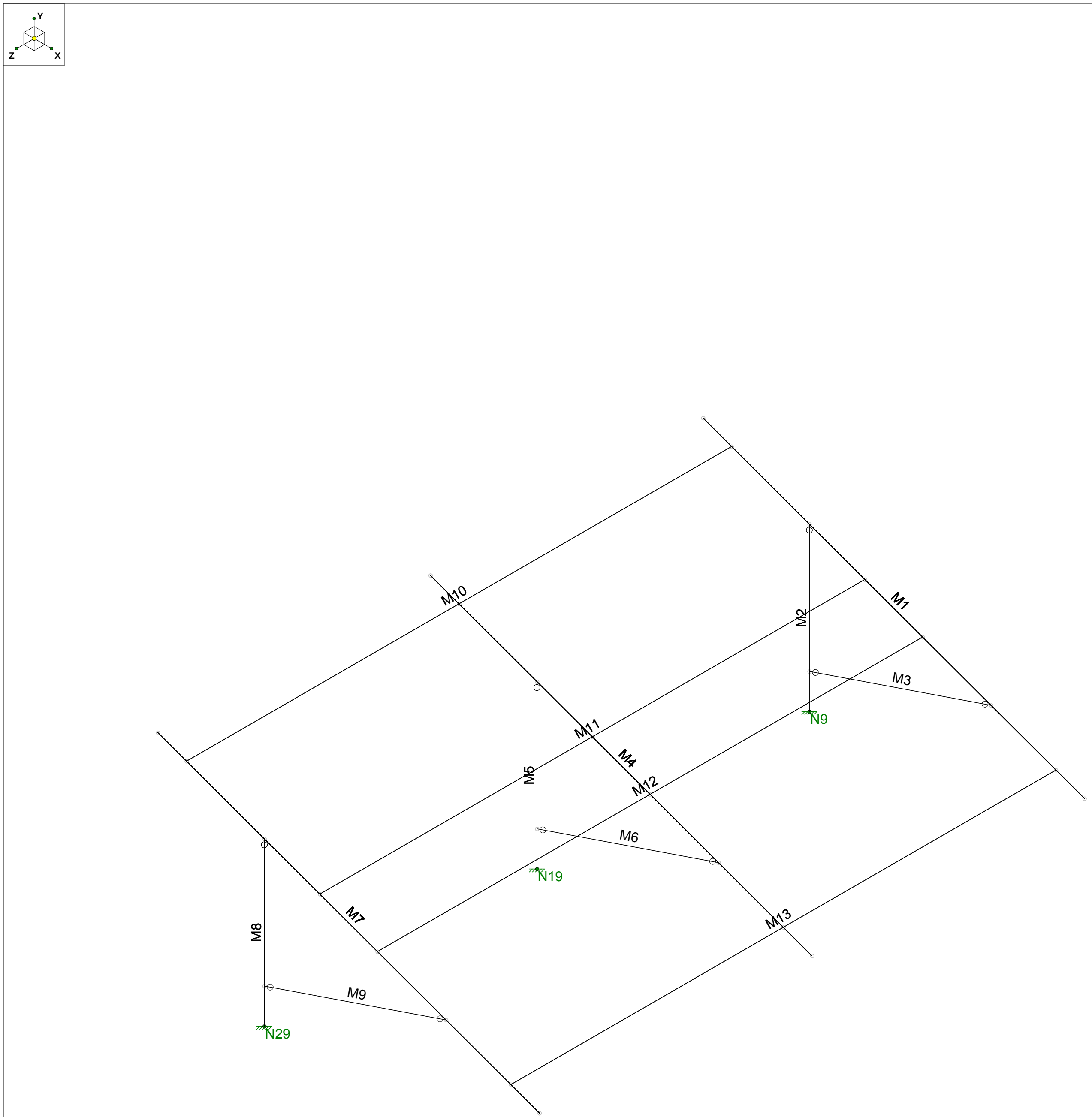


Schletter, Inc.		20° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

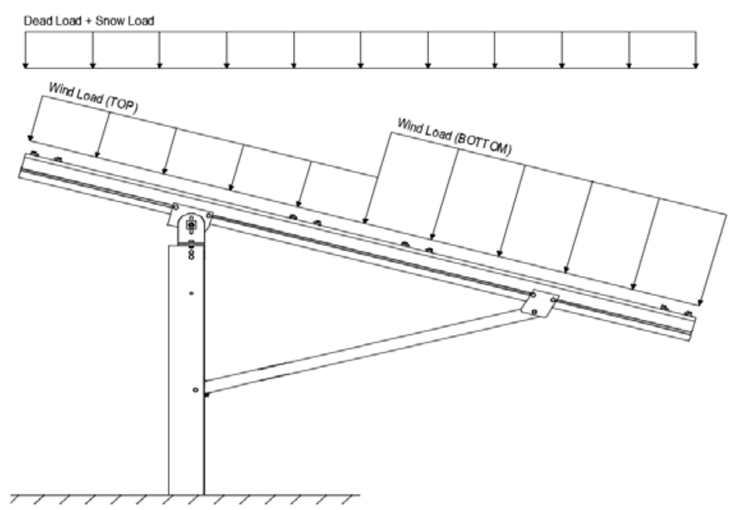
1.1 Project Description
The following sections will cover the determination of forces and structural design calculations for the Schletter, Inc. FS ground mount system.

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 =	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 =	20°
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 =	20.62 psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00	
C_s =	0.91	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V =	90 mph	Exposure Category = C
Height <	15 ft	Importance Category = II

Peak Velocity Pressure, q_z = 12.72 psf *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

$Cf+_{TOP}$	=	1.05	*(Pressure)*
$Cf+_{BOTTOM}$	=	1.65	
$Cf-_{TOP}$	=	-2.12	*(Suction)*
$Cf-_{BOTTOM}$	=	-1	

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

2.4 Seismic Loads

S_S =	2.50	R =	1.25
S_{DS} =	1.67	C_S =	0.8
S_1 =	1.00	ρ =	1.3
S_{D1} =	1.00	Ω =	1.25
T_a =	0.07	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

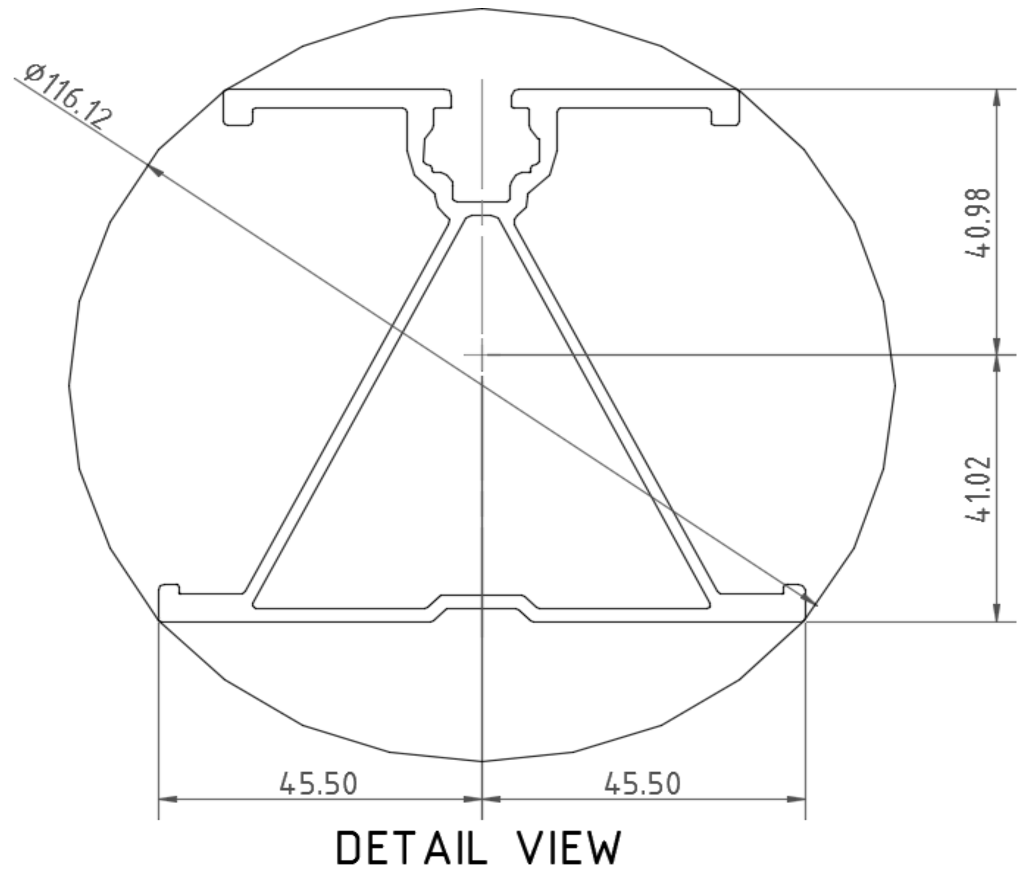
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

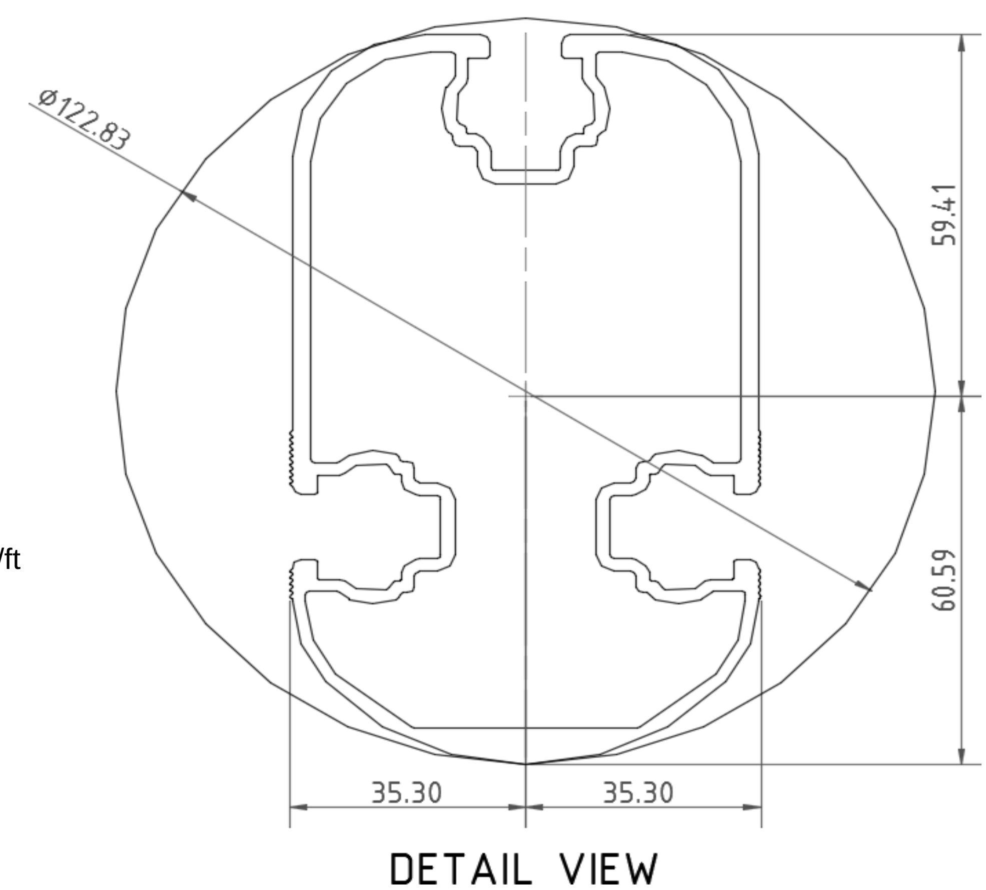
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	138	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	2.117	k-ft
M_z =	0.270	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	100%	



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).

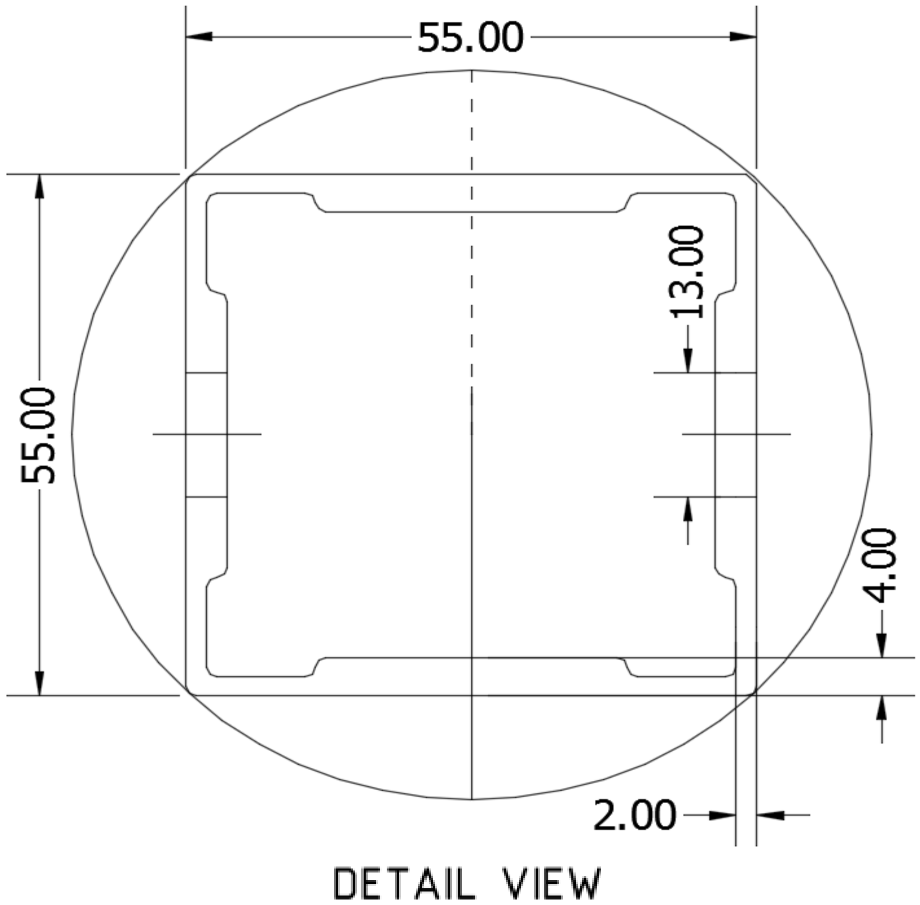
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.796	k-ft
M_z =	0.000	k-ft
P_n =	0.358	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).

