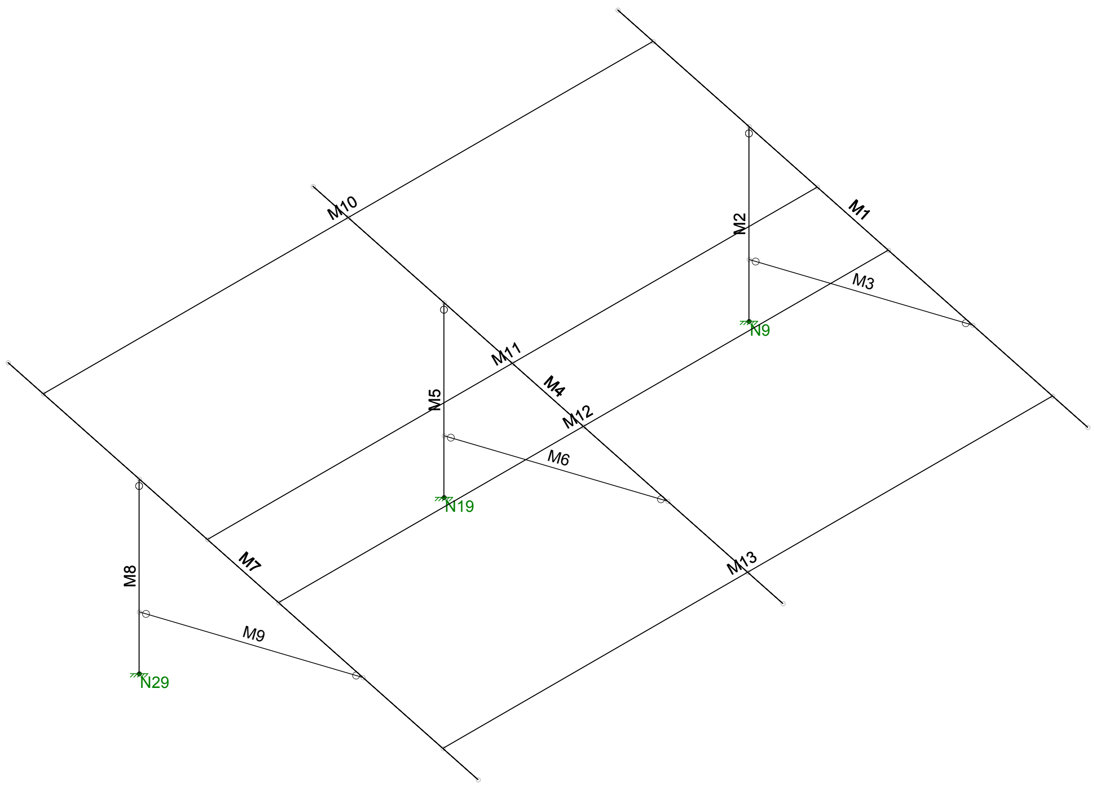


Schletter, Inc.		15° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

1. INTRODUCTION

1.1 Project Description

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

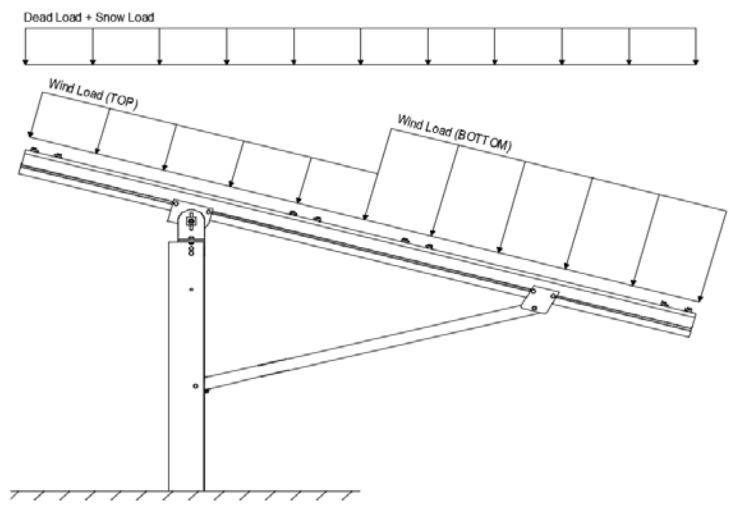
1.2 Construction

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

PV modules are required to meet the following specifications:

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

Modules Per Row = 2
Module Tilt = 15°
Maximum Height Above Grade = 3 ft



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

Self-weight of the PV modules.

2.2 Snow Loads

Ground Snow Load, P_g =	30.00 psf	
Sloped Roof Snow Load, P_s =	22.68 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	1.00	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V = 115 mph
Height < 15 ft

Exposure Category = C
Importance Category = II

Peak Velocity Pressure, q_z = 20.76 psf *Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

$Cf+_{TOP}$	=	1	*(Pressure)*
$Cf+_{BOTTOM}$	=	1.6	
$Cf-_{TOP}$	=	-2.04	*(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 + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W ^{M}
1.54D + 1.3E + 0.2S ^{R}
0.56D + 1.3E ^{R}
1.54D + 1.25E + 0.2S ^{O}
0.56D + 1.25E ^{O}

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

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W ^{M}
1.238D + 0.875E ^{O}
1.1785D + 0.65625E + 0.75S ^{O}
0.362D + 0.875E ^{O}

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

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

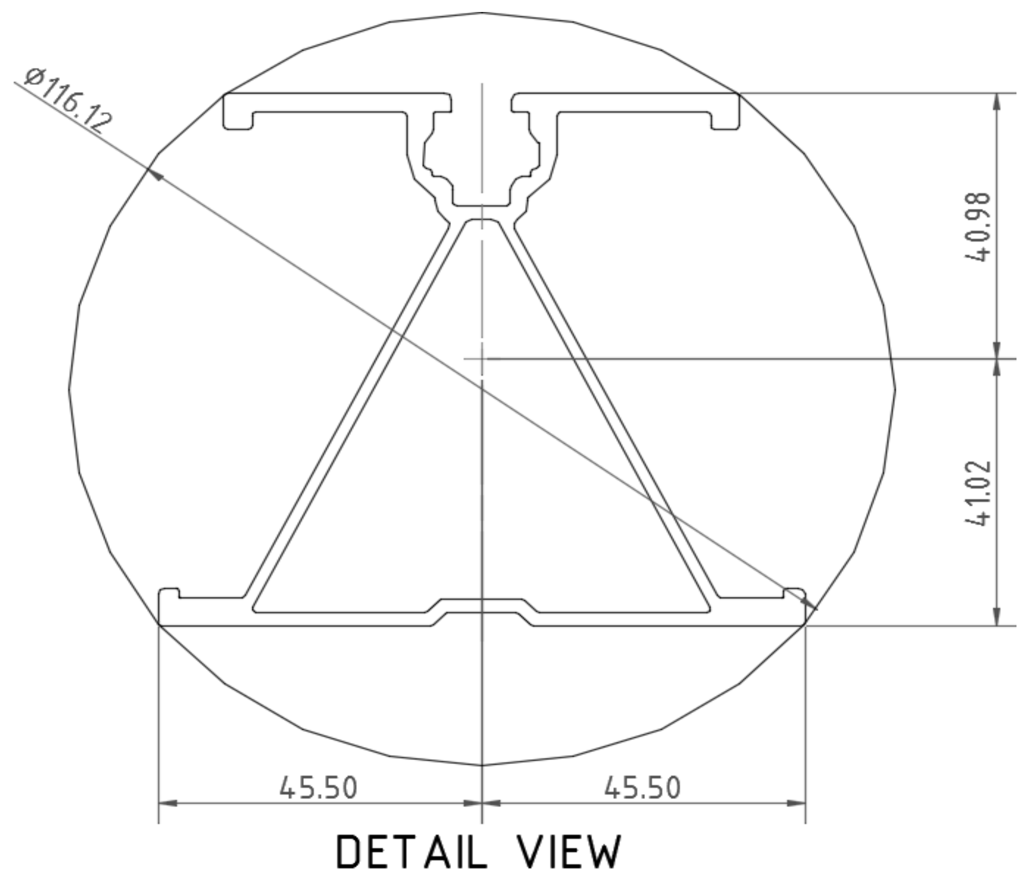
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

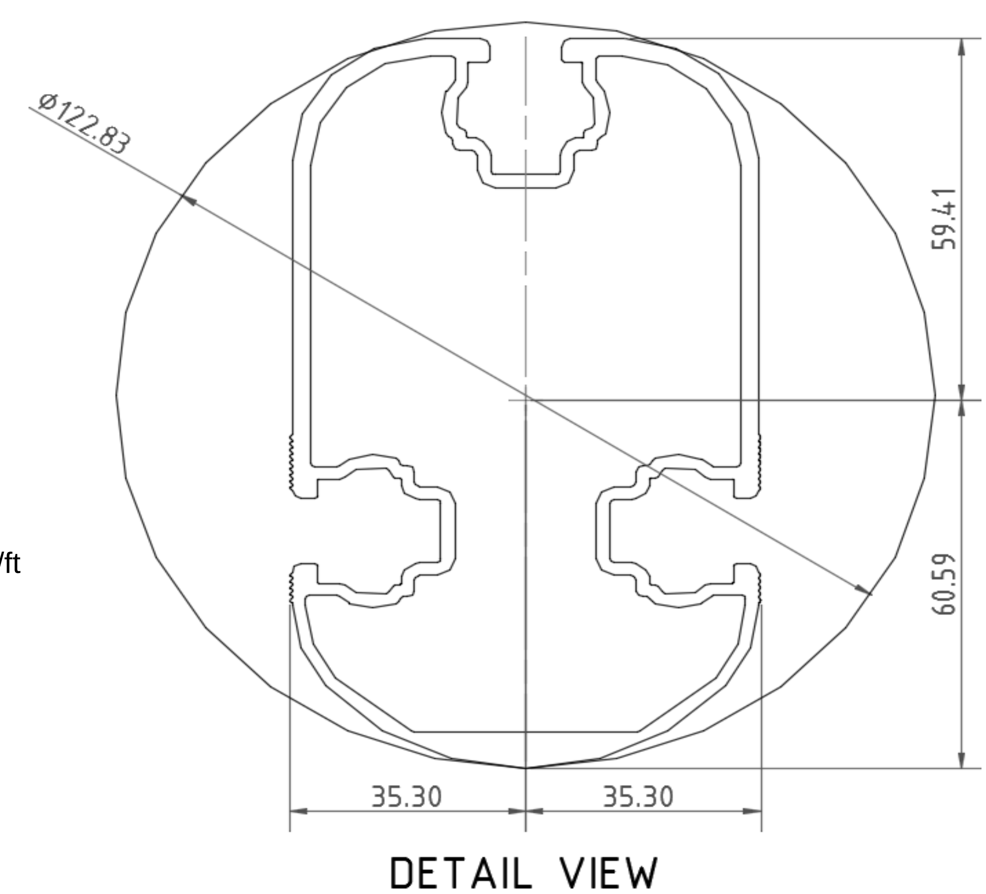
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	120	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.711	k-ft
M_z =	0.122	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	72%	



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).

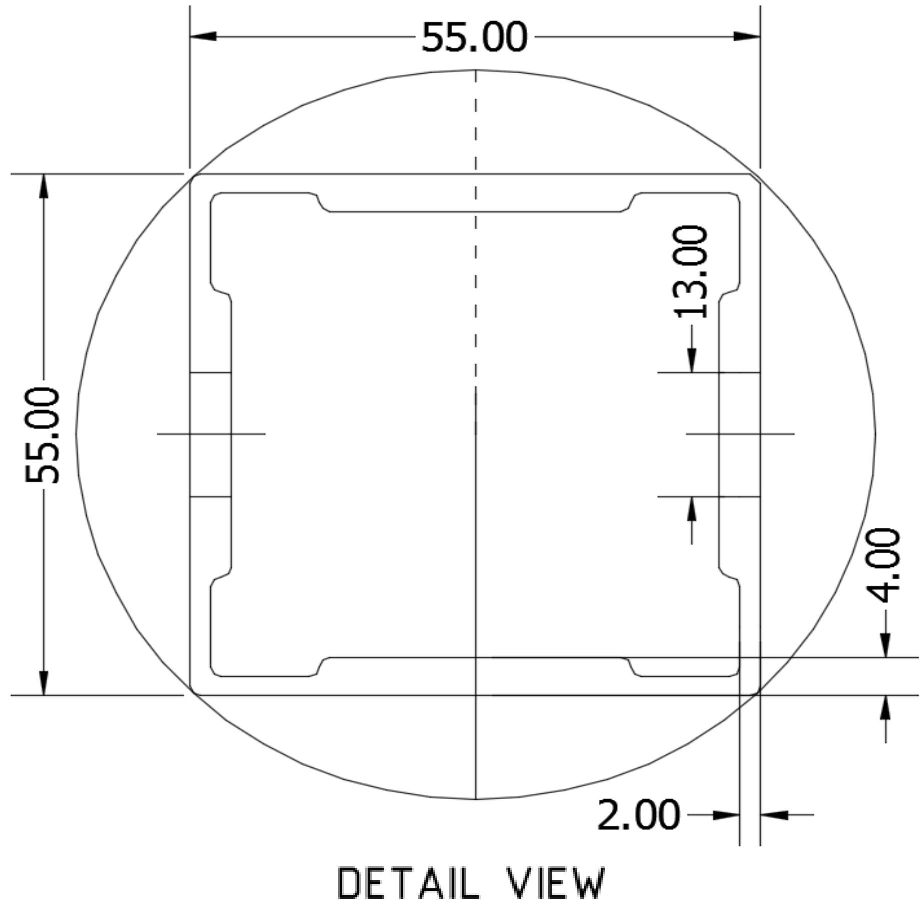
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	3.668	k-ft
M_z =	0.000	k-ft
P_n =	0.237	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	73%	



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).

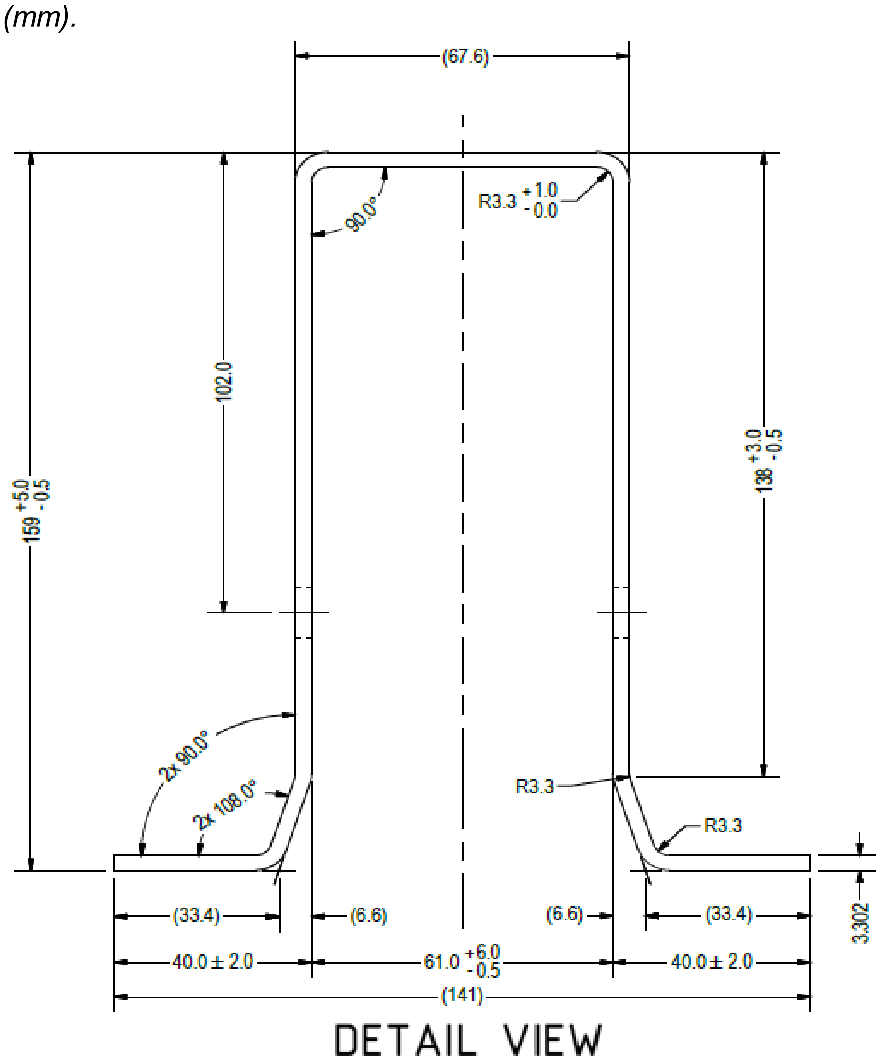
Strut Type =	**55x55**
Aluminum Type =	6105-T5
F_{ty} =	35 ksi
L_b =	61.00 in
$\Phi F_{ty\ AXIAL}$ =	13.67 ksi
$\Phi F_{ty\ BENDING}$ =	28.22 ksi
S_y =	0.60 in^3
S_x =	0.60 in^3
E =	10100 ksi
I_y =	0.67 in^4
I_x =	0.67 in^4
A =	0.98 in^2
g =	1.18 lbs/ft
M_y =	0.005 k-ft
M_z =	0.000 k-ft
P_n =	6.876 k
$M_{y\ allowable}$ =	1.408 k-ft
$M_{z\ allowable}$ =	1.408 k-ft
$P_{n\ allowable}$ =	13.425 k
Utilization =	52%



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 =	58.42 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 =	15.435 k-ft
M_z =	0.000 k-ft
P_r =	6.848 k
$M_{y\ allowable}$ =	19.207 k-ft
$M_{z\ allowable}$ =	14.389 k-ft
P_c =	57.399 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.

