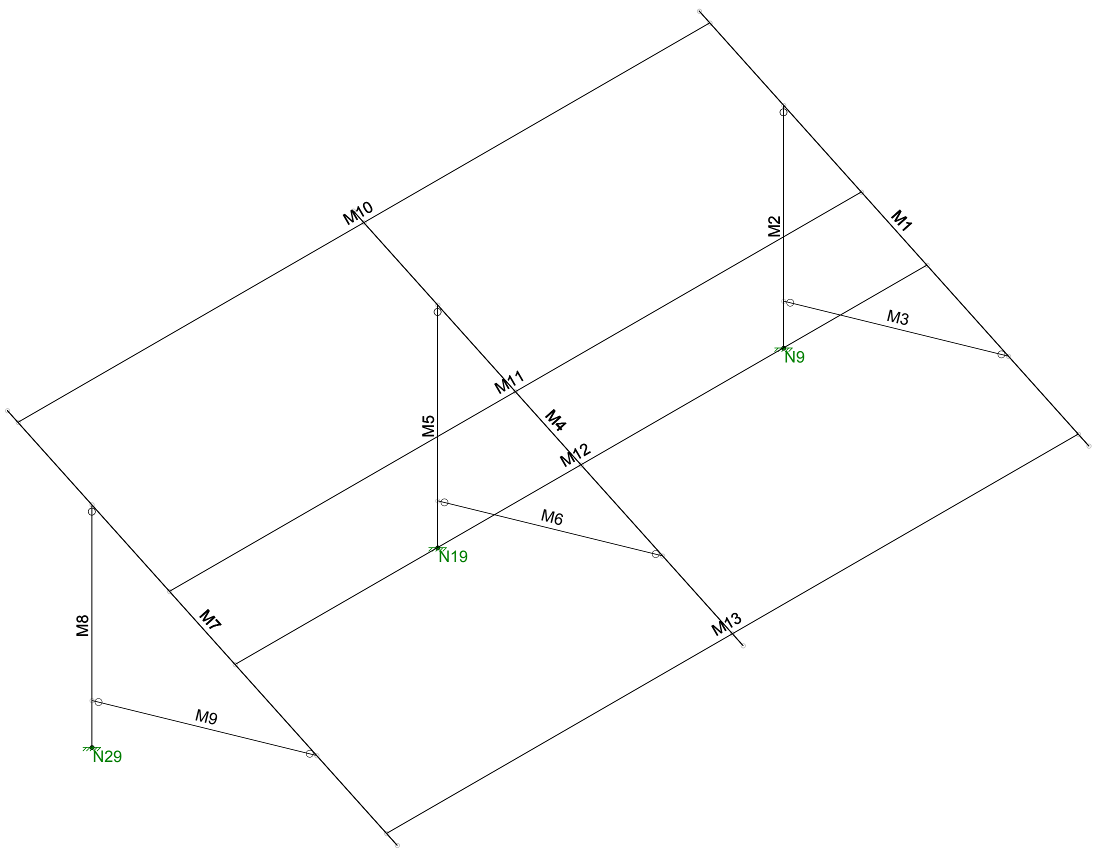


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

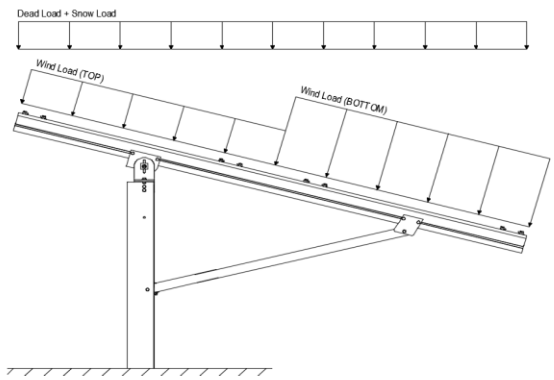
1.2 Construction

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

PV modules are required to meet the following specifications:

	Maximum			Minimum	
Height =	2000	mm	Height =	1900	mm
Width =	1050	mm	Width =	970	mm
Dead Load =	3.00	psf	Dead Load =	1.75	psf

Modules Per Row = 2
Module Tilt = 25°
Maximum Height Above Grade = 3 ft



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

g_{MAX} = 3.00 psf
g_{MIN} = 1.75 psf

Self-weight of the PV modules.

2.2 Snow Loads

Ground Snow Load, P_g =	30.00	psf	
Sloped Roof Snow Load, P_s =	18.56	psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00		
C_s =	0.82		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V = 160 mph
Height < 15 ft

Exposure Category = C
Importance Category = II

Peak Velocity Pressure, q_z = 40.19 psf *Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

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

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

2.4 Seismic Loads

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

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

2.5 Combination of Loads

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

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

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

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

Purlins	Location	**Posts**	Location
M10	Top	M2	Outer
M11	Mid-Top	M5	Inner
M12	Mid-Bottom	M8	Outer
M13	Bottom		

Girders	Location	**Reactions**	Location
M1	Outer	N9	Outer
M4	Inner	N19	Inner
M7	Outer	N29	Outer

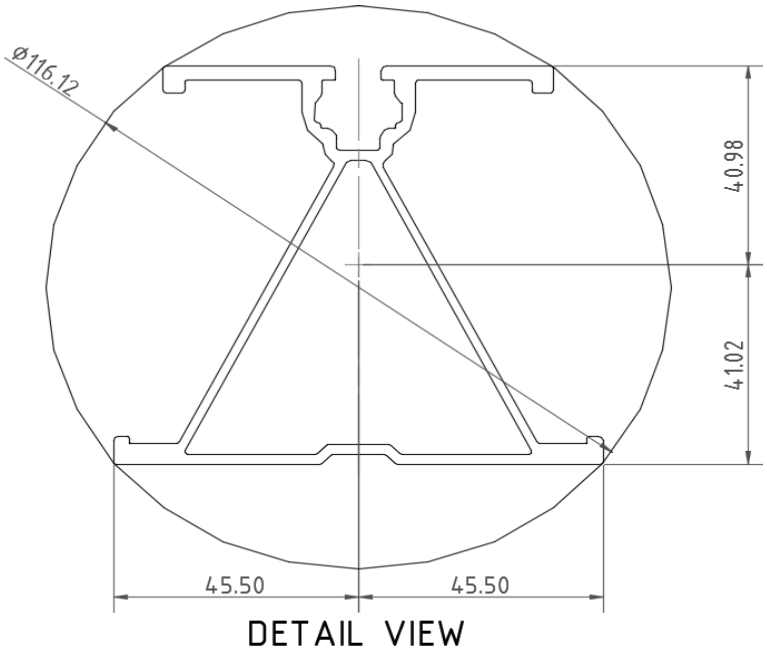
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

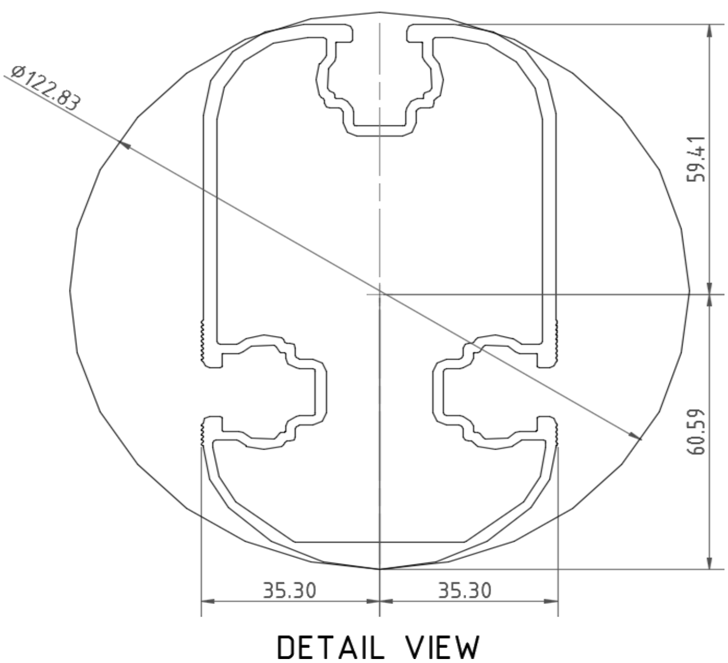
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	72	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	0.942	k-ft
M_z =	0.176	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	49%	



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).

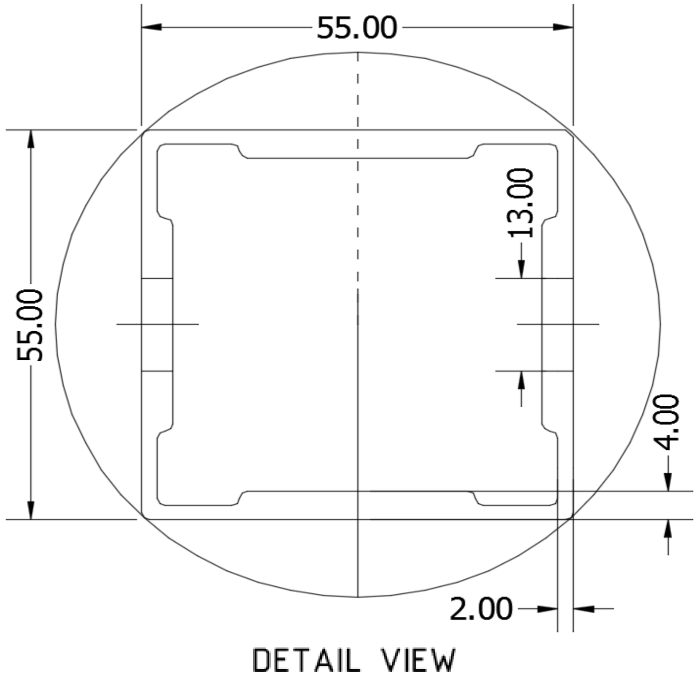
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	81.77	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.06	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.097	k-ft
M_z =	0.000	k-ft
P_n =	1.986	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	86%	



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).

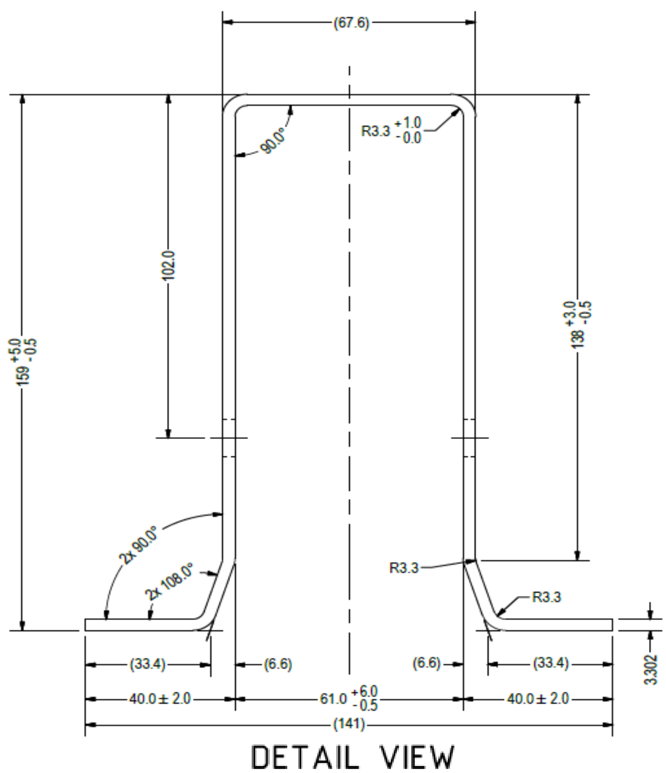
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	5.205	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	56%	



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 =	81.31	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 =	11.070	k-ft
M_z =	0.000	k-ft
P_r =	5.680	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	30.879	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 =	6.65	k
Maximum Lateral Load =	3.53	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)

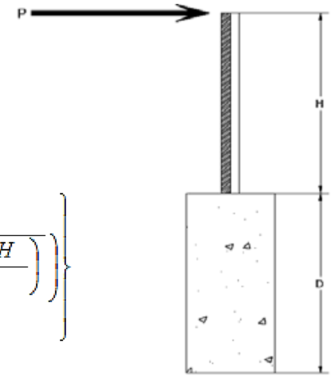
Lateral Force @ Top of Pole, P =	0.97	k
Height of Pole Above Grade, H =	5.78	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

$$A = 2.34\,\frac{P}{S_1 B}$$

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.97	k
Height of Pole Above Grade, H =	5.78	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 =	5.24	
Required Footing Depth, D =	8.93	ft
2nd Trial @ D_2 =	6.09	ft
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf
Lateral Soil Bearing @ D, S_3 =	1.22	ksf
Constant $2.34P/(S_1B)$, A =	2.80	
Required Footing Depth, D =	5.82	ft
3rd Trial @ D_3 =	5.96	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.19	ksf
Constant $2.34P/(S_1B)$, A =	2.86	
Required Footing Depth, D =	5.91	ft
4th Trial @ D_4 =	5.93	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.19	ksf
Constant $2.34P/(S_1B)$, A =	2.87	
Required Footing Depth, D =	5.92	ft
5th Trial @ D_5 =	5.93	ft
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf
Lateral Soil Bearing @ D, S_3 =	1.19	ksf
Constant $2.34P/(S_1B)$, A =	2.87	
Required Footing Depth, D =	6.00	ft

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

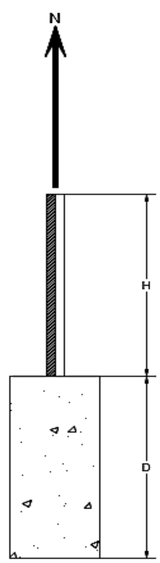
5.4 Uplifting Force Resistance

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

Weight of Concrete, g_{con} =	145	pcf
Uplifting Force, N =	3.05	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 =	1.97	k
Required Concrete Volume, V =	13.57	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.60
2	0.4	0.2	118.10	6.50
3	0.6	0.2	118.10	6.39
4	0.8	0.2	118.10	6.29
5	1	0.2	118.10	6.19
6	1.2	0.2	118.10	6.08
7	1.4	0.2	118.10	5.98
8	1.6	0.2	118.10	5.87
9	1.8	0.2	118.10	5.77
10	2	0.2	118.10	5.67
11	2.2	0.2	118.10	5.56
12	2.4	0.2	118.10	5.46
13	2.6	0.2	118.10	5.36
14	2.8	0.2	118.10	5.25
15	3	0.2	118.10	5.15
16	3.2	0.2	118.10	5.05
17	3.4	0.2	118.10	4.94
18	3.6	0.2	118.10	4.84
19	3.8	0.2	118.10	4.73
20	4	0.2	118.10	4.63
21	4.2	0.2	118.10	4.53
22	4.4	0.2	118.10	4.42
23	4.6	0.2	118.10	4.32
24	0	0.0	0.00	4.32
25	0	0.0	0.00	4.32
26	0	0.0	0.00	4.32
27	0	0.0	0.00	4.32
28	0	0.0	0.00	4.32
29	0	0.0	0.00	4.32
30	0	0.0	0.00	4.32
31	0	0.0	0.00	4.32
32	0	0.0	0.00	4.32
33	0	0.0	0.00	4.32
34	0	0.0	0.00	4.32
Max	4.6	Sum	1.09	

A 2ft diameter x 4.5ft deep footing unrestrained at ground level is required for the racking structure.



