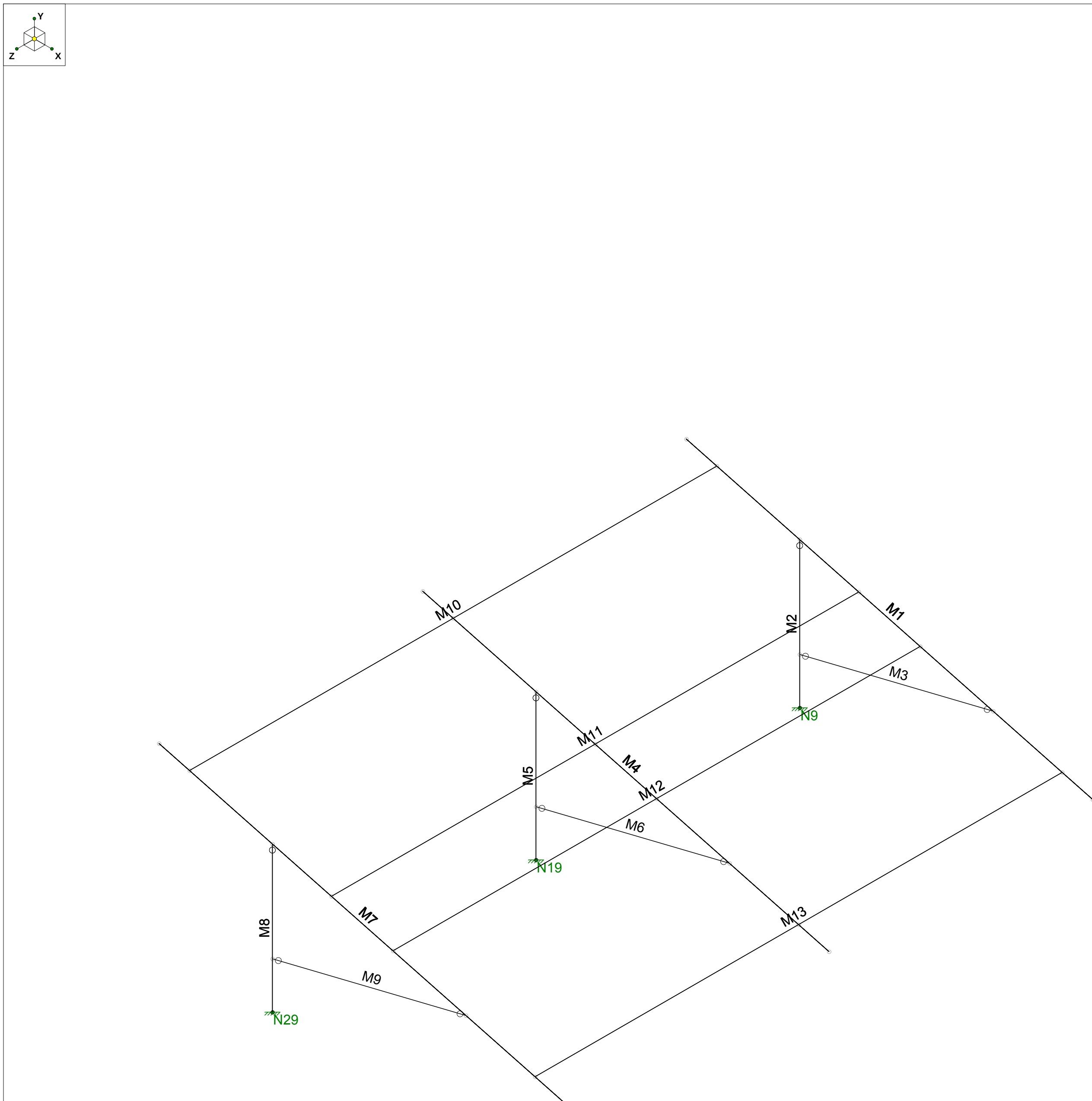


Schletter, Inc.	Standard FS Racking System	15° Tilt w/ Seismic Design
HCV	Representative Calculations - ASCE 7-10	

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.

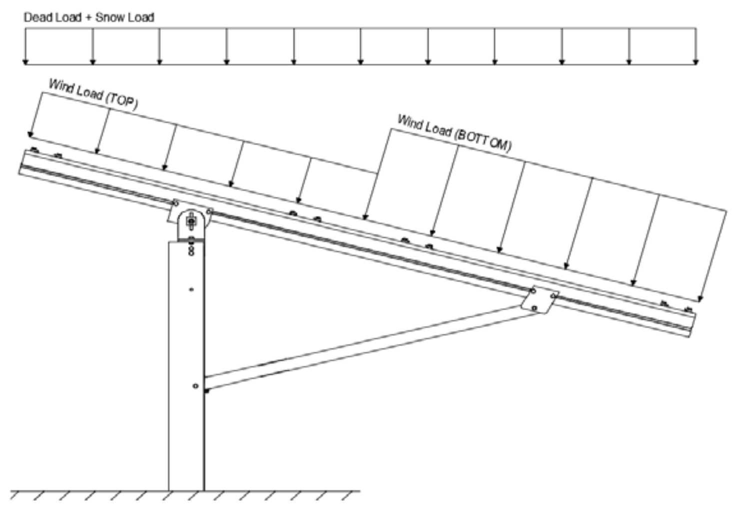
1.2 Construction

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 = 160 mph — Exposure Category = C
Height < 15 ft — Importance Category = II

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

Pressure Coefficients

$Cf+_{TOP}$	=	1	(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

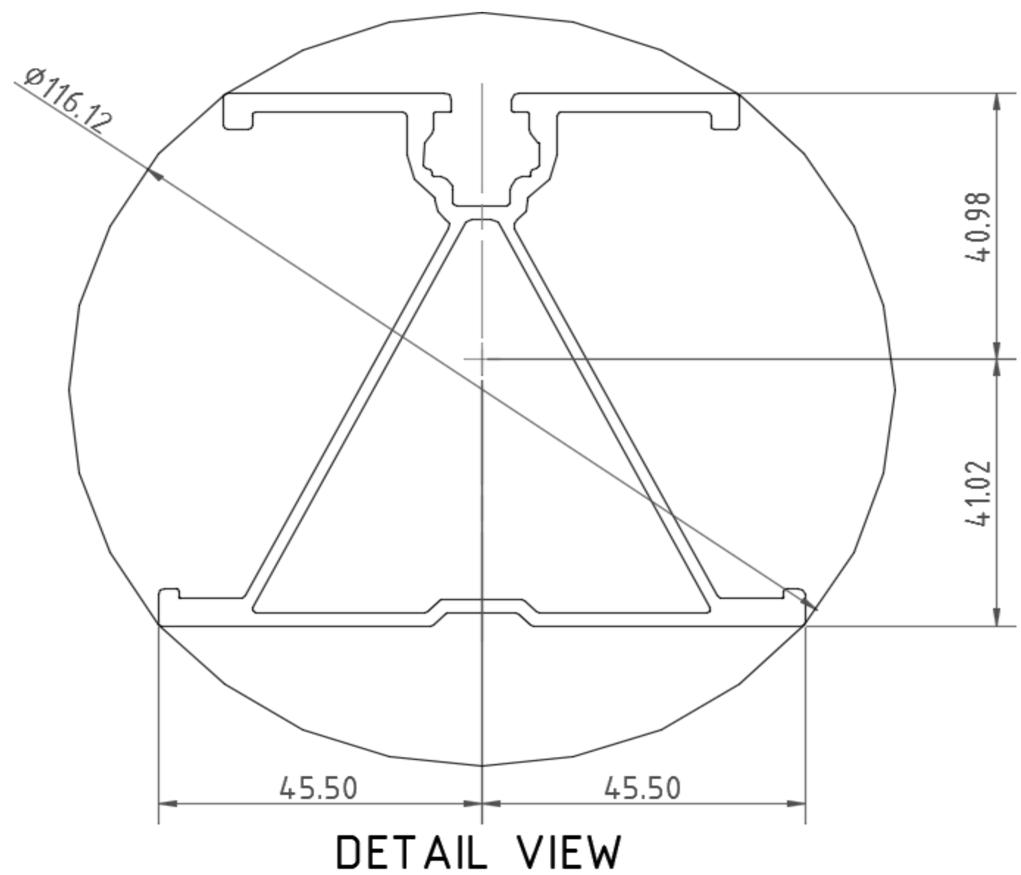
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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).

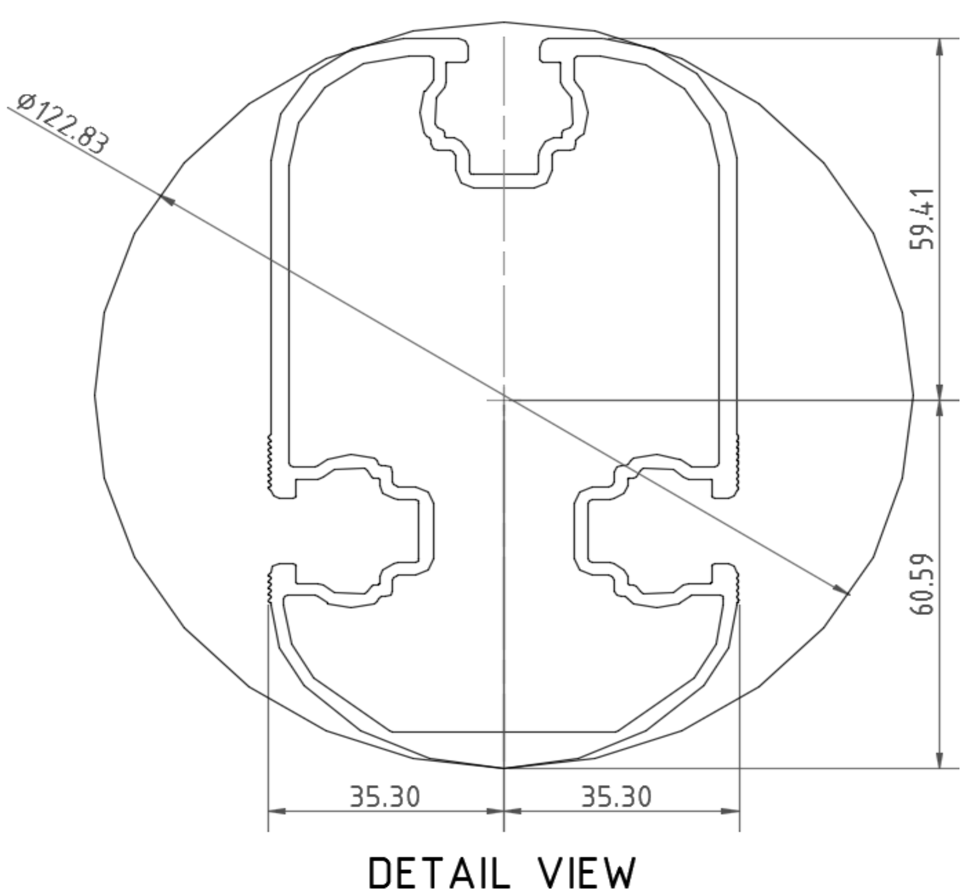
Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	90	in
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	25.07	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	23.08	ksi
S_y =	1.33	in^3
S_x =	0.6	in^3
E =	10100	ksi
I_y =	2.16	in^4
I_x =	1.07	in^4
A =	1.25	in^2
g =	1.50	lbs/ft
M_y =	1.293	k-ft
M_z =	0.169	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	61%	



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).

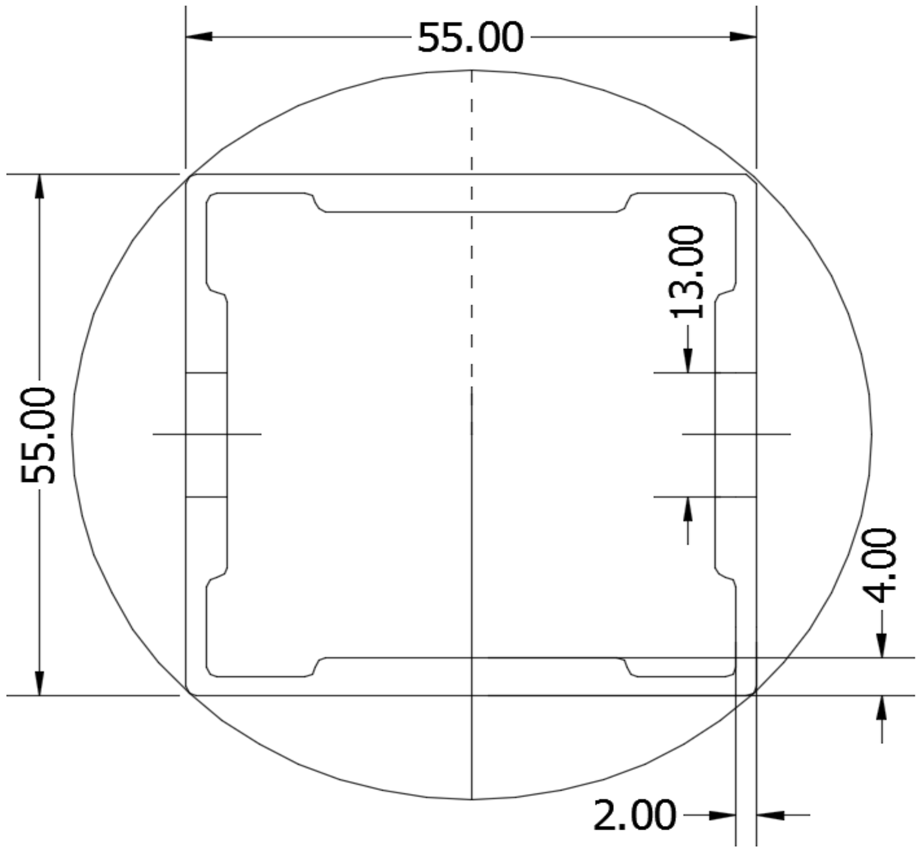
Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	63.82	in
$\Phi F_{ty\ AXIAL}$ =	30.80	ksi
$\Phi F_{ty\ STRONG\text{-}AXIS}$ =	30.46	ksi
$\Phi F_{ty\ WEAK\text{-}AXIS}$ =	31.56	ksi
S_y =	1.98	in^3
S_x =	1.32	in^3
E =	10100	ksi
I_y =	4.74	in^4
I_x =	1.83	in^4
A =	1.93	in^2
g =	2.32	lbs/ft
M_y =	4.322	k-ft
M_z =	0.000	k-ft
P_n =	0.042	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	86%	



4.3 Strut Design

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

Strut Type =	**55x55**
Aluminum Type =	6105-T5
F_{ty} =	35 ksi
L_b =	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 =	7.321 k
$M_{y\ allowable}$ =	1.408 k-ft
$M_{z\ allowable}$ =	1.408 k-ft
$P_{n\ allowable}$ =	13.425 k
Utilization =	55%