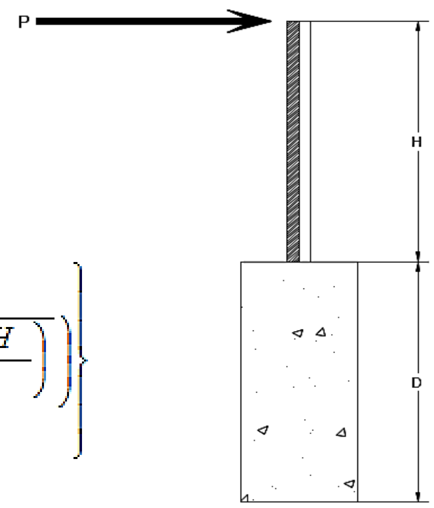
Maximum Tensile Load =	4.81	k
Maximum Lateral Load =	1.54	k

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 =	2.31	k
Height of Pole Above Grade, H =	3.87	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 =	2.31	k
Height of Pole Above Grade, H =	3.87	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 =	12.47	
Required Footing Depth, D =	15.80	ft
2nd Trial @ D_2 =	9.52	ft
Lateral Soil Bearing @ D/3, S_1 =	0.63	ksf
Lateral Soil Bearing @ D, S_3 =	1.90	ksf
Constant $2.34P/(S_1B)$, A =	4.26	
Required Footing Depth, D =	6.87	ft
3rd Trial @ D_3 =	8.20	ft
Lateral Soil Bearing @ D/3, S_1 =	0.55	ksf
Lateral Soil Bearing @ D, S_3 =	1.64	ksf
Constant $2.34P/(S_1B)$, A =	4.95	
Required Footing Depth, D =	7.67	ft
4th Trial @ D_4 =	7.93	ft
Lateral Soil Bearing @ D/3, S_1 =	0.53	ksf
Lateral Soil Bearing @ D, S_3 =	1.59	ksf
Constant $2.34P/(S_1B)$, A =	5.11	
Required Footing Depth, D =	7.85	ft
5th Trial @ D_5 =	7.89	ft
Lateral Soil Bearing @ D/3, S_1 =	0.53	ksf
Lateral Soil Bearing @ D, S_3 =	1.58	ksf
Constant $2.34P/(S_1B)$, A =	5.14	
Required Footing Depth, D =	8.00	ft

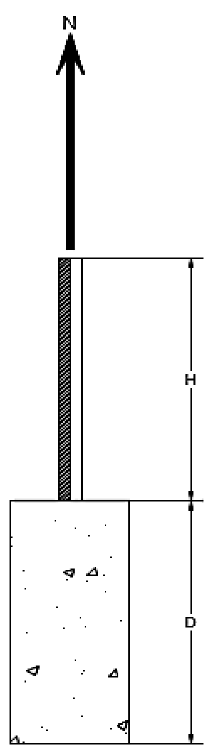
A 2ft diameter x 8ft deep footing unrestrained at ground level is required for the racking structure.

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 =	2.20	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 =	1.45	k
Required Concrete Volume, V =	9.97	ft^3
Required Footing Depth, D =	3.25	ft

A 2ft diameter x 3.25ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	4.73
2	0.4	0.2	118.10	4.62
3	0.6	0.2	118.10	4.52
4	0.8	0.2	118.10	4.42
5	1	0.2	118.10	4.31
6	1.2	0.2	118.10	4.21
7	1.4	0.2	118.10	4.11
8	1.6	0.2	118.10	4.00
9	1.8	0.2	118.10	3.90
10	2	0.2	118.10	3.79
11	2.2	0.2	118.10	3.69
12	2.4	0.2	118.10	3.59
13	2.6	0.2	118.10	3.48
14	2.8	0.2	118.10	3.38
15	3	0.2	118.10	3.28
16	3.2	0.2	118.10	3.17
17	0	0.0	0.00	3.17
18	0	0.0	0.00	3.17
19	0	0.0	0.00	3.17
20	0	0.0	0.00	3.17
21	0	0.0	0.00	3.17
22	0	0.0	0.00	3.17
23	0	0.0	0.00	3.17
24	0	0.0	0.00	3.17
25	0	0.0	0.00	3.17
26	0	0.0	0.00	3.17
27	0	0.0	0.00	3.17
28	0	0.0	0.00	3.17
29	0	0.0	0.00	3.17
30	0	0.0	0.00	3.17
31	0	0.0	0.00	3.17
32	0	0.0	0.00	3.17
33	0	0.0	0.00	3.17
34	0	0.0	0.00	3.17
Max	3.2	Sum	0.76	

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 =	8.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	4.20	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	31.42	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

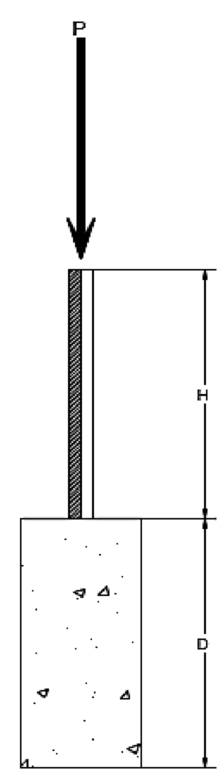
Weight of Concrete

Footing Volume	25.13	ft^3
Weight	3.64	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	4.71	k
1/3 Increase for Wind =	1.33	
Total Resistance =	12.57	k
Applied Force =	7.84	k
Utilization =	62%	

A 2ft diameter footing passes at a depth of 8ft.



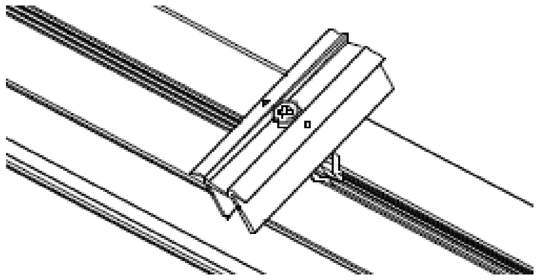
6. DESIGN OF JOINTS AND CONNECTIONS

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.

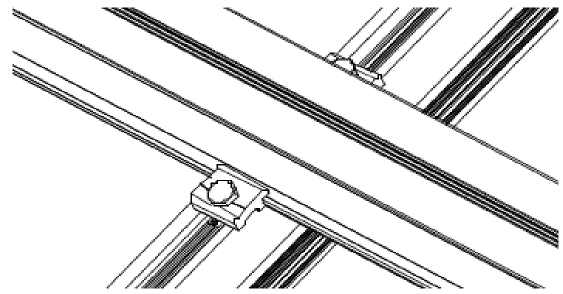
<u>Fastening of Modules to Purlins</u>

Maximum Uplifting Force =	0.392 k
Allowable Uplift =	1.214 k
Utilization =	<u>32%</u>



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

Maximum Uplifting Force =	1.371 k
Allowable Uplift =	2.180 k
Utilization =	<u>63%</u>

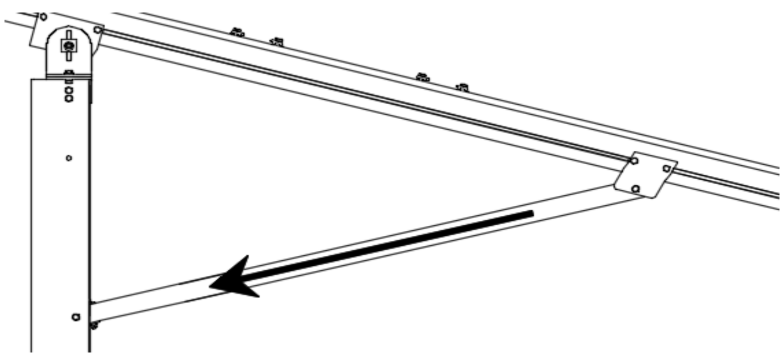


6.2 Strut Connections

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 =	6.876 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	<u>77%</u>

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

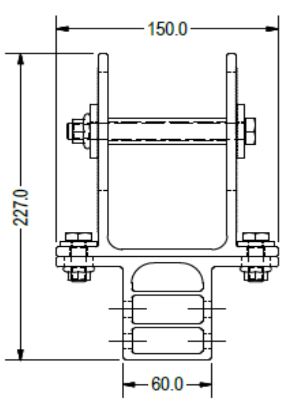


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

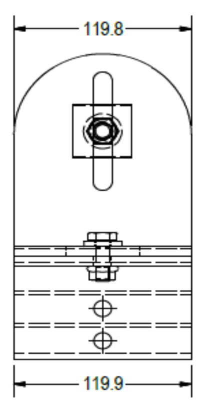
6.3 Girder to Post Connection

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.

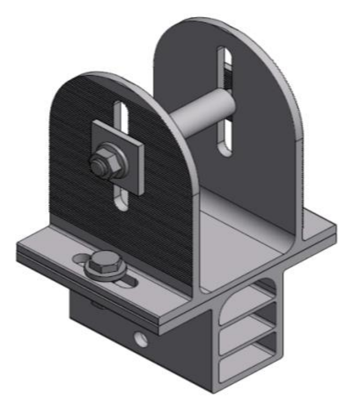
Maximum Tensile Load =	2.957 k
Allowable Load =	5.649 k
Utilization =	<u>52%</u>



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

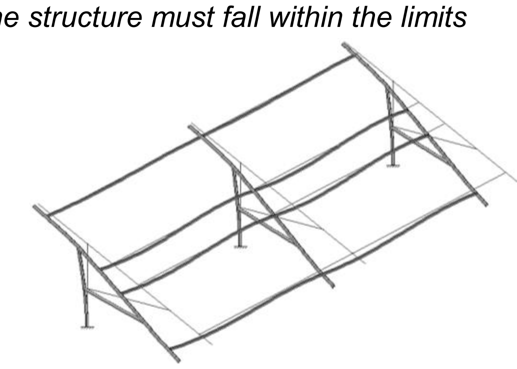
7.1 Seismic Drift

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} =	49.47 in
Allowable Story Drift for All Other Structures, Δ = {	$0.020h_{sx}$ 0.989 in
Max Drift, Δ_{MAX} =	0.476 in

<u>*0.476 ≤ 0.989, 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 = 120 in

J = 0.432

331.976

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

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= 27.4 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 in³

$M_{max}St$ = 2.788 k-ft

Weak Axis:

3.4.14

L_b = 120

J = 0.432

211.117

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

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= 28.6

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 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

φcc = 0.77756

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

φF_L = 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	58.42	in	
Pr =	6.85	k	(LRFD Factored Load)
Mr (Strong) =	15.44	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	84.05	
4.71√(E/Fy) =	103.55	=> kL/r ≤ 4.71√(E/Fy)
Fcr =	32.28	ksi
Fe =	40.51	ksi
Pn =	71.985	k

Torsional/Flexural Torsional Buckling:

Fcr =	25.7394	ksi
Fey =	103.338	ksi
Fez =	32.5781	ksi
Pn =	57.3988	k

Bending (Strong Axis):

Yielding:				
Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.1326 <	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 =	0.133 <	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	-61.093	-61.093	0	0
2	M11	Y	-61.093	-61.093	0	0
3	M12	Y	-61.093	-61.093	0	0
4	M13	Y	-61.093	-61.093	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	-57.906	-57.906	0	0
2	M11	y	-57.906	-57.906	0	0
3	M12	y	-92.65	-92.65	0	0
4	M13	y	-92.65	-92.65	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	118.129	118.129	0	0
2	M11	y	118.129	118.129	0	0
3	M12	y	57.906	57.906	0	0
4	M13	y	57.906	57.906	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

