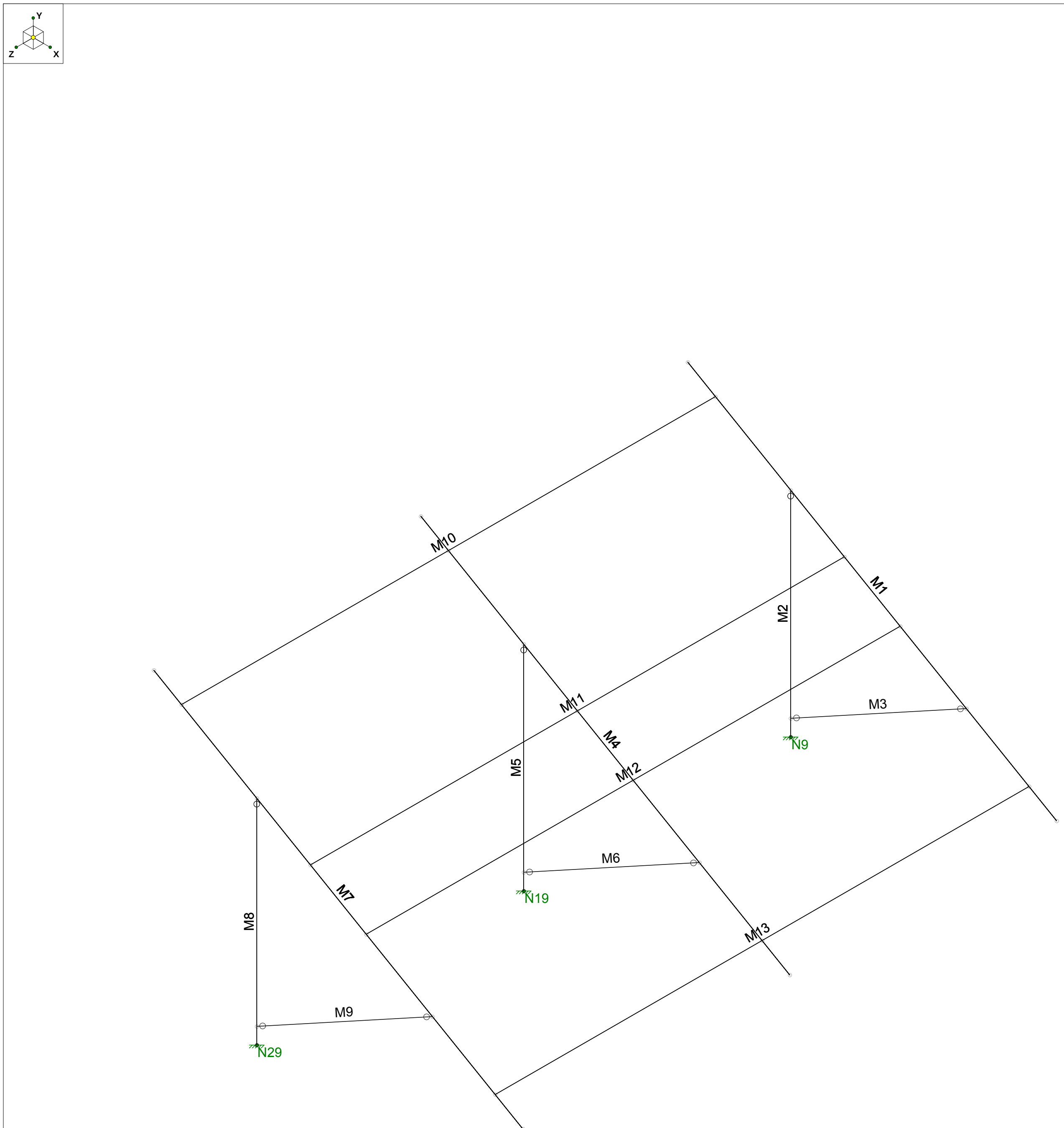


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

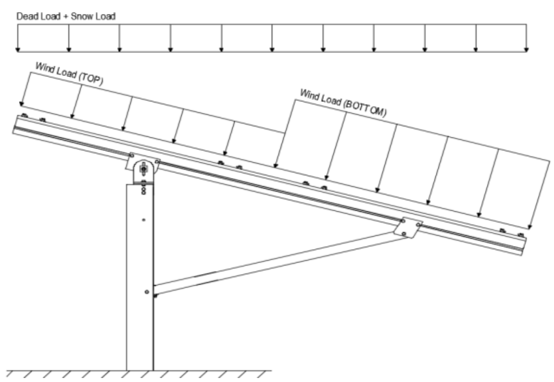
1.2 Construction

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)*
$Cf+_{BOTTOM}$	=	1.85	
$Cf-_{TOP}$	=	-2.3	*(Suction)*
$Cf-_{BOTTOM}$	=	-1.1	

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 - N/A

S_S =	0.00	R =	1.25
S_{DS} =	0.00	C_S =	0
S_1 =	0.00	ρ =	1.3
S_{D1} =	0.00	Ω =	1.25
T_a =	0.00	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
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

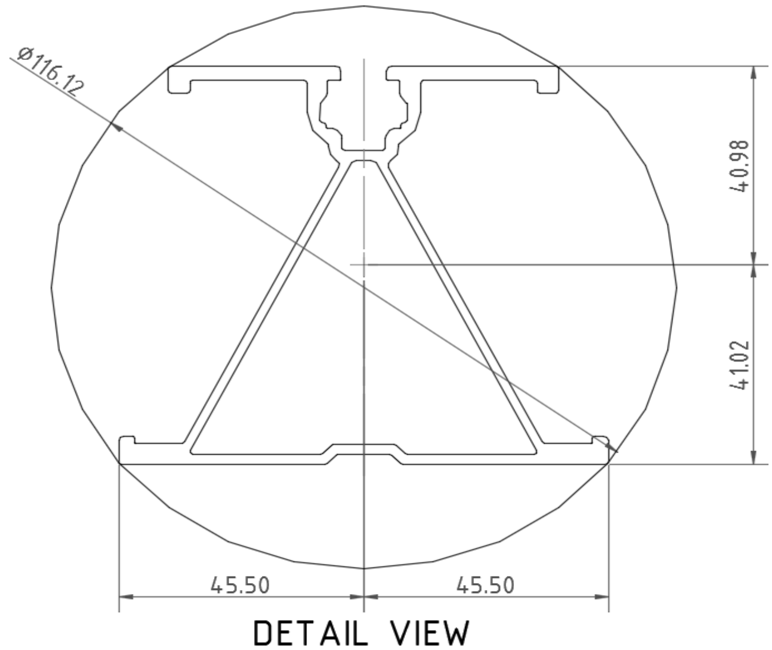
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

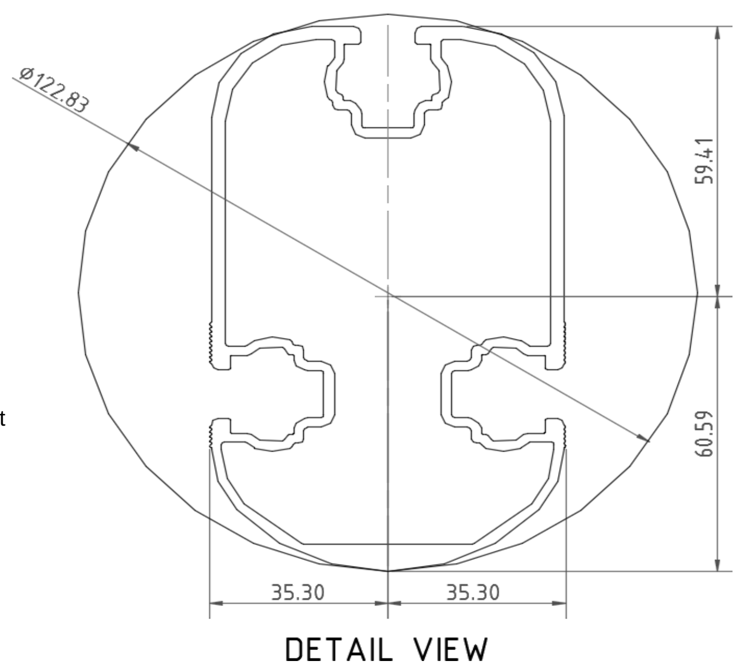
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	138	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.841	k-ft
M_z =	0.355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



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).

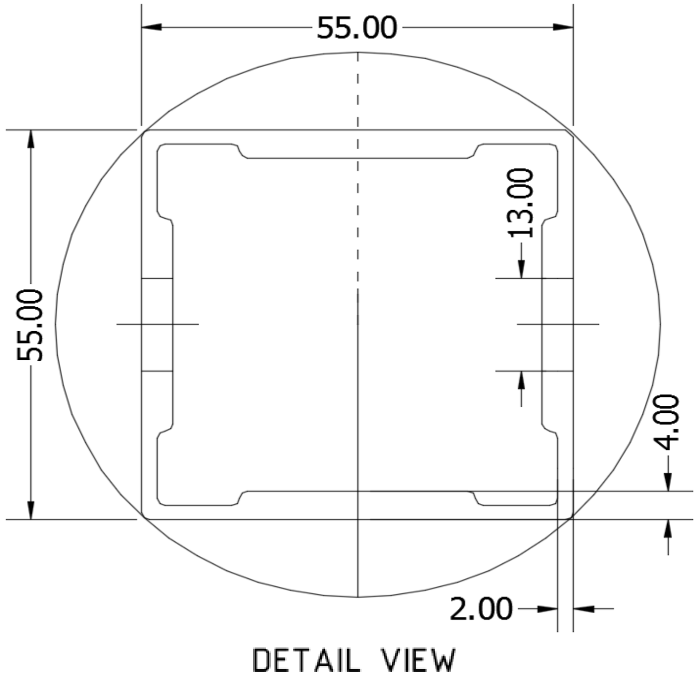
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	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%	



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).

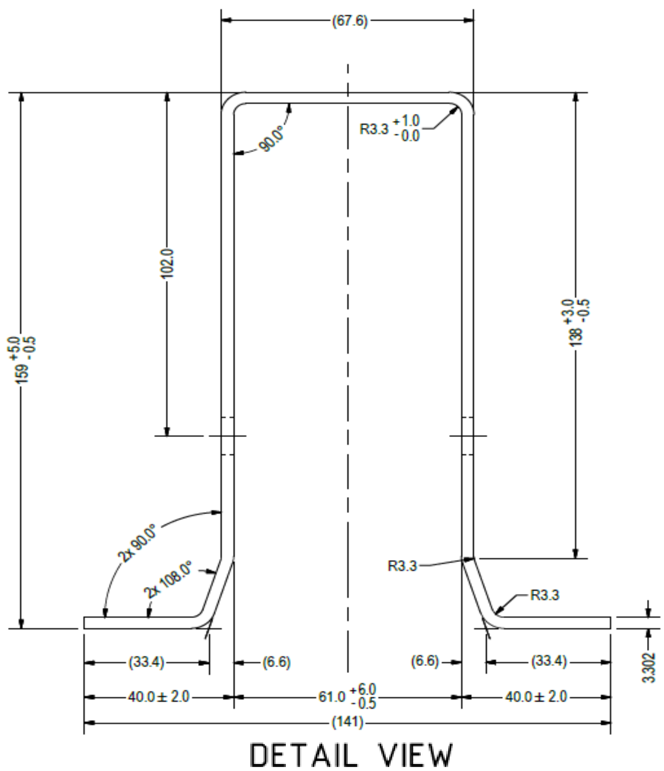
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.000	k-ft
M_z =	0.416	k-ft
P_n =	4.114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

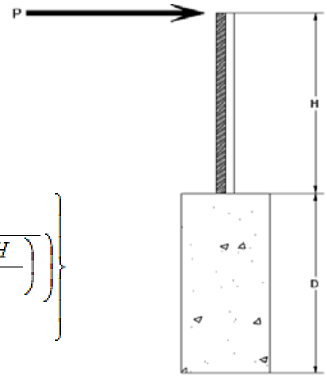
Lateral Force @ Top of Pole, P =	0.83	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	0.83	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

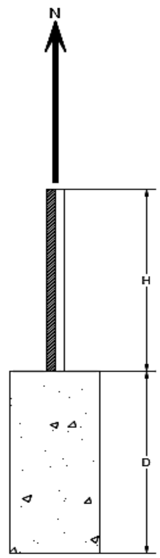
A 2ft diameter x 5.75ft deep footing unrestrained at ground level is required for the racking structure.

