	NC	1	344.406	2
405		13	max	.004	3	-.022	15	.366	5	7.616e-3	2	NC	1	NC	4
406			min	-.005	2	-.192	1	-.17	2	-3.627e-3	3	NC	1	355.549	2
407		14	max	.004	3	-.023	15	.392	5	7.938e-3	2	NC	1	NC	4
408			min	-.005	2	-.208	1	-.158	2	-3.793e-3	3	NC	1	380.638	2
409		15	max	.004	3	-.025	15	.418	5	8.259e-3	2	NC	1	NC	4
410			min	-.006	2	-.223	1	-.139	2	-3.959e-3	3	NC	1	351.841	14
411		16	max	.004	3	-.027	15	.443	5	8.58e-3	2	NC	1	NC	4
412			min	-.006	2	-.238	1	-.113	2	-4.125e-3	3	NC	1	316.8	14
413		17	max	.004	3	-.028	15	.466	5	8.902e-3	2	NC	1	NC	4
414			min	-.007	2	-.253	1	-.08	2	-4.291e-3	3	NC	1	286.333	14
415		18	max	.004	3	-.03	15	.489	4	9.223e-3	2	NC	1	NC	4
416			min	-.007	2	-.268	1	-.039	2	-4.456e-3	3	NC	1	259.662	14
417		19	max	.005	3	-.031	15	.515	4	9.545e-3	2	NC	1	NC	1
418			min	-.008	2	-.283	1	0	3	-4.622e-3	3	NC	1	236.18	14
419	M6	1	max	.003	3	0	15	.002	4	0	1	NC	1	NC	1
420			min	0	15	-.002	1	0	1	-4.144e-3	4	NC	1	NC	1
421		2	max	.004	3	-.002	15	.035	4	0	1	NC	1	NC	1
422			min	0	10	-.034	1	0	1	-4.154e-3	4	NC	1	NC	1
423		3	max	.005	3	-.003	15	.068	4	0	1	NC	1	NC	1
424			min	-.001	2	-.066	1	0	1	-4.164e-3	4	NC	1	7329.46	4
425		4	max	.005	3	-.005	15	.101	4	0	1	NC	1	NC	1
426			min	-.003	2	-.098	1	0	1	-4.174e-3	4	NC	1	4718.791	4
427		5	max	.006	3	-.006	15	.134	4	0	1	NC	1	NC	1
428			min	-.004	2	-.13	1	0	1	-4.183e-3	4	NC	1	3466.157	4
429		6	max	.006	3	-.007	15	.168	4	0	1	NC	1	NC	1
430			min	-.005	2	-.161	1	0	1	-4.193e-3	4	NC	1	2751.542	4
431		7	max	.007	3	-.009	15	.201	4	0	1	NC	1	NC	1
432			min	-.007	2	-.193	1	0	1	-4.203e-3	4	NC	1	2304.236	4
433		8	max	.007	3	-.01	15	.233	4	0	1	NC	1	NC	1
434			min	-.008	2	-.224	1	0	1	-4.212e-3	4	NC	1	2010.16	4
435		9	max	.008	3	-.012	15	.265	4	0	1	NC	1	NC	1
436			min	-.01	2	-.256	1	0	1	-4.222e-3	4	NC	1	1814.043	4
437		10	max	.009	3	-.013	15	.296	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	-.011	2	-.287	1	0	1	-4.232e-3	4	NC	1	1687.132	4
439		11	max	.009	3	-.014	15	.326	4	0	1	NC	1	NC	1
440			min	-.012	2	-.318	1	0	1	-4.242e-3	4	NC	1	1614.72	4
441		12	max	.01	3	-.015	15	.355	4	0	1	NC	1	NC	1
442			min	-.014	2	-.35	1	0	1	-4.251e-3	4	NC	1	1591.181	4
443		13	max	.01	3	-.017	15	.383	4	0	1	NC	1	NC	1
444			min	-.015	2	-.381	1	0	1	-4.261e-3	4	NC	1	1618.88	4
445		14	max	.011	3	-.018	15	.41	4	0	1	NC	1	NC	1
446			min	-.017	2	-.412	1	0	1	-4.271e-3	4	NC	1	1710.612	4
447		15	max	.011	3	-.019	15	.434	4	0	1	NC	1	NC	1
448			min	-.018	2	-.443	1	0	1	-4.281e-3	4	NC	1	1898.724	4
449		16	max	.012	3	-.02	15	.458	4	0	1	NC	1	NC	1
450			min	-.019	2	-.473	1	0	1	-4.29e-3	4	NC	1	2264.604	4
