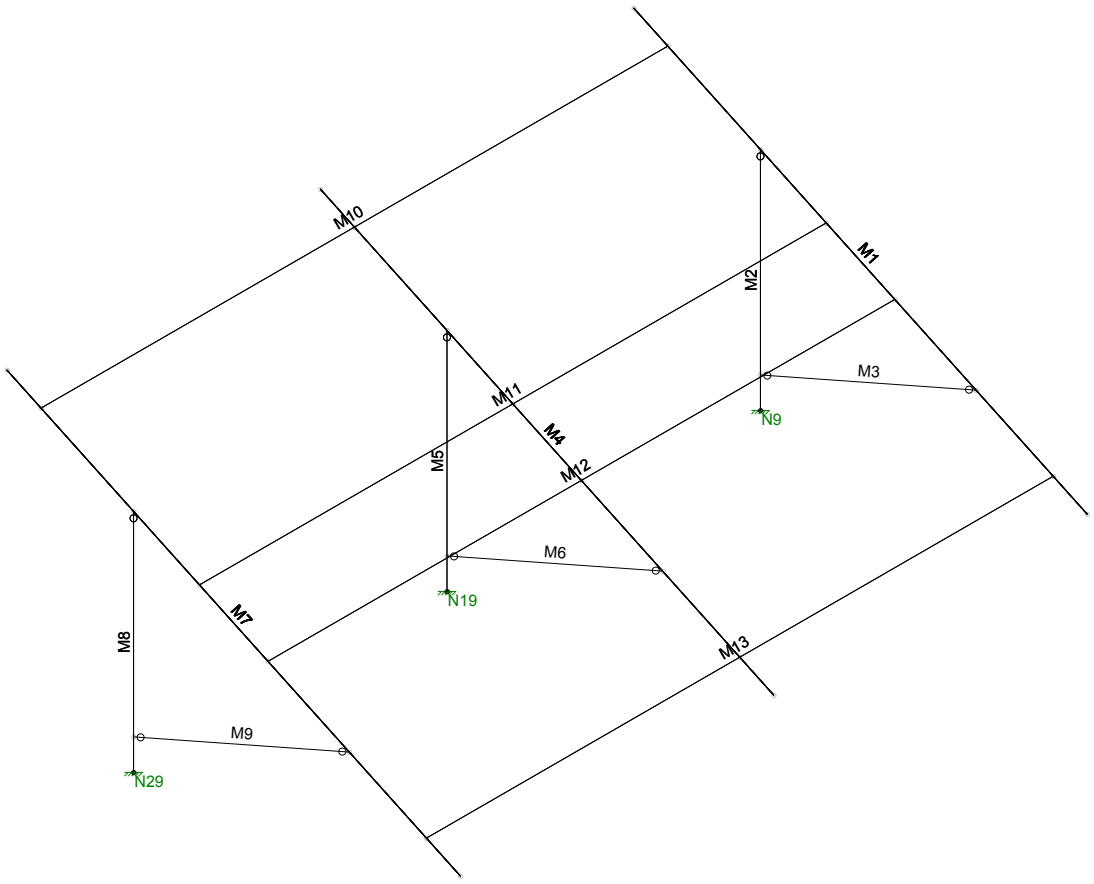


Schletter, Inc.		25° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-10	

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.

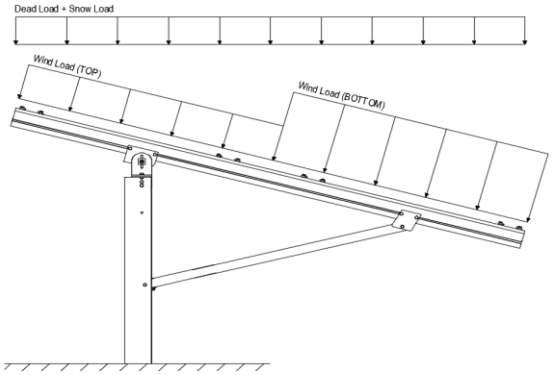
1.2 Construction

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 =	25°
Maximum Height Above Grade =	3 ft