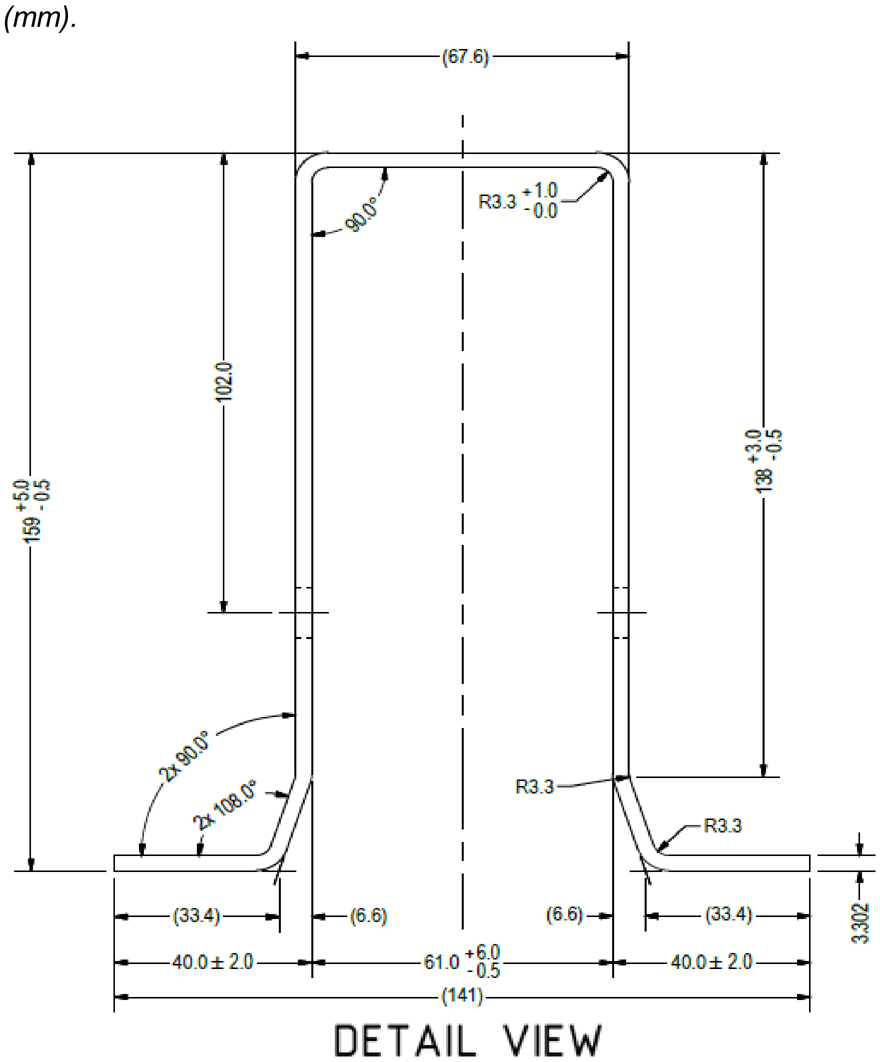
Strut Type =	**55x55**
Aluminum Type =	6105-T5
F_{ty} =	35 ksi
L_b =	61.00 in
$\Phi F_{ty\ AXIAL}$ =	13.67 ksi
$\Phi F_{ty\ BENDING}$ =	28.22 ksi
S_y =	0.60 in^3
S_x =	0.60 in^3
E =	10100 ksi
I_y =	0.67 in^4
I_x =	0.67 in^4
A =	0.98 in^2
g =	1.18 lbs/ft
M_y =	0.000 k-ft
M_z =	0.408 k-ft
P_n =	5.606 k
$M_{y\ allowable}$ =	1.408 k-ft
$M_{z\ allowable}$ =	1.408 k-ft
$P_{n\ allowable}$ =	13.425 k
Utilization =	71%



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 =	65.62 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 =	15.059 k-ft
M_z =	0.000 k-ft
P_r =	7.252 k
$M_{y\ allowable}$ =	19.207 k-ft
$M_{z\ allowable}$ =	14.389 k-ft
P_c =	46.025 k
Utilization =	96%



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

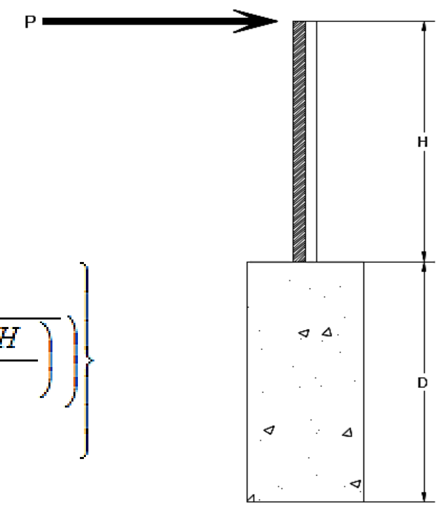
Maximum Tensile Load =	5.42	k
Maximum Lateral Load =	2.17	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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



Lateral Force @ Top of Pole, P =	1.95	k
Height of Pole Above Grade, H =	4.47	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

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

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

$$A = 2.34\ P/_{S_1 B}$$

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

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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	1.95	k
Height of Pole Above Grade, H =	4.47	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 =	10.52	
Required Footing Depth, D =	14.14	ft

2nd Trial @ D_2 =	8.69	ft
Lateral Soil Bearing @ D/3, S_1 =	0.58	ksf
Lateral Soil Bearing @ D, S_3 =	1.74	ksf
Constant 2.34P/(S_1B), A =	3.93	
Required Footing Depth, D =	6.76	ft

3rd Trial @ D_3 =	7.73	ft
Lateral Soil Bearing @ D/3, S_1 =	0.52	ksf
Lateral Soil Bearing @ D, S_3 =	1.55	ksf
Constant 2.34P/(S_1B), A =	4.42	
Required Footing Depth, D =	7.35	ft

4th Trial @ D_4 =	7.54	ft
Lateral Soil Bearing @ D/3, S_1 =	0.50	ksf
Lateral Soil Bearing @ D, S_3 =	1.51	ksf
Constant 2.34P/(S_1B), A =	4.53	
Required Footing Depth, D =	7.48	ft

5th Trial @ D_5 =	7.51	ft
Lateral Soil Bearing @ D/3, S_1 =	0.50	ksf
Lateral Soil Bearing @ D, S_3 =	1.50	ksf
Constant 2.34P/(S_1B), A =	4.55	
Required Footing Depth, D =	7.75	ft

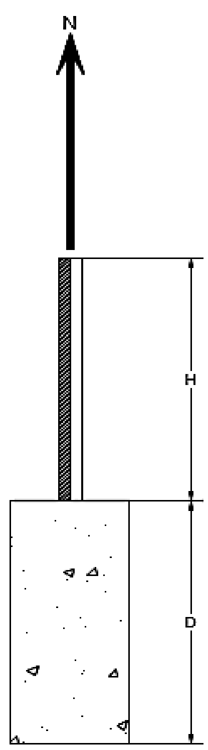
A 2ft diameter x 7.75ft deep footing unrestrained at ground level is required for the racking structure.

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 =	2.59	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 =	1.70	k
Required Concrete Volume, V =	11.69	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	5.59
2	0.4	0.2	118.10	5.49
3	0.6	0.2	118.10	5.38
4	0.8	0.2	118.10	5.28
5	1	0.2	118.10	5.17
6	1.2	0.2	118.10	5.07
7	1.4	0.2	118.10	4.97
8	1.6	0.2	118.10	4.86
9	1.8	0.2	118.10	4.76
10	2	0.2	118.10	4.66
11	2.2	0.2	118.10	4.55
12	2.4	0.2	118.10	4.45
13	2.6	0.2	118.10	4.34
14	2.8	0.2	118.10	4.24
15	3	0.2	118.10	4.14
16	3.2	0.2	118.10	4.03
17	3.4	0.2	118.10	3.93
18	3.6	0.2	118.10	3.83
19	3.8	0.2	118.10	3.72
20	0	0.0	0.00	3.72
21	0	0.0	0.00	3.72
22	0	0.0	0.00	3.72
23	0	0.0	0.00	3.72
24	0	0.0	0.00	3.72
25	0	0.0	0.00	3.72
26	0	0.0	0.00	3.72
27	0	0.0	0.00	3.72
28	0	0.0	0.00	3.72
29	0	0.0	0.00	3.72
30	0	0.0	0.00	3.72
31	0	0.0	0.00	3.72
32	0	0.0	0.00	3.72
33	0	0.0	0.00	3.72
34	0	0.0	0.00	3.72
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 =	7.75	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.59	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	29.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

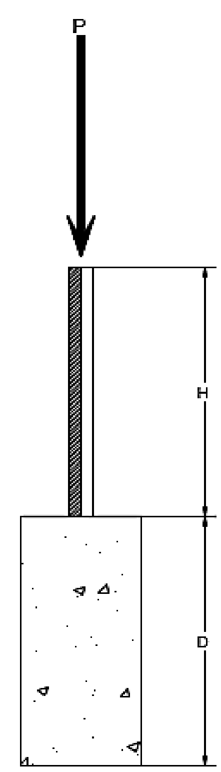
Weight of Concrete

Footing Volume	24.35	ft^3
Weight	3.53	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	4.48	k
1/3 Increase for Wind =	1.33	
Total Resistance =	12.25	k
Applied Force =	8.12	k
Utilization =	66%	

A 2ft diameter footing passes at a depth of 7.75ft.



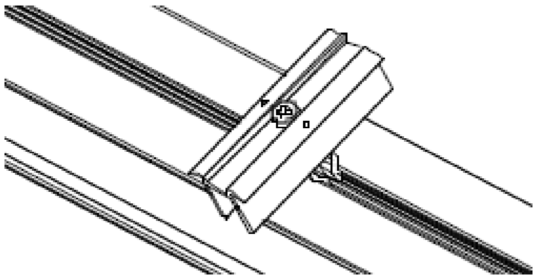
6. DESIGN OF JOINTS AND CONNECTIONS

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.

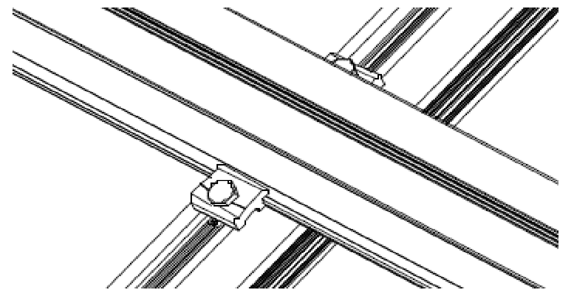
<u>Fastening of Modules to Purlins</u>

Maximum Uplifting Force =	0.399 k
Allowable Uplift =	1.214 k
Utilization =	<u>33%</u>



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

Maximum Uplifting Force =	1.611 k
Allowable Uplift =	2.180 k
Utilization =	<u>74%</u>

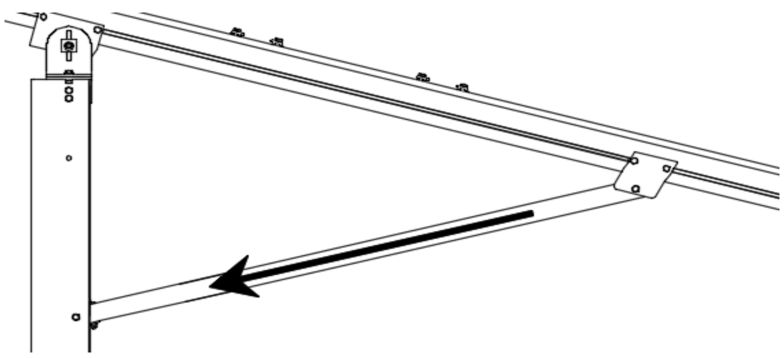


6.2 Strut Connections

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

Maximum Axial Load =	5.606 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	<u>63%</u>

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

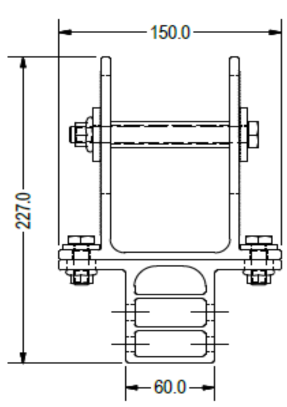


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

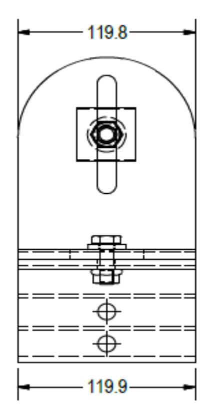
6.3 Girder to Post Connection

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.

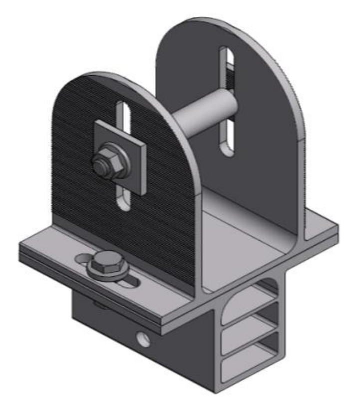
Maximum Tensile Load =	3.466 k
Allowable Load =	5.649 k
Utilization =	<u>61%</u>



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

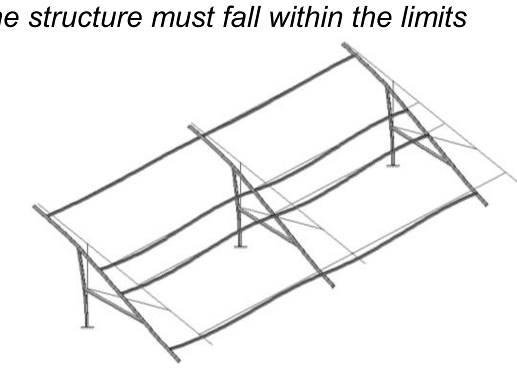
7.1 Seismic Drift

The racking structure has been analyzed under seismic loading. The allowable story drift of the structure must fall within the limits provided by (ASCE 7, Table 12.12-1).

Mean Height, h_{sx} =	53.92 in
Allowable Story Drift for All Other Structures, Δ = {	$0.020h_{sx}$ 1.078 in
Max Drift, Δ_{MAX} =	0.617 in

<u>*0.617 ≤ 1.078, OK.*</u>

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 in³

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 in³

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

Compression

3.4.9

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φyFcy

φF_L= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 31.6 ksi

3.4.10

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

φF_L= φc[Bt-Dt*√(Rb/t)]

φF_L= 30.80 ksi

φF_L= 30.80 ksi

A = 1215.13 mm^2

1.88 in^2

P_{max} = 58.01 kips

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

Strut = **55x55**

Strong Axis:

3.4.14

L_b = 61 in

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2 ksi

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1 Not Used

Rb/t = 0.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

φF_L= 1.17φyFcy

φF_L= 38.9 ksi

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LSt= 28.2 ksi

Ix = 279836 mm^4

0.672 in^4

y = 27.5 mm

Sx = 0.621 in^3

M_{max}St = 1.460 k-ft

Weak Axis:

3.4.14

L_b = 61

J = 0.942

95.1963

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

S1 = 0.51461

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

S2 = 1701.56

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

φF_L= 30.2

3.4.16

b/t = 24.5

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

S1 = 12.2

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

S2 = 46.7

φF_L= φb[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.16.1

N/A for Weak Direction

3.4.18

h/t = 24.5

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

S1 = 36.9

m = 0.65

C_0 = 27.5

Cc = 27.5

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

S2 = 77.3

φF_L= 1.3φyFcy

φF_L= 43.2 ksi

φF_LWk= 28.2 ksi

Iy = 279836 mm^4

0.672 in^4

x = 27.5 mm

Sy = 0.621 in^3

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

$\lambda =$ 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

$\varphi cc =$ 0.77756

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

$\varphi F_L =$ 13.6667 ksi

3.4.9

$b/t =$ 24.5

$S1 =$ 12.21 (See 3.4.16 above for formula)

$S2 =$ 32.70 (See 3.4.16 above for formula)

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

$\varphi F_L =$ 28.2 ksi

$b/t =$ 24.5

$S1 =$ 12.21

$S2 =$ 32.70

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

$\varphi F_L =$ 28.2 ksi

3.4.10

$Rb/t =$ 0.0

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

$S1 =$ 6.87

$S2 =$ 131.3

$\varphi F_L = \varphi yFcy$

$\varphi F_L =$ 33.25 ksi

$\varphi F_L =$ 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 =	65.62	in	
Pr =	7.25	k	(LRFD Factored Load)
Mr (Strong) =	15.06	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	94.42	
4.71√(E/Fy) =	103.55	=> kL/r ≤ 4.71√(E/Fy)
Fcr =	27.44	ksi
Fe =	32.10	ksi
Pn =	61.196	k

Torsional/Flexural Torsional Buckling:

Fcr =	20.6391	ksi
Fey =	81.8881	ksi
Fez =	26.2099	ksi
Pn =	46.0252	k

Bending (Strong Axis):

Yielding:				
Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.1751 <	0.2		
Utilization =	0.96 <	1.0	OK	

Bending (Weak Axis):

Yielding:			
Mn =	14.65	k-ft	
Flange Local Buckling:			
Mn =	14.39	k-ft	
Pr/Pc =	0.175 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 96%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-54.031	-54.031	0	0
2	M11	Y	-54.031	-54.031	0	0
3	M12	Y	-54.031	-54.031	0	0
4	M13	Y	-54.031	-54.031	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	-37.24	-37.24	0	0
2	M11	y	-37.24	-37.24	0	0
3	M12	y	-58.519	-58.519	0	0
4	M13	y	-58.519	-58.519	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	75.188	75.188	0	0
2	M11	y	75.188	75.188	0	0
3	M12	y	35.466	35.466	0	0
4	M13	y	35.466	35.466	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Z	6.693	6.693	0	0
2	M11	Z	6.693	6.693	0	0
3	M12	Z	6.693	6.693	0	0
4	M13	Z	6.693	6.693	0	0
5	M10	Z	0	0	0	0
6	M11	Z	0	0	0	0
7	M12	Z	0	0	0	0
8	M13	Z	0	0	0	0

