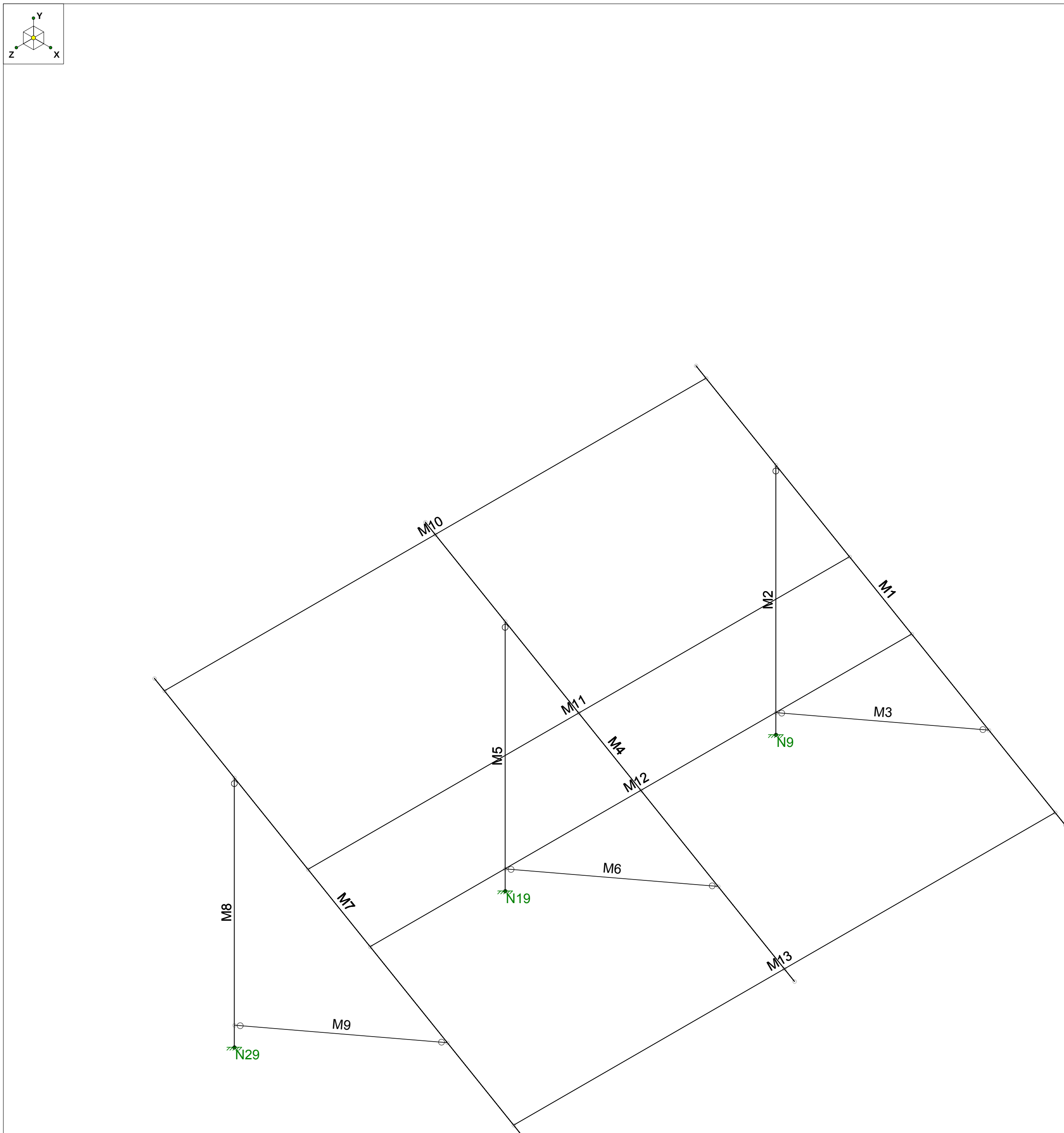


Schletter, Inc.		30° Tilt w/o Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

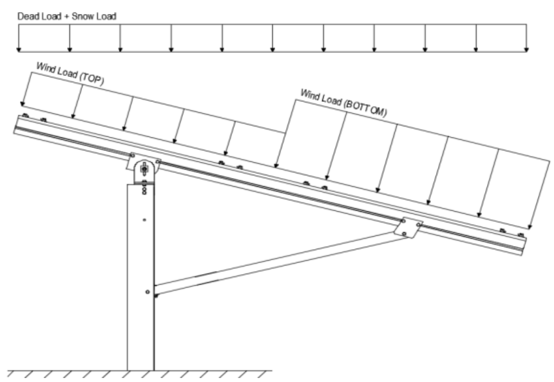
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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

PV modules are required to meet the following specifications:

	Maximum			Minimum	
Height =	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 =	30°
Maximum Height Above Grade =	3 ft



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

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

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

2.3 Wind Loads

Design Wind Speed, V =	110	mph	Exposure Category = C
Height <	15	ft	Importance Category = II

Peak Velocity Pressure, q_z = 19.00 psf *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

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

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

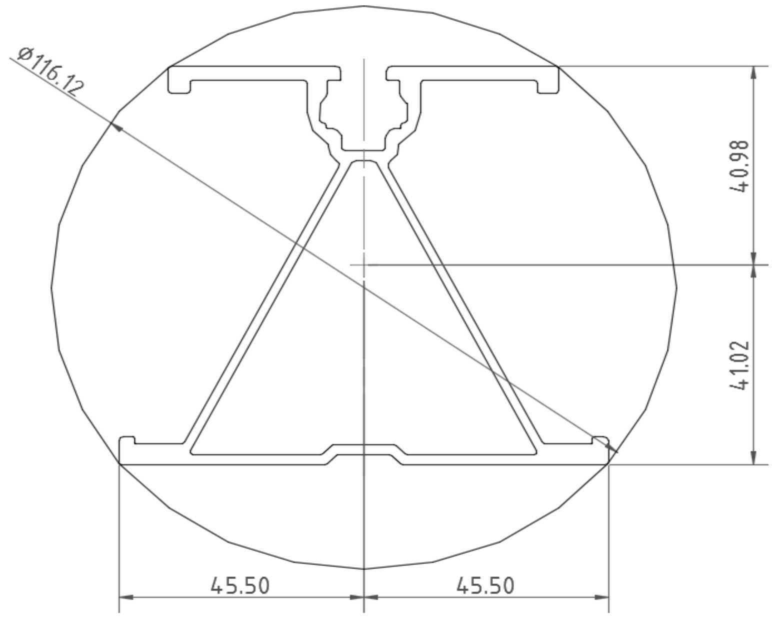
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	90	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 =	1.413	k-ft
M_z =	0.080	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	58%	

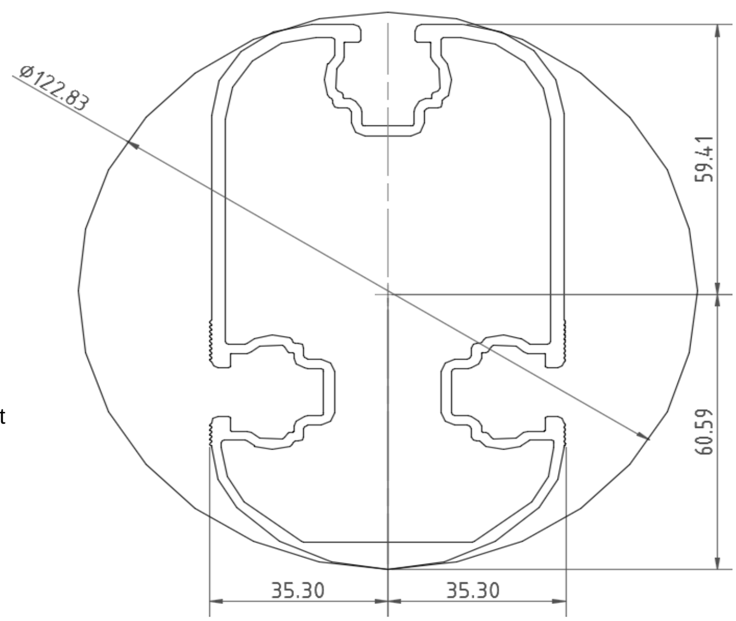


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	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 =	4.060	k-ft
M_z =	0.000	k-ft
P_n =	1.471	k
$M_{y\ allowable}$ =	4.960	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	84%	

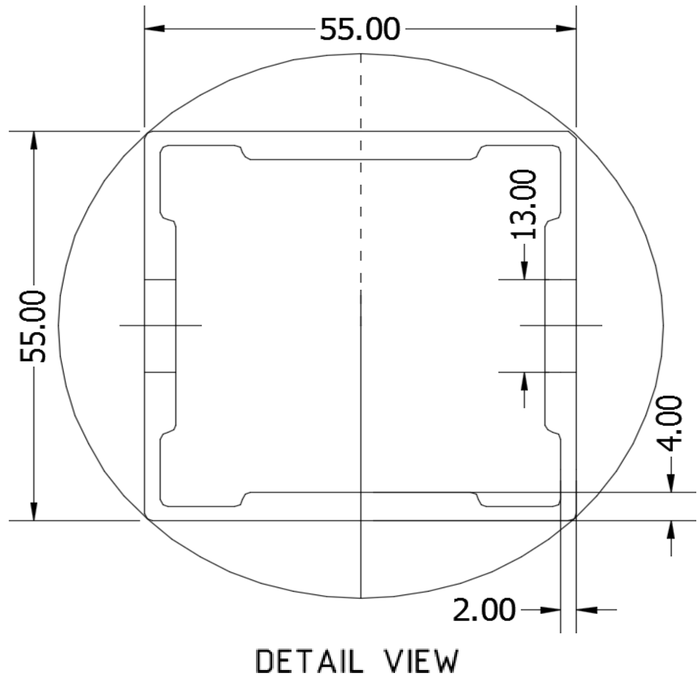


DETAIL VIEW

4.3 Strut Design

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

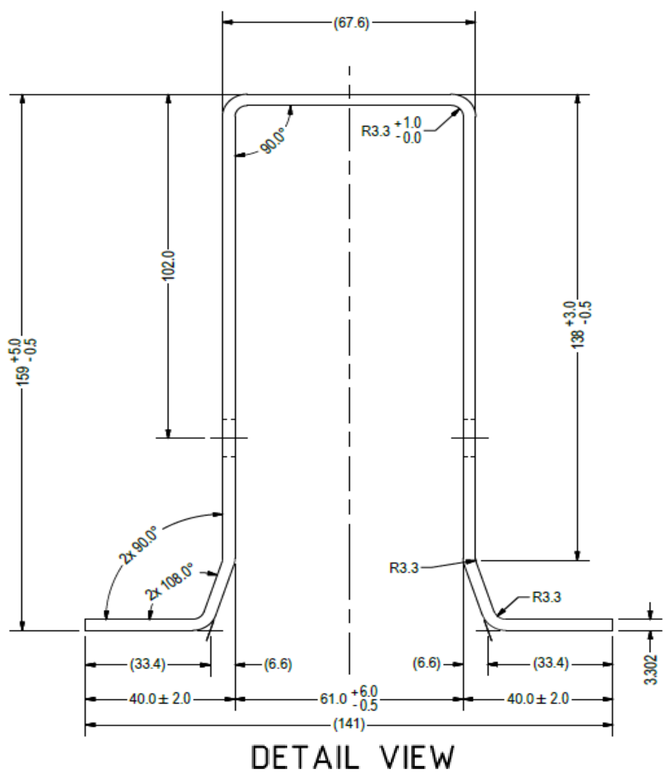
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	74.80	in
$\Phi F_{ty\ AXIAL}$ =	9.61	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.007	k-ft
M_z =	0.000	k-ft
P_n =	4.664	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	9.441	k
Utilization =	50%	



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 =	89.60	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 =	11.906	k-ft
M_z =	0.000	k-ft
P_r =	-5.029	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	25.874	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 =	6.51	k
Maximum Lateral Load =	3.92	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)

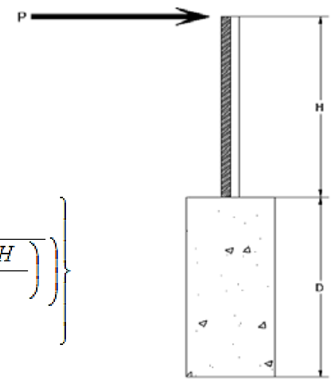
Lateral Force @ Top of Pole, P =	0.80	k
Height of Pole Above Grade, H =	6.47	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

$$A = 2.34 \, P/(S_1 B)$$

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	0.80	k
Height of Pole Above Grade, H =	6.47	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 =	4.31	
Required Footing Depth, D =	8.07	ft
2nd Trial @ D_2 =	5.66	ft
Lateral Soil Bearing @ D/3, S_1 =	0.38	ksf
Lateral Soil Bearing @ D, S_3 =	1.13	ksf
Constant $2.34P/(S_1B)$, A =	2.47	
Required Footing Depth, D =	5.59	ft
3rd Trial @ D_3 =	5.63	ft
Lateral Soil Bearing @ D/3, S_1 =	0.38	ksf
Lateral Soil Bearing @ D, S_3 =	1.13	ksf
Constant $2.34P/(S_1B)$, A =	2.49	
Required Footing Depth, D =	5.61	ft

4th Trial @ D_4 =	5.62	ft
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf
Lateral Soil Bearing @ D, S_3 =	1.12	ksf
Constant $2.34P/(S_1B)$, A =	2.49	
Required Footing Depth, D =	5.62	ft
5th Trial @ D_5 =	5.62	ft
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf
Lateral Soil Bearing @ D, S_3 =	1.12	ksf
Constant $2.34P/(S_1B)$, A =	2.49	
Required Footing Depth, D =	5.75	ft