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

A 2ft diameter x 3.75ft deep footing unrestrained at ground level is required for the racking structure.



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	

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

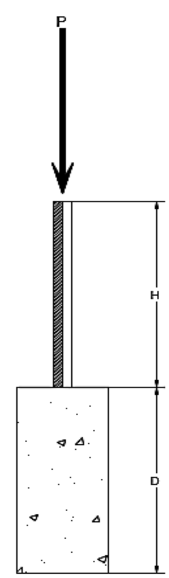
Weight of Concrete

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.



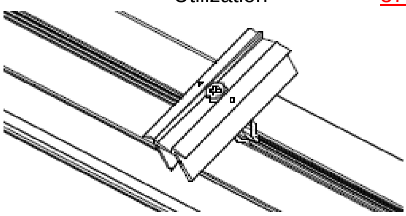
6. DESIGN OF JOINTS AND CONNECTIONS

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.

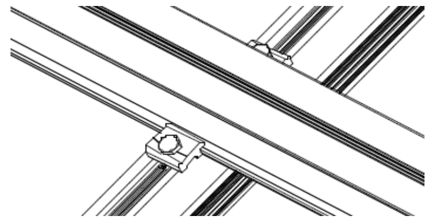
<u>Fastening of Modules to Purlins</u>

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



<u>Fastening of Purlins to Girders</u>

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

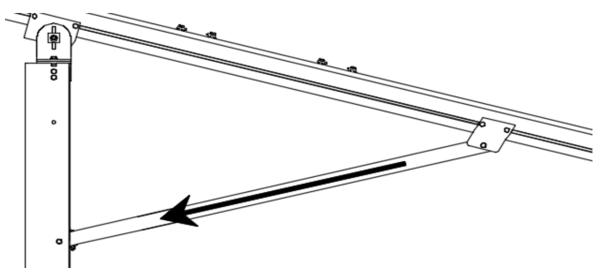


6.2 Strut Connections

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)

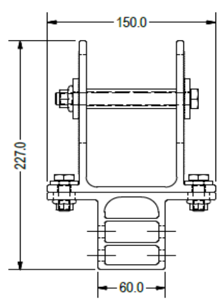


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

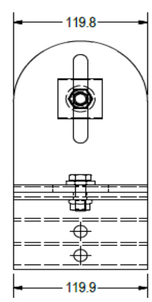
6.3 Girder to Post Connection

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.

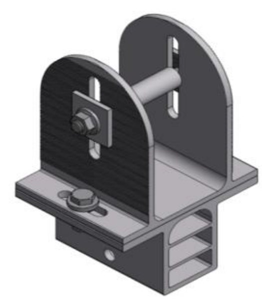
Maximum Tensile Load =	3.851	k
Allowable Load =	5.649	k
Utilization =	68%	



FRONT VIEW



SIDE VIEW



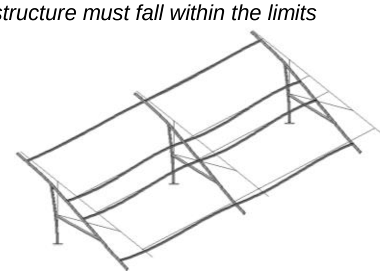
7. SEISMIC DESIGN

7.1 Seismic Drift - N/A

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	in
N/A		

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 = 138 in

J = 0.432

381.773

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

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= 27.0 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 = 138

J = 0.432

242.785

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

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= 28.3

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 = 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

φF_LSt= 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

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

φF_LWk= 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

<u>Compression</u>

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

φF_L= (φccFcy)/(λ²)

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)

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= 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								

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

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												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
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	.009	3	4.298	1
2		min	-963.227	3	-1418.073	3	-298.42	3	-.437	3	-.019	2	.209	15
3	N19	max	2538.864	2	6106.327	1	0	10	0	2	0	15	8.076	1
4		min	-2601.833	3	-4311.544	3	0	12	0	3	0	1	.361	15
5	N29	max	728.336	2	2288.735	1	298.42	3	.437	3	.019	2	4.298	1
6		min	-963.227	3	-1418.073	3	-290.449	2	-.409	1	-.009	3	.209	15
7	Totals:	max	3995.537	2	10683.798	1	0	3						
8		min	-4528.286	3	-7147.69	3	0	9						