5.5 Compressive Force Resistance

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

Depth Below Grade, D =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.49	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	18.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

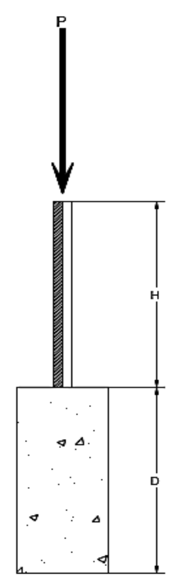
Weight of Concrete

Footing Volume	18.85	ft^3
Weight	2.73	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.83	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.05	k
Applied Force =	6.22	k
Utilization =	62%	

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

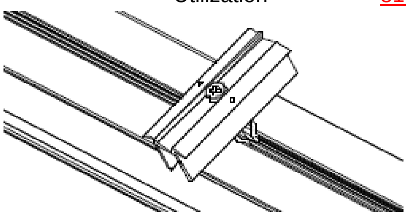


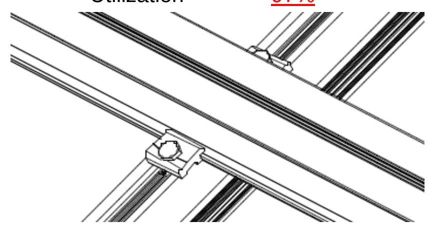
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

Fastening of Modules to Purlins		Fastening of Purlins to Girders	
Maximum Uplifting Force =	0.982 k	Maximum Uplifting Force =	2.106 k
Allowable Uplift =	1.214 k	Allowable Uplift =	2.180 k
Utilization =	81%	Utilization =	97%



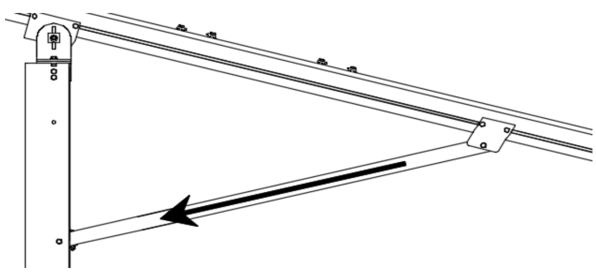


6.2 Strut Connections

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

Maximum Axial Load =	5.205 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	59%

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

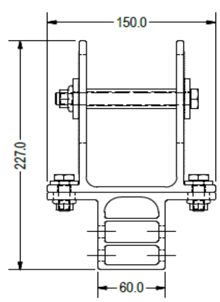


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

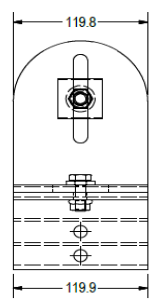
6.3 Girder to Post Connection

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.

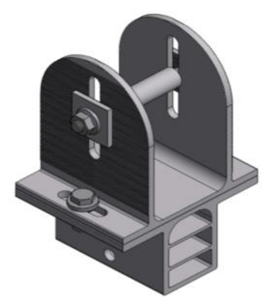
Maximum Tensile Load =	4.318 k
Allowable Load =	5.649 k
Utilization =	76%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

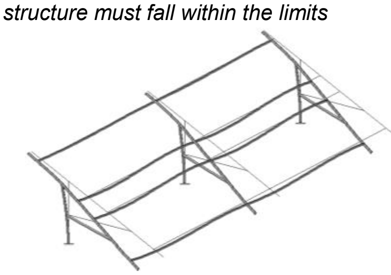
7.1 Seismic Drift

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} =	74.39 in
Allowable Story Drift for All Other Structures, Δ = {	$0.020h_{sx}$
	1.488 in
Max Drift, Δ_{MAX} =	0.655 in

0.655 ≤ 1.488, 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:

3.4.14

L_b = 72 in

J = 0.432

199.186

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

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= 28.8 ksi

3.4.16

b/t = 32.195

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 25.1 ksi

3.4.16.1 Not Used

Rb/t =

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 37.0588

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

S1 = 36.9

m = 0.65

C_0 = 40.985

Cc = 41.015

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

S2 = 77.2

φF_L= φb[Bbr-mDbr*h/t]

φF_L= 43.2 ksi

φF_LSt= 25.1 ksi

Ix = 897074 mm^4

2.155 in^4

y = 41.015 mm

Sx = 1.335 in^3

M_{max}St = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 72

J = 0.432

126.67

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

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= 29.7

3.4.16

b/t = 37.0588

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 23.1 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 32.195

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

S1 = 36.9

m = 0.65

C_0 = 45.5

Cc = 45.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 23.1 ksi

Iy = 446476 mm^4

1.073 in^4

x = 45.5 mm

Sy = 0.599 in^3

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 = 81.7717 in
J = 1.98
105.231

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

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= 30.1 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 = 81.7717
J = 1.98
114.202

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

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= 29.9

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

$\varphi F_L = \varphi b[Bt-Dt^*\sqrt{(Rb/t)}]$

$\varphi F_L =$ 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

$\varphi F_L = 1.3\varphi yFcy$

$\varphi F_L =$ 43.2 ksi

$\varphi F_L St =$ 30.1 ksi

Ix = 1970917 mm^4

4.735 in^4

y = 61.046 mm

Sx = 1.970 in^3

$M_{max}St$ = 4.935 k-ft

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

$\varphi F_L = 1.3\varphi yFcy$

$\varphi F_L =$ 43.2 ksi

$\varphi F_L Wk =$ 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)

$\varphi F_L = \varphi yFcy$

$\varphi F_L =$ 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

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

$\varphi F_L =$ 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

$\varphi F_L = \varphi c[Bt-Dt^*\sqrt{(Rb/t)}]$

$\varphi F_L =$ 30.80 ksi

$\varphi F_L =$ 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 = 74.8031 in
J = 0.942
116.737

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

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= 29.9 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 = 74.8031
J = 0.942
116.737

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

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= 29.9

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 = 1.73045

r = 0.81 in

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

$S1^{*}$ = 0.33515

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

$S2^{*}$ = 1.23671

φcc = 0.82226

φF_L= (φccFcy)/(λ²)

φF_L= 9.61085 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)

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L= φc[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

φF_L= φyFcy

φF_L= 33.25 ksi

φF_L= 9.61 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 9.89 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	81.31	in	
Pr =	5.68	k	(LRFD Factored Load)
Mr (Strong) =	11.07	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	116.99	
4.71√(E/Fy) =	103.55	=> kL/r > 4.71√(E/Fy)
Fcr =	18.34	ksi
Fe =	20.91	ksi
Pn =	40.9	k

Torsional/Flexural Torsional Buckling:

Fcr =	13.8471	ksi
Fey =	53.3447	ksi
Fez =	17.7356	ksi
Pn =	30.879	k

Bending (Strong Axis):