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

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.5W	Yes	Y		1	1.2	3	1.6	4	.5														
2	LRFD 1.2D + 1.0W + 0.5S	Yes	Y		1	1.2	3	.5	4	1														
3	LRFD 0.9D + 1.0W	Yes	Y		2	.9					5	1												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 0.6W	Yes	Y		1	1			4	.6														
11	ASD 1.0D + 0.75L + 0.45W + 0....	Yes	Y		1	1	3	.75	4	.45														
12	ASD 0.6D + 0.6W	Yes	Y		2	.6					5	.6												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65..	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	215.449	2	2503.791	1	315.437	1	.256	1	.005	5	6.505	1
2		min	-361.197	3	-1251.639	3	-320.227	5	-1.066	5	-.005	1	-.423	3
3	N19	max	1127.772	2	6891.03	1	0	1	0	1	.005	4	14.867	1
4		min	-1100.055	3	-3702.503	3	-349.559	5	-1.12	4	0	3	-1.482	3
5	N29	max	215.449	2	2503.791	1	205.555	3	.141	3	.006	4	6.505	1
6		min	-361.197	3	-1251.639	3	-393.781	4	-1.137	4	-.002	3	-.423	3
7	Totals:	max	1558.67	2	11898.611	1	0	3						
8		min	-1822.448	3	-6205.781	3	-1014.184	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	.005	1	.001	4	0	1	0	1	0	1
2			min	0	1	0	3	0	1	0	1	0	1	0	1
3		2	max	-.135	15	-.504	15	0	3	0	1	0	3	0	6
4			min	-.575	4	-2.144	6	-1.499	5	0	1	0	5	0	15
5		3	max	-2.536	12	213.825	3	15.467	3	.056	3	.23	1	.286	1
6			min	-157.734	1	-644.837	1	-158.445	1	-.22	1	-.003	3	-.094	3
7		4	max	-2.76	12	212.571	3	15.467	3	.056	3	.132	1	.687	1
8			min	-158.182	1	-646.508	1	-158.445	1	-.22	1	.004	12	-.227	3
9		5	max	-2.984	12	211.317	3	15.467	3	.056	3	.062	4	1.089	1
10			min	-158.63	1	-648.18	1	-158.445	1	-.22	1	-.006	10	-.358	3
11		6	max	616.984	3	556.325	1	32.053	3	-.004	15	.115	1	1.049	1
12			min	-2359.67	1	-134.824	3	-206.691	1	-.016	2	-.035	3	-.362	3
13		7	max	616.648	3	554.654	1	32.053	3	-.004	15	.008	2	.704	1
14			min	-2360.117	1	-136.078	3	-206.691	1	-.016	2	-.041	4	-.278	3
15		8	max	616.312	3	552.982	1	32.053	3	-.004	15	.005	3	.361	1
16			min	-2360.565	1	-137.332	3	-206.691	1	-.016	2	-.141	1	-.193	3
17		9	max	613.82	3	54.486	3	42.838	3	.009	5	.083	4	.167	1
18			min	-2525.515	1	-59.513	1	-226.102	1	-.195	2	.006	10	-.154	3
19		10	max	613.484	3	53.232	3	42.838	3	.009	5	.041	3	.204	1
20			min	-2525.963	1	-61.184	1	-226.102	1	-.195	2	-.066	1	-.188	3
21		11	max	613.148	3	51.979	3	42.838	3	.009	5	.068	3	.243	1
22			min	-2526.411	1	-62.856	1	-226.102	1	-.195	2	-.206	1	-.22	3
23		12	max	608.235	3	522.402	3	108.645	1	.281	3	.107	1	.511	1
24			min	-2686.232	1	-614.286	1	-204.576	5	-.441	1	.007	15	-.441	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	607.899	3	521.148	3	108.645	1	.281	3	.174	1	.893	1
26			min	-2686.68	1	-615.957	1	-206.075	5	-.441	1	-.116	5	-.765	3
27		14	max	160.08	1	555.803	1	75.246	5	.281	1	.047	1	1.259	1
28			min	2.277	12	-467.167	3	-156.507	1	-.28	3	-.217	5	-1.074	3
29		15	max	159.632	1	554.132	1	73.747	5	.281	1	-.004	10	.915	1
30			min	2.054	12	-468.421	3	-156.507	1	-.28	3	-.181	4	-.784	3
31		16	max	159.184	1	552.461	1	72.247	5	.281	1	-.004	12	.572	1
32			min	1.83	12	-469.674	3	-156.507	1	-.28	3	-.153	4	-.493	3
33		17	max	158.737	1	550.789	1	70.747	5	.281	1	.01	3	.229	1
34			min	1.606	12	-470.928	3	-156.507	1	-.28	3	-.244	1	-.201	3
35		18	max	.575	4	2.145	6	1.5	5	0	1	0	12	0	6
36			min	.135	15	.504	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	-.001	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.011	1	.001	4	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.135	15	-.504	15	0	1	0	1	0	1	0	4
42			min	-.575	4	-2.142	4	-1.499	5	0	1	0	5	0	15
43		3	max	-8.947	15	619.151	3	0	1	.011	4	.219	4	.66	1
44			min	-254.513	1	-1750.875	1	-105.731	5	0	1	0	1	-.233	3
45		4	max	-9.082	15	617.898	3	0	1	.011	4	.153	4	1.747	1
46			min	-254.961	1	-1752.546	1	-107.231	5	0	1	0	1	-.617	3
47		5	max	-9.217	15	616.644	3	0	1	.011	4	.086	4	2.835	1
48			min	-255.409	1	-1754.218	1	-108.731	5	0	1	0	1	-1	3
49		6	max	1939.702	3	1578.017	1	0	1	0	1	.004	4	2.701	1
50			min	-6335.16	1	-465.737	3	-110.053	4	-.008	4	0	1	-.986	3
51		7	max	1939.366	3	1576.346	1	0	1	0	1	0	1	1.722	1
52			min	-6335.608	1	-466.991	3	-111.553	4	-.008	4	-.065	5	-.697	3
53		8	max	1939.03	3	1574.675	1	0	1	0	1	0	1	.744	1
54			min	-6336.056	1	-468.244	3	-113.052	4	-.008	4	-.134	4	-.406	3
55		9	max	1915.268	3	192.997	3	0	1	.01	4	.134	4	.159	1
56			min	-6574.795	1	-276.413	1	-231.087	4	0	1	0	1	-.258	3
57		10	max	1914.932	3	191.743	3	0	1	.01	4	0	1	.331	1
58			min	-6575.243	1	-278.084	1	-232.587	4	0	1	-.01	4	-.377	3
59		11	max	1914.596	3	190.49	3	0	1	.01	4	0	1	.504	1
60			min	-6575.691	1	-279.756	1	-234.086	4	0	1	-.154	4	-.496	3
61		12	max	1895.676	3	1494.871	3	0	1	.09	4	.053	5	1.304	1
62			min	-6824.686	1	-1913.847	1	-245.169	5	0	1	0	1	-1.127	3
63		13	max	1895.34	3	1493.618	3	0	1	.09	4	0	1	2.492	1
64			min	-6825.133	1	-1915.519	1	-246.668	5	0	1	-.099	5	-2.055	3
65		14	max	253.853	1	1610.52	1	63.113	5	0	1	0	1	3.633	1
66			min	9.253	15	-1306.291	3	0	1	-.063	4	-.209	5	-2.943	3
67		15	max	253.405	1	1608.849	1	61.614	5	0	1	0	1	2.634	1
68			min	9.118	15	-1307.544	3	0	1	-.063	4	-.17	5	-2.132	3
69		16	max	252.957	1	1607.178	1	60.114	5	0	1	0	1	1.636	1
70			min	8.983	15	-1308.798	3	0	1	-.063	4	-.132	4	-1.32	3
71		17	max	252.509	1	1605.506	1	58.614	5	0	1	0	1	.639	1
72			min	8.847	15	-1310.051	3	0	1	-.063	4	-.096	4	-.507	3
73		18	max	.575	4	2.146	6	1.5	5	0	1	0	1	0	6
74			min	.135	15	.504	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.002	1	0	1	0	1	0	1	0	1
76			min	0	1	-.004	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.005	1	.002	4	0	1	0	1	0	1
78			min	0	1	0	3	0	3	0	1	0	1	0	1
79		2	max	-.135	15	-.504	15	0	1	0	1	0	1	0	4
80			min	-.575	4	-2.144	4	-1.499	5	0	1	0	5	0	15
81		3	max	19.369	5	213.825	3	158.445	1	.22	1	.11	5	.286	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	-157.734	1	-644.837	1	-47.33	5	-.056	3	-.23	1	-.094	3
83		4	max	19.16	5	212.571	3	158.445	1	.22	1	.08	5	.687	1
84			min	-158.182	1	-646.508	1	-48.83	5	-.056	3	-.132	1	-.227	3
85		5	max	18.951	5	211.317	3	158.445	1	.22	1	.049	5	1.089	1
86			min	-158.63	1	-648.18	1	-50.329	5	-.056	3	-.033	1	-.358	3
87		6	max	616.984	3	556.325	1	206.691	1	.016	2	.035	3	1.049	1
88			min	-2359.67	1	-134.824	3	-48.749	5	-.005	5	-.115	1	-.362	3
89		7	max	616.648	3	554.654	1	206.691	1	.016	2	.015	3	.704	1
90			min	-2360.117	1	-136.078	3	-50.248	5	-.005	5	-.035	5	-.278	3
91		8	max	616.312	3	552.982	1	206.691	1	.016	2	.141	1	.361	1
92			min	-2360.565	1	-137.332	3	-51.748	5	-.005	5	-.066	5	-.193	3
93		9	max	613.82	3	54.486	3	226.102	1	.195	2	.061	5	.167	1
94			min	-2525.515	1	-59.513	1	-96.198	5	.014	15	-.074	1	-.154	3
95		10	max	613.484	3	53.232	3	226.102	1	.195	2	.066	1	.204	1
96			min	-2525.963	1	-61.184	1	-97.698	5	.014	15	-.041	3	-.188	3
97		11	max	613.148	3	51.979	3	226.102	1	.195	2	.206	1	.243	1
98			min	-2526.411	1	-62.856	1	-99.198	5	.014	15	-.068	3	-.22	3
99		12	max	608.235	3	522.402	3	164.381	3	.441	1	.001	5	.511	1
100			min	-2686.232	1	-614.286	1	-226.693	4	-.281	3	-.107	1	-.441	3
101		13	max	607.899	3	521.148	3	164.381	3	.441	1	.086	3	.893	1
102			min	-2686.68	1	-615.957	1	-228.193	4	-.281	3	-.174	1	-.765	3
103		14	max	160.08	1	555.803	1	156.507	1	.28	3	.036	3	1.259	1
104			min	.721	15	-467.167	3	-24.885	3	-.281	1	-.228	4	-1.074	3
105		15	max	159.632	1	554.132	1	156.507	1	.28	3	.05	1	.915	1
106			min	.586	15	-468.421	3	-24.885	3	-.281	1	-.166	5	-.784	3
107		16	max	159.184	1	552.461	1	156.507	1	.28	3	.147	1	.572	1
108			min	.451	15	-469.674	3	-24.885	3	-.281	1	-.112	5	-.493	3
109		17	max	158.737	1	550.789	1	156.507	1	.28	3	.244	1	.229	1
110			min	.316	15	-470.928	3	-24.885	3	-.281	1	-.058	5	-.201	3
111		18	max	.575	6	2.145	4	1.5	5	0	1	0	1	0	4
112			min	.135	15	.504	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	-.001	3	0	4	0	1	0	1	0	1
115	M10	1	max	156.465	1	547.373	1	-.048	15	.006	1	.308	1	.281	1
116			min	-24.884	3	-473.382	3	-158.237	1	-.011	3	-.023	5	-.28	3
117		2	max	156.465	1	397.582	1	1.218	5	.006	1	.149	1	.176	3
118			min	-24.884	3	-347.879	3	-126.721	1	-.011	3	-.023	5	-.244	1
119		3	max	156.465	1	247.792	1	2.808	5	.006	1	.036	2	.493	3
120			min	-24.884	3	-222.375	3	-95.204	1	-.011	3	-.021	5	-.602	1
121		4	max	156.465	1	98.001	1	4.397	5	.006	1	.005	10	.67	3
122			min	-24.884	3	-96.872	3	-63.688	1	-.011	3	-.062	1	-.795	1
123		5	max	156.465	1	28.631	3	5.987	5	.006	1	-.007	10	.708	3
124			min	-24.884	3	-51.79	1	-32.171	1	-.011	3	-.115	1	-.82	1
125		6	max	156.465	1	154.134	3	8.729	4	.006	1	-.002	15	.606	3
126			min	-24.884	3	-201.581	1	-9.79	2	-.011	3	-.134	1	-.68	1
127		7	max	156.465	1	279.637	3	30.861	1	.006	1	.006	5	.365	3
128			min	-24.884	3	-351.371	1	-3.725	10	-.011	3	-.117	1	-.372	1
129		8	max	156.465	1	405.141	3	62.378	1	.006	1	.017	5	.101	1
130			min	-24.884	3	-501.162	1	-.887	10	-.011	3	-.065	1	-.015	3
131		9	max	156.465	1	530.644	3	93.894	1	.006	1	.039	4	.741	1
132			min	-24.884	3	-650.953	1	1.952	10	-.011	3	-.029	2	-.535	3
133		10	max	156.465	1	800.744	1	.673	5	.011	3	.144	1	1.548	1
134			min	-24.884	3	-656.147	3	-125.411	1	-.006	1	-.02	10	-1.194	3
135		11	max	156.465	1	650.953	1	2.263	5	.011	3	.03	9	.741	1
136			min	-24.884	3	-530.644	3	-93.894	1	-.006	1	-.029	2	-.535	3
137		12	max	156.465	1	501.162	1	3.852	5	.011	3	.013	3	.101	1
138			min	-24.884	3	-405.141	3	-62.378	1	-.006	1	-.065	1	-.015	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	156.465	1	351.371	1	5.442	5	.011	3	.003	3	.365	3
140			min	-24.884	3	-279.637	3	-30.861	1	-.006	1	-.117	1	-.372	1
141		14	max	156.465	1	201.581	1	9.79	2	.011	3	-.003	12	.606	3
142			min	-24.884	3	-154.134	3	-6.577	3	-.006	1	-.134	1	-.68	1
143		15	max	156.465	1	51.79	1	32.171	1	.011	3	0	15	.708	3
144			min	-24.884	3	-28.631	3	-5.036	3	-.006	1	-.115	1	-.82	1
145		16	max	156.465	1	96.872	3	63.688	1	.011	3	.01	5	.67	3
146			min	-33.559	5	-98.001	1	-3.495	3	-.006	1	-.062	1	-.795	1
147		17	max	156.465	1	222.375	3	95.204	1	.011	3	.036	2	.493	3
148			min	-44.965	5	-247.792	1	-1.954	3	-.006	1	-.019	3	-.602	1
149		18	max	156.465	1	347.879	3	126.721	1	.011	3	.149	1	.176	3
150			min	-56.371	5	-397.582	1	-.413	3	-.006	1	-.021	3	-.244	1