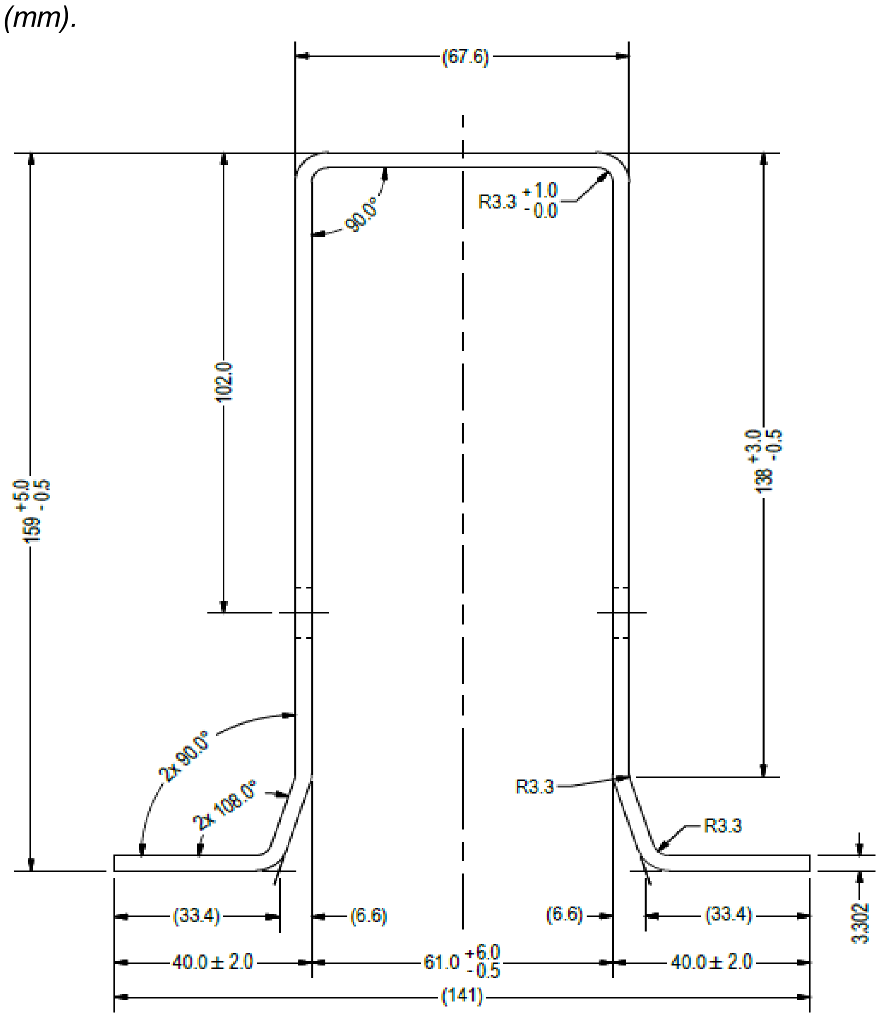


DETAIL VIEW

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 =	14.057 k-ft
M_z =	0.000 k-ft
P_r =	6.367 k
$M_{y\ allowable}$ =	19.207 k-ft
$M_{z\ allowable}$ =	14.389 k-ft
P_c =	57.399 k
Utilization =	87%



DETAIL VIEW

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 =	7.19	k
Maximum Lateral Load =	2.32	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)

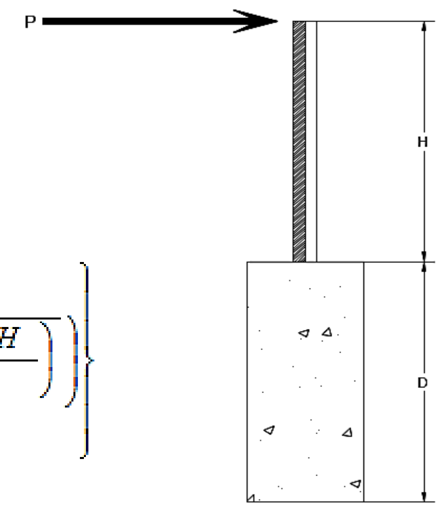
Lateral Force @ Top of Pole, P =	2.13	k
Height of Pole Above Grade, H =	3.87	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

$$A = 2.34\ P/S_1 B$$

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



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

	Non-Constrained	
Lateral Force @ Top of Pole, P =	2.13	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 =	11.48	
Required Footing Depth, D =	14.76	ft
2nd Trial @ D_2 =	9.01	ft
Lateral Soil Bearing @ D/3, S_1 =	0.60	ksf
Lateral Soil Bearing @ D, S_3 =	1.80	ksf
Constant 2.34P/(S_1B), A =	4.14	
Required Footing Depth, D =	6.74	ft
3rd Trial @ D_3 =	7.87	ft
Lateral Soil Bearing @ D/3, S_1 =	0.52	ksf
Lateral Soil Bearing @ D, S_3 =	1.57	ksf
Constant 2.34P/(S_1B), A =	4.74	
Required Footing Depth, D =	7.43	ft
4th Trial @ D_4 =	7.65	ft
Lateral Soil Bearing @ D/3, S_1 =	0.51	ksf
Lateral Soil Bearing @ D, S_3 =	1.53	ksf
Constant 2.34P/(S_1B), A =	4.88	
Required Footing Depth, D =	7.59	ft
5th Trial @ D_5 =	7.62	ft
Lateral Soil Bearing @ D/3, S_1 =	0.51	ksf
Lateral Soil Bearing @ D, S_3 =	1.52	ksf
Constant 2.34P/(S_1B), A =	4.90	
Required Footing Depth, D =	7.75	ft

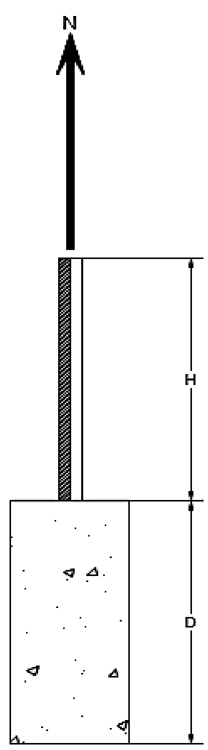
A 2ft diameter x 7.75ft deep footing unrestrained at ground level is required for the racking structure.

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 =	3.30	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	2.17	k
Required Concrete Volume, V =	14.96	ft^3
Required Footing Depth, D =	5.00	ft

A 2ft diameter x 5ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	7.15
2	0.4	0.2	118.10	7.04
3	0.6	0.2	118.10	6.94
4	0.8	0.2	118.10	6.84
5	1	0.2	118.10	6.73
6	1.2	0.2	118.10	6.63
7	1.4	0.2	118.10	6.52
8	1.6	0.2	118.10	6.42
9	1.8	0.2	118.10	6.32
10	2	0.2	118.10	6.21
11	2.2	0.2	118.10	6.11
12	2.4	0.2	118.10	6.01
13	2.6	0.2	118.10	5.90
14	2.8	0.2	118.10	5.80
15	3	0.2	118.10	5.70
16	3.2	0.2	118.10	5.59
17	3.4	0.2	118.10	5.49
18	3.6	0.2	118.10	5.38
19	3.8	0.2	118.10	5.28
20	4	0.2	118.10	5.18
21	4.2	0.2	118.10	5.07
22	4.4	0.2	118.10	4.97
23	4.6	0.2	118.10	4.87
24	4.8	0.2	118.10	4.76
25	0	0.0	0.00	4.76
26	0	0.0	0.00	4.76
27	0	0.0	0.00	4.76
28	0	0.0	0.00	4.76
29	0	0.0	0.00	4.76
30	0	0.0	0.00	4.76
31	0	0.0	0.00	4.76
32	0	0.0	0.00	4.76
33	0	0.0	0.00	4.76
34	0	0.0	0.00	4.76
Max	4.8	Sum	1.13	

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 =	4.18	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

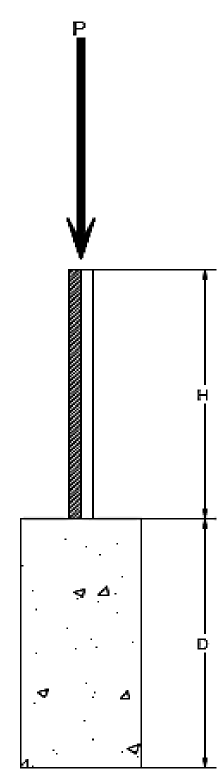
Weight of Concrete

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 =	7.71	k
Utilization =	63%	

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



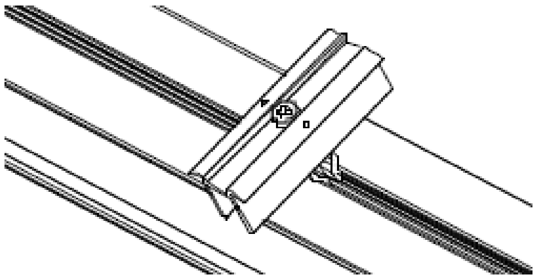
6. DESIGN OF JOINTS AND CONNECTIONS

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.

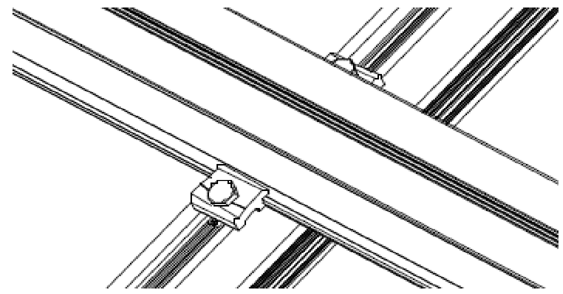
<u>Fastening of Modules to Purlins</u>

Maximum Uplifting Force =	0.773 k
Allowable Uplift =	1.214 k
Utilization =	64%



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

Maximum Uplifting Force =	2.064 k
Allowable Uplift =	2.180 k
Utilization =	95%

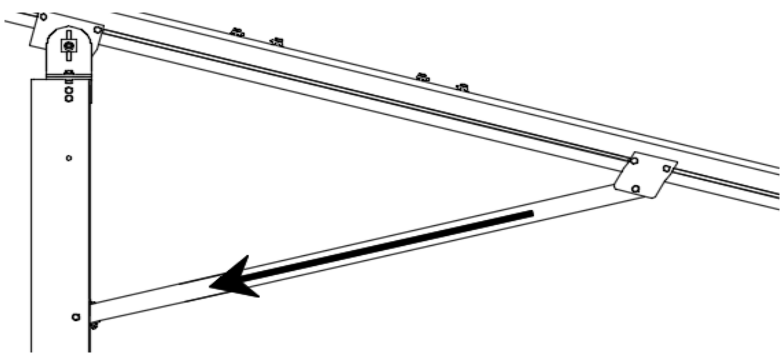


6.2 Strut Connections

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

Maximum Axial Load =	7.321 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	82%

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

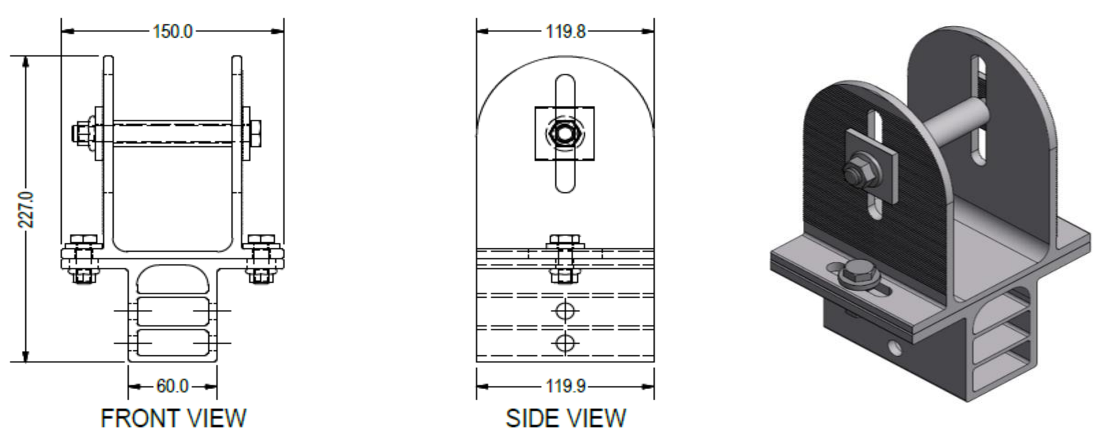


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

6.3 Girder to Post Connection

In order to connect the girder to the post, custom extruded sections are assembled to create a post head piece. The reliability of calculations is uncertain due to limited standards, therefore the strength of the head piece has been evaluated by load testing.

Maximum Tensile Load =	4.374 k
Allowable Load =	5.649 k
Utilization =	77%



7. SEISMIC DESIGN

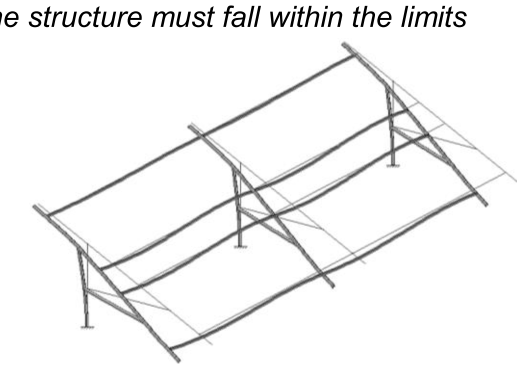
7.1 Seismic Drift

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} =	0.314 in

<u>0.314 ≤ 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:		Weak Axis:	
3.4.14		**3.4.14**	
L_b =	90 in	L_b =	90
J =	0.432	J =	0.432
	248.982		158.338
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
S1 =	0.51461	S1 =	0.51461
$S2 = \left(\frac{C_c}{1.6}\right)^2$		$S2 = \left(\frac{C_c}{1.6}\right)^2$	
S2 =	1701.56	S2 =	1701.56
φF_L =	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]	φF_L =	φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
φF_L =	28.2 ksi	φF_L =	29.3
3.4.16		**3.4.16**	
b/t =	32.195	b/t =	37.0588
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$		$S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$	
S1 =	12.2	S1 =	12.2
$S2 = \frac{k_1 Bp}{1.6Dp}$		$S2 = \frac{k_1 Bp}{1.6Dp}$	
S2 =	46.7	S2 =	46.7
φF_L =	φb[Bp-1.6Dp*b/t]	φF_L =	φb[Bp-1.6Dp*b/t]
φF_L =	25.1 ksi	φF_L =	23.1 ksi
3.4.16.1	Not Used	**3.4.16.1**	
Rb/t =		N/A for Weak Direction	
$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$			
S1 =	1.1		
$S2 = C_t$			
S2 =	141.0		
φF_L =	1.17φyFcy		
φF_L =	38.9 ksi		
3.4.18		**3.4.18**	
h/t =	37.0588	h/t =	32.195
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$		$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$	
S1 =	36.9	S1 =	36.9
m =	0.65	m =	0.65
C_0 =	40.985	C_0 =	45.5
Cc =	41.015	Cc =	45.5
$S2 = \frac{k_1 Bbr}{mDbr}$		$S2 = \frac{k_1 Bbr}{mDbr}$	
S2 =	77.2	S2 =	77.3
φF_L =	φb[Bbr-mDbr*h/t]	φF_L =	1.3φyFcy
φF_L =	43.2 ksi	φF_L =	43.2 ksi
φF_LSt=	25.1 ksi	φF_LWk=	23.1 ksi
Ix =	897074 mm^4	Iy =	446476 mm^4
	2.155 in^4		1.073 in^4
y =	41.015 mm	x =	45.5 mm
Sx =	1.335 in^3	Sy =	0.599 in^3
M_{max}St =	2.788 k-ft	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

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_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

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 in³

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 in³

M_{max}Wk = 1.460 k-ft

Compression

3.4.7

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

φF_L= (φccFcy)/(λ²)

φF_L= 13.6667 ksi

3.4.9

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

φF_L= φc[Bp-1.6Dp*b/t]

φF_L= 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

φF_L= φyFcy

φF_L= 33.25 ksi

φF_L= 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	58.42 in	
Pr =	6.37 k	(LRFD Factored Load)
Mr (Strong) =	14.06 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 =	0.1233 <	0.2	
Utilization =	0.87 <	1.0	OK

Bending (Weak Axis):

Yielding:			
Mn =	14.65 k-ft		
Flange Local Buckling:			
Mn =	14.39 k-ft		
Pr/Pc =	0.123 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 87%

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	-112.091	-112.091	0	0
2	M11	y	-112.091	-112.091	0	0
3	M12	y	-179.345	-179.345	0	0
4	M13	y	-179.345	-179.345	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	228.665	228.665	0	0
2	M11	y	228.665	228.665	0	0
3	M12	y	112.091	112.091	0	0
4	M13	y	112.091	112.091	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	288.881	2	2397.237	2	195.264	1	.169	1	.003	5	6.457	1
2		min	-500.842	3	-1927.033	3	-259.059	5	-.842	5	-.004	2	-.976	3
3	N19	max	1685.113	2	6416.803	2	0	3	0	3	.003	4	12.572	1
4		min	-1644.141	3	-5531.769	3	-278.451	5	-.883	4	0	2	-2.213	3
5	N29	max	288.881	2	2397.237	2	206.749	3	.153	3	.004	4	6.457	1
6		min	-500.842	3	-1927.033	3	-296.565	4	-.881	4	-.002	3	-.976	3
7	Totals:	max	2262.876	2	11211.277	2	0	3						
8		min	-2645.824	3	-9385.836	3	-808.88	4						