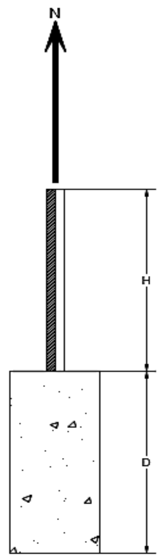
A 2ft diameter x 5.75ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.12	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	2.03	k
Required Concrete Volume, V =	14.00	ft^3
Required Footing Depth, D =	4.50	ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.74
2	0.4	0.2	118.10	6.64
3	0.6	0.2	118.10	6.53
4	0.8	0.2	118.10	6.43
5	1	0.2	118.10	6.32
6	1.2	0.2	118.10	6.22
7	1.4	0.2	118.10	6.12
8	1.6	0.2	118.10	6.01
9	1.8	0.2	118.10	5.91
10	2	0.2	118.10	5.81
11	2.2	0.2	118.10	5.70
12	2.4	0.2	118.10	5.60
13	2.6	0.2	118.10	5.49
14	2.8	0.2	118.10	5.39
15	3	0.2	118.10	5.29
16	3.2	0.2	118.10	5.18
17	3.4	0.2	118.10	5.08
18	3.6	0.2	118.10	4.98
19	3.8	0.2	118.10	4.87
20	4	0.2	118.10	4.77
21	4.2	0.2	118.10	4.66
22	4.4	0.2	118.10	4.56
23	4.6	0.2	118.10	4.46
24	0	0.0	0.00	4.46
25	0	0.0	0.00	4.46
26	0	0.0	0.00	4.46
27	0	0.0	0.00	4.46
28	0	0.0	0.00	4.46
29	0	0.0	0.00	4.46
30	0	0.0	0.00	4.46
31	0	0.0	0.00	4.46
32	0	0.0	0.00	4.46
33	0	0.0	0.00	4.46
34	0	0.0	0.00	4.46
Max	4.6	Sum	1.09	

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 =	3.77	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

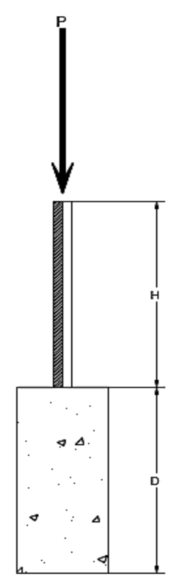
Weight of Concrete

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 =	6.39	k
Utilization =	66%	

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



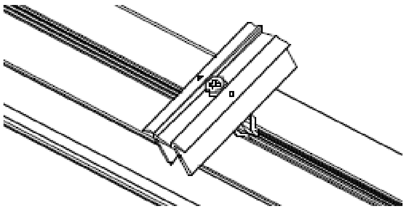
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

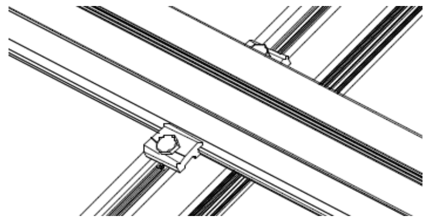
Fastening of Modules to Purlins

Maximum Uplifting Force = 0.772 k
Allowable Uplift = 1.214 k
Utilization = 64%



Fastening of Purlins to Girders

Maximum Uplifting Force = 2.066 k
Allowable Uplift = 2.180 k
Utilization = 95%

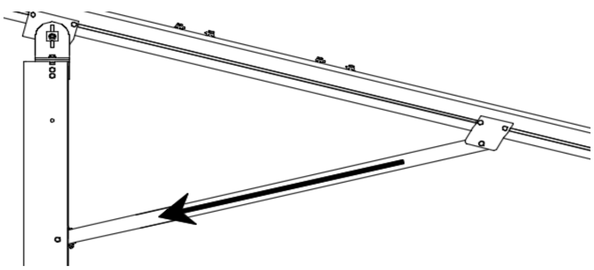


6.2 Strut Connections

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 = 4.664 k
M10 Bolt Shear Capacity = 8.894 k
Utilization = 52%

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

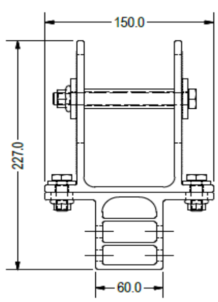


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

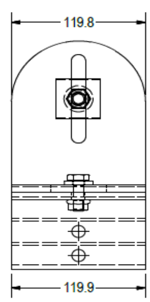
6.3 Girder to Post Connection

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.

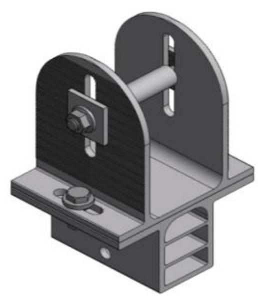
Maximum Tensile Load = 4.247 k
Allowable Load = 5.649 k
Utilization = 75%



FRONT VIEW



SIDE VIEW



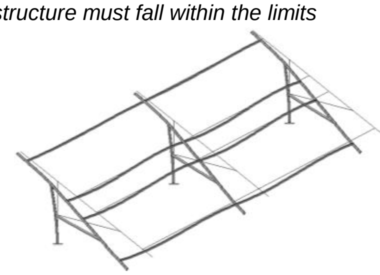
7. SEISMIC DESIGN

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} = 79.13 in
Allowable Story Drift for All Other Structures, Δ = { $0.020h_{sx}$
1.583 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 = 90 in
J = 0.432
248.982

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

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= 28.2 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

$\varphi F_L St$= 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 = 90
J = 0.432
158.338

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

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= 29.3

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

$\varphi F_L Wk$= 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	3.4.16.1
Rb/t =	20.0	N/A for Weak Direction

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= φb[Bt-Dt*√(Rb/t)]

φF_L= 30.8 ksi

3.4.18 (strong direction)

h/t = 16.3333

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

S1 =	37.9
m =	0.63
C_0 =	61.046
Cc =	58.954

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

S2 = 79.4

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

3.4.18 (weak direction)

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_LSt=	30.1 ksi		φF_LWk=	31.6 ksi	
Ix =	1970917 mm^4		Iy =	763048 mm^4	
	4.735 in^4			1.833 in^4	
y =	61.046 mm		x =	35 mm	
Sx =	1.970 in^3		Sy =	1.330 in^3	
M_{max}St =	4.935 k-ft		M_{max}Wk =	3.499 k-ft	

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 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 = $(\varphi ccFcy)/(\lambda^2)$

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L = $\varphi c[Bp-1.6Dp*b/t]$

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L = $\varphi yFcy$

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 =	89.60	in	
Pr =	-5.03	k	(LRFD Factored Load)
Mr (Strong) =	11.91	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	128.92		
4.71√(E/Fy) =	103.55 =>	kL/r	> 4.71√(E/Fy)
Fcr =	15.10 ksi		
Fe =	17.22 ksi		
Pn =	33.677 k		

Torsional/Flexural Torsional Buckling:

Fcr =	11.6026 ksi
Fey =	43.9243 ksi
Fez =	14.9387 ksi
Pn =	25.8738 k

Bending (Strong Axis):

Yielding:			
Mn =	21.95 k-ft		
Flange Local Buckling:			
Mn =	19.207 k-ft		
Pr/Pc =	0.1493 <	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 =	0.149 <	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	-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	-46.866	-46.866	0	0
2	M11	Y	-46.866	-46.866	0	0
3	M12	Y	-46.866	-46.866	0	0
4	M13	Y	-46.866	-46.866	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	-71.679	-71.679	0	0
2	M11	y	-71.679	-71.679	0	0
3	M12	y	-115.31	-115.31	0	0
4	M13	y	-115.31	-115.31	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	143.359	143.359	0	0
2	M11	y	143.359	143.359	0	0
3	M12	y	68.563	68.563	0	0
4	M13	y	68.563	68.563	0	0

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												

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 + 1.0W	Yes	Y		1	1			4	1														
11	ASD 1.0D + 0.75L + 0.75W + 0....	Yes	Y		1	1	3	.75	4	.75														
12	ASD 0.6D + 1.0W	Yes	Y		2	.6					5	1												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65..	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	745.095	2	2206.287	2	109.701	2	.166	1	.004	3	5.846	1
2		min	-1092.91	3	-1607.037	3	-134.729	3	-.21	3	-.009	2	.245	15
3	N19	max	2997.546	2	5887.416	2	0	3	0	15	0	15	8.476	1
4		min	-2900.308	3	-4991.574	3	0	2	0	3	0	1	.338	15
5	N29	max	745.095	2	2206.287	2	134.729	3	.21	3	.009	2	5.846	1
6		min	-1092.91	3	-1607.037	3	-109.701	2	-.166	1	-.004	3	.245	15
7	Totals:	max	4487.736	2	10299.99	2	0	1						
8		min	-5086.128	3	-8205.649	3	0	12						