151		19	max	156.465	1	473.382	3	158.237	1	.011	3	.308	1	.281	1
152			min	-67.777	5	-547.373	1	1.128	3	-.006	1	-.02	3	-.28	3
153	M11	1	max	335.112	1	545.83	1	28.263	5	.002	3	.321	1	.251	1
154			min	-207.021	3	-472.745	3	-160.234	1	-.011	1	-.168	5	-.331	3
155		2	max	335.112	1	396.039	1	29.852	5	.002	3	.16	1	.124	3
156			min	-207.021	3	-347.242	3	-128.717	1	-.011	1	-.136	5	-.272	1
157		3	max	335.112	1	246.248	1	31.442	5	.002	3	.035	2	.441	3
158			min	-207.021	3	-221.739	3	-97.201	1	-.011	1	-.102	5	-.629	1
159		4	max	335.112	1	96.458	1	33.031	5	.002	3	.003	10	.617	3
160			min	-207.021	3	-96.235	3	-65.684	1	-.011	1	-.079	4	-.819	1
161		5	max	335.112	1	29.268	3	34.621	5	.002	3	-.002	12	.654	3
162			min	-207.021	3	-53.333	1	-34.168	1	-.011	1	-.111	1	-.843	1
163		6	max	335.112	1	154.771	3	36.92	4	.002	3	.011	5	.552	3
164			min	-207.021	3	-203.124	1	-9.761	2	-.011	1	-.132	1	-.701	1
165		7	max	335.112	1	280.274	3	44.805	4	.002	3	.052	5	.31	3
166			min	-207.021	3	-352.915	1	-3.345	10	-.011	1	-.117	1	-.392	1
167		8	max	335.112	1	405.777	3	60.381	1	.002	3	.095	5	.084	1
168			min	-207.021	3	-502.705	1	-.506	10	-.011	1	-.068	1	-.071	3
169		9	max	335.112	1	531.28	3	91.898	1	.002	3	.148	4	.725	1
170			min	-207.021	3	-652.496	1	2.332	10	-.011	1	-.03	2	-.591	3
171		10	max	335.112	1	802.287	1	29.538	5	.002	3	.22	4	1.534	1
172			min	-207.021	3	-656.784	3	-123.414	1	-.011	1	-.019	10	-1.251	3
173		11	max	335.112	1	652.496	1	31.127	5	.011	1	.026	9	.725	1
174			min	-207.021	3	-531.28	3	-91.898	1	-.002	3	-.136	5	-.591	3
175		12	max	335.112	1	502.705	1	32.717	5	.011	1	.009	3	.084	1
176			min	-207.021	3	-405.777	3	-60.381	1	-.002	3	-.111	4	-.071	3
177		13	max	335.112	1	352.915	1	34.306	5	.011	1	.003	3	.31	3
178			min	-207.021	3	-280.274	3	-28.865	1	-.002	3	-.117	1	-.392	1
179		14	max	335.112	1	203.124	1	35.896	5	.011	1	0	3	.552	3
180			min	-207.021	3	-154.771	3	-3.029	3	-.002	3	-.132	1	-.701	1
181		15	max	335.112	1	53.333	1	43.289	4	.011	1	.017	5	.654	3
182			min	-207.021	3	-29.268	3	-1.488	3	-.002	3	-.111	1	-.843	1
183		16	max	335.112	1	96.235	3	65.684	1	.011	1	.059	5	.617	3
184			min	-207.021	3	-96.458	1	.053	3	-.002	3	-.056	1	-.819	1
185		17	max	335.112	1	221.739	3	97.201	1	.011	1	.108	4	.441	3
186			min	-207.021	3	-246.248	1	1.243	12	-.002	3	-.003	3	-.629	1
187		18	max	335.112	1	347.242	3	128.717	1	.011	1	.178	4	.124	3
188			min	-207.021	3	-396.039	1	2.27	12	-.002	3	0	3	-.272	1
189		19	max	335.112	1	472.745	3	160.234	1	.011	1	.321	1	.251	1
190			min	-207.021	3	-545.83	1	3.298	12	-.002	3	.003	12	-.331	3
191	M12	1	max	42.807	5	607.39	1	28.783	5	.003	3	.348	1	.179	2
192			min	-18.959	9	-193.757	3	-164.456	1	-.012	1	-.17	5	.017	15
193		2	max	31.401	5	438.297	1	30.372	5	.003	3	.183	1	.218	3
194			min	-18.959	9	-135.168	3	-132.939	1	-.012	1	-.137	5	-.405	1
195		3	max	19.995	5	269.204	1	31.962	5	.003	3	.053	1	.336	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	-18.959	9	-76.579	3	-101.423	1	-.012	1	-.102	5	-.798	1
197		4	max	10.922	2	100.111	1	33.551	5	.003	3	.008	10	.388	3
198			min	-18.959	9	-17.99	3	-69.906	1	-.012	1	-.077	4	-1.004	1
199		5	max	10.922	2	40.598	3	35.141	5	.003	3	-.005	10	.376	3
200			min	-18.959	9	-68.982	1	-38.39	1	-.012	1	-.103	1	-1.021	1
201		6	max	10.922	2	99.187	3	36.814	4	.003	3	.012	5	.298	3
202			min	-21.823	14	-238.075	1	-13.035	2	-.012	1	-.128	1	-.85	1
203		7	max	10.922	2	157.776	3	44.699	4	.003	3	.054	5	.155	3
204			min	-31.58	4	-407.168	1	-4.855	10	-.012	1	-.118	1	-.492	1
205		8	max	10.922	2	216.365	3	56.159	1	.003	3	.098	5	.055	1
206			min	-42.986	4	-576.261	1	-2.016	10	-.012	1	-.073	1	-.053	3
207		9	max	10.922	2	274.953	3	87.675	1	.003	3	.15	4	.789	1
208			min	-54.391	4	-745.354	1	.822	10	-.012	1	-.037	2	-.326	3
209		10	max	10.922	2	914.447	1	84.649	14	.003	3	.221	4	1.711	1
210			min	-65.797	4	-333.542	3	-119.192	1	-.012	1	-.024	10	-.664	3
211		11	max	44.945	5	745.354	1	31.978	5	.012	1	.023	3	.789	1
212			min	-18.959	9	-274.953	3	-87.675	1	-.003	3	-.14	5	-.326	3
213		12	max	33.539	5	576.261	1	33.568	5	.012	1	.012	3	.055	1
214			min	-18.959	9	-216.365	3	-56.159	1	-.003	3	-.114	4	-.053	3
215		13	max	22.133	5	407.168	1	35.157	5	.012	1	.004	3	.155	3
216			min	-18.959	9	-157.776	3	-24.643	1	-.003	3	-.118	1	-.492	1
217		14	max	10.922	2	238.075	1	36.912	4	.012	1	-.003	12	.298	3
218			min	-18.959	9	-99.187	3	-5.554	3	-.003	3	-.128	1	-.85	1
219		15	max	10.922	2	68.982	1	44.797	4	.012	1	.017	5	.376	3
220			min	-18.959	9	-40.598	3	-4.013	3	-.003	3	-.103	1	-1.021	1
221		16	max	10.922	2	17.99	3	69.906	1	.012	1	.06	5	.388	3
222			min	-20.584	14	-100.111	1	-2.472	3	-.003	3	-.042	1	-1.004	1
223		17	max	10.922	2	76.579	3	101.423	1	.012	1	.113	4	.336	3
224			min	-29.306	4	-269.204	1	-.931	3	-.003	3	-.014	3	-.798	1
225		18	max	10.922	2	135.168	3	132.939	1	.012	1	.184	4	.218	3
226			min	-40.711	4	-438.297	1	.61	3	-.003	3	-.015	3	-.405	1
227		19	max	10.922	2	193.757	3	164.456	1	.012	1	.348	1	.179	2
228			min	-52.117	4	-607.39	1	1.793	12	-.003	3	-.013	3	-.015	5
229	M13	1	max	44.247	5	642.365	1	19.789	5	.008	3	.294	1	.22	1
230			min	-158.35	1	-216.381	3	-156.42	1	-.025	1	-.129	5	-.056	3
231		2	max	32.841	5	473.272	1	21.378	5	.008	3	.138	1	.152	3
232			min	-158.35	1	-157.792	3	-124.904	1	-.025	1	-.107	5	-.4	1
233		3	max	21.436	5	304.18	1	22.968	5	.008	3	.029	2	.295	3
234			min	-158.35	1	-99.204	3	-93.388	1	-.025	1	-.082	5	-.832	1
235		4	max	15.467	3	135.087	1	24.557	5	.008	3	.002	10	.373	3
236			min	-158.35	1	-40.615	3	-61.871	1	-.025	1	-.071	4	-1.076	1
237		5	max	15.467	3	17.974	3	26.147	5	.008	3	-.005	12	.385	3
238			min	-158.35	1	-34.006	1	-30.355	1	-.025	1	-.121	1	-1.132	1
239		6	max	15.467	3	76.563	3	29.181	4	.008	3	.003	5	.333	3
240			min	-158.35	1	-203.099	1	-8.553	2	-.025	1	-.137	1	-1	1
241		7	max	15.467	3	135.151	3	37.066	4	.008	3	.034	5	.215	3
242			min	-158.35	1	-372.192	1	-3.192	10	-.025	1	-.119	1	-.681	1
243		8	max	15.467	3	193.74	3	64.194	1	.008	3	.068	5	.032	3
244			min	-158.35	1	-541.285	1	-.353	10	-.025	1	-.065	1	-.173	1
245		9	max	15.467	3	252.329	3	95.711	1	.008	3	.113	4	.522	1
246			min	-158.35	1	-710.378	1	2.485	10	-.025	1	-.028	2	-.216	3
247		10	max	15.467	3	879.471	1	83.604	14	.008	3	.176	4	1.405	1
248			min	-158.35	1	-319.266	14	-127.227	1	-.025	1	-.019	10	-.528	3
249		11	max	32.98	5	710.378	1	22.262	5	.025	1	.031	9	.522	1
250			min	-158.35	1	-252.329	3	-95.711	1	-.008	3	-.098	5	-.216	3
251		12	max	21.574	5	541.285	1	23.851	5	.025	1	.012	3	.032	3
252			min	-158.35	1	-193.74	3	-64.194	1	-.008	3	-.082	4	-.173	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	15.467	3	372.192	1	25.441	5	.025	1	.004	3	.215	3
254			min	-158.35	1	-135.151	3	-32.678	1	-.008	3	-.119	1	-.681	1
255		14	max	15.467	3	203.099	1	27.03	5	.025	1	-.002	12	.333	3
256			min	-158.35	1	-76.563	3	-5.029	3	-.008	3	-.137	1	-1	1
257		15	max	15.467	3	34.006	1	33.577	4	.025	1	.015	5	.385	3
258			min	-158.35	1	-17.974	3	-3.488	3	-.008	3	-.121	1	-1.132	1
259		16	max	15.467	3	40.615	3	61.871	1	.025	1	.048	5	.373	3
260			min	-158.35	1	-135.087	1	-1.947	3	-.008	3	-.07	1	-1.076	1
261		17	max	15.467	3	99.204	3	93.388	1	.025	1	.083	4	.295	3
262			min	-158.35	1	-304.18	1	-.406	3	-.008	3	-.012	3	-.832	1
263		18	max	15.467	3	157.792	3	124.904	1	.025	1	.142	4	.152	3
264			min	-158.35	1	-473.272	1	1.058	12	-.008	3	-.011	3	-.4	1
265		19	max	15.467	3	216.381	3	156.42	1	.025	1	.294	1	.22	1
266			min	-158.35	1	-642.365	1	2.086	12	-.008	3	-.009	3	-.056	3
267	M2	1	max	2503.791	1	361.378	3	315.692	1	.005	5	1.066	5	6.505	1
268			min	-1251.639	3	-212.734	2	-320.315	5	-.005	1	-.256	1	-.423	3
269		2	max	2501.834	1	361.378	3	315.692	1	.005	5	.997	5	6.502	1
270			min	-1253.106	3	-212.734	2	-318.619	5	-.005	1	-.188	1	-.501	3
271		3	max	2499.877	1	361.378	3	315.692	1	.005	5	.929	5	6.499	1
272			min	-1254.574	3	-212.734	2	-316.923	5	-.005	1	-.12	1	-.579	3
273		4	max	2497.92	1	361.378	3	315.692	1	.005	5	.861	5	6.496	1
274			min	-1256.041	3	-212.734	2	-315.227	5	-.005	1	-.052	1	-.656	3
275		5	max	2495.963	1	361.378	3	315.692	1	.005	5	.802	4	6.492	1
276			min	-1257.509	3	-212.734	2	-313.531	5	-.005	1	-.035	3	-.734	3
277		6	max	2494.007	1	361.378	3	315.692	1	.005	5	.745	4	6.489	1
278			min	-1258.977	3	-212.734	2	-311.836	5	-.005	1	-.08	3	-.812	3
279		7	max	1906.643	1	2455.005	1	265.273	1	.003	1	.68	4	6.331	1
280			min	-1092.735	3	-327.794	3	-304.246	5	0	3	-.093	3	-.845	3
281		8	max	1904.686	1	2455.005	1	265.273	1	.003	1	.623	4	5.803	1
282			min	-1094.203	3	-327.794	3	-302.55	5	0	3	-.133	3	-.775	3
283		9	max	1902.729	1	2455.005	1	265.273	1	.003	1	.567	4	5.276	1
284			min	-1095.67	3	-327.794	3	-300.854	5	0	3	-.174	3	-.704	3
285		10	max	1900.773	1	2455.005	1	265.273	1	.003	1	.51	4	4.748	1
286			min	-1097.138	3	-327.794	3	-299.158	5	0	3	-.215	3	-.634	3
287		11	max	1898.816	1	2455.005	1	265.273	1	.003	1	.454	4	4.221	1
288			min	-1098.606	3	-327.794	3	-297.462	5	0	3	-.255	3	-.564	3
289		12	max	1896.859	1	2455.005	1	265.273	1	.003	1	.399	4	3.693	1
290			min	-1100.073	3	-327.794	3	-295.767	5	0	3	-.296	3	-.493	3
291		13	max	1894.902	1	2455.005	1	265.273	1	.003	1	.405	1	3.165	1
292			min	-1101.541	3	-327.794	3	-294.071	5	0	3	-.337	3	-.423	3
293		14	max	1892.945	1	2455.005	1	265.273	1	.003	1	.462	1	2.638	1
294			min	-1103.008	3	-327.794	3	-292.375	5	0	3	-.377	3	-.352	3
295		15	max	1890.989	1	2455.005	1	265.273	1	.003	1	.519	1	2.11	1
296			min	-1104.476	3	-327.794	3	-290.679	5	0	3	-.418	3	-.282	3
297		16	max	1889.032	1	2455.005	1	265.273	1	.003	1	.576	1	1.583	1
298			min	-1105.943	3	-327.794	3	-288.983	5	0	3	-.459	3	-.211	3
299		17	max	1887.075	1	2455.005	1	265.273	1	.003	1	.633	1	1.055	1
300			min	-1107.411	3	-327.794	3	-287.287	5	0	3	-.5	3	-.141	3
301		18	max	1885.118	1	2455.005	1	265.273	1	.003	1	.69	1	.528	1
302			min	-1108.879	3	-327.794	3	-285.591	5	0	3	-.54	3	-.07	3
303		19	max	1883.161	1	2455.005	1	265.273	1	.003	1	.747	1	0	1
304			min	-1110.346	3	-327.794	3	-283.895	5	0	3	-.581	3	0	1
305	M5	1	max	6891.03	1	1101.883	3	0	1	.005	4	1.12	4	14.867	1
306			min	-3702.503	3	-1109.758	2	-349.761	5	0	1	0	1	-1.482	3