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00 psf	
Sloped Roof Snow Load, P_s =	18.56 psf	*(ASCE 7-10, Eq. 7.4-1)*
I_s =	1.00	
C_s =	0.82	
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

$Cf+_{TOP}$ =	1.1	*(Pressure)*
$Cf+_{BOTTOM}$ =	1.7	
$Cf-_{TOP}$ =	-2.2	*(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 =	0.08	C_d =	1.25

ASCE 7, Section 12.8.1.3: A maximum S_s of 1.5 may be used to calculate the base shear, C_s, of structures under five stories and with a period, T, of 0.5 or less. Therefore, a S_{ds} of 1.0 was used to calculate C_s.

2.5 Combination of Loads

ASCE 7 requires that all structures be checked by specified combinations of loads. Applicable load combinations are provided below.

Strength Design, LRFD

Component stresses are checked using the following LRFD load combinations:

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W [M]
1.238D + 0.875E [O]
1.1785D + 0.65625E + 0.75S [O]
0.362D + 0.875E [O]

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

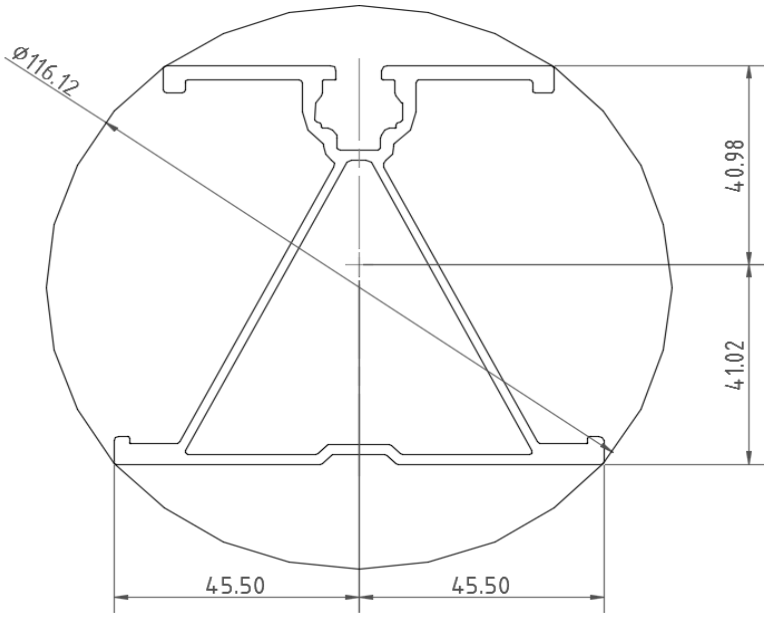
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	84	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 =	1.357	k-ft
M_z =	0.047	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	53%	

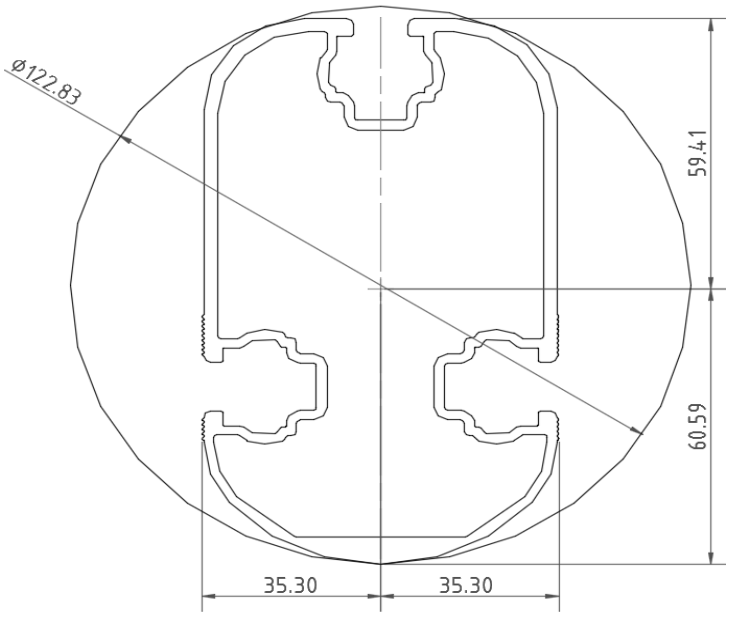


DETAIL VIEW

4.2 Girder Design

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

Girder Type =	**T5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	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 =	4.249	k-ft
M_z =	0.000	k-ft
P_n =	0.008	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	85%	