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	.003	2	0	5	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-8.611	15	304.287	3	-4.228	15	.037	3	.242	1	.257	2
4			min	-192.602	1	-694.288	2	-110.933	1	-.177	2	.01	15	-.11	3
5		3	max	-8.887	15	303.099	3	-4.228	15	.037	3	.169	1	.713	2
6			min	-193.517	1	-695.873	2	-110.933	1	-.177	2	.007	15	-.309	3
7		4	max	-9.163	15	301.91	3	-4.228	15	.037	3	.096	1	1.17	2
8			min	-194.432	1	-697.457	2	-110.933	1	-.177	2	.004	15	-.508	3
9		5	max	393.826	3	639.308	2	-2.841	12	.008	2	.112	1	1.382	2
10			min	-1114.489	2	-265.161	3	-138.773	1	-.037	3	-.022	3	-.601	3
11		6	max	393.14	3	637.723	2	-2.841	12	.008	2	.035	2	.963	2
12			min	-1115.404	2	-266.35	3	-138.773	1	-.037	3	-.024	3	-.427	3
13		7	max	392.454	3	636.139	2	-2.841	12	.008	2	-.003	15	.545	2
14			min	-1116.318	2	-267.538	3	-138.773	1	-.037	3	-.07	1	-.252	3
15		8	max	391.768	3	634.554	2	-2.841	12	.008	2	-.006	15	.128	2
16			min	-1117.233	2	-268.726	3	-138.773	1	-.037	3	-.161	1	-.076	3
17		9	max	364.943	3	13.54	3	3.906	3	-.001	15	.091	1	.008	3
18			min	-1226.311	2	-10.917	2	-182.41	1	-.117	2	.004	15	-.067	2
19		10	max	364.256	3	12.352	3	3.906	3	-.001	15	.04	3	0	12
20			min	-1227.226	2	-12.502	2	-182.41	1	-.117	2	-.033	2	-.059	2
21		11	max	363.57	3	11.164	3	3.906	3	-.001	15	.042	3	-.003	15
22			min	-1228.14	2	-14.086	2	-182.41	1	-.117	2	-.148	1	-.05	2
23		12	max	331.426	3	695.293	3	20.028	2	.18	3	.12	1	.102	2
24			min	-1416.492	1	-436.583	2	-161.825	3	-.153	2	.005	15	-.234	3
25		13	max	330.74	3	694.105	3	20.028	2	.18	3	.103	1	.389	2
26			min	-1417.406	1	-438.167	2	-161.825	3	-.153	2	-.022	3	-.689	3
27		14	max	330.054	3	692.916	3	20.028	2	.18	3	.089	2	.677	2
28			min	-1418.321	1	-439.752	2	-161.825	3	-.153	2	-.129	3	-1.144	3
29		15	max	329.368	3	691.728	3	20.028	2	.18	3	.102	2	.966	2
30			min	-1419.236	1	-441.336	2	-161.825	3	-.153	2	-.235	3	-1.599	3
31		16	max	194.78	1	442.868	2	-3.914	15	.13	2	.017	3	.736	2
32			min	9.189	15	-725.721	3	-95.314	1	-.318	3	-.128	1	-1.221	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	193.865	1	441.283	2	-3.914	15	.13	2	-.007	12	.446	2
34			min	8.913	15	-726.909	3	-95.314	1	-.318	3	-.19	1	-.744	3
35		18	max	192.95	1	439.699	2	-3.914	15	.13	2	-.01	15	.157	2
36			min	8.637	15	-728.097	3	-95.314	1	-.318	3	-.253	1	-.267	3
37		19	max	0	1	0	2	0	1	0	1	0	1	0	1
38			min	0	1	-.002	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.007	2	0	1	0	1	0	1	0	1
40			min	0	1	-.001	3	0	1	0	1	0	1	0	1
41		2	max	1.398	3	951.96	3	0	1	0	1	0	1	.574	2
42			min	-282.056	1	-1859.812	2	0	1	0	1	0	1	-.303	3
43		3	max	.712	3	950.771	3	0	1	0	1	0	1	1.795	2
44			min	-282.971	1	-1861.396	2	0	1	0	1	0	1	-.927	3
45		4	max	.026	3	949.583	3	0	1	0	1	0	1	3.017	2
46			min	-283.886	1	-1862.981	2	0	1	0	1	0	1	-1.55	3
47		5	max	1456.524	3	1866.264	2	0	1	0	1	0	1	3.554	2
48			min	-2916.148	2	-993.935	3	0	1	0	1	0	1	-1.816	3
49		6	max	1455.838	3	1864.68	2	0	1	0	1	0	1	2.33	2
50			min	-2917.062	2	-995.124	3	0	1	0	1	0	1	-1.164	3
51		7	max	1455.152	3	1863.095	2	0	1	0	1	0	1	1.107	2
52			min	-2917.977	2	-996.312	3	0	1	0	1	0	1	-.51	3
53		8	max	1454.466	3	1861.511	2	0	1	0	1	0	1	.144	3
54			min	-2918.892	2	-997.5	3	0	1	0	1	0	1	-.119	1
55		9	max	1459.088	3	-1.548	12	0	1	0	1	0	1	.455	3
56			min	-2981.353	2	-104.842	2	0	1	0	1	0	1	-.679	2
57		10	max	1458.402	3	-2.13	15	0	1	0	1	0	1	.457	3
58			min	-2982.267	2	-106.426	2	0	1	0	1	0	1	-.609	2
59		11	max	1457.716	3	-2.608	15	0	1	0	1	0	1	.459	3
60			min	-2983.182	2	-108.011	2	0	1	0	1	0	1	-.539	2
61		12	max	1472.976	3	1979.042	3	0	1	0	1	0	1	.019	9
62			min	-3055.274	2	-1470.867	2	0	1	0	1	0	1	-.168	3
63		13	max	1472.29	3	1977.854	3	0	1	0	1	0	1	.915	2
64			min	-3056.189	2	-1472.451	2	0	1	0	1	0	1	-1.466	3
65		14	max	1471.604	3	1976.665	3	0	1	0	1	0	1	1.882	2
66			min	-3057.103	2	-1474.036	2	0	1	0	1	0	1	-2.764	3
67		15	max	1470.918	3	1975.477	3	0	1	0	1	0	1	2.849	2
68			min	-3058.018	2	-1475.62	2	0	1	0	1	0	1	-4.06	3
69		16	max	283.19	1	1330.473	2	0	1	0	1	0	1	2.169	2
70			min	2.813	12	-1897.792	3	0	1	0	1	0	1	-3.082	3
71		17	max	282.275	1	1328.889	2	0	1	0	1	0	1	1.297	2
72			min	2.355	12	-1898.98	3	0	1	0	1	0	1	-1.836	3
73		18	max	281.36	1	1327.305	2	0	1	0	1	0	1	.425	2
74			min	1.898	12	-1900.168	3	0	1	0	1	0	1	-.59	3
75		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
76			min	0	1	-.005	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	1	.003	2	0	1	0	1	0	1	0	1
78			min	0	1	0	3	0	5	0	1	0	1	0	1
79		2	max	-8.611	15	304.287	3	110.933	1	.177	2	-.01	15	.257	2
80			min	-192.602	1	-694.288	2	4.228	15	-.037	3	-.242	1	-.11	3
81		3	max	-8.887	15	303.099	3	110.933	1	.177	2	-.007	15	.713	2
82			min	-193.517	1	-695.873	2	4.228	15	-.037	3	-.169	1	-.309	3
83		4	max	-9.163	15	301.91	3	110.933	1	.177	2	-.004	15	1.17	2
84			min	-194.432	1	-697.457	2	4.228	15	-.037	3	-.096	1	-.508	3
85		5	max	393.826	3	639.308	2	138.773	1	.037	3	.022	3	1.382	2
86			min	-1114.489	2	-265.161	3	2.841	12	-.008	2	-.112	1	-.601	3
87		6	max	393.14	3	637.723	2	138.773	1	.037	3	.024	3	.963	2
88			min	-1115.404	2	-266.35	3	2.841	12	-.008	2	-.035	2	-.427	3
89		7	max	392.454	3	636.139	2	138.773	1	.037	3	.07	1	.545	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	-1116.318	2	-267.538	3	2.841	12	-.008	2	.003	15	-.252	3
91		8	max	391.768	3	634.554	2	138.773	1	.037	3	.161	1	.128	2
92			min	-1117.233	2	-268.726	3	2.841	12	-.008	2	.006	15	-.076	3
93		9	max	364.943	3	13.54	3	182.41	1	.117	2	-.004	15	.008	3
94			min	-1226.311	2	-10.917	2	-3.906	3	.001	15	-.091	1	-.067	2
95		10	max	364.256	3	12.352	3	182.41	1	.117	2	.033	2	0	12
96			min	-1227.226	2	-12.502	2	-3.906	3	.001	15	-.04	3	-.059	2
97		11	max	363.57	3	11.164	3	182.41	1	.117	2	.148	1	-.003	15
98			min	-1228.14	2	-14.086	2	-3.906	3	.001	15	-.042	3	-.05	2
99		12	max	331.426	3	695.293	3	161.825	3	.153	2	-.005	15	.102	2
100			min	-1416.492	1	-436.583	2	-20.028	2	-.18	3	-.12	1	-.234	3
101		13	max	330.74	3	694.105	3	161.825	3	.153	2	.022	3	.389	2
102			min	-1417.406	1	-438.167	2	-20.028	2	-.18	3	-.103	1	-.689	3
103		14	max	330.054	3	692.916	3	161.825	3	.153	2	.129	3	.677	2
104			min	-1418.321	1	-439.752	2	-20.028	2	-.18	3	-.089	2	-1.144	3
105		15	max	329.368	3	691.728	3	161.825	3	.153	2	.235	3	.966	2
106			min	-1419.236	1	-441.336	2	-20.028	2	-.18	3	-.102	2	-1.599	3
107		16	max	194.78	1	442.868	2	95.314	1	.318	3	.128	1	.736	2
108			min	9.189	15	-725.721	3	3.914	15	-.13	2	-.017	3	-1.221	3
109		17	max	193.865	1	441.283	2	95.314	1	.318	3	.19	1	.446	2
110			min	8.913	15	-726.909	3	3.914	15	-.13	2	.007	12	-.744	3
111		18	max	192.95	1	439.699	2	95.314	1	.318	3	.253	1	.157	2
112			min	8.637	15	-728.097	3	3.914	15	-.13	2	.01	15	-.267	3
113		19	max	0	1	0	2	0	5	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	95.355	1	438.105	2	-8.362	15	.009	2	.285	1	.13	2
116			min	3.914	15	-729.165	3	-192.291	1	-.023	3	.011	15	-.318	3
117		2	max	95.355	1	315.794	2	-6.65	15	.009	2	.14	1	.212	3
118			min	3.914	15	-542.539	3	-155.373	1	-.023	3	.005	15	-.184	2
119		3	max	95.355	1	193.484	2	-4.939	15	.009	2	.044	2	.586	3
120			min	3.914	15	-355.914	3	-118.455	1	-.023	3	0	15	-.397	2
121		4	max	95.355	1	71.174	2	-3.227	15	.009	2	.006	10	.805	3
122			min	3.914	15	-169.288	3	-81.538	1	-.023	3	-.057	1	-.507	2
123		5	max	95.355	1	17.338	3	-1.515	15	.009	2	-.005	15	.868	3
124			min	3.914	15	-51.28	1	-44.62	1	-.023	3	-.11	1	-.515	2
125		6	max	95.355	1	203.963	3	2.621	9	.009	2	-.006	15	.776	3
126			min	3.914	15	-173.447	2	-21.085	2	-.023	3	-.132	1	-.422	2
127		7	max	95.355	1	390.589	3	29.215	1	.009	2	-.005	15	.528	3
128			min	3.914	15	-295.757	2	-8.619	10	-.023	3	-.123	1	-.226	2
129		8	max	95.355	1	577.215	3	66.132	1	.009	2	-.003	15	.125	3
130			min	3.914	15	-418.067	2	-4.618	3	-.023	3	-.083	1	.003	15
131		9	max	95.355	1	763.84	3	103.05	1	.009	2	.016	9	.471	2
132			min	3.914	15	-540.377	2	-2.008	3	-.023	3	-.061	2	-.434	3
133		10	max	95.355	1	950.466	3	.703	12	.023	3	.089	9	.972	2
134			min	3.914	15	16.304	15	-139.968	1	0	15	-.038	10	-1.148	3
135		11	max	95.355	1	540.377	2	2.008	3	.023	3	.016	9	.471	2
136			min	3.914	15	-763.84	3	-103.05	1	-.009	2	-.061	2	-.434	3
137		12	max	95.355	1	418.067	2	4.618	3	.023	3	-.003	15	.125	3
138			min	3.914	15	-577.215	3	-66.132	1	-.009	2	-.083	1	.003	15
139		13	max	95.355	1	295.757	2	8.619	10	.023	3	-.005	15	.528	3
140			min	3.914	15	-390.589	3	-29.215	1	-.009	2	-.123	1	-.226	2
141		14	max	95.355	1	173.447	2	21.085	2	.023	3	-.006	15	.776	3
142			min	3.914	15	-203.963	3	-2.621	9	-.009	2	-.132	1	-.422	2
143		15	max	95.355	1	51.28	1	44.62	1	.023	3	-.005	15	.868	3
144			min	3.914	15	-17.338	3	1.515	15	-.009	2	-.11	1	-.515	2
145		16	max	95.355	1	169.288	3	81.538	1	.023	3	.006	10	.805	3
146			min	3.914	15	-71.174	2	3.227	15	-.009	2	-.057	1	-.507	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
147		17	max	95.355	1	355.914	3	118.455	1	.023	3	.044	2	.586	3
148			min	3.914	15	-193.484	2	4.939	15	-.009	2	0	15	-.397	2
149		18	max	95.355	1	542.539	3	155.373	1	.023	3	.14	1	.212	3
150			min	3.914	15	-315.794	2	6.65	15	-.009	2	.005	15	-.184	2
151		19	max	95.355	1	729.165	3	192.291	1	.023	3	.285	1	.13	2
152			min	3.914	15	-438.105	2	8.362	15	-.009	2	.011	15	-.318	3
153	M11	1	max	155.512	1	420.35	2	-8.835	15	0	3	.339	1	.048	1
154			min	-165.596	3	-685.808	3	-203.162	1	-.008	1	.014	15	-.268	3
155		2	max	155.512	1	298.04	2	-7.123	15	0	3	.185	1	.226	3
156			min	-165.596	3	-499.183	3	-166.245	1	-.008	1	.007	15	-.264	2
157		3	max	155.512	1	175.73	2	-5.412	15	0	3	.062	2	.564	3
158			min	-165.596	3	-312.557	3	-129.327	1	-.008	1	.002	15	-.461	2
159		4	max	155.512	1	53.419	2	-3.7	15	0	3	.023	3	.747	3
160			min	-165.596	3	-125.931	3	-92.41	1	-.008	1	-.031	1	-.556	2