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	0	15	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	15	0	1	0	15	0	4
4			min	-1.11	4	-1.921	4	-.002	1	0	1	0	1	0	15
5		3	max	-10.769	15	261.852	3	-8.366	15	.072	3	.328	1	.271	2
6			min	-220.786	1	-629.254	2	-190.126	1	-.268	2	.015	15	-.11	3
7		4	max	-11.03	15	260.728	3	-8.366	15	.072	3	.21	1	.662	2
8			min	-221.651	1	-630.753	2	-190.126	1	-.268	2	.01	15	-.272	3
9		5	max	-11.291	15	259.604	3	-8.366	15	.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	-.038	1	-.337	3
15		8	max	228.484	3	556.432	2	20.418	3	.102	2	-.009	15	.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	-.003	15	.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	-.003	15	.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	-.003	15	.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	.009	15	-.58	3
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	-6.139	10	.294	1	.116	3	1.075	1
28			min	11.564	15	-623.236	3	-133.485	1	-.471	3	-.106	1	-1.434	3
29		15	max	222.397	1	471.638	1	-6.139	10	.294	1	.067	3	.782	1
30			min	11.303	15	-624.36	3	-133.485	1	-.471	3	-.189	1	-1.047	3
31		16	max	221.532	1	470.139	1	-6.139	10	.294	1	.019	3	.49	1
32			min	11.042	15	-625.484	3	-133.485	1	-.471	3	-.272	1	-.659	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
33		17	max	220.667	1	468.64	1	-6.139	10	.294	1	-.016	15	.198	1
34			min	10.781	15	-626.608	3	-133.485	1	-.471	3	-.355	1	-.271	3
35		18	max	1.11	4	1.923	4	.002	1	0	1	0	15	0	4
36			min	.261	15	.452	15	0	15	0	1	0	1	0	15
37		19	max	0	1	.003	2	.002	1	0	1	0	1	0	1
38			min	0	1	-.005	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.016	1	0	1	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	4
42			min	-1.11	4	-1.919	4	0	1	0	1	0	1	0	15
43		3	max	-13.62	12	827.703	3	0	1	0	1	0	1	.713	2
44			min	-432.809	1	-1841.033	2	0	1	0	1	0	1	-.325	3
45		4	max	-14.053	12	826.579	3	0	1	0	1	0	1	1.856	2
46			min	-433.674	1	-1842.532	2	0	1	0	1	0	1	-.839	3
47		5	max	-14.486	12	825.455	3	0	1	0	1	0	1	3	2
48			min	-434.54	1	-1844.03	2	0	1	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	0	1	0	1	0	1	-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	0	1	0	1	0	1	-.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	0	1	0	1	0	1	-.556	3
55		9	max	846.66	3	229.585	3	0	1	0	1	0	1	.182	1
56			min	-2741.844	1	-210.826	1	0	1	0	1	0	1	-.363	3
57		10	max	846.011	3	228.461	3	0	1	0	1	0	1	.314	1
58			min	-2742.709	1	-212.325	1	0	1	0	1	0	1	-.505	3
59		11	max	845.362	3	227.338	3	0	1	0	1	0	1	.446	1
60			min	-2743.574	1	-213.823	1	0	1	0	1	0	1	-.647	3
61		12	max	834.241	3	1926.283	3	0	1	0	1	0	1	1.114	1
62			min	-3165.021	1	-1584.172	1	0	1	0	1	0	1	-1.468	3
63		13	max	833.592	3	1925.159	3	0	1	0	1	0	1	2.098	1
64			min	-3165.886	1	-1585.67	1	0	1	0	1	0	1	-2.663	3
65		14	max	435.643	1	1351.742	1	0	1	0	1	0	1	3.042	1
66			min	15.289	12	-1694.243	3	0	1	0	1	0	1	-3.808	3
67		15	max	434.778	1	1350.243	1	0	1	0	1	0	1	2.204	1
68			min	14.856	12	-1695.367	3	0	1	0	1	0	1	-2.756	3
69		16	max	433.913	1	1348.745	1	0	1	0	1	0	1	1.366	1
70			min	14.424	12	-1696.491	3	0	1	0	1	0	1	-1.704	3
71		17	max	433.048	1	1347.246	1	0	1	0	1	0	1	.53	1
72			min	13.991	12	-1697.615	3	0	1	0	1	0	1	-.651	3
73		18	max	1.11	4	1.925	4	0	1	0	1	0	1	0	4
74			min	.261	15	.452	15	0	1	0	1	0	1	0	15
75		19	max	0	1	.008	2	0	1	0	1	0	1	0	1
76			min	0	1	-.013	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.007	1	.002	1	0	1	0	1	0	1
78			min	0	1	0	3	0	15	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	-1.921	4	0	15	0	1	0	15	0	15
81		3	max	-10.769	15	261.852	3	190.126	1	.268	2	-.015	15	.271	2
82			min	-220.786	1	-629.254	2	8.366	15	-.072	3	-.328	1	-.11	3
83		4	max	-11.03	15	260.728	3	190.126	1	.268	2	-.01	15	.662	2
84			min	-221.651	1	-630.753	2	8.366	15	-.072	3	-.21	1	-.272	3
85		5	max	-11.291	15	259.604	3	190.126	1	.268	2	0	10	1.054	2
86			min	-222.517	1	-632.252	2	8.366	15	-.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	-20.418	3	-.102	2	-.126	1	-.44	3
89		7	max	229.133	3	557.93	2	264.177	1	.098	3	.038	1	.663	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
90			min	-870.727	1	-164.918	3	-20.418	3	-.102	2	-.013	10	-.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	-20.418	3	-.102	2	.009	15	-.235	3
93		9	max	205.324	3	82.049	3	269.418	1	.212	2	.003	10	.127	1
94			min	-1100.149	1	-67.627	2	-4.052	3	.003	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	-4.052	3	.003	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	-4.052	3	.003	15	-.062	3	-.286	3
99		12	max	177.801	3	704.33	3	340.164	3	.408	2	-.009	15	.435	1
100			min	-1327.049	1	-525.363	1	-169.514	2	-.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	-169.514	2	-.427	3	-.245	1	-1.016	3
103		14	max	223.262	1	473.136	1	133.485	1	.471	3	.106	1	1.075	1
104			min	11.564	15	-623.236	3	6.139	10	-.294	1	-.116	3	-1.434	3
105		15	max	222.397	1	471.638	1	133.485	1	.471	3	.189	1	.782	1
106			min	11.303	15	-624.36	3	6.139	10	-.294	1	-.067	3	-1.047	3
107		16	max	221.532	1	470.139	1	133.485	1	.471	3	.272	1	.49	1
108			min	11.042	15	-625.484	3	6.139	10	-.294	1	-.019	3	-.659	3
109		17	max	220.667	1	468.64	1	133.485	1	.471	3	.355	1	.198	1
110			min	10.781	15	-626.608	3	6.139	10	-.294	1	.016	15	-.271	3
111		18	max	1.11	4	1.923	4	0	15	0	1	0	1	0	4
112			min	.261	15	.452	15	-.002	1	0	1	0	15	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	-10.259	15	.009	2	.409	1	.294	1
116			min	6.135	10	-628.898	3	-219.158	1	-.018	3	.019	15	-.471	3
117		2	max	133.493	1	339.098	1	-7.977	15	.009	2	.16	1	.227	3
118			min	6.135	10	-464.647	3	-170.87	1	-.018	3	.007	15	-.22	1
119		3	max	133.493	1	212.915	1	-5.694	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	-3.411	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	-1.128	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	-.01	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	-.007	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	15	.083	1
130			min	6.135	10	-417.999	1	1.964	12	-.018	3	-.04	1	.003	15
131		9	max	133.493	1	685.109	3	167.149	1	.009	2	.143	1	.697	1
132			min	6.135	10	-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	-.002	15	.083	1
138			min	6.135	10	-520.858	3	-118.86	1	-.009	2	-.04	1	.003	15
139		13	max	133.493	1	291.816	1	1.023	3	.018	3	-.007	15	.572	3
140			min	6.135	10	-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	-.01	15	.923	3
142			min	6.135	10	-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	6.135	10	-28.105	3	1.128	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	6.135	10	-86.732	1	3.411	15	-.009	2	-.153	1	-.764	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
147		17	max	133.493	1	300.396	3	122.581	1	.018	3	.015	3	.716	3
148			min	6.135	10	-212.915	1	5.694	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	6.135	10	-339.098	1	7.977	15	-.009	2	.007	15	-.22	1
151		19	max	133.493	1	628.898	3	219.158	1	.018	3	.409	1	.294	1
152			min	6.135	10	-465.281	1	10.259	15	-.009	2	.019	15	-.471	3
153	M11	1	max	348.479	1	455.506	1	-10.553	15	0	15	.453	1	.244	1
154			min	-344.178	3	-626.022	3	-224.887	1	-.004	1	.021	15	-.552	3
155		2	max	348.479	1	329.323	1	-8.27	15	0	15	.196	1	.143	3
156			min	-344.178	3	-461.771	3	-176.599	1	-.004	1	.009	15	-.276	2
157		3	max	348.479	1	203.141	1	-5.987	15	0	15	.034	3	.628	3
158			min	-344.178	3	-297.52	3	-128.311	1	-.004	1	-.001	9	-.598	1
159		4	max	348.479	1	76.958	1	-3.704	15	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	-1.422	15	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	16.554	1	0	15	-.01	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	-.007	15	.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	-.002	15	.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	.128	1	.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	-4.323	12	.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	-2.041	12	.004	1	.128	1	.747	1
174			min	-344.178	3	-687.985	3	-161.42	1	0	15	-.028	3	-.869	3
175		12	max	348.479	1	427.773	1	1.217	3	.004	1	-.002	15	.12	1
176			min	-344.178	3	-523.734	3	-113.131	1	0	15	-.047	1	-.095	3
177		13	max	348.479	1	301.59	1	4.64	3	.004	1	-.007	15	.47	3
178			min	-344.178	3	-359.484	3	-64.843	1	0	15	-.161	1	-.346	1
179		14	max	348.479	1	175.408	1	8.064	3	.004	1	-.01	15	.824	3
180			min	-344.178	3	-195.233	3	-16.554	1	0	15	-.213	1	-.651	1
181		15	max	348.479	1	51.276	2	31.734	1	.004	1	-.003	12	.968	3
182			min	-344.178	3	-30.982	3	1.422	15	0	15	-.203	1	-.795	1
183		16	max	348.479	1	133.269	3	80.022	1	.004	1	.013	3	.903	3
184			min	-344.178	3	-76.958	1	3.704	15	0	15	-.132	1	-.777	1
185		17	max	348.479	1	297.52	3	128.311	1	.004	1	.034	3	.628	3
186			min	-344.178	3	-203.141	1	5.987	15	0	15	-.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	8.27	15	0	15	.009	15	-.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	10.553	15	0	15	.021	15	-.552	3
191	M12	1	max	49.142	2	621.431	2	-10.635	15	0	15	.474	1	.314	2
192			min	-24.165	9	-249.47	3	-227.684	1	-.005	1	.022	15	.006	15
193		2	max	49.142	2	449.399	2	-8.352	15	0	15	.214	1	.298	3