Yielding:		
Mn =	21.95	k-ft
Flange Local Buckling:		
Mn =	19.207	k-ft

Pr/Pc =	0.2044	≥	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 =	0.204	≥	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	-9.843	-9.843	0	0
2	M11	Y	-9.843	-9.843	0	0
3	M12	Y	-9.843	-9.843	0	0
4	M13	Y	-9.843	-9.843	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	-5.454	-5.454	0	0
2	M11	Y	-5.454	-5.454	0	0
3	M12	Y	-5.454	-5.454	0	0
4	M13	Y	-5.454	-5.454	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	-55.176	-55.176	0	0
2	M11	Y	-55.176	-55.176	0	0
3	M12	Y	-55.176	-55.176	0	0
4	M13	Y	-55.176	-55.176	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	-145.059	-145.059	0	0
2	M11	y	-145.059	-145.059	0	0
3	M12	y	-224.182	-224.182	0	0
4	M13	y	-224.182	-224.182	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	290.117	290.117	0	0
2	M11	y	290.117	290.117	0	0
3	M12	y	131.872	131.872	0	0
4	M13	y	131.872	131.872	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	7.874	7.874	0	0
2	M11	Z	7.874	7.874	0	0
3	M12	Z	7.874	7.874	0	0
4	M13	Z	7.874	7.874	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	520.254	2	2309.585	2	89.771	2	.136	1	.006	5	6.989	1
2		min	-875.258	3	-1778.438	3	-265.385	5	-1.172	5	-.004	2	.676	12
3	N19	max	2704.643	2	5675.323	2	0	2	0	1	.006	4	8.803	1
4		min	-2529.651	3	-5107.483	3	-277.445	5	-1.212	4	0	3	.275	15
5	N29	max	520.254	2	2309.585	2	107.509	3	.148	3	.007	4	6.989	1
6		min	-875.258	3	-1778.438	3	-281.035	4	-1.211	4	-.001	3	-.543	5
7	Totals:	max	3745.152	2	10294.493	2	0	1						
8		min	-4280.166	3	-8664.36	3	-813.571	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.004	2	0	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-2.584	12	320.386	3	7.482	3	.042	3	.213	1	.27	2
4			min	-178.056	1	-729.804	2	-101.935	1	-.157	2	-.004	3	-.117	3
5		3	max	-2.971	12	319.143	3	7.482	3	.042	3	.146	1	.749	2
6			min	-178.829	1	-731.462	2	-101.935	1	-.157	2	0	3	-.327	3
7		4	max	-3.358	12	317.899	3	7.482	3	.042	3	.079	1	1.23	2
8			min	-179.602	1	-733.12	2	-101.935	1	-.157	2	.004	12	-.536	3
9		5	max	661.823	3	656.055	2	17.593	3	-.006	9	.101	2	1.456	2
10			min	-1726.299	2	-267.937	3	-122.732	1	-.024	2	-.029	3	-.637	3
11		6	max	661.243	3	654.397	2	17.593	3	-.006	9	.027	2	1.026	2
12			min	-1727.072	2	-269.18	3	-122.732	1	-.024	2	-.026	5	-.461	3
13		7	max	660.664	3	652.739	2	17.593	3	-.006	9	-.004	12	.597	2
14			min	-1727.845	2	-270.424	3	-122.732	1	-.024	2	-.067	4	-.284	3
15		8	max	660.084	3	651.081	2	17.593	3	-.006	9	.005	3	.169	2
16			min	-1728.618	2	-271.667	3	-122.732	1	-.024	2	-.144	1	-.106	3
17		9	max	658.536	3	11.517	3	32.169	3	.015	5	.089	1	-.001	15
18			min	-1855.456	2	-.034	15	-169.389	1	-.108	2	.005	12	-.035	2
19		10	max	657.956	3	10.273	3	32.169	3	.015	5	.029	3	-.001	15
20			min	-1856.229	2	-.788	5	-169.389	1	-.108	2	-.025	2	-.038	2
21		11	max	657.376	3	9.03	3	32.169	3	.015	5	.05	3	0	15
22			min	-1857.003	2	-1.798	13	-169.389	1	-.108	2	-.133	1	-.041	2
23		12	max	649.777	3	698.996	3	-1.494	10	.135	3	.108	1	.106	2
24			min	-1977.648	2	-425.115	2	-156.821	4	-.127	2	.024	12	-.267	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	649.197	3	697.752	3	-1.494	10	.135	3	.087	1	.385	2
26			min	-1978.421	2	-426.773	2	-158.407	4	-.127	2	-.025	3	-.725	3
27		14	max	648.617	3	696.508	3	-1.494	10	.135	3	.067	2	.666	2
28			min	-1979.194	2	-428.431	2	-159.992	4	-.127	2	-.11	5	-1.182	3
29		15	max	648.037	3	695.265	3	-1.494	10	.135	3	.06	2	.948	2
30			min	-1979.967	2	-430.089	2	-161.578	4	-.127	2	-.21	5	-1.639	3
31		16	max	179.53	1	434.293	2	52.054	5	.084	2	.015	3	.722	2
32			min	2.323	12	-743.355	3	-92.522	1	-.241	3	-.134	4	-1.251	3
33		17	max	178.757	1	432.635	2	50.469	5	.084	2	.016	3	.437	2
34			min	1.936	12	-744.598	3	-92.522	1	-.241	3	-.16	1	-.762	3
35		18	max	177.984	1	430.976	2	48.883	5	.084	2	.016	3	.154	2
36			min	1.484	3	-745.842	3	-92.522	1	-.241	3	-.221	1	-.273	3
37		19	max	0	1	0	15	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.006	2	0	4	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	31.62	10	869.578	3	0	1	.028	4	.189	4	.511	2
42			min	-162.976	1	-1679.981	2	-70.992	5	0	1	0	1	-.271	3
43		3	max	30.976	10	868.334	3	0	1	.028	4	.142	4	1.614	2
44			min	-163.749	1	-1681.639	2	-72.578	5	0	1	0	1	-.841	3
45		4	max	30.331	10	867.091	3	0	1	.028	4	.094	4	2.718	2
46			min	-164.522	1	-1683.297	2	-74.164	5	0	1	0	1	-1.41	3
47		5	max	2039.096	3	1730.79	2	0	1	0	1	.012	4	3.196	2
48			min	-3964.781	2	-940.601	3	-72.369	4	-.011	4	0	1	-1.647	3
49		6	max	2038.516	3	1729.132	2	0	1	0	1	0	1	2.06	2
50			min	-3965.554	2	-941.844	3	-73.955	4	-.011	4	-.036	5	-1.03	3
51		7	max	2037.936	3	1727.474	2	0	1	0	1	0	1	.926	2
52			min	-3966.327	2	-943.088	3	-75.541	4	-.011	4	-.085	4	-.411	3
53		8	max	2037.356	3	1725.815	2	0	1	0	1	0	1	.208	3
54			min	-3967.1	2	-944.331	3	-77.126	4	-.011	4	-.135	4	-.207	2
55		9	max	2006.951	3	-.04	3	0	1	.012	4	.12	4	.507	3
56			min	-3924.709	2	-132.97	2	-175.363	4	0	1	0	1	-.722	2
57		10	max	2006.371	3	-1.284	3	0	1	.012	4	.004	5	.507	3
58			min	-3925.483	2	-134.628	2	-176.949	4	0	1	0	1	-.635	2
59		11	max	2005.791	3	-2.306	12	0	1	.012	4	0	1	.509	3
60			min	-3926.256	2	-136.286	2	-178.534	4	0	1	-.113	4	-.546	2
61		12	max	1987.489	3	2020.444	3	0	1	.101	4	.127	5	.01	9
62			min	-3896.251	2	-1476.594	2	-170.217	4	0	1	0	1	-.123	3
63		13	max	1986.909	3	2019.2	3	0	1	.101	4	.015	5	.915	2
64			min	-3897.024	2	-1478.252	2	-171.803	4	0	1	0	1	-1.448	3
65		14	max	1986.329	3	2017.956	3	0	1	.101	4	0	1	1.885	2
66			min	-3897.797	2	-1479.91	2	-173.388	4	0	1	-.099	4	-2.773	3
67		15	max	1985.749	3	2016.713	3	0	1	.101	4	0	1	2.857	2
68			min	-3898.57	2	-1481.568	2	-174.974	4	0	1	-.213	4	-4.097	3
69		16	max	164.666	1	1334.456	2	42.732	5	0	1	0	1	2.175	2
70			min	-30.252	10	-1916.058	3	0	1	-.089	4	-.112	5	-3.111	3
71		17	max	163.893	1	1332.798	2	41.147	5	0	1	0	1	1.3	2
72			min	-30.897	10	-1917.301	3	0	1	-.089	4	-.085	5	-1.853	3
73		18	max	163.12	1	1331.14	2	39.561	5	0	1	0	1	.426	2
74			min	-31.541	10	-1918.545	3	0	1	-.089	4	-.058	4	-.595	3
75		19	max	0	1	0	2	0	1	0	1	0	1	0	1
76			min	0	1	-.003	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.004	2	0	4	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	28.319	5	320.386	3	101.935	1	.157	2	.101	5	.27	2
80			min	-178.056	1	-729.804	2	-33.109	5	-.042	3	-.213	1	-.117	3
81		3	max	27.958	5	319.143	3	101.935	1	.157	2	.079	5	.749	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	-178.829	1	-731.462	2	-34.694	5	-.042	3	-.146	1	-.327	3
83		4	max	27.597	5	317.899	3	101.935	1	.157	2	.055	5	1.23	2
84			min	-179.602	1	-733.12	2	-36.28	5	-.042	3	-.079	1	-.536	3
85		5	max	661.823	3	656.055	2	122.732	1	.024	2	.029	3	1.456	2
86			min	-1726.299	2	-267.937	3	-33.015	5	-.009	5	-.101	2	-.637	3
87		6	max	661.243	3	654.397	2	122.732	1	.024	2	.018	3	1.026	2
88			min	-1727.072	2	-269.18	3	-34.6	5	-.009	5	-.028	4	-.461	3
89		7	max	660.664	3	652.739	2	122.732	1	.024	2	.063	1	.597	2
90			min	-1727.845	2	-270.424	3	-36.186	5	-.009	5	-.05	5	-.284	3
91		8	max	660.084	3	651.081	2	122.732	1	.024	2	.144	1	.169	2
92			min	-1728.618	2	-271.667	3	-37.771	5	-.009	5	-.074	5	-.106	3
93		9	max	658.536	3	11.517	3	169.389	1	.108	2	.053	5	-.003	15
94			min	-1855.456	2	1.399	15	-59.074	5	.013	15	-.089	1	-.035	2
95		10	max	657.956	3	10.273	3	169.389	1	.108	2	.025	2	-.003	15
96			min	-1856.229	2	.899	15	-60.659	5	.013	15	-.029	3	-.038	2
97		11	max	657.376	3	9.03	3	169.389	1	.108	2	.133	1	-.004	15
98			min	-1857.003	2	-.355	13	-62.245	5	.013	15	-.05	3	-.041	2
99		12	max	649.777	3	698.996	3	97.43	3	.127	2	.078	5	.106	2
100			min	-1977.648	2	-425.115	2	-145.089	5	-.135	3	-.108	1	-.267	3
101		13	max	649.197	3	697.752	3	97.43	3	.127	2	.025	3	.385	2
102			min	-1978.421	2	-426.773	2	-146.674	5	-.135	3	-.087	1	-.725	3
103		14	max	648.617	3	696.508	3	97.43	3	.127	2	.089	3	.666	2
104			min	-1979.194	2	-428.431	2	-148.26	5	-.135	3	-.124	4	-1.182	3
105		15	max	648.037	3	695.265	3	97.43	3	.127	2	.153	3	.948	2
106			min	-1979.967	2	-430.089	2	-149.845	5	-.135	3	-.217	4	-1.639	3
107		16	max	179.53	1	434.293	2	92.522	1	.241	3	.099	1	.722	2
108			min	1.765	15	-743.355	3	-.206	3	-.086	4	-.109	5	-1.251	3
109		17	max	178.757	1	432.635	2	92.522	1	.241	3	.16	1	.437	2
110			min	1.532	15	-744.598	3	-.206	3	-.086	4	-.069	5	-.762	3
111		18	max	177.984	1	430.976	2	92.522	1	.241	3	.221	1	.154	2
112			min	1.299	15	-745.842	3	-.206	3	-.086	4	-.031	5	-.273	3
113		19	max	0	1	0	4	0	3	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	92.555	1	429.665	2	-.904	3	.01	2	.252	1	.086	4
116			min	-.205	3	-747.063	3	-177.472	1	-.024	3	-.016	3	-.241	3
117		2	max	92.555	1	308.063	2	.86	3	.01	2	.143	1	.194	3
118			min	-.205	3	-557.436	3	-148.763	1	-.024	3	-.016	3	-.161	2
119		3	max	92.555	1	186.461	2	2.625	3	.01	2	.076	2	.502	3
120			min	-.205	3	-367.808	3	-120.054	1	-.024	3	-.015	3	-.326	2
121		4	max	92.555	1	64.859	2	4.389	3	.01	2	.022	2	.684	3
122			min	-.205	3	-178.181	3	-91.344	1	-.024	3	-.023	9	-.41	2
123		5	max	92.555	1	17.846	5	6.154	3	.01	2	-.005	15	.74	3
124			min	-.205	3	-56.743	2	-62.881	2	-.024	3	-.068	1	-.413	2
125		6	max	92.555	1	201.074	3	7.918	3	.01	2	-.002	15	.669	3
126			min	-.205	3	-178.345	2	-51.272	2	-.024	3	-.101	1	-.334	2
127		7	max	92.555	1	390.701	3	13.92	14	.01	2	.002	5	.472	3
128			min	-.205	3	-299.947	2	-39.662	2	-.024	3	-.114	1	-.175	2
129		8	max	92.555	1	580.329	3	30.909	9	.01	2	.009	3	.148	3
130			min	-.205	3	-421.549	2	-28.053	2	-.024	3	-.115	2	-.016	5
131		9	max	92.555	1	769.956	3	52.203	1	.01	2	.017	3	.387	2
132			min	-6.653	5	-543.151	2	-19.345	10	-.024	3	-.129	2	-.302	3
133		10	max	92.555	1	959.583	3	16.148	10	.024	3	.034	4	.79	2
134			min	-.205	3	26.787	15	-80.912	1	-.004	14	-.137	2	-.879	3
135		11	max	92.555	1	543.151	2	19.345	10	.024	3	.017	3	.387	2
136			min	-.205	3	-769.956	3	-52.203	1	-.01	2	-.129	2	-.302	3
137		12	max	92.555	1	421.549	2	28.053	2	.024	3	.009	3	.148	3
138			min	-.205	3	-580.329	3	-30.909	9	-.01	2	-.115	2	.013	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	92.555	1	299.947	2	39.662	2	.024	3	.002	3	.472	3
140			min	-.232	15	-390.701	3	-12.166	9	-.01	2	-.114	1	-.175	2
141		14	max	92.555	1	178.345	2	51.272	2	.024	3	-.003	12	.669	3
142			min	-7.99	5	-201.074	3	-7.918	3	-.01	2	-.101	1	-.334	2