161		5	max	155.512	1	60.694	3	-1.989	15	0	3	.005	3	.774	3
162			min	-165.596	3	-68.891	2	-55.492	1	-.008	1	-.092	1	-.55	2
163		6	max	155.512	1	247.32	3	-.277	15	0	3	-.005	15	.646	3
164			min	-165.596	3	-191.201	2	-26.504	2	-.008	1	-.123	1	-.442	2
165		7	max	155.512	1	433.945	3	20.142	9	0	3	-.005	15	.362	3
166			min	-165.596	3	-313.511	2	-15.63	3	-.008	1	-.123	1	-.231	2
167		8	max	155.512	1	620.571	3	55.261	1	0	3	-.003	15	.081	2
168			min	-165.596	3	-435.821	2	-13.02	3	-.008	1	-.093	1	-.077	3
169		9	max	155.512	1	807.197	3	92.178	1	0	3	.004	9	.495	2
170			min	-165.596	3	-558.132	2	-10.411	3	-.008	1	-.071	2	-.672	3
171		10	max	155.512	1	-16.366	15	129.096	1	.008	1	.072	9	1.011	2
172			min	-165.596	3	-993.822	3	3.613	10	0	15	-.055	3	-1.423	3
173		11	max	155.512	1	558.132	2	10.411	3	.008	1	.004	9	.495	2
174			min	-165.596	3	-807.197	3	-92.178	1	0	3	-.071	2	-.672	3
175		12	max	155.512	1	435.821	2	13.02	3	.008	1	-.003	15	.081	2
176			min	-165.596	3	-620.571	3	-55.261	1	0	3	-.093	1	-.077	3
177		13	max	155.512	1	313.511	2	15.63	3	.008	1	-.005	15	.362	3
178			min	-165.596	3	-433.945	3	-20.142	9	0	3	-.123	1	-.231	2
179		14	max	155.512	1	191.201	2	26.504	2	.008	1	-.005	15	.646	3
180			min	-165.596	3	-247.32	3	.277	15	0	3	-.123	1	-.442	2
181		15	max	155.512	1	68.891	2	55.492	1	.008	1	.005	3	.774	3
182			min	-165.596	3	-60.694	3	1.989	15	0	3	-.092	1	-.55	2
183		16	max	155.512	1	125.931	3	92.41	1	.008	1	.023	3	.747	3
184			min	-165.596	3	-53.419	2	3.7	15	0	3	-.031	1	-.556	2
185		17	max	155.512	1	312.557	3	129.327	1	.008	1	.062	2	.564	3
186			min	-165.596	3	-175.73	2	5.412	15	0	3	.002	15	-.461	2
187		18	max	155.512	1	499.183	3	166.245	1	.008	1	.185	1	.226	3
188			min	-165.596	3	-298.04	2	7.123	15	0	3	.007	15	-.264	2
189		19	max	155.512	1	685.808	3	203.162	1	.008	1	.339	1	.048	1
190			min	-165.596	3	-420.35	2	8.835	15	0	3	.014	15	-.268	3
191	M12	1	max	7.685	3	642.935	2	-8.932	15	0	15	.358	1	.125	2
192			min	-43.003	1	-283.668	3	-207.036	1	-.004	1	.014	15	.002	15
193		2	max	7.685	3	462.451	2	-7.22	15	0	15	.201	1	.251	3
194			min	-43.003	1	-196.77	3	-170.119	1	-.004	1	.007	15	-.336	2
195		3	max	7.685	3	281.966	2	-5.509	15	0	15	.076	2	.378	3
196			min	-43.003	1	-109.872	3	-133.201	1	-.004	1	.002	15	-.646	2
197		4	max	7.685	3	101.481	2	-3.797	15	0	15	.018	2	.434	3
198			min	-43.003	1	-22.975	3	-96.284	1	-.004	1	-.026	9	-.806	2
199		5	max	7.685	3	63.923	3	-2.086	15	0	15	-.002	12	.417	3
200			min	-43.003	1	-79.004	2	-59.366	1	-.004	1	-.086	1	-.815	2
201		6	max	7.685	3	150.82	3	-.374	15	0	15	-.005	15	.327	3
202			min	-43.003	1	-259.489	2	-30.951	2	-.004	1	-.12	1	-.674	2
203		7	max	7.685	3	237.718	3	18.768	9	0	15	-.005	15	.165	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	-43.003	1	-439.974	2	-15.514	2	-.004	1	-.124	1	-.382	2
205		8	max	7.685	3	324.616	3	51.387	1	0	15	-.003	15	.059	2
206			min	-43.003	1	-620.459	2	-8.347	10	-.004	1	-.096	1	-.069	3
207		9	max	7.685	3	411.513	3	88.304	1	0	15	.002	9	.652	2
208			min	-43.003	1	-800.944	2	-5.271	3	-.004	1	-.079	2	-.376	3
209		10	max	7.685	3	-16.129	15	125.222	1	.004	1	.068	9	1.394	2
210			min	-43.003	1	-981.429	2	1.109	10	0	15	-.059	2	-.755	3
211		11	max	7.685	3	800.944	2	5.271	3	.004	1	.002	9	.652	2
212			min	-43.003	1	-411.513	3	-88.304	1	0	15	-.079	2	-.376	3
213		12	max	7.685	3	620.459	2	8.347	10	.004	1	-.003	15	.059	2
214			min	-43.003	1	-324.616	3	-51.387	1	0	15	-.096	1	-.069	3
215		13	max	7.685	3	439.974	2	15.514	2	.004	1	-.005	15	.165	3
216			min	-43.003	1	-237.718	3	-18.768	9	0	15	-.124	1	-.382	2
217		14	max	7.685	3	259.489	2	30.951	2	.004	1	-.005	15	.327	3
218			min	-43.003	1	-150.82	3	.374	15	0	15	-.12	1	-.674	2
219		15	max	7.685	3	79.004	2	59.366	1	.004	1	-.002	12	.417	3
220			min	-43.003	1	-63.923	3	2.086	15	0	15	-.086	1	-.815	2
221		16	max	7.685	3	22.975	3	96.284	1	.004	1	.018	2	.434	3
222			min	-43.003	1	-101.481	2	3.797	15	0	15	-.026	9	-.806	2
223		17	max	7.685	3	109.872	3	133.201	1	.004	1	.076	2	.378	3
224			min	-43.003	1	-281.966	2	5.509	15	0	15	.002	15	-.646	2
225		18	max	7.685	3	196.77	3	170.119	1	.004	1	.201	1	.251	3
226			min	-43.003	1	-462.451	2	7.22	15	0	15	.007	15	-.336	2
227		19	max	7.685	3	283.668	3	207.036	1	.004	1	.358	1	.125	2
228			min	-43.003	1	-642.935	2	8.932	15	0	15	.014	15	.002	15
229	M13	1	max	-4.228	15	693.618	2	-8.335	15	.008	3	.279	1	.177	2
230			min	-110.803	1	-305.496	3	-191.383	1	-.024	2	.011	15	-.037	3
231		2	max	-4.228	15	513.133	2	-6.623	15	.008	3	.135	1	.182	3
232			min	-110.803	1	-218.599	3	-154.465	1	-.024	2	.005	15	-.326	2
233		3	max	-4.228	15	332.648	2	-4.912	15	.008	3	.04	2	.328	3
234			min	-110.803	1	-131.701	3	-117.548	1	-.024	2	0	15	-.679	2
235		4	max	-4.228	15	152.163	2	-3.2	15	.008	3	.007	3	.401	3
236			min	-110.803	1	-44.803	3	-80.63	1	-.024	2	-.061	1	-.881	2
237		5	max	-4.228	15	42.094	3	-1.488	15	.008	3	-.004	12	.402	3
238			min	-110.803	1	-28.322	2	-43.713	1	-.024	2	-.113	1	-.932	2
239		6	max	-4.228	15	128.992	3	3.001	9	.008	3	-.006	15	.331	3
240			min	-110.803	1	-208.807	2	-20.177	2	-.024	2	-.134	1	-.833	2
241		7	max	-4.228	15	215.89	3	30.123	1	.008	3	-.005	15	.187	3
242			min	-110.803	1	-389.291	2	-8.853	3	-.024	2	-.124	1	-.584	2
243		8	max	-4.228	15	302.787	3	67.04	1	.008	3	-.003	15	-.005	15
244			min	-110.803	1	-569.776	2	-6.244	3	-.024	2	-.084	1	-.185	2
245		9	max	-4.228	15	389.685	3	103.958	1	.008	3	.016	9	.365	2
246			min	-110.803	1	-750.261	2	-3.634	3	-.024	2	-.061	2	-.317	3
247		10	max	-4.228	15	-14.802	15	140.875	1	.024	2	.089	1	1.066	2
248			min	-110.803	1	-930.746	2	.313	12	0	15	-.037	3	-.678	3
249		11	max	-4.228	15	750.261	2	3.634	3	.024	2	.016	9	.365	2
250			min	-110.803	1	-389.685	3	-103.958	1	-.008	3	-.061	2	-.317	3
251		12	max	-4.228	15	569.776	2	6.244	3	.024	2	-.003	15	-.005	15
252			min	-110.803	1	-302.787	3	-67.04	1	-.008	3	-.084	1	-.185	2
253		13	max	-4.228	15	389.291	2	8.853	3	.024	2	-.005	15	.187	3
254			min	-110.803	1	-215.89	3	-30.123	1	-.008	3	-.124	1	-.584	2
255		14	max	-4.228	15	208.807	2	20.177	2	.024	2	-.006	15	.331	3
256			min	-110.803	1	-128.992	3	-3.001	9	-.008	3	-.134	1	-.833	2
257		15	max	-4.228	15	28.322	2	43.713	1	.024	2	-.004	12	.402	3
258			min	-110.803	1	-42.094	3	1.488	15	-.008	3	-.113	1	-.932	2
259		16	max	-4.228	15	44.803	3	80.63	1	.024	2	.007	3	.401	3
260			min	-110.803	1	-152.163	2	3.2	15	-.008	3	-.061	1	-.881	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	-4.228	15	131.701	3	117.548	1	.024	2	.04	2	.328	3
262			min	-110.803	1	-332.648	2	4.912	15	-.008	3	0	15	-.679	2
263		18	max	-4.228	15	218.599	3	154.465	1	.024	2	.135	1	.182	3
264			min	-110.803	1	-513.133	2	6.623	15	-.008	3	.005	15	-.326	2
265		19	max	-4.228	15	305.496	3	191.383	1	.024	2	.279	1	.177	2
266			min	-110.803	1	-693.618	2	8.335	15	-.008	3	.011	15	-.037	3
267	M2	1	max	2206.287	2	1092.259	3	109.807	2	.004	3	.21	3	5.846	1
268			min	-1607.037	3	-743.964	2	-134.629	3	-.009	2	-.166	1	.245	15
269		2	max	2203.016	2	1092.259	3	109.807	2	.004	3	.162	3	5.928	1
270			min	-1609.491	3	-743.964	2	-134.629	3	-.009	2	-.132	1	.242	15
271		3	max	1560.108	1	1004.716	1	75.592	2	.001	2	.125	3	5.775	1
272			min	-1340.177	3	40.466	15	-121.641	3	0	3	-.116	1	.233	15
273		4	max	1556.836	1	1004.716	1	75.592	2	.001	2	.081	3	5.414	1
274			min	-1342.63	3	40.466	15	-121.641	3	0	3	-.092	1	.218	15
275		5	max	1553.565	1	1004.716	1	75.592	2	.001	2	.037	3	5.053	1
276			min	-1345.084	3	40.466	15	-121.641	3	0	3	-.067	1	.204	15
277		6	max	1550.294	1	1004.716	1	75.592	2	.001	2	-.002	15	4.693	1
278			min	-1347.538	3	40.466	15	-121.641	3	0	3	-.043	1	.189	15
279		7	max	1547.022	1	1004.716	1	75.592	2	.001	2	.003	10	4.332	1
280			min	-1349.991	3	40.466	15	-121.641	3	0	3	-.05	3	.174	15
281		8	max	1543.751	1	1004.716	1	75.592	2	.001	2	.027	2	3.971	1
282			min	-1352.445	3	40.466	15	-121.641	3	0	3	-.094	3	.16	15
283		9	max	1540.479	1	1004.716	1	75.592	2	.001	2	.054	2	3.61	1
284			min	-1354.898	3	40.466	15	-121.641	3	0	3	-.138	3	.145	15
285		10	max	1537.208	1	1004.716	1	75.592	2	.001	2	.081	2	3.249	1
286			min	-1357.352	3	40.466	15	-121.641	3	0	3	-.181	3	.131	15
287		11	max	1533.936	1	1004.716	1	75.592	2	.001	2	.108	2	2.888	1
288			min	-1359.806	3	40.466	15	-121.641	3	0	3	-.225	3	.116	15
289		12	max	1530.665	1	1004.716	1	75.592	2	.001	2	.135	2	2.527	1
290			min	-1362.259	3	40.466	15	-121.641	3	0	3	-.269	3	.102	15
291		13	max	1527.393	1	1004.716	1	75.592	2	.001	2	.162	2	2.166	1
292			min	-1364.713	3	40.466	15	-121.641	3	0	3	-.312	3	.087	15
293		14	max	1524.122	1	1004.716	1	75.592	2	.001	2	.19	2	1.805	1
294			min	-1367.166	3	40.466	15	-121.641	3	0	3	-.356	3	.073	15
295		15	max	1520.85	1	1004.716	1	75.592	2	.001	2	.217	2	1.444	1
296			min	-1369.62	3	40.466	15	-121.641	3	0	3	-.4	3	.058	15
297		16	max	1517.579	1	1004.716	1	75.592	2	.001	2	.244	2	1.083	1
298			min	-1372.073	3	40.466	15	-121.641	3	0	3	-.443	3	.044	15
299		17	max	1514.308	1	1004.716	1	75.592	2	.001	2	.271	2	.722	1
300			min	-1374.527	3	40.466	15	-121.641	3	0	3	-.487	3	.029	15
301		18	max	1511.036	1	1004.716	1	75.592	2	.001	2	.298	2	.361	1
302			min	-1376.981	3	40.466	15	-121.641	3	0	3	-.531	3	.015	15
303		19	max	1507.765	1	1004.716	1	75.592	2	.001	2	.325	2	0	1
304			min	-1379.434	3	40.466	15	-121.641	3	0	3	-.575	3	0	1
305	M5	1	max	5887.416	2	2896.801	3	0	1	0	1	0	1	8.476	1
306			min	-4991.574	3	-2993.378	2	0	1	0	1	0	1	.338	15
307		2	max	5884.144	2	2896.801	3	0	1	0	1	0	1	9.115	1
308			min	-4994.028	3	-2993.378	2	0	1	0	1	0	1	.344	15
309		3	max	4079.011	2	1585.666	1	0	1	0	1	0	1	9.115	1
310			min	-4054.706	3	58.383	15	0	1	0	1	0	1	.336	15
311		4	max	4075.739	2	1585.666	1	0	1	0	1	0	1	8.545	1