194			min	-24.165	9	-174.009	3	-179.396	1	-.005	1	.01	15	-.37	2
195		3	max	49.142	2	277.366	2	-6.07	15	0	15	.02	3	.472	3
196			min	-24.165	9	-98.548	3	-131.108	1	-.005	1	0	15	-.834	2
197		4	max	49.142	2	105.334	2	-3.787	15	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	-1.504	15	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	13.757	1	0	15	-.01	15	.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	-.007	15	.204	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
204			min	-24.165	9	-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	-.002	15	.141	2
206			min	-24.165	9	-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	.121	1	.996	2
208			min	-24.165	9	-754.826	2	3.647	12	-.005	1	-.021	3	-.508	3
209		10	max	49.142	2	926.859	2	-5.929	12	.005	1	.355	1	2.07	2
210			min	-24.165	9	-429.677	3	-206.911	1	0	15	-.013	3	-1.009	3
211		11	max	49.142	2	754.826	2	-3.647	12	.005	1	.121	1	.996	2
212			min	-24.165	9	-354.216	3	-158.623	1	0	15	-.021	3	-.508	3
213		12	max	49.142	2	582.794	2	-1.364	12	.005	1	-.002	15	.141	2
214			min	-24.165	9	-278.755	3	-110.334	1	0	15	-.051	1	-.104	3
215		13	max	49.142	2	410.762	2	1.951	3	.005	1	-.007	15	.204	3
216			min	-24.165	9	-203.295	3	-62.046	1	0	15	-.161	1	-.493	2
217		14	max	49.142	2	238.73	2	5.374	3	.005	1	-.01	15	.416	3
218			min	-24.165	9	-127.834	3	-13.757	1	0	15	-.209	1	-.908	2
219		15	max	49.142	2	66.698	2	34.531	1	.005	1	-.008	12	.531	3
220			min	-24.165	9	-52.373	3	1.504	15	0	15	-.196	1	-1.104	2
221		16	max	49.142	2	23.087	3	82.819	1	.005	1	.002	3	.55	3
222			min	-24.165	9	-105.334	2	3.787	15	0	15	-.121	1	-1.079	2
223		17	max	49.142	2	98.548	3	131.108	1	.005	1	.02	3	.472	3
224			min	-24.165	9	-277.366	2	6.07	15	0	15	0	15	-.834	2
225		18	max	49.142	2	174.009	3	179.396	1	.005	1	.214	1	.298	3
226			min	-24.165	9	-449.399	2	8.352	15	0	15	.01	15	-.37	2
227		19	max	49.142	2	249.47	3	227.684	1	.005	1	.474	1	.314	2
228			min	-24.165	9	-621.431	2	10.635	15	0	15	.022	15	.006	15
229	M13	1	max	-8.366	15	626.832	2	-10.246	15	.005	3	.405	1	.268	2
230			min	-189.936	1	-264.124	3	-218.733	1	-.016	2	.019	15	-.072	3
231		2	max	-8.366	15	454.8	2	-7.963	15	.005	3	.157	1	.217	3
232			min	-189.936	1	-188.663	3	-170.445	1	-.016	2	.007	15	-.423	2
233		3	max	-8.366	15	282.768	2	-5.68	15	.005	3	.017	3	.41	3
234			min	-189.936	1	-113.202	3	-122.156	1	-.016	2	-.03	1	-.895	2
235		4	max	-8.366	15	110.736	2	-3.398	15	.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	-8.366	15	37.719	3	-1.115	15	.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	-8.366	15	113.18	3	22.709	1	.005	3	-.01	15	.41	3
240			min	-189.936	1	-233.329	2	-4.688	3	-.016	2	-.221	1	-.989	2
241		7	max	-8.366	15	188.64	3	70.997	1	.005	3	-.007	15	.217	3
242			min	-189.936	1	-405.361	2	-1.265	3	-.016	2	-.161	1	-.581	2
243		8	max	-8.366	15	264.101	3	119.285	1	.005	3	-.002	15	.047	2
244			min	-189.936	1	-577.393	2	1.82	12	-.016	2	-.04	1	-.072	3
245		9	max	-8.366	15	339.562	3	167.574	1	.005	3	.144	1	.894	2
246			min	-189.936	1	-749.425	2	4.103	12	-.016	2	-.019	3	-.457	3
247		10	max	-8.366	15	921.457	2	-6.385	12	.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	-8.366	15	749.425	2	-4.103	12	.016	2	.144	1	.894	2
250			min	-189.936	1	-339.562	3	-167.574	1	-.005	3	-.019	3	-.457	3
251		12	max	-8.366	15	577.393	2	-1.82	12	.016	2	-.002	15	.047	2
252			min	-189.936	1	-264.101	3	-119.285	1	-.005	3	-.04	1	-.072	3
253		13	max	-8.366	15	405.361	2	1.265	3	.016	2	-.007	15	.217	3
254			min	-189.936	1	-188.64	3	-70.997	1	-.005	3	-.161	1	-.581	2
255		14	max	-8.366	15	233.329	2	4.688	3	.016	2	-.01	15	.41	3
256			min	-189.936	1	-113.18	3	-22.709	1	-.005	3	-.221	1	-.989	2
257		15	max	-8.366	15	61.297	2	25.58	1	.016	2	-.009	12	.507	3
258			min	-189.936	1	-37.719	3	1.115	15	-.005	3	-.219	1	-1.178	2
259		16	max	-8.366	15	37.742	3	73.868	1	.016	2	0	3	.507	3
260			min	-189.936	1	-110.736	2	3.398	15	-.005	3	-.156	1	-1.146	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
261		17	max	-8.366	15	113.202	3	122.156	1	.016	2	.017	3	.41	3
262			min	-189.936	1	-282.768	2	5.68	15	-.005	3	-.03	1	-.895	2
263		18	max	-8.366	15	188.663	3	170.445	1	.016	2	.157	1	.217	3
264			min	-189.936	1	-454.8	2	7.963	15	-.005	3	.007	15	-.423	2
265		19	max	-8.366	15	264.124	3	218.733	1	.016	2	.405	1	.268	2
266			min	-189.936	1	-626.832	2	10.246	15	-.005	3	.019	15	-.072	3
267	M2	1	max	2288.735	1	962.759	3	290.65	2	.009	3	.437	3	4.298	1
268			min	-1418.073	3	-727.906	2	-298.266	3	-.019	2	-.409	1	.209	15
269		2	max	2285.898	1	962.759	3	290.65	2	.009	3	.344	3	4.373	1
270			min	-1420.201	3	-727.906	2	-298.266	3	-.019	2	-.319	1	.207	15
271		3	max	1691.539	1	848.965	1	212.74	1	.002	2	.269	3	4.233	1
272			min	-1190.109	3	39.806	15	-261.827	3	-.001	3	-.261	1	.198	15
273		4	max	1688.702	1	848.965	1	212.74	1	.002	2	.187	3	3.968	1
274			min	-1192.237	3	39.806	15	-261.827	3	-.001	3	-.194	1	.186	15
275		5	max	1685.864	1	848.965	1	212.74	1	.002	2	.105	3	3.704	1
276			min	-1194.365	3	39.806	15	-261.827	3	-.001	3	-.128	1	.174	15
277		6	max	1683.027	1	848.965	1	212.74	1	.002	2	.024	3	3.439	1
278			min	-1196.493	3	39.806	15	-261.827	3	-.001	3	-.062	1	.161	15
279		7	max	1680.189	1	848.965	1	212.74	1	.002	2	.024	2	3.175	1
280			min	-1198.621	3	39.806	15	-261.827	3	-.001	3	-.058	3	.149	15
281		8	max	1677.352	1	848.965	1	212.74	1	.002	2	.089	2	2.91	1
282			min	-1200.75	3	39.806	15	-261.827	3	-.001	3	-.139	3	.136	15
283		9	max	1674.514	1	848.965	1	212.74	1	.002	2	.154	2	2.645	1
284			min	-1202.878	3	39.806	15	-261.827	3	-.001	3	-.221	3	.124	15
285		10	max	1671.677	1	848.965	1	212.74	1	.002	2	.219	2	2.381	1
286			min	-1205.006	3	39.806	15	-261.827	3	-.001	3	-.303	3	.112	15
287		11	max	1668.84	1	848.965	1	212.74	1	.002	2	.284	2	2.116	1
288			min	-1207.134	3	39.806	15	-261.827	3	-.001	3	-.384	3	.099	15
289		12	max	1666.002	1	848.965	1	212.74	1	.002	2	.35	2	1.852	1
290			min	-1209.262	3	39.806	15	-261.827	3	-.001	3	-.466	3	.087	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	39.806	15	-261.827	3	-.001	3	-.547	3	.074	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	39.806	15	-261.827	3	-.001	3	-.629	3	.062	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	39.806	15	-261.827	3	-.001	3	-.71	3	.05	15
297		16	max	1654.652	1	848.965	1	212.74	1	.002	2	.61	2	.794	1
298			min	-1217.774	3	39.806	15	-261.827	3	-.001	3	-.792	3	.037	15
299		17	max	1651.815	1	848.965	1	212.74	1	.002	2	.675	2	.529	1
300			min	-1219.902	3	39.806	15	-261.827	3	-.001	3	-.874	3	.025	15
301		18	max	1648.978	1	848.965	1	212.74	1	.002	2	.741	2	.265	1
302			min	-1222.03	3	39.806	15	-261.827	3	-.001	3	-.955	3	.012	15
303		19	max	1646.14	1	848.965	1	212.74	1	.002	2	.806	2	0	1
304			min	-1224.158	3	39.806	15	-261.827	3	-.001	3	-1.037	3	0	1
305	M5	1	max	6106.327	1	2598.723	3	0	1	0	1	0	1	8.076	1
306			min	-4311.544	3	-2536.643	2	0	1	0	1	0	1	.361	15
307		2	max	6103.49	1	2598.723	3	0	1	0	1	0	1	8.547	1
308			min	-4313.672	3	-2536.643	2	0	1	0	1	0	1	.365	15
309		3	max	4401.838	1	1681.813	1	0	1	0	1	0	1	8.385	1
310			min	-3512.075	3	70.805	15	0	1	0	1	0	1	.353	15
311		4	max	4399.001	1	1681.813	1	0	1	0	1	0	1	7.861	1
312			min	-3514.203	3	70.805	15	0	1	0	1	0	1	.331	15
313		5	max	4396.163	1	1681.813	1	0	1	0	1	0	1	7.337	1
314			min	-3516.331	3	70.805	15	0	1	0	1	0	1	.309	15
315		6	max	4393.326	1	1681.813	1	0	1	0	1	0	1	6.813	1
316			min	-3518.459	3	70.805	15	0	1	0	1	0	1	.287	15
317		7	max	4390.488	1	1681.813	1	0	1	0	1	0	1	6.289	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
318			min	-3520.587	3	70.805	15	0	1	0	1	0	1	.265	15
319		8	max	4387.651	1	1681.813	1	0	1	0	1	0	1	5.765	1
320			min	-3522.715	3	70.805	15	0	1	0	1	0	1	.243	15
321		9	max	4384.813	1	1681.813	1	0	1	0	1	0	1	5.241	1
322			min	-3524.844	3	70.805	15	0	1	0	1	0	1	.221	15
323		10	max	4381.976	1	1681.813	1	0	1	0	1	0	1	4.717	1
324			min	-3526.972	3	70.805	15	0	1	0	1	0	1	.199	15
325		11	max	4379.138	1	1681.813	1	0	1	0	1	0	1	4.193	1
326			min	-3529.1	3	70.805	15	0	1	0	1	0	1	.177	15
327		12	max	4376.301	1	1681.813	1	0	1	0	1	0	1	3.668	1
328			min	-3531.228	3	70.805	15	0	1	0	1	0	1	.154	15
329		13	max	4373.464	1	1681.813	1	0	1	0	1	0	1	3.144	1
330			min	-3533.356	3	70.805	15	0	1	0	1	0	1	.132	15
331		14	max	4370.626	1	1681.813	1	0	1	0	1	0	1	2.62	1
332			min	-3535.484	3	70.805	15	0	1	0	1	0	1	.11	15
333		15	max	4367.789	1	1681.813	1	0	1	0	1	0	1	2.096	1
334			min	-3537.612	3	70.805	15	0	1	0	1	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	70.805	15	0	1	0	1	0	1	.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	70.805	15	0	1	0	1	0	1	.044	15
339		18	max	4359.276	1	1681.813	1	0	1	0	1	0	1	.524	1
340			min	-3543.996	3	70.805	15	0	1	0	1	0	1	.022	15
341		19	max	4356.439	1	1681.813	1	0	1	0	1	0	1	0	1
342			min	-3546.124	3	70.805	15	0	1	0	1	0	1	0	1
343	M8	1	max	2288.735	1	962.759	3	298.266	3	.019	2	.409	1	4.298	1
344			min	-1418.073	3	-727.906	2	-290.65	2	-.009	3	-.437	3	.209	15
345		2	max	2285.898	1	962.759	3	298.266	3	.019	2	.319	1	4.373	1
346			min	-1420.201	3	-727.906	2	-290.65	2	-.009	3	-.344	3	.207	15