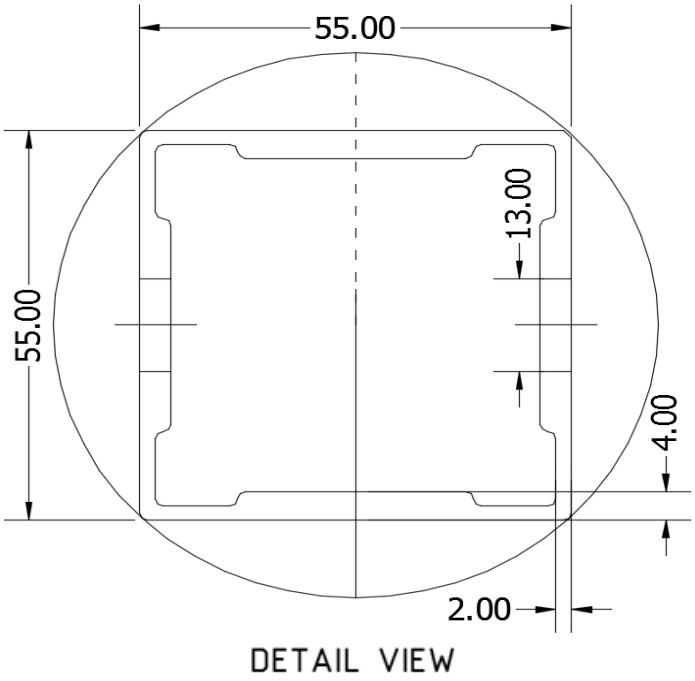


DETAIL VIEW

4.3 Strut Design

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

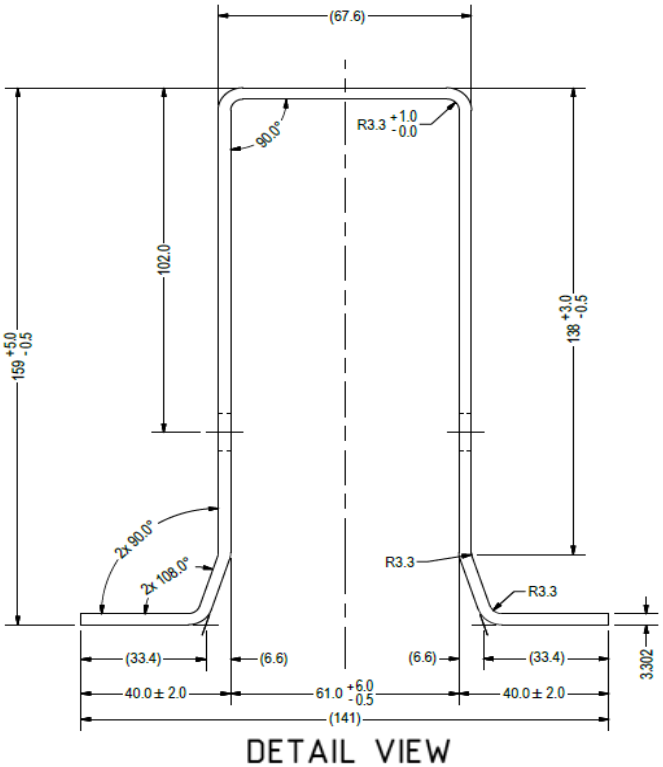
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.005	k-ft
M_z =	0.000	k-ft
P_n =	4.586	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	35%	