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.8W	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												
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	389.329	2	2656.24	1	383.721	1	.405	1	.008	5	6.38	1
2		min	-571.854	3	-1404.15	3	-361.101	5	-1.356	5	-.008	1	.366	12
3	N19	max	1631.852	2	7280.954	1	0	2	0	1	.008	4	14.409	1
4		min	-1641.749	3	-4172.434	3	-397.776	5	-1.429	4	0	3	.425	15
5	N29	max	389.329	2	2656.24	1	281.853	3	.279	3	.01	4	6.38	1
6		min	-571.854	3	-1404.15	3	-452.907	4	-1.471	4	-.003	3	-.11	5
7	Totals:	max	2410.511	2	12593.434	1	0	2						
8		min	-2785.458	3	-6980.734	3	-1151.528	5						

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
1	M1	1	max	0	1	.006	1	.002	4	0	1	0	1	0	1
2			min	0	1	-.001	3	-.001	1	0	1	0	1	0	1
3		2	max	-.179	15	-.49	15	0	3	0	1	0	12	0	6
4			min	-.76	4	-2.085	6	-1.499	5	0	1	0	5	0	15
5		3	max	-6.621	12	233.856	3	11.637	3	.065	3	.316	1	.29	1
6			min	-203.659	1	-660.239	1	-211.67	1	-.266	1	.01	12	-.101	3
7		4	max	-6.917	12	232.637	3	11.637	3	.065	3	.184	1	.7	1
8			min	-204.251	1	-661.865	1	-211.67	1	-.266	1	.014	12	-.246	3
9		5	max	-7.213	12	231.417	3	11.637	3	.065	3	.076	4	1.112	1
10			min	-204.843	1	-663.491	1	-211.67	1	-.266	1	-.012	10	-.39	3
11		6	max	455.542	3	574.353	1	38.489	3	.045	1	.157	1	1.069	1
12			min	-1764.518	1	-146.604	3	-283.503	1	-.052	3	-.049	3	-.395	3
13		7	max	455.099	3	572.727	1	38.489	3	.045	1	.016	2	.713	1
14			min	-1765.109	1	-147.824	3	-283.503	1	-.052	3	-.058	4	-.304	3
15		8	max	454.655	3	571.101	1	38.489	3	.045	1	-.001	12	.358	1
16			min	-1765.701	1	-149.043	3	-283.503	1	-.052	3	-.195	1	-.211	3
17		9	max	445.429	3	66.705	3	39.856	3	.015	5	.096	1	.157	1
18			min	-1976.832	1	-71.18	1	-286.759	1	-.237	2	0	10	-.169	3
19		10	max	444.985	3	65.486	3	39.856	3	.015	5	.057	3	.202	1
20			min	-1977.424	1	-72.806	1	-286.759	1	-.237	2	-.082	1	-.21	3
21		11	max	444.541	3	64.266	3	39.856	3	.015	5	.082	3	.248	1
22			min	-1978.016	1	-74.432	1	-286.759	1	-.237	2	-.26	1	-.25	3
23		12	max	432.766	3	622.306	3	156.383	2	.4	3	.166	1	.53	1
24			min	-2184.209	1	-649.145	1	-254.549	3	-.546	1	-.011	5	-.512	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
25		13	max	432.322	3	621.087	3	156.383	2	.4	3	.247	1	.934	1
26			min	-2184.801	1	-650.771	1	-254.549	3	-.546	1	-.153	5	-.898	3
27		14	max	205.898	1	582.686	1	83.831	5	.368	1	0	10	1.321	1
28			min	6.698	12	-551.208	3	-179.922	1	-.405	3	-.246	4	-1.267	3
29		15	max	205.307	1	581.06	1	82.331	5	.368	1	-.001	12	.96	1
30			min	6.402	12	-552.428	3	-179.922	1	-.405	3	-.216	4	-.924	3
31		16	max	204.715	1	579.434	1	80.831	5	.368	1	0	3	.6	1
32			min	6.107	12	-553.647	3	-179.922	1	-.405	3	-.229	1	-.581	3
33		17	max	204.123	1	577.808	1	79.332	5	.368	1	0	3	.241	1
34			min	5.811	12	-554.867	3	-179.922	1	-.405	3	-.341	1	-.237	3
35		18	max	.76	4	2.087	6	1.5	5	0	1	0	12	0	6
36			min	.179	15	.49	15	0	12	0	1	0	5	0	15
37		19	max	0	1	0	1	0	1	0	1	0	1	0	1
38			min	0	1	-.003	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.015	1	.002	4	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.179	15	-.49	15	0	1	0	1	0	1	0	4
42			min	-.76	6	-2.083	4	-1.499	5	0	1	0	5	0	15
43		3	max	-14.116	15	713.984	3	0	1	.021	4	.252	4	.714	1
44			min	-369.457	1	-1872.031	1	-120.63	5	0	1	0	1	-.274	3
45		4	max	-14.295	15	712.764	3	0	1	.021	4	.177	4	1.876	1
46			min	-370.049	1	-1873.657	1	-122.13	5	0	1	0	1	-.717	3
47		5	max	-14.473	15	711.545	3	0	1	.021	4	.101	4	3.039	1
48			min	-370.641	1	-1875.283	1	-123.63	5	0	1	0	1	-1.159	3
49		6	max	1518.611	3	1672.007	1	0	1	0	1	0	1	2.902	1
50			min	-4845.256	1	-526.743	3	-119.866	4	-.018	4	-.007	5	-1.146	3
51		7	max	1518.167	3	1670.381	1	0	1	0	1	0	1	1.864	1
52			min	-4845.847	1	-527.963	3	-121.366	4	-.018	4	-.081	4	-.819	3
53		8	max	1517.723	3	1668.755	1	0	1	0	1	0	1	.828	1
54			min	-4846.439	1	-529.182	3	-122.866	4	-.018	4	-.157	4	-.491	3
55		9	max	1492.69	3	219.581	3	0	1	.015	4	.133	4	.209	1
56			min	-5199.177	1	-272.078	1	-250.377	4	0	1	0	1	-.327	3
57		10	max	1492.246	3	218.361	3	0	1	.015	4	0	1	.378	1
58			min	-5199.769	1	-273.704	1	-251.877	4	0	1	-.023	4	-.463	3
59		11	max	1491.802	3	217.142	3	0	1	.015	4	0	1	.549	1
60			min	-5200.361	1	-275.33	1	-253.376	4	0	1	-.18	4	-.598	3
61		12	max	1471.866	3	1739.452	3	0	1	.13	4	.029	5	1.373	1
62			min	-5562.974	1	-1968.186	1	-274.33	5	0	1	0	1	-1.335	3
63		13	max	1471.422	3	1738.232	3	0	1	.13	4	0	1	2.595	1
64			min	-5563.566	1	-1969.812	1	-275.83	5	0	1	-.142	4	-2.415	3
65		14	max	370.305	1	1670.823	1	71.775	5	0	1	0	1	3.768	1
66			min	14.567	15	-1531.035	3	0	1	-.093	4	-.23	5	-3.448	3
67		15	max	369.713	1	1669.197	1	70.275	5	0	1	0	1	2.732	1
68			min	14.389	15	-1532.255	3	0	1	-.093	4	-.185	5	-2.498	3
69		16	max	369.121	1	1667.571	1	68.776	5	0	1	0	1	1.697	1
70			min	14.21	15	-1533.474	3	0	1	-.093	4	-.142	5	-1.546	3
71		17	max	368.529	1	1665.945	1	67.276	5	0	1	0	1	.662	1
72			min	14.032	15	-1534.694	3	0	1	-.093	4	-.101	4	-.594	3
73		18	max	.76	6	2.088	6	1.5	5	0	1	0	1	0	6
74			min	.179	15	.491	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.004	1	0	1	0	1	0	1	0	1
76			min	0	1	-.007	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	1	.003	4	0	1	0	1	0	1
78			min	0	1	-.001	3	0	3	0	1	0	1	0	1
79		2	max	-.179	15	-.491	15	.001	1	0	1	0	1	0	4
80			min	-.76	4	-2.085	4	-1.499	5	0	1	0	5	0	15
81		3	max	15.515	5	233.856	3	211.67	1	.266	1	.12	5	.29	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
82			min	-203.659	1	-660.239	1	-51.571	5	-.065	3	-.316	1	-.101	3
83		4	max	15.239	5	232.637	3	211.67	1	.266	1	.087	5	.7	1
84			min	-204.251	1	-661.865	1	-53.071	5	-.065	3	-.184	1	-.246	3
85		5	max	14.963	5	231.417	3	211.67	1	.266	1	.054	5	1.112	1
86			min	-204.843	1	-663.491	1	-54.57	5	-.065	3	-.053	1	-.39	3
87		6	max	455.542	3	574.353	1	283.503	1	.052	3	.049	3	1.069	1
88			min	-1764.518	1	-146.604	3	-47.013	5	-.045	1	-.157	1	-.395	3
89		7	max	455.099	3	572.727	1	283.503	1	.052	3	.025	3	.713	1
90			min	-1765.109	1	-147.824	3	-48.513	5	-.045	1	-.047	5	-.304	3
91		8	max	454.655	3	571.101	1	283.503	1	.052	3	.195	1	.358	1
92			min	-1765.701	1	-149.043	3	-50.013	5	-.045	1	-.078	5	-.211	3
93		9	max	445.429	3	66.705	3	286.759	1	.237	2	.054	5	.157	1
94			min	-1976.832	1	-71.18	1	-104.999	5	.019	15	-.096	1	-.169	3
95		10	max	444.985	3	65.486	3	286.759	1	.237	2	.082	1	.202	1
96			min	-1977.424	1	-72.806	1	-106.499	5	.019	15	-.057	3	-.21	3
97		11	max	444.541	3	64.266	3	286.759	1	.237	2	.26	1	.248	1
98			min	-1978.016	1	-74.432	1	-107.999	5	.019	15	-.082	3	-.25	3
99		12	max	432.766	3	622.306	3	254.549	3	.546	1	-.012	12	.53	1
100			min	-2184.209	1	-649.145	1	-250.908	4	-.4	3	-.166	1	-.512	3
101		13	max	432.322	3	621.087	3	254.549	3	.546	1	.139	3	.934	1
102			min	-2184.801	1	-650.771	1	-252.408	4	-.4	3	-.247	1	-.898	3
103		14	max	205.898	1	582.686	1	179.922	1	.405	3	.006	1	1.321	1
104			min	3.797	15	-551.208	3	-.71	3	-.368	1	-.244	5	-1.267	3
105		15	max	205.307	1	581.06	1	179.922	1	.405	3	.118	1	.96	1
106			min	3.619	15	-552.428	3	-.71	3	-.368	1	-.18	5	-.924	3
107		16	max	204.715	1	579.434	1	179.922	1	.405	3	.229	1	.6	1
108			min	3.44	15	-553.647	3	-.71	3	-.368	1	-.118	5	-.581	3
109		17	max	204.123	1	577.808	1	179.922	1	.405	3	.341	1	.241	1
110			min	3.262	15	-554.867	3	-.71	3	-.368	1	-.056	5	-.237	3
111		18	max	.76	4	2.087	4	1.499	5	0	1	0	1	0	4
112			min	.179	15	.491	15	0	1	0	1	0	5	0	15
113		19	max	0	1	0	1	0	12	0	1	0	1	0	1
114			min	0	1	-.003	3	0	1	0	1	0	1	0	1
115	M10	1	max	179.876	1	574.323	1	-2.908	15	.006	1	.414	1	.368	1
116			min	-.705	3	-557.239	3	-203.408	1	-.013	3	-.016	5	-.405	3
117		2	max	179.876	1	418.233	1	-1.347	15	.006	1	.181	1	.213	3
118			min	-.705	3	-409.956	3	-160.451	1	-.013	3	-.02	5	-.266	1
119		3	max	179.876	1	262.142	1	.215	15	.006	1	.025	2	.643	3
120			min	-.705	3	-262.672	3	-117.494	1	-.013	3	-.024	4	-.701	1
121		4	max	179.876	1	106.051	1	2.489	5	.006	1	-.002	10	.884	3
122			min	-.705	3	-115.389	3	-74.537	1	-.013	3	-.119	1	-.936	1
123		5	max	179.876	1	31.894	3	4.904	5	.006	1	-.01	12	.938	3
124			min	-.705	3	-50.039	1	-31.58	1	-.013	3	-.187	1	-.972	1
125		6	max	179.876	1	179.178	3	11.897	14	.006	1	-.005	15	.803	3
126			min	-.705	3	-206.13	1	-4.1	10	-.013	3	-.2	1	-.808	1
127		7	max	179.876	1	326.461	3	54.333	1	.006	1	.003	5	.48	3
128			min	-.705	3	-362.221	1	.214	10	-.013	3	-.158	1	-.445	1
129		8	max	179.876	1	473.744	3	97.29	1	.006	1	.017	5	.118	1
130			min	-.705	3	-518.311	1	4.527	10	-.013	3	-.061	1	-.031	3
131		9	max	179.876	1	621.028	3	140.247	1	.006	1	.091	1	.88	1
132			min	-9.526	5	-674.402	1	7.271	12	-.013	3	-.014	10	-.731	3
133		10	max	179.876	1	830.493	1	-2.526	15	.013	3	.298	1	1.841	1
134			min	-.705	3	-768.311	3	-183.204	1	-.006	1	0	10	-1.618	3
135		11	max	179.876	1	674.402	1	-.964	15	.013	3	.091	1	.88	1
136			min	-.705	3	-621.028	3	-140.247	1	-.006	1	-.022	5	-.731	3
137		12	max	179.876	1	518.311	1	.668	5	.013	3	.005	3	.118	1
138			min	-.705	3	-473.744	3	-97.29	1	-.006	1	-.061	1	-.031	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
139		13	max	179.876	1	362.221	1	3.083	5	.013	3	-.003	12	.48	3
140			min	-.705	3	-326.461	3	-54.333	1	-.006	1	-.158	1	-.445	1
141		14	max	179.876	1	206.13	1	5.499	5	.013	3	-.007	12	.803	3
142			min	-10.787	5	-179.178	3	-11.377	1	-.006	1	-.2	1	-.808	1
143		15	max	179.876	1	50.039	1	31.58	1	.013	3	-.004	15	.938	3
144			min	-23.903	5	-31.894	3	-1.732	3	-.006	1	-.187	1	-.972	1
145		16	max	179.876	1	115.389	3	74.537	1	.013	3	.006	5	.884	3
146			min	-37.02	5	-106.051	1	.535	12	-.006	1	-.119	1	-.936	1
147		17	max	179.876	1	262.672	3	117.494	1	.013	3	.025	2	.643	3
148			min	-50.137	5	-262.142	1	2.096	12	-.006	1	-.013	3	-.701	1
149		18	max	179.876	1	409.956	3	160.451	1	.013	3	.181	1	.213	3
150			min	-63.253	5	-418.233	1	3.658	12	-.006	1	-.008	3	-.266	1
151		19	max	179.876	1	557.239	3	203.408	1	.013	3	.414	1	.368	1
152			min	-76.37	5	-574.323	1	5.219	12	-.006	1	0	3	-.405	3
153	M11	1	max	416.912	1	570.066	1	21.355	5	0	3	.439	1	.332	1
154			min	-294.245	3	-560.201	3	-206.698	1	-.009	1	-.167	5	-.491	3
155		2	max	416.912	1	413.975	1	23.771	5	0	3	.202	1	.13	3
156			min	-294.245	3	-412.918	3	-163.741	1	-.009	1	-.138	5	-.297	1
157		3	max	416.912	1	257.884	1	26.186	5	0	3	.026	2	.564	3
158			min	-294.245	3	-265.634	3	-120.784	1	-.009	1	-.106	5	-.726	1
159		4	max	416.912	1	101.794	1	28.602	5	0	3	0	12	.809	3
160			min	-294.245	3	-118.351	3	-77.827	1	-.009	1	-.107	1	-.956	1
161		5	max	416.912	1	28.932	3	31.017	5	0	3	-.004	12	.866	3
162			min	-294.245	3	-54.297	1	-34.87	1	-.009	1	-.179	1	-.986	1
163		6	max	416.912	1	176.216	3	36.125	4	0	3	.008	5	.735	3
164			min	-294.245	3	-210.388	1	-3.709	10	-.009	1	-.196	1	-.817	1
165		7	max	416.912	1	323.499	3	51.044	1	0	3	.052	5	.416	3
166			min	-294.245	3	-366.478	1	.605	10	-.009	1	-.158	1	-.449	1
167		8	max	416.912	1	470.783	3	94.001	1	0	3	.1	5	.119	1
168			min	-294.245	3	-522.569	1	3.358	12	-.009	1	-.065	1	-.092	3
169		9	max	416.912	1	618.066	3	136.958	1	0	3	.172	4	.887	1
170			min	-294.245	3	-678.66	1	4.919	12	-.009	1	-.014	10	-.787	3