312			min	-4057.16	3	58.383	15	0	1	0	1	0	1	.315	15
313		5	max	4072.468	2	1585.666	1	0	1	0	1	0	1	7.976	1
314			min	-4059.614	3	58.383	15	0	1	0	1	0	1	.294	15
315		6	max	4069.196	2	1585.666	1	0	1	0	1	0	1	7.406	1
316			min	-4062.067	3	58.383	15	0	1	0	1	0	1	.273	15
317		7	max	4065.925	2	1585.666	1	0	1	0	1	0	1	6.836	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	-4064.521	3	58.383	15	0	1	0	1	0	1	.252	15
319		8	max	4062.653	2	1585.666	1	0	1	0	1	0	1	6.267	1
320			min	-4066.974	3	58.383	15	0	1	0	1	0	1	.231	15
321		9	max	4059.382	2	1585.666	1	0	1	0	1	0	1	5.697	1
322			min	-4069.428	3	58.383	15	0	1	0	1	0	1	.21	15
323		10	max	4056.111	2	1585.666	1	0	1	0	1	0	1	5.127	1
324			min	-4071.881	3	58.383	15	0	1	0	1	0	1	.189	15
325		11	max	4052.839	2	1585.666	1	0	1	0	1	0	1	4.557	1
326			min	-4074.335	3	58.383	15	0	1	0	1	0	1	.168	15
327		12	max	4049.568	2	1585.666	1	0	1	0	1	0	1	3.988	1
328			min	-4076.789	3	58.383	15	0	1	0	1	0	1	.147	15
329		13	max	4046.296	2	1585.666	1	0	1	0	1	0	1	3.418	1
330			min	-4079.242	3	58.383	15	0	1	0	1	0	1	.126	15
331		14	max	4043.025	2	1585.666	1	0	1	0	1	0	1	2.848	1
332			min	-4081.696	3	58.383	15	0	1	0	1	0	1	.105	15
333		15	max	4039.753	2	1585.666	1	0	1	0	1	0	1	2.279	1
334			min	-4084.149	3	58.383	15	0	1	0	1	0	1	.084	15
335		16	max	4036.482	2	1585.666	1	0	1	0	1	0	1	1.709	1
336			min	-4086.603	3	58.383	15	0	1	0	1	0	1	.063	15
337		17	max	4033.21	2	1585.666	1	0	1	0	1	0	1	1.139	1
338			min	-4089.057	3	58.383	15	0	1	0	1	0	1	.042	15
339		18	max	4029.939	2	1585.666	1	0	1	0	1	0	1	.57	1
340			min	-4091.51	3	58.383	15	0	1	0	1	0	1	.021	15
341		19	max	4026.667	2	1585.666	1	0	1	0	1	0	1	0	1
342			min	-4093.964	3	58.383	15	0	1	0	1	0	1	0	1
343	M8	1	max	2206.287	2	1092.259	3	134.629	3	.009	2	.166	1	5.846	1
344			min	-1607.037	3	-743.964	2	-109.807	2	-.004	3	-.21	3	.245	15
345		2	max	2203.016	2	1092.259	3	134.629	3	.009	2	.132	1	5.928	1
346			min	-1609.491	3	-743.964	2	-109.807	2	-.004	3	-.162	3	.242	15
347		3	max	1560.108	1	1004.716	1	121.641	3	0	3	.116	1	5.775	1
348			min	-1340.177	3	40.466	15	-75.592	2	-.001	2	-.125	3	.233	15
349		4	max	1556.836	1	1004.716	1	121.641	3	0	3	.092	1	5.414	1
350			min	-1342.63	3	40.466	15	-75.592	2	-.001	2	-.081	3	.218	15
351		5	max	1553.565	1	1004.716	1	121.641	3	0	3	.067	1	5.053	1
352			min	-1345.084	3	40.466	15	-75.592	2	-.001	2	-.037	3	.204	15
353		6	max	1550.294	1	1004.716	1	121.641	3	0	3	.043	1	4.693	1
354			min	-1347.538	3	40.466	15	-75.592	2	-.001	2	.002	15	.189	15
355		7	max	1547.022	1	1004.716	1	121.641	3	0	3	.05	3	4.332	1
356			min	-1349.991	3	40.466	15	-75.592	2	-.001	2	-.003	10	.174	15
357		8	max	1543.751	1	1004.716	1	121.641	3	0	3	.094	3	3.971	1
358			min	-1352.445	3	40.466	15	-75.592	2	-.001	2	-.027	2	.16	15
359		9	max	1540.479	1	1004.716	1	121.641	3	0	3	.138	3	3.61	1
360			min	-1354.898	3	40.466	15	-75.592	2	-.001	2	-.054	2	.145	15
361		10	max	1537.208	1	1004.716	1	121.641	3	0	3	.181	3	3.249	1
362			min	-1357.352	3	40.466	15	-75.592	2	-.001	2	-.081	2	.131	15
363		11	max	1533.936	1	1004.716	1	121.641	3	0	3	.225	3	2.888	1
364			min	-1359.806	3	40.466	15	-75.592	2	-.001	2	-.108	2	.116	15
365		12	max	1530.665	1	1004.716	1	121.641	3	0	3	.269	3	2.527	1
366			min	-1362.259	3	40.466	15	-75.592	2	-.001	2	-.135	2	.102	15
367		13	max	1527.393	1	1004.716	1	121.641	3	0	3	.312	3	2.166	1
368			min	-1364.713	3	40.466	15	-75.592	2	-.001	2	-.162	2	.087	15
369		14	max	1524.122	1	1004.716	1	121.641	3	0	3	.356	3	1.805	1
370			min	-1367.166	3	40.466	15	-75.592	2	-.001	2	-.19	2	.073	15
371		15	max	1520.85	1	1004.716	1	121.641	3	0	3	.4	3	1.444	1
372			min	-1369.62	3	40.466	15	-75.592	2	-.001	2	-.217	2	.058	15
373		16	max	1517.579	1	1004.716	1	121.641	3	0	3	.443	3	1.083	1
374			min	-1372.073	3	40.466	15	-75.592	2	-.001	2	-.244	2	.044	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	1514.308	1	1004.716	1	121.641	3	0	3	.487	3	.722	1
376			min	-1374.527	3	40.466	15	-75.592	2	-.001	2	-.271	2	.029	15
377		18	max	1511.036	1	1004.716	1	121.641	3	0	3	.531	3	.361	1
378			min	-1376.981	3	40.466	15	-75.592	2	-.001	2	-.298	2	.015	15
379		19	max	1507.765	1	1004.716	1	121.641	3	0	3	.575	3	0	1
380			min	-1379.434	3	40.466	15	-75.592	2	-.001	2	-.325	2	0	1
381	M3	1	max	1677.369	2	5.617	4	33.829	2	.01	3	0	3	0	1
382			min	-701.989	3	1.32	15	-13.367	3	-.021	2	-.002	2	0	1
383		2	max	1677.16	2	4.993	4	33.829	2	.01	3	.01	2	0	15
384			min	-702.145	3	1.174	15	-13.367	3	-.021	2	-.004	3	-.002	4
385		3	max	1676.952	2	4.369	4	33.829	2	.01	3	.022	2	0	15
386			min	-702.302	3	1.027	15	-13.367	3	-.021	2	-.009	3	-.004	4
387		4	max	1676.743	2	3.745	4	33.829	2	.01	3	.034	2	-.001	15
388			min	-702.458	3	.88	15	-13.367	3	-.021	2	-.014	3	-.005	4
389		5	max	1676.535	2	3.121	4	33.829	2	.01	3	.046	2	-.001	15
390			min	-702.615	3	.734	15	-13.367	3	-.021	2	-.018	3	-.006	4
391		6	max	1676.326	2	2.497	4	33.829	2	.01	3	.058	2	-.002	15
392			min	-702.771	3	.587	15	-13.367	3	-.021	2	-.023	3	-.007	4
393		7	max	1676.117	2	1.872	4	33.829	2	.01	3	.07	2	-.002	15
394			min	-702.928	3	.44	15	-13.367	3	-.021	2	-.028	3	-.008	4
395		8	max	1675.909	2	1.248	4	33.829	2	.01	3	.082	2	-.002	15
396			min	-703.084	3	.293	15	-13.367	3	-.021	2	-.033	3	-.009	4
397		9	max	1675.7	2	.624	4	33.829	2	.01	3	.094	2	-.002	15
398			min	-703.241	3	.147	15	-13.367	3	-.021	2	-.037	3	-.009	4
399		10	max	1675.492	2	0	1	33.829	2	.01	3	.106	2	-.002	15
400			min	-703.397	3	0	1	-13.367	3	-.021	2	-.042	3	-.009	4
401		11	max	1675.283	2	-.147	15	33.829	2	.01	3	.118	2	-.002	15
402			min	-703.553	3	-.624	4	-13.367	3	-.021	2	-.047	3	-.009	4
403		12	max	1675.074	2	-.293	15	33.829	2	.01	3	.13	2	-.002	15
404			min	-703.71	3	-1.248	4	-13.367	3	-.021	2	-.052	3	-.009	4
405		13	max	1674.866	2	-.44	15	33.829	2	.01	3	.142	2	-.002	15
406			min	-703.866	3	-1.872	4	-13.367	3	-.021	2	-.057	3	-.008	4
407		14	max	1674.657	2	-.587	15	33.829	2	.01	3	.154	2	-.002	15
408			min	-704.023	3	-2.497	4	-13.367	3	-.021	2	-.061	3	-.007	4
409		15	max	1674.449	2	-.734	15	33.829	2	.01	3	.167	2	-.001	15
410			min	-704.179	3	-3.121	4	-13.367	3	-.021	2	-.066	3	-.006	4
411		16	max	1674.24	2	-.88	15	33.829	2	.01	3	.179	2	-.001	15
412			min	-704.336	3	-3.745	4	-13.367	3	-.021	2	-.071	3	-.005	4
413		17	max	1674.031	2	-1.027	15	33.829	2	.01	3	.191	2	0	15
414			min	-704.492	3	-4.369	4	-13.367	3	-.021	2	-.076	3	-.004	4
415		18	max	1673.823	2	-1.174	15	33.829	2	.01	3	.203	2	0	15
416			min	-704.649	3	-4.993	4	-13.367	3	-.021	2	-.08	3	-.002	4
417		19	max	1673.614	2	-1.32	15	33.829	2	.01	3	.215	2	0	1
418			min	-704.805	3	-5.617	4	-13.367	3	-.021	2	-.085	3	0	1
419	M6	1	max	4664.206	2	5.617	4	0	1	0	1	0	1	0	1
420			min	-2421.106	3	1.32	15	0	1	0	1	0	1	0	1
421		2	max	4663.997	2	4.993	4	0	1	0	1	0	1	0	15
422			min	-2421.262	3	1.174	15	0	1	0	1	0	1	-.002	4
423		3	max	4663.789	2	4.369	4	0	1	0	1	0	1	0	15
424			min	-2421.419	3	1.027	15	0	1	0	1	0	1	-.004	4
425		4	max	4663.58	2	3.745	4	0	1	0	1	0	1	-.001	15
426			min	-2421.575	3	.88	15	0	1	0	1	0	1	-.005	4
427		5	max	4663.371	2	3.121	4	0	1	0	1	0	1	-.001	15
428			min	-2421.732	3	.734	15	0	1	0	1	0	1	-.006	4
429		6	max	4663.163	2	2.497	4	0	1	0	1	0	1	-.002	15
430			min	-2421.888	3	.587	15	0	1	0	1	0	1	-.007	4
431		7	max	4662.954	2	1.872	4	0	1	0	1	0	1	-.002	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	-2422.045	3	.44	15	0	1	0	1	0	1	-.008	4
433		8	max	4662.746	2	1.248	4	0	1	0	1	0	1	-.002	15
434			min	-2422.201	3	.293	15	0	1	0	1	0	1	-.009	4
435		9	max	4662.537	2	.624	4	0	1	0	1	0	1	-.002	15
436			min	-2422.358	3	.147	15	0	1	0	1	0	1	-.009	4
437		10	max	4662.328	2	0	1	0	1	0	1	0	1	-.002	15
438			min	-2422.514	3	0	1	0	1	0	1	0	1	-.009	4
439		11	max	4662.12	2	-.147	15	0	1	0	1	0	1	-.002	15
440			min	-2422.67	3	-.624	4	0	1	0	1	0	1	-.009	4
441		12	max	4661.911	2	-.293	15	0	1	0	1	0	1	-.002	15
442			min	-2422.827	3	-1.248	4	0	1	0	1	0	1	-.009	4
443		13	max	4661.703	2	-.44	15	0	1	0	1	0	1	-.002	15
444			min	-2422.983	3	-1.872	4	0	1	0	1	0	1	-.008	4
445		14	max	4661.494	2	-.587	15	0	1	0	1	0	1	-.002	15
446			min	-2423.14	3	-2.497	4	0	1	0	1	0	1	-.007	4
447		15	max	4661.285	2	-.734	15	0	1	0	1	0	1	-.001	15
448			min	-2423.296	3	-3.121	4	0	1	0	1	0	1	-.006	4
449		16	max	4661.077	2	-.88	15	0	1	0	1	0	1	-.001	15
450			min	-2423.453	3	-3.745	4	0	1	0	1	0	1	-.005	4
451		17	max	4660.868	2	-1.027	15	0	1	0	1	0	1	0	15
452			min	-2423.609	3	-4.369	4	0	1	0	1	0	1	-.004	4
453		18	max	4660.66	2	-1.174	15	0	1	0	1	0	1	0	15
454			min	-2423.766	3	-4.993	4	0	1	0	1	0	1	-.002	4
455		19	max	4660.451	2	-1.32	15	0	1	0	1	0	1	0	1
456			min	-2423.922	3	-5.617	4	0	1	0	1	0	1	0	1
457	M9	1	max	1677.369	2	5.617	4	13.367	3	.021	2	.002	2	0	1
458			min	-701.989	3	1.32	15	-33.829	2	-.01	3	0	3	0	1
459		2	max	1677.16	2	4.993	4	13.367	3	.021	2	.004	3	0	15
460			min	-702.145	3	1.174	15	-33.829	2	-.01	3	-.01	2	-.002	4
461		3	max	1676.952	2	4.369	4	13.367	3	.021	2	.009	3	0	15
462			min	-702.302	3	1.027	15	-33.829	2	-.01	3	-.022	2	-.004	4
463		4	max	1676.743	2	3.745	4	13.367	3	.021	2	.014	3	-.001	15
464			min	-702.458	3	.88	15	-33.829	2	-.01	3	-.034	2	-.005	4
465		5	max	1676.535	2	3.121	4	13.367	3	.021	2	.018	3	-.001	15
466			min	-702.615	3	.734	15	-33.829	2	-.01	3	-.046	2	-.006	4
467		6	max	1676.326	2	2.497	4	13.367	3	.021	2	.023	3	-.002	15
468			min	-702.771	3	.587	15	-33.829	2	-.01	3	-.058	2	-.007	4
469		7	max	1676.117	2	1.872	4	13.367	3	.021	2	.028	3	-.002	15
470			min	-702.928	3	.44	15	-33.829	2	-.01	3	-.07	2	-.008	4
471		8	max	1675.909	2	1.248	4	13.367	3	.021	2	.033	3	-.002	15
472			min	-703.084	3	.293	15	-33.829	2	-.01	3	-.082	2	-.009	4
473		9	max	1675.7	2	.624	4	13.367	3	.021	2	.037	3	-.002	15
474			min	-703.241	3	.147	15	-33.829	2	-.01	3	-.094	2	-.009	4
475		10	max	1675.492	2	0	1	13.367	3	.021	2	.042	3	-.002	15