307		2	max	6889.073	1	1101.883	3	0	1	.005	4	1.046	4	15.033	1
308			min	-3703.971	3	-1109.758	2	-348.065	5	0	1	0	1	-1.719	3
309		3	max	6887.117	1	1101.883	3	0	1	.005	4	.971	4	15.199	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	-3705.439	3	-1109.758	2	-346.369	5	0	1	0	1	-1.956	3
311		4	max	6885.16	1	1101.883	3	0	1	.005	4	.897	4	15.364	1
312			min	-3706.906	3	-1109.758	2	-344.673	5	0	1	0	1	-2.192	3
313		5	max	6883.203	1	1101.883	3	0	1	.005	4	.824	4	15.53	1
314			min	-3708.374	3	-1109.758	2	-342.977	5	0	1	0	1	-2.429	3
315		6	max	6881.246	1	1101.883	3	0	1	.005	4	.751	4	15.696	1
316			min	-3709.841	3	-1109.758	2	-341.281	5	0	1	0	1	-2.666	3
317		7	max	5344.044	1	5983.999	1	0	1	0	1	.687	4	15.431	1
318			min	-3170.222	3	-1071.981	3	-337.99	4	0	4	0	1	-2.764	3
319		8	max	5342.087	1	5983.999	1	0	1	0	1	.614	4	14.145	1
320			min	-3171.69	3	-1071.981	3	-336.294	4	0	4	0	1	-2.534	3
321		9	max	5340.13	1	5983.999	1	0	1	0	1	.542	4	12.859	1
322			min	-3173.157	3	-1071.981	3	-334.598	4	0	4	0	1	-2.304	3
323		10	max	5338.173	1	5983.999	1	0	1	0	1	.47	4	11.573	1
324			min	-3174.625	3	-1071.981	3	-332.903	4	0	4	0	1	-2.073	3
325		11	max	5336.217	1	5983.999	1	0	1	0	1	.399	4	10.287	1
326			min	-3176.093	3	-1071.981	3	-331.207	4	0	4	0	1	-1.843	3
327		12	max	5334.26	1	5983.999	1	0	1	0	1	.328	4	9.002	1
328			min	-3177.56	3	-1071.981	3	-329.511	4	0	4	0	1	-1.613	3
329		13	max	5332.303	1	5983.999	1	0	1	0	1	.258	4	7.716	1
330			min	-3179.028	3	-1071.981	3	-327.815	4	0	4	0	1	-1.382	3
331		14	max	5330.346	1	5983.999	1	0	1	0	1	.187	4	6.43	1
332			min	-3180.495	3	-1071.981	3	-326.119	4	0	4	0	1	-1.152	3
333		15	max	5328.389	1	5983.999	1	0	1	0	1	.117	4	5.144	1
334			min	-3181.963	3	-1071.981	3	-324.423	4	0	4	0	1	-.921	3
335		16	max	5326.433	1	5983.999	1	0	1	0	1	.048	4	3.858	1
336			min	-3183.431	3	-1071.981	3	-322.727	4	0	4	0	1	-.691	3
337		17	max	5324.476	1	5983.999	1	0	1	0	1	0	1	2.572	1
338			min	-3184.898	3	-1071.981	3	-321.031	4	0	4	-.022	5	-.461	3
339		18	max	5322.519	1	5983.999	1	0	1	0	1	0	1	1.286	1
340			min	-3186.366	3	-1071.981	3	-319.335	4	0	4	-.09	4	-.23	3
341		19	max	5320.562	1	5983.999	1	0	1	0	1	0	1	0	1
342			min	-3187.833	3	-1071.981	3	-317.64	4	0	4	-.159	4	0	1
343	M8	1	max	2503.791	1	361.378	3	205.494	3	.006	4	1.137	4	6.505	1
344			min	-1251.639	3	-212.734	2	-394.162	4	-.002	3	-.141	3	-.423	3
345		2	max	2501.834	1	361.378	3	205.494	3	.006	4	1.052	4	6.502	1
346			min	-1253.106	3	-212.734	2	-392.466	4	-.002	3	-.097	3	-.501	3
347		3	max	2499.877	1	361.378	3	205.494	3	.006	4	.968	4	6.499	1
348			min	-1254.574	3	-212.734	2	-390.77	4	-.002	3	-.053	3	-.579	3
349		4	max	2497.92	1	361.378	3	205.494	3	.006	4	.884	4	6.496	1
350			min	-1256.041	3	-212.734	2	-389.074	4	-.002	3	-.009	3	-.656	3
351		5	max	2495.963	1	361.378	3	205.494	3	.006	4	.801	4	6.492	1
352			min	-1257.509	3	-212.734	2	-387.378	4	-.002	3	-.028	2	-.734	3
353		6	max	2494.007	1	361.378	3	205.494	3	.006	4	.72	5	6.489	1
354			min	-1258.977	3	-212.734	2	-385.682	4	-.002	3	-.083	1	-.812	3
355		7	max	1906.643	1	2455.005	1	189.387	3	0	3	.659	5	6.331	1
356			min	-1092.735	3	-327.794	3	-369.871	4	-.003	1	-.063	1	-.845	3
357		8	max	1904.686	1	2455.005	1	189.387	3	0	3	.589	5	5.803	1
358			min	-1094.203	3	-327.794	3	-368.175	4	-.003	1	-.12	1	-.775	3
359		9	max	1902.729	1	2455.005	1	189.387	3	0	3	.52	5	5.276	1
360			min	-1095.67	3	-327.794	3	-366.479	4	-.003	1	-.177	1	-.704	3
361		10	max	1900.773	1	2455.005	1	189.387	3	0	3	.451	5	4.748	1
362			min	-1097.138	3	-327.794	3	-364.783	4	-.003	1	-.234	1	-.634	3
363		11	max	1898.816	1	2455.005	1	189.387	3	0	3	.382	5	4.221	1
364			min	-1098.606	3	-327.794	3	-363.087	4	-.003	1	-.291	1	-.564	3
365		12	max	1896.859	1	2455.005	1	189.387	3	0	3	.314	5	3.693	1
366			min	-1100.073	3	-327.794	3	-361.391	4	-.003	1	-.348	1	-.493	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
367		13	max	1894.902	1	2455.005	1	189.387	3	0	3	.337	3	3.165	1
368			min	-1101.541	3	-327.794	3	-359.695	4	-.003	1	-.405	1	-.423	3
369		14	max	1892.945	1	2455.005	1	189.387	3	0	3	.377	3	2.638	1
370			min	-1103.008	3	-327.794	3	-358	4	-.003	1	-.462	1	-.352	3
371		15	max	1890.989	1	2455.005	1	189.387	3	0	3	.418	3	2.11	1
372			min	-1104.476	3	-327.794	3	-356.304	4	-.003	1	-.519	1	-.282	3
373		16	max	1889.032	1	2455.005	1	189.387	3	0	3	.459	3	1.583	1
374			min	-1105.943	3	-327.794	3	-354.608	4	-.003	1	-.576	1	-.211	3
375		17	max	1887.075	1	2455.005	1	189.387	3	0	3	.5	3	1.055	1
376			min	-1107.411	3	-327.794	3	-352.912	4	-.003	1	-.633	1	-.141	3
377		18	max	1885.118	1	2455.005	1	189.387	3	0	3	.54	3	.528	1
378			min	-1108.879	3	-327.794	3	-351.216	4	-.003	1	-.69	1	-.07	3
379		19	max	1883.161	1	2455.005	1	189.387	3	0	3	.581	3	0	1
380			min	-1110.346	3	-327.794	3	-349.52	4	-.003	1	-.747	1	0	1
381	M3	1	max	2502.376	1	4.89	6	49.009	1	.03	3	.014	1	0	1
382			min	-709.873	3	1.149	15	-16.573	3	-.085	1	-.005	3	0	1
383		2	max	2502.272	1	4.347	6	49.009	1	.03	3	.028	1	0	15
384			min	-709.951	3	1.022	15	-16.573	3	-.085	1	-.01	3	-.001	6
385		3	max	2502.167	1	3.803	6	49.009	1	.03	3	.042	1	0	15
386			min	-710.029	3	.894	15	-16.573	3	-.085	1	-.015	3	-.003	6
387		4	max	2502.063	1	3.26	6	49.009	1	.03	3	.057	1	0	15
388			min	-710.108	3	.766	15	-16.573	3	-.085	1	-.019	3	-.004	6
389		5	max	2501.959	1	2.717	6	49.009	1	.03	3	.071	1	-.001	15
390			min	-710.186	3	.639	15	-16.573	3	-.085	1	-.024	3	-.004	6
391		6	max	2501.854	1	2.173	6	49.009	1	.03	3	.086	1	-.001	15
392			min	-710.264	3	.511	15	-16.573	3	-.085	1	-.029	3	-.005	6
393		7	max	2501.75	1	1.63	6	49.009	1	.03	3	.1	1	-.001	15
394			min	-710.342	3	.383	15	-16.573	3	-.085	1	-.034	3	-.006	6
395		8	max	2501.646	1	1.087	6	49.009	1	.03	3	.114	1	-.001	15
396			min	-710.421	3	.255	15	-16.573	3	-.085	1	-.039	3	-.006	6
397		9	max	2501.541	1	.543	6	49.009	1	.03	3	.129	1	-.002	15
398			min	-710.499	3	.128	15	-16.573	3	-.085	1	-.044	3	-.006	6
399		10	max	2501.437	1	0	1	49.009	1	.03	3	.143	1	-.002	15
400			min	-710.577	3	0	1	-16.573	3	-.085	1	-.049	3	-.006	6
401		11	max	2501.333	1	-.128	15	49.009	1	.03	3	.158	1	-.002	15
402			min	-710.655	3	-.543	4	-16.573	3	-.085	1	-.054	3	-.006	6
403		12	max	2501.228	1	-.255	15	49.009	1	.03	3	.172	1	-.001	15
404			min	-710.734	3	-1.087	4	-16.573	3	-.085	1	-.058	3	-.006	6
405		13	max	2501.124	1	-.383	15	49.009	1	.03	3	.186	1	-.001	15
406			min	-710.812	3	-1.63	4	-16.573	3	-.085	1	-.063	3	-.006	6
407		14	max	2501.02	1	-.511	15	49.009	1	.03	3	.201	1	-.001	15
408			min	-710.89	3	-2.173	4	-16.573	3	-.085	1	-.068	3	-.005	6
409		15	max	2500.915	1	-.639	15	49.009	1	.03	3	.215	1	-.001	15
410			min	-710.968	3	-2.717	4	-16.573	3	-.085	1	-.073	3	-.004	6
411		16	max	2500.811	1	-.766	15	49.009	1	.03	3	.23	1	0	15
412			min	-711.047	3	-3.26	4	-16.573	3	-.085	1	-.078	3	-.004	6
413		17	max	2500.707	1	-.894	15	49.009	1	.03	3	.244	1	0	15
414			min	-711.125	3	-3.803	4	-16.573	3	-.085	1	-.083	3	-.003	6
415		18	max	2500.602	1	-1.022	15	49.009	1	.03	3	.258	1	0	15
416			min	-711.203	3	-4.347	4	-16.573	3	-.085	1	-.088	3	-.001	6
417		19	max	2500.498	1	-1.149	15	49.009	1	.03	3	.273	1	0	1
418			min	-711.281	3	-4.89	4	-16.573	3	-.085	1	-.092	3	0	1
419	M6	1	max	6875.658	1	4.89	4	0	1	.01	4	.003	4	0	1
420			min	-2245.742	3	1.149	15	-8.103	4	0	1	0	1	0	1
421		2	max	6875.554	1	4.347	4	0	1	.01	4	0	5	0	15
422			min	-2245.82	3	1.022	15	-7.726	4	0	1	0	1	-.001	4
423		3	max	6875.449	1	3.803	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	-2245.899	3	.894	15	-7.348	4	0	1	-.001	4	-.003	4
425		4	max	6875.345	1	3.26	4	0	1	.01	4	0	1	0	15
426			min	-2245.977	3	.766	15	-6.97	4	0	1	-.003	4	-.004	4
427		5	max	6875.241	1	2.717	4	0	1	.01	4	0	1	-.001	15
428			min	-2246.055	3	.639	15	-6.592	4	0	1	-.005	4	-.004	4
429		6	max	6875.136	1	2.173	4	0	1	.01	4	0	1	-.001	15
430			min	-2246.133	3	.511	15	-6.214	4	0	1	-.007	4	-.005	4
431		7	max	6875.032	1	1.63	4	0	1	.01	4	0	1	-.001	15
432			min	-2246.212	3	.383	15	-5.836	4	0	1	-.009	4	-.006	4
433		8	max	6874.928	1	1.087	4	0	1	.01	4	0	1	-.001	15
434			min	-2246.29	3	.255	15	-5.458	4	0	1	-.011	4	-.006	4
435		9	max	6874.823	1	.543	4	0	1	.01	4	0	1	-.002	15
436			min	-2246.368	3	.128	15	-5.08	4	0	1	-.012	4	-.006	4
437		10	max	6874.719	1	0	1	0	1	.01	4	0	1	-.002	15
438			min	-2246.446	3	0	1	-4.702	4	0	1	-.014	4	-.006	4
439		11	max	6874.615	1	-.128	15	0	1	.01	4	0	1	-.002	15
440			min	-2246.525	3	-.543	6	-4.324	4	0	1	-.015	4	-.006	4
441		12	max	6874.51	1	-.255	15	0	1	.01	4	0	1	-.001	15
442			min	-2246.603	3	-1.087	6	-3.947	4	0	1	-.016	4	-.006	4
443		13	max	6874.406	1	-.383	15	0	1	.01	4	0	1	-.001	15
444			min	-2246.681	3	-1.63	6	-3.569	4	0	1	-.017	4	-.006	4
445		14	max	6874.302	1	-.511	15	0	1	.01	4	0	1	-.001	15
446			min	-2246.759	3	-2.173	6	-3.191	4	0	1	-.018	4	-.005	4
447		15	max	6874.197	1	-.639	15	0	1	.01	4	0	1	-.001	15
448			min	-2246.838	3	-2.717	6	-2.813	4	0	1	-.019	4	-.004	4
449		16	max	6874.093	1	-.766	15	0	1	.01	4	0	1	0	15
450			min	-2246.916	3	-3.26	6	-2.435	4	0	1	-.02	4	-.004	4
451		17	max	6873.989	1	-.894	15	0	1	.01	4	0	1	0	15
452			min	-2246.994	3	-3.803	6	-2.057	4	0	1	-.021	4	-.003	4
453		18	max	6873.884	1	-1.022	15	0	1	.01	4	0	1	0	15
454			min	-2247.072	3	-4.347	6	-1.679	4	0	1	-.021	4	-.001	4
455		19	max	6873.78	1	-1.149	15	0	1	.01	4	0	1	0	1
456			min	-2247.151	3	-4.89	6	-1.301	4	0	1	-.022	4	0	1
457	M9	1	max	2502.376	1	4.89	4	16.573	3	.085	1	.005	3	0	1
458			min	-709.873	3	1.149	15	-49.009	1	-.03	3	-.014	1	0	1
459		2	max	2502.272	1	4.347	4	16.573	3	.085	1	.01	3	0	15
460			min	-709.951	3	1.022	15	-49.009	1	-.03	3	-.028	1	-.001	4
461		3	max	2502.167	1	3.803	4	16.573	3	.085	1	.015	3	0	15
462			min	-710.029	3	.894	15	-49.009	1	-.03	3	-.042	1	-.003	4
463		4	max	2502.063	1	3.26	4	16.573	3	.085	1	.019	3	0	15
464			min	-710.108	3	.766	15	-49.009	1	-.03	3	-.057	1	-.004	4
465		5	max	2501.959	1	2.717	4	16.573	3	.085	1	.024	3	-.001	15
466			min	-710.186	3	.639	15	-49.009	1	-.03	3	-.071	1	-.004	4
467		6	max	2501.854	1	2.173	4	16.573	3	.085	1	.029	3	-.001	15
468			min	-710.264	3	.511	15	-49.009	1	-.03	3	-.086	1	-.005	4
469		7	max	2501.75	1	1.63	4	16.573	3	.085	1	.034	3	-.001	15
470			min	-710.342	3	.383	15	-49.009	1	-.03	3	-.1	1	-.006	4