451		17	max	.013	3	-.021	15	.479	4	0	1	NC	1	NC	1
452			min	-.021	2	-.504	1	0	1	-4.3e-3	4	NC	1	3058.402	4
453		18	max	.013	3	-.023	15	.498	4	0	1	NC	1	NC	1
454			min	-.022	2	-.535	1	0	1	-4.31e-3	4	NC	1	5539.19	4
455		19	max	.014	3	-.024	15	.515	4	0	1	NC	1	NC	1
456			min	-.023	2	-.566	1	0	1	-4.319e-3	4	NC	1	NC	1
457	M9	1	max	.002	1	0	5	.002	4	1.637e-3	3	NC	1	NC	1
458			min	0	5	-.001	1	0	3	-4.564e-3	4	NC	1	NC	1
459		2	max	.002	3	0	15	.038	4	1.803e-3	3	NC	1	NC	5
460			min	0	5	-.017	1	-.012	3	-4.594e-3	4	NC	1	2434.694	2
461		3	max	.002	3	0	15	.073	4	1.969e-3	3	NC	1	NC	15
462			min	0	10	-.034	1	-.024	3	-4.625e-3	4	NC	1	1224.754	2
463		4	max	.002	3	0	15	.109	4	2.135e-3	3	NC	1	6955.026	15
464			min	0	2	-.05	1	-.035	3	-4.723e-3	2	NC	1	827.024	2
465		5	max	.002	3	0	5	.145	4	2.3e-3	3	NC	1	5108.889	15
466			min	-.001	2	-.066	1	-.046	3	-5.045e-3	2	NC	1	632.673	2
467		6	max	.002	3	0	5	.181	4	2.466e-3	3	NC	1	4055.655	15
468			min	-.002	2	-.082	1	-.056	3	-5.366e-3	2	NC	1	520.107	2
469		7	max	.003	3	0	5	.216	4	2.632e-3	3	NC	1	3396.375	15
470			min	-.002	2	-.098	1	-.065	3	-5.688e-3	2	NC	1	448.978	2
471		8	max	.003	3	.001	5	.25	4	2.798e-3	3	NC	1	2962.928	15
472			min	-.002	2	-.114	1	-.072	3	-6.009e-3	2	NC	1	402.208	2
473		9	max	.003	3	.001	5	.283	4	2.964e-3	3	NC	1	2673.854	15
474			min	-.003	2	-.13	1	-.078	3	-6.33e-3	2	NC	1	371.537	2
475		10	max	.003	3	.002	5	.314	4	3.13e-3	3	NC	1	2486.783	15
476			min	-.003	2	-.146	1	-.082	3	-6.652e-3	2	NC	1	352.745	2
477		11	max	.003	3	.002	5	.345	4	3.296e-3	3	NC	1	2380.035	15
478			min	-.004	2	-.161	1	-.084	3	-6.973e-3	2	NC	1	343.844	2
479		12	max	.003	3	.002	5	.373	4	3.461e-3	3	NC	1	2345.319	15
480			min	-.004	2	-.177	1	-.084	3	-7.295e-3	2	NC	1	344.406	2
481		13	max	.004	3	.003	5	.4	4	3.627e-3	3	NC	1	2386.119	15
482			min	-.005	2	-.192	1	-.081	3	-7.616e-3	2	NC	1	355.549	2
483		14	max	.004	3	.003	5	.424	4	3.793e-3	3	NC	1	2521.293	15
484			min	-.005	2	-.208	1	-.076	3	-7.938e-3	2	NC	1	380.638	2
485		15	max	.004	3	.004	5	.446	4	3.959e-3	3	NC	1	2798.516	15
486			min	-.006	2	-.223	1	-.067	3	-8.259e-3	2	NC	1	427.483	2
487		16	max	.004	3	.005	5	.466	4	4.125e-3	3	NC	1	3337.731	15
488			min	-.006	2	-.238	1	-.056	3	-8.58e-3	2	NC	1	515.267	2
489		17	max	.004	3	.005	5	.482	4	4.291e-3	3	NC	1	4507.611	15
490			min	-.007	2	-.253	1	-.041	3	-8.902e-3	2	NC	1	702.525	2
491		18	max	.004	3	.006	5	.496	4	4.456e-3	3	NC	1	8163.763	15
492			min	-.007	2	-.268	1	-.022	3	-9.223e-3	2	NC	1	1283.315	2
493		19	max	.005	3	.006	5	.506	5	4.622e-3	3	NC	1	NC	1
494			min	-.008	2	-.283	1	-.017	1	-9.545e-3	2	9879.654	5	NC	1