347		3	max	1691.539	1	848.965	1	261.827	3	.001	3	.261	1	4.233	1
348			min	-1190.109	3	39.806	15	-212.74	1	-.002	2	-.269	3	.198	15
349		4	max	1688.702	1	848.965	1	261.827	3	.001	3	.194	1	3.968	1
350			min	-1192.237	3	39.806	15	-212.74	1	-.002	2	-.187	3	.186	15
351		5	max	1685.864	1	848.965	1	261.827	3	.001	3	.128	1	3.704	1
352			min	-1194.365	3	39.806	15	-212.74	1	-.002	2	-.105	3	.174	15
353		6	max	1683.027	1	848.965	1	261.827	3	.001	3	.062	1	3.439	1
354			min	-1196.493	3	39.806	15	-212.74	1	-.002	2	-.024	3	.161	15
355		7	max	1680.189	1	848.965	1	261.827	3	.001	3	.058	3	3.175	1
356			min	-1198.621	3	39.806	15	-212.74	1	-.002	2	-.024	2	.149	15
357		8	max	1677.352	1	848.965	1	261.827	3	.001	3	.139	3	2.91	1
358			min	-1200.75	3	39.806	15	-212.74	1	-.002	2	-.089	2	.136	15
359		9	max	1674.514	1	848.965	1	261.827	3	.001	3	.221	3	2.645	1
360			min	-1202.878	3	39.806	15	-212.74	1	-.002	2	-.154	2	.124	15
361		10	max	1671.677	1	848.965	1	261.827	3	.001	3	.303	3	2.381	1
362			min	-1205.006	3	39.806	15	-212.74	1	-.002	2	-.219	2	.112	15
363		11	max	1668.84	1	848.965	1	261.827	3	.001	3	.384	3	2.116	1
364			min	-1207.134	3	39.806	15	-212.74	1	-.002	2	-.284	2	.099	15
365		12	max	1666.002	1	848.965	1	261.827	3	.001	3	.466	3	1.852	1
366			min	-1209.262	3	39.806	15	-212.74	1	-.002	2	-.35	2	.087	15
367		13	max	1663.165	1	848.965	1	261.827	3	.001	3	.547	3	1.587	1
368			min	-1211.39	3	39.806	15	-212.74	1	-.002	2	-.415	2	.074	15
369		14	max	1660.327	1	848.965	1	261.827	3	.001	3	.629	3	1.323	1
370			min	-1213.518	3	39.806	15	-212.74	1	-.002	2	-.48	2	.062	15
371		15	max	1657.49	1	848.965	1	261.827	3	.001	3	.71	3	1.058	1
372			min	-1215.646	3	39.806	15	-212.74	1	-.002	2	-.545	2	.05	15
373		16	max	1654.652	1	848.965	1	261.827	3	.001	3	.792	3	.794	1
374			min	-1217.774	3	39.806	15	-212.74	1	-.002	2	-.61	2	.037	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
375		17	max	1651.815	1	848.965	1	261.827	3	.001	3	.874	3	.529	1
376			min	-1219.902	3	39.806	15	-212.74	1	-.002	2	-.675	2	.025	15
377		18	max	1648.978	1	848.965	1	261.827	3	.001	3	.955	3	.265	1
378			min	-1222.03	3	39.806	15	-212.74	1	-.002	2	-.741	2	.012	15
379		19	max	1646.14	1	848.965	1	261.827	3	.001	3	1.037	3	0	1
380			min	-1224.158	3	39.806	15	-212.74	1	-.002	2	-.806	2	0	1
381	M3	1	max	1401.021	2	4.384	4	80.998	2	.014	3	.004	3	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	.014	2	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	4	-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	4	-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	4	-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	4	-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	4	-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	4	-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	4	-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	4	-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	4	-36.841	3	-.027	2	-.19	3	0	1
419	M6	1	max	4114.234	2	4.384	4	0	1	0	1	0	1	0	1
420			min	-1693.756	3	1.031	15	0	1	0	1	0	1	0	1
421		2	max	4114.026	2	3.897	4	0	1	0	1	0	1	0	15
422			min	-1693.912	3	.916	15	0	1	0	1	0	1	-.001	4
423		3	max	4113.818	2	3.41	4	0	1	0	1	0	1	0	15
424			min	-1694.068	3	.802	15	0	1	0	1	0	1	-.002	4
425		4	max	4113.61	2	2.923	4	0	1	0	1	0	1	0	15
426			min	-1694.224	3	.687	15	0	1	0	1	0	1	-.003	4
427		5	max	4113.402	2	2.436	4	0	1	0	1	0	1	0	15
428			min	-1694.38	3	.573	15	0	1	0	1	0	1	-.004	4
429		6	max	4113.194	2	1.949	4	0	1	0	1	0	1	-.001	15
430			min	-1694.536	3	.458	15	0	1	0	1	0	1	-.005	4
431		7	max	4112.986	2	1.461	4	0	1	0	1	0	1	-.001	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
432			min	-1694.692	3	.344	15	0	1	0	1	0	1	-.005	4
433		8	max	4112.778	2	.974	4	0	1	0	1	0	1	-.001	15
434			min	-1694.848	3	.229	15	0	1	0	1	0	1	-.005	4
435		9	max	4112.57	2	.487	4	0	1	0	1	0	1	-.001	15
436			min	-1695.004	3	.115	15	0	1	0	1	0	1	-.006	4
437		10	max	4112.362	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1695.16	3	0	1	0	1	0	1	0	1	-.006	4
439		11	max	4112.154	2	-.115	15	0	1	0	1	0	1	-.001	15
440			min	-1695.316	3	-.487	4	0	1	0	1	0	1	-.006	4
441		12	max	4111.946	2	-.229	15	0	1	0	1	0	1	-.001	15
442			min	-1695.472	3	-.974	4	0	1	0	1	0	1	-.005	4
443		13	max	4111.738	2	-.344	15	0	1	0	1	0	1	-.001	15
444			min	-1695.628	3	-1.461	4	0	1	0	1	0	1	-.005	4
445		14	max	4111.53	2	-.458	15	0	1	0	1	0	1	-.001	15
446			min	-1695.784	3	-1.949	4	0	1	0	1	0	1	-.005	4
447		15	max	4111.322	2	-.573	15	0	1	0	1	0	1	0	15
448			min	-1695.941	3	-2.436	4	0	1	0	1	0	1	-.004	4
449		16	max	4111.114	2	-.687	15	0	1	0	1	0	1	0	15
450			min	-1696.097	3	-2.923	4	0	1	0	1	0	1	-.003	4
451		17	max	4110.905	2	-.802	15	0	1	0	1	0	1	0	15
452			min	-1696.253	3	-3.41	4	0	1	0	1	0	1	-.002	4
453		18	max	4110.697	2	-.916	15	0	1	0	1	0	1	0	15
454			min	-1696.409	3	-3.897	4	0	1	0	1	0	1	-.001	4
455		19	max	4110.489	2	-1.031	15	0	1	0	1	0	1	0	1
456			min	-1696.565	3	-4.384	4	0	1	0	1	0	1	0	1
457	M9	1	max	1401.021	2	4.384	4	36.841	3	.027	2	.009	2	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	4	36.841	3	.027	2	.007	3	0	15
460			min	-490.356	3	.916	15	-80.998	2	-.014	3	-.014	2	-.001	4
461		3	max	1400.605	2	3.41	4	36.841	3	.027	2	.018	3	0	15
462			min	-490.512	3	.802	15	-80.998	2	-.014	3	-.038	2	-.002	4
463		4	max	1400.397	2	2.923	4	36.841	3	.027	2	.029	3	0	15
464			min	-490.668	3	.687	15	-80.998	2	-.014	3	-.062	2	-.003	4
465		5	max	1400.189	2	2.436	4	36.841	3	.027	2	.039	3	0	15
466			min	-490.824	3	.573	15	-80.998	2	-.014	3	-.085	2	-.004	4
467		6	max	1399.981	2	1.949	4	36.841	3	.027	2	.05	3	-.001	15
468			min	-490.98	3	.458	15	-80.998	2	-.014	3	-.109	2	-.005	4
469		7	max	1399.772	2	1.461	4	36.841	3	.027	2	.061	3	-.001	15
470			min	-491.136	3	.344	15	-80.998	2	-.014	3	-.133	2	-.005	4
471		8	max	1399.564	2	.974	4	36.841	3	.027	2	.072	3	-.001	15
472			min	-491.292	3	.229	15	-80.998	2	-.014	3	-.156	2	-.005	4
473		9	max	1399.356	2	.487	4	36.841	3	.027	2	.082	3	-.001	15
474			min	-491.448	3	.115	15	-80.998	2	-.014	3	-.18	2	-.006	4
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	4
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	4
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	4
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	4
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	4
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	4
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	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
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	4
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	4
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	-.011	15	-.02	15	.032	1	1.104e-2	3	NC	3	NC	3
2			min	-.239	1	-.505	1	.001	15	-2.806e-2	2	239.546	1	2184.159	1
3		2	max	-.011	15	-.017	15	.01	1	1.104e-2	3	NC	3	NC	3
4			min	-.239	1	-.42	1	0	15	-2.806e-2	2	282.519	1	3422.337	1
5		3	max	-.011	15	-.014	15	0	15	1.047e-2	3	NC	12	NC	2
6			min	-.239	1	-.335	1	-.009	1	-2.596e-2	2	344.366	1	6706.821	1
7		4	max	-.011	15	-.011	15	0	15	9.605e-3	3	8110.727	15	NC	1
8			min	-.239	1	-.253	1	-.018	1	-2.274e-2	2	436.313	1	NC	1
9		5	max	-.011	15	-.008	15	0	12	8.739e-3	3	NC	10	NC	1
10			min	-.239	1	-.179	1	-.018	1	-1.952e-2	2	574.428	1	NC	1
11		6	max	-.011	15	-.006	15	.001	3	9.08e-3	3	NC	2	NC	2
12			min	-.239	1	-.118	1	-.015	1	-1.893e-2	2	775.779	1	9074.329	1
13		7	max	-.011	15	-.004	15	.002	3	1.026e-2	3	NC	15	NC	2
14			min	-.239	1	-.077	3	-.007	1	-2.016e-2	2	1072.093	1	5963.576	1
15		8	max	-.011	15	0	10	.001	3	1.143e-2	3	NC	5	NC	2
16			min	-.238	1	-.065	3	-.002	2	-2.139e-2	2	1438.165	9	4653.687	1
17		9	max	-.011	15	.015	2	0	15	1.273e-2	3	NC	3	NC	2
18			min	-.238	1	-.051	3	0	1	-2.125e-2	2	1811.912	2	4625.439	1
19		10	max	-.011	15	.038	1	0	2	1.423e-2	3	NC	3	NC	2
20			min	-.238	1	-.034	3	0	3	-1.87e-2	2	1421.58	2	4542.86	1
21		11	max	-.011	15	.07	1	.002	3	1.574e-2	3	NC	5	NC	2
22			min	-.237	1	-.014	3	-.002	2	-1.615e-2	2	1192.267	2	4811.898	1
23		12	max	-.011	15	.099	1	.007	3	1.3e-2	3	NC	4	NC	2
24			min	-.237	1	.004	15	-.008	1	-1.21e-2	2	1048.033	2	6247.289	1
25		13	max	-.011	15	.122	1	.013	3	7.858e-3	3	NC	4	NC	2
26			min	-.236	1	.005	15	-.009	2	-7.241e-3	1	973.355	2	6393.602	1
27		14	max	-.011	15	.134	1	.012	3	2.954e-3	3	NC	4	NC	2
28			min	-.236	1	.006	15	-.004	2	-2.615e-3	1	975.698	2	4577.951	1
29		15	max	-.011	15	.154	3	.011	1	8.63e-3	3	NC	4	NC	3
30			min	-.236	1	.007	15	0	10	-6.157e-3	1	669.324	3	3343.995	1
31		16	max	-.011	15	.233	3	.015	1	1.431e-2	3	NC	4	NC	3
32			min	-.236	1	.007	15	0	15	-9.699e-3	1	478.548	3	3039.99	1
33		17	max	-.011	15	.322	3	.009	1	1.998e-2	3	NC	4	NC	3
34			min	-.236	1	-.009	10	0	15	-1.324e-2	1	363.199	3	3496.3	1
35		18	max	-.011	15	.415	3	0	15	2.368e-2	3	NC	4	NC	2
36			min	-.236	1	-.029	10	-.009	1	-1.555e-2	1	290.405	3	6473.979	1
37		19	max	-.011	15	.507	3	-.001	15	2.368e-2	3	NC	1	NC	1
38			min	-.236	1	-.059	2	-.029	1	-1.555e-2	1	241.971	3	NC	1
39	M4	1	max	-.02	15	0	3	0	1	0	1	NC	3	NC	1
40			min	-.474	1	-1.153	1	0	1	0	1	123.385	1	NC	1
41		2	max	-.02	15	-.032	12	0	1	0	1	5105.554	12	NC	1
42			min	-.474	1	-.948	1	0	1	0	1	152.032	1	NC	1