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 =	72.60	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	9.237	k-ft
M_z =	0.000	k-ft
P_r =	-5.191	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	38.073	k
Utilization =	58%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	6.72	k
Maximum Lateral Load =	3.28	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

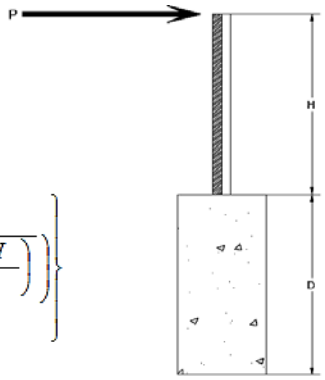
Lateral Force @ Top of Pole, P =	0.85	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.85	k
Height of Pole Above Grade, H =	5.05	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.20	ksf/ft

1st Trial @ D_1 =	3.25	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf	
Lateral Soil Bearing @ D, S_3 =	0.65	ksf	
Constant 2.34P/(S_1B), A =	4.60		
Required Footing Depth, D =	7.83	ft	
2nd Trial @ D_2 =	5.54	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf	
Lateral Soil Bearing @ D, S_3 =	1.11	ksf	
Constant 2.34P/(S_1B), A =	2.70		
Required Footing Depth, D =	5.43	ft	
3rd Trial @ D_3 =	5.49	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf	
Lateral Soil Bearing @ D, S_3 =	1.10	ksf	
Constant 2.34P/(S_1B), A =	2.72		
Required Footing Depth, D =	5.47	ft	
4th Trial @ D_4 =	5.48	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf	
Lateral Soil Bearing @ D, S_3 =	1.10	ksf	
Constant 2.34P/(S_1B), A =	2.73		
Required Footing Depth, D =	5.47	ft	
5th Trial @ D_5 =	5.48	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.37	ksf	
Lateral Soil Bearing @ D, S_3 =	1.10	ksf	
Constant 2.34P/(S_1B), A =	2.73		
Required Footing Depth, D =	5.50	ft	

A 2ft diameter x 5.5ft deep footing unrestrained at ground level is required for the racking structure.

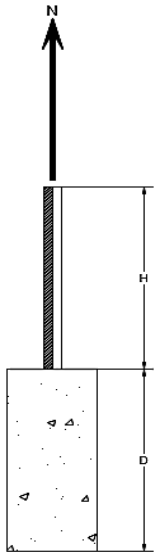
5.4 Uplifting Force Resistance

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 =	3.09	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 =	2.00	k
Required Concrete Volume, V =	13.79	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.67
2	0.4	0.2	118.10	6.57
3	0.6	0.2	118.10	6.46
4	0.8	0.2	118.10	6.36
5	1	0.2	118.10	6.26
6	1.2	0.2	118.10	6.15
7	1.4	0.2	118.10	6.05
8	1.6	0.2	118.10	5.95
9	1.8	0.2	118.10	5.84
10	2	0.2	118.10	5.74
11	2.2	0.2	118.10	5.63
12	2.4	0.2	118.10	5.53
13	2.6	0.2	118.10	5.43
14	2.8	0.2	118.10	5.32
15	3	0.2	118.10	5.22
16	3.2	0.2	118.10	5.12
17	3.4	0.2	118.10	5.01
18	3.6	0.2	118.10	4.91
19	3.8	0.2	118.10	4.81
20	4	0.2	118.10	4.70
21	4.2	0.2	118.10	4.60
22	4.4	0.2	118.10	4.49
23	4.6	0.2	118.10	4.39
24	0	0.0	0.00	4.39
25	0	0.0	0.00	4.39
26	0	0.0	0.00	4.39
27	0	0.0	0.00	4.39
28	0	0.0	0.00	4.39
29	0	0.0	0.00	4.39
30	0	0.0	0.00	4.39
31	0	0.0	0.00	4.39
32	0	0.0	0.00	4.39
33	0	0.0	0.00	4.39
34	0	0.0	0.00	4.39
Max	4.6	Sum	1.09	

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



5.5 Compressive Force Resistance

Skin friction of the soil is checked against the compression force from the racking and the weight of the drilled shaft foundation. Skin friction starts at 3ft below grade. Clay soils are again assumed.