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	2	0	4	0	1	0	1	0	1
2			min	0	1	-.002	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	6.186	3	346.37	3	27.215	3	.082	3	.183	1	.33	2
6			min	-138.451	1	-742.773	2	-122.965	1	-.209	2	-.025	3	-.154	3
7		4	max	5.85	3	345.117	3	27.215	3	.082	3	.106	1	.792	2
8			min	-138.898	1	-744.444	2	-122.965	1	-.209	2	-.008	3	-.368	3
9		5	max	5.514	3	343.863	3	27.215	3	.082	3	.047	4	1.254	2
10			min	-139.346	1	-746.115	2	-122.965	1	-.209	2	0	10	-.582	3
11		6	max	1000.766	3	641.628	2	44.768	3	.008	3	.085	2	1.208	2
12			min	-2612.767	2	-207.49	3	-157.085	1	-.05	2	-.039	3	-.593	3
13		7	max	1000.43	3	639.957	2	44.768	3	.008	3	.002	10	.81	2
14			min	-2613.215	2	-208.744	3	-157.085	1	-.05	2	-.035	4	-.464	3
15		8	max	1000.094	3	638.285	2	44.768	3	.008	3	.017	3	.414	2
16			min	-2613.663	2	-209.998	3	-157.085	1	-.05	2	-.113	1	-.334	3
17		9	max	1008.707	3	82.626	3	62.007	3	.008	5	.071	1	.193	1
18			min	-2699.956	2	-40.869	1	-179.357	1	-.186	2	.001	12	-.275	3
19		10	max	1008.371	3	81.372	3	62.007	3	.008	5	.04	3	.219	1
20			min	-2700.404	2	-42.54	1	-179.357	1	-.186	2	-.04	1	-.325	3
21		11	max	1008.035	3	80.118	3	62.007	3	.008	5	.078	3	.246	1
22			min	-2700.852	2	-44.211	1	-179.357	1	-.186	2	-.151	1	-.376	3
23		12	max	1012.307	3	763.424	3	59.469	2	.257	3	.088	1	.479	1
24			min	-2781.727	2	-533.102	1	-160.932	5	-.264	2	.004	12	-.7	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	1011.971	3	762.17	3	59.469	2	.257	3	.114	1	.81	1
26			min	-2782.175	2	-534.773	1	-162.432	5	-.264	2	-.089	3	-1.174	3
27		14	max	140.103	1	497.027	1	58.391	5	.158	1	.028	2	1.128	1
28			min	-7.29	3	-706.492	3	-118.04	1	-.294	3	-.157	5	-1.626	3
29		15	max	139.655	1	495.356	1	56.892	5	.158	1	-.007	12	.82	1
30			min	-7.626	3	-707.746	3	-118.04	1	-.294	3	-.129	4	-1.188	3
31		16	max	139.208	1	493.684	1	55.392	5	.158	1	.011	3	.513	1
32			min	-7.962	3	-709	3	-118.04	1	-.294	3	-.119	1	-.748	3
33		17	max	138.76	1	492.013	1	53.892	5	.158	1	.033	3	.208	1
34			min	-8.298	3	-710.253	3	-118.04	1	-.294	3	-.192	1	-.308	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	3	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	-.002	3	0	4	0	1	0	1	0	1
39	M4	1	max	0	1	.011	2	0	4	0	1	0	1	0	1
40			min	0	1	-.004	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	6	-2.143	4	-1.499	5	0	1	0	5	0	15
43		3	max	19.207	10	903.002	3	0	1	.009	4	.164	4	.682	2
44			min	-151.26	1	-1826.142	2	-79.747	5	0	1	0	1	-.337	3
45		4	max	18.834	10	901.748	3	0	1	.009	4	.114	4	1.816	2
46			min	-151.708	1	-1827.814	2	-81.247	5	0	1	0	1	-.897	3
47		5	max	18.461	10	900.495	3	0	1	.009	4	.063	4	2.951	2
48			min	-152.156	1	-1829.485	2	-82.747	5	0	1	0	1	-1.456	3
49		6	max	2902.807	3	1718.225	2	0	1	0	1	.001	4	2.784	2
50			min	-6479.033	2	-715.67	3	-84.992	4	-.005	4	0	1	-1.422	3
51		7	max	2902.471	3	1716.553	2	0	1	0	1	0	1	1.719	2
52			min	-6479.481	2	-716.923	3	-86.492	4	-.005	4	-.052	4	-.977	3
53		8	max	2902.135	3	1714.882	2	0	1	0	1	0	1	.654	2
54			min	-6479.929	2	-718.177	3	-87.992	4	-.005	4	-.106	4	-.532	3
55		9	max	2863.098	3	283.729	3	0	1	.007	4	.11	4	.052	1
56			min	-6473.259	2	-277.216	1	-183.992	4	0	1	0	1	-.3	3
57		10	max	2862.762	3	282.476	3	0	1	.007	4	0	1	.224	1
58			min	-6473.707	2	-278.887	1	-185.492	4	0	1	-.004	4	-.476	3
59		11	max	2862.426	3	281.222	3	0	1	.007	4	0	1	.398	1
60			min	-6474.155	2	-280.559	1	-186.991	4	0	1	-.12	4	-.651	3
61		12	max	2832.07	3	2241.029	3	0	1	.069	4	.052	5	1.137	1
62			min	-6478.322	2	-1766.358	1	-187.857	5	0	1	0	1	-1.594	3
63		13	max	2831.734	3	2239.776	3	0	1	.069	4	0	1	2.234	1
64			min	-6478.769	2	-1768.03	1	-189.357	5	0	1	-.065	5	-2.985	3
65		14	max	151.986	1	1459.952	1	50.58	5	0	1	0	1	3.287	1
66			min	-18.368	10	-1921.166	3	0	1	-.046	4	-.149	5	-4.318	3
67		15	max	151.538	1	1458.281	1	49.08	5	0	1	0	1	2.382	1
68			min	-18.741	10	-1922.419	3	0	1	-.046	4	-.118	5	-3.125	3
69		16	max	151.09	1	1456.609	1	47.58	5	0	1	0	1	1.477	1
70			min	-19.115	10	-1923.673	3	0	1	-.046	4	-.088	4	-1.931	3
71		17	max	150.642	1	1454.938	1	46.081	5	0	1	0	1	.574	1
72			min	-19.488	10	-1924.926	3	0	1	-.046	4	-.059	4	-.737	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	-.005	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.005	2	0	4	0	1	0	1	0	1
78			min	0	1	-.002	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	6	-2.144	4	-1.499	5	0	1	0	5	0	15
81		3	max	21.158	5	346.37	3	122.965	1	.209	2	.085	5	.33	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
82			min	-138.451	1	-742.773	2	-37.086	5	-.082	3	-.183	1	-.154	3
83		4	max	20.949	5	345.117	3	122.965	1	.209	2	.062	5	.792	2
84			min	-138.898	1	-744.444	2	-38.586	5	-.082	3	-.106	1	-.368	3
85		5	max	20.74	5	343.863	3	122.965	1	.209	2	.037	5	1.254	2
86			min	-139.346	1	-746.115	2	-40.086	5	-.082	3	-.03	1	-.582	3
87		6	max	1000.766	3	641.628	2	157.085	1	.05	2	.039	3	1.208	2
88			min	-2612.767	2	-207.49	3	-44.768	3	-.008	3	-.085	2	-.593	3
89		7	max	1000.43	3	639.957	2	157.085	1	.05	2	.016	1	.81	2
90			min	-2613.215	2	-208.744	3	-44.768	3	-.008	3	-.029	5	-.464	3
91		8	max	1000.094	3	638.285	2	157.085	1	.05	2	.113	1	.414	2
92			min	-2613.663	2	-209.998	3	-44.768	3	-.008	3	-.055	5	-.334	3
93		9	max	1008.707	3	82.626	3	179.357	1	.186	2	.049	5	.193	1
94			min	-2699.956	2	-40.869	1	-73.419	5	.01	15	-.071	1	-.275	3
95		10	max	1008.371	3	81.372	3	179.357	1	.186	2	.04	1	.219	1
96			min	-2700.404	2	-42.54	1	-74.919	5	.01	15	-.04	3	-.325	3
97		11	max	1008.035	3	80.118	3	179.357	1	.186	2	.151	1	.246	1
98			min	-2700.852	2	-44.211	1	-76.418	5	.01	15	-.078	3	-.376	3
99		12	max	1012.307	3	763.424	3	153.33	3	.264	2	.014	5	.479	1
100			min	-2781.727	2	-533.102	1	-166.355	4	-.257	3	-.088	1	-.7	3
101		13	max	1011.971	3	762.17	3	153.33	3	.264	2	.089	3	.81	1
102			min	-2782.175	2	-534.773	1	-167.854	4	-.257	3	-.114	1	-1.174	3
103		14	max	140.103	1	497.027	1	118.04	1	.294	3	.034	3	1.128	1
104			min	-7.29	3	-706.492	3	-36.358	3	-.158	1	-.163	4	-1.626	3
105		15	max	139.655	1	495.356	1	118.04	1	.294	3	.046	1	.82	1
106			min	-7.626	3	-707.746	3	-36.358	3	-.158	1	-.118	5	-1.188	3
107		16	max	139.208	1	493.684	1	118.04	1	.294	3	.119	1	.513	1
108			min	-7.962	3	-709	3	-36.358	3	-.158	1	-.077	5	-.748	3
109		17	max	138.76	1	492.013	1	118.04	1	.294	3	.192	1	.208	1
110			min	-8.298	3	-710.253	3	-36.358	3	-.158	1	-.038	5	-.308	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	3	0	1	0	1	0	1
114			min	0	1	-.002	3	0	1	0	1	0	1	0	1
115	M10	1	max	118.024	1	488.715	1	8.94	3	.008	1	.24	1	.158	1
116			min	-36.361	3	-712.709	3	-138.172	1	-.021	3	-.048	3	-.294	3
117		2	max	118.024	1	353.795	1	10.096	3	.008	1	.135	1	.222	3
118			min	-36.361	3	-526.469	3	-114.534	1	-.021	3	-.04	3	-.193	1
119		3	max	118.024	1	218.874	1	11.251	3	.008	1	.067	2	.583	3
120			min	-36.361	3	-340.228	3	-90.897	1	-.021	3	-.031	3	-.432	1
121		4	max	118.024	1	83.953	1	12.407	3	.008	1	.021	2	.789	3
122			min	-36.361	3	-153.987	3	-67.259	1	-.021	3	-.022	9	-.558	1
123		5	max	118.024	1	32.253	3	13.563	3	.008	1	-.001	10	.84	3
124			min	-36.361	3	-52.622	2	-43.622	1	-.021	3	-.063	1	-.572	1
125		6	max	118.024	1	218.494	3	14.719	3	.008	1	.001	3	.735	3
126			min	-36.361	3	-185.889	1	-32.546	2	-.021	3	-.09	1	-.473	1
127		7	max	118.024	1	404.735	3	15.875	3	.008	1	.014	3	.476	3
128			min	-36.361	3	-320.809	1	-23.403	2	-.021	3	-.096	1	-.262	1
129		8	max	118.024	1	590.976	3	27.733	9	.008	1	.028	3	.075	2
130			min	-36.361	3	-455.73	1	-14.435	10	-.021	3	-.088	2	-.008	5
131		9	max	118.024	1	777.216	3	50.928	1	.008	1	.042	3	.498	1
132			min	-36.361	3	-590.651	1	-12.306	10	-.021	3	-.096	2	-.509	3
133		10	max	118.024	1	725.572	1	10.178	10	.008	1	.058	3	1.046	1
134			min	-36.361	3	-963.457	3	-74.566	1	-.021	3	-.096	2	-1.235	3
135		11	max	118.024	1	590.651	1	12.306	10	.021	3	.042	3	.498	1
136			min	-36.361	3	-777.216	3	-50.928	1	-.008	1	-.096	2	-.509	3
137		12	max	118.024	1	455.73	1	14.435	10	.021	3	.028	3	.075	2
138			min	-36.361	3	-590.976	3	-27.733	9	-.008	1	-.088	2	.007	15