143		15	max	92.555	1	56.743	2	62.881	2	.024	3	0	15	.74	3
144			min	-15.857	5	-11.446	3	-6.154	3	-.01	2	-.068	1	-.413	2
145		16	max	92.555	1	178.181	3	91.344	1	.024	3	.022	2	.684	3
146			min	-23.724	5	-64.859	2	-4.389	3	-.01	2	-.023	9	-.41	2
147		17	max	92.555	1	367.808	3	120.054	1	.024	3	.076	2	.502	3
148			min	-31.591	5	-186.461	2	-2.625	3	-.01	2	-.015	3	-.326	2
149		18	max	92.555	1	557.436	3	148.763	1	.024	3	.143	1	.194	3
150			min	-39.458	5	-308.063	2	-.86	3	-.01	2	-.016	3	-.161	2
151		19	max	92.555	1	747.063	3	177.472	1	.024	3	.252	1	.084	2
152			min	-47.325	5	-429.665	2	.904	3	-.01	2	-.016	3	-.241	3
153	M11	1	max	135.759	1	425.984	2	50.072	5	.005	3	.31	1	.078	4
154			min	-129.428	3	-692.509	3	-192.164	1	-.012	2	-.171	5	-.185	3
155		2	max	135.759	1	304.382	2	51.862	5	.005	3	.191	1	.213	3
156			min	-129.428	3	-502.882	3	-163.455	1	-.012	2	-.137	5	-.225	2
157		3	max	135.759	1	182.78	2	53.653	5	.005	3	.104	2	.485	3
158			min	-129.428	3	-313.255	3	-134.745	1	-.012	2	-.102	5	-.387	2
159		4	max	135.759	1	61.178	2	55.443	5	.005	3	.043	2	.631	3
160			min	-129.428	3	-123.627	3	-106.036	1	-.012	2	-.069	4	-.468	2
161		5	max	135.759	1	66	3	57.233	5	.005	3	.001	10	.65	3
162			min	-129.428	3	-60.424	2	-77.327	1	-.012	2	-.05	1	-.468	2
163		6	max	135.759	1	255.628	3	59.024	5	.005	3	.01	5	.543	3
164			min	-129.428	3	-182.026	2	-62.214	2	-.012	2	-.092	1	-.388	2
165		7	max	135.759	1	445.255	3	62.59	4	.005	3	.05	5	.309	3
166			min	-129.428	3	-303.628	2	-50.604	2	-.012	2	-.114	1	-.226	2
167		8	max	135.759	1	634.882	3	70.622	4	.005	3	.092	5	.018	1
168			min	-129.428	3	-425.231	2	-38.995	2	-.012	2	-.123	2	-.051	3
169		9	max	135.759	1	824.51	3	78.655	4	.005	3	.134	5	.341	2
170			min	-129.428	3	-546.833	2	-27.386	2	-.012	2	-.145	2	-.537	3
171		10	max	135.759	1	190.54	14	66.22	1	.005	3	.181	4	.746	2
172			min	-129.428	3	-1014.137	3	-21.098	10	-.012	2	-.159	2	-1.15	3
173		11	max	135.759	1	546.833	2	56.295	5	.012	2	.01	3	.341	2
174			min	-129.428	3	-824.51	3	-42.146	9	-.005	3	-.147	4	-.537	3
175		12	max	135.759	1	425.231	2	58.085	5	.012	2	.005	3	.022	4
176			min	-129.428	3	-634.882	3	-23.403	9	-.005	3	-.123	2	-.051	3
177		13	max	135.759	1	303.628	2	59.875	5	.012	2	.003	3	.309	3
178			min	-129.428	3	-445.255	3	-4.66	9	-.005	3	-.114	1	-.226	2
179		14	max	135.759	1	182.026	2	66.526	4	.012	2	0	3	.543	3
180			min	-129.428	3	-255.628	3	-1.776	3	-.005	3	-.092	1	-.388	2
181		15	max	135.759	1	60.424	2	77.327	1	.012	2	.021	5	.65	3
182			min	-129.428	3	-66	3	-.012	3	-.005	3	-.05	1	-.468	2
183		16	max	135.759	1	123.627	3	106.036	1	.012	2	.064	5	.631	3
184			min	-129.428	3	-61.178	2	1.366	12	-.005	3	-.008	9	-.468	2
185		17	max	135.759	1	313.255	3	134.745	1	.012	2	.119	4	.485	3
186			min	-129.428	3	-182.78	2	2.542	12	-.005	3	.002	12	-.387	2
187		18	max	135.759	1	502.882	3	163.455	1	.012	2	.191	1	.213	3
188			min	-129.428	3	-304.382	2	3.718	12	-.005	3	.004	12	-.225	2
189		19	max	135.759	1	692.509	3	192.164	1	.012	2	.31	1	.028	1
190			min	-129.428	3	-425.984	2	4.895	12	-.005	3	.007	12	-.185	3
191	M12	1	max	19.554	5	641.182	2	46.645	5	0	12	.329	1	.084	2
192			min	-45.892	1	-285.059	3	-197.167	1	-.006	1	-.159	5	.016	9
193		2	max	14.643	3	466.831	2	48.435	5	0	12	.207	1	.201	3
194			min	-45.892	1	-200.928	3	-168.458	1	-.006	1	-.128	5	-.285	2
195		3	max	14.643	3	292.481	2	50.226	5	0	12	.118	2	.307	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	-45.892	1	-116.797	3	-139.748	1	-.006	1	-.095	5	-.538	2
197		4	max	14.643	3	118.13	2	52.016	5	0	12	.054	2	.356	3
198			min	-45.892	1	-32.667	3	-111.039	1	-.006	1	-.063	4	-.675	2
199		5	max	14.643	3	51.464	3	53.806	5	0	12	.005	10	.35	3
200			min	-45.892	1	-56.221	2	-82.33	1	-.006	1	-.044	1	-.696	2
201		6	max	14.643	3	135.595	3	55.597	5	0	12	.011	5	.288	3
202			min	-45.892	1	-230.571	2	-67.941	2	-.006	1	-.089	1	-.6	2
203		7	max	14.643	3	219.726	3	58.673	4	0	12	.049	5	.169	3
204			min	-45.892	1	-404.922	2	-56.332	2	-.006	1	-.115	1	-.388	2
205		8	max	14.643	3	303.856	3	66.706	4	0	12	.088	5	-.003	12
206			min	-45.892	1	-579.273	2	-44.723	2	-.006	1	-.128	2	-.063	1
207		9	max	14.643	3	387.987	3	74.738	4	0	12	.128	5	.384	2
208			min	-52.447	4	-753.623	2	-33.114	2	-.006	1	-.154	2	-.236	3
209		10	max	14.643	3	-8.782	15	82.771	4	0	3	.172	4	.945	2
210			min	-60.314	4	-927.974	2	-24.182	10	-.006	1	-.172	2	-.523	3
211		11	max	37.461	5	753.623	2	53.233	5	.006	1	.018	3	.384	2
212			min	-45.892	1	-387.987	3	-40.393	9	-.001	5	-.154	2	-.236	3
213		12	max	29.594	5	579.273	2	55.023	5	.006	1	.01	3	0	5
214			min	-45.892	1	-303.856	3	-21.65	9	-.001	5	-.128	2	-.063	1
215		13	max	21.727	5	404.922	2	56.814	5	.006	1	.003	3	.169	3
216			min	-45.892	1	-219.726	3	-9.622	3	-.001	5	-.115	1	-.388	2
217		14	max	14.643	3	230.571	2	67.941	2	.006	1	-.002	12	.288	3
218			min	-45.892	1	-135.595	3	-7.858	3	-.001	5	-.089	1	-.6	2
219		15	max	14.643	3	56.221	2	82.33	1	.006	1	.019	5	.35	3
220			min	-45.892	1	-51.464	3	-6.094	3	-.001	5	-.044	1	-.696	2
221		16	max	14.643	3	32.667	3	111.039	1	.006	1	.06	5	.356	3
222			min	-45.892	1	-118.13	2	-4.329	3	-.001	5	-.011	3	-.675	2
223		17	max	14.643	3	116.797	3	139.748	1	.006	1	.118	2	.307	3
224			min	-45.892	1	-292.481	2	-2.565	3	-.001	5	-.013	3	-.538	2
225		18	max	14.643	3	200.928	3	168.458	1	.006	1	.207	1	.201	3
226			min	-45.892	1	-466.831	2	-.8	3	-.001	5	-.014	3	-.285	2
227		19	max	14.643	3	285.059	3	197.167	1	.006	1	.329	1	.084	2
228			min	-45.892	1	-641.182	2	.964	3	-.001	5	-.014	3	-.026	5
229	M13	1	max	31.429	5	729.405	2	28.683	5	.01	3	.247	1	.157	2
230			min	-101.834	1	-321.663	3	-176.985	1	-.025	2	-.112	5	-.042	3
231		2	max	23.562	5	555.055	2	30.473	5	.01	3	.139	1	.144	3
232			min	-101.834	1	-237.532	3	-148.276	1	-.025	2	-.092	5	-.271	2
233		3	max	15.695	5	380.704	2	32.263	5	.01	3	.072	2	.275	3
234			min	-101.834	1	-153.401	3	-119.566	1	-.025	2	-.071	5	-.583	2
235		4	max	7.828	5	206.353	2	34.054	5	.01	3	.019	2	.349	3
236			min	-101.834	1	-69.271	3	-90.857	1	-.025	2	-.058	4	-.779	2
237		5	max	7.481	3	34.241	1	35.844	5	.01	3	-.003	12	.367	3
238			min	-101.834	1	5.574	15	-62.649	2	-.025	2	-.072	1	-.858	2
239		6	max	7.481	3	98.991	3	37.634	5	.01	3	0	15	.329	3
240			min	-101.834	1	-142.348	2	-51.04	2	-.025	2	-.103	1	-.821	2
241		7	max	7.481	3	183.122	3	43.72	4	.01	3	.024	5	.235	3
242			min	-101.834	1	-316.699	2	-39.431	2	-.025	2	-.116	1	-.668	2
243		8	max	7.481	3	267.252	3	51.752	4	.01	3	.051	5	.085	3
244			min	-101.834	1	-491.049	2	-27.822	2	-.025	2	-.118	2	-.399	2
245		9	max	7.481	3	351.383	3	60.556	14	.01	3	.079	5	.002	10
246			min	-101.834	1	-665.4	2	-19.26	10	-.025	2	-.132	2	-.121	3
247		10	max	7.481	3	839.751	2	75.984	14	.01	3	.117	4	.488	2
248			min	-101.834	1	-435.514	3	-81.399	1	-.025	2	-.139	2	-.383	3
249		11	max	22.211	5	665.4	2	33.451	5	.025	2	.017	3	.006	5
250			min	-101.834	1	-351.383	3	-52.69	1	-.01	3	-.132	2	-.121	3
251		12	max	14.344	5	491.049	2	35.241	5	.025	2	.01	3	.085	3
252			min	-101.834	1	-267.252	3	-31.215	9	-.01	3	-.118	2	-.399	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	7.481	3	316.699	2	39.431	2	.025	2	.004	3	.235	3
254			min	-101.834	1	-183.122	3	-12.473	9	-.01	3	-.116	1	-.668	2
255		14	max	7.481	3	142.348	2	51.04	2	.025	2	0	12	.329	3
256			min	-101.834	1	-98.991	3	-6.193	3	-.01	3	-.103	1	-.821	2
257		15	max	7.481	3	5.52	5	62.649	2	.025	2	.017	5	.367	3
258			min	-101.834	1	-34.241	1	-4.428	3	-.01	3	-.072	1	-.858	2
259		16	max	7.481	3	69.271	3	90.857	1	.025	2	.044	5	.349	3
260			min	-101.834	1	-206.353	2	-2.664	3	-.01	3	-.025	9	-.779	2
261		17	max	7.481	3	153.401	3	119.566	1	.025	2	.077	4	.275	3
262			min	-101.834	1	-380.704	2	-.899	3	-.01	3	-.008	3	-.583	2
263		18	max	7.481	3	237.532	3	148.276	1	.025	2	.139	1	.144	3
264			min	-101.834	1	-555.055	2	.865	3	-.01	3	-.008	3	-.271	2
265		19	max	7.481	3	321.663	3	176.985	1	.025	2	.247	1	.157	2
266			min	-101.834	1	-729.405	2	2.197	12	-.01	3	-.007	3	-.042	3
267	M2	1	max	2309.585	2	874.853	3	89.93	2	.006	5	1.172	5	6.989	1
268			min	-1778.438	3	-516.341	2	-265.478	5	-.004	2	-.136	1	.676	12
269		2	max	2306.663	2	874.853	3	89.93	2	.006	5	1.087	5	7.024	1
270			min	-1780.63	3	-516.341	2	-262.946	5	-.004	2	-.11	1	.507	12
271		3	max	2303.742	2	874.853	3	89.93	2	.006	5	1.003	5	7.059	1
272			min	-1782.821	3	-516.341	2	-260.414	5	-.004	2	-.084	1	.338	12
273		4	max	2300.82	2	874.853	3	89.93	2	.006	5	.92	5	7.093	1
274			min	-1785.012	3	-516.341	2	-257.882	5	-.004	2	-.058	1	.17	12
275		5	max	1724.31	2	1538.108	2	63.967	2	.001	2	.844	5	6.909	2
276			min	-1545.654	3	19.014	12	-243.748	5	0	3	-.061	1	.085	12
277		6	max	1721.388	2	1538.108	2	63.967	2	.001	2	.767	4	6.416	2
278			min	-1547.845	3	19.014	12	-241.216	5	0	3	-.042	1	.079	12
279		7	max	1718.466	2	1538.108	2	63.967	2	.001	2	.692	4	5.922	2
280			min	-1550.037	3	19.014	12	-238.684	5	0	3	-.038	3	.073	12
281		8	max	1715.545	2	1538.108	2	63.967	2	.001	2	.617	4	5.429	2
282			min	-1552.228	3	19.014	12	-236.152	5	0	3	-.07	3	.067	12
283		9	max	1712.623	2	1538.108	2	63.967	2	.001	2	.544	4	4.935	2
284			min	-1554.419	3	19.014	12	-233.619	5	0	3	-.101	3	.061	12
285		10	max	1709.701	2	1538.108	2	63.967	2	.001	2	.471	4	4.442	2
286			min	-1556.61	3	19.014	12	-231.087	5	0	3	-.132	3	.055	12
287		11	max	1706.779	2	1538.108	2	63.967	2	.001	2	.399	4	3.948	2
288			min	-1558.802	3	19.014	12	-228.555	5	0	3	-.164	3	.049	12
289		12	max	1703.858	2	1538.108	2	63.967	2	.001	2	.327	4	3.455	2
290			min	-1560.993	3	19.014	12	-226.023	5	0	3	-.195	3	.043	12
291		13	max	1700.936	2	1538.108	2	63.967	2	.001	2	.257	4	2.961	2
292			min	-1563.184	3	19.014	12	-223.491	5	0	3	-.226	3	.037	12
293		14	max	1698.014	2	1538.108	2	63.967	2	.001	2	.187	4	2.468	2
294			min	-1565.376	3	19.014	12	-220.959	5	0	3	-.258	3	.031	12
295		15	max	1695.092	2	1538.108	2	63.967	2	.001	2	.151	2	1.974	2
296			min	-1567.567	3	19.014	12	-218.426	5	0	3	-.289	3	.024	12
297		16	max	1692.171	2	1538.108	2	63.967	2	.001	2	.172	2	1.481	2
298			min	-1569.758	3	19.014	12	-215.894	5	0	3	-.32	3	.018	12
299		17	max	1689.249	2	1538.108	2	63.967	2	.001	2	.192	2	.987	2
300			min	-1571.95	3	19.014	12	-213.362	5	0	3	-.352	3	.012	12
301		18	max	1686.327	2	1538.108	2	63.967	2	.001	2	.213	2	.494	2
302			min	-1574.141	3	19.014	12	-210.83	5	0	3	-.383	3	.006	12