171		10	max	416.912	1	834.75	1	22.37	5	0	12	.285	1	1.854	1
172			min	-294.245	3	-765.349	3	-179.915	1	-.009	1	0	10	-1.671	3
173		11	max	416.912	1	678.66	1	24.785	5	.009	1	.082	1	.887	1
174			min	-294.245	3	-618.066	3	-136.958	1	0	3	-.138	5	-.787	3
175		12	max	416.912	1	522.569	1	27.201	5	.009	1	0	3	.119	1
176			min	-294.245	3	-470.783	3	-94.001	1	0	3	-.116	4	-.092	3
177		13	max	416.912	1	366.478	1	29.616	5	.009	1	-.003	12	.416	3
178			min	-294.245	3	-323.499	3	-51.044	1	0	3	-.158	1	-.449	1
179		14	max	416.912	1	210.388	1	32.032	5	.009	1	-.004	12	.735	3
180			min	-294.245	3	-176.216	3	-8.087	1	0	3	-.196	1	-.817	1
181		15	max	416.912	1	54.297	1	40.944	4	.009	1	.013	5	.866	3
182			min	-294.245	3	-28.932	3	1.326	12	0	3	-.179	1	-.986	1
183		16	max	416.912	1	118.351	3	77.827	1	.009	1	.059	5	.809	3
184			min	-294.245	3	-101.794	1	2.887	12	0	3	-.107	1	-.956	1
185		17	max	416.912	1	265.634	3	120.784	1	.009	1	.109	4	.564	3
186			min	-294.245	3	-257.884	1	4.449	12	0	3	.004	12	-.726	1
187		18	max	416.912	1	412.918	3	163.741	1	.009	1	.202	1	.13	3
188			min	-294.245	3	-413.975	1	6.01	12	0	3	.01	12	-.297	1
189		19	max	416.912	1	560.201	3	206.698	1	.009	1	.439	1	.332	1
190			min	-294.245	3	-570.066	1	7.571	12	0	3	.019	12	-.491	3
191	M12	1	max	53.344	5	638.673	1	22.911	5	.002	3	.468	1	.273	2
192			min	-16.708	9	-217.52	3	-210.535	1	-.009	1	-.175	5	.025	12
193		2	max	40.228	5	460.831	1	25.326	5	.002	3	.226	1	.275	3
194			min	-16.708	9	-151.446	3	-167.578	1	-.009	1	-.144	5	-.444	1
195		3	max	37.43	2	282.988	1	27.742	5	.002	3	.042	2	.426	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
196			min	-16.708	9	-85.372	3	-124.621	1	-.009	1	-.11	5	-.919	1
197		4	max	37.43	2	105.146	1	30.157	5	.002	3	.002	10	.493	3
198			min	-16.708	9	-19.298	3	-81.664	1	-.009	1	-.095	4	-1.167	1
199		5	max	37.43	2	46.776	3	32.573	5	.002	3	-.008	12	.475	3
200			min	-16.708	9	-72.697	1	-38.707	1	-.009	1	-.169	1	-1.188	1
201		6	max	37.43	2	112.85	3	37.125	4	.002	3	.01	5	.373	3
202			min	-19.068	14	-250.539	1	-6.4	2	-.009	1	-.191	1	-.981	1
203		7	max	37.43	2	178.924	3	48.49	4	.002	3	.056	5	.187	3
204			min	-30.774	4	-428.382	1	-.971	10	-.009	1	-.158	1	-.547	1
205		8	max	37.43	2	244.998	3	90.164	1	.002	3	.105	5	.114	1
206			min	-43.891	4	-606.224	1	3.342	10	-.009	1	-.07	1	-.084	3
207		9	max	37.43	2	311.072	3	133.12	1	.002	3	.178	4	1.002	1
208			min	-57.008	4	-784.067	1	6.539	12	-.009	1	-.018	10	-.439	3
209		10	max	37.43	2	961.91	1	113.773	14	.002	3	.277	4	2.117	1
210			min	-70.124	4	-377.146	3	-176.077	1	-.009	1	-.005	10	-.879	3
211		11	max	48.079	5	784.067	1	26.663	5	.009	1	.072	1	1.002	1
212			min	-16.708	9	-311.072	3	-133.12	1	-.002	3	-.147	5	-.439	3
213		12	max	37.43	2	606.224	1	29.078	5	.009	1	.004	3	.114	1
214			min	-16.708	9	-244.998	3	-90.164	1	-.002	3	-.123	4	-.084	3
215		13	max	37.43	2	428.382	1	31.494	5	.009	1	-.003	12	.187	3
216			min	-16.708	9	-178.924	3	-47.207	1	-.002	3	-.158	1	-.547	1
217		14	max	37.43	2	250.539	1	33.909	5	.009	1	-.006	12	.373	3
218			min	-16.708	9	-112.85	3	-6.162	9	-.002	3	-.191	1	-.981	1
219		15	max	37.43	2	72.697	1	43.434	4	.009	1	.014	5	.475	3
220			min	-16.708	9	-46.776	3	-.586	3	-.002	3	-.169	1	-1.188	1
221		16	max	37.43	2	19.298	3	81.664	1	.009	1	.062	5	.493	3
222			min	-22.857	4	-105.146	1	1.267	12	-.002	3	-.092	1	-1.167	1
223		17	max	37.43	2	85.372	3	124.621	1	.009	1	.118	4	.426	3
224			min	-35.973	4	-282.988	1	2.828	12	-.002	3	-.007	3	-.919	1
225		18	max	37.43	2	151.446	3	167.578	1	.009	1	.226	1	.275	3
226			min	-49.09	4	-460.831	1	4.389	12	-.002	3	0	3	-.444	1
227		19	max	37.43	2	217.52	3	210.535	1	.009	1	.468	1	.273	2
228			min	-62.207	4	-638.673	1	5.951	12	-.002	3	.007	12	-.025	5
229	M13	1	max	48.488	5	658.366	1	16.07	5	.007	3	.401	1	.266	1
230			min	-211.497	1	-236.346	3	-201.908	1	-.022	1	-.141	5	-.065	3
231		2	max	35.371	5	480.524	1	18.485	5	.007	3	.171	1	.195	3
232			min	-211.497	1	-170.272	3	-158.951	1	-.022	1	-.119	5	-.462	1
233		3	max	22.254	5	302.681	1	20.901	5	.007	3	.018	2	.37	3
234			min	-211.497	1	-104.198	3	-115.994	1	-.022	1	-.098	4	-.962	1
235		4	max	11.637	3	124.839	1	23.316	5	.007	3	-.005	10	.461	3
236			min	-211.497	1	-38.124	3	-73.037	1	-.022	1	-.126	1	-1.235	1
237		5	max	11.637	3	27.95	3	25.732	5	.007	3	-.007	12	.468	3
238			min	-211.497	1	-53.004	1	-30.08	1	-.022	1	-.192	1	-1.281	1
239		6	max	11.637	3	94.024	3	31.838	4	.007	3	0	15	.39	3
240			min	-211.497	1	-230.846	1	-3.558	10	-.022	1	-.202	1	-1.1	1
241		7	max	11.637	3	160.098	3	55.833	1	.007	3	.038	5	.228	3
242			min	-211.497	1	-408.689	1	.756	10	-.022	1	-.159	1	-.691	1
243		8	max	11.637	3	226.172	3	98.79	1	.007	3	.078	5	-.004	15
244			min	-211.497	1	-586.531	1	4.901	12	-.022	1	-.06	1	-.055	1
245		9	max	11.637	3	292.246	3	141.747	1	.007	3	.146	4	.808	1
246			min	-211.497	1	-764.374	1	6.462	12	-.022	1	-.014	10	-.35	3
247		10	max	11.637	3	942.217	1	114.175	14	.007	3	.302	1	1.898	1
248			min	-211.497	1	-358.32	3	-184.704	1	-.022	1	.001	10	-.766	3
249		11	max	35.069	5	764.374	1	18.94	5	.022	1	.094	1	.808	1
250			min	-211.497	1	-292.246	3	-141.747	1	-.007	3	-.109	5	-.35	3
251		12	max	21.952	5	586.531	1	21.355	5	.022	1	.004	3	0	5
252			min	-211.497	1	-226.172	3	-98.79	1	-.007	3	-.092	4	-.055	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
253		13	max	11.637	3	408.689	1	23.771	5	.022	1	-.003	12	.228	3
254			min	-211.497	1	-160.098	3	-55.833	1	-.007	3	-.159	1	-.691	1
255		14	max	11.637	3	230.846	1	26.186	5	.022	1	-.006	12	.39	3
256			min	-211.497	1	-94.024	3	-12.876	1	-.007	3	-.202	1	-1.1	1
257		15	max	11.637	3	53.004	1	33.992	4	.022	1	.013	5	.468	3
258			min	-211.497	1	-27.95	3	-.434	3	-.007	3	-.192	1	-1.281	1
259		16	max	11.637	3	38.124	3	73.037	1	.022	1	.051	5	.461	3
260			min	-211.497	1	-124.839	1	1.344	12	-.007	3	-.126	1	-1.235	1
261		17	max	11.637	3	104.198	3	115.994	1	.022	1	.092	5	.37	3
262			min	-211.497	1	-302.681	1	2.906	12	-.007	3	-.012	9	-.962	1
263		18	max	11.637	3	170.272	3	158.951	1	.022	1	.171	1	.195	3
264			min	-211.497	1	-480.524	1	4.467	12	-.007	3	0	3	-.462	1
265		19	max	11.637	3	236.346	3	201.908	1	.022	1	.401	1	.266	1
266			min	-211.497	1	-658.366	1	6.028	12	-.007	3	.007	12	-.065	3
267	M2	1	max	2656.24	1	571.706	3	384.176	1	.008	5	1.356	5	6.38	1
268			min	-1404.15	3	-387.16	2	-361.205	5	-.008	1	-.405	1	.366	12
269		2	max	2653.979	1	571.706	3	384.176	1	.008	5	1.267	5	6.395	1
270			min	-1405.845	3	-387.16	2	-359.246	5	-.008	1	-.31	1	.277	12
271		3	max	2651.719	1	571.706	3	384.176	1	.008	5	1.178	5	6.41	1
272			min	-1407.541	3	-387.16	2	-357.287	5	-.008	1	-.215	1	.188	12
273		4	max	2649.458	1	571.706	3	384.176	1	.008	5	1.089	5	6.425	1
274			min	-1409.236	3	-387.16	2	-355.328	5	-.008	1	-.119	1	.099	12
275		5	max	2019.34	1	1833.88	1	309.993	1	.003	1	1.004	5	6.374	1
276			min	-1221.742	3	4.044	3	-343.604	5	-.001	3	-.106	1	.014	3
277		6	max	2017.079	1	1833.88	1	309.993	1	.003	1	.924	4	5.919	1
278			min	-1223.437	3	4.044	3	-341.645	5	-.001	3	-.032	3	.013	3
279		7	max	2014.818	1	1833.88	1	309.993	1	.003	1	.851	4	5.463	1
280			min	-1225.132	3	4.044	3	-339.686	5	-.001	3	-.095	3	.012	3
281		8	max	2012.558	1	1833.88	1	309.993	1	.003	1	.778	4	5.008	1
282			min	-1226.828	3	4.044	3	-337.727	5	-.001	3	-.159	3	.011	3
283		9	max	2010.297	1	1833.88	1	309.993	1	.003	1	.705	4	4.553	1
284			min	-1228.523	3	4.044	3	-335.767	5	-.001	3	-.222	3	.01	3
285		10	max	2008.037	1	1833.88	1	309.993	1	.003	1	.633	4	4.097	1
286			min	-1230.219	3	4.044	3	-333.808	5	-.001	3	-.286	3	.009	3
287		11	max	2005.776	1	1833.88	1	309.993	1	.003	1	.561	4	3.642	1
288			min	-1231.914	3	4.044	3	-331.849	5	-.001	3	-.349	3	.008	3
289		12	max	2003.515	1	1833.88	1	309.993	1	.003	1	.49	4	3.187	1
290			min	-1233.61	3	4.044	3	-329.89	5	-.001	3	-.413	3	.007	3
291		13	max	2001.255	1	1833.88	1	309.993	1	.003	1	.51	1	2.732	1
292			min	-1235.305	3	4.044	3	-327.931	5	-.001	3	-.476	3	.006	3
293		14	max	1998.994	1	1833.88	1	309.993	1	.003	1	.586	1	2.276	1
294			min	-1237.001	3	4.044	3	-325.972	5	-.001	3	-.539	3	.005	3
295		15	max	1996.734	1	1833.88	1	309.993	1	.003	1	.663	1	1.821	1
296			min	-1238.696	3	4.044	3	-324.012	5	-.001	3	-.603	3	.004	3
297		16	max	1994.473	1	1833.88	1	309.993	1	.003	1	.74	1	1.366	1
298			min	-1240.392	3	4.044	3	-322.053	5	-.001	3	-.666	3	.003	3
299		17	max	1992.212	1	1833.88	1	309.993	1	.003	1	.817	1	.911	1
300			min	-1242.087	3	4.044	3	-320.094	5	-.001	3	-.73	3	.002	3
301		18	max	1989.952	1	1833.88	1	309.993	1	.003	1	.894	1	.455	1
302			min	-1243.782	3	4.044	3	-318.135	5	-.001	3	-.793	3	.001	3
303		19	max	1987.691	1	1833.88	1	309.993	1	.003	1	.971	1	0	1
304			min	-1245.478	3	4.044	3	-316.176	5	-.001	3	-.857	3	0	1
305	M5	1	max	7280.954	1	1641.267	3	0	1	.008	4	1.429	4	14.409	1
306			min	-4172.434	3	-1617.281	2	-398.016	5	0	1	0	1	.425	15
307		2	max	7278.693	1	1641.267	3	0	1	.008	4	1.331	4	14.671	1
308			min	-4174.13	3	-1617.281	2	-396.057	5	0	1	0	1	.241	12
309		3	max	7276.433	1	1641.267	3	0	1	.008	4	1.234	4	14.933	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
310			min	-4175.825	3	-1617.281	2	-394.098	5	0	1	0	1	-.063	3
311		4	max	7274.172	1	1641.267	3	0	1	.008	4	1.137	4	15.195	1
312			min	-4177.521	3	-1617.281	2	-392.139	5	0	1	0	1	-.471	3
313		5	max	5539.514	1	4392.62	1	0	1	0	1	1.048	4	15.267	1
314			min	-3544.978	3	-233.867	3	-383.593	4	0	4	0	1	-.813	3
315		6	max	5537.253	1	4392.62	1	0	1	0	1	.953	4	14.177	1
316			min	-3546.673	3	-233.867	3	-381.634	4	0	4	0	1	-.755	3
317		7	max	5534.992	1	4392.62	1	0	1	0	1	.858	4	13.086	1
318			min	-3548.369	3	-233.867	3	-379.675	4	0	4	0	1	-.697	3
319		8	max	5532.732	1	4392.62	1	0	1	0	1	.764	4	11.996	1
320			min	-3550.064	3	-233.867	3	-377.716	4	0	4	0	1	-.639	3
321		9	max	5530.471	1	4392.62	1	0	1	0	1	.671	4	10.905	1
322			min	-3551.76	3	-233.867	3	-375.757	4	0	4	0	1	-.581	3
323		10	max	5528.211	1	4392.62	1	0	1	0	1	.578	4	9.815	1
324			min	-3553.455	3	-233.867	3	-373.797	4	0	4	0	1	-.523	3
325		11	max	5525.95	1	4392.62	1	0	1	0	1	.485	4	8.724	1
326			min	-3555.15	3	-233.867	3	-371.838	4	0	4	0	1	-.464	3
327		12	max	5523.689	1	4392.62	1	0	1	0	1	.393	4	7.634	1
328			min	-3556.846	3	-233.867	3	-369.879	4	0	4	0	1	-.406	3
329		13	max	5521.429	1	4392.62	1	0	1	0	1	.302	4	6.543	1
330			min	-3558.541	3	-233.867	3	-367.92	4	0	4	0	1	-.348	3
331		14	max	5519.168	1	4392.62	1	0	1	0	1	.211	4	5.453	1
332			min	-3560.237	3	-233.867	3	-365.961	4	0	4	0	1	-.29	3
333		15	max	5516.908	1	4392.62	1	0	1	0	1	.12	4	4.362	1
334			min	-3561.932	3	-233.867	3	-364.002	4	0	4	0	1	-.232	3
335		16	max	5514.647	1	4392.62	1	0	1	0	1	.03	4	3.272	1
336			min	-3563.628	3	-233.867	3	-362.042	4	0	4	0	1	-.174	3
337		17	max	5512.386	1	4392.62	1	0	1	0	1	0	1	2.181	1
338			min	-3565.323	3	-233.867	3	-360.083	4	0	4	-.06	4	-.116	3
339		18	max	5510.126	1	4392.62	1	0	1	0	1	0	1	1.091	1
340			min	-3567.019	3	-233.867	3	-358.124	4	0	4	-.149	4	-.058	3
341		19	max	5507.865	1	4392.62	1	0	1	0	1	0	1	0	1
342			min	-3568.714	3	-233.867	3	-356.165	4	0	4	-.238	4	0	1
343	M8	1	max	2656.24	1	571.706	3	281.691	3	.01	4	1.471	4	6.38	1