Depth Below Grade, D =	5.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.59	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	15.71	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

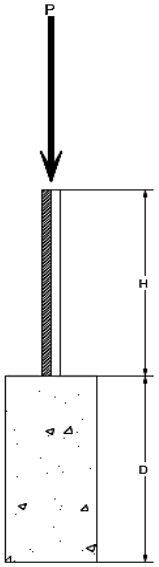
Weight of Concrete

Footing Volume	17.28	ft^3
Weight	2.51	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.36	k
1/3 Increase for Wind =	1.33	
Total Resistance =	9.42	k
Applied Force =	6.09	k
Utilization =	65%	

A 2ft diameter footing passes at a depth of 5.5ft.



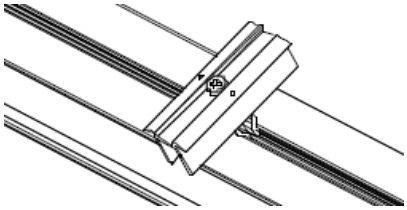
6. DESIGN OF JOINTS AND CONNECTIONS

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

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

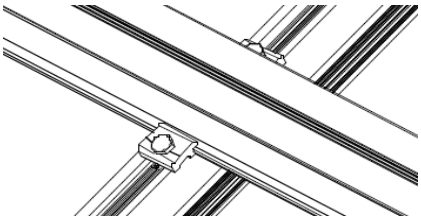
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.834 k
Allowable Uplift	=	1.214 k
Utilization	=	69%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.088 k
Allowable Uplift	=	2.180 k
Utilization	=	96%

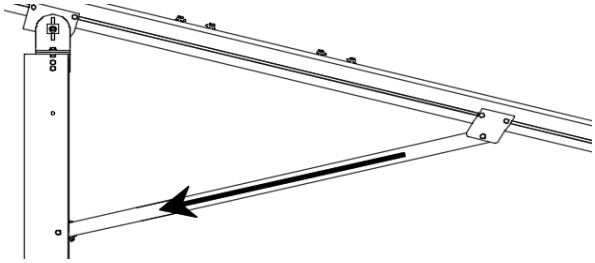


6.2 Strut Connections

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

Maximum Axial Load	=	4.586 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	52%

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

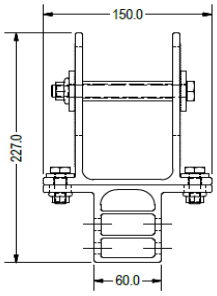


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

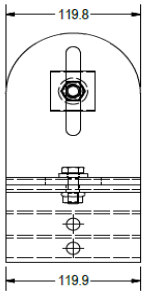
6.3 Girder to Post Connection

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

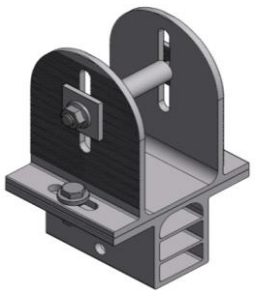
Maximum Tensile Load	=	4.408 k
Allowable Load	=	5.649 k
Utilization	=	78%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

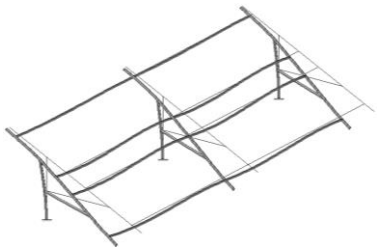
7.1 Seismic Drift

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}	=	70.15 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.403 in
Max Drift, Δ_{MAX}	=	0.419 in

0.419 ≤ 1.403, OK.