43		3	max	-.02	15	-.027	15	0	1	0	1	4391.074	15	NC	1
44			min	-.474	1	-.743	1	0	1	0	1	198.156	1	NC	1
45		4	max	-.02	15	-.021	15	0	1	0	1	5555.745	15	NC	1
46			min	-.474	1	-.546	1	0	1	0	1	279.612	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
47		5	max	-.02	15	-.015	15	0	1	0	1	7313.786	15	NC	1
48			min	-.474	1	-.371	1	0	1	0	1	439.793	1	NC	1
49		6	max	-.02	15	-.01	15	0	1	0	1	9909.833	15	NC	1
50			min	-.473	1	-.234	1	0	1	0	1	773.162	9	NC	1
51		7	max	-.02	15	-.006	15	0	1	0	1	NC	15	NC	1
52			min	-.472	1	-.164	3	0	1	0	1	780.766	2	NC	1
53		8	max	-.02	15	0	10	0	1	0	1	NC	5	NC	1
54			min	-.471	1	-.142	3	0	1	0	1	588.459	2	NC	1
55		9	max	-.02	15	.034	2	0	1	0	1	NC	5	NC	1
56			min	-.471	1	-.114	3	0	1	0	1	489.852	2	NC	1
57		10	max	-.02	15	.085	1	0	1	0	1	NC	4	NC	1
58			min	-.469	1	-.08	3	0	1	0	1	421.768	2	NC	1
59		11	max	-.02	15	.149	1	0	1	0	1	NC	5	NC	1
60			min	-.468	1	-.039	3	0	1	0	1	374.292	2	NC	1
61		12	max	-.02	15	.206	1	0	1	0	1	NC	3	NC	1
62			min	-.467	1	.007	12	0	1	0	1	340.847	2	NC	1
63		13	max	-.02	15	.249	1	0	1	0	1	NC	5	NC	1
64			min	-.466	1	.01	15	0	1	0	1	323.464	2	NC	1
65		14	max	-.02	15	.263	1	0	1	0	1	NC	5	NC	1
66			min	-.465	1	.011	15	0	1	0	1	328.477	2	NC	1
67		15	max	-.02	15	.342	3	0	1	0	1	NC	5	NC	1
68			min	-.465	1	.011	15	0	1	0	1	369.414	2	NC	1
69		16	max	-.02	15	.537	3	0	1	0	1	NC	5	NC	1
70			min	-.465	1	.005	10	0	1	0	1	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	0	1	0	1	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	0	1	0	1	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	0	1	0	1	110.715	3	NC	1
77	M7	1	max	-.011	15	-.02	15	-.001	15	2.806e-2	2	NC	3	NC	3
78			min	-.239	1	-.505	1	-.032	1	-1.104e-2	3	239.546	1	2184.159	1
79		2	max	-.011	15	-.017	15	0	15	2.806e-2	2	NC	3	NC	3
80			min	-.239	1	-.42	1	-.01	1	-1.104e-2	3	282.519	1	3422.337	1
81		3	max	-.011	15	-.014	15	.009	1	2.596e-2	2	NC	12	NC	2
82			min	-.239	1	-.335	1	0	15	-1.047e-2	3	344.366	1	6706.821	1
83		4	max	-.011	15	-.011	15	.018	1	2.274e-2	2	8110.727	15	NC	1
84			min	-.239	1	-.253	1	0	15	-9.605e-3	3	436.313	1	NC	1
85		5	max	-.011	15	-.008	15	.018	1	1.952e-2	2	NC	10	NC	1
86			min	-.239	1	-.179	1	0	12	-8.739e-3	3	574.428	1	NC	1
87		6	max	-.011	15	-.006	15	.015	1	1.893e-2	2	NC	2	NC	2
88			min	-.239	1	-.118	1	-.001	3	-9.08e-3	3	775.779	1	9074.329	1
89		7	max	-.011	15	-.004	15	.007	1	2.016e-2	2	NC	15	NC	2
90			min	-.239	1	-.077	3	-.002	3	-1.026e-2	3	1072.093	1	5963.576	1
91		8	max	-.011	15	0	10	.002	2	2.139e-2	2	NC	5	NC	2
92			min	-.238	1	-.065	3	-.001	3	-1.143e-2	3	1438.165	9	4653.687	1
93		9	max	-.011	15	.015	2	0	1	2.125e-2	2	NC	3	NC	2
94			min	-.238	1	-.051	3	0	15	-1.273e-2	3	1811.912	2	4625.439	1
95		10	max	-.011	15	.038	1	0	3	1.87e-2	2	NC	3	NC	2
96			min	-.238	1	-.034	3	0	2	-1.423e-2	3	1421.58	2	4542.86	1
97		11	max	-.011	15	.07	1	.002	2	1.615e-2	2	NC	5	NC	2
98			min	-.237	1	-.014	3	-.002	3	-1.574e-2	3	1192.267	2	4811.898	1
99		12	max	-.011	15	.099	1	.008	1	1.21e-2	2	NC	4	NC	2
100			min	-.237	1	.004	15	-.007	3	-1.3e-2	3	1048.033	2	6247.289	1
101		13	max	-.011	15	.122	1	.009	2	7.241e-3	1	NC	4	NC	2
102			min	-.236	1	.005	15	-.013	3	-7.858e-3	3	973.355	2	6393.602	1
103		14	max	-.011	15	.134	1	.004	2	2.615e-3	1	NC	4	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
104			min	-.236	1	.006	15	-.012	3	-2.954e-3	3	975.698	2	4577.951	1
105		15	max	-.011	15	.154	3	0	10	6.157e-3	1	NC	4	NC	3
106			min	-.236	1	.007	15	-.011	1	-8.63e-3	3	669.324	3	3343.995	1
107		16	max	-.011	15	.233	3	0	15	9.699e-3	1	NC	4	NC	3
108			min	-.236	1	.007	15	-.015	1	-1.431e-2	3	478.548	3	3039.99	1
109		17	max	-.011	15	.322	3	0	15	1.324e-2	1	NC	4	NC	3
110			min	-.236	1	-.009	10	-.009	1	-1.998e-2	3	363.199	3	3496.3	1
111		18	max	-.011	15	.415	3	.009	1	1.555e-2	1	NC	4	NC	2
112			min	-.236	1	-.029	10	0	15	-2.368e-2	3	290.405	3	6473.979	1
113		19	max	-.011	15	.507	3	.029	1	1.555e-2	1	NC	1	NC	1
114			min	-.236	1	-.059	2	.001	15	-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	0	10	-.022	10	.011	15	-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	0	10	-.255	2	.015	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	0	10	-.471	2	.021	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	15	NC	5
122			min	0	10	-.618	2	.026	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	15	NC	15
124			min	0	10	-.673	2	.03	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	15	NC	15
126			min	0	10	-.631	2	.031	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	15
128			min	0	10	-.508	2	.029	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	0	10	-.339	2	.026	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	0	10	-.181	2	.022	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	0	1	-.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	0	1	-.181	2	.022	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	0	1	-.339	2	.026	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	5	NC	15
140			min	0	1	-.508	2	.029	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	NC	15	NC	15
142			min	0	1	-.631	2	.031	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	NC	15	NC	15
144			min	0	1	-.673	2	.03	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	NC	15	NC	5
146			min	0	1	-.618	2	.026	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	NC	5	NC	5
148			min	-.001	1	-.471	2	.021	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	5	NC	3
150			min	-.001	1	-.255	2	.015	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	-.001	1	-.022	10	.011	15	-4.51e-3	2	NC	1	NC	1
153	M11	1	max	.004	1	.081	1	.237	1	3.906e-3	1	NC	1	NC	1
154			min	-.004	3	-.005	3	.011	15	1.899e-4	15	NC	1	NC	1
155		2	max	.003	1	.264	3	.301	1	4.34e-3	1	NC	5	NC	3
156			min	-.003	3	-.176	2	.014	15	2.064e-4	15	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	-.003	3	-.377	2	.019	15	2.228e-4	15	529.092	3	1523.344	1
159		4	max	.003	1	.69	3	.537	1	5.209e-3	1	NC	5	NC	5
160			min	-.003	3	-.502	2	.025	15	2.392e-4	15	396.97	3	920.886	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
161		5	max	.002	1	.749	3	.622	1	5.644e-3	1	NC	15	NC	5
162			min	-.002	3	-.531	2	.028	15	2.556e-4	15	365.98	3	716.299	1
163		6	max	.002	1	.685	3	.656	1	6.078e-3	1	NC	5	NC	15
164			min	-.002	3	-.461	2	.029	15	2.72e-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	-.001	3	-.312	2	.028	15	2.884e-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	0	3	-.121	2	.025	15	3.048e-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	0	3	.004	15	.022	15	3.212e-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	0	1	-.023	3	.02	15	3.376e-4	15	3086.819	1	1194.623	1
173		11	max	0	3	.088	1	.505	1	7.381e-3	1	NC	1	NC	5
174			min	0	1	.004	15	.022	15	3.212e-4	15	3419.78	3	1031.275	1
175		12	max	0	3	.288	3	.576	1	6.947e-3	1	NC	5	NC	5
176			min	0	1	-.121	2	.025	15	3.048e-4	15	940.157	3	814.187	1
177		13	max	.001	3	.516	3	.636	1	6.512e-3	1	NC	5	NC	5
178			min	-.001	1	-.312	2	.028	15	2.884e-4	15	529.783	3	690.957	1
179		14	max	.002	3	.685	3	.656	1	6.078e-3	1	NC	5	NC	15
180			min	-.002	1	-.461	2	.029	15	2.72e-4	15	400.117	3	658.082	1
181		15	max	.002	3	.749	3	.622	1	5.644e-3	1	NC	15	NC	5
182			min	-.002	1	-.531	2	.028	15	2.556e-4	15	365.98	3	716.299	1
183		16	max	.003	3	.69	3	.537	1	5.209e-3	1	NC	5	NC	5
184			min	-.003	1	-.502	2	.025	15	2.392e-4	15	396.97	3	920.886	1
185		17	max	.003	3	.516	3	.418	1	4.775e-3	1	NC	5	NC	3
186			min	-.003	1	-.377	2	.019	15	2.228e-4	15	529.092	3	1523.344	1
187		18	max	.003	3	.264	3	.301	1	4.34e-3	1	NC	5	NC	3
188			min	-.003	1	-.176	2	.014	15	2.064e-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	-.004	1	-.005	3	.011	15	1.899e-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	0	9	-.056	3	.011	15	2.203e-4	15	NC	1	NC	1
193		2	max	0	2	.122	3	.293	1	5.268e-3	1	NC	5	NC	2
194			min	0	9	-.337	2	.014	15	2.398e-4	15	802.532	2	5036.79	1
195		3	max	0	2	.263	3	.405	1	5.785e-3	1	NC	5	NC	5
196			min	0	9	-.635	2	.019	15	2.594e-4	15	429.739	2	1656.24	1
197		4	max	0	2	.344	3	.522	1	6.302e-3	1	NC	15	NC	5
198			min	0	9	-.828	2	.024	15	2.789e-4	15	330.596	2	972.199	1
199		5	max	0	2	.354	3	.609	1	6.819e-3	1	NC	15	NC	5
200			min	0	9	-.883	2	.028	15	2.985e-4	15	310.095	2	744.005	1
201		6	max	0	2	.297	3	.646	1	7.336e-3	1	NC	15	NC	15
202			min	0	9	-.798	2	.029	15	3.18e-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	0	9	-.597	2	.028	15	3.376e-4	15	457.035	2	703.062	1
205		8	max	0	2	.051	3	.574	1	8.37e-3	1	NC	5	NC	5
206			min	0	9	-.335	2	.025	15	3.571e-4	15	807.997	2	820.812	1
207		9	max	0	2	-.004	15	.506	1	8.888e-3	1	NC	3	NC	5
208			min	0	9	-.106	1	.022	15	3.767e-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
210			min	0	1	-.124	3	.02	15	3.962e-4	15	4046.118	3	1185.876	1
211		11	max	0	9	-.004	15	.506	1	8.888e-3	1	NC	3	NC	5
212			min	0	2	-.106	1	.022	15	3.767e-4	15	2761.164	2	1029.604	1
213		12	max	0	9	.051	3	.574	1	8.37e-3	1	NC	5	NC	5
214			min	0	2	-.335	2	.025	15	3.571e-4	15	807.997	2	820.812	1
215		13	max	0	9	.187	3	.631	1	7.853e-3	1	NC	5	NC	5
216			min	0	2	-.597	2	.028	15	3.376e-4	15	457.035	2	703.062	1
217		14	max	0	9	.297	3	.646	1	7.336e-3	1	NC	15	NC	15