344			min	-1404.15	3	-387.16	2	-453.351	4	-.003	3	-.279	3	-.11	5
345		2	max	2653.979	1	571.706	3	281.691	3	.01	4	1.359	4	6.395	1
346			min	-1405.845	3	-387.16	2	-451.392	4	-.003	3	-.209	3	-.086	5
347		3	max	2651.719	1	571.706	3	281.691	3	.01	4	1.247	4	6.41	1
348			min	-1407.541	3	-387.16	2	-449.433	4	-.003	3	-.139	3	-.062	5
349		4	max	2649.458	1	571.706	3	281.691	3	.01	4	1.136	4	6.425	1
350			min	-1409.236	3	-387.16	2	-447.474	4	-.003	3	-.069	3	-.039	5
351		5	max	2019.34	1	1833.88	1	255.46	3	.001	3	1.045	4	6.374	1
352			min	-1221.742	3	-5.89	15	-422.392	4	-.003	1	-.031	3	-.02	15
353		6	max	2017.079	1	1833.88	1	255.46	3	.001	3	.941	4	5.919	1
354			min	-1223.437	3	-5.89	15	-420.433	4	-.003	1	0	10	-.019	15
355		7	max	2014.818	1	1833.88	1	255.46	3	.001	3	.837	4	5.463	1
356			min	-1225.132	3	-5.89	15	-418.474	4	-.003	1	-.054	2	-.018	15
357		8	max	2012.558	1	1833.88	1	255.46	3	.001	3	.741	5	5.008	1
358			min	-1226.828	3	-5.89	15	-416.515	4	-.003	1	-.125	1	-.016	15
359		9	max	2010.297	1	1833.88	1	255.46	3	.001	3	.651	5	4.553	1
360			min	-1228.523	3	-5.89	15	-414.556	4	-.003	1	-.202	1	-.015	15
361		10	max	2008.037	1	1833.88	1	255.46	3	.001	3	.561	5	4.097	1
362			min	-1230.219	3	-5.89	15	-412.596	4	-.003	1	-.279	1	-.013	15
363		11	max	2005.776	1	1833.88	1	255.46	3	.001	3	.472	5	3.642	1
364			min	-1231.914	3	-5.89	15	-410.637	4	-.003	1	-.356	1	-.012	15
365		12	max	2003.515	1	1833.88	1	255.46	3	.001	3	.413	3	3.187	1
366			min	-1233.61	3	-5.89	15	-408.678	4	-.003	1	-.433	1	-.01	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
367		13	max	2001.255	1	1833.88	1	255.46	3	.001	3	.476	3	2.732	1
368			min	-1235.305	3	-5.89	15	-406.719	4	-.003	1	-.51	1	-.009	15
369		14	max	1998.994	1	1833.88	1	255.46	3	.001	3	.539	3	2.276	1
370			min	-1237.001	3	-5.89	15	-404.76	4	-.003	1	-.586	1	-.007	15
371		15	max	1996.734	1	1833.88	1	255.46	3	.001	3	.603	3	1.821	1
372			min	-1238.696	3	-5.89	15	-402.8	4	-.003	1	-.663	1	-.006	15
373		16	max	1994.473	1	1833.88	1	255.46	3	.001	3	.666	3	1.366	1
374			min	-1240.392	3	-5.89	15	-400.841	4	-.003	1	-.74	1	-.004	15
375		17	max	1992.212	1	1833.88	1	255.46	3	.001	3	.73	3	.911	1
376			min	-1242.087	3	-5.89	15	-398.882	4	-.003	1	-.817	1	-.003	15
377		18	max	1989.952	1	1833.88	1	255.46	3	.001	3	.793	3	.455	1
378			min	-1243.782	3	-5.89	15	-396.923	4	-.003	1	-.894	1	-.001	15
379		19	max	1987.691	1	1833.88	1	255.46	3	.001	3	.857	3	0	1
380			min	-1245.478	3	-5.89	15	-394.964	4	-.003	1	-.971	1	0	1
381	M3	1	max	1986.615	1	4.757	4	72.655	1	.031	3	.015	1	0	1
382			min	-598.337	3	1.118	15	-26.854	3	-.079	1	-.006	3	0	1
383		2	max	1986.476	1	4.229	4	72.655	1	.031	3	.036	1	0	15
384			min	-598.441	3	.994	15	-26.854	3	-.079	1	-.014	3	-.001	4
385		3	max	1986.336	1	3.7	4	72.655	1	.031	3	.057	1	0	15
386			min	-598.546	3	.87	15	-26.854	3	-.079	1	-.022	3	-.002	4
387		4	max	1986.197	1	3.171	4	72.655	1	.031	3	.079	1	0	15
388			min	-598.65	3	.745	15	-26.854	3	-.079	1	-.03	3	-.003	4
389		5	max	1986.057	1	2.643	4	72.655	1	.031	3	.1	1	-.001	15
390			min	-598.755	3	.621	15	-26.854	3	-.079	1	-.037	3	-.004	4
391		6	max	1985.918	1	2.114	4	72.655	1	.031	3	.121	1	-.001	15
392			min	-598.859	3	.497	15	-26.854	3	-.079	1	-.045	3	-.005	4
393		7	max	1985.779	1	1.586	4	72.655	1	.031	3	.143	1	-.001	15
394			min	-598.964	3	.373	15	-26.854	3	-.079	1	-.053	3	-.006	4
395		8	max	1985.639	1	1.057	4	72.655	1	.031	3	.164	1	-.001	15
396			min	-599.069	3	.248	15	-26.854	3	-.079	1	-.061	3	-.006	4
397		9	max	1985.5	1	.529	4	72.655	1	.031	3	.185	1	-.001	15
398			min	-599.173	3	.124	15	-26.854	3	-.079	1	-.069	3	-.006	4
399		10	max	1985.36	1	0	1	72.655	1	.031	3	.206	1	-.001	15
400			min	-599.278	3	0	1	-26.854	3	-.079	1	-.077	3	-.006	4
401		11	max	1985.221	1	-.124	15	72.655	1	.031	3	.228	1	-.001	15
402			min	-599.382	3	-.529	6	-26.854	3	-.079	1	-.085	3	-.006	4
403		12	max	1985.082	1	-.248	15	72.655	1	.031	3	.249	1	-.001	15
404			min	-599.487	3	-1.057	6	-26.854	3	-.079	1	-.093	3	-.006	4
405		13	max	1984.942	1	-.373	15	72.655	1	.031	3	.27	1	-.001	15
406			min	-599.591	3	-1.586	6	-26.854	3	-.079	1	-.1	3	-.006	4
407		14	max	1984.803	1	-.497	15	72.655	1	.031	3	.292	1	-.001	15
408			min	-599.696	3	-2.114	6	-26.854	3	-.079	1	-.108	3	-.005	4
409		15	max	1984.663	1	-.621	15	72.655	1	.031	3	.313	1	-.001	15
410			min	-599.8	3	-2.643	6	-26.854	3	-.079	1	-.116	3	-.004	4
411		16	max	1984.524	1	-.745	15	72.655	1	.031	3	.334	1	0	15
412			min	-599.905	3	-3.171	6	-26.854	3	-.079	1	-.124	3	-.003	4
413		17	max	1984.384	1	-.87	15	72.655	1	.031	3	.356	1	0	15
414			min	-600.01	3	-3.7	6	-26.854	3	-.079	1	-.132	3	-.002	4
415		18	max	1984.245	1	-.994	15	72.655	1	.031	3	.377	1	0	15
416			min	-600.114	3	-4.229	6	-26.854	3	-.079	1	-.14	3	-.001	4
417		19	max	1984.106	1	-1.118	15	72.655	1	.031	3	.398	1	0	1
418			min	-600.219	3	-4.757	6	-26.854	3	-.079	1	-.148	3	0	1
419	M6	1	max	5659.802	1	4.757	4	0	1	.01	4	.006	4	0	1
420			min	-1981.5	3	1.118	15	-13.956	4	0	1	0	1	0	1
421		2	max	5659.662	1	4.229	4	0	1	.01	4	.002	4	0	15
422			min	-1981.604	3	.994	15	-13.579	4	0	1	0	1	-.001	4
423		3	max	5659.523	1	3.7	4	0	1	.01	4	0	1	0	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
424			min	-1981.709	3	.87	15	-13.202	4	0	1	-.002	4	-.002	4
425		4	max	5659.384	1	3.171	4	0	1	.01	4	0	1	0	15
426			min	-1981.813	3	.745	15	-12.825	4	0	1	-.005	4	-.003	4
427		5	max	5659.244	1	2.643	4	0	1	.01	4	0	1	-.001	15
428			min	-1981.918	3	.621	15	-12.448	4	0	1	-.009	4	-.004	4
429		6	max	5659.105	1	2.114	4	0	1	.01	4	0	1	-.001	15
430			min	-1982.022	3	.497	15	-12.071	4	0	1	-.013	4	-.005	4
431		7	max	5658.965	1	1.586	4	0	1	.01	4	0	1	-.001	15
432			min	-1982.127	3	.373	15	-11.695	4	0	1	-.016	4	-.006	4
433		8	max	5658.826	1	1.057	4	0	1	.01	4	0	1	-.001	15
434			min	-1982.232	3	.248	15	-11.318	4	0	1	-.02	4	-.006	4
435		9	max	5658.686	1	.529	4	0	1	.01	4	0	1	-.001	15
436			min	-1982.336	3	.124	15	-10.941	4	0	1	-.023	4	-.006	4
437		10	max	5658.547	1	0	1	0	1	.01	4	0	1	-.001	15
438			min	-1982.441	3	0	1	-10.564	4	0	1	-.026	4	-.006	4
439		11	max	5658.408	1	-.124	15	0	1	.01	4	0	1	-.001	15
440			min	-1982.545	3	-.529	6	-10.187	4	0	1	-.029	4	-.006	4
441		12	max	5658.268	1	-.248	15	0	1	.01	4	0	1	-.001	15
442			min	-1982.65	3	-1.057	6	-9.81	4	0	1	-.032	4	-.006	4
443		13	max	5658.129	1	-.373	15	0	1	.01	4	0	1	-.001	15
444			min	-1982.754	3	-1.586	6	-9.433	4	0	1	-.035	4	-.006	4
445		14	max	5657.989	1	-.497	15	0	1	.01	4	0	1	-.001	15
446			min	-1982.859	3	-2.114	6	-9.057	4	0	1	-.037	4	-.005	4
447		15	max	5657.85	1	-.621	15	0	1	.01	4	0	1	-.001	15
448			min	-1982.963	3	-2.643	6	-8.68	4	0	1	-.04	4	-.004	4
449		16	max	5657.711	1	-.745	15	0	1	.01	4	0	1	0	15
450			min	-1983.068	3	-3.171	6	-8.303	4	0	1	-.043	4	-.003	4
451		17	max	5657.571	1	-.87	15	0	1	.01	4	0	1	0	15
452			min	-1983.173	3	-3.7	6	-7.926	4	0	1	-.045	4	-.002	4
453		18	max	5657.432	1	-.994	15	0	1	.01	4	0	1	0	15
454			min	-1983.277	3	-4.229	6	-7.549	4	0	1	-.047	4	-.001	4
455		19	max	5657.292	1	-1.118	15	0	1	.01	4	0	1	0	1
456			min	-1983.382	3	-4.757	6	-7.172	4	0	1	-.049	4	0	1
457	M9	1	max	1986.615	1	4.757	6	26.854	3	.079	1	.006	5	0	1
458			min	-598.337	3	1.118	15	-72.655	1	-.031	3	-.015	1	0	1
459		2	max	1986.476	1	4.229	6	26.854	3	.079	1	.014	3	0	15
460			min	-598.441	3	.994	15	-72.655	1	-.031	3	-.036	1	-.001	6
461		3	max	1986.336	1	3.7	6	26.854	3	.079	1	.022	3	0	15
462			min	-598.546	3	.87	15	-72.655	1	-.031	3	-.057	1	-.002	6
463		4	max	1986.197	1	3.171	6	26.854	3	.079	1	.03	3	0	15
464			min	-598.65	3	.745	15	-72.655	1	-.031	3	-.079	1	-.003	6
465		5	max	1986.057	1	2.643	6	26.854	3	.079	1	.037	3	-.001	15
466			min	-598.755	3	.621	15	-72.655	1	-.031	3	-.1	1	-.004	6
467		6	max	1985.918	1	2.114	6	26.854	3	.079	1	.045	3	-.001	15
468			min	-598.859	3	.497	15	-72.655	1	-.031	3	-.121	1	-.005	6
469		7	max	1985.779	1	1.586	6	26.854	3	.079	1	.053	3	-.001	15
470			min	-598.964	3	.373	15	-72.655	1	-.031	3	-.143	1	-.006	6
471		8	max	1985.639	1	1.057	6	26.854	3	.079	1	.061	3	-.001	15
472			min	-599.069	3	.248	15	-72.655	1	-.031	3	-.164	1	-.006	6
473		9	max	1985.5	1	.529	6	26.854	3	.079	1	.069	3	-.001	15
474			min	-599.173	3	.124	15	-72.655	1	-.031	3	-.185	1	-.006	6
475		10	max	1985.36	1	0	1	26.854	3	.079	1	.077	3	-.001	15
476			min	-599.278	3	0	1	-72.655	1	-.031	3	-.206	1	-.006	6
477		11	max	1985.221	1	-.124	15	26.854	3	.079	1	.085	3	-.001	15
478			min	-599.382	3	-.529	4	-72.655	1	-.031	3	-.228	1	-.006	6
479		12	max	1985.082	1	-.248	15	26.854	3	.079	1	.093	3	-.001	15
480			min	-599.487	3	-1.057	4	-72.655	1	-.031	3	-.249	1	-.006	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
481		13	max	1984.942	1	-.373	15	26.854	3	.079	1	.1	3	-.001	15
482			min	-599.591	3	-1.586	4	-72.655	1	-.031	3	-.27	1	-.006	6
483		14	max	1984.803	1	-.497	15	26.854	3	.079	1	.108	3	-.001	15
484			min	-599.696	3	-2.114	4	-72.655	1	-.031	3	-.292	1	-.005	6
485		15	max	1984.663	1	-.621	15	26.854	3	.079	1	.116	3	-.001	15
486			min	-599.8	3	-2.643	4	-72.655	1	-.031	3	-.313	1	-.004	6
487		16	max	1984.524	1	-.745	15	26.854	3	.079	1	.124	3	0	15
488			min	-599.905	3	-3.171	4	-72.655	1	-.031	3	-.334	1	-.003	6
489		17	max	1984.384	1	-.87	15	26.854	3	.079	1	.132	3	0	15
490			min	-600.01	3	-3.7	4	-72.655	1	-.031	3	-.356	1	-.002	6
491		18	max	1984.245	1	-.994	15	26.854	3	.079	1	.14	3	0	15
492			min	-600.114	3	-4.229	4	-72.655	1	-.031	3	-.377	1	-.001	6
493		19	max	1984.106	1	-1.118	15	26.854	3	.079	1	.148	3	0	1
494			min	-600.219	3	-4.757	4	-72.655	1	-.031	3	-.398	1	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	-.003	12	.114	3	.031	1	1.175e-2	3	NC	3	NC	3
2			min	-.271	1	-.798	1	-.628	5	-3.437e-2	1	159.37	1	232.132	5
3		2	max	-.003	12	.087	3	.01	1	1.175e-2	3	7883.428	12	NC	3
4			min	-.271	1	-.687	1	-.597	4	-3.437e-2	1	183.729	1	246.142	5
5		3	max	-.003	12	.059	3	0	12	1.125e-2	3	3938.369	12	NC	2
6			min	-.271	1	-.575	1	-.566	4	-3.228e-2	1	216.912	1	262.65	5
7		4	max	-.003	12	.033	3	0	12	1.047e-2	3	2942.091	15	NC	1
8			min	-.271	1	-.467	1	-.528	4	-2.908e-2	1	262.751	1	284.552	4
9		5	max	-.003	12	.01	3	0	3	9.69e-3	3	3265.747	15	NC	1
10			min	-.271	1	-.369	1	-.485	4	-2.588e-2	1	325.32	1	313.34	4
11		6	max	-.004	12	-.005	12	.002	3	9.742e-3	3	3633.035	15	NC	1
12			min	-.27	1	-.287	1	-.439	4	-2.489e-2	1	406.585	1	350.449	5
13		7	max	-.004	12	-.012	12	.002	3	1.037e-2	3	4049.303	15	NC	2
14			min	-.27	1	-.22	1	-.392	4	-2.542e-2	1	510.62	1	397.383	5
15		8	max	-.004	12	-.012	15	0	3	1.1e-2	3	4536.205	15	NC	2
16			min	-.269	1	-.162	1	-.347	4	-2.596e-2	1	653.196	1	455.964	5
17		9	max	-.004	12	-.009	15	0	9	1.179e-2	3	5130.274	15	NC	2
18			min	-.268	1	-.11	1	-.307	4	-2.538e-2	1	877.9	1	528.499	5
19		10	max	-.004	12	-.006	15	0	1	1.289e-2	3	5885.259	15	NC	2
20			min	-.267	1	-.059	1	-.266	4	-2.28e-2	1	903.562	3	630.496	5
21		11	max	-.004	12	-.002	15	.002	3	1.398e-2	3	NC	10	NC	2
22			min	-.267	1	-.034	3	-.225	4	-2.022e-2	1	906.293	3	778.201	5
23		12	max	-.004	12	.033	1	.007	3	1.13e-2	3	NC	1	NC	2
24			min	-.266	1	-.03	3	-.188	4	-1.51e-2	1	929.915	3	999.678	5