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 =	84 in	L_b =	84
J =	0.432	J =	0.432
	232.383		147.782
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	28.4 ksi	φF_L=	29.4
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

$\varphi F_L St$= 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

$\varphi F_L Wk$= 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

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

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

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)

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 =	72.60	in	
Pr =	-5.19	k	(LRFD Factored Load)
Mr (Strong) =	9.24	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	104.47			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	23.00	ksi		
Fe =	26.23	ksi		
Pn =	51.291	k		

Torsional/Flexural Torsional Buckling:

Fcr =	17.0733	ksi
Fey =	66.8981	ksi
Fez =	21.7595	ksi
Pn =	38.0734	k

Bending (Strong Axis):

Yielding:

Mn =	21.95	k-ft

Flange Local Buckling:

Mn =	19.207	k-ft

Pr/Pc =	0.1012	<	0.2	
Utilization =	0.58	<	1.0	OK

Bending (Weak Axis):

Yielding:

Mn =	14.65	k-ft

Flange Local Buckling:

Mn =	14.39	k-ft

Pr/Pc =	0.101	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 58%

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	-46.9	-46.9	0	0
2	M11	Y	-46.9	-46.9	0	0
3	M12	Y	-46.9	-46.9	0	0
4	M13	Y	-46.9	-46.9	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	-123.3	-123.3	0	0
2	M11	y	-123.3	-123.3	0	0
3	M12	y	-190.554	-190.554	0	0
4	M13	y	-190.554	-190.554	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	246.6	246.6	0	0
2	M11	y	246.6	246.6	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	609.619	2	2171.649	2	138.213	2	.164	2	.007	5	4.29	1
2		min	-900.018	3	-1726.288	3	-257.103	5	-1.009	5	-.006	2	.48	15
3	N19	max	2494.695	2	5852.561	2	0	3	0	2	.007	4	6.881	1
4		min	-2444.467	3	-5158.575	3	-273.307	5	-1.05	4	0	3	.225	15
5	N29	max	609.619	2	2171.649	2	169.802	3	.22	3	.008	4	4.29	1
6		min	-900.018	3	-1726.288	3	-280.018	4	-1.047	4	-.003	3	-.254	5
7	Totals:	max	3713.932	2	10195.86	2	0	3						
8		min	-4244.502	3	-8611.151	3	-795.707	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	.006	2	.001	4	0	1	0	1	0	1
2			min	0	1	-.001	3	0	1	0	1	0	1	0	1
3		2	max	-.221	15	-.473	15	0	12	0	1	0	12	0	6
4			min	-.939	4	-2.011	6	-1.499	5	0	1	0	5	0	15
5		3	max	-9.471	12	302.277	3	-3.323	12	.053	3	.17	1	.297	2
6			min	-152.34	1	-674.931	2	-103.531	1	-.174	2	.016	12	-.132	3
7		4	max	-9.836	12	301.101	3	-3.323	12	.053	3	.105	1	.717	2
8			min	-153.072	1	-676.499	2	-103.531	1	-.174	2	.014	12	-.319	3
9		5	max	-10.202	12	299.925	3	-3.323	12	.053	3	.048	4	1.137	2
10			min	-153.803	1	-678.068	2	-103.531	1	-.174	2	.004	10	-.506	3
11		6	max	383.968	3	570.194	2	10.935	3	-.002	9	.069	2	1.1	2