476			min	-703.397	3	0	1	-33.829	2	-.01	3	-.106	2	-.009	4
477		11	max	1675.283	2	-.147	15	13.367	3	.021	2	.047	3	-.002	15
478			min	-703.553	3	-.624	4	-33.829	2	-.01	3	-.118	2	-.009	4
479		12	max	1675.074	2	-.293	15	13.367	3	.021	2	.052	3	-.002	15
480			min	-703.71	3	-1.248	4	-33.829	2	-.01	3	-.13	2	-.009	4
481		13	max	1674.866	2	-.44	15	13.367	3	.021	2	.057	3	-.002	15
482			min	-703.866	3	-1.872	4	-33.829	2	-.01	3	-.142	2	-.008	4
483		14	max	1674.657	2	-.587	15	13.367	3	.021	2	.061	3	-.002	15
484			min	-704.023	3	-2.497	4	-33.829	2	-.01	3	-.154	2	-.007	4
485		15	max	1674.449	2	-.734	15	13.367	3	.021	2	.066	3	-.001	15
486			min	-704.179	3	-3.121	4	-33.829	2	-.01	3	-.167	2	-.006	4
487		16	max	1674.24	2	-.88	15	13.367	3	.021	2	.071	3	-.001	15
488			min	-704.336	3	-3.745	4	-33.829	2	-.01	3	-.179	2	-.005	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
489		17	max	1674.031	2	-1.027	15	13.367	3	.021	2	.076	3	0	15
490			min	-704.492	3	-4.369	4	-33.829	2	-.01	3	-.191	2	-.004	4
491		18	max	1673.823	2	-1.174	15	13.367	3	.021	2	.08	3	0	15
492			min	-704.649	3	-4.993	4	-33.829	2	-.01	3	-.203	2	-.002	4
493		19	max	1673.614	2	-1.32	15	13.367	3	.021	2	.085	3	0	1
494			min	-704.805	3	-5.617	4	-33.829	2	-.01	3	-.215	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	-.017	15	-.026	15	.01	1	6.508e-3	3	NC	3	NC	1
2			min	-.431	1	-.73	1	0	15	-1.954e-2	2	137.908	1	NC	1
3		2	max	-.017	15	-.022	15	0	15	6.269e-3	3	NC	12	NC	2
4			min	-.431	1	-.614	1	-.007	1	-1.84e-2	2	155.497	1	8897.478	1
5		3	max	-.017	15	-.019	15	0	15	5.801e-3	3	8528.846	12	NC	3
6			min	-.431	1	-.501	1	-.016	1	-1.615e-2	2	177.573	1	6030.531	1
7		4	max	-.017	15	-.015	15	0	15	5.332e-3	3	6604.074	12	NC	3
8			min	-.431	1	-.396	1	-.018	1	-1.39e-2	2	204.347	1	5833.843	1
9		5	max	-.017	15	-.012	15	0	3	5.127e-3	3	6645.309	12	NC	3
10			min	-.43	1	-.306	1	-.015	1	-1.232e-2	2	234.803	1	6725.64	1
11		6	max	-.017	15	-.01	15	.001	3	5.6e-3	3	9227.116	12	NC	2
12			min	-.43	1	-.233	1	-.01	1	-1.242e-2	2	267.046	1	9875.654	1
13		7	max	-.017	15	-.007	15	.002	3	6.073e-3	3	NC	3	NC	1
14			min	-.43	1	-.172	1	-.004	2	-1.252e-2	2	301.76	1	NC	1
15		8	max	-.017	15	-.005	15	0	3	6.546e-3	3	NC	3	NC	1
16			min	-.429	1	-.118	1	0	10	-1.262e-2	2	341.234	1	NC	1
17		9	max	-.017	15	-.003	15	0	10	7.35e-3	3	8110.239	15	NC	1
18			min	-.429	1	-.066	3	0	3	-1.191e-2	2	390.984	1	NC	1
19		10	max	-.017	15	0	10	.001	2	8.465e-3	3	9266.41	15	NC	1
20			min	-.428	1	-.046	3	-.001	3	-1.042e-2	2	459.079	1	NC	1
21		11	max	-.017	15	.043	1	0	1	9.58e-3	3	NC	15	NC	1
22			min	-.428	1	-.025	3	0	3	-8.93e-3	2	557.443	1	NC	1
23		12	max	-.017	15	.099	1	.003	3	9.044e-3	3	NC	15	NC	1
24			min	-.427	1	-.005	3	-.003	1	-7.222e-3	2	712.194	1	NC	1
25		13	max	-.017	15	.153	1	.009	3	6.754e-3	3	NC	5	NC	1
26			min	-.427	1	.006	15	-.006	2	-5.279e-3	2	977.062	1	NC	1
27		14	max	-.017	15	.201	1	.015	3	4.464e-3	3	NC	5	NC	1
28			min	-.426	1	.008	15	-.005	2	-3.336e-3	2	957.699	3	8636.757	3
29		15	max	-.017	15	.24	1	.015	3	2.175e-3	3	NC	2	NC	1
30			min	-.426	1	.01	15	-.001	10	-1.393e-3	2	708.335	3	8441.983	3
31		16	max	-.017	15	.266	1	.011	1	5.557e-3	3	NC	5	NC	2
32			min	-.426	1	.011	15	0	15	-2.665e-3	2	512.469	3	8604.913	1
33		17	max	-.017	15	.281	1	.012	1	9.604e-3	3	NC	4	NC	2
34			min	-.426	1	.012	15	0	15	-4.316e-3	2	380.92	3	7459.412	1
35		18	max	-.017	15	.384	3	.006	1	1.365e-2	3	NC	1	NC	1
36			min	-.426	1	.013	15	0	15	-5.966e-3	2	295.83	3	NC	1
37		19	max	-.017	15	.495	3	0	15	1.572e-2	3	NC	1	NC	1
38			min	-.426	1	.014	15	-.009	1	-6.807e-3	2	240.24	3	NC	1
39	M4	1	max	-.025	15	-.018	12	0	1	0	1	NC	3	NC	1
40			min	-.678	1	-1.289	2	0	1	0	1	88.975	1	NC	1
41		2	max	-.025	15	-.034	15	0	1	0	1	4075.608	12	NC	1
42			min	-.678	1	-1.057	1	0	1	0	1	103.249	1	NC	1
43		3	max	-.025	15	-.028	15	0	1	0	1	3251.502	15	NC	1
44			min	-.678	1	-.843	1	0	1	0	1	122.301	1	NC	1
45		4	max	-.025	15	-.023	15	0	1	0	1	3707.592	15	NC	1
46			min	-.678	1	-.65	1	0	1	0	1	146.671	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	-.025	15	-.018	15	0	1	0	1	4212.718	15	NC	1
48			min	-.677	1	-.495	1	0	1	0	1	174.902	1	NC	1
49		6	max	-.025	15	-.014	15	0	1	0	1	4729.884	15	NC	1
50			min	-.676	1	-.381	1	0	1	0	1	203.363	1	NC	1
51		7	max	-.025	15	-.011	15	0	1	0	1	5277.399	15	NC	1
52			min	-.675	1	-.295	1	0	1	0	1	231.961	1	NC	1
53		8	max	-.025	15	-.008	15	0	1	0	1	5906.801	15	NC	1
54			min	-.674	1	-.222	1	0	1	0	1	263.488	1	NC	1
55		9	max	-.025	15	-.005	15	0	1	0	1	8606.326	12	NC	1
56			min	-.673	1	-.147	1	0	1	0	1	306.478	1	NC	1
57		10	max	-.025	15	-.002	15	0	1	0	1	NC	3	NC	1
58			min	-.672	1	-.062	1	0	1	0	1	375.044	1	NC	1
59		11	max	-.025	15	.03	1	0	1	0	1	9775.226	15	NC	1
60			min	-.671	1	0	3	0	1	0	1	496.152	1	NC	1
61		12	max	-.025	15	.13	1	0	1	0	1	NC	15	NC	1
62			min	-.67	1	.005	15	0	1	0	1	761.157	1	NC	1
63		13	max	-.025	15	.229	1	0	1	0	1	NC	5	NC	1
64			min	-.669	1	.008	15	0	1	0	1	1640.719	1	NC	1
65		14	max	-.025	15	.316	1	0	1	0	1	NC	1	NC	1
66			min	-.668	1	.011	15	0	1	0	1	1461.838	3	NC	1
67		15	max	-.025	15	.375	1	0	1	0	1	NC	4	NC	1
68			min	-.666	1	.014	15	0	1	0	1	785.254	3	NC	1
69		16	max	-.025	15	.394	1	0	1	0	1	NC	4	NC	1
70			min	-.666	1	.015	15	0	1	0	1	434.946	3	NC	1
71		17	max	-.025	15	.498	3	0	1	0	1	NC	4	NC	1
72			min	-.666	1	.016	15	0	1	0	1	272.911	3	NC	1
73		18	max	-.025	15	.719	3	0	1	0	1	NC	4	NC	1
74			min	-.667	1	.016	15	0	1	0	1	191.214	3	NC	1
75		19	max	-.025	15	.95	3	0	1	0	1	NC	1	NC	1
76			min	-.667	1	.016	15	0	1	0	1	145.86	3	NC	1
77	M7	1	max	-.017	15	-.026	15	0	15	1.954e-2	2	NC	3	NC	1
78			min	-.431	1	-.73	1	-.01	1	-6.508e-3	3	137.908	1	NC	1
79		2	max	-.017	15	-.022	15	.007	1	1.84e-2	2	NC	12	NC	2
80			min	-.431	1	-.614	1	0	15	-6.269e-3	3	155.497	1	8897.478	1
81		3	max	-.017	15	-.019	15	.016	1	1.615e-2	2	8528.846	12	NC	3
82			min	-.431	1	-.501	1	0	15	-5.801e-3	3	177.573	1	6030.531	1
83		4	max	-.017	15	-.015	15	.018	1	1.39e-2	2	6604.074	12	NC	3
84			min	-.431	1	-.396	1	0	15	-5.332e-3	3	204.347	1	5833.843	1
85		5	max	-.017	15	-.012	15	.015	1	1.232e-2	2	6645.309	12	NC	3
86			min	-.43	1	-.306	1	0	3	-5.127e-3	3	234.803	1	6725.64	1
87		6	max	-.017	15	-.01	15	.01	1	1.242e-2	2	9227.116	12	NC	2
88			min	-.43	1	-.233	1	-.001	3	-5.6e-3	3	267.046	1	9875.654	1
89		7	max	-.017	15	-.007	15	.004	2	1.252e-2	2	NC	3	NC	1
90			min	-.43	1	-.172	1	-.002	3	-6.073e-3	3	301.76	1	NC	1
91		8	max	-.017	15	-.005	15	0	10	1.262e-2	2	NC	3	NC	1
92			min	-.429	1	-.118	1	0	3	-6.546e-3	3	341.234	1	NC	1
93		9	max	-.017	15	-.003	15	0	3	1.191e-2	2	8110.239	15	NC	1
94			min	-.429	1	-.066	3	0	10	-7.35e-3	3	390.984	1	NC	1
95		10	max	-.017	15	0	10	.001	3	1.042e-2	2	9266.41	15	NC	1
96			min	-.428	1	-.046	3	-.001	2	-8.465e-3	3	459.079	1	NC	1
97		11	max	-.017	15	.043	1	0	3	8.93e-3	2	NC	15	NC	1
98			min	-.428	1	-.025	3	0	1	-9.58e-3	3	557.443	1	NC	1
99		12	max	-.017	15	.099	1	.003	1	7.222e-3	2	NC	15	NC	1
100			min	-.427	1	-.005	3	-.003	3	-9.044e-3	3	712.194	1	NC	1
101		13	max	-.017	15	.153	1	.006	2	5.279e-3	2	NC	5	NC	1
102			min	-.427	1	.006	15	-.009	3	-6.754e-3	3	977.062	1	NC	1
103		14	max	-.017	15	.201	1	.005	2	3.336e-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
104			min	-.426	1	.008	15	-.015	3	-4.464e-3	3	957.699	3	8636.757	3
105		15	max	-.017	15	.24	1	.001	10	1.393e-3	2	NC	2	NC	1
106			min	-.426	1	.01	15	-.015	3	-2.175e-3	3	708.335	3	8441.983	3
107		16	max	-.017	15	.266	1	0	15	2.665e-3	2	NC	5	NC	2
108			min	-.426	1	.011	15	-.011	1	-5.557e-3	3	512.469	3	8604.913	1
109		17	max	-.017	15	.281	1	0	15	4.316e-3	2	NC	4	NC	2
110			min	-.426	1	.012	15	-.012	1	-9.604e-3	3	380.92	3	7459.412	1
111		18	max	-.017	15	.384	3	0	15	5.966e-3	2	NC	1	NC	1
112			min	-.426	1	.013	15	-.006	1	-1.365e-2	3	295.83	3	NC	1
113		19	max	-.017	15	.495	3	.009	1	6.807e-3	2	NC	1	NC	1
114			min	-.426	1	.014	15	0	15	-1.572e-2	3	240.24	3	NC	1
115	M10	1	max	0	1	.441	3	.426	1	1.406e-2	3	NC	1	NC	1
116			min	0	15	.014	15	.017	15	-1.112e-3	2	NC	1	NC	1
117		2	max	0	1	.601	3	.46	1	1.574e-2	3	NC	4	NC	3
118			min	0	15	.012	15	.019	15	-1.802e-3	2	1121.809	3	5318.871	1
119		3	max	0	1	.751	3	.509	1	1.742e-2	3	NC	4	NC	5
120			min	0	15	.011	15	.02	15	-2.493e-3	2	580.745	3	2156.465	1
121		4	max	0	1	.869	3	.562	1	1.91e-2	3	NC	5	NC	5
122			min	0	15	-.007	10	.022	15	-3.184e-3	2	420.713	3	1321.092	1
123		5	max	0	1	.943	3	.609	1	2.078e-2	3	NC	5	NC	5
124			min	0	15	-.013	10	.024	15	-3.874e-3	2	358.5	3	983.835	1
125		6	max	0	1	.97	3	.644	1	2.246e-2	3	NC	4	NC	5
126			min	0	15	-.004	10	.025	15	-4.565e-3	2	340.138	3	826.563	1
127		7	max	0	1	.955	3	.664	1	2.414e-2	3	NC	4	NC	5
128			min	0	15	.012	15	.025	15	-5.256e-3	2	350.03	3	755.438	1
129		8	max	0	1	.912	3	.671	1	2.582e-2	3	NC	4	NC	5
130			min	0	15	.014	15	.025	15	-5.946e-3	2	382.265	3	733.32	1
131		9	max	0	1	.862	3	.67	1	2.75e-2	3	NC	2	NC	5
132			min	0	15	.015	15	.025	15	-6.637e-3	2	427.221	3	738.528	1
133		10	max	0	1	.837	3	.667	1	2.918e-2	3	NC	2	NC	5
134			min	0	1	.016	15	.025	15	-7.328e-3	2	454.105	3	747.242	1
135		11	max	0	15	.862	3	.67	1	2.75e-2	3	NC	2	NC	5
136			min	0	1	.015	15	.025	15	-6.637e-3	2	427.221	3	738.528	1
137		12	max	0	15	.912	3	.671	1	2.582e-2	3	NC	4	NC	5
138			min	0	1	.014	15	.025	15	-5.946e-3	2	382.265	3	733.32	1
139		13	max	0	15	.955	3	.664	1	2.414e-2	3	NC	4	NC	5
140			min	0	1	.012	15	.025	15	-5.256e-3	2	350.03	3	755.438	1
141		14	max	0	15	.97	3	.644	1	2.246e-2	3	NC	4	NC	5
142			min	0	1	-.004	10	.025	15	-4.565e-3	2	340.138	3	826.563	1
143		15	max	0	15	.943	3	.609	1	2.078e-2	3	NC	5	NC	5
144			min	0	1	-.013	10	.024	15	-3.874e-3	2	358.5	3	983.835	1
145		16	max	0	15	.869	3	.562	1	1.91e-2	3	NC	5	NC	5
146			min	0	1	-.007	10	.022	15	-3.184e-3	2	420.713	3	1321.092	1
147		17	max	0	15	.751	3	.509	1	1.742e-2	3	NC	4	NC	5