25		13	max	-.004	12	.07	1	.013	3	6.479e-3	3	NC	9	NC	1
26			min	-.265	1	-.019	3	-.151	4	-8.528e-3	1	1004.273	3	1384.503	5
27		14	max	-.004	12	.095	1	.014	3	1.871e-3	3	NC	4	NC	2
28			min	-.264	1	.003	12	-.118	4	-4.946e-3	4	1214.686	3	2060.264	5
29		15	max	-.004	12	.101	1	.01	3	6.745e-3	3	NC	4	NC	2
30			min	-.264	1	.009	15	-.093	4	-6.632e-3	1	1911.915	3	3183.84	5
31		16	max	-.004	12	.097	3	.008	1	1.162e-2	3	NC	4	NC	2
32			min	-.264	1	.011	15	-.077	5	-1.106e-2	1	2605.366	1	4092.874	1
33		17	max	-.004	12	.158	3	.006	1	1.649e-2	3	NC	4	NC	2
34			min	-.264	1	.013	15	-.066	5	-1.549e-2	1	3046.534	3	4402.233	1
35		18	max	-.004	12	.223	3	0	12	1.967e-2	3	NC	4	NC	2
36			min	-.265	1	.015	15	-.061	4	-1.838e-2	1	1239.097	3	7992.981	1
37		19	max	-.004	12	.287	3	-.003	10	1.967e-2	3	NC	1	NC	1
38			min	-.265	1	.007	10	-.057	4	-1.838e-2	1	778.218	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
39	M4	1	max	.023	3	.383	3	0	1	1.873e-4	4	NC	3	NC	1
40			min	-.641	1	-1.965	1	-.624	4	0	1	68.168	1	234.413	4
41		2	max	.023	3	.301	3	0	1	1.873e-4	4	2881.854	15	NC	1
42			min	-.641	1	-1.685	1	-.597	4	0	1	79.463	1	246.052	4
43		3	max	.023	3	.22	3	0	1	1.992e-5	5	3438.327	15	NC	1
44			min	-.641	1	-1.405	1	-.568	4	0	1	95.285	1	260.029	4
45		4	max	.023	3	.142	3	0	1	0	1	4229.622	15	NC	1
46			min	-.641	1	-1.134	1	-.53	4	-2.397e-4	4	117.994	1	280.535	4
47		5	max	.023	3	.074	3	0	1	0	1	5352.097	15	NC	1
48			min	-.641	1	-.889	1	-.486	4	-4.982e-4	4	150.404	1	308.998	4
49		6	max	.023	3	.022	3	0	1	0	1	6882.431	15	NC	1
50			min	-.64	1	-.688	1	-.439	4	-4.79e-4	4	194.385	1	346.926	4
51		7	max	.022	3	-.009	12	0	1	0	1	8969.879	15	NC	1
52			min	-.638	1	-.527	1	-.391	4	-2.677e-4	4	253.294	1	395.307	4
53		8	max	.021	3	-.011	15	0	1	0	1	NC	15	NC	1
54			min	-.636	1	-.393	1	-.347	4	-5.636e-5	4	319.293	3	454.815	4
55		9	max	.021	3	-.008	15	0	1	1.241e-5	5	NC	5	NC	1
56			min	-.634	1	-.269	1	-.307	4	0	1	306.541	3	525.566	4
57		10	max	.02	3	-.004	15	0	1	0	1	NC	5	NC	1
58			min	-.632	1	-.148	1	-.266	4	-1.732e-4	4	297.6	3	627.719	4
59		11	max	.02	3	0	15	0	1	0	1	NC	4	NC	1
60			min	-.63	1	-.074	3	-.225	4	-3.582e-4	4	293.215	3	775.402	4
61		12	max	.019	3	.077	1	0	1	0	1	NC	5	NC	1
62			min	-.628	1	-.073	3	-.188	4	-1.427e-3	4	293.933	3	986.124	4
63		13	max	.019	3	.168	1	0	1	0	1	NC	5	NC	1
64			min	-.626	1	-.054	3	-.151	4	-2.996e-3	4	306.812	3	1356.011	4
65		14	max	.018	3	.222	1	0	1	0	1	NC	5	NC	1
66			min	-.624	1	-.002	3	-.119	4	-4.506e-3	4	348.834	3	2003.963	4
67		15	max	.018	3	.226	1	0	1	0	1	NC	5	NC	1
68			min	-.624	1	.006	15	-.096	4	-3.384e-3	4	470.24	3	3071.619	4
69		16	max	.018	3	.231	3	0	1	0	1	NC	5	NC	1
70			min	-.624	1	.005	15	-.079	4	-2.261e-3	4	705.881	1	4959.082	4
71		17	max	.018	3	.387	3	0	1	0	1	NC	3	NC	1
72			min	-.624	1	.004	15	-.068	4	-1.139e-3	4	1013.703	1	8632.898	4
73		18	max	.018	3	.55	3	0	1	0	1	NC	5	NC	1
74			min	-.624	1	.002	15	-.06	4	-4.069e-4	4	803.266	3	NC	1
75		19	max	.018	3	.712	3	0	1	0	1	NC	1	NC	1
76			min	-.624	1	-.006	9	-.052	4	-4.069e-4	4	406.988	3	NC	1
77	M7	1	max	.002	5	.114	3	0	12	3.437e-2	1	NC	3	NC	3
78			min	-.271	1	-.798	1	-.641	4	-1.175e-2	3	159.37	1	224.668	4
79		2	max	.002	5	.087	3	0	12	3.437e-2	1	NC	5	NC	3
80			min	-.271	1	-.687	1	-.602	4	-1.175e-2	3	183.729	1	240.523	4
81		3	max	.002	5	.059	3	.009	1	3.228e-2	1	NC	5	NC	2
82			min	-.271	1	-.575	1	-.562	4	-1.125e-2	3	216.912	1	259.016	4
83		4	max	.002	5	.033	3	.016	1	2.908e-2	1	NC	5	NC	1
84			min	-.271	1	-.467	1	-.52	5	-1.047e-2	3	262.751	1	281.726	4
85		5	max	.002	5	.01	3	.017	1	2.588e-2	1	NC	5	NC	1
86			min	-.271	1	-.369	1	-.477	5	-9.69e-3	3	325.32	1	310.065	4
87		6	max	.002	5	.001	5	.015	1	2.489e-2	1	NC	5	NC	1
88			min	-.27	1	-.287	1	-.432	4	-9.742e-3	3	406.585	1	345.594	4
89		7	max	.002	5	.002	5	.008	1	2.542e-2	1	NC	5	NC	2
90			min	-.27	1	-.22	1	-.389	4	-1.037e-2	3	510.62	1	388.916	4
91		8	max	.002	5	.002	5	.002	2	2.596e-2	1	NC	5	NC	2
92			min	-.269	1	-.162	1	-.347	4	-1.1e-2	3	653.196	1	442.528	4
93		9	max	.002	5	.002	5	0	3	2.538e-2	1	NC	4	NC	2
94			min	-.268	1	-.11	1	-.307	4	-1.179e-2	3	877.9	1	510.846	4
95		10	max	.002	5	.002	5	0	3	2.28e-2	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
96			min	-.267	1	-.059	1	-.266	4	-1.289e-2	3	903.562	3	605.552	4
97		11	max	.002	5	.002	5	.002	1	2.022e-2	1	NC	4	NC	2
98			min	-.267	1	-.034	3	-.225	4	-1.398e-2	3	906.293	3	743.451	4
99		12	max	.002	5	.033	1	.01	1	1.51e-2	1	NC	1	NC	2
100			min	-.266	1	-.03	3	-.184	4	-1.13e-2	3	929.915	3	958.42	4
101		13	max	.002	5	.07	1	.013	1	8.528e-3	1	NC	5	NC	1
102			min	-.265	1	-.019	3	-.147	5	-6.479e-3	3	1004.273	3	1316.654	4
103		14	max	.002	5	.095	1	.009	2	2.201e-3	1	NC	5	NC	2
104			min	-.264	1	0	5	-.116	4	-4.369e-3	5	1214.686	3	1872.042	4
105		15	max	.002	5	.101	1	.002	2	6.632e-3	1	NC	5	NC	2
106			min	-.264	1	-.004	5	-.096	4	-6.745e-3	3	1911.915	3	2611.373	4
107		16	max	.002	5	.097	3	0	10	1.106e-2	1	NC	5	NC	2
108			min	-.264	1	-.007	5	-.081	4	-1.162e-2	3	2605.366	1	3649.104	4
109		17	max	.002	5	.158	3	0	10	1.549e-2	1	NC	5	NC	2
110			min	-.264	1	-.011	5	-.069	4	-1.649e-2	3	3046.534	3	4402.233	1
111		18	max	.002	5	.223	3	.008	1	1.838e-2	1	NC	4	NC	2
112			min	-.265	1	-.016	5	-.057	5	-1.967e-2	3	1239.097	3	7992.981	1
113		19	max	.002	5	.287	3	.025	1	1.838e-2	1	NC	1	NC	1
114			min	-.265	1	-.02	5	-.048	5	-1.967e-2	3	778.218	3	NC	1
115	M10	1	max	.002	1	.2	3	.265	1	8.604e-3	3	NC	1	NC	1
116			min	-.061	4	-.014	5	-.002	5	-2.432e-3	1	NC	1	NC	1
117		2	max	.002	1	.513	3	.342	1	1.007e-2	3	NC	5	NC	3
118			min	-.061	4	-.223	1	.009	12	-3.145e-3	1	881.414	3	3549.786	1
119		3	max	.002	1	.801	3	.468	1	1.154e-2	3	NC	5	NC	3
120			min	-.062	4	-.481	1	.013	12	-3.857e-3	1	459.472	3	1353.509	1
121		4	max	.001	1	1.007	3	.597	1	1.301e-2	3	NC	5	NC	3
122			min	-.062	4	-.651	1	.014	12	-4.57e-3	1	342.012	3	830.674	1
123		5	max	.001	1	1.101	3	.695	1	1.448e-2	3	NC	5	NC	3
124			min	-.062	4	-.701	1	.013	12	-5.283e-3	1	306.415	3	640.595	1
125		6	max	0	1	1.075	3	.747	1	1.595e-2	3	NC	5	NC	3
126			min	-.062	4	-.628	1	.009	12	-5.995e-3	1	315.419	3	572.577	1
127		7	max	0	1	.948	3	.747	1	1.741e-2	3	NC	5	NC	3
128			min	-.062	4	-.452	1	.004	12	-6.708e-3	1	369.318	3	572.085	1
129		8	max	0	1	.76	3	.708	1	1.888e-2	3	NC	5	NC	3
130			min	-.062	4	-.221	1	-.006	3	-7.42e-3	1	493.309	3	622.994	1
131		9	max	0	1	.578	3	.653	1	2.035e-2	3	NC	4	NC	3
132			min	-.062	4	-.009	14	-.014	3	-8.133e-3	1	730.634	3	709.55	1
133		10	max	0	1	.493	3	.624	1	2.182e-2	3	NC	1	NC	3
134			min	-.062	4	.003	15	-.018	3	-8.846e-3	1	942.794	3	767.039	1
135		11	max	0	3	.578	3	.653	1	2.035e-2	3	NC	4	NC	3
136			min	-.062	4	-.009	9	-.014	3	-8.133e-3	1	730.634	3	709.55	1
137		12	max	0	3	.76	3	.708	1	1.888e-2	3	NC	5	NC	3
138			min	-.062	4	-.221	1	-.006	3	-7.42e-3	1	493.309	3	622.994	1
139		13	max	0	3	.948	3	.747	1	1.741e-2	3	NC	5	NC	3
140			min	-.062	4	-.452	1	.004	12	-6.708e-3	1	369.318	3	572.085	1
141		14	max	0	3	1.075	3	.747	1	1.595e-2	3	NC	5	NC	3
142			min	-.062	4	-.628	1	.009	12	-5.995e-3	1	315.419	3	572.577	1
143		15	max	0	3	1.101	3	.695	1	1.448e-2	3	NC	5	NC	3
144			min	-.062	4	-.701	1	.013	12	-5.283e-3	1	306.415	3	640.595	1
145		16	max	0	3	1.007	3	.597	1	1.301e-2	3	NC	5	NC	3
146			min	-.062	4	-.651	1	.014	12	-4.57e-3	1	342.012	3	830.674	1
147		17	max	0	3	.801	3	.468	1	1.154e-2	3	NC	5	NC	3
148			min	-.062	4	-.481	1	.013	12	-3.857e-3	1	459.472	3	1353.509	1
149		18	max	0	3	.513	3	.342	1	1.007e-2	3	NC	5	NC	3
150			min	-.062	4	-.223	1	.009	12	-3.145e-3	1	881.414	3	3549.786	1
151		19	max	0	3	.2	3	.265	1	8.604e-3	3	NC	1	NC	1
152			min	-.062	4	.015	15	.004	12	-2.432e-3	1	7681.883	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
153	M11	1	max	.005	1	.005	1	.266	1	6.015e-3	1	NC	1	NC	1
154			min	-.21	4	-.033	3	-.002	5	-4.897e-5	5	NC	1	NC	1
155		2	max	.004	1	.205	3	.333	1	6.98e-3	1	NC	5	NC	3
156			min	-.21	4	-.297	1	0	3	9.891e-6	15	913.249	1	3981.421	4
157		3	max	.004	1	.428	3	.454	1	7.946e-3	1	NC	5	NC	3
158			min	-.21	4	-.563	1	-.003	3	6.06e-5	15	485.83	1	1473.845	1
159		4	max	.003	1	.579	3	.581	1	8.911e-3	1	NC	5	NC	3
160			min	-.211	4	-.737	1	-.003	3	1.113e-4	15	371.951	1	878.179	1
161		5	max	.003	1	.628	3	.681	1	9.877e-3	1	NC	5	NC	3
162			min	-.211	4	-.789	1	-.003	3	1.62e-4	15	347.501	1	665.447	1
163		6	max	.002	1	.567	3	.736	1	1.084e-2	1	NC	5	NC	3
164			min	-.211	4	-.716	1	-.005	3	1.633e-4	12	382.909	1	587.312	1
165		7	max	.002	1	.412	3	.742	1	1.181e-2	1	NC	5	NC	3
166			min	-.211	4	-.539	1	-.013	5	1.358e-4	12	507.717	1	580.603	1
167		8	max	.001	1	.206	3	.707	1	1.277e-2	1	NC	5	NC	3
168			min	-.211	4	-.306	1	-.03	5	1.083e-4	12	889.096	1	626.014	1
169		9	max	0	1	.013	3	.657	1	1.374e-2	1	NC	4	NC	3
170			min	-.211	4	-.09	1	-.021	5	8.087e-5	12	2910.025	1	706.583	1
171		10	max	0	1	.009	1	.629	1	1.47e-2	1	NC	1	NC	3
172			min	-.212	4	-.075	3	-.019	3	5.34e-5	12	6501.241	3	760.402	1
173		11	max	0	3	.013	3	.657	1	1.374e-2	1	NC	4	NC	3
174			min	-.212	4	-.09	1	-.017	3	8.087e-5	12	2910.025	1	706.583	1
175		12	max	0	3	.206	3	.707	1	1.277e-2	1	NC	5	NC	3
176			min	-.212	4	-.306	1	-.013	3	1.083e-4	12	889.096	1	626.014	1
177		13	max	.001	3	.412	3	.742	1	1.181e-2	1	NC	5	NC	3
178			min	-.212	4	-.539	1	-.009	3	1.358e-4	12	507.717	1	580.603	1
179		14	max	.001	3	.567	3	.736	1	1.084e-2	1	NC	15	NC	3
180			min	-.212	4	-.716	1	-.005	3	1.633e-4	12	382.909	1	587.312	1
181		15	max	.002	3	.628	3	.681	1	9.877e-3	1	8221.403	15	NC	3
182			min	-.212	4	-.789	1	-.003	3	1.907e-4	12	347.501	1	665.447	1
183		16	max	.002	3	.579	3	.581	1	8.911e-3	1	7912.655	15	NC	3
184			min	-.212	4	-.737	1	-.015	5	2.182e-4	12	371.951	1	878.179	1
185		17	max	.002	3	.428	3	.454	1	7.946e-3	1	9222.508	15	NC	3
186			min	-.212	4	-.563	1	-.033	5	2.457e-4	12	485.83	1	1473.845	1
187		18	max	.003	3	.205	3	.333	1	6.98e-3	1	NC	5	NC	3
188			min	-.212	4	-.297	1	-.023	5	2.731e-4	12	913.249	1	4136.164	1
189		19	max	.003	3	.005	1	.266	1	6.015e-3	1	NC	1	NC	1
190			min	-.212	4	-.033	3	.004	12	3.006e-4	12	NC	1	NC	1
191	M12	1	max	0	2	.002	5	.268	1	7.039e-3	1	NC	1	NC	1
192			min	-.321	4	-.129	1	-.002	5	-5.991e-4	3	NC	1	NC	1
193		2	max	0	2	.136	3	.322	1	8.103e-3	1	NC	5	NC	2
194			min	-.321	4	-.532	1	.006	12	-7.862e-4	3	684.523	1	4011.098	4
195		3	max	0	2	.268	3	.436	1	9.168e-3	1	NC	5	NC	3
196			min	-.321	4	-.88	1	.008	12	-9.733e-4	3	367.336	1	1645.614	1
197		4	max	0	2	.346	3	.562	1	1.023e-2	1	NC	5	NC	3
198			min	-.321	4	-1.112	1	.008	12	-1.16e-3	3	280.803	1	941.517	1
199		5	max	0	2	.36	3	.664	1	1.13e-2	1	NC	15	NC	3
200			min	-.321	4	-1.194	1	.007	12	-1.347e-3	3	258.987	1	697.376	1
201		6	max	0	2	.314	3	.724	1	1.236e-2	1	NC	15	NC	3
202			min	-.321	4	-1.126	1	.005	12	-1.535e-3	3	276.816	1	605.828	1
203		7	max	0	2	.221	3	.735	1	1.343e-2	1	NC	5	NC	3
204			min	-.321	4	-.932	1	-.018	5	-1.722e-3	3	343.394	1	591.224	1
205		8	max	0	2	.104	3	.707	1	1.449e-2	1	NC	5	NC	3
206			min	-.321	4	-.671	1	-.034	5	-1.909e-3	3	509.266	1	630.011	1
207		9	max	0	2	-.001	12	.661	1	1.555e-2	1	NC	5	NC	3
208			min	-.321	4	-.426	1	-.024	5	-2.096e-3	3	928.243	1	703.717	1
209		10	max	0	1	-.009	15	.635	1	1.662e-2	1	NC	3	NC	3