12			min	-1189.502	2	-159.3	3	-134.694	1	-.019	3	-.025	3	-.523	3
13		7	max	383.42	3	568.626	2	10.935	3	-.002	9	.002	10	.746	2
14			min	-1190.233	2	-160.476	3	-134.694	1	-.019	3	-.047	4	-.424	3
15		8	max	382.871	3	567.057	2	10.935	3	-.002	9	-.008	12	.394	2
16			min	-1190.964	2	-161.652	3	-134.694	1	-.019	3	-.106	1	-.324	3
17		9	max	368.122	3	101.792	3	11.882	3	.012	5	.071	1	.186	2
18			min	-1279.249	2	-50.713	2	-155.077	1	-.118	2	.014	10	-.283	3
19		10	max	367.573	3	100.616	3	11.882	3	.012	5	.032	3	.218	2
20			min	-1279.98	2	-52.281	2	-155.077	1	-.118	2	-.029	2	-.345	3
21		11	max	367.025	3	99.44	3	11.882	3	.012	5	.04	3	.251	2
22			min	-1280.711	2	-53.849	2	-155.077	1	-.118	2	-.121	1	-.408	3
23		12	max	348.068	3	788.266	3	46.271	2	.202	3	.096	1	.457	2
24			min	-1364.799	2	-473.903	2	-179.847	3	-.171	2	-.003	5	-.742	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	347.52	3	787.09	3	46.271	2	.202	3	.1	1	.752	2
26			min	-1365.531	2	-475.471	2	-179.847	3	-.171	2	-.095	5	-1.23	3
27		14	max	154.175	1	453.702	2	53.435	5	.14	2	.034	3	1.034	2
28			min	7.133	15	-735.948	3	-83.716	1	-.304	3	-.131	4	-1.698	3
29		15	max	153.444	1	452.133	2	51.935	5	.14	2	.018	3	.753	2
30			min	6.912	15	-737.125	3	-83.716	1	-.304	3	-.108	4	-1.241	3
31		16	max	152.712	1	450.565	2	50.435	5	.14	2	.002	3	.473	2
32			min	6.692	15	-738.301	3	-83.716	1	-.304	3	-.127	1	-.783	3
33		17	max	151.981	1	448.997	2	48.936	5	.14	2	-.009	12	.194	2
34			min	6.471	15	-739.477	3	-83.716	1	-.304	3	-.179	1	-.324	3
35		18	max	.939	4	2.012	6	1.5	4	0	1	0	12	0	6
36			min	.221	15	.473	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.002	2	0	1	0	1	0	1	0	1
38			min	0	1	-.005	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.013	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	-.221	15	-.473	15	0	1	0	1	0	1	0	4
42			min	-.939	6	-2.01	4	-1.499	5	0	1	0	5	0	15
43		3	max	-1.092	10	889.52	3	0	1	.021	4	.153	4	.671	2
44			min	-213.771	1	-1771.995	2	-73.92	5	0	1	0	1	-.339	3
45		4	max	-1.702	10	888.344	3	0	1	.021	4	.107	4	1.771	2
46			min	-214.502	1	-1773.563	2	-75.42	5	0	1	0	1	-.891	3
47		5	max	-2.311	10	887.168	3	0	1	.021	4	.06	4	2.872	2
48			min	-215.233	1	-1775.132	2	-76.92	5	0	1	0	1	-1.442	3
49		6	max	1404.8	3	1672.914	2	0	1	0	1	0	1	2.709	2
50			min	-3107.985	2	-716.966	3	-72.591	4	-.015	4	-.014	5	-1.404	3
51		7	max	1404.252	3	1671.346	2	0	1	0	1	0	1	1.671	2
52			min	-3108.717	2	-718.142	3	-74.091	4	-.015	4	-.059	4	-.959	3
53		8	max	1403.703	3	1669.777	2	0	1	0	1	0	1	.634	2
54			min	-3109.448	2	-719.318	3	-75.591	4	-.015	4	-.106	4	-.513	3
55		9	max	1399.852	3	246.061	3	0	1	.009	4	.086	4	.037	1
56			min	-3143.897	2	-228.98	2	-161.608	4	0	1	0	1	-.283	3
57		10	max	1399.303	3	244.884	3	0	1	.009	4	0	1	.165	1
58			min	-3144.628	2	-230.548	2	-163.107	4	0	1	-.014	4	-.435	3