148			min	0	1	.011	15	.02	15	-2.493e-3	2	580.745	3	2156.465	1
149		18	max	0	15	.601	3	.46	1	1.574e-2	3	NC	4	NC	3
150			min	0	1	.012	15	.019	15	-1.802e-3	2	1121.809	3	5318.871	1
151		19	max	0	15	.441	3	.426	1	1.406e-2	3	NC	1	NC	1
152			min	0	1	.014	15	.017	15	-1.112e-3	2	NC	1	NC	1
153	M11	1	max	.001	1	.072	1	.428	1	7.003e-3	1	NC	1	NC	1
154			min	-.001	3	-.015	3	.017	15	2.872e-4	15	NC	1	NC	1
155		2	max	0	1	.089	3	.451	1	7.622e-3	1	NC	4	NC	2
156			min	-.001	3	-.016	2	.018	15	3.054e-4	15	1735.814	3	7635.437	1
157		3	max	0	1	.181	3	.495	1	8.242e-3	1	NC	5	NC	3
158			min	0	3	-.081	2	.02	15	3.237e-4	15	920.048	3	2650.855	1
159		4	max	0	1	.243	3	.547	1	8.862e-3	1	NC	5	NC	5
160			min	0	3	-.121	2	.022	15	3.419e-4	15	699.86	3	1508.192	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	0	1	.264	3	.595	1	9.481e-3	1	NC	5	NC	5
162			min	0	3	-.131	2	.023	15	3.602e-4	15	646.817	3	1073.468	1
163		6	max	0	1	.243	3	.634	1	1.01e-2	1	NC	5	NC	5
164			min	0	3	-.112	2	.025	15	3.784e-4	15	699.249	3	873.461	1
165		7	max	0	1	.187	3	.659	1	1.072e-2	1	NC	4	NC	5
166			min	0	3	-.068	2	.025	15	3.967e-4	15	892.564	3	778.821	1
167		8	max	0	1	.112	3	.67	1	1.134e-2	1	NC	4	NC	5
168			min	0	3	-.012	2	.025	15	4.149e-4	15	1421.014	3	741.363	1
169		9	max	0	1	.059	1	.672	1	1.196e-2	1	NC	1	NC	5
170			min	0	3	.002	15	.025	15	4.331e-4	15	3177.731	3	736.183	1
171		10	max	0	1	.08	1	.671	1	1.258e-2	1	NC	1	NC	5
172			min	0	1	.003	15	.025	15	4.514e-4	15	7385.513	3	740.599	1
173		11	max	0	3	.059	1	.672	1	1.196e-2	1	NC	1	NC	5
174			min	0	1	.002	15	.025	15	4.331e-4	15	3177.731	3	736.183	1
175		12	max	0	3	.112	3	.67	1	1.134e-2	1	NC	4	NC	5
176			min	0	1	-.012	2	.025	15	4.149e-4	15	1421.014	3	741.363	1
177		13	max	0	3	.187	3	.659	1	1.072e-2	1	NC	4	NC	5
178			min	0	1	-.068	2	.025	15	3.967e-4	15	892.564	3	778.821	1
179		14	max	0	3	.243	3	.634	1	1.01e-2	1	NC	5	NC	5
180			min	0	1	-.112	2	.025	15	3.784e-4	15	699.249	3	873.461	1
181		15	max	0	3	.264	3	.595	1	9.481e-3	1	NC	5	NC	5
182			min	0	1	-.131	2	.023	15	3.602e-4	15	646.817	3	1073.468	1
183		16	max	0	3	.243	3	.547	1	8.862e-3	1	NC	5	NC	5
184			min	0	1	-.121	2	.022	15	3.419e-4	15	699.86	3	1508.192	1
185		17	max	0	3	.181	3	.495	1	8.242e-3	1	NC	5	NC	3
186			min	0	1	-.081	2	.02	15	3.237e-4	15	920.048	3	2650.855	1
187		18	max	.001	3	.089	3	.451	1	7.622e-3	1	NC	4	NC	2
188			min	0	1	-.016	2	.018	15	3.054e-4	15	1735.814	3	7635.437	1
189		19	max	.001	3	.072	1	.428	1	7.003e-3	1	NC	1	NC	1
190			min	-.001	1	-.015	3	.017	15	2.872e-4	15	NC	1	NC	1
191	M12	1	max	0	3	-.004	15	.429	1	6.732e-3	1	NC	1	NC	1
192			min	0	1	-.092	1	.017	15	2.72e-4	15	NC	1	NC	1
193		2	max	0	3	-.007	15	.449	1	7.053e-3	1	NC	4	NC	2
194			min	0	1	-.194	1	.018	15	2.834e-4	15	1437.124	2	8935.694	1
195		3	max	0	3	.038	3	.492	1	7.374e-3	1	NC	5	NC	3
196			min	0	1	-.299	2	.02	15	2.948e-4	15	773.531	2	2866.919	1
197		4	max	0	3	.068	3	.543	1	7.695e-3	1	NC	5	NC	5
198			min	0	1	-.372	2	.022	15	3.062e-4	15	589.673	2	1579.925	1
199		5	max	0	3	.075	3	.592	1	8.016e-3	1	NC	5	NC	5
200			min	0	1	-.401	2	.023	15	3.176e-4	15	538.745	2	1104.368	1
201		6	max	0	3	.059	3	.632	1	8.336e-3	1	NC	5	NC	5
202			min	0	1	-.385	2	.025	15	3.29e-4	15	564.704	2	887.649	1
203		7	max	0	3	.025	3	.659	1	8.657e-3	1	NC	5	NC	5
204			min	0	1	-.333	2	.025	15	3.404e-4	15	674.283	2	784.19	1
205		8	max	0	3	-.009	15	.672	1	8.978e-3	1	NC	5	NC	5
206			min	0	1	-.264	1	.025	15	3.518e-4	15	924.18	2	741.104	1
207		9	max	0	3	-.007	15	.675	1	9.299e-3	1	NC	5	NC	5
208			min	0	1	-.211	1	.025	15	3.633e-4	15	1422.342	2	732.139	1
209		10	max	0	1	-.007	15	.674	1	9.62e-3	1	NC	3	NC	5
210			min	0	1	-.187	1	.025	15	3.747e-4	15	1895.909	2	734.982	1
211		11	max	0	1	-.007	15	.675	1	9.299e-3	1	NC	5	NC	5
212			min	0	3	-.211	1	.025	15	3.633e-4	15	1422.342	2	732.139	1
213		12	max	0	1	-.009	15	.672	1	8.978e-3	1	NC	5	NC	5
214			min	0	3	-.264	1	.025	15	3.518e-4	15	924.18	2	741.104	1
215		13	max	0	1	.025	3	.659	1	8.657e-3	1	NC	5	NC	5
216			min	0	3	-.333	2	.025	15	3.404e-4	15	674.283	2	784.19	1
217		14	max	0	1	.059	3	.632	1	8.336e-3	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
218			min	0	3	-.385	2	.025	15	3.29e-4	15	564.704	2	887.649	1
219		15	max	0	1	.075	3	.592	1	8.016e-3	1	NC	5	NC	5
220			min	0	3	-.401	2	.023	15	3.176e-4	15	538.745	2	1104.368	1
221		16	max	0	1	.068	3	.543	1	7.695e-3	1	NC	5	NC	5
222			min	0	3	-.372	2	.022	15	3.062e-4	15	589.673	2	1579.925	1
223		17	max	0	1	.038	3	.492	1	7.374e-3	1	NC	5	NC	3
224			min	0	3	-.299	2	.02	15	2.948e-4	15	773.531	2	2866.919	1
225		18	max	0	1	-.007	15	.449	1	7.053e-3	1	NC	4	NC	2
226			min	0	3	-.194	1	.018	15	2.834e-4	15	1437.124	2	8935.694	1
227		19	max	0	1	-.004	15	.429	1	6.732e-3	1	NC	1	NC	1
228			min	0	3	-.092	1	.017	15	2.72e-4	15	NC	1	NC	1
229	M13	1	max	0	15	-.024	15	.431	1	1.537e-2	2	NC	1	NC	1
230			min	0	1	-.673	1	.017	15	-1.853e-3	3	NC	1	NC	1
231		2	max	0	15	-.027	12	.467	1	1.715e-2	2	NC	5	NC	3
232			min	0	1	-.836	1	.019	15	-2.441e-3	3	922.618	2	4989.562	1
233		3	max	0	15	.016	3	.518	1	1.893e-2	2	NC	5	NC	5
234			min	0	1	-.994	2	.021	15	-3.029e-3	3	482.697	2	2060.431	1
235		4	max	0	15	.052	3	.572	1	2.071e-2	2	NC	5	NC	5
236			min	0	1	-1.135	2	.023	15	-3.618e-3	3	350.193	2	1273.838	1
237		5	max	0	15	.067	3	.62	1	2.25e-2	2	NC	15	NC	5
238			min	0	1	-1.228	2	.024	15	-4.206e-3	3	296.414	2	953.558	1
239		6	max	0	15	.06	3	.655	1	2.428e-2	2	NC	15	NC	5
240			min	0	1	-1.271	2	.025	15	-4.794e-3	3	276.995	2	803.543	1
241		7	max	0	15	.034	3	.676	1	2.606e-2	2	NC	15	NC	5
242			min	0	1	-1.268	2	.026	15	-5.382e-3	3	278.138	2	735.598	1
243		8	max	0	15	0	3	.683	1	2.784e-2	2	NC	15	NC	5
244			min	0	1	-1.234	2	.026	15	-5.971e-3	3	293.645	2	714.526	1
245		9	max	0	15	-.026	12	.681	1	2.963e-2	2	NC	15	NC	5
246			min	0	1	-1.19	2	.025	15	-6.559e-3	3	316.165	2	719.596	1
247		10	max	0	1	-.035	12	.678	1	3.141e-2	2	NC	15	NC	5
248			min	0	1	-1.169	1	.025	15	-7.147e-3	3	329.378	2	727.969	1
249		11	max	0	1	-.026	12	.681	1	2.963e-2	2	NC	15	NC	5
250			min	0	15	-1.19	2	.025	15	-6.559e-3	3	316.165	2	719.596	1
251		12	max	0	1	0	3	.683	1	2.784e-2	2	NC	15	NC	5
252			min	0	15	-1.234	2	.026	15	-5.971e-3	3	293.645	2	714.526	1
253		13	max	0	1	.034	3	.676	1	2.606e-2	2	NC	15	NC	5
254			min	0	15	-1.268	2	.026	15	-5.382e-3	3	278.138	2	735.598	1
255		14	max	0	1	.06	3	.655	1	2.428e-2	2	NC	15	NC	5
256			min	0	15	-1.271	2	.025	15	-4.794e-3	3	276.995	2	803.543	1
257		15	max	0	1	.067	3	.62	1	2.25e-2	2	NC	15	NC	5
258			min	0	15	-1.228	2	.024	15	-4.206e-3	3	296.414	2	953.558	1
259		16	max	0	1	.052	3	.572	1	2.071e-2	2	NC	5	NC	5
260			min	0	15	-1.135	2	.023	15	-3.618e-3	3	350.193	2	1273.838	1
261		17	max	0	1	.016	3	.518	1	1.893e-2	2	NC	5	NC	5
262			min	0	15	-.994	2	.021	15	-3.029e-3	3	482.697	2	2060.431	1
263		18	max	0	1	-.027	12	.467	1	1.715e-2	2	NC	5	NC	3
264			min	0	15	-.836	1	.019	15	-2.441e-3	3	922.618	2	4989.562	1
265		19	max	0	1	-.024	15	.431	1	1.537e-2	2	NC	1	NC	1
266			min	0	15	-.673	1	.017	15	-1.853e-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	3.375e-3	2	NC	1	NC	1
270			min	0	2	-.002	1	0	1	-1.374e-3	3	NC	1	NC	1
271		3	max	0	3	0	15	0	3	4.764e-3	2	NC	2	NC	1
272			min	0	2	-.008	1	0	1	-1.908e-3	3	9316.288	1	NC	1
273		4	max	0	3	0	15	.001	3	4.383e-3	2	NC	4	NC	1
274			min	0	2	-.019	1	-.001	1	-1.694e-3	3	4130.07	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	-.001	15	.002	3	4.003e-3	2	NC	5	NC	1
276			min	0	2	-.033	1	-.002	1	-1.479e-3	3	2348.329	1	NC	1
277		6	max	0	3	-.002	15	.003	3	3.622e-3	2	NC	5	NC	1
278			min	0	2	-.051	1	-.003	1	-1.265e-3	3	1525.9	1	NC	1
279		7	max	0	3	-.003	15	.004	3	3.242e-3	2	NC	5	NC	1
280			min	0	2	-.072	1	-.004	1	-1.05e-3	3	1078.256	1	NC	1
281		8	max	0	3	-.004	15	.005	3	2.861e-3	2	NC	5	NC	1
282			min	0	2	-.096	1	-.005	1	-8.354e-4	3	807.352	1	NC	1
283		9	max	0	3	-.005	15	.006	3	2.481e-3	2	NC	5	NC	1
284			min	0	2	-.123	1	-.006	1	-6.208e-4	3	630.536	1	NC	1
285		10	max	0	3	-.006	15	.006	3	2.101e-3	2	NC	15	NC	1
286			min	0	2	-.153	1	-.007	1	-4.062e-4	3	508.705	1	NC	1
287		11	max	0	3	-.007	15	.006	3	1.72e-3	2	NC	15	NC	1
288			min	-.001	2	-.184	1	-.007	1	-1.916e-4	3	421.005	1	NC	1
289		12	max	.001	3	-.009	15	.006	3	1.34e-3	2	8778.926	15	NC	1
290			min	-.001	2	-.218	1	-.008	1	1.308e-5	15	355.777	1	NC	1
291		13	max	.001	3	-.01	15	.005	3	9.593e-4	2	7550.818	15	NC	1
292			min	-.001	1	-.254	1	-.009	1	4.932e-6	15	305.883	1	NC	1
293		14	max	.001	3	-.012	15	.004	3	5.789e-4	2	6589.754	15	NC	1
294			min	-.001	1	-.291	1	-.009	1	-4.508e-5	9	266.862	1	NC	1
295		15	max	.001	3	-.013	15	.002	3	6.667e-4	3	5823.279	15	NC	1
296			min	-.001	1	-.329	1	-.009	1	-1.607e-4	9	235.757	1	NC	1
297		16	max	.001	3	-.015	15	0	15	8.813e-4	3	5202.22	15	NC	1
298			min	-.002	1	-.369	1	-.008	1	-4.233e-4	1	210.564	1	NC	1
299		17	max	.001	3	-.017	15	0	15	1.096e-3	3	4692.176	15	NC	1
300			min	-.002	1	-.409	1	-.008	1	-7.53e-4	1	189.882	1	NC	1
301		18	max	.002	3	-.018	15	0	15	1.31e-3	3	4268.388	15	NC	1
302			min	-.002	1	-.449	1	-.009	3	-1.083e-3	1	172.704	1	8598.844	3
303		19	max	.002	3	-.02	15	0	10	1.525e-3	3	3912.804	15	NC	1
304			min	-.002	1	-.49	1	-.014	3	-1.412e-3	1	158.294	1	5414.109	3
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	2	-.003	1	0	1	0	1	NC	1	NC	1
309		3	max	0	3	0	15	0	1	0	1	NC	3	NC	1
310			min	0	2	-.012	1	0	1	0	1	6361.616	1	NC	1
311		4	max	0	3	-.001	15	0	1	0	1	NC	4	NC	1
312			min	0	2	-.028	1	0	1	0	1	2740.34	1	NC	1
313		5	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
314			min	-.001	2	-.05	1	0	1	0	1	1538.815	1	NC	1
315		6	max	.001	3	-.003	15	0	1	0	1	NC	5	NC	1
316			min	-.002	2	-.078	1	0	1	0	1	992.971	1	NC	1
317		7	max	.002	3	-.004	15	0	1	0	1	NC	5	NC	1
318			min	-.002	2	-.111	1	0	1	0	1	698.582	1	NC	1
319		8	max	.002	3	-.006	15	0	1	0	1	NC	15	NC	1