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.321	4	-.314	1	-.021	3	-2.283e-3	3	1492.166	1	753.459	1
211		11	max	0	9	-.001	12	.661	1	1.555e-2	1	NC	5	NC	3
212			min	-.321	4	-.426	1	-.018	3	-2.096e-3	3	928.243	1	703.717	1
213		12	max	0	9	.104	3	.707	1	1.449e-2	1	NC	5	NC	3
214			min	-.321	4	-.671	1	-.011	3	-1.909e-3	3	509.266	1	630.011	1
215		13	max	0	9	.221	3	.735	1	1.343e-2	1	NC	15	NC	3
216			min	-.321	4	-.932	1	-.002	3	-1.722e-3	3	343.394	1	591.224	1
217		14	max	0	9	.314	3	.724	1	1.236e-2	1	8837.402	15	NC	3
218			min	-.321	4	-1.126	1	.005	12	-1.535e-3	3	276.816	1	605.828	1
219		15	max	0	9	.36	3	.664	1	1.13e-2	1	7992.166	15	NC	3
220			min	-.321	4	-1.194	1	.007	12	-1.347e-3	3	258.987	1	697.376	1
221		16	max	0	9	.346	3	.562	1	1.023e-2	1	8327.681	15	NC	3
222			min	-.321	4	-1.112	1	-.017	5	-1.16e-3	3	280.803	1	941.517	1
223		17	max	0	9	.268	3	.436	1	9.168e-3	1	NC	15	NC	3
224			min	-.321	4	-.88	1	-.036	5	-9.733e-4	3	367.336	1	1645.614	1
225		18	max	0	9	.136	3	.322	1	8.103e-3	1	NC	5	NC	2
226			min	-.321	4	-.532	1	-.026	5	-7.862e-4	3	684.523	1	5129.744	1
227		19	max	0	9	-.01	15	.268	1	7.039e-3	1	NC	1	NC	1
228			min	-.321	4	-.129	1	.004	12	-5.991e-4	3	NC	1	NC	1
229	M13	1	max	0	3	.077	3	.271	1	1.497e-2	1	NC	1	NC	1
230			min	-.588	4	-.648	1	-.002	5	-3.704e-3	3	NC	1	NC	1
231		2	max	0	3	.255	3	.356	1	1.748e-2	1	NC	5	NC	3
232			min	-.588	4	-1.175	1	.005	12	-4.505e-3	3	523.924	1	3236.571	1
233		3	max	0	3	.409	3	.487	1	1.999e-2	1	NC	15	NC	3
234			min	-.588	4	-1.644	1	.007	12	-5.307e-3	3	277.047	1	1276.545	1
235		4	max	0	3	.516	3	.618	1	2.249e-2	1	NC	15	NC	3
236			min	-.588	4	-1.991	1	.007	12	-6.109e-3	3	205.442	1	795.231	1
237		5	max	0	3	.564	3	.717	1	2.5e-2	1	8544.657	15	NC	3
238			min	-.588	4	-2.181	1	.006	12	-6.91e-3	3	180.029	1	618.257	1
239		6	max	0	3	.552	3	.768	1	2.75e-2	1	8076.649	15	NC	3
240			min	-.588	4	-2.207	1	.003	3	-7.712e-3	3	177.015	1	555.222	1
241		7	max	0	3	.49	3	.767	1	3.001e-2	1	8368.316	15	NC	3
242			min	-.588	4	-2.093	1	-.005	3	-8.514e-3	3	190.97	1	556.166	1
243		8	max	0	3	.4	3	.726	1	3.252e-2	1	9299.179	15	NC	3
244			min	-.588	4	-1.892	1	-.013	3	-9.315e-3	3	221.826	1	606.176	1
245		9	max	0	3	.313	3	.671	1	3.502e-2	1	NC	15	NC	3
246			min	-.588	4	-1.686	1	-.02	3	-1.012e-2	3	265.776	1	690.014	1
247		10	max	0	1	.273	3	.641	1	3.753e-2	1	NC	15	NC	3
248			min	-.588	4	-1.588	1	-.023	3	-1.092e-2	3	293.673	1	745.346	1
249		11	max	0	1	.313	3	.671	1	3.502e-2	1	NC	15	NC	3
250			min	-.587	4	-1.686	1	-.02	3	-1.012e-2	3	265.776	1	690.014	1
251		12	max	0	1	.4	3	.726	1	3.252e-2	1	8362.026	15	NC	3
252			min	-.587	4	-1.892	1	-.013	3	-9.315e-3	3	221.826	1	606.176	1
253		13	max	0	1	.49	3	.767	1	3.001e-2	1	7047.626	15	NC	3
254			min	-.587	4	-2.093	1	-.005	3	-8.514e-3	3	190.97	1	556.166	1
255		14	max	.001	1	.552	3	.768	1	2.75e-2	1	6395.503	15	NC	3
256			min	-.587	4	-2.207	1	.003	3	-7.712e-3	3	177.015	1	555.222	1
257		15	max	.001	1	.564	3	.717	1	2.5e-2	1	6359.586	15	NC	3
258			min	-.587	4	-2.181	1	.006	12	-6.91e-3	3	180.029	1	618.257	1
259		16	max	.002	1	.516	3	.618	1	2.249e-2	1	7073.902	15	NC	3
260			min	-.587	4	-1.991	1	-.014	5	-6.109e-3	3	205.442	1	795.231	1
261		17	max	.002	1	.409	3	.487	1	1.999e-2	1	9248.792	15	NC	3
262			min	-.587	4	-1.644	1	-.028	5	-5.307e-3	3	277.047	1	1276.545	1
263		18	max	.002	1	.255	3	.356	1	1.748e-2	1	NC	5	NC	3
264			min	-.587	4	-1.175	1	-.017	5	-4.505e-3	3	523.924	1	3236.571	1
265		19	max	.002	1	.077	3	.271	1	1.497e-2	1	NC	1	NC	1
266			min	-.587	4	-.648	1	.003	12	-3.704e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	5	2.075e-3	1	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-1.961e-3	5	NC	1	NC	1
271		3	max	0	3	0	12	.002	5	4.149e-3	1	NC	1	NC	1
272			min	0	1	-.004	1	0	1	-3.923e-3	5	NC	1	NC	1
273		4	max	0	3	0	12	.005	5	6.224e-3	1	NC	3	NC	1
274			min	0	1	-.01	1	-.001	1	-5.884e-3	5	5562.998	1	NC	1
275		5	max	0	3	0	12	.009	5	7.907e-3	1	NC	3	NC	1
276			min	0	1	-.017	1	-.002	1	-7.544e-3	5	3118.812	1	6231.996	5
277		6	max	0	3	-.001	12	.013	5	7.194e-3	1	NC	3	NC	1
278			min	0	1	-.027	1	-.003	1	-7.363e-3	5	1981.254	1	4101.005	5
279		7	max	0	3	-.001	12	.018	5	6.481e-3	1	NC	3	NC	2
280			min	0	1	-.039	1	-.004	1	-7.182e-3	5	1377.698	1	2925.582	5
281		8	max	0	3	-.002	12	.024	5	5.768e-3	1	NC	3	NC	2
282			min	0	1	-.053	1	-.005	1	-7.001e-3	5	1019.305	1	2207.511	5
283		9	max	0	3	-.002	12	.031	5	5.055e-3	1	NC	3	NC	2
284			min	0	1	-.068	1	-.005	1	-6.82e-3	5	788.772	1	1735.593	5
285		10	max	0	3	-.002	12	.038	5	4.342e-3	1	NC	3	NC	2
286			min	0	1	-.085	1	-.006	1	-6.638e-3	5	631.738	1	1408.641	5
287		11	max	0	3	-.002	12	.046	5	3.629e-3	1	NC	3	NC	2
288			min	-.001	1	-.103	1	-.006	1	-6.457e-3	5	519.832	1	1172.47	5
289		12	max	0	3	-.003	12	.054	5	2.924e-3	2	NC	3	NC	2
290			min	-.001	1	-.123	1	-.006	1	-6.276e-3	5	437.187	1	996.129	5
291		13	max	0	3	-.003	12	.062	5	2.306e-3	2	NC	3	NC	2
292			min	-.001	1	-.143	1	-.006	1	-6.095e-3	5	374.409	1	860.952	5
293		14	max	0	3	-.003	12	.071	5	1.687e-3	2	NC	3	NC	2
294			min	-.001	1	-.165	1	-.005	1	-5.914e-3	5	325.57	1	755.008	5
295		15	max	0	3	-.004	12	.08	4	1.069e-3	2	NC	3	NC	2
296			min	-.001	1	-.187	1	-.003	1	-5.733e-3	5	286.825	1	668.48	4
297		16	max	0	3	-.004	12	.09	4	4.504e-4	2	NC	12	NC	2
298			min	-.001	1	-.21	1	-.003	3	-5.628e-3	4	255.576	1	597.773	4
299		17	max	0	3	-.004	12	.099	4	4.792e-4	3	NC	12	NC	2
300			min	-.002	1	-.233	1	-.006	3	-5.551e-3	4	230.012	1	539.615	4
301		18	max	0	3	-.005	12	.109	4	7.691e-4	3	NC	12	NC	1
302			min	-.002	1	-.257	1	-.01	3	-5.473e-3	4	208.849	1	491.227	4
303		19	max	.001	3	-.005	12	.119	4	1.059e-3	3	NC	12	NC	1
304			min	-.002	1	-.281	1	-.014	3	-5.395e-3	4	191.148	1	450.567	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	4	0	1	NC	1	NC	1
308			min	0	1	-.002	1	0	1	-2.092e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.002	4	0	1	NC	3	NC	1
310			min	0	1	-.01	1	0	1	-4.184e-3	4	5621.212	1	NC	1
311		4	max	0	3	0	15	.005	4	0	1	NC	3	NC	1
312			min	-.001	1	-.022	1	0	1	-6.276e-3	4	2461.698	1	NC	1
313		5	max	0	3	0	12	.009	4	0	1	NC	3	NC	1
314			min	-.001	1	-.039	1	0	1	-8.044e-3	4	1367.05	1	5931.204	4
315		6	max	0	3	0	12	.014	4	0	1	NC	3	NC	1
316			min	-.002	1	-.062	1	0	1	-7.826e-3	4	860.656	1	3907.042	4
317		7	max	.001	3	0	12	.019	4	0	1	NC	3	NC	1
318			min	-.002	1	-.09	1	0	1	-7.609e-3	4	594.89	1	2789.994	4
319		8	max	.001	3	0	3	.025	4	0	1	NC	3	NC	1
320			min	-.002	1	-.122	1	0	1	-7.391e-3	4	438.264	1	2107.499	4
321		9	max	.001	3	.001	3	.032	4	0	1	NC	3	NC	1
322			min	-.002	1	-.159	1	0	1	-7.174e-3	4	338.069	1	1658.982	4
323		10	max	.002	3	.002	3	.04	4	0	1	NC	3	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.003	1	-.199	1	0	1	-6.956e-3	4	270.105	1	1348.278	4
325		11	max	.002	3	.004	3	.048	4	0	1	NC	3	NC	1
326			min	-.003	1	-.242	1	0	1	-6.739e-3	4	221.831	1	1123.891	4
327		12	max	.002	3	.005	3	.056	4	0	1	NC	3	NC	1
328			min	-.003	1	-.288	1	0	1	-6.521e-3	4	186.275	1	956.403	4
329		13	max	.002	3	.007	3	.065	4	0	1	NC	12	NC	1
330			min	-.003	1	-.337	1	0	1	-6.304e-3	4	159.324	1	828.069	4
331		14	max	.002	3	.008	3	.074	4	0	1	NC	12	NC	1
332			min	-.004	1	-.387	1	0	1	-6.086e-3	4	138.396	1	727.552	4
333		15	max	.002	3	.01	3	.083	4	0	1	9553.998	12	NC	1
334			min	-.004	1	-.44	1	0	1	-5.869e-3	4	121.819	1	647.389	4
335		16	max	.003	3	.012	3	.092	4	0	1	7994.131	12	NC	1
336			min	-.004	1	-.494	1	0	1	-5.651e-3	4	108.467	1	582.492	4
337		17	max	.003	3	.014	3	.101	4	0	1	6841.62	12	NC	1
338			min	-.004	1	-.55	1	0	1	-5.434e-3	4	97.557	1	529.287	4
339		18	max	.003	3	.016	3	.111	4	0	1	5964.204	12	NC	1
340			min	-.005	1	-.606	1	0	1	-5.217e-3	4	88.534	1	485.212	4
341		19	max	.003	3	.018	3	.12	4	0	1	5280.248	12	NC	1
342			min	-.005	1	-.662	1	0	1	-4.999e-3	4	80.994	1	448.386	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	0	4	7.879e-4	3	NC	1	NC	1
346			min	0	1	-.001	1	0	3	-2.422e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.002	4	1.576e-3	3	NC	1	NC	1
348			min	0	1	-.004	1	0	3	-4.845e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.005	4	2.364e-3	3	NC	3	NC	1
350			min	0	1	-.01	1	0	3	-7.267e-3	4	5562.998	1	9982.319	4
351		5	max	0	3	0	5	.009	4	3.e-3	3	NC	3	NC	1
352			min	0	1	-.017	1	-.001	3	-9.301e-3	4	3118.812	1	5812.92	4
353		6	max	0	3	0	5	.014	4	2.71e-3	3	NC	3	NC	1
354			min	0	1	-.027	1	-.002	3	-8.958e-3	4	1981.254	1	3841.653	4
355		7	max	0	3	0	5	.019	4	2.42e-3	3	NC	3	NC	2
356			min	0	1	-.039	1	-.002	3	-8.614e-3	4	1377.698	1	2750.954	4
357		8	max	0	3	0	5	.026	4	2.13e-3	3	NC	3	NC	2
358			min	0	1	-.053	1	-.003	3	-8.27e-3	4	1019.305	1	2083.482	4
359		9	max	0	3	0	5	.033	4	1.84e-3	3	NC	3	NC	2
360			min	0	1	-.068	1	-.003	3	-7.927e-3	4	788.772	1	1644.391	4
361		10	max	0	3	0	5	.04	4	1.55e-3	3	NC	3	NC	2
362			min	0	1	-.085	1	-.003	3	-7.583e-3	4	631.738	1	1340.014	4
363		11	max	0	3	0	5	.048	4	1.26e-3	3	NC	3	NC	2
364			min	-.001	1	-.103	1	-.003	3	-7.24e-3	4	519.832	1	1120.122	4
365		12	max	0	3	0	5	.056	4	9.705e-4	3	NC	3	NC	2
366			min	-.001	1	-.123	1	-.003	3	-6.896e-3	4	437.187	1	955.993	4
367		13	max	0	3	.001	5	.065	4	6.806e-4	3	NC	3	NC	2
368			min	-.001	1	-.143	1	-.002	3	-6.552e-3	4	374.409	1	830.274	4
369		14	max	0	3	.001	5	.073	4	3.906e-4	3	NC	3	NC	2
370			min	-.001	1	-.165	1	0	3	-6.209e-3	4	325.57	1	731.88	4
371		15	max	0	3	.001	5	.082	4	1.007e-4	3	NC	3	NC	2
372			min	-.001	1	-.187	1	0	10	-5.865e-3	4	286.825	1	653.513	4
373		16	max	0	3	.001	5	.091	4	1.318e-4	9	NC	5	NC	2
374			min	-.001	1	-.21	1	0	10	-5.529e-3	5	255.576	1	590.188	4
375		17	max	0	3	.002	5	.1	4	6.5e-4	1	NC	5	NC	2
376			min	-.002	1	-.233	1	-.003	2	-5.292e-3	5	230.012	1	538.415	4
377		18	max	0	3	.002	5	.108	4	1.363e-3	1	NC	5	NC	1
378			min	-.002	1	-.257	1	-.006	2	-5.054e-3	5	208.849	1	495.686	4
379		19	max	.001	3	.002	5	.117	4	2.076e-3	1	NC	5	NC	1
380			min	-.002	1	-.281	1	-.009	2	-4.817e-3	5	191.148	1	460.166	4