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
218			min	0	2	-.798	2	.029	15	3.18e-4	15	343.013	2	675.904	1
219		15	max	0	9	.354	3	.609	1	6.819e-3	1	NC	15	NC	5
220			min	0	2	-.883	2	.028	15	2.985e-4	15	310.095	2	744.005	1
221		16	max	0	9	.344	3	.522	1	6.302e-3	1	NC	15	NC	5
222			min	0	2	-.828	2	.024	15	2.789e-4	15	330.596	2	972.199	1
223		17	max	0	9	.263	3	.405	1	5.785e-3	1	NC	5	NC	5
224			min	0	2	-.635	2	.019	15	2.594e-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	0	2	-.337	2	.014	15	2.398e-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	0	2	-.056	3	.011	15	2.203e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.016	15	.239	1	1.143e-2	1	NC	1	NC	1
230			min	-.002	1	-.39	1	.011	15	-1.459e-3	3	NC	1	NC	1
231		2	max	0	15	.106	3	.326	1	1.321e-2	1	NC	5	NC	3
232			min	-.002	1	-.784	1	.015	15	-1.973e-3	3	640.281	2	3171.96	1
233		3	max	0	15	.245	3	.456	1	1.5e-2	1	NC	15	NC	5
234			min	-.002	1	-1.132	1	.021	15	-2.487e-3	3	340.89	2	1277.017	1
235		4	max	0	15	.333	3	.578	1	1.678e-2	1	NC	15	NC	5
236			min	-.001	1	-1.38	2	.027	15	-3.001e-3	3	256.815	2	814.925	1
237		5	max	0	15	.356	3	.662	1	1.857e-2	1	9056.012	15	NC	15
238			min	-.001	1	-1.499	2	.03	15	-3.515e-3	3	231.222	2	653.924	1
239		6	max	0	15	.314	3	.689	1	2.035e-2	1	9066.991	15	NC	15
240			min	0	1	-1.482	1	.031	15	-4.029e-3	3	237.436	2	613.68	1
241		7	max	0	15	.221	3	.661	1	2.214e-2	1	NC	15	NC	15
242			min	0	1	-1.353	1	.029	15	-4.543e-3	3	274.525	2	655.21	1
243		8	max	0	15	.1	3	.592	1	2.392e-2	1	NC	15	NC	5
244			min	0	1	-1.157	1	.026	15	-5.057e-3	3	355.949	2	783.797	1
245		9	max	0	15	-.011	3	.514	1	2.57e-2	1	NC	5	NC	5
246			min	0	1	-.966	1	.022	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	0	1	-.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	5	NC	5
250			min	0	15	-.966	1	.022	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	NC	5
252			min	0	15	-1.157	1	.026	15	-5.057e-3	3	355.949	2	783.797	1
253		13	max	0	1	.221	3	.661	1	2.214e-2	1	NC	15	NC	15
254			min	0	15	-1.353	1	.029	15	-4.543e-3	3	274.525	2	655.21	1
255		14	max	0	1	.314	3	.689	1	2.035e-2	1	9066.991	15	NC	15
256			min	0	15	-1.482	1	.031	15	-4.029e-3	3	237.436	2	613.68	1
257		15	max	.001	1	.356	3	.662	1	1.857e-2	1	9056.012	15	NC	15
258			min	0	15	-1.499	2	.03	15	-3.515e-3	3	231.222	2	653.924	1
259		16	max	.001	1	.333	3	.578	1	1.678e-2	1	NC	15	NC	5
260			min	0	15	-1.38	2	.027	15	-3.001e-3	3	256.815	2	814.925	1
261		17	max	.002	1	.245	3	.456	1	1.5e-2	1	NC	15	NC	5
262			min	0	15	-1.132	1	.021	15	-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	0	15	-.784	1	.015	15	-1.973e-3	3	640.281	2	3171.96	1
265		19	max	.002	1	-.016	15	.239	1	1.143e-2	1	NC	1	NC	1
266			min	0	15	-.39	1	.011	15	-1.459e-3	3	NC	1	NC	1
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	3	5.941e-3	2	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-2.74e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	.001	3	7.709e-3	2	NC	1	NC	1
272			min	0	1	-.005	1	-.001	1	-3.51e-3	3	NC	1	NC	1
273		4	max	0	3	0	15	.002	3	7.083e-3	2	NC	2	NC	1
274			min	0	1	-.01	1	-.002	1	-3.149e-3	3	6446.258	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
275		5	max	0	3	0	15	.004	3	6.458e-3	2	NC	4	NC	1
276			min	0	1	-.018	1	-.003	1	-2.787e-3	3	3666.999	1	NC	1
277		6	max	0	3	-.001	15	.005	3	5.832e-3	2	NC	5	NC	1
278			min	0	1	-.028	1	-.005	1	-2.426e-3	3	2384.595	1	7953.626	3
279		7	max	0	3	-.002	15	.007	3	5.206e-3	2	NC	5	NC	1
280			min	0	1	-.04	1	-.007	1	-2.065e-3	3	1686.462	1	6298.862	3
281		8	max	0	3	-.003	15	.008	3	4.581e-3	2	NC	5	NC	4
282			min	0	1	-.053	1	-.008	1	-1.703e-3	3	1263.203	1	5245.778	3
283		9	max	0	3	-.003	15	.009	3	3.955e-3	2	NC	5	NC	4
284			min	0	1	-.068	1	-.01	1	-1.342e-3	3	987.116	1	4550.907	3
285		10	max	0	3	-.004	15	.01	3	3.329e-3	2	NC	5	NC	4
286			min	0	1	-.084	1	-.011	1	-9.808e-4	3	796.588	1	4091.373	3
287		11	max	0	3	-.005	15	.011	3	2.704e-3	2	NC	15	NC	4
288			min	-.001	1	-.102	1	-.012	1	-6.195e-4	3	659.493	1	3801.192	3
289		12	max	0	3	-.006	15	.011	3	2.078e-3	2	NC	15	NC	4
290			min	-.001	1	-.121	1	-.013	1	-2.583e-4	3	557.448	1	3648.48	3
291		13	max	0	3	-.007	15	.011	3	1.452e-3	2	NC	15	NC	4
292			min	-.001	1	-.14	1	-.013	1	6.477e-6	15	479.371	1	3626.146	3
293		14	max	0	3	-.008	15	.009	3	8.268e-4	2	8874.681	15	NC	4
294			min	-.001	1	-.161	1	-.012	1	-1.531e-4	9	418.297	1	3750.74	3
295		15	max	0	3	-.009	15	.007	3	8.256e-4	3	7843.506	15	NC	4
296			min	-.001	1	-.182	1	-.012	1	-3.969e-4	9	369.592	1	4084.444	3
297		16	max	.001	3	-.01	15	.004	3	1.187e-3	3	7007.904	15	NC	4
298			min	-.001	1	-.204	1	-.01	1	-9.813e-4	1	330.141	1	4786.17	3
299		17	max	.001	3	-.011	15	0	3	1.548e-3	3	6321.487	15	NC	4
300			min	-.002	1	-.226	1	-.007	1	-1.587e-3	1	297.746	1	6359.666	3
301		18	max	.001	3	-.012	15	0	10	1.909e-3	3	5751.076	15	NC	1
302			min	-.002	1	-.249	1	-.005	3	-2.193e-3	1	270.835	1	NC	1
303		19	max	.001	3	-.013	15	.005	2	2.271e-3	3	5272.385	15	NC	1
304			min	-.002	1	-.271	1	-.012	3	-2.799e-3	1	248.257	1	NC	1
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	1	0	1	NC	1	NC	1
308			min	0	1	-.002	3	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	2	NC	1
310			min	0	1	-.009	1	0	1	0	1	7717.714	1	NC	1
311		4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312			min	0	1	-.02	1	0	1	0	1	3353.743	1	NC	1
313		5	max	0	3	-.002	15	0	1	0	1	NC	5	NC	1
314			min	-.001	1	-.036	1	0	1	0	1	1891.303	1	NC	1
315		6	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
316			min	-.001	1	-.055	1	0	1	0	1	1224.125	1	NC	1
317		7	max	.001	3	-.003	15	0	1	0	1	NC	5	NC	1
318			min	-.002	1	-.078	1	0	1	0	1	863.216	1	NC	1
319		8	max	.001	3	-.004	15	0	1	0	1	NC	15	NC	1
320			min	-.002	1	-.104	1	0	1	0	1	645.288	1	NC	1
321		9	max	.002	3	-.006	15	0	1	0	1	NC	15	NC	1
322			min	-.002	1	-.134	1	0	1	0	1	503.533	1	NC	1
323		10	max	.002	3	-.007	15	0	1	0	1	9539.992	15	NC	1
324			min	-.002	1	-.166	1	0	1	0	1	405.908	1	NC	1
325		11	max	.002	3	-.009	15	0	1	0	1	7898.95	15	NC	1
326			min	-.003	1	-.2	1	0	1	0	1	335.77	1	NC	1
327		12	max	.002	3	-.01	15	0	1	0	1	6677.279	15	NC	1
328			min	-.003	1	-.237	1	0	1	0	1	283.627	1	NC	1
329		13	max	.003	3	-.012	15	0	1	0	1	5742.433	15	NC	1
330			min	-.003	1	-.276	1	0	1	0	1	243.771	1	NC	1
331		14	max	.003	3	-.013	15	0	1	0	1	5011.095	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
332			min	-.003	1	-.317	1	0	1	0	1	212.62	1	NC	1
333		15	max	.003	3	-.015	15	0	1	0	1	4427.822	15	NC	1
334			min	-.004	1	-.358	1	0	1	0	1	187.794	1	NC	1
335		16	max	.003	3	-.017	15	0	1	0	1	3955.344	15	NC	1
336			min	-.004	1	-.401	1	0	1	0	1	167.697	1	NC	1
337		17	max	.003	3	-.019	15	0	1	0	1	3567.342	15	NC	1
338			min	-.004	1	-.445	1	0	1	0	1	151.203	1	NC	1
339		18	max	.004	3	-.021	15	0	1	0	1	3245	15	NC	1
340			min	-.004	1	-.489	1	0	1	0	1	137.506	1	NC	1
341		19	max	.004	3	-.023	15	0	1	0	1	2974.555	15	NC	1
342			min	-.005	1	-.534	1	0	1	0	1	126.02	1	NC	1
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	15	0	1	2.74e-3	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-5.941e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	.001	1	3.51e-3	3	NC	1	NC	1
348			min	0	1	-.005	1	-.001	3	-7.709e-3	2	NC	1	NC	1
349		4	max	0	3	0	15	.002	1	3.149e-3	3	NC	2	NC	1
350			min	0	1	-.01	1	-.002	3	-7.083e-3	2	6446.258	1	NC	1
351		5	max	0	3	0	15	.003	1	2.787e-3	3	NC	4	NC	1
352			min	0	1	-.018	1	-.004	3	-6.458e-3	2	3666.999	1	NC	1
353		6	max	0	3	-.001	15	.005	1	2.426e-3	3	NC	5	NC	1
354			min	0	1	-.028	1	-.005	3	-5.832e-3	2	2384.595	1	7953.626	3
355		7	max	0	3	-.002	15	.007	1	2.065e-3	3	NC	5	NC	1
356			min	0	1	-.04	1	-.007	3	-5.206e-3	2	1686.462	1	6298.862	3
357		8	max	0	3	-.003	15	.008	1	1.703e-3	3	NC	5	NC	4