471		8	max	2501.646	1	1.087	4	16.573	3	.085	1	.039	3	-.001	15
472			min	-710.421	3	.255	15	-49.009	1	-.03	3	-.114	1	-.006	4
473		9	max	2501.541	1	.543	4	16.573	3	.085	1	.044	3	-.002	15
474			min	-710.499	3	.128	15	-49.009	1	-.03	3	-.129	1	-.006	4
475		10	max	2501.437	1	0	1	16.573	3	.085	1	.049	3	-.002	15
476			min	-710.577	3	0	1	-49.009	1	-.03	3	-.143	1	-.006	4
477		11	max	2501.333	1	-.128	15	16.573	3	.085	1	.054	3	-.002	15
478			min	-710.655	3	-.543	6	-49.009	1	-.03	3	-.158	1	-.006	4
479		12	max	2501.228	1	-.255	15	16.573	3	.085	1	.058	3	-.001	15
480			min	-710.734	3	-1.087	6	-49.009	1	-.03	3	-.172	1	-.006	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
481		13	max	2501.124	1	-.383	15	16.573	3	.085	1	.063	3	-.001	15
482			min	-710.812	3	-1.63	6	-49.009	1	-.03	3	-.186	1	-.006	4
483		14	max	2501.02	1	-.511	15	16.573	3	.085	1	.068	3	-.001	15
484			min	-710.89	3	-2.173	6	-49.009	1	-.03	3	-.201	1	-.005	4
485		15	max	2500.915	1	-.639	15	16.573	3	.085	1	.073	3	-.001	15
486			min	-710.968	3	-2.717	6	-49.009	1	-.03	3	-.215	1	-.004	4
487		16	max	2500.811	1	-.766	15	16.573	3	.085	1	.078	3	0	15
488			min	-711.047	3	-3.26	6	-49.009	1	-.03	3	-.23	1	-.004	4
489		17	max	2500.707	1	-.894	15	16.573	3	.085	1	.083	3	0	15
490			min	-711.125	3	-3.803	6	-49.009	1	-.03	3	-.244	1	-.003	4
491		18	max	2500.602	1	-1.022	15	16.573	3	.085	1	.088	3	0	15
492			min	-711.203	3	-4.347	6	-49.009	1	-.03	3	-.258	1	-.001	4
493		19	max	2500.498	1	-1.149	15	16.573	3	.085	1	.092	3	0	1
494			min	-711.281	3	-4.89	6	-49.009	1	-.03	3	-.273	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	.026	3	.185	3	.022	1	9.743e-3	3	NC	3	NC	3
2			min	-.228	1	-.864	1	-.487	5	-3.013e-2	1	150.053	1	281.314	5
3		2	max	.026	3	.153	3	.007	1	9.743e-3	3	7107.847	12	NC	2
4			min	-.228	1	-.751	1	-.462	4	-3.013e-2	1	171.788	1	297.272	5
5		3	max	.026	3	.121	3	0	3	9.306e-3	3	3551.786	12	NC	1
6			min	-.228	1	-.637	1	-.438	4	-2.841e-2	1	200.913	1	316.007	5
7		4	max	.026	3	.09	3	0	3	8.635e-3	3	3319.824	15	NC	1
8			min	-.228	1	-.528	1	-.408	4	-2.576e-2	1	240.301	1	340.647	4
9		5	max	.026	3	.063	3	0	3	7.964e-3	3	3697.448	15	NC	1
10			min	-.227	1	-.428	1	-.373	4	-2.311e-2	1	292.695	1	373.335	4
11		6	max	.026	3	.04	3	.002	3	7.797e-3	3	4126.736	15	NC	1
12			min	-.227	1	-.344	1	-.336	4	-2.193e-2	1	358.838	1	415.803	5
13		7	max	.026	3	.022	3	.001	3	7.978e-3	3	4613.552	15	NC	1
14			min	-.226	1	-.274	1	-.299	4	-2.176e-2	1	440.887	1	468.839	5
15		8	max	.026	3	.009	3	0	3	8.16e-3	3	5183.747	15	NC	2
16			min	-.225	1	-.214	1	-.263	4	-2.16e-2	1	548.77	1	534.536	5
17		9	max	.025	3	-.002	12	0	9	8.494e-3	3	5881.577	15	NC	2
18			min	-.224	1	-.16	1	-.23	4	-2.067e-2	1	708.062	1	614.899	5
19		10	max	.025	3	-.007	12	0	1	9.099e-3	3	6772.768	15	NC	2
20			min	-.223	1	-.107	1	-.196	4	-1.838e-2	1	683.391	3	727.483	5
21		11	max	.025	3	-.004	15	0	3	9.704e-3	3	7943.037	15	NC	2
22			min	-.222	1	-.057	1	-.163	4	-1.61e-2	1	661.99	3	889.551	5
23		12	max	.025	3	-.002	15	.005	3	7.763e-3	3	NC	9	NC	1
24			min	-.221	1	-.021	3	-.131	4	-1.189e-2	1	651.005	3	1131.079	5
25		13	max	.024	3	.03	1	.009	3	4.382e-3	3	NC	1	NC	1
26			min	-.22	1	-.018	3	-.1	4	-6.579e-3	1	659.152	3	1551.882	5
27		14	max	.024	3	.058	1	.01	3	1.15e-3	3	NC	2	NC	1
28			min	-.219	1	-.005	3	-.071	4	-3.305e-3	4	704.731	3	2294.561	5
29		15	max	.024	3	.068	1	.008	3	4.526e-3	3	NC	4	NC	2
30			min	-.219	1	.006	15	-.049	4	-4.847e-3	1	824.747	3	3532.721	5
31		16	max	.024	3	.066	1	.005	3	7.903e-3	3	NC	4	NC	2
32			min	-.219	1	.008	15	-.034	5	-8.23e-3	1	1081.042	3	5681.887	5
33		17	max	.024	3	.106	3	.003	1	1.128e-2	3	NC	4	NC	2
34			min	-.219	1	.009	15	-.024	5	-1.161e-2	1	1704.452	3	7088.19	1
35		18	max	.024	3	.154	3	0	12	1.348e-2	3	NC	1	NC	1
36			min	-.219	1	.011	15	-.019	4	-1.382e-2	1	4372.714	3	NC	1
37		19	max	.024	3	.202	3	-.002	12	1.348e-2	3	NC	1	NC	1
38			min	-.219	1	.008	9	-.016	1	-1.382e-2	1	7776.582	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	.087	3	.529	3	0	1	2.047e-4	4	NC	12	NC	1
40			min	-.545	1	-2.103	1	-.482	4	0	1	63.986	1	285.032	4
41		2	max	.087	3	.443	3	0	1	2.047e-4	4	3342.913	12	NC	1
42			min	-.545	1	-1.828	1	-.462	4	0	1	73.672	1	297.935	4
43		3	max	.087	3	.356	3	0	1	1.17e-4	5	3538.492	15	NC	1
44			min	-.545	1	-1.552	1	-.439	4	0	1	86.848	1	313.483	4
45		4	max	.087	3	.273	3	0	1	0	1	4292.149	15	NC	1
46			min	-.545	1	-1.284	1	-.41	4	-1.862e-5	4	105.045	1	336.815	4
47		5	max	.087	3	.198	3	0	1	0	1	5330.44	15	NC	1
48			min	-.544	1	-1.041	1	-.375	4	-1.538e-4	4	129.78	1	369.406	4
49		6	max	.086	3	.138	3	0	1	0	1	6697.935	15	NC	1
50			min	-.543	1	-.838	1	-.337	4	-1.519e-4	4	161.519	1	412.767	4
51		7	max	.085	3	.091	3	0	1	0	1	8489.334	15	NC	1
52			min	-.541	1	-.674	1	-.298	4	-5.512e-5	4	201.459	1	467.979	4
53		8	max	.085	3	.055	3	0	1	4.217e-5	5	NC	15	NC	1
54			min	-.538	1	-.533	1	-.262	4	0	1	255.484	1	535.24	4
55		9	max	.084	3	.023	3	0	1	5.908e-5	5	NC	15	NC	1
56			min	-.536	1	-.402	1	-.23	4	0	1	279.173	3	613.806	4
57		10	max	.083	3	-.003	12	0	1	0	1	NC	5	NC	1
58			min	-.533	1	-.273	1	-.196	4	-6.465e-5	4	263.758	3	727.641	4
59		11	max	.083	3	-.004	15	0	1	0	1	NC	5	NC	1
60			min	-.531	1	-.148	1	-.162	4	-1.881e-4	4	252.413	3	891.261	4
61		12	max	.082	3	0	15	0	1	0	1	NC	4	NC	1
62			min	-.528	1	-.044	3	-.131	4	-9.252e-4	4	244.872	3	1121.617	4
63		13	max	.081	3	.071	1	0	1	0	1	NC	2	NC	1
64			min	-.526	1	-.045	3	-.099	4	-2.009e-3	4	244.363	3	1530.985	4
65		14	max	.08	3	.137	1	0	1	0	1	NC	5	NC	1
66			min	-.523	1	-.018	3	-.071	4	-3.053e-3	4	257.187	3	2265.213	4
67		15	max	.08	3	.154	1	0	1	0	1	NC	5	NC	1
68			min	-.523	1	.004	15	-.05	4	-2.29e-3	4	295.191	3	3510.577	4
69		16	max	.08	3	.146	3	0	1	0	1	NC	5	NC	1
70			min	-.523	1	.003	15	-.035	4	-1.528e-3	4	374.965	3	5755.922	4
71		17	max	.08	3	.261	3	0	1	0	1	NC	5	NC	1
72			min	-.523	1	.002	15	-.025	4	-7.652e-4	4	552.484	3	NC	1
73		18	max	.08	3	.382	3	0	1	0	1	NC	4	NC	1
74			min	-.523	1	0	9	-.018	4	-2.681e-4	4	1106.88	3	NC	1
75		19	max	.08	3	.503	3	0	1	0	1	NC	1	NC	1
76			min	-.523	1	-.031	9	-.012	4	-2.681e-4	4	NC	1	NC	1
77	M7	1	max	.026	3	.185	3	0	3	3.013e-2	1	NC	3	NC	3
78			min	-.228	1	-.864	1	-.495	4	-9.743e-3	3	150.053	1	274.392	4
79		2	max	.026	3	.153	3	0	3	3.013e-2	1	NC	5	NC	2
80			min	-.228	1	-.751	1	-.465	4	-9.743e-3	3	171.788	1	292.217	4
81		3	max	.026	3	.121	3	.006	1	2.841e-2	1	NC	5	NC	1
82			min	-.228	1	-.637	1	-.435	4	-9.306e-3	3	200.913	1	312.927	4
83		4	max	.026	3	.09	3	.012	1	2.576e-2	1	NC	5	NC	1
84			min	-.228	1	-.528	1	-.403	5	-8.635e-3	3	240.301	1	338.73	4
85		5	max	.026	3	.063	3	.012	1	2.311e-2	1	NC	5	NC	1
86			min	-.227	1	-.428	1	-.368	5	-7.964e-3	3	292.695	1	371.186	4
87		6	max	.026	3	.04	3	.011	1	2.193e-2	1	NC	5	NC	1
88			min	-.227	1	-.344	1	-.332	5	-7.797e-3	3	358.838	1	411.986	4
89		7	max	.026	3	.022	3	.005	1	2.176e-2	1	NC	5	NC	1
90			min	-.226	1	-.274	1	-.297	4	-7.978e-3	3	440.887	1	461.901	4
91		8	max	.026	3	.009	3	0	2	2.16e-2	1	NC	5	NC	2
92			min	-.225	1	-.214	1	-.263	4	-8.16e-3	3	548.77	1	523.313	4
93		9	max	.025	3	.001	5	0	3	2.067e-2	1	NC	4	NC	2
94			min	-.224	1	-.16	1	-.23	4	-8.494e-3	3	708.062	1	600.253	4
95		10	max	.025	3	.002	5	0	3	1.838e-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	-.223	1	-.107	1	-.196	4	-9.099e-3	3	683.391	3	706.913	4
97		11	max	.025	3	.002	5	.001	1	1.61e-2	1	NC	4	NC	2
98			min	-.222	1	-.057	1	-.162	4	-9.704e-3	3	661.99	3	861.813	4
99		12	max	.025	3	.001	5	.008	1	1.189e-2	1	NC	4	NC	1
100			min	-.221	1	-.021	3	-.128	5	-7.763e-3	3	651.005	3	1102.194	4
101		13	max	.024	3	.03	1	.011	1	6.579e-3	1	NC	1	NC	1
102			min	-.22	1	-.018	3	-.096	5	-4.382e-3	3	659.152	3	1513.119	4
103		14	max	.024	3	.058	1	.009	1	1.464e-3	1	NC	2	NC	1
104			min	-.219	1	-.005	3	-.068	5	-2.935e-3	5	704.731	3	2186.571	4
105		15	max	.024	3	.068	1	.004	2	4.847e-3	1	NC	5	NC	2
106			min	-.219	1	-.003	5	-.049	4	-4.526e-3	3	824.747	3	3151.582	4
107		16	max	.024	3	.066	1	0	10	8.23e-3	1	NC	5	NC	2
108			min	-.219	1	-.006	5	-.036	4	-7.903e-3	3	1081.042	3	4563.446	4
109		17	max	.024	3	.106	3	0	10	1.161e-2	1	NC	4	NC	2
110			min	-.219	1	-.009	5	-.026	4	-1.128e-2	3	1704.452	3	6958.38	4
111		18	max	.024	3	.154	3	.005	1	1.382e-2	1	NC	1	NC	1
112			min	-.219	1	-.013	5	-.017	5	-1.348e-2	3	4372.714	3	NC	1
113		19	max	.024	3	.202	3	.016	1	1.382e-2	1	NC	1	NC	1
114			min	-.219	1	-.016	5	-.009	5	-1.348e-2	3	7776.582	3	NC	1
115	M10	1	max	.001	1	.138	3	.219	1	6.432e-3	3	NC	1	NC	1
116			min	-.02	4	-.011	5	-.024	3	-1.739e-3	1	NC	1	NC	1
117		2	max	.001	1	.323	3	.263	1	7.524e-3	3	NC	5	NC	2
118			min	-.02	4	-.141	1	-.022	3	-2.292e-3	1	1273.775	1	5475.33	1
119		3	max	.001	1	.492	3	.337	1	8.616e-3	3	NC	5	NC	3
120			min	-.02	4	-.307	1	-.023	3	-2.845e-3	1	677.284	3	2039.895	1
121		4	max	0	1	.614	3	.417	1	9.709e-3	3	NC	5	NC	3
122			min	-.02	4	-.415	1	-.028	3	-3.398e-3	1	503.804	3	1217.098	1
123		5	max	0	1	.672	3	.485	1	1.08e-2	3	NC	5	NC	3
124			min	-.02	4	-.447	1	-.036	3	-3.951e-3	1	449.521	3	905.428	1
125		6	max	0	1	.661	3	.53	1	1.189e-2	3	NC	5	NC	3
126			min	-.02	4	-.4	1	-.047	3	-4.504e-3	1	458.699	3	772.194	1
127		7	max	0	1	.592	3	.55	1	1.299e-2	3	NC	5	NC	5
128			min	-.02	4	-.287	1	-.058	3	-5.057e-3	1	528.313	3	725.503	1
129		8	max	0	1	.488	3	.548	1	1.408e-2	3	NC	5	NC	5
130			min	-.02	4	-.14	1	-.069	3	-5.61e-3	1	684.383	3	730.867	1
131		9	max	0	1	.387	3	.533	1	1.517e-2	3	NC	2	NC	5
132			min	-.02	4	-.022	9	-.077	3	-6.162e-3	1	961.135	3	765.02	1
133		10	max	0	1	.34	3	.523	1	1.626e-2	3	NC	1	NC	5
134			min	-.02	4	0	15	-.08	3	-6.715e-3	1	1186.477	3	789.696	1
135		11	max	0	3	.387	3	.533	1	1.517e-2	3	NC	2	NC	5
136			min	-.02	4	-.022	9	-.077	3	-6.162e-3	1	961.135	3	765.02	1
137		12	max	0	3	.488	3	.548	1	1.408e-2	3	NC	5	NC	5
138			min	-.02	4	-.14	1	-.069	3	-5.61e-3	1	684.383	3	730.867	1
139		13	max	0	3	.592	3	.55	1	1.299e-2	3	NC	5	NC	5
140			min	-.02	4	-.287	1	-.058	3	-5.057e-3	1	528.313	3	725.503	1
141		14	max	0	3	.661	3	.53	1	1.189e-2	3	NC	5	NC	3
142			min	-.02	4	-.4	1	-.047	3	-4.504e-3	1	458.699	3	772.194	1
143		15	max	0	3	.672	3	.485	1	1.08e-2	3	NC	5	NC	3
144			min	-.02	4	-.447	1	-.036	3	-3.951e-3	1	449.521	3	905.428	1
145		16	max	0	3	.614	3	.417	1	9.709e-3	3	NC	5	NC	3