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
139		13	max	118.024	1	320.809	1	23.403	2	.021	3	.014	3	.476	3
140			min	-36.361	3	-404.735	3	-15.875	3	-.008	1	-.096	1	-.262	1
141		14	max	118.024	1	185.889	1	32.546	2	.021	3	.001	3	.735	3
142			min	-36.361	3	-218.494	3	-14.719	3	-.008	1	-.09	1	-.473	1
143		15	max	118.024	1	52.622	2	43.622	1	.021	3	0	15	.84	3
144			min	-36.361	3	-32.253	3	-13.563	3	-.008	1	-.063	1	-.572	1
145		16	max	118.024	1	153.987	3	67.259	1	.021	3	.021	2	.789	3
146			min	-36.361	3	-83.953	1	-12.407	3	-.008	1	-.022	9	-.558	1
147		17	max	118.024	1	340.228	3	90.897	1	.021	3	.067	2	.583	3
148			min	-36.361	3	-218.874	1	-11.251	3	-.008	1	-.031	3	-.432	1
149		18	max	118.024	1	526.469	3	114.534	1	.021	3	.135	1	.222	3
150			min	-42.351	5	-353.795	1	-10.096	3	-.008	1	-.04	3	-.193	1
151		19	max	118.024	1	712.709	3	138.172	1	.021	3	.24	1	.158	1
152			min	-50.906	5	-488.715	1	-8.94	3	-.008	1	-.048	3	-.294	3
153	M11	1	max	221.267	1	483.348	1	32.706	5	.004	3	.263	1	.113	1
154			min	-215.026	3	-687.374	3	-143.028	1	-.013	2	-.139	5	-.298	3
155		2	max	221.267	1	348.427	1	33.898	5	.004	3	.154	1	.197	3
156			min	-215.026	3	-501.134	3	-119.391	1	-.013	2	-.111	5	-.246	2
157		3	max	221.267	1	213.506	1	35.09	5	.004	3	.075	2	.537	3
158			min	-215.026	3	-314.893	3	-95.753	1	-.013	2	-.082	5	-.467	1
159		4	max	221.267	1	78.585	1	36.283	5	.004	3	.027	2	.722	3
160			min	-215.026	3	-128.652	3	-72.116	1	-.013	2	-.058	4	-.589	1
161		5	max	221.267	1	57.589	3	37.475	5	.004	3	0	10	.751	3
162			min	-215.026	3	-58.026	2	-48.478	1	-.013	2	-.056	1	-.598	1
163		6	max	221.267	1	243.829	3	38.667	5	.004	3	.01	5	.626	3
164			min	-215.026	3	-191.256	1	-35.263	2	-.013	2	-.086	1	-.495	1
165		7	max	221.267	1	430.07	3	42.936	4	.004	3	.042	5	.345	3
166			min	-215.026	3	-326.177	1	-26.12	2	-.013	2	-.097	1	-.28	1
167		8	max	221.267	1	616.311	3	48.85	4	.004	3	.076	5	.048	1
168			min	-215.026	3	-461.098	1	-16.977	2	-.013	2	-.091	2	-.091	3
169		9	max	221.267	1	802.551	3	54.764	4	.004	3	.111	5	.489	1
170			min	-215.026	3	-596.019	1	-13.29	10	-.013	2	-.101	2	-.682	3
171		10	max	221.267	1	988.792	3	69.709	1	.013	2	.157	4	1.042	1
172			min	-215.026	3	-730.939	1	-25.156	14	-.004	3	-.104	2	-1.429	3
173		11	max	221.267	1	596.019	1	35.956	5	.013	2	.035	3	.489	1
174			min	-215.026	3	-802.551	3	-46.072	1	-.004	3	-.114	4	-.682	3
175		12	max	221.267	1	461.098	1	37.148	5	.013	2	.025	3	.048	1
176			min	-215.026	3	-616.311	3	-24.941	9	-.004	3	-.092	4	-.091	3
177		13	max	221.267	1	326.177	1	38.34	5	.013	2	.015	3	.345	3
178			min	-215.026	3	-430.07	3	-11.364	3	-.004	3	-.097	1	-.28	1
179		14	max	221.267	1	191.256	1	41.361	4	.013	2	.006	3	.626	3
180			min	-215.026	3	-243.829	3	-10.208	3	-.004	3	-.086	1	-.495	1
181		15	max	221.267	1	58.026	2	48.478	1	.013	2	.016	5	.751	3
182			min	-215.026	3	-57.589	3	-9.052	3	-.004	3	-.056	1	-.598	1
183		16	max	221.267	1	128.652	3	72.116	1	.013	2	.05	5	.722	3
184			min	-215.026	3	-78.585	1	-7.896	3	-.004	3	-.015	9	-.589	1
185		17	max	221.267	1	314.893	3	95.753	1	.013	2	.092	4	.537	3
186			min	-215.026	3	-213.506	1	-6.74	3	-.004	3	-.016	3	-.467	1
187		18	max	221.267	1	501.134	3	119.391	1	.013	2	.154	1	.197	3
188			min	-215.026	3	-348.427	1	-5.585	3	-.004	3	-.021	3	-.246	2
189		19	max	221.267	1	687.374	3	143.028	1	.013	2	.263	1	.113	1
190			min	-215.026	3	-483.348	1	-4.429	3	-.004	3	-.025	3	-.298	3
191	M12	1	max	28.264	5	668.543	2	32.848	5	.005	3	.287	1	.136	2
192			min	-21.124	1	-295.771	3	-147.877	1	-.013	2	-.138	5	.011	15
193		2	max	19.709	5	484.967	2	34.04	5	.005	3	.173	1	.259	3
194			min	-21.124	1	-206.676	3	-124.24	1	-.013	2	-.111	5	-.344	2
195		3	max	17.422	3	301.391	2	35.232	5	.005	3	.09	2	.394	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	-21.124	1	-117.58	3	-100.603	1	-.013	2	-.082	5	-.672	2
197		4	max	17.422	3	117.815	2	36.424	5	.005	3	.038	2	.455	3
198			min	-21.124	1	-28.484	3	-76.965	1	-.013	2	-.055	4	-.847	2
199		5	max	17.422	3	60.612	3	37.616	5	.005	3	.004	10	.442	3
200			min	-21.124	1	-65.762	2	-53.328	1	-.013	2	-.049	1	-.868	2
201		6	max	17.422	3	149.707	3	38.808	5	.005	3	.011	5	.354	3
202			min	-21.14	14	-249.338	2	-40.137	2	-.013	2	-.083	1	-.737	2
203		7	max	17.422	3	238.803	3	42.494	4	.005	3	.044	5	.192	3
204			min	-28.64	4	-432.914	2	-30.994	2	-.013	2	-.098	1	-.453	2
205		8	max	17.422	3	327.899	3	48.408	4	.005	3	.077	5	-.001	15
206			min	-37.195	4	-616.49	2	-21.851	2	-.013	2	-.096	2	-.044	3
207		9	max	17.422	3	416.994	3	54.322	4	.005	3	.112	5	.575	2
208			min	-45.749	4	-800.067	2	-15.79	10	-.013	2	-.11	2	-.354	3
209		10	max	17.422	3	506.09	3	64.86	1	.013	2	.157	4	1.318	2
210			min	-54.303	4	-983.643	2	-13.661	10	-.005	3	-.117	2	-.739	3
211		11	max	37.01	5	800.067	2	36.408	5	.013	2	.043	3	.575	2
212			min	-21.124	1	-416.994	3	-41.222	1	-.005	3	-.117	4	-.354	3
213		12	max	28.456	5	616.49	2	37.6	5	.013	2	.029	3	0	5
214			min	-21.124	1	-327.899	3	-23.002	9	-.005	3	-.096	2	-.044	3
215		13	max	19.901	5	432.914	2	38.792	5	.013	2	.015	3	.192	3
216			min	-21.124	1	-238.803	3	-15.898	3	-.005	3	-.098	1	-.453	2
217		14	max	17.422	3	249.338	2	42.426	4	.013	2	.002	3	.354	3
218			min	-21.124	1	-149.707	3	-14.742	3	-.005	3	-.083	1	-.737	2
219		15	max	17.422	3	65.762	2	53.328	1	.013	2	.015	5	.442	3
220			min	-21.124	1	-60.612	3	-13.587	3	-.005	3	-.049	1	-.868	2
221		16	max	17.422	3	28.484	3	76.965	1	.013	2	.05	5	.455	3
222			min	-21.124	1	-117.815	2	-12.431	3	-.005	3	-.02	3	-.847	2
223		17	max	17.422	3	117.58	3	100.603	1	.013	2	.095	4	.394	3
224			min	-21.124	1	-301.391	2	-11.275	3	-.005	3	-.03	3	-.672	2
225		18	max	17.422	3	206.676	3	124.24	1	.013	2	.173	1	.259	3
226			min	-28.382	4	-484.967	2	-10.119	3	-.005	3	-.039	3	-.344	2
227		19	max	17.422	3	295.771	3	147.877	1	.013	2	.287	1	.136	2
228			min	-36.936	4	-668.543	2	-8.963	3	-.005	3	-.047	3	-.013	5
229	M13	1	max	34.029	5	739.641	2	21.577	5	.014	3	.233	1	.209	2
230			min	-122.903	1	-348.945	3	-137.219	1	-.029	2	-.101	5	-.082	3
231		2	max	27.215	3	556.065	2	22.77	5	.014	3	.128	1	.171	3
232			min	-122.903	1	-259.849	3	-113.582	1	-.029	2	-.082	5	-.331	2
233		3	max	27.215	3	372.489	2	23.962	5	.014	3	.062	2	.351	3
234			min	-122.903	1	-170.754	3	-89.944	1	-.029	2	-.063	5	-.718	2
235		4	max	27.215	3	188.912	2	25.154	5	.014	3	.016	2	.456	3
236			min	-122.903	1	-81.658	3	-66.307	1	-.029	2	-.05	4	-.952	2
237		5	max	27.215	3	8.323	1	26.346	5	.014	3	-.003	10	.487	3
238			min	-122.903	1	1.515	15	-42.67	1	-.029	2	-.067	1	-1.033	2
239		6	max	27.215	3	96.533	3	27.538	5	.014	3	.004	3	.443	3
240			min	-122.903	1	-178.24	2	-31.917	2	-.029	2	-.093	1	-.961	2
241		7	max	27.215	3	185.629	3	32.777	4	.014	3	.025	5	.326	3
242			min	-122.903	1	-361.816	2	-22.774	2	-.029	2	-.099	1	-.736	2
243		8	max	27.215	3	274.725	3	38.69	4	.014	3	.05	5	.134	3
244			min	-122.903	1	-545.393	2	-14.163	10	-.029	2	-.09	2	-.358	2
245		9	max	27.215	3	363.821	3	51.88	1	.014	3	.075	5	.173	2
246			min	-122.903	1	-728.969	2	-12.034	10	-.029	2	-.098	2	-.132	3
247		10	max	27.215	3	452.916	3	75.518	1	.029	2	.114	4	.857	2
248			min	-122.903	1	-912.545	2	-10.71	12	-.008	14	-.098	2	-.472	3
249		11	max	27.215	3	728.969	2	24.321	5	.029	2	.04	3	.173	2
250			min	-122.903	1	-363.821	3	-51.88	1	-.014	3	-.098	2	-.132	3
251		12	max	27.215	3	545.393	2	25.513	5	.029	2	.027	3	.134	3
252			min	-122.903	1	-274.725	3	-28.249	9	-.014	3	-.09	2	-.358	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	27.215	3	361.816	2	26.705	5	.029	2	.015	3	.326	3
254			min	-122.903	1	-185.629	3	-13.816	3	-.014	3	-.099	1	-.736	2
255		14	max	27.215	3	178.24	2	31.917	2	.029	2	.004	3	.443	3
256			min	-122.903	1	-96.533	3	-12.66	3	-.014	3	-.093	1	-.961	2
257		15	max	27.215	3	1.56	5	42.67	1	.029	2	.014	5	.487	3
258			min	-122.903	1	-8.323	1	-11.505	3	-.014	3	-.067	1	-1.033	2
259		16	max	27.215	3	81.658	3	66.307	1	.029	2	.038	5	.456	3
260			min	-122.903	1	-188.912	2	-10.349	3	-.014	3	-.024	9	-.952	2
261		17	max	27.215	3	170.754	3	89.944	1	.029	2	.067	4	.351	3
262			min	-122.903	1	-372.489	2	-9.193	3	-.014	3	-.023	3	-.718	2
263		18	max	27.215	3	259.849	3	113.582	1	.029	2	.128	1	.171	3
264			min	-122.903	1	-556.065	2	-8.037	3	-.014	3	-.03	3	-.331	2
265		19	max	27.215	3	348.945	3	137.219	1	.029	2	.233	1	.209	2
266			min	-122.903	1	-739.641	2	-6.881	3	-.014	3	-.036	3	-.082	3
267	M2	1	max	2397.237	2	501.437	3	195.432	1	.003	5	.842	5	6.457	1
268			min	-1927.033	3	-284.63	2	-259.117	5	-.004	2	-.169	1	-.976	3
269		2	max	2395.28	2	501.437	3	195.432	1	.003	5	.786	5	6.462	1
270			min	-1928.501	3	-284.63	2	-257.421	5	-.004	2	-.127	1	-1.083	3
271		3	max	2393.324	2	501.437	3	195.432	1	.003	5	.731	5	6.468	1
272			min	-1929.969	3	-284.63	2	-255.725	5	-.004	2	-.085	1	-1.191	3
273		4	max	2391.367	2	501.437	3	195.432	1	.003	5	.676	5	6.499	2
274			min	-1931.436	3	-284.63	2	-254.029	5	-.004	2	-.043	1	-1.299	3
275		5	max	2389.41	2	501.437	3	195.432	1	.003	5	.625	4	6.56	2
276			min	-1932.904	3	-284.63	2	-252.333	5	-.004	2	-.025	3	-1.407	3
277		6	max	2387.453	2	501.437	3	195.432	1	.003	5	.576	4	6.621	2
278			min	-1934.371	3	-284.63	2	-250.638	5	-.004	2	-.069	3	-1.514	3
279		7	max	1762	1	2522.052	2	159.88	1	.002	2	.525	4	6.504	2
280			min	-1664.498	3	-601.851	3	-243.327	5	0	3	-.081	3	-1.552	3
281		8	max	1760.044	1	2522.052	2	159.88	1	.002	2	.477	4	5.962	2
282			min	-1665.966	3	-601.851	3	-241.632	5	0	3	-.121	3	-1.423	3
283		9	max	1758.087	1	2522.052	2	159.88	1	.002	2	.429	4	5.42	2
284			min	-1667.433	3	-601.851	3	-239.936	5	0	3	-.162	3	-1.293	3
285		10	max	1756.13	1	2522.052	2	159.88	1	.002	2	.382	4	4.878	2
286			min	-1668.901	3	-601.851	3	-238.24	5	0	3	-.203	3	-1.164	3
287		11	max	1754.173	1	2522.052	2	159.88	1	.002	2	.335	4	4.336	2
288			min	-1670.368	3	-601.851	3	-236.544	5	0	3	-.244	3	-1.035	3
289		12	max	1752.216	1	2522.052	2	159.88	1	.002	2	.288	4	3.794	2
290			min	-1671.836	3	-601.851	3	-234.848	5	0	3	-.285	3	-.905	3
291		13	max	1750.26	1	2522.052	2	159.88	1	.002	2	.242	4	3.252	2
292			min	-1673.304	3	-601.851	3	-233.152	5	0	3	-.325	3	-.776	3
293		14	max	1748.303	1	2522.052	2	159.88	1	.002	2	.261	1	2.71	2
294			min	-1674.771	3	-601.851	3	-231.456	5	0	3	-.366	3	-.647	3
295		15	max	1746.346	1	2522.052	2	159.88	1	.002	2	.295	1	2.168	2
296			min	-1676.239	3	-601.851	3	-229.76	5	0	3	-.407	3	-.517	3
297		16	max	1744.389	1	2522.052	2	159.88	1	.002	2	.33	1	1.626	2
298			min	-1677.706	3	-601.851	3	-228.064	5	0	3	-.448	3	-.388	3
299		17	max	1742.432	1	2522.052	2	159.88	1	.002	2	.364	1	1.084	2
300			min	-1679.174	3	-601.851	3	-226.369	5	0	3	-.489	3	-.259	3
301		18	max	1740.476	1	2522.052	2	159.88	1	.002	2	.398	1	.542	2
302			min	-1680.642	3	-601.851	3	-224.673	5	0	3	-.529	3	-.129	3
303		19	max	1738.519	1	2522.052	2	159.88	1	.002	2	.433	1	0	1
304			min	-1682.109	3	-601.851	3	-222.977	5	0	3	-.57	3	0	1
305	M5	1	max	6416.803	2	1648.218	3	0	1	.003	4	.883	4	12.572	1
306			min	-5531.769	3	-1661.983	2	-278.573	5	0	1	0	1	-2.213	3
307		2	max	6414.846	2	1648.218	3	0	1	.003	4	.823	4	12.891	2
308			min	-5533.236	3	-1661.983	2	-276.878	5	0	1	0	1	-2.567	3
309		3	max	6412.889	2	1648.218	3	0	1	.003	4	.764	4	13.248	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
310			min	-5534.704	3	-1661.983	2	-275.182	5	0	1	0	1	-2.922	3
311		4	max	6410.932	2	1648.218	3	0	1	.003	4	.705	4	13.605	2
312			min	-5536.172	3	-1661.983	2	-273.486	5	0	1	0	1	-3.276	3