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
381	M3	1	max	.015	1	0	12	.008	5	2.336e-3	1	NC	1	NC	1
382			min	0	12	-.006	1	-.002	1	-1.189e-3	5	NC	1	NC	1
383		2	max	.014	1	0	12	.035	5	3.267e-3	1	NC	1	NC	5
384			min	0	12	-.03	1	-.029	1	-1.247e-3	5	NC	1	2275.061	1
385		3	max	.014	1	0	12	.062	5	4.199e-3	1	NC	1	NC	5
386			min	.001	12	-.054	1	-.055	1	-1.563e-3	3	NC	1	1153.9	1
387		4	max	.013	1	-.001	12	.089	5	5.131e-3	1	NC	1	NC	5
388			min	.001	15	-.078	1	-.079	1	-1.932e-3	3	NC	1	785.007	1
389		5	max	.012	1	-.002	12	.115	5	6.062e-3	1	NC	1	NC	15
390			min	.001	15	-.102	1	-.102	1	-2.301e-3	3	NC	1	604.618	1
391		6	max	.012	1	-.002	12	.142	5	6.994e-3	1	NC	1	NC	15
392			min	.001	15	-.126	1	-.123	1	-2.67e-3	3	NC	1	500.136	1
393		7	max	.011	1	-.002	12	.169	5	7.926e-3	1	NC	1	9147.257	15
394			min	.001	15	-.15	1	-.141	1	-3.039e-3	3	NC	1	434.203	1
395		8	max	.01	1	-.002	12	.195	5	8.857e-3	1	NC	1	8088.97	15
396			min	.001	15	-.174	1	-.157	1	-3.408e-3	3	NC	1	379.447	4
397		9	max	.01	1	-.003	12	.222	5	9.789e-3	1	NC	1	7394.106	15
398			min	.001	15	-.197	1	-.168	1	-3.777e-3	3	NC	1	330.38	4
399		10	max	.009	1	-.003	12	.247	5	1.072e-2	1	NC	1	6961.551	15
400			min	.001	15	-.221	1	-.175	1	-4.146e-3	3	NC	1	292.179	4
401		11	max	.008	1	-.003	12	.273	5	1.165e-2	1	NC	1	6741.661	15
402			min	0	15	-.244	1	-.178	1	-4.515e-3	3	NC	1	261.578	4
403		12	max	.008	1	-.003	12	.298	5	1.258e-2	1	NC	1	6719.499	15
404			min	0	15	-.268	1	-.176	1	-4.884e-3	3	NC	1	236.501	4
405		13	max	.007	1	-.003	12	.323	5	1.352e-2	1	NC	1	6912.689	15
406			min	0	15	-.291	1	-.169	1	-5.253e-3	3	NC	1	215.562	4
407		14	max	.006	1	-.003	12	.347	5	1.445e-2	1	NC	1	7384.027	15
408			min	0	10	-.314	1	-.155	1	-5.622e-3	3	NC	1	197.804	4
409		15	max	.006	1	-.003	12	.371	5	1.538e-2	1	NC	1	8283.8	15
410			min	0	10	-.337	1	-.135	1	-5.991e-3	3	NC	1	182.541	4
411		16	max	.005	1	-.002	12	.394	5	1.631e-2	1	NC	1	9984.369	15
412			min	0	10	-.36	1	-.109	1	-6.36e-3	3	NC	1	169.273	4
413		17	max	.004	3	-.002	3	.417	5	1.724e-2	1	NC	1	NC	15
414			min	0	10	-.383	1	-.075	1	-6.729e-3	3	NC	1	157.622	4
415		18	max	.005	3	-.002	3	.439	5	1.817e-2	1	NC	1	NC	5
416			min	0	10	-.406	1	-.035	2	-7.098e-3	3	NC	1	147.303	4
417		19	max	.005	3	-.001	3	.466	4	1.91e-2	1	NC	1	NC	1
418			min	-.001	10	-.429	1	-.001	3	-7.467e-3	3	NC	1	138.091	4
419	M6	1	max	.034	1	0	3	.008	4	0	1	NC	1	NC	1
420			min	0	12	-.013	1	0	1	-1.292e-3	4	NC	1	NC	1
421		2	max	.032	1	.003	3	.037	4	0	1	NC	1	NC	1
422			min	0	15	-.07	1	0	1	-1.415e-3	4	NC	1	NC	1
423		3	max	.03	1	.005	3	.066	4	0	1	NC	1	NC	1
424			min	0	15	-.127	1	0	1	-1.538e-3	4	NC	1	NC	1
425		4	max	.028	1	.008	3	.094	4	0	1	NC	1	NC	1
426			min	0	15	-.183	1	0	1	-1.661e-3	4	8424.161	3	6873.074	4
427		5	max	.026	1	.01	3	.122	4	0	1	NC	1	NC	1
428			min	0	15	-.24	1	0	1	-1.784e-3	4	6273.689	3	5207.657	4
429		6	max	.024	1	.013	3	.151	4	0	1	NC	1	NC	1
430			min	0	15	-.297	1	0	1	-1.907e-3	4	4976.145	3	4247.988	4
431		7	max	.023	1	.016	3	.179	4	0	1	NC	1	NC	1
432			min	0	15	-.354	1	0	1	-2.03e-3	4	4106.173	3	3644.372	4
433		8	max	.021	1	.018	3	.206	4	0	1	NC	1	NC	1
434			min	0	15	-.41	1	0	1	-2.154e-3	4	3481.455	3	3248.948	4
435		9	max	.019	1	.021	3	.233	4	0	1	NC	1	NC	1
436			min	0	15	-.466	1	0	1	-2.277e-3	4	3010.792	3	2990.17	4
437		10	max	.017	1	.024	3	.26	4	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438			min	0	15	-.523	1	0	1	-2.4e-3	4	2643.479	3	2831.415	4
439		11	max	.015	1	.027	3	.286	4	0	1	NC	1	NC	1
440			min	0	15	-.579	1	0	1	-2.523e-3	4	2349.047	3	2755.15	4
441		12	max	.013	1	.03	3	.311	4	0	1	NC	1	NC	1
442			min	0	15	-.635	1	0	1	-2.646e-3	4	2108.066	3	2757.044	4
443		13	max	.011	1	.033	3	.336	4	0	1	NC	1	NC	1
444			min	0	15	-.691	1	0	1	-2.769e-3	4	1907.545	3	2845.6	4
445		14	max	.01	3	.037	3	.36	4	0	1	NC	1	NC	1
446			min	0	10	-.747	1	0	1	-2.893e-3	4	1738.456	3	3047.668	4
447		15	max	.011	3	.04	3	.383	4	0	1	NC	1	NC	1
448			min	-.001	10	-.803	1	0	1	-3.016e-3	4	1594.321	3	3426.171	4
449		16	max	.012	3	.043	3	.406	4	0	1	NC	1	NC	1
450			min	-.002	10	-.858	1	0	1	-3.139e-3	4	1470.366	3	4136.07	4
451		17	max	.012	3	.047	3	.427	4	0	1	NC	1	NC	1
452			min	-.003	2	-.914	1	0	1	-3.262e-3	4	1362.991	3	5650.573	4
453		18	max	.013	3	.05	3	.447	4	0	1	NC	1	NC	1
454			min	-.005	2	-.97	1	0	1	-3.385e-3	4	1269.429	3	NC	1
455		19	max	.014	3	.054	3	.467	4	0	1	NC	1	NC	1
456			min	-.007	2	-1.025	1	0	1	-3.508e-3	4	1187.515	3	NC	1
457	M9	1	max	.015	1	0	5	.009	4	8.247e-4	3	NC	1	NC	1
458			min	0	5	-.006	1	-.001	3	-2.336e-3	1	NC	1	NC	1
459		2	max	.014	1	0	15	.041	4	1.194e-3	3	NC	1	NC	5
460			min	0	5	-.03	1	-.012	3	-3.267e-3	1	NC	1	2275.061	1
461		3	max	.014	1	0	15	.074	4	1.563e-3	3	NC	1	NC	15
462			min	0	5	-.054	1	-.022	3	-4.199e-3	1	NC	1	1153.9	1
463		4	max	.013	1	0	15	.107	4	1.932e-3	3	NC	1	8392.462	15
464			min	0	5	-.078	1	-.031	3	-5.131e-3	1	NC	1	785.007	1
465		5	max	.012	1	0	15	.139	4	2.301e-3	3	NC	1	6372.015	15
466			min	0	5	-.102	1	-.04	3	-6.062e-3	1	NC	1	604.618	1
467		6	max	.012	1	0	15	.17	4	2.67e-3	3	NC	1	5206.571	15
468			min	0	5	-.126	1	-.048	3	-6.994e-3	1	NC	1	500.136	1
469		7	max	.011	1	0	15	.201	4	3.039e-3	3	NC	1	4472.901	15
470			min	0	5	-.15	1	-.055	3	-7.926e-3	1	NC	1	434.203	1
471		8	max	.01	1	0	15	.231	4	3.408e-3	3	NC	1	3992.01	15
472			min	0	5	-.174	1	-.061	3	-8.857e-3	1	NC	1	391.018	1
473		9	max	.01	1	0	15	.259	4	3.777e-3	3	NC	1	3677.289	15
474			min	0	5	-.197	1	-.065	3	-9.789e-3	1	NC	1	362.954	1
475		10	max	.009	1	0	15	.287	4	4.146e-3	3	NC	1	3484.434	15
476			min	0	5	-.221	1	-.068	3	-1.072e-2	1	NC	1	346.148	1
477		11	max	.008	1	0	15	.313	4	4.515e-3	3	NC	1	3392.309	15
478			min	0	5	-.244	1	-.069	3	-1.165e-2	1	NC	1	338.826	1
479		12	max	.008	1	0	15	.338	4	4.884e-3	3	NC	1	3395.852	15
480			min	0	5	-.268	1	-.069	3	-1.258e-2	1	NC	1	340.702	1
481		13	max	.007	1	0	15	.361	4	5.253e-3	3	NC	1	3505.697	15
482			min	0	5	-.291	1	-.066	3	-1.352e-2	1	NC	1	353.006	1
483		14	max	.006	1	0	15	.383	4	5.622e-3	3	NC	1	3755.006	15
484			min	0	5	-.314	1	-.062	3	-1.445e-2	1	NC	1	379.203	1
485		15	max	.006	1	0	15	.402	4	5.991e-3	3	NC	1	4221.303	15
486			min	0	5	-.337	1	-.054	3	-1.538e-2	1	NC	1	427.234	1
487		16	max	.005	1	0	15	.42	4	6.36e-3	3	NC	1	5095.376	15
488			min	0	5	-.36	1	-.045	3	-1.631e-2	1	NC	1	516.515	1
489		17	max	.004	3	.001	15	.435	4	6.729e-3	3	NC	1	6959.725	15
490			min	0	5	-.383	1	-.032	3	-1.724e-2	1	NC	1	706.22	1
491		18	max	.005	3	.001	15	.448	4	7.098e-3	3	NC	1	NC	15
492			min	0	5	-.406	1	-.017	3	-1.817e-2	1	NC	1	1293.51	1
493		19	max	.005	3	.002	15	.459	5	7.467e-3	3	NC	1	NC	1
494			min	-.001	10	-.429	1	-.017	1	-1.91e-2	1	NC	1	NC	1