146			min	-.02	4	-.415	1	-.028	3	-3.398e-3	1	503.804	3	1217.098	1
147		17	max	0	3	.492	3	.337	1	8.616e-3	3	NC	5	NC	3
148			min	-.02	4	-.307	1	-.023	3	-2.845e-3	1	677.284	3	2039.895	1
149		18	max	0	3	.323	3	.263	1	7.524e-3	3	NC	4	NC	2
150			min	-.02	4	-.141	1	-.022	3	-2.292e-3	1	1273.775	1	5475.33	1
151		19	max	0	3	.138	3	.219	1	6.432e-3	3	NC	1	NC	1
152			min	-.02	4	.01	15	-.024	3	-1.739e-3	1	8927.782	4	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	.003	1	.002	5	.222	1	6.328e-3	1	NC	1	NC	1
154			min	-.15	4	-.039	1	-.025	3	-4.979e-4	3	NC	1	NC	1
155		2	max	.003	1	.121	3	.262	1	7.395e-3	1	NC	5	NC	2
156			min	-.15	4	-.246	1	-.031	3	-6.949e-4	3	1162.718	1	5038.291	4
157		3	max	.002	1	.25	3	.334	1	8.461e-3	1	NC	5	NC	3
158			min	-.15	4	-.427	1	-.037	3	-8.918e-4	3	619.294	1	2141.119	1
159		4	max	.002	1	.338	3	.413	1	9.527e-3	1	NC	5	NC	3
160			min	-.15	4	-.548	1	-.043	3	-1.089e-3	3	472.052	1	1253.006	1
161		5	max	.002	1	.365	3	.482	1	1.059e-2	1	NC	5	NC	12
162			min	-.15	4	-.59	1	-.051	3	-1.286e-3	3	436.045	1	921.16	1
163		6	max	.001	1	.33	3	.53	1	1.166e-2	1	NC	5	NC	5
164			min	-.151	4	-.55	1	-.059	3	-1.483e-3	3	469.54	1	778.777	1
165		7	max	.001	1	.242	3	.552	1	1.273e-2	1	NC	5	NC	5
166			min	-.151	4	-.444	1	-.067	3	-1.679e-3	3	593.193	1	726.356	1
167		8	max	0	1	.125	3	.552	1	1.379e-2	1	NC	5	NC	4
168			min	-.151	4	-.3	1	-.074	3	-1.876e-3	3	919.475	1	726.985	1
169		9	max	0	1	.016	3	.539	1	1.486e-2	1	NC	5	NC	4
170			min	-.151	4	-.166	1	-.08	3	-2.073e-3	3	1889.873	1	756.911	1
171		10	max	0	1	-.002	15	.53	1	1.593e-2	1	NC	3	NC	5
172			min	-.151	4	-.105	1	-.082	3	-2.27e-3	3	3670.433	1	779.443	1
173		11	max	0	3	.016	3	.539	1	1.486e-2	1	NC	4	7716.142	15
174			min	-.151	4	-.166	1	-.08	3	-2.073e-3	3	1889.873	1	756.911	1
175		12	max	0	3	.125	3	.552	1	1.379e-2	1	NC	5	8268.12	12
176			min	-.151	4	-.3	1	-.074	3	-1.876e-3	3	919.475	1	726.985	1
177		13	max	0	3	.242	3	.552	1	1.273e-2	1	NC	5	9804.561	12
178			min	-.151	4	-.444	1	-.067	3	-1.679e-3	3	593.193	1	726.356	1
179		14	max	0	3	.33	3	.53	1	1.166e-2	1	NC	15	NC	5
180			min	-.151	4	-.55	1	-.059	3	-1.483e-3	3	469.54	1	778.777	1
181		15	max	.001	3	.365	3	.482	1	1.059e-2	1	NC	15	NC	5
182			min	-.151	4	-.59	1	-.051	3	-1.286e-3	3	436.045	1	921.16	1
183		16	max	.001	3	.338	3	.413	1	9.527e-3	1	NC	15	NC	3
184			min	-.151	4	-.548	1	-.043	3	-1.089e-3	3	472.052	1	1253.006	1
185		17	max	.002	3	.25	3	.334	1	8.461e-3	1	NC	15	NC	3
186			min	-.151	4	-.427	1	-.037	3	-8.918e-4	3	619.294	1	2141.119	1
187		18	max	.002	3	.121	3	.262	1	7.395e-3	1	NC	5	NC	2
188			min	-.151	4	-.246	1	-.031	3	-6.949e-4	3	1162.718	1	5998.671	1
189		19	max	.002	3	-.003	15	.222	1	6.328e-3	1	NC	1	NC	1
190			min	-.151	4	-.039	1	-.025	3	-4.979e-4	3	NC	1	NC	1
191	M12	1	max	0	2	.002	3	.225	1	7.362e-3	1	NC	1	NC	1
192			min	-.242	4	-.179	1	-.026	3	-1.446e-3	3	NC	1	NC	1
193		2	max	0	2	.107	3	.256	1	8.5e-3	1	NC	5	NC	2
194			min	-.242	4	-.464	1	-.026	3	-1.749e-3	3	843.753	1	5214.885	4
195		3	max	0	2	.191	3	.323	1	9.638e-3	1	NC	5	NC	3
196			min	-.242	4	-.71	1	-.029	3	-2.053e-3	3	452.225	1	2432.851	1
197		4	max	0	2	.243	3	.402	1	1.078e-2	1	NC	5	NC	3
198			min	-.242	4	-.879	1	-.035	3	-2.356e-3	3	342.715	1	1354.185	1
199		5	max	0	2	.258	3	.473	1	1.191e-2	1	NC	5	NC	3
200			min	-.242	4	-.952	1	-.043	3	-2.66e-3	3	310.444	1	967.627	1
201		6	max	0	2	.236	3	.524	1	1.305e-2	1	NC	5	NC	5
202			min	-.242	4	-.927	1	-.053	3	-2.963e-3	3	321.112	1	802.114	1
203		7	max	0	2	.186	3	.55	1	1.419e-2	1	NC	5	NC	5
204			min	-.242	4	-.819	1	-.064	3	-3.267e-3	3	375.028	1	736.608	1
205		8	max	0	2	.12	3	.554	1	1.533e-2	1	NC	5	NC	4
206			min	-.242	4	-.665	1	-.074	3	-3.57e-3	3	493.976	1	727.717	1
207		9	max	0	2	.061	3	.545	1	1.646e-2	1	NC	5	NC	4
208			min	-.242	4	-.518	1	-.081	3	-3.873e-3	3	708.738	1	750.029	1
209		10	max	0	1	.034	3	.537	1	1.76e-2	1	NC	5	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
210			min	-.242	4	-.449	1	-.084	3	-4.177e-3	3	888.181	1	768.947	1
211		11	max	0	9	.061	3	.545	1	1.646e-2	1	NC	5	7497.107	15
212			min	-.242	4	-.518	1	-.081	3	-3.873e-3	3	708.738	1	750.029	1
213		12	max	0	9	.12	3	.554	1	1.533e-2	1	NC	5	8496.749	12
214			min	-.242	4	-.665	1	-.074	3	-3.57e-3	3	493.976	1	727.717	1
215		13	max	0	9	.186	3	.55	1	1.419e-2	1	NC	15	NC	12
216			min	-.242	4	-.819	1	-.064	3	-3.267e-3	3	375.028	1	736.608	1
217		14	max	0	9	.236	3	.524	1	1.305e-2	1	NC	15	NC	5
218			min	-.242	4	-.927	1	-.053	3	-2.963e-3	3	321.112	1	802.114	1
219		15	max	0	9	.258	3	.473	1	1.191e-2	1	NC	15	NC	3
220			min	-.242	4	-.952	1	-.043	3	-2.66e-3	3	310.444	1	967.627	1
221		16	max	0	9	.243	3	.402	1	1.078e-2	1	NC	15	NC	3
222			min	-.242	4	-.879	1	-.035	3	-2.356e-3	3	342.715	1	1354.185	1
223		17	max	0	9	.191	3	.323	1	9.638e-3	1	NC	15	NC	3
224			min	-.242	4	-.71	1	-.029	3	-2.053e-3	3	452.225	1	2432.851	1
225		18	max	0	9	.107	3	.256	1	8.5e-3	1	NC	5	NC	2
226			min	-.242	4	-.464	1	-.026	3	-1.749e-3	3	843.753	1	6418.449	5
227		19	max	0	9	.002	3	.225	1	7.362e-3	1	NC	1	NC	1
228			min	-.242	4	-.179	1	-.026	3	-1.446e-3	3	NC	1	NC	1
229	M13	1	max	0	3	.142	3	.228	1	1.518e-2	1	NC	1	NC	1
230			min	-.455	4	-.711	1	-.026	3	-4.297e-3	3	NC	1	NC	1
231		2	max	0	3	.271	3	.278	1	1.76e-2	1	NC	5	NC	3
232			min	-.455	4	-1.112	1	-.028	3	-5.104e-3	3	598.061	1	4719.934	1
233		3	max	0	3	.385	3	.357	1	2.002e-2	1	NC	5	NC	3
234			min	-.455	4	-1.476	1	-.032	3	-5.911e-3	3	313.751	1	1855.151	1
235		4	max	0	3	.471	3	.439	1	2.245e-2	1	NC	15	NC	3
236			min	-.455	4	-1.76	1	-.038	3	-6.718e-3	3	228.874	1	1133.726	1
237		5	max	0	3	.521	3	.508	1	2.487e-2	1	9301.405	15	NC	3
238			min	-.455	4	-1.94	1	-.047	3	-7.524e-3	3	195.375	1	854.597	1
239		6	max	0	3	.534	3	.554	1	2.729e-2	1	8591.943	15	NC	5
240			min	-.455	4	-2.01	1	-.057	3	-8.331e-3	3	184.783	1	734.591	1
241		7	max	0	3	.515	3	.574	1	2.972e-2	1	8564.248	15	NC	5
242			min	-.455	4	-1.984	1	-.067	3	-9.138e-3	3	188.566	1	693.376	1
243		8	max	0	3	.476	3	.57	1	3.214e-2	1	9006.332	15	NC	5
244			min	-.455	4	-1.893	1	-.077	3	-9.945e-3	3	203.123	1	700.124	1
245		9	max	0	3	.433	3	.555	1	3.456e-2	1	9678.094	15	NC	5
246			min	-.455	4	-1.786	1	-.084	3	-1.075e-2	3	223.28	1	733.277	1
247		10	max	0	1	.413	3	.545	1	3.698e-2	1	NC	15	NC	5
248			min	-.455	4	-1.732	1	-.087	3	-1.156e-2	3	235.087	1	756.802	1
249		11	max	0	1	.433	3	.555	1	3.456e-2	1	9452.578	15	NC	15
250			min	-.455	4	-1.786	1	-.084	3	-1.075e-2	3	223.28	1	733.277	1
251		12	max	0	1	.476	3	.57	1	3.214e-2	1	8480.63	15	9038.019	15
252			min	-.455	4	-1.893	1	-.077	3	-9.945e-3	3	203.123	1	700.124	1
253		13	max	0	1	.515	3	.574	1	2.972e-2	1	7756.956	15	NC	12
254			min	-.455	4	-1.984	1	-.067	3	-9.138e-3	3	188.566	1	693.376	1
255		14	max	0	1	.534	3	.554	1	2.729e-2	1	7487.263	15	NC	5
256			min	-.454	4	-2.01	1	-.057	3	-8.331e-3	3	184.783	1	734.591	1
257		15	max	0	1	.521	3	.508	1	2.487e-2	1	7791.047	15	NC	3
258			min	-.454	4	-1.94	1	-.047	3	-7.524e-3	3	195.375	1	854.597	1
259		16	max	.001	1	.471	3	.439	1	2.245e-2	1	8965.511	15	NC	3
260			min	-.454	4	-1.76	1	-.038	3	-6.718e-3	3	228.874	1	1133.726	1
261		17	max	.001	1	.385	3	.357	1	2.002e-2	1	NC	15	NC	3
262			min	-.454	4	-1.476	1	-.032	3	-5.911e-3	3	313.751	1	1855.151	1
263		18	max	.001	1	.271	3	.278	1	1.76e-2	1	NC	5	NC	3
264			min	-.454	4	-1.112	1	-.028	3	-5.104e-3	3	598.061	1	4719.934	1
265		19	max	.002	1	.142	3	.228	1	1.518e-2	1	NC	1	NC	1
266			min	-.454	4	-.711	1	-.026	3	-4.297e-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	3	0	5	9.686e-4	1	NC	1	NC	1
270			min	0	1	0	1	0	1	-9.718e-4	5	NC	1	NC	1
271		3	max	0	3	0	3	.001	5	1.937e-3	1	NC	1	NC	1
272			min	0	1	-.003	1	0	1	-1.944e-3	5	NC	1	NC	1
273		4	max	0	3	0	3	.003	5	2.906e-3	1	NC	3	NC	1
274			min	0	1	-.007	1	0	1	-2.915e-3	5	6302.89	1	NC	1
275		5	max	0	3	0	3	.005	5	3.874e-3	1	NC	3	NC	1
276			min	0	1	-.013	1	0	1	-3.887e-3	5	3546.754	1	9091.013	5
277		6	max	0	3	.002	3	.008	5	4.843e-3	1	NC	3	NC	1
278			min	0	1	-.02	1	-.001	1	-4.859e-3	5	2270.522	1	5984.667	5
279		7	max	0	3	.002	3	.011	5	5.363e-3	1	NC	3	NC	1
280			min	0	1	-.03	1	-.002	1	-5.504e-3	5	1573.04	1	4270.395	5
281		8	max	0	3	.004	3	.014	5	4.816e-3	1	NC	3	NC	1
282			min	0	1	-.04	1	-.002	1	-5.375e-3	5	1150.797	1	3222.445	5
283		9	max	0	3	.005	3	.018	5	4.27e-3	1	NC	12	NC	1
284			min	0	1	-.053	1	-.002	1	-5.245e-3	5	882.145	1	2533.641	5
285		10	max	0	3	.006	3	.023	5	3.723e-3	1	NC	12	NC	1
286			min	0	1	-.066	1	-.002	1	-5.115e-3	5	700.849	1	2055.939	5
287		11	max	0	3	.008	3	.027	5	3.176e-3	1	NC	12	NC	1
288			min	0	1	-.081	1	-.002	1	-4.986e-3	5	572.786	1	1710.679	5
289		12	max	0	3	.01	3	.032	4	2.63e-3	1	8287.953	12	NC	1
290			min	0	1	-.097	1	-.002	1	-4.856e-3	5	478.998	1	1451.215	4
291		13	max	0	3	.012	3	.037	4	2.083e-3	1	6923.356	12	NC	1
292			min	-.001	1	-.114	1	-.001	1	-4.726e-3	5	408.24	1	1249.618	4
293		14	max	0	3	.014	3	.043	4	1.537e-3	1	5898.078	12	NC	1
294			min	-.001	1	-.131	1	-.002	3	-4.596e-3	5	353.535	1	1091.533	4
295		15	max	0	3	.016	3	.048	4	1.034e-3	2	5108.416	12	NC	1
296			min	-.001	1	-.15	1	-.003	3	-4.467e-3	5	310.378	1	965.252	4
297		16	max	0	3	.018	3	.054	4	5.856e-4	2	4487.41	12	NC	1
298			min	-.001	1	-.168	1	-.004	3	-4.337e-3	5	275.74	1	862.762	4
299		17	max	0	3	.02	3	.06	4	1.367e-4	2	4026.619	15	NC	1
300			min	-.001	1	-.188	1	-.006	3	-4.27e-3	4	247.528	1	778.443	4
301		18	max	0	3	.023	3	.066	4	2.832e-4	3	3658.667	15	NC	9
302			min	-.001	1	-.207	1	-.008	3	-4.219e-3	4	224.266	1	708.271	4
303		19	max	0	3	.025	3	.071	4	4.786e-4	3	3350.529	15	NC	9
304			min	-.001	1	-.227	1	-.01	3	-4.169e-3	4	204.881	1	649.284	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	3	0	4	0	1	NC	1	NC	1
308			min	0	1	-.002	1	0	1	-1.019e-3	4	NC	1	NC	1
309		3	max	0	3	0	3	.001	4	0	1	NC	3	NC	1
310			min	0	1	-.007	1	0	1	-2.038e-3	4	6292.405	1	NC	1
311		4	max	0	3	.002	3	.003	4	0	1	NC	3	NC	1
312			min	0	1	-.017	1	0	1	-3.057e-3	4	2766.654	1	NC	1
313		5	max	0	3	.003	3	.005	4	0	1	NC	3	NC	1
314			min	-.001	1	-.03	1	0	1	-4.076e-3	4	1545.089	1	8665.284	4
315		6	max	0	3	.005	3	.008	4	0	1	NC	5	NC	1
316			min	-.001	1	-.047	1	0	1	-5.095e-3	4	983.141	1	5710.6	4
317		7	max	0	3	.008	3	.011	4	0	1	NC	5	NC	1
318			min	-.002	1	-.069	1	0	1	-5.769e-3	4	677.202	1	4079.119	4