313		5	max	6408.976	2	1648.218	3	0	1	.003	4	.647	4	13.962	2
314			min	-5537.639	3	-1661.983	2	-271.79	5	0	1	0	1	-3.63	3
315		6	max	6407.019	2	1648.218	3	0	1	.003	4	.589	4	14.319	2
316			min	-5539.107	3	-1661.983	2	-270.094	5	0	1	0	1	-3.984	3
317		7	max	4824.473	1	5514.217	2	0	1	0	1	.538	4	14.22	2
318			min	-4723.922	3	-1602.142	3	-265.064	4	0	4	0	1	-4.132	3
319		8	max	4822.517	1	5514.217	2	0	1	0	1	.481	4	13.035	2
320			min	-4725.39	3	-1602.142	3	-263.368	4	0	4	0	1	-3.787	3
321		9	max	4820.56	1	5514.217	2	0	1	0	1	.425	4	11.85	2
322			min	-4726.858	3	-1602.142	3	-261.672	4	0	4	0	1	-3.443	3
323		10	max	4818.603	1	5514.217	2	0	1	0	1	.369	4	10.665	2
324			min	-4728.325	3	-1602.142	3	-259.976	4	0	4	0	1	-3.099	3
325		11	max	4816.646	1	5514.217	2	0	1	0	1	.313	4	9.48	2
326			min	-4729.793	3	-1602.142	3	-258.28	4	0	4	0	1	-2.754	3
327		12	max	4814.689	1	5514.217	2	0	1	0	1	.258	4	8.295	2
328			min	-4731.26	3	-1602.142	3	-256.584	4	0	4	0	1	-2.41	3
329		13	max	4812.733	1	5514.217	2	0	1	0	1	.203	4	7.11	2
330			min	-4732.728	3	-1602.142	3	-254.888	4	0	4	0	1	-2.066	3
331		14	max	4810.776	1	5514.217	2	0	1	0	1	.148	4	5.925	2
332			min	-4734.196	3	-1602.142	3	-253.192	4	0	4	0	1	-1.721	3
333		15	max	4808.819	1	5514.217	2	0	1	0	1	.094	4	4.74	2
334			min	-4735.663	3	-1602.142	3	-251.496	4	0	4	0	1	-1.377	3
335		16	max	4806.862	1	5514.217	2	0	1	0	1	.04	4	3.555	2
336			min	-4737.131	3	-1602.142	3	-249.801	4	0	4	0	1	-1.033	3
337		17	max	4804.905	1	5514.217	2	0	1	0	1	0	1	2.37	2
338			min	-4738.598	3	-1602.142	3	-248.105	4	0	4	-.014	5	-.689	3
339		18	max	4802.949	1	5514.217	2	0	1	0	1	0	1	1.185	2
340			min	-4740.066	3	-1602.142	3	-246.409	4	0	4	-.067	4	-.344	3
341		19	max	4800.992	1	5514.217	2	0	1	0	1	0	1	0	1
342			min	-4741.534	3	-1602.142	3	-244.713	4	0	4	-.12	4	0	1
343	M8	1	max	2397.237	2	501.437	3	206.639	3	.004	4	.881	4	6.457	1
344			min	-1927.033	3	-284.63	2	-296.802	4	-.002	3	-.153	3	-.976	3
345		2	max	2395.28	2	501.437	3	206.639	3	.004	4	.818	4	6.462	1
346			min	-1928.501	3	-284.63	2	-295.106	4	-.002	3	-.109	3	-1.083	3
347		3	max	2393.324	2	501.437	3	206.639	3	.004	4	.754	4	6.468	1
348			min	-1929.969	3	-284.63	2	-293.41	4	-.002	3	-.064	3	-1.191	3
349		4	max	2391.367	2	501.437	3	206.639	3	.004	4	.692	4	6.499	2
350			min	-1931.436	3	-284.63	2	-291.714	4	-.002	3	-.02	3	-1.299	3
351		5	max	2389.41	2	501.437	3	206.639	3	.004	4	.629	4	6.56	2
352			min	-1932.904	3	-284.63	2	-290.019	4	-.002	3	-.012	2	-1.407	3
353		6	max	2387.453	2	501.437	3	206.639	3	.004	4	.567	4	6.621	2
354			min	-1934.371	3	-284.63	2	-288.323	4	-.002	3	-.053	2	-1.514	3
355		7	max	1762	1	2522.052	2	189.822	3	0	3	.52	4	6.504	2
356			min	-1664.498	3	-601.851	3	-276.39	4	-.002	2	-.025	2	-1.552	3
357		8	max	1760.044	1	2522.052	2	189.822	3	0	3	.463	5	5.962	2
358			min	-1665.966	3	-601.851	3	-274.694	4	-.002	2	-.058	2	-1.423	3
359		9	max	1758.087	1	2522.052	2	189.822	3	0	3	.409	5	5.42	2
360			min	-1667.433	3	-601.851	3	-272.998	4	-.002	2	-.091	2	-1.293	3
361		10	max	1756.13	1	2522.052	2	189.822	3	0	3	.355	5	4.878	2
362			min	-1668.901	3	-601.851	3	-271.302	4	-.002	2	-.123	1	-1.164	3
363		11	max	1754.173	1	2522.052	2	189.822	3	0	3	.302	5	4.336	2
364			min	-1670.368	3	-601.851	3	-269.607	4	-.002	2	-.158	1	-1.035	3
365		12	max	1752.216	1	2522.052	2	189.822	3	0	3	.285	3	3.794	2
366			min	-1671.836	3	-601.851	3	-267.911	4	-.002	2	-.192	1	-.905	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	1750.26	1	2522.052	2	189.822	3	0	3	.325	3	3.252	2
368			min	-1673.304	3	-601.851	3	-266.215	4	-.002	2	-.227	1	-.776	3
369		14	max	1748.303	1	2522.052	2	189.822	3	0	3	.366	3	2.71	2
370			min	-1674.771	3	-601.851	3	-264.519	4	-.002	2	-.261	1	-.647	3
371		15	max	1746.346	1	2522.052	2	189.822	3	0	3	.407	3	2.168	2
372			min	-1676.239	3	-601.851	3	-262.823	4	-.002	2	-.295	1	-.517	3
373		16	max	1744.389	1	2522.052	2	189.822	3	0	3	.448	3	1.626	2
374			min	-1677.706	3	-601.851	3	-261.127	4	-.002	2	-.33	1	-.388	3
375		17	max	1742.432	1	2522.052	2	189.822	3	0	3	.489	3	1.084	2
376			min	-1679.174	3	-601.851	3	-259.431	4	-.002	2	-.364	1	-.259	3
377		18	max	1740.476	1	2522.052	2	189.822	3	0	3	.529	3	.542	2
378			min	-1680.642	3	-601.851	3	-257.735	4	-.002	2	-.398	1	-.129	3
379		19	max	1738.519	1	2522.052	2	189.822	3	0	3	.57	3	0	1
380			min	-1682.109	3	-601.851	3	-256.039	4	-.002	2	-.433	1	0	1
381	M3	1	max	2879.709	2	4.89	4	37.747	2	.031	3	.011	2	0	1
382			min	-1137.818	3	1.149	15	-17.508	3	-.066	2	-.005	3	0	1
383		2	max	2879.604	2	4.347	4	37.747	2	.031	3	.022	2	0	15
384			min	-1137.897	3	1.022	15	-17.508	3	-.066	2	-.01	3	-.001	4
385		3	max	2879.5	2	3.803	4	37.747	2	.031	3	.033	2	0	15
386			min	-1137.975	3	.894	15	-17.508	3	-.066	2	-.015	3	-.003	4
387		4	max	2879.396	2	3.26	4	37.747	2	.031	3	.044	2	0	15
388			min	-1138.053	3	.766	15	-17.508	3	-.066	2	-.02	3	-.004	4
389		5	max	2879.291	2	2.717	4	37.747	2	.031	3	.055	2	-.001	15
390			min	-1138.131	3	.639	15	-17.508	3	-.066	2	-.026	3	-.004	4
391		6	max	2879.187	2	2.173	4	37.747	2	.031	3	.066	2	-.001	15
392			min	-1138.21	3	.511	15	-17.508	3	-.066	2	-.031	3	-.005	4
393		7	max	2879.083	2	1.63	4	37.747	2	.031	3	.077	2	-.001	15
394			min	-1138.288	3	.383	15	-17.508	3	-.066	2	-.036	3	-.006	4
395		8	max	2878.978	2	1.087	4	37.747	2	.031	3	.088	2	-.001	15
396			min	-1138.366	3	.255	15	-17.508	3	-.066	2	-.041	3	-.006	4
397		9	max	2878.874	2	.543	4	37.747	2	.031	3	.099	2	-.002	15
398			min	-1138.444	3	.128	15	-17.508	3	-.066	2	-.046	3	-.006	4
399		10	max	2878.77	2	0	1	37.747	2	.031	3	.11	2	-.002	15
400			min	-1138.523	3	0	1	-17.508	3	-.066	2	-.051	3	-.006	4
401		11	max	2878.665	2	-.128	15	37.747	2	.031	3	.122	2	-.002	15
402			min	-1138.601	3	-.543	6	-17.508	3	-.066	2	-.056	3	-.006	4
403		12	max	2878.561	2	-.255	15	37.747	2	.031	3	.133	2	-.001	15
404			min	-1138.679	3	-1.087	6	-17.508	3	-.066	2	-.062	3	-.006	4
405		13	max	2878.457	2	-.383	15	37.747	2	.031	3	.144	2	-.001	15
406			min	-1138.757	3	-1.63	6	-17.508	3	-.066	2	-.067	3	-.006	4
407		14	max	2878.352	2	-.511	15	37.747	2	.031	3	.155	2	-.001	15
408			min	-1138.836	3	-2.173	6	-17.508	3	-.066	2	-.072	3	-.005	4
409		15	max	2878.248	2	-.639	15	37.747	2	.031	3	.166	2	-.001	15
410			min	-1138.914	3	-2.717	6	-17.508	3	-.066	2	-.077	3	-.004	4
411		16	max	2878.144	2	-.766	15	37.747	2	.031	3	.177	2	0	15
412			min	-1138.992	3	-3.26	6	-17.508	3	-.066	2	-.082	3	-.004	4
413		17	max	2878.039	2	-.894	15	37.747	2	.031	3	.188	2	0	15
414			min	-1139.07	3	-3.803	6	-17.508	3	-.066	2	-.087	3	-.003	4
415		18	max	2877.935	2	-1.022	15	37.747	2	.031	3	.199	2	0	15
416			min	-1139.149	3	-4.347	6	-17.508	3	-.066	2	-.093	3	-.001	4
417		19	max	2877.831	2	-1.149	15	37.747	2	.031	3	.21	2	0	1
418			min	-1139.227	3	-4.89	6	-17.508	3	-.066	2	-.098	3	0	1
419	M6	1	max	7321.133	2	4.89	6	0	1	.007	4	.002	4	0	1
420			min	-3363.699	3	1.149	15	-6.691	4	0	1	0	1	0	1
421		2	max	7321.028	2	4.347	6	0	1	.007	4	0	5	0	15
422			min	-3363.777	3	1.022	15	-6.313	4	0	1	0	1	-.001	6
423		3	max	7320.924	2	3.803	6	0	1	.007	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	-3363.855	3	.894	15	-5.935	4	0	1	-.002	4	-.003	6
425		4	max	7320.82	2	3.26	6	0	1	.007	4	0	1	0	15
426			min	-3363.934	3	.766	15	-5.557	4	0	1	-.003	4	-.004	6
427		5	max	7320.715	2	2.717	6	0	1	.007	4	0	1	-.001	15
428			min	-3364.012	3	.639	15	-5.179	4	0	1	-.005	4	-.004	6
429		6	max	7320.611	2	2.173	6	0	1	.007	4	0	1	-.001	15
430			min	-3364.09	3	.511	15	-4.801	4	0	1	-.006	4	-.005	6
431		7	max	7320.507	2	1.63	6	0	1	.007	4	0	1	-.001	15
432			min	-3364.168	3	.383	15	-4.423	4	0	1	-.008	4	-.006	6
433		8	max	7320.402	2	1.087	6	0	1	.007	4	0	1	-.001	15
434			min	-3364.247	3	.255	15	-4.046	4	0	1	-.009	4	-.006	6
435		9	max	7320.298	2	.543	6	0	1	.007	4	0	1	-.002	15
436			min	-3364.325	3	.128	15	-3.668	4	0	1	-.01	4	-.006	6
437		10	max	7320.194	2	0	1	0	1	.007	4	0	1	-.002	15
438			min	-3364.403	3	0	1	-3.29	4	0	1	-.011	4	-.006	6
439		11	max	7320.089	2	-.128	15	0	1	.007	4	0	1	-.002	15
440			min	-3364.481	3	-.543	4	-2.912	4	0	1	-.012	4	-.006	6
441		12	max	7319.985	2	-.255	15	0	1	.007	4	0	1	-.001	15
442			min	-3364.56	3	-1.087	4	-2.534	4	0	1	-.013	4	-.006	6
443		13	max	7319.881	2	-.383	15	0	1	.007	4	0	1	-.001	15
444			min	-3364.638	3	-1.63	4	-2.156	4	0	1	-.014	4	-.006	6
445		14	max	7319.776	2	-.511	15	0	1	.007	4	0	1	-.001	15
446			min	-3364.716	3	-2.173	4	-1.778	4	0	1	-.014	4	-.005	6
447		15	max	7319.672	2	-.639	15	0	1	.007	4	0	1	-.001	15
448			min	-3364.794	3	-2.717	4	-1.4	4	0	1	-.015	4	-.004	6
449		16	max	7319.568	2	-.766	15	0	1	.007	4	0	1	0	15
450			min	-3364.873	3	-3.26	4	-1.022	4	0	1	-.015	4	-.004	6
451		17	max	7319.463	2	-.894	15	0	1	.007	4	0	1	0	15
452			min	-3364.951	3	-3.803	4	-.644	4	0	1	-.015	4	-.003	6
453		18	max	7319.359	2	-1.022	15	0	1	.007	4	0	1	0	15
454			min	-3365.029	3	-4.347	4	-.267	4	0	1	-.015	4	-.001	6
455		19	max	7319.255	2	-1.149	15	.143	5	.007	4	0	1	0	1
456			min	-3365.107	3	-4.89	4	0	1	0	1	-.015	4	0	1
457	M9	1	max	2879.709	2	4.89	6	17.508	3	.066	2	.005	3	0	1
458			min	-1137.818	3	1.149	15	-37.747	2	-.031	3	-.011	2	0	1
459		2	max	2879.604	2	4.347	6	17.508	3	.066	2	.01	3	0	15
460			min	-1137.897	3	1.022	15	-37.747	2	-.031	3	-.022	2	-.001	6
461		3	max	2879.5	2	3.803	6	17.508	3	.066	2	.015	3	0	15
462			min	-1137.975	3	.894	15	-37.747	2	-.031	3	-.033	2	-.003	6
463		4	max	2879.396	2	3.26	6	17.508	3	.066	2	.02	3	0	15
464			min	-1138.053	3	.766	15	-37.747	2	-.031	3	-.044	2	-.004	6
465		5	max	2879.291	2	2.717	6	17.508	3	.066	2	.026	3	-.001	15
466			min	-1138.131	3	.639	15	-37.747	2	-.031	3	-.055	2	-.004	6
467		6	max	2879.187	2	2.173	6	17.508	3	.066	2	.031	3	-.001	15
468			min	-1138.21	3	.511	15	-37.747	2	-.031	3	-.066	2	-.005	6
469		7	max	2879.083	2	1.63	6	17.508	3	.066	2	.036	3	-.001	15
470			min	-1138.288	3	.383	15	-37.747	2	-.031	3	-.077	2	-.006	6
471		8	max	2878.978	2	1.087	6	17.508	3	.066	2	.041	3	-.001	15
472			min	-1138.366	3	.255	15	-37.747	2	-.031	3	-.088	2	-.006	6
473		9	max	2878.874	2	.543	6	17.508	3	.066	2	.046	3	-.002	15
474			min	-1138.444	3	.128	15	-37.747	2	-.031	3	-.099	2	-.006	6
475		10	max	2878.77	2	0	1	17.508	3	.066	2	.051	3	-.002	15
476			min	-1138.523	3	0	1	-37.747	2	-.031	3	-.11	2	-.006	6
477		11	max	2878.665	2	-.128	15	17.508	3	.066	2	.056	3	-.002	15
478			min	-1138.601	3	-.543	4	-37.747	2	-.031	3	-.122	2	-.006	6
479		12	max	2878.561	2	-.255	15	17.508	3	.066	2	.062	3	-.001	15
480			min	-1138.679	3	-1.087	4	-37.747	2	-.031	3	-.133	2	-.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	2878.457	2	-.383	15	17.508	3	.066	2	.067	3	-.001	15
482			min	-1138.757	3	-1.63	4	-37.747	2	-.031	3	-.144	2	-.006	6
483		14	max	2878.352	2	-.511	15	17.508	3	.066	2	.072	3	-.001	15
484			min	-1138.836	3	-2.173	4	-37.747	2	-.031	3	-.155	2	-.005	6
485		15	max	2878.248	2	-.639	15	17.508	3	.066	2	.077	3	-.001	15
486			min	-1138.914	3	-2.717	4	-37.747	2	-.031	3	-.166	2	-.004	6
487		16	max	2878.144	2	-.766	15	17.508	3	.066	2	.082	3	0	15
488			min	-1138.992	3	-3.26	4	-37.747	2	-.031	3	-.177	2	-.004	6
489		17	max	2878.039	2	-.894	15	17.508	3	.066	2	.087	3	0	15
490			min	-1139.07	3	-3.803	4	-37.747	2	-.031	3	-.188	2	-.003	6
491		18	max	2877.935	2	-1.022	15	17.508	3	.066	2	.093	3	0	15
492			min	-1139.149	3	-4.347	4	-37.747	2	-.031	3	-.199	2	-.001	6
493		19	max	2877.831	2	-1.149	15	17.508	3	.066	2	.098	3	0	1
494			min	-1139.227	3	-4.89	4	-37.747	2	-.031	3	-.21	2	0	1