303		19	max	1683.405	2	1538.108	2	63.967	2	.001	2	.233	2	0	1
304			min	-1576.332	3	19.014	12	-208.298	5	0	3	-.414	3	0	1
305	M5	1	max	5675.323	2	2527.352	3	0	1	.006	4	1.212	4	8.803	1
306			min	-5107.483	3	-2692.276	2	-277.594	5	0	1	0	1	.275	15
307		2	max	5672.401	2	2527.352	3	0	1	.006	4	1.124	4	9.328	1
308			min	-5109.674	3	-2692.276	2	-275.062	5	0	1	0	1	.279	15
309		3	max	5669.479	2	2527.352	3	0	1	.006	4	1.036	4	9.853	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	-5111.865	3	-2692.276	2	-272.53	5	0	1	0	1	.284	15
311		4	max	5666.558	2	2527.352	3	0	1	.006	4	.95	4	10.622	2
312			min	-5114.057	3	-2692.276	2	-269.998	5	0	1	0	1	-.118	3
313		5	max	4286.837	2	2369.148	2	0	1	0	1	.871	4	10.642	2
314			min	-4358.718	3	-109.032	3	-258.223	4	0	4	0	1	-.49	3
315		6	max	4283.915	2	2369.148	2	0	1	0	1	.789	4	9.882	2
316			min	-4360.909	3	-109.032	3	-255.691	4	0	4	0	1	-.455	3
317		7	max	4280.994	2	2369.148	2	0	1	0	1	.707	4	9.122	2
318			min	-4363.1	3	-109.032	3	-253.159	4	0	4	0	1	-.42	3
319		8	max	4278.072	2	2369.148	2	0	1	0	1	.626	4	8.362	2
320			min	-4365.291	3	-109.032	3	-250.627	4	0	4	0	1	-.385	3
321		9	max	4275.15	2	2369.148	2	0	1	0	1	.546	4	7.602	2
322			min	-4367.483	3	-109.032	3	-248.095	4	0	4	0	1	-.35	3
323		10	max	4272.229	2	2369.148	2	0	1	0	1	.467	4	6.842	2
324			min	-4369.674	3	-109.032	3	-245.562	4	0	4	0	1	-.315	3
325		11	max	4269.307	2	2369.148	2	0	1	0	1	.389	4	6.081	2
326			min	-4371.865	3	-109.032	3	-243.03	4	0	4	0	1	-.28	3
327		12	max	4266.385	2	2369.148	2	0	1	0	1	.311	4	5.321	2
328			min	-4374.057	3	-109.032	3	-240.498	4	0	4	0	1	-.245	3
329		13	max	4263.463	2	2369.148	2	0	1	0	1	.234	4	4.561	2
330			min	-4376.248	3	-109.032	3	-237.966	4	0	4	0	1	-.21	3
331		14	max	4260.542	2	2369.148	2	0	1	0	1	.158	4	3.801	2
332			min	-4378.439	3	-109.032	3	-235.434	4	0	4	0	1	-.175	3
333		15	max	4257.62	2	2369.148	2	0	1	0	1	.083	4	3.041	2
334			min	-4380.631	3	-109.032	3	-232.902	4	0	4	0	1	-.14	3
335		16	max	4254.698	2	2369.148	2	0	1	0	1	.009	4	2.281	2
336			min	-4382.822	3	-109.032	3	-230.369	4	0	4	0	1	-.105	3
337		17	max	4251.776	2	2369.148	2	0	1	0	1	0	1	1.52	2
338			min	-4385.013	3	-109.032	3	-227.837	4	0	4	-.065	4	-.07	3
339		18	max	4248.855	2	2369.148	2	0	1	0	1	0	1	.76	2
340			min	-4387.204	3	-109.032	3	-225.305	4	0	4	-.137	4	-.035	3
341		19	max	4245.933	2	2369.148	2	0	1	0	1	0	1	0	1
342			min	-4389.396	3	-109.032	3	-222.773	4	0	4	-.209	4	0	1
343	M8	1	max	2309.585	2	874.853	3	107.378	3	.007	4	1.211	4	6.989	1
344			min	-1778.438	3	-516.341	2	-281.329	4	-.001	3	-.148	3	-.543	5
345		2	max	2306.663	2	874.853	3	107.378	3	.007	4	1.121	4	7.024	1
346			min	-1780.63	3	-516.341	2	-278.797	4	-.001	3	-.113	3	-.492	5
347		3	max	2303.742	2	874.853	3	107.378	3	.007	4	1.032	4	7.059	1
348			min	-1782.821	3	-516.341	2	-276.264	4	-.001	3	-.079	3	-.441	5
349		4	max	2300.82	2	874.853	3	107.378	3	.007	4	.943	4	7.093	1
350			min	-1785.012	3	-516.341	2	-273.732	4	-.001	3	-.044	3	-.39	5
351		5	max	1724.31	2	1538.108	2	97.724	3	0	3	.866	4	6.909	2
352			min	-1545.654	3	-78.567	5	-257.524	4	-.001	2	-.025	3	-.353	5
353		6	max	1721.388	2	1538.108	2	97.724	3	0	3	.784	4	6.416	2
354			min	-1547.845	3	-78.567	5	-254.992	4	-.001	2	.004	12	-.328	5
355		7	max	1718.466	2	1538.108	2	97.724	3	0	3	.703	4	5.922	2
356			min	-1550.037	3	-78.567	5	-252.46	4	-.001	2	.005	10	-.303	5
357		8	max	1715.545	2	1538.108	2	97.724	3	0	3	.622	4	5.429	2
358			min	-1552.228	3	-78.567	5	-249.927	4	-.001	2	-.007	2	-.277	5
359		9	max	1712.623	2	1538.108	2	97.724	3	0	3	.542	4	4.935	2
360			min	-1554.419	3	-78.567	5	-247.395	4	-.001	2	-.028	2	-.252	5
361		10	max	1709.701	2	1538.108	2	97.724	3	0	3	.463	4	4.442	2
362			min	-1556.61	3	-78.567	5	-244.863	4	-.001	2	-.048	2	-.227	5
363		11	max	1706.779	2	1538.108	2	97.724	3	0	3	.386	5	3.948	2
364			min	-1558.802	3	-78.567	5	-242.331	4	-.001	2	-.069	2	-.202	5
365		12	max	1703.858	2	1538.108	2	97.724	3	0	3	.312	5	3.455	2
366			min	-1560.993	3	-78.567	5	-239.799	4	-.001	2	-.089	2	-.176	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	1700.936	2	1538.108	2	97.724	3	0	3	.238	5	2.961	2
368			min	-1563.184	3	-78.567	5	-237.267	4	-.001	2	-.11	2	-.151	5
369		14	max	1698.014	2	1538.108	2	97.724	3	0	3	.258	3	2.468	2
370			min	-1565.376	3	-78.567	5	-234.734	4	-.001	2	-.131	2	-.126	5
371		15	max	1695.092	2	1538.108	2	97.724	3	0	3	.289	3	1.974	2
372			min	-1567.567	3	-78.567	5	-232.202	4	-.001	2	-.151	2	-.101	5
373		16	max	1692.171	2	1538.108	2	97.724	3	0	3	.32	3	1.481	2
374			min	-1569.758	3	-78.567	5	-229.67	4	-.001	2	-.172	2	-.076	5
375		17	max	1689.249	2	1538.108	2	97.724	3	0	3	.352	3	.987	2
376			min	-1571.95	3	-78.567	5	-227.138	4	-.001	2	-.192	2	-.05	5
377		18	max	1686.327	2	1538.108	2	97.724	3	0	3	.383	3	.494	2
378			min	-1574.141	3	-78.567	5	-224.606	4	-.001	2	-.213	2	-.025	5
379		19	max	1683.405	2	1538.108	2	97.724	3	0	3	.414	3	0	1
380			min	-1576.332	3	-78.567	5	-222.074	4	-.001	2	-.233	2	0	1
381	M3	1	max	2122.622	2	5.879	4	25.475	2	.013	3	.006	4	0	1
382			min	-885.259	3	1.382	15	-12.025	5	-.03	2	-.002	3	0	1
383		2	max	2122.475	2	5.226	4	25.475	2	.013	3	.013	2	0	15
384			min	-885.369	3	1.228	15	-11.566	5	-.03	2	-.005	3	-.002	4
385		3	max	2122.329	2	4.572	4	25.475	2	.013	3	.022	2	0	15
386			min	-885.479	3	1.075	15	-11.107	5	-.03	2	-.009	3	-.004	4
387		4	max	2122.182	2	3.919	4	25.475	2	.013	3	.031	2	-.001	15
388			min	-885.589	3	.921	15	-10.648	5	-.03	2	-.013	3	-.005	4
389		5	max	2122.036	2	3.266	4	25.475	2	.013	3	.04	2	-.002	15
390			min	-885.699	3	.768	15	-10.189	5	-.03	2	-.016	3	-.007	4
391		6	max	2121.889	2	2.613	4	25.475	2	.013	3	.049	2	-.002	15
392			min	-885.809	3	.614	15	-10.1	3	-.03	2	-.02	3	-.008	4
393		7	max	2121.742	2	1.96	4	25.475	2	.013	3	.059	2	-.002	15
394			min	-885.919	3	.461	15	-10.1	3	-.03	2	-.023	3	-.008	4
395		8	max	2121.596	2	1.306	4	25.475	2	.013	3	.068	2	-.002	15
396			min	-886.029	3	.307	15	-10.1	3	-.03	2	-.027	3	-.009	4
397		9	max	2121.449	2	.653	4	25.475	2	.013	3	.077	2	-.002	15
398			min	-886.139	3	.154	15	-10.1	3	-.03	2	-.031	3	-.009	4
399		10	max	2121.302	2	0	1	25.475	2	.013	3	.086	2	-.002	15
400			min	-886.249	3	0	1	-10.1	3	-.03	2	-.034	3	-.009	4
401		11	max	2121.156	2	-.154	15	25.475	2	.013	3	.095	2	-.002	15
402			min	-886.359	3	-.653	4	-10.1	3	-.03	2	-.038	3	-.009	4
403		12	max	2121.009	2	-.307	15	25.475	2	.013	3	.104	2	-.002	15
404			min	-886.469	3	-1.306	4	-10.1	3	-.03	2	-.041	3	-.009	4
405		13	max	2120.863	2	-.461	15	25.475	2	.013	3	.113	2	-.002	15
406			min	-886.579	3	-1.96	4	-10.1	3	-.03	2	-.045	3	-.008	4
407		14	max	2120.716	2	-.614	15	25.475	2	.013	3	.122	2	-.002	15
408			min	-886.689	3	-2.613	4	-10.1	3	-.03	2	-.049	3	-.008	4
409		15	max	2120.569	2	-.768	15	25.475	2	.013	3	.131	2	-.002	15
410			min	-886.799	3	-3.266	4	-10.1	3	-.03	2	-.052	3	-.007	4
411		16	max	2120.423	2	-.921	15	25.475	2	.013	3	.14	2	-.001	15
412			min	-886.909	3	-3.919	4	-10.1	3	-.03	2	-.056	3	-.005	4
413		17	max	2120.276	2	-1.075	15	25.475	2	.013	3	.15	2	0	15
414			min	-887.019	3	-4.572	4	-10.1	3	-.03	2	-.059	3	-.004	4
415		18	max	2120.13	2	-1.228	15	25.475	2	.013	3	.159	2	0	15
416			min	-887.129	3	-5.226	4	-10.1	3	-.03	2	-.063	3	-.002	4
417		19	max	2119.983	2	-1.382	15	25.475	2	.013	3	.168	2	0	1
418			min	-887.239	3	-5.879	4	-10.1	3	-.03	2	-.067	3	0	1
419	M6	1	max	5204.538	2	5.879	4	0	1	.008	4	.005	4	0	1
420			min	-2744.866	3	1.382	15	-12.882	4	0	1	0	1	0	1
421		2	max	5204.392	2	5.226	4	0	1	.008	4	0	4	0	15
422			min	-2744.976	3	1.228	15	-12.423	4	0	1	0	1	-.002	4
423		3	max	5204.245	2	4.572	4	0	1	.008	4	0	1	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	-2745.086	3	1.075	15	-11.964	4	0	1	-.004	4	-.004	4
425		4	max	5204.099	2	3.919	4	0	1	.008	4	0	1	-.001	15
426			min	-2745.196	3	.921	15	-11.505	4	0	1	-.008	4	-.005	4
427		5	max	5203.952	2	3.266	4	0	1	.008	4	0	1	-.002	15
428			min	-2745.306	3	.768	15	-11.046	4	0	1	-.012	4	-.007	4
429		6	max	5203.805	2	2.613	4	0	1	.008	4	0	1	-.002	15
430			min	-2745.416	3	.614	15	-10.587	4	0	1	-.016	4	-.008	4
431		7	max	5203.659	2	1.96	4	0	1	.008	4	0	1	-.002	15
432			min	-2745.526	3	.461	15	-10.128	4	0	1	-.02	4	-.008	4
433		8	max	5203.512	2	1.306	4	0	1	.008	4	0	1	-.002	15
434			min	-2745.636	3	.307	15	-9.669	4	0	1	-.023	4	-.009	4
435		9	max	5203.365	2	.653	4	0	1	.008	4	0	1	-.002	15
436			min	-2745.746	3	.154	15	-9.21	4	0	1	-.027	4	-.009	4
437		10	max	5203.219	2	0	1	0	1	.008	4	0	1	-.002	15
438			min	-2745.856	3	0	1	-8.751	4	0	1	-.03	4	-.009	4
439		11	max	5203.072	2	-.154	15	0	1	.008	4	0	1	-.002	15
440			min	-2745.966	3	-.653	6	-8.292	4	0	1	-.033	4	-.009	4
441		12	max	5202.926	2	-.307	15	0	1	.008	4	0	1	-.002	15
442			min	-2746.076	3	-1.306	6	-7.833	4	0	1	-.036	4	-.009	4
443		13	max	5202.779	2	-.461	15	0	1	.008	4	0	1	-.002	15
444			min	-2746.186	3	-1.96	6	-7.373	4	0	1	-.039	4	-.008	4
445		14	max	5202.632	2	-.614	15	0	1	.008	4	0	1	-.002	15
446			min	-2746.296	3	-2.613	6	-6.914	4	0	1	-.041	4	-.008	4
447		15	max	5202.486	2	-.768	15	0	1	.008	4	0	1	-.002	15
448			min	-2746.406	3	-3.266	6	-6.455	4	0	1	-.043	4	-.007	4
449		16	max	5202.339	2	-.921	15	0	1	.008	4	0	1	-.001	15
450			min	-2746.516	3	-3.919	6	-5.996	4	0	1	-.046	4	-.005	4
451		17	max	5202.193	2	-1.075	15	0	1	.008	4	0	1	0	15
452			min	-2746.626	3	-4.572	6	-5.537	4	0	1	-.048	4	-.004	4
453		18	max	5202.046	2	-1.228	15	0	1	.008	4	0	1	0	15
454			min	-2746.736	3	-5.226	6	-5.078	4	0	1	-.05	4	-.002	4
455		19	max	5201.899	2	-1.382	15	0	1	.008	4	0	1	0	1
456			min	-2746.846	3	-5.879	6	-4.619	4	0	1	-.051	4	0	1
457	M9	1	max	2122.622	2	5.879	6	10.1	3	.03	2	.005	5	0	1
458			min	-885.259	3	1.382	15	-25.475	2	-.013	3	-.004	2	0	1
459		2	max	2122.475	2	5.226	6	10.1	3	.03	2	.005	3	0	15
460			min	-885.369	3	1.228	15	-25.475	2	-.013	3	-.013	2	-.002	6
461		3	max	2122.329	2	4.572	6	10.1	3	.03	2	.009	3	0	15
462			min	-885.479	3	1.075	15	-25.475	2	-.013	3	-.022	2	-.004	6
463		4	max	2122.182	2	3.919	6	10.1	3	.03	2	.013	3	-.001	15
464			min	-885.589	3	.921	15	-25.475	2	-.013	3	-.031	2	-.005	6
465		5	max	2122.036	2	3.266	6	10.1	3	.03	2	.016	3	-.002	15
466			min	-885.699	3	.768	15	-25.475	2	-.013	3	-.04	2	-.007	6
467		6	max	2121.889	2	2.613	6	10.1	3	.03	2	.02	3	-.002	15
468			min	-885.809	3	.614	15	-25.475	2	-.013	3	-.049	2	-.008	6
469		7	max	2121.742	2	1.96	6	10.1	3	.03	2	.023	3	-.002	15