319		8	max	.001	3	.012	3	.015	4	0	1	NC	5	NC	1
320			min	-.002	1	-.094	1	0	1	-5.622e-3	4	492.627	1	3080.951	4
321		9	max	.001	3	.016	3	.019	4	0	1	NC	15	NC	1
322			min	-.002	1	-.123	1	0	1	-5.474e-3	4	375.981	1	2424.65	4
323		10	max	.001	3	.021	3	.024	4	0	1	NC	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	1	-.156	1	0	1	-5.327e-3	4	297.689	1	1969.484	4
325		11	max	.001	3	.027	3	.028	4	0	1	9435.16	15	NC	1
326			min	-.002	1	-.191	1	0	1	-5.18e-3	4	242.629	1	1640.571	4
327		12	max	.002	3	.033	3	.033	4	0	1	7881.469	15	NC	1
328			min	-.003	1	-.229	1	0	1	-5.032e-3	4	202.451	1	1395.053	4
329		13	max	.002	3	.039	3	.038	4	0	1	6711.061	15	NC	1
330			min	-.003	1	-.27	1	0	1	-4.885e-3	4	172.23	1	1206.846	4
331		14	max	.002	3	.046	3	.044	4	0	1	5807.323	15	NC	1
332			min	-.003	1	-.312	1	0	1	-4.738e-3	4	148.925	1	1059.386	4
333		15	max	.002	3	.053	3	.049	4	0	1	5095.151	15	NC	1
334			min	-.003	1	-.355	1	0	1	-4.59e-3	4	130.579	1	941.753	4
335		16	max	.002	3	.06	3	.055	4	0	1	4524.094	15	NC	1
336			min	-.004	1	-.401	1	0	1	-4.443e-3	4	115.882	1	846.475	4
337		17	max	.002	3	.067	3	.06	4	0	1	4059.376	15	NC	1
338			min	-.004	1	-.447	1	0	1	-4.295e-3	4	103.932	1	768.314	4
339		18	max	.002	3	.075	3	.066	4	0	1	3676.476	15	NC	1
340			min	-.004	1	-.493	1	0	1	-4.148e-3	4	94.093	1	703.514	4
341		19	max	.002	3	.083	3	.071	4	0	1	3357.594	15	NC	1
342			min	-.004	1	-.54	1	0	1	-4.001e-3	4	85.904	1	649.314	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	3.374e-4	3	NC	1	NC	1
346			min	0	1	0	1	0	3	-1.182e-3	4	NC	1	NC	1
347		3	max	0	3	0	3	.001	4	6.748e-4	3	NC	1	NC	1
348			min	0	1	-.003	1	0	3	-2.364e-3	4	NC	1	NC	1
349		4	max	0	3	0	3	.003	4	1.012e-3	3	NC	3	NC	1
350			min	0	1	-.007	1	0	3	-3.545e-3	4	6302.89	1	NC	1
351		5	max	0	3	0	3	.005	4	1.35e-3	3	NC	3	NC	1
352			min	0	1	-.013	1	0	3	-4.727e-3	4	3546.754	1	8608.326	4
353		6	max	0	3	.002	3	.008	4	1.687e-3	3	NC	3	NC	1
354			min	0	1	-.02	1	0	3	-5.909e-3	4	2270.522	1	5694.259	4
355		7	max	0	3	.002	3	.011	4	1.867e-3	3	NC	3	NC	1
356			min	0	1	-.03	1	0	3	-6.667e-3	4	1573.04	1	4082.632	4
357		8	max	0	3	.004	3	.015	4	1.671e-3	3	NC	3	NC	1
358			min	0	1	-.04	1	0	3	-6.416e-3	4	1150.797	1	3094.12	4
359		9	max	0	3	.005	3	.019	4	1.476e-3	3	NC	5	NC	1
360			min	0	1	-.053	1	0	3	-6.166e-3	4	882.145	1	2442.641	4
361		10	max	0	3	.006	3	.023	4	1.28e-3	3	NC	5	NC	1
362			min	0	1	-.066	1	0	3	-5.916e-3	4	700.849	1	1990.16	4
363		11	max	0	3	.008	3	.028	4	1.085e-3	3	NC	5	NC	1
364			min	0	1	-.081	1	0	3	-5.666e-3	4	572.786	1	1662.91	4
365		12	max	0	3	.01	3	.033	4	8.894e-4	3	NC	5	NC	1
366			min	0	1	-.097	1	0	10	-5.416e-3	4	478.998	1	1418.543	4
367		13	max	0	3	.012	3	.038	4	6.94e-4	3	NC	5	NC	1
368			min	-.001	1	-.114	1	0	10	-5.165e-3	4	408.24	1	1231.237	4
369		14	max	0	3	.014	3	.043	4	4.985e-4	3	NC	5	NC	1
370			min	-.001	1	-.131	1	0	2	-4.915e-3	4	353.535	1	1084.571	4
371		15	max	0	3	.016	3	.048	4	3.031e-4	3	NC	5	NC	1
372			min	-.001	1	-.15	1	-.001	2	-4.665e-3	4	310.378	1	967.703	4
373		16	max	0	3	.018	3	.053	4	1.077e-4	3	NC	5	NC	1
374			min	-.001	1	-.168	1	-.003	2	-4.415e-3	4	275.74	1	873.213	4
375		17	max	0	3	.02	3	.058	4	1.373e-4	9	NC	5	NC	1
376			min	-.001	1	-.188	1	-.004	1	-4.186e-3	5	247.528	1	795.905	4
377		18	max	0	3	.023	3	.064	5	6.494e-4	1	NC	5	NC	9
378			min	-.001	1	-.207	1	-.006	1	-4.017e-3	5	224.266	1	730.485	5
379		19	max	0	3	.025	3	.069	5	1.196e-3	1	NC	5	NC	9
380			min	-.001	1	-.227	1	-.009	1	-3.847e-3	5	204.881	1	674.287	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
381	M3	1	max	.026	1	0	3	.01	5	1.236e-3	1	NC	1	NC	1
382			min	-.002	3	-.007	1	-.002	1	-4.395e-4	3	NC	1	NC	1
383		2	max	.025	1	.004	3	.03	5	2.238e-3	1	NC	1	NC	5
384			min	-.002	3	-.032	1	-.02	1	-7.931e-4	3	NC	1	3240.459	1
385		3	max	.024	1	.006	3	.05	5	3.24e-3	1	NC	1	NC	5
386			min	-.002	3	-.058	1	-.039	1	-1.147e-3	3	NC	1	1646.07	1
387		4	max	.023	1	.009	3	.07	5	4.241e-3	1	NC	1	NC	5
388			min	-.001	3	-.083	1	-.056	1	-1.5e-3	3	7712.248	3	1121.406	1
389		5	max	.022	1	.012	3	.09	5	5.243e-3	1	NC	1	NC	5
390			min	-.001	3	-.108	1	-.072	1	-1.854e-3	3	5745.679	3	864.829	1
391		6	max	.021	1	.015	3	.11	5	6.245e-3	1	NC	1	NC	5
392			min	0	3	-.134	1	-.086	1	-2.207e-3	3	4559.414	3	713.406	4
393		7	max	.021	1	.018	3	.13	5	7.246e-3	1	NC	1	NC	5
394			min	0	3	-.159	1	-.099	1	-2.561e-3	3	3764.25	3	591.856	4
395		8	max	.02	1	.021	3	.15	5	8.248e-3	1	NC	1	NC	5
396			min	0	3	-.184	1	-.109	1	-2.915e-3	3	3193.365	3	504.927	4
397		9	max	.019	1	.024	3	.17	5	9.249e-3	1	NC	1	NC	7
398			min	0	3	-.209	1	-.117	1	-3.268e-3	3	2763.32	3	439.623	4
399		10	max	.018	1	.027	3	.189	5	1.025e-2	1	NC	1	NC	15
400			min	0	12	-.233	1	-.122	1	-3.622e-3	3	2427.724	3	388.727	4
401		11	max	.017	1	.03	3	.209	5	1.125e-2	1	NC	1	NC	15
402			min	0	12	-.258	1	-.124	1	-3.975e-3	3	2158.707	3	347.907	4
403		12	max	.016	1	.034	3	.228	5	1.225e-2	1	NC	1	NC	15
404			min	0	12	-.283	1	-.123	1	-4.329e-3	3	1938.5	3	314.408	4
405		13	max	.016	1	.037	3	.247	5	1.326e-2	1	NC	1	NC	15
406			min	0	12	-.307	1	-.117	1	-4.682e-3	3	1755.226	3	286.394	4
407		14	max	.015	1	.04	3	.265	5	1.426e-2	1	NC	1	NC	7
408			min	0	12	-.332	1	-.108	1	-5.036e-3	3	1600.632	3	262.595	4
409		15	max	.014	1	.044	3	.284	5	1.526e-2	1	NC	1	NC	5
410			min	0	12	-.356	1	-.094	1	-5.39e-3	3	1468.801	3	242.104	4
411		16	max	.013	1	.048	3	.302	5	1.626e-2	1	NC	1	NC	5
412			min	.001	12	-.38	1	-.075	1	-5.743e-3	3	1355.373	3	224.255	4
413		17	max	.012	1	.051	3	.32	5	1.726e-2	1	NC	1	NC	5
414			min	.001	12	-.404	1	-.052	1	-6.097e-3	3	1257.062	3	208.551	4
415		18	max	.011	1	.055	3	.337	5	1.826e-2	1	NC	1	NC	5
416			min	.001	12	-.428	1	-.023	1	-6.45e-3	3	1171.342	3	194.611	4
417		19	max	.01	1	.059	3	.358	4	1.927e-2	1	NC	1	NC	1
418			min	.001	15	-.453	1	-.001	3	-6.804e-3	3	1096.239	3	182.141	4
419	M6	1	max	.059	1	.003	3	.01	4	0	1	NC	1	NC	1
420			min	-.007	3	-.016	1	0	1	-1.521e-4	5	NC	1	NC	1
421		2	max	.057	1	.013	3	.031	4	0	1	NC	1	NC	1
422			min	-.006	3	-.077	1	0	1	-2.7e-4	5	6326.062	3	NC	1
423		3	max	.055	1	.023	3	.052	4	0	1	NC	1	NC	1
424			min	-.005	3	-.138	1	0	1	-3.88e-4	5	3160.31	3	NC	1
425		4	max	.052	1	.033	3	.073	4	0	1	NC	1	NC	1
426			min	-.005	3	-.198	1	0	1	-5.06e-4	5	2103.989	3	NC	1
427		5	max	.05	1	.043	3	.094	4	0	1	NC	1	NC	1
428			min	-.004	3	-.259	1	0	1	-6.24e-4	5	1575.112	3	9822.237	4
429		6	max	.048	1	.053	3	.115	4	0	1	NC	1	NC	1
430			min	-.003	3	-.319	1	0	1	-7.419e-4	5	1257.283	3	8045.207	4
431		7	max	.045	1	.063	3	.136	4	0	1	NC	1	NC	1
432			min	-.002	3	-.38	1	0	1	-8.599e-4	5	1045.036	3	6932.995	4
433		8	max	.043	1	.074	3	.156	4	0	1	NC	1	NC	1
434			min	-.002	3	-.44	1	0	1	-9.779e-4	5	893.172	3	6210.53	4
435		9	max	.041	1	.084	3	.176	4	0	1	NC	1	NC	1
436			min	0	3	-.5	1	0	1	-1.096e-3	5	779.091	3	5745.155	4
437		10	max	.038	1	.095	3	.196	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	3	-.56	1	0	1	-1.214e-3	5	690.236	3	5469.569	4
439		11	max	.036	1	.105	3	.216	4	0	1	NC	1	NC	1
440			min	0	12	-.62	1	0	1	-1.332e-3	5	619.073	3	5352.489	4
441		12	max	.034	1	.116	3	.235	4	0	1	NC	1	NC	1
442			min	0	15	-.68	1	0	1	-1.45e-3	5	560.805	3	5387.997	4
443		13	max	.031	1	.126	3	.254	4	0	1	NC	1	NC	1
444			min	0	15	-.74	1	0	1	-1.568e-3	4	512.237	3	5595.505	4
445		14	max	.029	1	.137	3	.273	4	0	1	NC	1	NC	1
446			min	0	15	-.8	1	0	1	-1.687e-3	4	471.152	3	6031.443	4
447		15	max	.027	1	.148	3	.291	4	0	1	NC	1	NC	1
448			min	0	15	-.859	1	0	1	-1.805e-3	4	435.97	3	6825.83	4
449		16	max	.024	1	.159	3	.309	4	0	1	NC	1	NC	1
450			min	0	15	-.919	1	0	1	-1.924e-3	4	405.528	3	8297.188	4
451		17	max	.022	1	.17	3	.326	4	0	1	NC	1	NC	1
452			min	0	15	-.978	1	0	1	-2.042e-3	4	378.955	3	NC	1
453		18	max	.02	1	.181	3	.343	4	0	1	NC	1	NC	1
454			min	0	15	-1.037	1	0	1	-2.161e-3	4	355.586	3	NC	1
455		19	max	.018	1	.192	3	.359	4	0	1	NC	1	NC	1
456			min	0	15	-1.097	1	0	1	-2.28e-3	4	334.901	3	NC	1
457	M9	1	max	.026	1	0	3	.01	4	4.395e-4	3	NC	1	NC	1
458			min	-.002	3	-.007	1	0	3	-1.236e-3	1	NC	1	NC	1
459		2	max	.025	1	.004	3	.035	4	7.931e-4	3	NC	1	NC	4
460			min	-.002	3	-.032	1	-.007	3	-2.238e-3	1	NC	1	3240.459	1
461		3	max	.024	1	.006	3	.059	4	1.147e-3	3	NC	1	NC	5
462			min	-.002	3	-.058	1	-.014	3	-3.24e-3	1	NC	1	1646.07	1
463		4	max	.023	1	.009	3	.083	4	1.5e-3	3	NC	1	NC	15
464			min	-.001	3	-.083	1	-.02	3	-4.241e-3	1	7712.248	3	1121.406	1
465		5	max	.022	1	.012	3	.106	4	1.854e-3	3	NC	1	NC	15
466			min	-.001	3	-.108	1	-.025	3	-5.243e-3	1	5745.679	3	864.829	1
467		6	max	.021	1	.015	3	.129	4	2.207e-3	3	NC	1	8645.99	15
468			min	0	3	-.134	1	-.03	3	-6.245e-3	1	4559.414	3	716.232	1
469		7	max	.021	1	.018	3	.152	4	2.561e-3	3	NC	1	7460	15
470			min	0	5	-.159	1	-.035	3	-7.246e-3	1	3764.25	3	622.493	1
471		8	max	.02	1	.021	3	.174	4	2.915e-3	3	NC	1	6687.403	15
472			min	0	5	-.184	1	-.038	3	-8.248e-3	1	3193.365	3	561.152	1
473		9	max	.019	1	.024	3	.196	4	3.268e-3	3	NC	1	6187.865	15
474			min	0	5	-.209	1	-.041	3	-9.249e-3	1	2763.32	3	521.37	1
475		10	max	.018	1	.027	3	.216	4	3.622e-3	3	NC	1	5890.126	15
476			min	0	5	-.233	1	-.043	3	-1.025e-2	1	2427.724	3	497.668	1
477		11	max	.017	1	.03	3	.236	4	3.975e-3	3	NC	1	5761.031	15
478			min	0	5	-.258	1	-.044	3	-1.125e-2	1	2158.707	3	487.542	1
479		12	max	.016	1	.034	3	.255	4	4.329e-3	3	NC	1	5794.291	15
480			min	0	5	-.283	1	-.043	3	-1.225e-2	1	1938.5	3	490.62	1
481		13	max	.016	1	.037	3	.273	4	4.682e-3	3	NC	1	6010.465	15
482			min	0	5	-.307	1	-.042	3	-1.326e-2	1	1755.226	3	508.706	1
483		14	max	.015	1	.04	3	.289	4	5.036e-3	3	NC	1	6469.388	15
484			min	0	5	-.332	1	-.039	3	-1.426e-2	1	1600.632	3	546.83	1
485		15	max	.014	1	.044	3	.305	4	5.39e-3	3	NC	1	7308.962	15
486			min	0	5	-.356	1	-.034	3	-1.526e-2	1	1468.801	3	616.488	1
487		16	max	.013	1	.048	3	.319	4	5.743e-3	3	NC	1	8867.087	15
488			min	0	5	-.38	1	-.028	3	-1.626e-2	1	1355.373	3	745.769	1
489		17	max	.012	1	.051	3	.332	4	6.097e-3	3	NC	1	NC	15
490			min	0	5	-.404	1	-.02	3	-1.726e-2	1	1257.062	3	1020.259	1
491		18	max	.011	1	.055	3	.343	4	6.45e-3	3	NC	1	NC	5
492			min	0	5	-.428	1	-.01	3	-1.826e-2	1	1171.342	3	1869.713	1
493		19	max	.01	1	.059	3	.353	5	6.804e-3	3	NC	1	NC	1
494			min	-.001	5	-.453	1	-.012	1	-1.927e-2	1	1096.239	3	NC	1