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	.05	3	.321	3	.017	1	1.11e-2	3	NC	12	NC	3
2			min	-.23	2	-.909	2	-.321	5	-2.478e-2	2	136.659	2	446.579	5
3		2	max	.05	3	.267	3	.005	1	1.11e-2	3	6099.124	12	NC	2
4			min	-.23	2	-.787	2	-.306	4	-2.478e-2	2	156.083	2	470.902	5
5		3	max	.05	3	.213	3	0	3	1.045e-2	3	3133.35	15	NC	1
6			min	-.23	2	-.665	2	-.291	4	-2.314e-2	2	181.971	2	499.647	5
7		4	max	.05	3	.161	3	.002	3	9.461e-3	3	3447.875	15	NC	1
8			min	-.23	2	-.547	2	-.272	4	-2.063e-2	2	216.628	2	539.226	5
9		5	max	.05	3	.114	3	.002	3	8.469e-3	3	3814.002	15	NC	1
10			min	-.23	2	-.44	2	-.25	4	-1.812e-2	2	261.867	2	592.134	5
11		6	max	.05	3	.075	3	.002	3	8.007e-3	3	4229.266	15	NC	1
12			min	-.229	2	-.351	2	-.226	4	-1.674e-2	2	317.067	2	661.09	5
13		7	max	.049	3	.044	3	.002	3	7.912e-3	3	4699.945	15	NC	1
14			min	-.228	2	-.279	2	-.201	4	-1.614e-2	2	382.111	2	748.564	5
15		8	max	.049	3	.02	3	0	3	7.818e-3	3	5248.953	15	NC	1
16			min	-.227	2	-.218	2	-.178	4	-1.554e-2	2	462.146	2	856.618	5
17		9	max	.049	3	0	3	0	10	7.938e-3	3	5913.603	15	NC	1
18			min	-.226	2	-.163	2	-.158	4	-1.435e-2	2	445.545	3	986.984	5
19		10	max	.048	3	-.007	15	0	1	8.441e-3	3	6748.017	15	NC	2
20			min	-.225	2	-.11	2	-.136	4	-1.211e-2	2	423.235	3	1172.251	5
21		11	max	.048	3	-.004	15	0	3	8.943e-3	3	7821.321	15	NC	1
22			min	-.224	2	-.06	2	-.114	4	-9.877e-3	2	408.585	3	1443.419	5
23		12	max	.048	3	-.001	15	.004	3	7.15e-3	3	9245.704	15	NC	1
24			min	-.223	2	-.033	3	-.094	4	-7.042e-3	2	400.845	3	1856.259	5
25		13	max	.047	3	.029	1	.008	3	4.059e-3	3	NC	9	NC	1
26			min	-.222	2	-.03	3	-.073	4	-3.868e-3	2	404.657	3	2619.071	5
27		14	max	.047	3	.058	2	.009	3	1.114e-3	3	NC	1	NC	1
28			min	-.221	2	-.011	3	-.055	4	-2.369e-3	4	429.867	3	4059.817	5
29		15	max	.047	3	.074	2	.007	3	4.655e-3	3	NC	2	NC	2
30			min	-.221	2	.006	15	-.041	4	-2.737e-3	1	495.718	3	6605.252	5
31		16	max	.047	3	.089	3	.004	1	8.197e-3	3	NC	2	NC	2
32			min	-.221	2	.007	15	-.033	5	-4.639e-3	1	630.666	3	7597.589	1
33		17	max	.047	3	.157	3	.003	1	1.174e-2	3	NC	2	NC	2
34			min	-.221	2	.009	15	-.028	5	-6.54e-3	1	928.676	3	8064.686	1
35		18	max	.047	3	.229	3	0	12	1.405e-2	3	NC	1	NC	1
36			min	-.221	2	.011	15	-.025	4	-7.78e-3	1	1859.066	3	NC	1
37		19	max	.047	3	.301	3	0	12	1.405e-2	3	NC	1	NC	1
38			min	-.221	2	.012	9	-.023	4	-7.78e-3	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
39	M4	1	max	.129	3	.768	3	0	1	2.69e-4	4	4846.749	12	NC	1
40			min	-.49	2	-1.973	2	-.317	4	0	1	66.472	2	453.096	4
41		2	max	.129	3	.645	3	0	1	2.69e-4	4	4217.091	15	NC	1
42			min	-.49	2	-1.709	2	-.305	4	0	1	76.473	2	471.794	4
43		3	max	.129	3	.521	3	0	1	1.982e-4	5	4986.838	15	NC	1
44			min	-.49	2	-1.444	2	-.292	4	0	1	90.054	2	494.745	4
45		4	max	.129	3	.402	3	0	1	9.003e-5	5	6059.983	15	NC	1
46			min	-.49	2	-1.189	2	-.274	4	0	1	108.707	2	531.309	4
47		5	max	.129	3	.295	3	0	1	0	1	7544.358	15	NC	1
48			min	-.49	2	-.959	2	-.251	4	-1.948e-5	4	133.671	2	583.922	4
49		6	max	.129	3	.209	3	0	1	0	1	9507.697	15	NC	1
50			min	-.488	2	-.77	2	-.226	4	-2.855e-5	4	164.587	2	655.084	4
51		7	max	.128	3	.143	3	0	1	3.203e-5	5	NC	15	NC	1
52			min	-.486	2	-.622	2	-.201	4	0	1	201.354	2	746.294	4
53		8	max	.127	3	.09	3	0	1	9.133e-5	5	NC	5	NC	1
54			min	-.483	2	-.497	2	-.178	4	0	1	213.418	3	856.654	4
55		9	max	.126	3	.045	3	0	1	9.869e-5	4	NC	5	NC	1
56			min	-.481	2	-.38	2	-.158	4	0	1	199.017	3	982.424	4
57		10	max	.124	3	.003	3	0	1	1.387e-5	5	NC	5	NC	1
58			min	-.478	2	-.263	2	-.136	4	0	1	187.456	3	1169.387	4
59		11	max	.123	3	-.003	15	0	1	0	1	NC	4	NC	1
60			min	-.476	2	-.149	2	-.114	4	-7.181e-5	4	178.72	3	1441.728	4
61		12	max	.122	3	0	15	0	1	0	1	NC	1	NC	1
62			min	-.473	2	-.058	3	-.095	4	-6.344e-4	4	172.619	3	1823.358	4
63		13	max	.121	3	.06	1	0	1	0	1	NC	2	NC	1
64			min	-.471	2	-.063	3	-.074	4	-1.467e-3	4	171.509	3	2536.216	4
65		14	max	.12	3	.123	2	0	1	0	1	NC	5	NC	1
66			min	-.468	2	-.027	3	-.056	4	-2.269e-3	4	179.88	3	3883.638	4
67		15	max	.12	3	.146	2	0	1	0	1	NC	5	NC	1
68			min	-.468	2	.003	15	-.043	4	-1.71e-3	4	206.056	3	6252.572	4
69		16	max	.12	3	.206	3	0	1	0	1	NC	5	NC	1
70			min	-.468	2	.002	15	-.034	4	-1.151e-3	4	261.497	3	NC	1
71		17	max	.12	3	.37	3	0	1	0	1	NC	5	NC	1
72			min	-.468	2	.001	15	-.028	4	-5.922e-4	4	385.216	3	NC	1
73		18	max	.12	3	.545	3	0	1	0	1	NC	4	NC	1
74			min	-.468	2	-.01	9	-.025	4	-2.279e-4	4	771.847	3	NC	1
75		19	max	.12	3	.718	3	0	1	0	1	NC	1	NC	1
76			min	-.468	2	-.034	9	-.021	4	-2.279e-4	4	NC	1	NC	1
77	M7	1	max	.05	3	.321	3	.003	3	2.478e-2	2	NC	5	NC	3
78			min	-.23	2	-.909	2	-.326	4	-1.11e-2	3	136.659	2	435.204	4
79		2	max	.05	3	.267	3	0	3	2.478e-2	2	NC	5	NC	2
80			min	-.23	2	-.787	2	-.308	4	-1.11e-2	3	156.083	2	462.686	4
81		3	max	.05	3	.213	3	.005	1	2.314e-2	2	NC	5	NC	1
82			min	-.23	2	-.665	2	-.289	4	-1.045e-2	3	181.971	2	494.738	4
83		4	max	.05	3	.161	3	.009	1	2.063e-2	2	NC	5	NC	1
84			min	-.23	2	-.547	2	-.269	5	-9.461e-3	3	216.628	2	535.593	4
85		5	max	.05	3	.114	3	.01	1	1.812e-2	2	NC	5	NC	1
86			min	-.23	2	-.44	2	-.247	5	-8.469e-3	3	261.867	2	587.876	4
87		6	max	.05	3	.075	3	.008	1	1.674e-2	2	NC	5	NC	1
88			min	-.229	2	-.351	2	-.223	5	-8.007e-3	3	317.067	2	654.393	4
89		7	max	.049	3	.044	3	.004	2	1.614e-2	2	NC	5	NC	1
90			min	-.228	2	-.279	2	-.2	4	-7.912e-3	3	382.111	2	736.388	4
91		8	max	.049	3	.02	3	0	2	1.554e-2	2	NC	4	NC	1
92			min	-.227	2	-.218	2	-.178	4	-7.818e-3	3	462.146	2	837.116	4
93		9	max	.049	3	.003	5	0	3	1.435e-2	2	NC	4	NC	1
94			min	-.226	2	-.163	2	-.158	4	-7.938e-3	3	445.545	3	961.763	4
95		10	max	.048	3	.003	5	0	3	1.211e-2	2	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	-.225	2	-.11	2	-.136	4	-8.441e-3	3	423.235	3	1136.161	4
97		11	max	.048	3	.002	5	0	2	9.877e-3	2	NC	4	NC	1
98			min	-.224	2	-.06	2	-.114	4	-8.943e-3	3	408.585	3	1392.052	4
99		12	max	.048	3	.002	5	.004	1	7.042e-3	2	NC	4	NC	1
100			min	-.223	2	-.033	3	-.093	5	-7.15e-3	3	400.845	3	1794.284	4
101		13	max	.047	3	.029	1	.006	1	3.868e-3	2	NC	5	NC	1
102			min	-.222	2	-.03	3	-.072	5	-4.059e-3	3	404.657	3	2512.916	4
103		14	max	.047	3	.058	2	.004	2	8.355e-4	1	NC	1	NC	1
104			min	-.221	2	-.011	3	-.054	4	-2.192e-3	5	429.867	3	3752.55	4
105		15	max	.047	3	.074	2	0	10	2.737e-3	1	NC	2	NC	2
106			min	-.221	2	-.003	5	-.042	4	-4.655e-3	3	495.718	3	5577.058	4
107		16	max	.047	3	.089	3	0	10	4.639e-3	1	NC	2	NC	2
108			min	-.221	2	-.006	5	-.034	4	-8.197e-3	3	630.666	3	7597.589	1
109		17	max	.047	3	.157	3	0	12	6.54e-3	1	NC	2	NC	2
110			min	-.221	2	-.009	5	-.029	4	-1.174e-2	3	928.676	3	8064.686	1
111		18	max	.047	3	.229	3	.004	1	7.78e-3	1	NC	1	NC	1
112			min	-.221	2	-.013	5	-.024	5	-1.405e-2	3	1859.066	3	NC	1
113		19	max	.047	3	.301	3	.013	1	7.78e-3	1	NC	1	NC	1
114			min	-.221	2	-.016	5	-.02	5	-1.405e-2	3	NC	1	NC	1
115	M10	1	max	0	1	.204	3	.221	2	9.683e-3	3	NC	1	NC	1
116			min	-.025	4	-.012	5	-.047	3	-1.079e-3	1	NC	1	NC	1
117		2	max	0	1	.347	3	.243	1	1.12e-2	3	NC	4	NC	2
118			min	-.025	4	-.017	14	-.048	3	-1.649e-3	1	1256.753	3	7604.687	1
119		3	max	0	1	.479	3	.281	1	1.271e-2	3	NC	4	NC	3
120			min	-.026	4	-.085	1	-.054	3	-2.219e-3	1	654.725	3	2883.836	1
121		4	max	0	1	.579	3	.326	1	1.423e-2	3	NC	5	NC	3
122			min	-.026	4	-.13	1	-.063	3	-2.789e-3	1	479.751	3	1685.964	1
123		5	max	0	1	.637	3	.368	1	1.574e-2	3	NC	5	NC	5
124			min	-.026	4	-.145	1	-.074	3	-3.36e-3	1	416.004	3	1204.709	1
125		6	max	0	1	.649	3	.404	1	1.726e-2	3	NC	5	NC	5
126			min	-.026	4	-.129	1	-.086	3	-3.93e-3	1	404.849	3	971.657	1
127		7	max	0	1	.621	3	.43	1	1.878e-2	3	NC	4	NC	5
128			min	-.026	4	-.087	1	-.099	3	-4.5e-3	1	431.947	3	851.707	1
129		8	max	0	1	.567	3	.447	2	2.029e-2	3	NC	4	NC	5
130			min	-.026	4	-.033	9	-.109	3	-5.07e-3	1	495.429	3	793.2	1
131		9	max	0	1	.511	3	.463	2	2.181e-2	3	NC	2	NC	5
132			min	-.026	4	-.012	9	-.117	3	-5.64e-3	1	585.776	3	744.007	2
133		10	max	0	1	.484	3	.468	2	2.332e-2	3	NC	1	NC	5
134			min	-.026	4	-.002	9	-.12	3	-6.21e-3	1	642.805	3	727.644	2
135		11	max	0	3	.511	3	.463	2	2.181e-2	3	NC	2	NC	5
136			min	-.026	4	-.012	9	-.117	3	-5.64e-3	1	585.776	3	744.007	2
137		12	max	0	3	.567	3	.447	2	2.029e-2	3	NC	4	NC	5
138			min	-.026	4	-.033	9	-.109	3	-5.07e-3	1	495.429	3	793.2	1
139		13	max	0	3	.621	3	.43	1	1.878e-2	3	NC	4	NC	5
140			min	-.026	4	-.087	1	-.099	3	-4.5e-3	1	431.947	3	851.707	1
141		14	max	0	3	.649	3	.404	1	1.726e-2	3	NC	5	NC	5
142			min	-.026	4	-.129	1	-.086	3	-3.93e-3	1	404.849	3	971.657	1
143		15	max	0	3	.637	3	.368	1	1.574e-2	3	NC	5	NC	5
144			min	-.026	4	-.145	1	-.074	3	-3.36e-3	1	416.004	3	1204.709	1
145		16	max	0	3	.579	3	.326	1	1.423e-2	3	NC	4	NC	3
146			min	-.026	4	-.13	1	-.063	3	-2.789e-3	1	479.751	3	1685.964	1
147		17	max	0	3	.479	3	.281	1	1.271e-2	3	NC	4	NC	3
148			min	-.026	4	-.085	1	-.054	3	-2.219e-3	1	654.725	3	2883.836	1
149		18	max	0	3	.347	3	.243	1	1.12e-2	3	NC	4	NC	2
150			min	-.026	4	-.017	1	-.048	3	-1.649e-3	1	1256.753	3	7604.687	1
151		19	max	0	3	.204	3	.221	2	9.683e-3	3	NC	1	NC	1
152			min	-.026	4	.011	15	-.047	3	-1.079e-3	1	6544.191	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	.002	1	.002	5	.224	2	6.359e-3	2	NC	1	NC	1
154			min	-.107	4	-.043	2	-.048	3	-9.222e-4	3	NC	1	NC	1
155		2	max	.001	1	.065	3	.241	1	7.294e-3	2	NC	4	NC	2
156			min	-.107	4	-.132	2	-.054	3	-1.225e-3	3	1909.943	3	8301.305	4
157		3	max	.001	1	.149	3	.278	1	8.229e-3	2	NC	5	NC	3
158			min	-.107	4	-.208	2	-.062	3	-1.528e-3	3	1009.203	3	3190.078	1
159		4	max	.001	1	.204	3	.322	1	9.164e-3	2	NC	5	NC	12
160			min	-.107	4	-.26	2	-.072	3	-1.83e-3	3	770.523	3	1789.864	1
161		5	max	0	1	.22	3	.366	1	1.01e-2	2	NC	5	NC	5