470			min	-885.919	3	.461	15	-25.475	2	-.013	3	-.059	2	-.008	6
471		8	max	2121.596	2	1.306	6	10.1	3	.03	2	.027	3	-.002	15
472			min	-886.029	3	.307	15	-25.475	2	-.013	3	-.068	2	-.009	6
473		9	max	2121.449	2	.653	6	10.1	3	.03	2	.031	3	-.002	15
474			min	-886.139	3	.154	15	-25.475	2	-.013	3	-.077	2	-.009	6
475		10	max	2121.302	2	0	1	10.1	3	.03	2	.034	3	-.002	15
476			min	-886.249	3	0	1	-25.475	2	-.013	3	-.086	2	-.009	6
477		11	max	2121.156	2	-.154	15	10.1	3	.03	2	.038	3	-.002	15
478			min	-886.359	3	-.653	4	-25.475	2	-.013	3	-.095	2	-.009	6
479		12	max	2121.009	2	-.307	15	10.1	3	.03	2	.041	3	-.002	15
480			min	-886.469	3	-1.306	4	-25.475	2	-.013	3	-.104	2	-.009	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	2120.863	2	-.461	15	10.1	3	.03	2	.045	3	-.002	15
482			min	-886.579	3	-1.96	4	-25.475	2	-.013	3	-.113	2	-.008	6
483		14	max	2120.716	2	-.614	15	10.1	3	.03	2	.049	3	-.002	15
484			min	-886.689	3	-2.613	4	-25.475	2	-.013	3	-.122	2	-.008	6
485		15	max	2120.569	2	-.768	15	10.1	3	.03	2	.052	3	-.002	15
486			min	-886.799	3	-3.266	4	-25.475	2	-.013	3	-.131	2	-.007	6
487		16	max	2120.423	2	-.921	15	10.1	3	.03	2	.056	3	-.001	15
488			min	-886.909	3	-3.919	4	-25.475	2	-.013	3	-.14	2	-.005	6
489		17	max	2120.276	2	-1.075	15	10.1	3	.03	2	.059	3	0	15
490			min	-887.019	3	-4.572	4	-25.475	2	-.013	3	-.15	2	-.004	6
491		18	max	2120.13	2	-1.228	15	10.1	3	.03	2	.063	3	0	15
492			min	-887.129	3	-5.226	4	-25.475	2	-.013	3	-.159	2	-.002	6
493		19	max	2119.983	2	-1.382	15	10.1	3	.03	2	.067	3	0	1
494			min	-887.239	3	-5.879	4	-25.475	2	-.013	3	-.168	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	-.013	12	.124	3	.008	1	6.581e-3	3	NC	3	NC	1
2			min	-.468	1	-1.05	2	-.543	4	-1.833e-2	2	104.479	2	334.334	5
3		2	max	-.013	12	.084	3	0	3	6.309e-3	3	6012.446	12	NC	1
4			min	-.468	1	-.898	2	-.525	4	-1.731e-2	2	117.72	2	349.7	4
5		3	max	-.013	12	.046	3	0	3	5.775e-3	3	3071.878	12	NC	3
6			min	-.467	1	-.749	2	-.502	4	-1.531e-2	2	134.308	2	370.881	4
7		4	max	-.013	12	.012	3	.001	3	5.242e-3	3	2157.657	12	NC	3
8			min	-.467	1	-.612	2	-.474	4	-1.33e-2	2	152.909	1	400.015	4
9		5	max	-.013	12	-.009	12	.002	3	4.899e-3	3	1767.211	12	NC	3
10			min	-.467	1	-.494	2	-.443	4	-1.178e-2	2	173.14	1	438.239	4
11		6	max	-.013	12	-.018	12	.002	3	5.049e-3	3	1596.228	12	NC	1
12			min	-.467	1	-.402	1	-.411	4	-1.147e-2	2	194.601	1	485.971	4
13		7	max	-.013	12	-.022	12	.001	3	5.199e-3	3	1702.961	15	NC	1
14			min	-.466	1	-.325	1	-.381	4	-1.117e-2	2	217.83	1	543.269	4
15		8	max	-.013	12	-.024	12	0	1	5.349e-3	3	1854.198	15	NC	1
16			min	-.465	1	-.254	1	-.353	4	-1.086e-2	2	244.218	1	607.342	5
17		9	max	-.013	12	-.02	15	0	10	5.752e-3	3	2034.424	15	NC	1
18			min	-.465	1	-.186	1	-.328	4	-1.e-2	2	276.809	1	680.33	5
19		10	max	-.014	12	-.014	15	0	2	6.393e-3	3	2254.209	15	NC	1
20			min	-.464	1	-.117	1	-.301	4	-8.622e-3	2	319.826	1	780.008	5
21		11	max	-.014	12	-.007	15	0	1	7.035e-3	3	2528.016	15	NC	1
22			min	-.463	1	-.048	1	-.274	4	-7.242e-3	2	379.123	1	916.782	5
23		12	max	-.014	12	.024	2	.002	3	6.533e-3	3	2878.149	15	NC	1
24			min	-.463	1	-.043	3	-.247	4	-5.745e-3	2	466.36	1	1106.531	5
25		13	max	-.014	12	.092	2	.007	3	4.816e-3	3	3343.077	15	NC	1
26			min	-.462	1	-.04	3	-.218	4	-4.124e-3	2	602.216	1	1429.855	5
27		14	max	-.014	12	.154	2	.01	3	3.1e-3	3	3993.282	15	NC	1
28			min	-.461	1	-.026	3	-.189	4	-3.736e-3	4	823.052	1	2008.086	5
29		15	max	-.014	12	.208	1	.009	3	1.383e-3	3	4970.298	15	NC	1
30			min	-.461	1	.005	12	-.164	4	-4.658e-3	4	1197.305	1	3051.986	5
31		16	max	-.014	12	.249	1	.009	1	3.948e-3	3	6607.444	15	NC	1
32			min	-.46	1	.028	15	-.146	5	-4.042e-3	4	1826.638	1	4869.567	5
33		17	max	-.014	12	.279	1	.01	1	7.016e-3	3	9897.419	15	NC	2
34			min	-.461	1	.035	15	-.134	5	-3.245e-3	4	3016.777	1	8575.363	5
35		18	max	-.014	12	.304	1	.005	1	1.008e-2	3	NC	5	NC	1
36			min	-.461	1	.042	15	-.125	4	-3.823e-3	2	1324.82	3	NC	1
37		19	max	-.014	12	.326	1	0	12	1.165e-2	3	NC	1	NC	1
38			min	-.461	1	.049	15	-.12	4	-4.371e-3	2	709.085	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	0	3	.299	3	0	1	9.909e-4	4	NC	3	NC	1
40			min	-.689	2	-1.682	2	-.542	4	0	1	71.549	2	334.681	4
41		2	max	0	3	.217	3	0	1	8.079e-4	4	3187.718	15	NC	1
42			min	-.689	2	-1.423	2	-.526	4	0	1	82.31	2	347.67	4
43		3	max	0	3	.139	3	0	1	4.49e-4	5	3577.014	15	NC	1
44			min	-.689	2	-1.172	2	-.504	4	0	1	96.389	2	367.87	4
45		4	max	0	3	.074	3	0	1	9.252e-5	5	4033.892	15	NC	1
46			min	-.689	2	-.945	2	-.476	4	0	1	113.945	2	396.8	4
47		5	max	0	3	.032	3	0	1	0	1	4534.255	15	NC	1
48			min	-.688	2	-.762	2	-.444	4	-1.279e-4	4	133.675	2	435.602	4
49		6	max	0	3	.015	3	0	1	1.889e-5	5	5045.9	15	NC	1
50			min	-.687	2	-.628	2	-.411	4	0	1	151.849	1	484.201	4
51		7	max	-.002	3	.014	3	0	1	1.619e-4	5	5590.164	15	NC	1
52			min	-.685	2	-.526	2	-.38	4	0	1	170.033	1	541.999	4
53		8	max	-.003	3	.019	3	0	1	3.057e-4	4	6218.53	15	NC	1
54			min	-.684	2	-.439	2	-.352	4	0	1	190.39	1	606.481	4
55		9	max	-.003	3	.021	3	0	1	3.001e-4	4	7038.775	15	NC	1
56			min	-.682	2	-.347	2	-.328	4	0	1	217.407	1	676.487	4
57		10	max	-.004	3	.015	3	0	1	1.53e-4	4	8208.126	15	NC	1
58			min	-.68	2	-.244	2	-.301	4	0	1	257.768	1	778.209	4
59		11	max	-.005	3	0	3	0	1	6.727e-6	5	9971.455	15	NC	1
60			min	-.679	2	-.131	2	-.273	4	0	1	322.298	1	916.878	4
61		12	max	-.006	12	.002	9	0	1	0	1	NC	15	NC	1
62			min	-.677	2	-.022	3	-.248	4	-6.932e-4	4	439.719	1	1091.233	4
63		13	max	-.006	12	.116	1	0	1	0	1	NC	5	NC	1
64			min	-.676	2	-.044	3	-.22	4	-1.979e-3	4	413.687	3	1389.792	4
65		14	max	-.006	12	.222	2	0	1	0	1	NC	5	NC	1
66			min	-.674	2	-.043	3	-.192	4	-3.264e-3	4	414.886	3	1928.4	4
67		15	max	-.007	12	.302	2	0	1	0	1	NC	2	NC	1
68			min	-.673	2	.001	3	-.167	4	-4.55e-3	4	476.038	3	2893.934	4
69		16	max	-.007	12	.338	2	0	1	0	1	NC	4	NC	1
70			min	-.672	2	.01	15	-.15	4	-3.672e-3	4	740.237	3	4556.884	4
71		17	max	-.007	12	.346	1	0	1	0	1	NC	4	NC	1
72			min	-.672	2	.01	15	-.136	4	-2.539e-3	4	3386.182	2	7979.508	4
73		18	max	-.007	12	.446	3	0	1	0	1	NC	4	NC	1
74			min	-.672	2	.011	15	-.126	4	-1.407e-3	4	965.249	3	NC	1
75		19	max	-.007	12	.638	3	0	1	0	1	NC	1	NC	1
76			min	-.672	2	.011	15	-.118	4	-8.298e-4	4	418.118	3	NC	1
77	M7	1	max	.027	5	.124	3	0	3	1.833e-2	2	NC	3	NC	1
78			min	-.468	1	-1.05	2	-.546	4	-6.581e-3	3	104.479	2	329.92	4
79		2	max	.027	5	.084	3	.006	1	1.731e-2	2	NC	5	NC	1
80			min	-.468	1	-.898	2	-.523	4	-6.309e-3	3	117.72	2	349.23	4
81		3	max	.027	5	.046	3	.014	1	1.531e-2	2	NC	5	NC	3
82			min	-.467	1	-.749	2	-.496	4	-5.775e-3	3	134.308	2	373.218	4
83		4	max	.026	5	.028	5	.015	1	1.33e-2	2	NC	5	NC	3
84			min	-.467	1	-.612	2	-.468	4	-5.242e-3	3	152.909	1	403.253	4
85		5	max	.026	5	.026	5	.013	1	1.178e-2	2	NC	5	NC	3
86			min	-.467	1	-.494	2	-.438	4	-4.899e-3	3	173.14	1	440.74	4
87		6	max	.027	5	.023	5	.008	1	1.147e-2	2	NC	5	NC	1
88			min	-.467	1	-.402	1	-.409	4	-5.049e-3	3	194.601	1	485.582	4
89		7	max	.027	5	.02	5	.003	2	1.117e-2	2	NC	5	NC	1
90			min	-.466	1	-.325	1	-.38	4	-5.199e-3	3	217.83	1	538.291	4
91		8	max	.027	5	.016	5	0	10	1.086e-2	2	NC	5	NC	1
92			min	-.465	1	-.254	1	-.353	4	-5.349e-3	3	244.218	1	599.785	4
93		9	max	.027	5	.012	5	0	3	1.e-2	2	NC	5	NC	1
94			min	-.465	1	-.186	1	-.328	4	-5.752e-3	3	276.809	1	672.258	4
95		10	max	.027	5	.008	5	0	3	8.622e-3	2	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.464	1	-.117	1	-.301	4	-6.393e-3	3	319.826	1	768.888	4
97		11	max	.027	5	.005	5	0	3	7.242e-3	2	NC	5	NC	1
98			min	-.463	1	-.048	1	-.274	4	-7.035e-3	3	379.123	1	901.698	4
99		12	max	.027	5	.024	2	.003	1	5.745e-3	2	NC	4	NC	1
100			min	-.463	1	-.043	3	-.246	4	-6.533e-3	3	466.36	1	1092.657	4
101		13	max	.026	5	.092	2	.004	2	4.124e-3	2	NC	4	NC	1
102			min	-.462	1	-.04	3	-.217	4	-4.816e-3	3	602.216	1	1410.086	4
103		14	max	.026	5	.154	2	.003	2	2.503e-3	2	NC	4	NC	1
104			min	-.461	1	-.026	3	-.189	4	-3.305e-3	5	823.052	1	1952.487	4
105		15	max	.026	5	.208	1	0	10	8.823e-4	2	NC	4	NC	1
106			min	-.461	1	-.012	5	-.166	4	-4.471e-3	5	1197.305	1	2854.928	4
107		16	max	.026	5	.249	1	-.003	10	1.674e-3	2	NC	4	NC	1
108			min	-.46	1	-.018	5	-.15	4	-3.948e-3	3	1826.638	1	4230.031	4
109		17	max	.026	5	.279	1	-.002	12	2.748e-3	2	NC	4	NC	2
110			min	-.461	1	-.025	5	-.138	4	-7.016e-3	3	3016.777	1	6696.442	4
111		18	max	.026	5	.304	1	0	12	3.823e-3	2	NC	4	NC	1
112			min	-.461	1	-.032	5	-.127	4	-1.008e-2	3	1324.82	3	NC	1
113		19	max	.026	5	.326	1	.007	1	4.371e-3	2	NC	1	NC	1
114			min	-.461	1	-.04	5	-.117	4	-1.165e-2	3	709.085	3	NC	1
115	M10	1	max	0	1	.315	1	.461	1	1.177e-2	3	NC	1	NC	1
116			min	-.122	4	-.036	5	-.026	5	-9.551e-4	5	NC	1	NC	1
117		2	max	0	1	.373	3	.483	1	1.317e-2	3	NC	4	NC	3
118			min	-.122	4	-.027	5	-.018	5	-8.457e-4	5	1523.689	3	6569.992	1
119		3	max	0	1	.461	3	.515	1	1.456e-2	3	NC	4	NC	3
120			min	-.122	4	-.02	5	-.011	5	-7.364e-4	5	788.825	3	2662.839	1
121		4	max	0	1	.532	3	.551	1	1.595e-2	3	NC	4	NC	3
122			min	-.122	4	-.014	5	-.005	5	-6.27e-4	5	568.608	3	1597.704	1
123		5	max	0	1	.578	3	.586	1	1.735e-2	3	NC	4	NC	3
124			min	-.122	4	-.009	5	0	15	-5.177e-4	5	479.698	3	1151.269	1
125		6	max	0	1	.6	3	.616	1	1.874e-2	3	NC	4	NC	3
126			min	-.122	4	-.005	5	.003	15	-6.863e-4	2	448.031	3	927.296	1
127		7	max	0	1	.598	3	.639	1	2.013e-2	3	NC	4	NC	3
128			min	-.122	4	0	15	.007	15	-1.262e-3	2	450.844	3	806.807	1
129		8	max	0	1	.579	3	.654	1	2.153e-2	3	NC	4	NC	3
130			min	-.122	4	.003	15	.009	12	-1.839e-3	2	478.2	3	733.761	2
131		9	max	0	1	.556	3	.668	2	2.292e-2	3	NC	1	NC	3
132			min	-.122	4	.007	15	.008	12	-2.415e-3	2	517.971	3	684.89	2
133		10	max	0	1	.544	3	.672	2	2.431e-2	3	NC	1	NC	3
134			min	-.122	4	.011	15	.007	12	-2.991e-3	2	541.536	3	669.372	2
135		11	max	0	3	.556	3	.668	2	2.292e-2	3	NC	1	NC	3
136			min	-.122	4	.015	15	.008	12	-2.415e-3	2	517.971	3	684.89	2
137		12	max	0	3	.579	3	.654	1	2.153e-2	3	NC	4	NC	3
138			min	-.122	4	.017	15	.009	12	-1.839e-3	2	478.2	3	733.761	2
139		13	max	0	3	.598	3	.639	1	2.013e-2	3	NC	4	NC	3
140			min	-.122	4	.019	15	.01	12	-1.262e-3	2	450.844	3	806.807	1
141		14	max	0	3	.6	3	.616	1	1.874e-2	3	NC	5	NC	3
142			min	-.122	4	.022	15	.012	12	-6.863e-4	2	448.031	3	927.296	1
143		15	max	0	3	.578	3	.586	1	1.735e-2	3	NC	5	NC	3
144			min	-.122	4	.024	15	.013	12	-2.107e-4	10	479.698	3	1151.269	1