358			min	0	1	-.053	1	-.008	3	-4.581e-3	2	1263.203	1	5245.778	3
359		9	max	0	3	-.003	15	.01	1	1.342e-3	3	NC	5	NC	4
360			min	0	1	-.068	1	-.009	3	-3.955e-3	2	987.116	1	4550.907	3
361		10	max	0	3	-.004	15	.011	1	9.808e-4	3	NC	5	NC	4
362			min	0	1	-.084	1	-.01	3	-3.329e-3	2	796.588	1	4091.373	3
363		11	max	0	3	-.005	15	.012	1	6.195e-4	3	NC	15	NC	4
364			min	-.001	1	-.102	1	-.011	3	-2.704e-3	2	659.493	1	3801.192	3
365		12	max	0	3	-.006	15	.013	1	2.583e-4	3	NC	15	NC	4
366			min	-.001	1	-.121	1	-.011	3	-2.078e-3	2	557.448	1	3648.48	3
367		13	max	0	3	-.007	15	.013	1	-6.477e-6	15	NC	15	NC	4
368			min	-.001	1	-.14	1	-.011	3	-1.452e-3	2	479.371	1	3626.146	3
369		14	max	0	3	-.008	15	.012	1	1.531e-4	9	8874.681	15	NC	4
370			min	-.001	1	-.161	1	-.009	3	-8.268e-4	2	418.297	1	3750.74	3
371		15	max	0	3	-.009	15	.012	1	3.969e-4	9	7843.506	15	NC	4
372			min	-.001	1	-.182	1	-.007	3	-8.256e-4	3	369.592	1	4084.444	3
373		16	max	.001	3	-.01	15	.01	1	9.813e-4	1	7007.904	15	NC	4
374			min	-.001	1	-.204	1	-.004	3	-1.187e-3	3	330.141	1	4786.17	3
375		17	max	.001	3	-.011	15	.007	1	1.587e-3	1	6321.487	15	NC	4
376			min	-.002	1	-.226	1	0	3	-1.548e-3	3	297.746	1	6359.666	3
377		18	max	.001	3	-.012	15	.005	3	2.193e-3	1	5751.076	15	NC	1
378			min	-.002	1	-.249	1	0	10	-1.909e-3	3	270.835	1	NC	1
379		19	max	.001	3	-.013	15	.012	3	2.799e-3	1	5272.385	15	NC	1
380			min	-.002	1	-.271	1	-.005	2	-2.271e-3	3	248.257	1	NC	1
381	M3	1	max	.002	1	0	15	0	3	3.759e-3	2	NC	1	NC	1
382			min	0	15	-.001	1	0	1	-1.637e-3	3	NC	1	NC	1
383		2	max	.002	3	0	15	.012	3	4.08e-3	2	NC	1	NC	4
384			min	0	10	-.017	1	-.026	2	-1.803e-3	3	NC	1	2434.694	2
385		3	max	.002	3	-.002	15	.024	3	4.402e-3	2	NC	1	NC	5
386			min	0	10	-.034	1	-.051	2	-1.969e-3	3	NC	1	1224.754	2
387		4	max	.002	3	-.003	15	.035	3	4.723e-3	2	NC	1	NC	5
388			min	0	2	-.05	1	-.075	2	-2.135e-3	3	NC	1	827.024	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
389		5	max	.002	3	-.004	15	.046	3	5.045e-3	2	NC	1	NC	5
390			min	-.001	2	-.066	1	-.098	2	-2.3e-3	3	NC	1	632.673	2
391		6	max	.002	3	-.004	15	.056	3	5.366e-3	2	NC	1	NC	5
392			min	-.002	2	-.082	1	-.118	2	-2.466e-3	3	NC	1	520.107	2
393		7	max	.003	3	-.005	15	.065	3	5.688e-3	2	NC	1	NC	5
394			min	-.002	2	-.098	1	-.137	2	-2.632e-3	3	NC	1	448.978	2
395		8	max	.003	3	-.006	15	.072	3	6.009e-3	2	NC	1	NC	5
396			min	-.002	2	-.114	1	-.153	2	-2.798e-3	3	NC	1	402.208	2
397		9	max	.003	3	-.007	15	.078	3	6.33e-3	2	NC	1	NC	15
398			min	-.003	2	-.13	1	-.165	2	-2.964e-3	3	NC	1	371.537	2
399		10	max	.003	3	-.008	15	.082	3	6.652e-3	2	NC	1	NC	15
400			min	-.003	2	-.146	1	-.173	2	-3.13e-3	3	NC	1	352.745	2
401		11	max	.003	3	-.008	15	.084	3	6.973e-3	2	NC	1	NC	15
402			min	-.004	2	-.161	1	-.177	2	-3.296e-3	3	NC	1	343.844	2
403		12	max	.003	3	-.009	15	.084	3	7.295e-3	2	NC	1	NC	15
404			min	-.004	2	-.177	1	-.176	2	-3.461e-3	3	NC	1	344.406	2
405		13	max	.004	3	-.01	15	.081	3	7.616e-3	2	NC	1	NC	15
406			min	-.005	2	-.192	1	-.17	2	-3.627e-3	3	NC	1	355.549	2
407		14	max	.004	3	-.01	15	.076	3	7.938e-3	2	NC	1	NC	15
408			min	-.005	2	-.208	1	-.158	2	-3.793e-3	3	NC	1	380.638	2
409		15	max	.004	3	-.011	15	.067	3	8.259e-3	2	NC	1	NC	5
410			min	-.006	2	-.223	1	-.139	2	-3.959e-3	3	NC	1	427.483	2
411		16	max	.004	3	-.012	15	.056	3	8.58e-3	2	NC	1	NC	5
412			min	-.006	2	-.238	1	-.113	2	-4.125e-3	3	NC	1	515.267	2
413		17	max	.004	3	-.012	15	.041	3	8.902e-3	2	NC	1	NC	5
414			min	-.007	2	-.253	1	-.08	2	-4.291e-3	3	NC	1	702.525	2
415		18	max	.004	3	-.013	15	.022	3	9.223e-3	2	NC	1	NC	5
416			min	-.007	2	-.268	1	-.039	2	-4.456e-3	3	NC	1	1283.315	2
417		19	max	.005	3	-.013	15	.017	1	9.545e-3	2	NC	1	NC	1
418			min	-.008	2	-.283	1	0	3	-4.622e-3	3	NC	1	NC	1
419	M6	1	max	.003	3	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.002	1	0	1	0	1	NC	1	NC	1
421		2	max	.004	3	-.002	15	0	1	0	1	NC	1	NC	1
422			min	0	10	-.034	1	0	1	0	1	NC	1	NC	1
423		3	max	.005	3	-.003	15	0	1	0	1	NC	1	NC	1
424			min	-.001	2	-.066	1	0	1	0	1	NC	1	NC	1
425		4	max	.005	3	-.005	15	0	1	0	1	NC	1	NC	1
426			min	-.003	2	-.098	1	0	1	0	1	NC	1	NC	1
427		5	max	.006	3	-.006	15	0	1	0	1	NC	1	NC	1
428			min	-.004	2	-.13	1	0	1	0	1	NC	1	NC	1
429		6	max	.006	3	-.007	15	0	1	0	1	NC	1	NC	1
430			min	-.005	2	-.161	1	0	1	0	1	NC	1	NC	1
431		7	max	.007	3	-.009	15	0	1	0	1	NC	1	NC	1
432			min	-.007	2	-.193	1	0	1	0	1	NC	1	NC	1
433		8	max	.007	3	-.01	15	0	1	0	1	NC	1	NC	1
434			min	-.008	2	-.224	1	0	1	0	1	NC	1	NC	1
435		9	max	.008	3	-.012	15	0	1	0	1	NC	1	NC	1
436			min	-.01	2	-.256	1	0	1	0	1	NC	1	NC	1
437		10	max	.009	3	-.013	15	0	1	0	1	NC	1	NC	1
438			min	-.011	2	-.287	1	0	1	0	1	NC	1	NC	1
439		11	max	.009	3	-.014	15	0	1	0	1	NC	1	NC	1
440			min	-.012	2	-.318	1	0	1	0	1	NC	1	NC	1
441		12	max	.01	3	-.015	15	0	1	0	1	NC	1	NC	1
442			min	-.014	2	-.35	1	0	1	0	1	NC	1	NC	1
443		13	max	.01	3	-.017	15	0	1	0	1	NC	1	NC	1
444			min	-.015	2	-.381	1	0	1	0	1	NC	1	NC	1
445		14	max	.011	3	-.018	15	0	1	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
446			min	-.017	2	-.412	1	0	1	0	1	NC	1	NC	1
447		15	max	.011	3	-.019	15	0	1	0	1	NC	1	NC	1
448			min	-.018	2	-.443	1	0	1	0	1	NC	1	NC	1
449		16	max	.012	3	-.02	15	0	1	0	1	NC	1	NC	1
450			min	-.019	2	-.473	1	0	1	0	1	NC	1	NC	1
451		17	max	.013	3	-.021	15	0	1	0	1	NC	1	NC	1
452			min	-.021	2	-.504	1	0	1	0	1	NC	1	NC	1
453		18	max	.013	3	-.023	15	0	1	0	1	NC	1	NC	1
454			min	-.022	2	-.535	1	0	1	0	1	NC	1	NC	1
455		19	max	.014	3	-.024	15	0	1	0	1	NC	1	NC	1
456			min	-.023	2	-.566	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.002	1	0	15	0	1	1.637e-3	3	NC	1	NC	1
458			min	0	15	-.001	1	0	3	-3.759e-3	2	NC	1	NC	1
459		2	max	.002	3	0	15	.026	2	1.803e-3	3	NC	1	NC	4
460			min	0	10	-.017	1	-.012	3	-4.08e-3	2	NC	1	2434.694	2
461		3	max	.002	3	-.002	15	.051	2	1.969e-3	3	NC	1	NC	5
462			min	0	10	-.034	1	-.024	3	-4.402e-3	2	NC	1	1224.754	2
463		4	max	.002	3	-.003	15	.075	2	2.135e-3	3	NC	1	NC	5
464			min	0	2	-.05	1	-.035	3	-4.723e-3	2	NC	1	827.024	2
465		5	max	.002	3	-.004	15	.098	2	2.3e-3	3	NC	1	NC	5
466			min	-.001	2	-.066	1	-.046	3	-5.045e-3	2	NC	1	632.673	2
467		6	max	.002	3	-.004	15	.118	2	2.466e-3	3	NC	1	NC	5
468			min	-.002	2	-.082	1	-.056	3	-5.366e-3	2	NC	1	520.107	2
469		7	max	.003	3	-.005	15	.137	2	2.632e-3	3	NC	1	NC	5
470			min	-.002	2	-.098	1	-.065	3	-5.688e-3	2	NC	1	448.978	2
471		8	max	.003	3	-.006	15	.153	2	2.798e-3	3	NC	1	NC	5
472			min	-.002	2	-.114	1	-.072	3	-6.009e-3	2	NC	1	402.208	2
473		9	max	.003	3	-.007	15	.165	2	2.964e-3	3	NC	1	NC	15
474			min	-.003	2	-.13	1	-.078	3	-6.33e-3	2	NC	1	371.537	2
475		10	max	.003	3	-.008	15	.173	2	3.13e-3	3	NC	1	NC	15
476			min	-.003	2	-.146	1	-.082	3	-6.652e-3	2	NC	1	352.745	2
477		11	max	.003	3	-.008	15	.177	2	3.296e-3	3	NC	1	NC	15
478			min	-.004	2	-.161	1	-.084	3	-6.973e-3	2	NC	1	343.844	2
479		12	max	.003	3	-.009	15	.176	2	3.461e-3	3	NC	1	NC	15
480			min	-.004	2	-.177	1	-.084	3	-7.295e-3	2	NC	1	344.406	2
481		13	max	.004	3	-.01	15	.17	2	3.627e-3	3	NC	1	NC	15
482			min	-.005	2	-.192	1	-.081	3	-7.616e-3	2	NC	1	355.549	2
483		14	max	.004	3	-.01	15	.158	2	3.793e-3	3	NC	1	NC	15
484			min	-.005	2	-.208	1	-.076	3	-7.938e-3	2	NC	1	380.638	2
485		15	max	.004	3	-.011	15	.139	2	3.959e-3	3	NC	1	NC	5
486			min	-.006	2	-.223	1	-.067	3	-8.259e-3	2	NC	1	427.483	2
487		16	max	.004	3	-.012	15	.113	2	4.125e-3	3	NC	1	NC	5
488			min	-.006	2	-.238	1	-.056	3	-8.58e-3	2	NC	1	515.267	2
489		17	max	.004	3	-.012	15	.08	2	4.291e-3	3	NC	1	NC	5
490			min	-.007	2	-.253	1	-.041	3	-8.902e-3	2	NC	1	702.525	2
491		18	max	.004	3	-.013	15	.039	2	4.456e-3	3	NC	1	NC	5
492			min	-.007	2	-.268	1	-.022	3	-9.223e-3	2	NC	1	1283.315	2
493		19	max	.005	3	-.013	15	0	3	4.622e-3	3	NC	1	NC	1
494			min	-.008	2	-.283	1	-.017	1	-9.545e-3	2	NC	1	NC	1