162			min	-.107	4	-.28	2	-.083	3	-2.133e-3	3	720.559	3	1247.633	1
163		6	max	0	1	.196	3	.403	1	1.103e-2	2	NC	5	NC	5
164			min	-.107	4	-.269	2	-.094	3	-2.436e-3	3	797.447	2	989.109	1
165		7	max	0	1	.137	3	.432	1	1.197e-2	2	NC	5	NC	5
166			min	-.107	4	-.231	2	-.105	3	-2.738e-3	3	954.478	2	855.881	1
167		8	max	0	1	.061	3	.452	2	1.291e-2	2	NC	5	NC	4
168			min	-.107	4	-.18	2	-.114	3	-3.041e-3	3	1313.167	2	788.221	2
169		9	max	0	1	-.002	15	.469	2	1.384e-2	2	NC	4	NC	5
170			min	-.107	4	-.131	2	-.121	3	-3.344e-3	3	2034.088	2	733.698	2
171		10	max	0	1	-.002	15	.475	2	1.478e-2	2	NC	3	NC	5
172			min	-.107	4	-.109	2	-.123	3	-3.646e-3	3	2727.136	2	716.677	2
173		11	max	0	3	-.002	15	.469	2	1.384e-2	2	NC	4	NC	15
174			min	-.107	4	-.131	2	-.121	3	-3.344e-3	3	2034.088	2	733.698	2
175		12	max	0	3	.061	3	.452	2	1.291e-2	2	NC	5	NC	15
176			min	-.107	4	-.18	2	-.114	3	-3.041e-3	3	1313.167	2	788.221	2
177		13	max	0	3	.137	3	.432	1	1.197e-2	2	NC	5	NC	15
178			min	-.107	4	-.231	2	-.105	3	-2.738e-3	3	954.478	2	855.881	1
179		14	max	0	3	.196	3	.403	1	1.103e-2	2	NC	5	NC	5
180			min	-.107	4	-.269	2	-.094	3	-2.436e-3	3	797.447	2	989.109	1
181		15	max	0	3	.22	3	.366	1	1.01e-2	2	NC	5	NC	4
182			min	-.107	4	-.28	2	-.083	3	-2.133e-3	3	720.559	3	1247.633	1
183		16	max	.001	3	.204	3	.322	1	9.164e-3	2	NC	5	NC	4
184			min	-.107	4	-.26	2	-.072	3	-1.83e-3	3	770.523	3	1789.864	1
185		17	max	.001	3	.149	3	.278	1	8.229e-3	2	NC	5	NC	3
186			min	-.107	4	-.208	2	-.062	3	-1.528e-3	3	1009.203	3	3190.078	1
187		18	max	.001	3	.065	3	.241	1	7.294e-3	2	NC	4	NC	2
188			min	-.107	4	-.132	2	-.054	3	-1.225e-3	3	1909.943	3	9186.409	1
189		19	max	.002	3	-.003	15	.224	2	6.359e-3	2	NC	1	NC	1
190			min	-.107	4	-.043	2	-.048	3	-9.222e-4	3	NC	1	NC	1
191	M12	1	max	0	3	.007	3	.226	2	7.397e-3	2	NC	1	NC	1
192			min	-.165	4	-.183	2	-.049	3	-2.567e-3	3	NC	1	NC	1
193		2	max	0	3	.081	3	.239	1	8.32e-3	2	NC	4	NC	1
194			min	-.165	4	-.333	2	-.051	3	-2.955e-3	3	1198.062	2	8650.359	4
195		3	max	0	3	.141	3	.274	1	9.243e-3	2	NC	5	NC	3
196			min	-.165	4	-.465	2	-.057	3	-3.342e-3	3	637.834	2	3563.94	1
197		4	max	0	3	.18	3	.318	1	1.017e-2	2	NC	5	NC	3
198			min	-.165	4	-.561	2	-.067	3	-3.729e-3	3	476.403	2	1905.409	1
199		5	max	0	3	.193	3	.363	1	1.109e-2	2	NC	5	NC	5
200			min	-.165	4	-.61	2	-.079	3	-4.117e-3	3	421.057	2	1292.618	1
201		6	max	0	3	.183	3	.403	1	1.201e-2	2	NC	5	NC	5
202			min	-.165	4	-.613	2	-.091	3	-4.504e-3	3	418.601	2	1006.442	1
203		7	max	0	3	.154	3	.433	1	1.293e-2	2	NC	5	NC	5
204			min	-.165	4	-.576	2	-.104	3	-4.891e-3	3	458.494	2	859.499	1
205		8	max	0	3	.114	3	.456	2	1.386e-2	2	NC	5	NC	4
206			min	-.165	4	-.514	2	-.115	3	-5.279e-3	3	543.939	2	782.709	2
207		9	max	0	3	.078	3	.475	2	1.478e-2	2	NC	5	NC	5
208			min	-.165	4	-.452	2	-.123	3	-5.666e-3	3	668.925	2	724.078	2
209		10	max	0	1	.061	3	.482	2	1.57e-2	2	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	-.165	4	-.423	2	-.126	3	-6.053e-3	3	751.178	2	705.673	2
211		11	max	0	1	.078	3	.475	2	1.478e-2	2	NC	5	NC	15
212			min	-.165	4	-.452	2	-.123	3	-5.666e-3	3	668.925	2	724.078	2
213		12	max	0	1	.114	3	.456	2	1.386e-2	2	NC	5	NC	15
214			min	-.165	4	-.514	2	-.115	3	-5.279e-3	3	543.939	2	782.709	2
215		13	max	0	1	.154	3	.433	1	1.293e-2	2	NC	5	NC	15
216			min	-.165	4	-.576	2	-.104	3	-4.891e-3	3	458.494	2	859.499	1
217		14	max	0	1	.183	3	.403	1	1.201e-2	2	NC	5	NC	5
218			min	-.165	4	-.613	2	-.091	3	-4.504e-3	3	418.601	2	1006.442	1
219		15	max	0	1	.193	3	.363	1	1.109e-2	2	NC	5	NC	4
220			min	-.165	4	-.61	2	-.079	3	-4.117e-3	3	421.057	2	1292.618	1
221		16	max	0	1	.18	3	.318	1	1.017e-2	2	NC	5	NC	3
222			min	-.165	4	-.561	2	-.067	3	-3.729e-3	3	476.403	2	1905.409	1
223		17	max	0	1	.141	3	.274	1	9.243e-3	2	NC	5	NC	3
224			min	-.165	4	-.465	2	-.057	3	-3.342e-3	3	637.834	2	3563.94	1
225		18	max	0	1	.081	3	.239	1	8.32e-3	2	NC	5	NC	1
226			min	-.165	4	-.333	2	-.051	3	-2.955e-3	3	1198.062	2	NC	1
227		19	max	0	1	.007	3	.226	2	7.397e-3	2	NC	1	NC	1
228			min	-.165	4	-.183	2	-.049	3	-2.567e-3	3	NC	1	NC	1
229	M13	1	max	0	3	.248	3	.23	2	1.639e-2	2	NC	1	NC	1
230			min	-.302	4	-.745	2	-.05	3	-7.277e-3	3	NC	1	NC	1
231		2	max	0	3	.359	3	.254	1	1.85e-2	2	NC	5	NC	3
232			min	-.301	4	-.993	2	-.055	3	-8.309e-3	3	725.576	2	6675.884	1
233		3	max	0	3	.461	3	.295	1	2.062e-2	2	NC	5	NC	3
234			min	-.301	4	-1.223	2	-.062	3	-9.341e-3	3	376.087	2	2635.958	1
235		4	max	0	3	.543	3	.342	1	2.273e-2	2	NC	5	NC	12
236			min	-.301	4	-1.415	2	-.073	3	-1.037e-2	3	268.544	2	1570.943	1
237		5	max	0	3	.601	3	.386	1	2.484e-2	2	NC	15	NC	5
238			min	-.301	4	-1.555	2	-.085	3	-1.14e-2	3	222.17	2	1134.664	1
239		6	max	0	3	.632	3	.422	1	2.696e-2	2	NC	15	NC	5
240			min	-.301	4	-1.639	2	-.097	3	-1.244e-2	3	201.368	2	921.057	1
241		7	max	0	3	.639	3	.449	1	2.907e-2	2	NC	15	NC	5
242			min	-.301	4	-1.67	2	-.109	3	-1.347e-2	3	194.524	2	810.426	1
243		8	max	0	3	.629	3	.468	2	3.118e-2	2	NC	15	NC	5
244			min	-.301	4	-1.662	2	-.119	3	-1.45e-2	3	196.306	2	756.287	1
245		9	max	0	3	.612	3	.484	2	3.33e-2	2	NC	15	NC	5
246			min	-.301	4	-1.634	2	-.127	3	-1.553e-2	3	202.355	2	707.988	2
247		10	max	0	1	.602	3	.49	2	3.541e-2	2	NC	15	NC	5
248			min	-.301	4	-1.617	2	-.129	3	-1.657e-2	3	206.337	2	692.957	2
249		11	max	0	1	.612	3	.484	2	3.33e-2	2	NC	15	NC	5
250			min	-.301	4	-1.634	2	-.127	3	-1.553e-2	3	202.355	2	707.988	2
251		12	max	0	1	.629	3	.468	2	3.118e-2	2	NC	15	NC	5
252			min	-.301	4	-1.662	2	-.119	3	-1.45e-2	3	196.306	2	756.287	1
253		13	max	0	1	.639	3	.449	1	2.907e-2	2	NC	15	NC	5
254			min	-.301	4	-1.67	2	-.109	3	-1.347e-2	3	194.524	2	810.426	1
255		14	max	0	1	.632	3	.422	1	2.696e-2	2	NC	15	NC	5
256			min	-.301	4	-1.639	2	-.097	3	-1.244e-2	3	201.368	2	921.057	1
257		15	max	0	1	.601	3	.386	1	2.484e-2	2	NC	15	NC	4
258			min	-.301	4	-1.555	2	-.085	3	-1.14e-2	3	222.17	2	1134.664	1
259		16	max	0	1	.543	3	.342	1	2.273e-2	2	NC	15	NC	4
260			min	-.301	4	-1.415	2	-.073	3	-1.037e-2	3	268.544	2	1570.943	1
261		17	max	0	1	.461	3	.295	1	2.062e-2	2	NC	5	NC	3
262			min	-.301	4	-1.223	2	-.062	3	-9.341e-3	3	376.087	2	2635.958	1
263		18	max	0	1	.359	3	.254	1	1.85e-2	2	NC	5	NC	3
264			min	-.301	4	-.993	2	-.055	3	-8.309e-3	3	725.576	2	6675.884	1
265		19	max	0	1	.248	3	.23	2	1.639e-2	2	NC	1	NC	1
266			min	-.301	4	-.745	2	-.05	3	-7.277e-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	7.538e-4	2	NC	1	NC	1
270			min	0	2	0	1	0	1	-6.628e-4	5	NC	1	NC	1
271		3	max	0	3	0	3	.001	5	1.508e-3	2	NC	1	NC	1
272			min	0	2	-.003	1	0	1	-1.326e-3	5	NC	1	NC	1
273		4	max	0	3	.001	3	.002	5	2.261e-3	2	NC	3	NC	1
274			min	0	2	-.007	1	0	1	-1.988e-3	5	6352.062	1	NC	1
275		5	max	0	3	.002	3	.004	5	3.015e-3	2	NC	3	NC	1
276			min	0	2	-.013	1	0	1	-2.651e-3	5	3571.373	1	NC	1
277		6	max	0	3	.003	3	.006	5	3.769e-3	2	NC	3	NC	1
278			min	0	2	-.02	1	0	1	-3.314e-3	5	2284.712	1	7592.223	5
279		7	max	0	3	.005	3	.009	5	4.18e-3	2	NC	5	NC	1
280			min	0	2	-.029	1	-.001	1	-3.752e-3	5	1581.829	1	5420.923	5
281		8	max	0	3	.007	3	.011	5	3.775e-3	2	NC	5	NC	1
282			min	0	2	-.04	1	-.001	1	-3.655e-3	5	1156.477	1	4093.16	5
283		9	max	0	3	.01	3	.014	5	3.37e-3	2	NC	15	NC	1
284			min	0	2	-.052	1	-.001	1	-3.559e-3	5	886.055	1	3220.085	5
285		10	max	0	3	.013	3	.018	5	2.966e-3	2	NC	15	NC	1
286			min	0	2	-.066	2	-.002	1	-3.463e-3	5	703.382	2	2614.4	5
287		11	max	0	3	.016	3	.021	5	2.561e-3	2	9535.427	15	NC	1
288			min	0	1	-.081	2	-.002	1	-3.366e-3	5	573.476	2	2176.532	5
289		12	max	0	3	.019	3	.025	5	2.156e-3	2	8044.205	15	NC	1
290			min	0	1	-.097	2	-.001	1	-3.27e-3	5	478.641	2	1849.518	5
291		13	max	0	3	.023	3	.029	5	1.751e-3	2	6905.939	15	NC	1
292			min	0	1	-.114	2	-.001	1	-3.173e-3	5	407.282	2	1598.686	5
293		14	max	0	3	.027	3	.033	4	1.347e-3	2	6017.067	15	NC	1
294			min	-.001	1	-.132	2	-.001	3	-3.077e-3	5	352.234	2	1399.359	4
295		15	max	0	3	.031	3	.037	4	9.42e-4	2	5309.755	15	NC	1
296			min	-.001	1	-.15	2	-.002	3	-2.981e-3	5	308.891	2	1239.879	4
297		16	max	.001	3	.035	3	.042	4	5.373e-4	2	4737.759	15	NC	1
298			min	-.001	1	-.169	2	-.003	3	-2.884e-3	5	274.161	2	1110.474	4
299		17	max	.001	3	.039	3	.046	4	1.326e-4	2	4268.782	15	NC	1
300			min	-.001	1	-.189	2	-.005	3	-2.826e-3	4	245.915	2	1004.062	4
301		18	max	.001	3	.044	3	.051	4	3.078e-4	3	3879.783	15	NC	1
302			min	-.001	1	-.208	2	-.007	3	-2.774e-3	4	222.655	2	915.564	4
303		19	max	.001	3	.048	3	.055	4	5.13e-4	3	3553.865	15	NC	1
304			min	-.001	1	-.228	2	-.009	3	-2.721e-3	4	203.294	2	841.245	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	2	-.001	1	0	1	-6.872e-4	4	NC	1	NC	1
309		3	max	0	3	0	3	.001	4	0	1	NC	3	NC	1
310			min	0	2	-.006	1	0	1	-1.374e-3	4	7506.308	1	NC	1
311		4	max	0	3	.002	3	.002	4	0	1	NC	3	NC	1
312			min	0	2	-.014	1	0	1	-2.062e-3	4	3278.068	1	NC	1
313		5	max	0	3	.005	3	.004	4	0	1	NC	4	NC	1
314			min	-.001	2	-.025	2	0	1	-2.749e-3	4	1821.017	2	NC	1
315		6	max	.001	3	.008	3	.006	4	0	1	NC	5	NC	1
316			min	-.001	2	-.04	2	0	1	-3.436e-3	4	1148.46	2	7257.316	4
317		7	max	.001	3	.012	3	.009	4	0	1	NC	5	NC	1
318			min	-.002	2	-.059	2	0	1	-3.888e-3	4	784.492	2	5185.604	4
319		8	max	.002	3	.018	3	.012	4	0	1	NC	5	NC	1
320			min	-.002	2	-.082	2	0	1	-3.784e-3	4	566.086	2	3917.984	4
321		9	max	.002	3	.024	3	.015	4	0	1	NC	5	NC	1
322			min	-.002	2	-.108	2	0	1	-3.679e-3	4	429.402	2	3084.258	4
323		10	max	.002	3	.032	3	.019	4	0	1	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	2	-.137	2	0	1	-3.574e-3	4	338.367	2	2505.867	4
325		11	max	.002	3	.04	3	.022	4	0	1	NC	15	NC	1
326			min	-.002	2	-.169	2	0	1	-3.469e-3	4	274.74	2	2087.787	4
327		12	max	.002	3	.049	3	.026	4	0	1	NC	15	NC	1
328			min	-.002	2	-.203	2	0	1	-3.364e-3	4	228.545	2	1775.623	4