320			min	-.002	2	-.149	1	0	1	0	1	521.485	1	NC	1
321		9	max	.002	3	-.007	15	0	1	0	1	NC	15	NC	1
322			min	-.002	2	-.191	1	0	1	0	1	406.376	1	NC	1
323		10	max	.003	3	-.009	15	0	1	0	1	8762.835	15	NC	1
324			min	-.003	2	-.237	1	0	1	0	1	327.308	1	NC	1
325		11	max	.003	3	-.011	15	0	1	0	1	7251.54	15	NC	1
326			min	-.003	2	-.287	1	0	1	0	1	270.526	1	NC	1
327		12	max	.003	3	-.013	15	0	1	0	1	6127.632	15	NC	1
328			min	-.003	2	-.34	1	0	1	0	1	228.374	1	NC	1
329		13	max	.003	3	-.015	15	0	1	0	1	5268.018	15	NC	1
330			min	-.003	2	-.396	1	0	1	0	1	196.18	1	NC	1
331		14	max	.004	3	-.017	15	0	1	0	1	4595.779	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	-.004	2	-.454	1	0	1	0	1	171.034	1	NC	1
333		15	max	.004	3	-.019	15	0	1	0	1	4059.955	15	NC	1
334			min	-.004	2	-.514	1	0	1	0	1	151.01	1	NC	1
335		16	max	.004	3	-.021	15	0	1	0	1	3626	15	NC	1
336			min	-.004	2	-.576	1	0	1	0	1	134.807	1	NC	1
337		17	max	.004	3	-.024	15	0	1	0	1	3269.765	15	NC	1
338			min	-.005	2	-.639	1	0	1	0	1	121.516	1	NC	1
339		18	max	.005	3	-.026	15	0	1	0	1	2973.884	15	NC	1
340			min	-.005	2	-.702	1	0	1	0	1	110.484	1	NC	1
341		19	max	.005	3	-.028	15	0	1	0	1	2725.703	15	NC	1
342			min	-.005	2	-.767	1	0	1	0	1	101.235	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	1.374e-3	3	NC	1	NC	1
346			min	0	2	-.002	1	0	3	-3.375e-3	2	NC	1	NC	1
347		3	max	0	3	0	15	0	1	1.908e-3	3	NC	2	NC	1
348			min	0	2	-.008	1	0	3	-4.764e-3	2	9316.288	1	NC	1
349		4	max	0	3	0	15	.001	1	1.694e-3	3	NC	4	NC	1
350			min	0	2	-.019	1	-.001	3	-4.383e-3	2	4130.07	1	NC	1
351		5	max	0	3	-.001	15	.002	1	1.479e-3	3	NC	5	NC	1
352			min	0	2	-.033	1	-.002	3	-4.003e-3	2	2348.329	1	NC	1
353		6	max	0	3	-.002	15	.003	1	1.265e-3	3	NC	5	NC	1
354			min	0	2	-.051	1	-.003	3	-3.622e-3	2	1525.9	1	NC	1
355		7	max	0	3	-.003	15	.004	1	1.05e-3	3	NC	5	NC	1
356			min	0	2	-.072	1	-.004	3	-3.242e-3	2	1078.256	1	NC	1
357		8	max	0	3	-.004	15	.005	1	8.354e-4	3	NC	5	NC	1
358			min	0	2	-.096	1	-.005	3	-2.861e-3	2	807.352	1	NC	1
359		9	max	0	3	-.005	15	.006	1	6.208e-4	3	NC	5	NC	1
360			min	0	2	-.123	1	-.006	3	-2.481e-3	2	630.536	1	NC	1
361		10	max	0	3	-.006	15	.007	1	4.062e-4	3	NC	15	NC	1
362			min	0	2	-.153	1	-.006	3	-2.101e-3	2	508.705	1	NC	1
363		11	max	0	3	-.007	15	.007	1	1.916e-4	3	NC	15	NC	1
364			min	-.001	2	-.184	1	-.006	3	-1.72e-3	2	421.005	1	NC	1
365		12	max	.001	3	-.009	15	.008	1	-1.308e-5	15	8778.926	15	NC	1
366			min	-.001	2	-.218	1	-.006	3	-1.34e-3	2	355.777	1	NC	1
367		13	max	.001	3	-.01	15	.009	1	-4.932e-6	15	7550.818	15	NC	1
368			min	-.001	1	-.254	1	-.005	3	-9.593e-4	2	305.883	1	NC	1
369		14	max	.001	3	-.012	15	.009	1	4.508e-5	9	6589.754	15	NC	1
370			min	-.001	1	-.291	1	-.004	3	-5.789e-4	2	266.862	1	NC	1
371		15	max	.001	3	-.013	15	.009	1	1.607e-4	9	5823.279	15	NC	1
372			min	-.001	1	-.329	1	-.002	3	-6.667e-4	3	235.757	1	NC	1
373		16	max	.001	3	-.015	15	.008	1	4.233e-4	1	5202.22	15	NC	1
374			min	-.002	1	-.369	1	0	15	-8.813e-4	3	210.564	1	NC	1
375		17	max	.001	3	-.017	15	.008	1	7.53e-4	1	4692.176	15	NC	1
376			min	-.002	1	-.409	1	0	15	-1.096e-3	3	189.882	1	NC	1
377		18	max	.002	3	-.018	15	.009	3	1.083e-3	1	4268.388	15	NC	1
378			min	-.002	1	-.449	1	0	15	-1.31e-3	3	172.704	1	8598.844	3
379		19	max	.002	3	-.02	15	.014	3	1.412e-3	1	3912.804	15	NC	1
380			min	-.002	1	-.49	1	0	10	-1.525e-3	3	158.294	1	5414.109	3
381	M3	1	max	.004	1	0	15	0	3	1.882e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	1	-6.992e-4	3	NC	1	NC	1
383		2	max	.003	1	-.002	15	.009	3	2.184e-3	2	NC	1	NC	4
384			min	0	15	-.033	1	-.02	2	-8.376e-4	3	NC	1	3780.911	2
385		3	max	.003	3	-.003	15	.017	3	2.486e-3	2	NC	1	NC	4
386			min	0	15	-.065	1	-.039	2	-9.761e-4	3	NC	1	1905.051	2
387		4	max	.003	3	-.005	15	.024	3	2.788e-3	2	NC	1	NC	4
388			min	0	15	-.096	1	-.058	2	-1.115e-3	3	NC	1	1288.283	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	.004	3	-.006	15	.032	3	3.09e-3	2	NC	1	NC	5
390			min	0	10	-.127	1	-.076	2	-1.253e-3	3	NC	1	986.843	2
391		6	max	.004	3	-.008	15	.038	3	3.391e-3	2	NC	1	NC	5
392			min	0	10	-.158	1	-.092	2	-1.392e-3	3	NC	1	812.241	2
393		7	max	.004	3	-.009	15	.044	3	3.693e-3	2	NC	1	NC	5
394			min	-.001	2	-.189	1	-.106	2	-1.53e-3	3	8990.605	4	701.931	2
395		8	max	.004	3	-.011	15	.049	3	3.995e-3	2	NC	1	NC	5
396			min	-.002	2	-.219	1	-.118	2	-1.669e-3	3	8301.976	4	629.447	2
397		9	max	.005	3	-.012	15	.053	3	4.297e-3	2	NC	1	NC	5
398			min	-.003	2	-.25	1	-.127	2	-1.807e-3	3	7931.316	4	581.987	2
399		10	max	.005	3	-.013	15	.056	3	4.599e-3	2	NC	1	NC	5
400			min	-.003	2	-.28	1	-.133	2	-1.945e-3	3	7814.056	4	553.026	2
401		11	max	.005	3	-.014	15	.057	3	4.901e-3	2	NC	1	NC	5
402			min	-.004	2	-.31	1	-.136	2	-2.084e-3	3	7931.316	4	539.5	2
403		12	max	.006	3	-.016	15	.057	3	5.203e-3	2	NC	1	NC	5
404			min	-.005	2	-.339	1	-.135	2	-2.222e-3	3	8301.976	4	540.78	2
405		13	max	.006	3	-.017	15	.055	3	5.505e-3	2	NC	1	NC	5
406			min	-.005	2	-.369	1	-.13	2	-2.361e-3	3	8990.605	4	558.661	2
407		14	max	.006	3	-.018	15	.052	3	5.807e-3	2	NC	1	NC	5
408			min	-.006	2	-.398	1	-.12	2	-2.499e-3	3	NC	1	598.465	2
409		15	max	.006	3	-.018	15	.046	3	6.109e-3	2	NC	1	NC	5
410			min	-.007	2	-.427	1	-.105	2	-2.638e-3	3	NC	1	672.522	2
411		16	max	.007	3	-.019	15	.038	3	6.41e-3	2	NC	1	NC	5
412			min	-.007	2	-.456	1	-.085	2	-2.776e-3	3	NC	1	811.082	2
413		17	max	.007	3	-.02	15	.028	3	6.712e-3	2	NC	1	NC	5
414			min	-.008	2	-.485	1	-.059	2	-2.915e-3	3	NC	1	1106.431	2
415		18	max	.007	3	-.021	15	.016	3	7.014e-3	2	NC	1	NC	4
416			min	-.009	2	-.513	1	-.027	2	-3.053e-3	3	NC	1	2022.143	2
417		19	max	.008	3	-.022	15	.016	1	7.316e-3	2	NC	1	NC	1
418			min	-.01	2	-.542	1	0	12	-3.192e-3	3	NC	1	NC	1
419	M6	1	max	.006	1	0	15	0	1	0	1	NC	1	NC	1
420			min	0	15	-.003	1	0	1	0	1	NC	1	NC	1
421		2	max	.005	3	-.002	15	0	1	0	1	NC	1	NC	1
422			min	0	15	-.052	1	0	1	0	1	NC	1	NC	1
423		3	max	.006	3	-.004	15	0	1	0	1	NC	1	NC	1
424			min	0	10	-.101	1	0	1	0	1	NC	1	NC	1
425		4	max	.007	3	-.007	15	0	1	0	1	NC	1	NC	1
426			min	-.002	2	-.15	1	0	1	0	1	NC	1	NC	1
427		5	max	.008	3	-.009	15	0	1	0	1	NC	1	NC	1
428			min	-.004	2	-.199	1	0	1	0	1	NC	1	NC	1
429		6	max	.009	3	-.011	15	0	1	0	1	NC	1	NC	1
430			min	-.006	2	-.248	1	0	1	0	1	NC	1	NC	1
431		7	max	.01	3	-.013	15	0	1	0	1	NC	1	NC	1
432			min	-.008	2	-.296	1	0	1	0	1	8990.605	4	NC	1
433		8	max	.011	3	-.015	15	0	1	0	1	NC	1	NC	1
434			min	-.01	2	-.344	1	0	1	0	1	8301.976	4	NC	1
435		9	max	.012	3	-.016	15	0	1	0	1	NC	1	NC	1
436			min	-.011	2	-.392	1	0	1	0	1	7931.316	4	NC	1
437		10	max	.013	3	-.018	15	0	1	0	1	NC	1	NC	1
438			min	-.013	2	-.44	1	0	1	0	1	7814.056	4	NC	1
439		11	max	.014	3	-.02	15	0	1	0	1	NC	1	NC	1
440			min	-.015	2	-.488	1	0	1	0	1	7931.316	4	NC	1
441		12	max	.015	3	-.022	15	0	1	0	1	NC	1	NC	1
442			min	-.017	2	-.535	1	0	1	0	1	8301.976	4	NC	1
443		13	max	.016	3	-.023	15	0	1	0	1	NC	1	NC	1
444			min	-.019	2	-.582	1	0	1	0	1	8990.605	4	NC	1
445		14	max	.017	3	-.025	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	-.021	2	-.629	1	0	1	0	1	NC	1	NC	1
447		15	max	.018	3	-.026	15	0	1	0	1	NC	1	NC	1
448			min	-.023	2	-.676	1	0	1	0	1	NC	1	NC	1
449		16	max	.019	3	-.028	15	0	1	0	1	NC	1	NC	1
450			min	-.025	2	-.723	1	0	1	0	1	NC	1	NC	1
451		17	max	.02	3	-.029	15	0	1	0	1	NC	1	NC	1
452			min	-.027	2	-.769	1	0	1	0	1	NC	1	NC	1
453		18	max	.021	3	-.03	15	0	1	0	1	NC	1	NC	1
454			min	-.029	2	-.816	1	0	1	0	1	NC	1	NC	1
455		19	max	.022	3	-.032	15	0	1	0	1	NC	1	NC	1
456			min	-.031	2	-.862	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.004	1	0	15	0	1	6.992e-4	3	NC	1	NC	1
458			min	0	15	-.002	1	0	3	-1.882e-3	2	NC	1	NC	1
459		2	max	.003	1	-.002	15	.02	2	8.376e-4	3	NC	1	NC	4
460			min	0	15	-.033	1	-.009	3	-2.184e-3	2	NC	1	3780.911	2
461		3	max	.003	3	-.003	15	.039	2	9.761e-4	3	NC	1	NC	4
462			min	0	15	-.065	1	-.017	3	-2.486e-3	2	NC	1	1905.051	2
463		4	max	.003	3	-.005	15	.058	2	1.115e-3	3	NC	1	NC	4
464			min	0	15	-.096	1	-.024	3	-2.788e-3	2	NC	1	1288.283	2
465		5	max	.004	3	-.006	15	.076	2	1.253e-3	3	NC	1	NC	5
466			min	0	10	-.127	1	-.032	3	-3.09e-3	2	NC	1	986.843	2
467		6	max	.004	3	-.008	15	.092	2	1.392e-3	3	NC	1	NC	5
468			min	0	10	-.158	1	-.038	3	-3.391e-3	2	NC	1	812.241	2
469		7	max	.004	3	-.009	15	.106	2	1.53e-3	3	NC	1	NC	5
470			min	-.001	2	-.189	1	-.044	3	-3.693e-3	2	8990.605	4	701.931	2
471		8	max	.004	3	-.011	15	.118	2	1.669e-3	3	NC	1	NC	5
472			min	-.002	2	-.219	1	-.049	3	-3.995e-3	2	8301.976	4	629.447	2
473		9	max	.005	3	-.012	15	.127	2	1.807e-3	3	NC	1	NC	5
474			min	-.003	2	-.25	1	-.053	3	-4.297e-3	2	7931.316	4	581.987	2
475		10	max	.005	3	-.013	15	.133	2	1.945e-3	3	NC	1	NC	5
476			min	-.003	2	-.28	1	-.056	3	-4.599e-3	2	7814.056	4	553.026	2
477		11	max	.005	3	-.014	15	.136	2	2.084e-3	3	NC	1	NC	5
478			min	-.004	2	-.31	1	-.057	3	-4.901e-3	2	7931.316	4	539.5	2
479		12	max	.006	3	-.016	15	.135	2	2.222e-3	3	NC	1	NC	5
480			min	-.005	2	-.339	1	-.057	3	-5.203e-3	2	8301.976	4	540.78	2
481		13	max	.006	3	-.017	15	.13	2	2.361e-3	3	NC	1	NC	5
482			min	-.005	2	-.369	1	-.055	3	-5.505e-3	2	8990.605	4	558.661	2
483		14	max	.006	3	-.018	15	.12	2	2.499e-3	3	NC	1	NC	5
484			min	-.006	2	-.398	1	-.052	3	-5.807e-3	2	NC	1	598.465	2
485		15	max	.006	3	-.018	15	.105	2	2.638e-3	3	NC	1	NC	5
486			min	-.007	2	-.427	1	-.046	3	-6.109e-3	2	NC	1	672.522	2
487		16	max	.007	3	-.019	15	.085	2	2.776e-3	3	NC	1	NC	5
488			min	-.007	2	-.456	1	-.038	3	-6.41e-3	2	NC	1	811.082	2
489		17	max	.007	3	-.02	15	.059	2	2.915e-3	3	NC	1	NC	5
490			min	-.008	2	-.485	1	-.028	3	-6.712e-3	2	NC	1	1106.431	2
491		18	max	.007	3	-.021	15	.027	2	3.053e-3	3	NC	1	NC	4
492			min	-.009	2	-.513	1	-.016	3	-7.014e-3	2	NC	1	2022.143	2
493		19	max	.008	3	-.022	15	0	12	3.192e-3	3	NC	1	NC	1
494			min	-.01	2	-.542	1	-.016	1	-7.316e-3	2	NC	1	NC	1