145		16	max	0	3	.532	3	.551	1	1.595e-2	3	NC	5	NC	3
146			min	-.122	4	.028	15	.015	12	9.637e-5	10	568.608	3	1597.704	1
147		17	max	0	3	.461	3	.515	1	1.456e-2	3	NC	5	NC	3
148			min	-.122	4	.032	15	.015	12	4.034e-4	10	788.825	3	2662.839	1
149		18	max	0	3	.373	3	.483	1	1.317e-2	3	NC	4	NC	3
150			min	-.122	4	.038	15	.015	12	7.104e-4	10	1523.689	3	6569.992	1
151		19	max	0	3	.315	1	.461	1	1.177e-2	3	NC	1	NC	1
152			min	-.122	4	.046	15	.014	12	9.085e-4	15	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	0	1	.003	5	.463	1	8.869e-3	1	NC	1	NC	1
154			min	-.26	4	-.043	3	-.027	5	-4.581e-4	5	NC	1	NC	1
155		2	max	0	1	.017	3	.478	1	9.556e-3	2	NC	4	NC	2
156			min	-.26	4	-.06	2	-.006	5	-3.67e-4	3	2424.735	3	8151.342	4
157		3	max	0	1	.069	3	.507	1	1.029e-2	2	NC	4	NC	3
158			min	-.26	4	-.104	2	.003	15	-6.724e-4	3	1290	3	3299.152	1
159		4	max	0	1	.104	3	.542	1	1.102e-2	2	NC	4	NC	3
160			min	-.26	4	-.133	2	.005	15	-9.779e-4	3	978.758	3	1824.734	1
161		5	max	0	1	.118	3	.578	1	1.175e-2	2	NC	4	NC	3
162			min	-.26	4	-.147	2	.005	15	-1.283e-3	3	895.836	3	1250.971	1
163		6	max	0	1	.109	3	.611	1	1.248e-2	2	NC	4	NC	3
164			min	-.26	4	-.144	2	.002	15	-1.589e-3	3	948.579	3	973.623	1
165		7	max	0	1	.081	3	.637	1	1.322e-2	2	NC	4	NC	3
166			min	-.26	4	-.128	2	0	15	-1.894e-3	3	1160.418	3	826.103	1
167		8	max	0	1	.043	3	.657	2	1.395e-2	2	NC	4	NC	3
168			min	-.26	4	-.104	2	.002	15	-2.2e-3	3	1529.844	2	732.445	2
169		9	max	0	1	.007	3	.672	2	1.468e-2	2	NC	4	NC	5
170			min	-.26	4	-.081	2	.006	12	-2.505e-3	3	2028.417	2	677.807	2
171		10	max	0	1	-.002	15	.678	2	1.541e-2	2	NC	4	NC	5
172			min	-.26	4	-.07	2	.005	12	-2.81e-3	3	2394.933	2	660.35	2
173		11	max	0	3	.007	3	.672	2	1.468e-2	2	NC	4	NC	12
174			min	-.26	4	-.081	2	.006	12	-2.505e-3	3	2028.417	2	677.807	2
175		12	max	0	3	.043	3	.657	2	1.395e-2	2	NC	4	NC	3
176			min	-.26	4	-.104	2	.006	12	-2.2e-3	3	1529.844	2	732.445	2
177		13	max	0	3	.081	3	.637	1	1.322e-2	2	NC	5	NC	3
178			min	-.26	4	-.128	2	.007	12	-1.894e-3	3	1160.418	3	826.103	1
179		14	max	0	3	.109	3	.611	1	1.248e-2	2	NC	5	NC	3
180			min	-.26	4	-.144	2	.008	12	-1.589e-3	3	948.579	3	973.623	1
181		15	max	0	3	.118	3	.578	1	1.175e-2	2	NC	5	NC	3
182			min	-.26	4	-.147	2	.009	12	-1.283e-3	3	895.836	3	1250.971	1
183		16	max	0	3	.104	3	.542	1	1.102e-2	2	NC	5	NC	3
184			min	-.26	4	-.133	2	.01	12	-9.779e-4	3	978.758	3	1824.734	1
185		17	max	0	3	.069	3	.507	1	1.029e-2	2	NC	5	NC	3
186			min	-.26	4	-.104	2	.011	12	-6.724e-4	3	1290	3	3299.152	1
187		18	max	0	3	.017	3	.478	1	9.556e-3	2	NC	4	NC	2
188			min	-.26	4	-.06	2	.012	12	-3.67e-4	3	2424.735	3	9603.626	1
189		19	max	0	3	-.003	15	.463	1	8.869e-3	1	NC	1	NC	1
190			min	-.26	4	-.043	3	.014	12	-6.156e-5	3	NC	1	NC	1
191	M12	1	max	0	3	.014	5	.465	1	8.7e-3	1	NC	1	NC	1
192			min	-.341	4	-.221	1	-.027	5	-4.876e-4	5	NC	1	NC	1
193		2	max	0	3	.011	5	.478	1	9.042e-3	1	NC	4	NC	1
194			min	-.341	4	-.302	2	-.007	5	-3.754e-4	5	1701.986	2	8912.94	4
195		3	max	0	3	.037	3	.506	1	9.385e-3	1	NC	5	NC	3
196			min	-.341	4	-.377	2	.002	15	-2.631e-4	5	902.787	2	3547.362	1
197		4	max	0	3	.061	3	.541	1	9.727e-3	1	NC	5	NC	3
198			min	-.341	4	-.433	2	.004	15	-1.509e-4	5	667.377	2	1899.815	1
199		5	max	0	3	.073	3	.578	1	1.007e-2	1	NC	5	NC	3
200			min	-.341	4	-.466	2	.003	15	-3.86e-5	5	579.308	2	1279.012	1
201		6	max	0	3	.072	3	.612	1	1.041e-2	1	NC	5	NC	3
202			min	-.341	4	-.475	2	.002	15	1.295e-5	3	559.909	2	983.634	1
203		7	max	0	3	.061	3	.639	1	1.075e-2	1	NC	5	NC	3
204			min	-.341	4	-.462	2	0	15	6.26e-5	3	587.806	2	827.528	1
205		8	max	0	3	.045	3	.66	2	1.11e-2	1	NC	5	NC	3
206			min	-.341	4	-.437	2	.002	15	1.055e-4	12	656.259	2	728.278	2
207		9	max	0	3	.029	3	.677	2	1.144e-2	1	NC	5	NC	5
208			min	-.34	4	-.409	2	.004	3	1.362e-4	12	749.626	2	671.089	2
209		10	max	0	1	.021	3	.683	2	1.178e-2	1	NC	5	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	-.34	4	-.396	2	.003	3	1.67e-4	12	806.004	2	652.785	2
211		11	max	0	1	.029	3	.677	2	1.144e-2	1	NC	5	NC	12
212			min	-.34	4	-.409	2	.004	3	1.362e-4	12	749.626	2	671.089	2
213		12	max	0	1	.045	3	.66	2	1.11e-2	1	NC	5	NC	3
214			min	-.34	4	-.437	2	.006	12	1.055e-4	12	656.259	2	728.278	2
215		13	max	0	1	.061	3	.639	1	1.075e-2	1	NC	5	NC	3
216			min	-.34	4	-.462	2	.007	12	6.26e-5	3	587.806	2	827.528	1
217		14	max	0	1	.072	3	.612	1	1.041e-2	1	NC	5	NC	3
218			min	-.34	4	-.475	2	.009	12	1.295e-5	3	559.909	2	983.634	1
219		15	max	0	1	.073	3	.578	1	1.007e-2	1	NC	5	NC	3
220			min	-.34	4	-.466	2	.011	12	-3.67e-5	3	579.308	2	1279.012	1
221		16	max	0	1	.061	3	.541	1	9.727e-3	1	NC	5	NC	3
222			min	-.34	4	-.433	2	.012	12	-8.636e-5	3	667.377	2	1899.815	1
223		17	max	0	1	.037	3	.506	1	9.385e-3	1	NC	5	NC	3
224			min	-.34	4	-.377	2	.013	12	-1.36e-4	3	902.787	2	3547.362	1
225		18	max	0	1	.002	3	.478	1	9.042e-3	1	NC	4	NC	1
226			min	-.34	4	-.302	2	.013	12	-1.857e-4	3	1701.986	2	NC	1
227		19	max	0	1	-.024	15	.465	1	8.7e-3	1	NC	1	NC	1
228			min	-.34	4	-.221	1	.013	12	-2.353e-4	3	NC	1	NC	1
229	M13	1	max	0	3	.104	3	.468	1	1.935e-2	2	NC	1	NC	1
230			min	-.535	4	-.975	2	-.027	5	-5.063e-3	3	NC	1	NC	1
231		2	max	0	3	.156	3	.491	1	2.085e-2	2	NC	5	NC	3
232			min	-.535	4	-1.122	2	-.009	5	-5.652e-3	3	982.251	2	6085.523	1
233		3	max	0	3	.204	3	.525	1	2.234e-2	2	NC	5	NC	3
234			min	-.535	4	-1.259	2	0	15	-6.24e-3	3	507.062	2	2514.151	1
235		4	max	0	3	.241	3	.562	1	2.384e-2	2	NC	5	NC	3
236			min	-.535	4	-1.377	2	.004	15	-6.829e-3	3	358.96	2	1523.612	1
237		5	max	0	3	.267	3	.598	1	2.533e-2	2	NC	5	NC	3
238			min	-.535	4	-1.467	2	.006	15	-7.417e-3	3	293.153	2	1104.283	1
239		6	max	0	3	.279	3	.629	1	2.683e-2	2	NC	5	NC	3
240			min	-.535	4	-1.527	2	.006	15	-8.006e-3	3	261.181	2	892.586	1
241		7	max	0	3	.281	3	.653	1	2.832e-2	2	NC	5	NC	3
242			min	-.535	4	-1.558	2	.005	12	-8.594e-3	3	247.061	2	778.222	1
243		8	max	0	3	.274	3	.67	2	2.982e-2	2	NC	15	NC	5
244			min	-.535	4	-1.567	2	.003	3	-9.183e-3	3	243.6	2	703.884	2
245		9	max	0	3	.264	3	.684	2	3.131e-2	2	NC	15	NC	5
246			min	-.535	4	-1.561	2	0	3	-9.771e-3	3	245.865	2	657.928	2
247		10	max	0	1	.259	3	.689	2	3.281e-2	2	NC	15	NC	5
248			min	-.535	4	-1.556	2	0	3	-1.036e-2	3	248.231	2	643.329	2
249		11	max	0	1	.264	3	.684	2	3.131e-2	2	NC	15	NC	5
250			min	-.535	4	-1.561	2	0	3	-9.771e-3	3	245.865	2	657.928	2
251		12	max	0	1	.274	3	.67	2	2.982e-2	2	NC	15	NC	5
252			min	-.535	4	-1.567	2	.003	3	-9.183e-3	3	243.6	2	703.884	2
253		13	max	0	1	.281	3	.653	1	2.832e-2	2	NC	15	NC	3
254			min	-.535	4	-1.558	2	.005	12	-8.594e-3	3	247.061	2	778.222	1
255		14	max	0	1	.279	3	.629	1	2.683e-2	2	NC	15	NC	3
256			min	-.535	4	-1.527	2	.007	12	-8.006e-3	3	261.181	2	892.586	1
257		15	max	0	1	.267	3	.598	1	2.533e-2	2	NC	15	NC	3
258			min	-.535	4	-1.467	2	.009	12	-7.417e-3	3	293.153	2	1104.283	1
259		16	max	0	1	.241	3	.562	1	2.384e-2	2	NC	5	NC	3
260			min	-.535	4	-1.377	2	.01	12	-6.829e-3	3	358.96	2	1523.612	1
261		17	max	0	1	.204	3	.525	1	2.234e-2	2	NC	5	NC	3
262			min	-.535	4	-1.259	2	.011	12	-6.24e-3	3	507.062	2	2514.151	1
263		18	max	0	1	.156	3	.491	1	2.085e-2	2	NC	5	NC	3
264			min	-.535	4	-1.122	2	.012	12	-5.652e-3	3	982.251	2	6085.523	1
265		19	max	0	1	.104	3	.468	1	1.935e-2	2	NC	1	NC	1
266			min	-.535	4	-.975	2	.013	12	-5.063e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	5	1.132e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	2	-1.917e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.003	5	2.264e-3	2	NC	3	NC	1
272			min	0	2	-.008	1	0	1	-3.833e-3	5	8849.635	1	NC	1
273		4	max	0	3	-.002	12	.007	5	3.395e-3	2	NC	3	NC	1
274			min	0	2	-.018	1	0	1	-5.75e-3	5	3921.246	1	9780.261	5
275		5	max	0	3	-.002	12	.012	5	3.764e-3	2	NC	3	NC	1
276			min	0	2	-.032	1	-.001	1	-6.583e-3	5	2191.341	1	5668.492	5
277		6	max	0	3	-.003	12	.019	5	3.427e-3	2	NC	3	NC	1
278			min	0	2	-.05	1	-.002	1	-6.413e-3	5	1399.129	1	3733.567	5
279		7	max	0	3	-.004	12	.026	5	3.091e-3	2	NC	3	NC	1
280			min	0	2	-.071	1	-.002	1	-6.244e-3	5	976.021	1	2666.805	5
281		8	max	0	3	-.005	12	.034	5	2.754e-3	2	NC	12	NC	1
282			min	0	2	-.096	1	-.003	1	-6.074e-3	5	723.639	1	2015.08	5
283		9	max	0	3	-.006	12	.044	5	2.417e-3	2	NC	12	NC	1
284			min	0	2	-.124	1	-.004	1	-5.904e-3	5	560.914	1	1587.004	5
285		10	max	0	3	-.007	12	.054	5	2.081e-3	2	NC	12	NC	1
286			min	-.001	2	-.154	1	-.004	1	-5.735e-3	5	449.747	1	1290.226	5
287		11	max	0	3	-.008	12	.064	5	1.744e-3	2	9009.292	12	NC	1
288			min	-.001	2	-.187	1	-.005	1	-5.565e-3	5	370.405	1	1075.857	5
289		12	max	.001	3	-.009	12	.076	5	1.407e-3	2	7960.979	12	NC	1
290			min	-.001	2	-.222	1	-.005	1	-5.396e-3	5	311.751	1	915.827	5
291		13	max	.001	3	-.01	12	.087	5	1.07e-3	2	7113.685	12	NC	1
292			min	-.001	2	-.259	1	-.006	1	-5.226e-3	5	267.142	1	793.135	5
293		14	max	.001	3	-.011	12	.099	4	7.336e-4	2	6417.184	12	NC	1
294			min	-.001	2	-.298	1	-.006	1	-5.059e-3	4	232.41	1	696.881	4
295		15	max	.001	3	-.012	12	.112	4	3.969e-4	2	5836.456	12	NC	1
296			min	-.002	2	-.338	1	-.006	1	-4.921e-3	4	204.832	1	619.731	4
297		16	max	.001	3	-.013	12	.124	4	4.171e-4	3	5346.473	12	NC	1
298			min	-.002	2	-.38	1	-.006	1	-4.783e-3	4	182.577	1	557.206	4
299		17	max	.002	3	-.014	12	.137	4	5.908e-4	3	4928.793	12	NC	1
300			min	-.002	2	-.422	1	-.006	1	-4.645e-3	4	164.362	1	505.876	4
301		18	max	.002	3	-.015	12	.15	4	7.646e-4	3	4569.583	12	NC	1
302			min	-.002	2	-.464	1	-.006	3	-4.507e-3	4	149.275	1	463.279	4
303		19	max	.002	3	-.016	12	.162	4	9.383e-4	3	4258.278	12	NC	1
304			min	-.002	2	-.507	1	-.009	3	-4.37e-3	4	136.651	1	427.609	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	4	0	1	NC	1	NC	1
308			min	0	2	-.002	1	0	1	-1.979e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	3	NC	1
310			min	0	2	-.01	1	0	1	-3.957e-3	4	7101.987	1	NC	1
311		4	max	0	3	0	15	.007	4	0	1	NC	3	NC	1
312			min	-.001	2	-.023	1	0	1	-5.936e-3	4	3042.618	1	9460.592	4
313		5	max	.001	3	-.001	15	.013	4	0	1	NC	3	NC	1
314			min	-.001	2	-.042	1	0	1	-6.793e-3	4	1652.964	1	5484.542	4
315		6	max	.001	3	-.002	15	.019	4	0	1	NC	3	NC	1
316			min	-.002	2	-.067	1	0	1	-6.613e-3	4	1032.919	1	3613.069	4
317		7	max	.002	3	-.003	15	.027	4	0	1	NC	3	NC	1
318			min	-.002	2	-.098	1	0	1	-6.433e-3	4	710.117	1	2581.379	4
319		8	max	.002	3	-.004	15	.036	4	0	1	NC	3	NC	1
320			min	-.002	2	-.133	1	0	1	-6.253e-3	4	521.015	1	1951.181	4
321		9	max	.002	3	-.005	15	.045	4	0	1	NC	3	NC	1