329		13	max	.002	3	.059	3	.03	4	0	1	9303.212	15	NC	1
330			min	-.003	2	-.239	2	0	1	-3.259e-3	4	193.943	2	1536.262	4
331		14	max	.003	3	.069	3	.034	4	0	1	8048.415	15	NC	1
332			min	-.003	2	-.277	2	0	1	-3.154e-3	4	167.352	2	1348.67	4
333		15	max	.003	3	.079	3	.039	4	0	1	7059.95	15	NC	1
334			min	-.003	2	-.317	2	0	1	-3.05e-3	4	146.483	2	1198.979	4
335		16	max	.003	3	.09	3	.043	4	0	1	6267.589	15	NC	1
336			min	-.003	2	-.358	2	0	1	-2.945e-3	4	129.808	2	1077.698	4
337		17	max	.003	3	.101	3	.047	4	0	1	5622.952	15	NC	1
338			min	-.003	2	-.399	2	0	1	-2.84e-3	4	116.279	2	978.172	4
339		18	max	.003	3	.112	3	.052	4	0	1	5091.934	15	NC	1
340			min	-.004	2	-.441	2	0	1	-2.735e-3	4	105.163	2	895.625	4
341		19	max	.004	3	.123	3	.056	4	0	1	4649.792	15	NC	1
342			min	-.004	1	-.484	2	0	1	-2.63e-3	4	95.927	2	826.549	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	3	0	4	3.525e-4	3	NC	1	NC	1
346			min	0	2	0	1	0	3	-7.791e-4	4	NC	1	NC	1
347		3	max	0	3	0	3	.001	4	7.05e-4	3	NC	1	NC	1
348			min	0	2	-.003	1	0	3	-1.558e-3	4	NC	1	NC	1
349		4	max	0	3	.001	3	.002	4	1.057e-3	3	NC	3	NC	1
350			min	0	2	-.007	1	0	3	-2.337e-3	4	6352.062	1	NC	1
351		5	max	0	3	.002	3	.004	4	1.41e-3	3	NC	3	NC	1
352			min	0	2	-.013	1	0	3	-3.116e-3	4	3571.373	1	NC	1
353		6	max	0	3	.003	3	.006	4	1.762e-3	3	NC	3	NC	1
354			min	0	2	-.02	1	0	3	-3.895e-3	4	2284.712	1	7320.803	4
355		7	max	0	3	.005	3	.009	4	1.95e-3	3	NC	4	NC	1
356			min	0	2	-.029	1	0	3	-4.395e-3	4	1581.829	1	5242.841	4
357		8	max	0	3	.007	3	.012	4	1.744e-3	3	NC	4	NC	1
358			min	0	2	-.04	1	0	3	-4.231e-3	4	1156.477	1	3969.296	4
359		9	max	0	3	.01	3	.015	4	1.539e-3	3	NC	5	NC	1
360			min	0	2	-.052	1	0	3	-4.067e-3	4	886.055	1	3130.367	4
361		10	max	0	3	.013	3	.018	4	1.334e-3	3	NC	5	NC	1
362			min	0	2	-.066	2	0	3	-3.904e-3	4	703.382	2	2547.802	4
363		11	max	0	3	.016	3	.022	4	1.129e-3	3	NC	5	NC	1
364			min	0	1	-.081	2	0	3	-3.74e-3	4	573.476	2	2126.461	4
365		12	max	0	3	.019	3	.026	4	9.236e-4	3	NC	5	NC	1
366			min	0	1	-.097	2	0	3	-3.576e-3	4	478.641	2	1811.77	4
367		13	max	0	3	.023	3	.03	4	7.184e-4	3	NC	5	NC	1
368			min	0	1	-.114	2	0	12	-3.412e-3	4	407.282	2	1570.468	4
369		14	max	0	3	.027	3	.034	4	5.131e-4	3	NC	5	NC	1
370			min	-.001	1	-.132	2	0	10	-3.248e-3	4	352.234	2	1381.404	4
371		15	max	0	3	.031	3	.038	4	3.079e-4	3	NC	5	NC	1
372			min	-.001	1	-.15	2	0	2	-3.084e-3	4	308.891	2	1230.622	4
373		16	max	.001	3	.035	3	.042	4	1.027e-4	3	NC	5	NC	1
374			min	-.001	1	-.169	2	-.001	2	-2.92e-3	4	274.161	2	1108.565	4
375		17	max	.001	3	.039	3	.046	4	9.004e-5	9	NC	5	NC	1
376			min	-.001	1	-.189	2	-.002	2	-2.774e-3	5	245.915	2	1008.538	4
377		18	max	.001	3	.044	3	.05	4	4.289e-4	1	NC	5	NC	1
378			min	-.001	1	-.208	2	-.003	2	-2.655e-3	5	222.655	2	925.727	4
379		19	max	.001	3	.048	3	.054	4	8.116e-4	1	NC	5	NC	1
380			min	-.001	1	-.228	2	-.005	2	-2.536e-3	5	203.294	2	856.605	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	.026	1	.002	3	.008	5	9.808e-4	2	NC	1	NC	1
382			min	-.004	3	-.007	1	-.001	1	-4.448e-4	3	NC	1	NC	1
383		2	max	.025	1	.007	3	.022	5	1.759e-3	2	NC	1	NC	5
384			min	-.004	3	-.033	2	-.016	2	-8.151e-4	3	NC	1	4198.037	2
385		3	max	.024	1	.012	3	.035	5	2.537e-3	2	NC	1	NC	5
386			min	-.004	3	-.059	2	-.03	2	-1.185e-3	3	5810.79	3	2132.701	2
387		4	max	.023	1	.018	3	.049	5	3.315e-3	2	NC	1	NC	5
388			min	-.003	3	-.085	2	-.043	2	-1.556e-3	3	3864.119	3	1453.059	2
389		5	max	.022	1	.023	3	.063	5	4.093e-3	2	NC	1	NC	5
390			min	-.003	3	-.11	2	-.056	2	-1.926e-3	3	2888.391	3	1120.692	2
391		6	max	.021	1	.029	3	.077	5	4.871e-3	2	NC	1	NC	5
392			min	-.002	3	-.136	2	-.067	2	-2.297e-3	3	2301.292	3	928.201	2
393		7	max	.02	1	.035	3	.09	5	5.649e-3	2	NC	1	NC	5
394			min	-.002	3	-.162	2	-.077	2	-2.667e-3	3	1908.718	3	806.776	2
395		8	max	.02	1	.041	3	.104	5	6.427e-3	2	NC	1	NC	5
396			min	-.002	3	-.187	2	-.085	2	-3.037e-3	3	1627.482	3	723.757	4
397		9	max	.019	1	.046	3	.117	5	7.205e-3	2	NC	1	NC	13
398			min	-.001	3	-.213	2	-.091	2	-3.408e-3	3	1415.983	3	632.121	4
399		10	max	.018	1	.052	3	.13	5	7.983e-3	2	NC	1	NC	13
400			min	0	3	-.238	2	-.095	2	-3.778e-3	3	1251.11	3	560.833	4
401		11	max	.017	1	.058	3	.143	5	8.761e-3	2	NC	1	NC	13
402			min	0	3	-.263	2	-.097	2	-4.148e-3	3	1118.988	3	503.764	4
403		12	max	.016	1	.064	3	.156	5	9.54e-3	2	NC	1	NC	13
404			min	0	3	-.289	2	-.095	2	-4.519e-3	3	1010.786	3	457.016	4
405		13	max	.015	1	.07	3	.168	5	1.032e-2	2	NC	1	NC	13
406			min	0	12	-.314	2	-.091	2	-4.889e-3	3	920.61	3	417.988	4
407		14	max	.014	1	.077	3	.18	5	1.11e-2	2	NC	1	NC	5
408			min	0	12	-.339	2	-.084	2	-5.259e-3	3	844.377	3	384.881	4
409		15	max	.013	1	.083	3	.192	5	1.187e-2	2	NC	1	NC	5
410			min	0	12	-.363	2	-.074	2	-5.63e-3	3	779.167	3	356.411	4
411		16	max	.013	1	.089	3	.204	5	1.265e-2	2	NC	1	NC	5
412			min	0	12	-.388	2	-.059	2	-6.e-3	3	722.836	3	331.635	4
413		17	max	.012	1	.096	3	.216	5	1.343e-2	2	NC	1	NC	5
414			min	.001	12	-.413	2	-.041	2	-6.37e-3	3	673.771	3	309.849	4
415		18	max	.011	1	.102	3	.227	5	1.421e-2	2	NC	1	NC	5
416			min	.001	15	-.438	2	-.019	2	-6.741e-3	3	630.738	3	290.512	4
417		19	max	.01	1	.109	3	.24	4	1.499e-2	2	NC	1	NC	1
418			min	.001	15	-.462	2	-.002	3	-7.111e-3	3	592.777	3	273.206	4
419	M6	1	max	.051	2	.004	3	.008	4	4.13e-5	4	NC	1	NC	1
420			min	-.01	3	-.014	2	0	1	0	1	NC	1	NC	1
421		2	max	.049	2	.019	3	.022	4	0	1	NC	1	NC	1
422			min	-.009	3	-.07	2	0	1	-5.082e-5	5	4163.842	3	NC	1
423		3	max	.046	1	.034	3	.037	4	0	1	NC	1	NC	1
424			min	-.008	3	-.125	2	0	1	-1.391e-4	5	2080.742	3	NC	1
425		4	max	.044	1	.05	3	.051	4	0	1	NC	1	NC	1
426			min	-.007	3	-.181	2	0	1	-2.275e-4	5	1385.91	3	NC	1
427		5	max	.042	1	.065	3	.065	4	0	1	NC	1	NC	1
428			min	-.006	3	-.236	2	0	1	-3.158e-4	5	1038.182	3	NC	1
429		6	max	.04	1	.08	3	.079	4	0	1	NC	1	NC	1
430			min	-.005	3	-.292	2	0	1	-4.041e-4	5	829.326	3	9825.491	4
431		7	max	.038	1	.096	3	.093	4	0	1	NC	1	NC	1
432			min	-.003	3	-.347	2	0	1	-4.924e-4	5	689.929	3	8505.959	4
433		8	max	.035	1	.111	3	.107	4	0	1	NC	1	NC	1
434			min	-.002	3	-.402	2	0	1	-5.807e-4	5	590.245	3	7654.315	4
435		9	max	.033	1	.127	3	.12	4	0	1	NC	1	NC	1
436			min	-.001	3	-.457	2	0	1	-6.69e-4	5	515.4	3	7113.045	4
437		10	max	.031	1	.143	3	.134	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	-.512	2	0	1	-7.574e-4	5	457.131	3	6802.887	4
439		11	max	.029	1	.158	3	.147	4	0	1	NC	1	NC	1
440			min	0	15	-.567	2	0	1	-8.457e-4	5	410.478	3	6688.07	4
441		12	max	.027	1	.174	3	.16	4	0	1	NC	1	NC	1
442			min	0	15	-.622	2	0	1	-9.34e-4	5	372.287	3	6763.992	4
443		13	max	.025	1	.19	3	.172	4	0	1	NC	1	NC	1
444			min	0	15	-.677	2	0	1	-1.023e-3	4	340.453	3	7057.945	4
445		14	max	.022	1	.206	3	.184	4	0	1	NC	1	NC	1
446			min	0	15	-.731	2	0	1	-1.111e-3	4	313.521	3	7644.733	4
447		15	max	.02	1	.222	3	.196	4	0	1	NC	1	NC	1
448			min	0	15	-.786	2	0	1	-1.2e-3	4	290.449	3	8694.48	4
449		16	max	.018	1	.239	3	.208	4	0	1	NC	1	NC	1
450			min	0	15	-.84	2	0	1	-1.289e-3	4	270.473	3	NC	1
451		17	max	.016	1	.255	3	.219	4	0	1	NC	1	NC	1
452			min	0	15	-.894	2	0	1	-1.377e-3	4	253.022	3	NC	1
453		18	max	.014	1	.271	3	.23	4	0	1	NC	1	NC	1
454			min	0	15	-.949	2	0	1	-1.466e-3	4	237.658	3	NC	1
455		19	max	.011	1	.287	3	.241	4	0	1	NC	1	NC	1
456			min	0	15	-1.003	2	0	1	-1.555e-3	4	224.039	3	NC	1
457	M9	1	max	.026	1	.002	3	.008	4	4.448e-4	3	NC	1	NC	1
458			min	-.004	3	-.007	1	0	3	-9.808e-4	2	NC	1	NC	1
459		2	max	.025	1	.007	3	.024	4	8.151e-4	3	NC	1	NC	4
460			min	-.004	3	-.033	2	-.008	3	-1.759e-3	2	NC	1	4198.037	2
461		3	max	.024	1	.012	3	.04	4	1.185e-3	3	NC	1	NC	5
462			min	-.004	3	-.059	2	-.014	3	-2.537e-3	2	5810.79	3	2132.701	2
463		4	max	.023	1	.018	3	.056	4	1.556e-3	3	NC	1	NC	5
464			min	-.003	3	-.085	2	-.021	3	-3.315e-3	2	3864.119	3	1453.059	2
465		5	max	.022	1	.023	3	.072	4	1.926e-3	3	NC	1	NC	15
466			min	-.003	3	-.11	2	-.026	3	-4.093e-3	2	2888.391	3	1120.692	2
467		6	max	.021	1	.029	3	.087	4	2.297e-3	3	NC	1	NC	15
468			min	-.002	3	-.136	2	-.032	3	-4.871e-3	2	2301.292	3	928.201	2
469		7	max	.02	1	.035	3	.102	4	2.667e-3	3	NC	1	9767.581	15
470			min	-.002	3	-.162	2	-.036	3	-5.649e-3	2	1908.718	3	806.776	2
471		8	max	.02	1	.041	3	.117	4	3.037e-3	3	NC	1	8783.642	15
472			min	-.002	3	-.187	2	-.04	3	-6.427e-3	2	1627.482	3	727.322	2
473		9	max	.019	1	.046	3	.131	4	3.408e-3	3	NC	1	8153.973	15
474			min	-.001	3	-.213	2	-.043	3	-7.205e-3	2	1415.983	3	675.802	2
475		10	max	.018	1	.052	3	.145	4	3.778e-3	3	NC	1	7787.666	15
476			min	0	5	-.238	2	-.045	3	-7.983e-3	2	1251.11	3	645.115	2
477		11	max	.017	1	.058	3	.158	4	4.148e-3	3	NC	1	7643.302	15
478			min	0	5	-.263	2	-.046	3	-8.761e-3	2	1118.988	3	632.021	2
479		12	max	.016	1	.064	3	.171	4	4.519e-3	3	NC	1	7714.783	15
480			min	0	5	-.289	2	-.045	3	-9.54e-3	2	1010.786	3	636.043	2
481		13	max	.015	1	.07	3	.182	4	4.889e-3	3	NC	1	8031.932	15
482			min	0	5	-.314	2	-.043	3	-1.032e-2	2	920.61	3	659.521	2
483		14	max	.014	1	.077	3	.193	4	5.259e-3	3	NC	1	8677.82	15
484			min	0	5	-.339	2	-.04	3	-1.11e-2	2	844.377	3	708.978	2
485		15	max	.013	1	.083	3	.204	4	5.63e-3	3	NC	1	9842.087	15
486			min	-.001	5	-.363	2	-.035	3	-1.187e-2	2	779.167	3	799.323	2
487		16	max	.013	1	.089	3	.213	4	6.e-3	3	NC	1	NC	15
488			min	-.001	5	-.388	2	-.029	3	-1.265e-2	2	722.836	3	966.984	2
489		17	max	.012	1	.096	3	.222	4	6.37e-3	3	NC	1	NC	5
490			min	-.001	5	-.413	2	-.02	3	-1.343e-2	2	673.771	3	1322.943	2
491		18	max	.011	1	.102	3	.23	4	6.741e-3	3	NC	1	NC	4
492			min	-.001	5	-.438	2	-.01	3	-1.421e-2	2	630.738	3	2424.492	2
493		19	max	.01	1	.109	3	.237	5	7.111e-3	3	NC	1	NC	1
494			min	-.001	5	-.462	2	-.009	1	-1.499e-2	2	592.777	3	NC	1