322			min	-.002	2	-.173	1	0	1	-6.073e-3	4	400.708	1	1537.319	4
323		10	max	.002	3	-.006	15	.055	4	0	1	NC	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.003	2	-.217	1	0	1	-5.892e-3	4	319.356	1	1250.45	4
325		11	max	.003	3	-.008	15	.066	4	0	1	NC	3	NC	1
326			min	-.003	2	-.265	2	0	1	-5.712e-3	4	261.743	2	1043.281	4
327		12	max	.003	3	-.008	12	.078	4	0	1	NC	3	NC	1
328			min	-.003	2	-.317	2	0	1	-5.532e-3	4	218.849	2	888.663	4
329		13	max	.003	3	-.009	12	.09	4	0	1	NC	3	NC	1
330			min	-.003	2	-.372	2	0	1	-5.352e-3	4	186.526	2	770.156	4
331		14	max	.004	3	-.009	12	.102	4	0	1	NC	3	NC	1
332			min	-.004	2	-.429	2	0	1	-5.172e-3	4	161.553	2	677.323	4
333		15	max	.004	3	-.009	12	.115	4	0	1	NC	3	NC	1
334			min	-.004	2	-.489	2	0	1	-4.992e-3	4	141.854	2	603.273	4
335		16	max	.004	3	-.009	12	.128	4	0	1	NC	3	NC	1
336			min	-.004	2	-.55	2	0	1	-4.812e-3	4	126.045	2	543.316	4
337		17	max	.004	3	-.009	12	.14	4	0	1	NC	3	NC	1
338			min	-.004	2	-.612	2	0	1	-4.632e-3	4	113.17	2	494.155	4
339		18	max	.005	3	-.009	12	.153	4	0	1	NC	3	NC	1
340			min	-.005	2	-.676	2	0	1	-4.452e-3	4	102.552	2	453.425	4
341		19	max	.005	3	-.009	12	.165	4	0	1	NC	3	NC	1
342			min	-.005	2	-.74	2	0	1	-4.271e-3	4	93.702	2	419.392	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	0	4	4.551e-4	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-2.082e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.003	4	9.103e-4	3	NC	3	NC	1
348			min	0	2	-.008	1	0	3	-4.164e-3	4	8849.635	1	NC	1
349		4	max	0	3	.001	5	.007	4	1.365e-3	3	NC	3	NC	1
350			min	0	2	-.018	1	0	3	-6.246e-3	4	3921.246	1	9485.224	4
351		5	max	0	3	.002	5	.013	4	1.494e-3	3	NC	3	NC	1
352			min	0	2	-.032	1	-.001	3	-7.131e-3	4	2191.341	1	5501.996	4
353		6	max	0	3	.003	5	.019	4	1.32e-3	3	NC	3	NC	1
354			min	0	2	-.05	1	-.002	3	-6.908e-3	4	1399.129	1	3626.009	4
355		7	max	0	3	.005	5	.027	4	1.146e-3	3	NC	3	NC	1
356			min	0	2	-.071	1	-.002	3	-6.685e-3	4	976.021	1	2591.333	4
357		8	max	0	3	.006	5	.035	4	9.727e-4	3	NC	5	NC	1
358			min	0	2	-.096	1	-.003	3	-6.462e-3	4	723.639	1	1959.113	4
359		9	max	0	3	.008	5	.045	4	7.99e-4	3	NC	12	NC	1
360			min	0	2	-.124	1	-.003	3	-6.24e-3	4	560.914	1	1543.831	4
361		10	max	0	3	.009	5	.055	4	6.252e-4	3	NC	12	NC	1
362			min	-.001	2	-.154	1	-.003	3	-6.017e-3	4	449.747	1	1255.932	4
363		11	max	0	3	.011	5	.066	4	4.515e-4	3	NC	13	NC	1
364			min	-.001	2	-.187	1	-.003	3	-5.794e-3	4	370.405	1	1047.993	4
365		12	max	.001	3	.013	5	.078	4	2.778e-4	3	9726.322	13	NC	1
366			min	-.001	2	-.222	1	-.003	3	-5.571e-3	4	311.751	1	892.787	4
367		13	max	.001	3	.015	5	.09	4	1.041e-4	3	8267.478	13	NC	1
368			min	-.001	2	-.259	1	-.002	3	-5.348e-3	4	267.142	1	773.82	4
369		14	max	.001	3	.018	5	.102	4	-4.223e-5	12	7144.781	13	NC	1
370			min	-.001	2	-.298	1	-.001	3	-5.125e-3	4	232.41	1	680.623	4
371		15	max	.001	3	.02	5	.114	4	2.128e-5	9	6262.05	13	NC	1
372			min	-.002	2	-.338	1	0	3	-4.903e-3	4	204.832	1	606.28	4
373		16	max	.001	3	.022	5	.127	4	1.204e-4	9	5555.637	13	NC	1
374			min	-.002	2	-.38	1	0	12	-4.695e-3	5	182.577	1	546.086	4
375		17	max	.002	3	.024	5	.14	4	4.069e-4	1	4981.709	13	NC	1
376			min	-.002	2	-.422	1	.002	10	-4.506e-3	5	164.362	1	496.731	4
377		18	max	.002	3	.027	5	.152	4	6.967e-4	1	4569.583	12	NC	1
378			min	-.002	2	-.464	1	.001	10	-4.318e-3	5	149.275	1	455.842	4
379		19	max	.002	3	.029	5	.164	4	9.864e-4	1	4258.278	12	NC	1
380			min	-.002	2	-.507	1	0	10	-4.129e-3	5	136.651	1	421.678	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	.023	1	0	12	.009	5	9.856e-4	2	NC	1	NC	1
382			min	.002	12	-.007	1	0	1	-5.786e-4	5	NC	1	NC	1
383		2	max	.022	1	-.002	12	.038	5	1.423e-3	2	NC	1	NC	3
384			min	.002	12	-.047	1	-.017	2	-6.594e-4	5	NC	1	4539.04	2
385		3	max	.021	1	-.003	12	.068	5	1.861e-3	2	NC	1	NC	4
386			min	.002	12	-.087	1	-.033	2	-7.401e-4	5	NC	1	2298.219	2
387		4	max	.021	1	-.004	12	.097	5	2.298e-3	2	NC	1	NC	13
388			min	.003	15	-.127	1	-.048	2	-8.973e-4	3	NC	1	1561.042	2
389		5	max	.02	1	-.006	12	.125	5	2.736e-3	2	NC	1	7625.429	13
390			min	.003	15	-.166	2	-.062	2	-1.086e-3	3	NC	1	1200.6	2
391		6	max	.019	1	-.007	12	.154	5	3.173e-3	2	NC	1	6235.878	13
392			min	.003	15	-.206	2	-.075	2	-1.275e-3	3	9670.313	4	991.817	2
393		7	max	.019	1	-.008	12	.182	5	3.611e-3	2	NC	1	5365.471	13
394			min	.003	15	-.245	2	-.086	2	-1.465e-3	3	8575.823	6	860.017	2
395		8	max	.018	1	-.009	12	.209	5	4.049e-3	2	NC	1	4799.065	13
396			min	.002	15	-.284	2	-.096	2	-1.654e-3	3	7918.965	6	773.609	2
397		9	max	.017	1	-.01	12	.236	5	4.486e-3	2	NC	3	4432.826	13
398			min	.002	15	-.323	2	-.103	2	-1.843e-3	3	7565.404	6	717.336	2
399		10	max	.017	1	-.011	12	.262	5	4.924e-3	2	NC	3	4213.946	13
400			min	.002	15	-.362	2	-.107	2	-2.032e-3	3	7453.555	6	683.456	2
401		11	max	.016	1	-.011	12	.287	5	5.361e-3	2	NC	3	4117.668	13
402			min	.002	15	-.4	2	-.109	2	-2.221e-3	3	7565.404	4	639.908	14
403		12	max	.015	1	-.012	12	.311	5	5.799e-3	2	NC	1	4138.88	13
404			min	.002	15	-.438	2	-.108	2	-2.41e-3	3	7918.965	4	578.745	14
405		13	max	.014	1	-.012	12	.334	5	6.236e-3	2	NC	1	4291.928	13
406			min	.002	15	-.476	2	-.103	2	-2.599e-3	3	8575.823	6	527.609	14
407		14	max	.014	1	-.012	12	.356	5	6.674e-3	2	NC	1	4619.422	13
408			min	.002	15	-.514	2	-.095	2	-2.788e-3	3	9670.313	4	484.163	14
409		15	max	.013	1	-.013	12	.377	5	7.112e-3	2	NC	1	5219.979	13
410			min	.002	15	-.552	2	-.083	2	-2.977e-3	3	NC	1	446.743	14
411		16	max	.012	1	-.013	12	.397	5	7.549e-3	2	NC	1	6335.529	13
412			min	.002	15	-.589	2	-.066	2	-3.166e-3	3	NC	1	414.127	14
413		17	max	.012	1	-.013	12	.415	5	7.987e-3	2	NC	1	8703.96	13
414			min	.002	15	-.626	2	-.045	2	-3.355e-3	3	NC	1	385.402	14
415		18	max	.011	1	-.013	12	.434	4	8.424e-3	2	NC	1	NC	4
416			min	.002	15	-.664	2	-.019	2	-3.544e-3	3	NC	1	359.87	14
417		19	max	.01	1	-.013	12	.452	4	8.862e-3	2	NC	1	NC	1
418			min	.002	10	-.701	2	-.002	3	-3.733e-3	3	NC	1	336.991	14
419	M6	1	max	.03	1	0	15	.01	4	0	1	NC	1	NC	1
420			min	0	15	-.01	1	0	1	-5.969e-4	5	NC	1	NC	1
421		2	max	.028	1	0	3	.04	4	0	1	NC	1	NC	1
422			min	0	15	-.069	2	0	1	-7.067e-4	4	NC	1	NC	1
423		3	max	.026	1	0	3	.07	4	0	1	NC	1	NC	1
424			min	0	15	-.129	2	0	1	-8.169e-4	4	NC	1	7122.13	4
425		4	max	.025	1	.002	3	.1	4	0	1	NC	1	NC	1
426			min	0	15	-.189	2	0	1	-9.271e-4	4	NC	1	4784.887	4
427		5	max	.023	1	.002	3	.129	4	0	1	NC	1	NC	1
428			min	0	15	-.248	2	0	1	-1.037e-3	4	NC	1	3648.02	4
429		6	max	.021	1	.003	3	.159	4	0	1	NC	1	NC	1
430			min	0	15	-.308	2	0	1	-1.147e-3	4	9670.313	4	2993.089	4
431		7	max	.02	1	.005	3	.187	4	0	1	NC	1	NC	1
432			min	0	15	-.367	2	0	1	-1.258e-3	4	8575.823	4	2581.904	4
433		8	max	.018	1	.006	3	.215	4	0	1	NC	1	NC	1
434			min	0	15	-.426	2	0	1	-1.368e-3	4	7918.965	4	2313.802	4
435		9	max	.016	1	.007	3	.243	4	0	1	NC	5	NC	1
436			min	0	15	-.485	2	0	1	-1.478e-3	4	7565.404	4	2140.182	4
437		10	max	.016	3	.009	3	.269	4	0	1	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	0	15	-.543	2	0	1	-1.588e-3	4	7453.555	4	2036.349	4
439		11	max	.017	3	.011	3	.295	4	0	1	NC	5	NC	1
440			min	0	15	-.601	2	0	1	-1.698e-3	4	6756.494	3	1990.784	4
441		12	max	.019	3	.013	3	.319	4	0	1	NC	1	NC	1
442			min	0	15	-.66	2	0	1	-1.809e-3	4	5747.784	3	2001.245	4
443		13	max	.02	3	.015	3	.342	4	0	1	NC	1	NC	1
444			min	0	10	-.717	2	0	1	-1.919e-3	4	4946.623	3	2074.749	4
445		14	max	.021	3	.017	3	.364	4	0	1	NC	1	NC	1
446			min	-.002	10	-.775	2	0	1	-2.029e-3	4	4302.992	3	2231.826	4
447		15	max	.022	3	.02	3	.385	4	0	1	NC	1	NC	1
448			min	-.003	10	-.833	2	0	1	-2.139e-3	4	3780.8	3	2519.856	4
449		16	max	.023	3	.022	3	.404	4	0	1	NC	1	NC	1
450			min	-.004	2	-.89	2	0	1	-2.249e-3	4	3353.528	3	3054.974	4
451		17	max	.024	3	.025	3	.422	4	0	1	NC	1	NC	1
452			min	-.007	2	-.947	2	0	1	-2.36e-3	4	3001.394	3	4191.31	4
453		18	max	.025	3	.028	3	.438	4	0	1	NC	1	NC	1
454			min	-.009	2	-1.004	2	0	1	-2.47e-3	4	2709.464	3	7707.542	4
455		19	max	.026	3	.031	3	.453	4	0	1	NC	1	NC	1
456			min	-.011	2	-1.061	2	0	1	-2.58e-3	4	2466.35	3	NC	1
457	M9	1	max	.023	1	0	5	.01	4	3.301e-4	3	NC	1	NC	1
458			min	-.002	5	-.007	1	0	3	-9.856e-4	2	NC	1	NC	1
459		2	max	.022	1	.002	5	.041	4	5.192e-4	3	NC	1	NC	3
460			min	-.002	5	-.047	1	-.008	3	-1.423e-3	2	NC	1	4539.04	2
461		3	max	.021	1	.003	5	.073	4	7.083e-4	3	NC	1	NC	15
462			min	-.002	5	-.087	1	-.014	3	-1.861e-3	2	NC	1	2298.219	2
463		4	max	.021	1	.005	5	.104	4	8.973e-4	3	NC	1	6822.065	15
464			min	-.002	5	-.127	1	-.02	3	-2.298e-3	2	NC	1	1561.042	2
465		5	max	.02	1	.006	5	.135	4	1.086e-3	3	NC	1	5200.706	15
466			min	-.002	5	-.166	2	-.026	3	-2.736e-3	2	NC	1	1200.6	2
467		6	max	.019	1	.008	5	.165	4	1.275e-3	3	NC	1	4266.48	15
468			min	-.002	5	-.206	2	-.031	3	-3.173e-3	2	9670.313	6	991.817	2
469		7	max	.019	1	.01	5	.195	4	1.465e-3	3	NC	1	3679.776	15
470			min	-.002	5	-.245	2	-.036	3	-3.611e-3	2	8438.514	5	860.017	2
471		8	max	.018	1	.011	5	.224	4	1.654e-3	3	NC	1	3297.055	15
472			min	-.002	5	-.284	2	-.04	3	-4.049e-3	2	7051.943	5	773.609	2
473		9	max	.017	1	.013	5	.252	4	1.843e-3	3	NC	3	3049.009	15
474			min	-.002	5	-.323	2	-.043	3	-4.486e-3	2	6006.847	5	717.336	2
475		10	max	.017	1	.015	5	.278	4	2.032e-3	3	NC	3	2900.4	15
476			min	-.002	5	-.362	2	-.044	3	-4.924e-3	2	5192.83	5	683.456	2
477		11	max	.016	1	.017	5	.304	4	2.221e-3	3	NC	3	2834.773	15
478			min	-.002	5	-.4	2	-.045	3	-5.361e-3	2	4543.136	5	668.391	2
479		12	max	.015	1	.02	5	.328	4	2.41e-3	3	NC	1	2848.881	15
480			min	-.002	5	-.438	2	-.045	3	-5.799e-3	2	4014.838	5	671.523	2
481		13	max	.014	1	.022	5	.35	4	2.599e-3	3	NC	1	2952.645	15
482			min	-.002	5	-.476	2	-.043	3	-6.236e-3	2	3578.956	5	695.221	2
483		14	max	.014	1	.024	5	.371	4	2.788e-3	3	NC	1	3175.193	15
484			min	-.002	5	-.514	2	-.04	3	-6.674e-3	2	3215.145	5	746.258	2
485		15	max	.013	1	.027	5	.39	4	2.977e-3	3	NC	1	3583.787	15
486			min	-.002	5	-.552	2	-.035	3	-7.112e-3	2	2908.651	5	840.19	2
487		16	max	.012	1	.03	5	.407	4	3.166e-3	3	NC	1	4343.337	15
488			min	-.002	5	-.589	2	-.029	3	-7.549e-3	2	2648.499	5	1015.097	2
489		17	max	.012	1	.032	5	.423	4	3.355e-3	3	NC	1	5956.737	15
490			min	-.002	5	-.626	2	-.021	3	-7.987e-3	2	2426.344	5	1387.055	2
491		18	max	.011	1	.035	5	.436	4	3.544e-3	3	NC	1	NC	12
492			min	-.002	5	-.664	2	-.01	3	-8.424e-3	2	2235.729	5	2539.025	2
493		19	max	.01	1	.038	5	.447	4	3.733e-3	3	NC	1	NC	1
494			min	-.002	5	-.701	2	-.014	1	-8.862e-3	2	2071.593	5	NC	1