59		11	max	1398.755	3	243.708	3	0	1	.009	4	0	1	.299	2
60			min	-3145.36	2	-232.117	2	-164.607	4	0	1	-.116	4	-.587	3
61		12	max	1403.317	3	2237.21	3	0	1	.099	4	.018	5	.967	2
62			min	-3188.201	2	-1585.132	2	-167.138	5	0	1	0	1	-1.53	3
63		13	max	1402.768	3	2236.034	3	0	1	.099	4	0	1	1.951	2
64			min	-3188.932	2	-1586.701	2	-168.638	5	0	1	-.087	4	-2.918	3
65		14	max	216.683	1	1290.921	2	50.154	5	0	1	0	1	2.897	2
66			min	3.179	10	-1895.386	3	0	1	-.066	4	-.113	5	-4.249	3
67		15	max	215.952	1	1289.353	2	48.654	5	0	1	0	1	2.096	2
68			min	2.57	10	-1896.563	3	0	1	-.066	4	-.083	5	-3.072	3
69		16	max	215.221	1	1287.784	2	47.154	5	0	1	0	1	1.296	2
70			min	1.961	10	-1897.739	3	0	1	-.066	4	-.053	5	-1.895	3
71		17	max	214.489	1	1286.216	2	45.655	5	0	1	0	1	.498	2
72			min	1.351	10	-1898.915	3	0	1	-.066	4	-.024	4	-.717	3
73		18	max	.939	6	2.013	6	1.5	5	0	1	0	1	0	6
74			min	.221	15	.473	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.005	2	0	1	0	1	0	1	0	1
76			min	0	1	-.011	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	.002	4	0	1	0	1	0	1
78			min	0	1	-.001	3	0	12	0	1	0	1	0	1
79		2	max	-.221	15	-.473	15	0	1	0	1	0	1	0	4
80			min	-.939	4	-2.012	4	-1.499	5	0	1	0	5	0	15
81		3	max	18.3	5	302.277	3	103.531	1	.174	2	.078	5	.297	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	-152.34	1	-674.931	2	-34.219	5	-.053	3	-.17	1	-.132	3
83		4	max	17.959	5	301.101	3	103.531	1	.174	2	.056	5	.717	2
84			min	-153.072	1	-676.499	2	-35.719	5	-.053	3	-.105	1	-.319	3
85		5	max	17.617	5	299.925	3	103.531	1	.174	2	.033	5	1.137	2
86			min	-153.803	1	-678.068	2	-37.219	5	-.053	3	-.041	1	-.506	3
87		6	max	383.968	3	570.194	2	134.694	1	.019	3	.025	3	1.1	2
88			min	-1189.502	2	-159.3	3	-31.708	5	-.012	5	-.069	2	-.523	3
89		7	max	383.42	3	568.626	2	134.694	1	.019	3	.022	1	.746	2
90			min	-1190.233	2	-160.476	3	-33.208	5	-.012	5	-.037	5	-.424	3
91		8	max	382.871	3	567.057	2	134.694	1	.019	3	.106	1	.394	2
92			min	-1190.964	2	-161.652	3	-34.708	5	-.012	5	-.059	5	-.324	3
93		9	max	368.122	3	101.792	3	155.077	1	.118	2	.032	5	.186	2
94			min	-1279.249	2	-50.713	2	-63.82	5	.011	15	-.071	1	-.283	3
95		10	max	367.573	3	100.616	3	155.077	1	.118	2	.029	2	.218	2
96			min	-1279.98	2	-52.281	2	-65.32	5	.011	15	-.032	3	-.345	3
97		11	max	367.025	3	99.44	3	155.077	1	.118	2	.121	1	.251	2
98			min	-1280.711	2	-53.849	2	-66.819	5	.011	15	-.049	5	-.408	3
99		12	max	348.068	3	788.266	3	179.847	3	.171	2	-.008	15	.457	2
100			min	-1364.799	2	-473.903	2	-146.228	5	-.202	3	-.096	1	-.742	3
101		13	max	347.52	3	787.09	3	179.847	3	.171	2	.092	3	.752	2
102			min	-1365.531	2	-475.471	2	-147.728	5	-.202	3	-.119	4	-1.23	3
103		14	max	154.175	1	453.702	2	83.716	1	.304	3	.024	2	1.034	2
104			min	6.521	15	-735.948	3	15.799	12	-.14	2	-.126	5	-1.698	3
105		15	max	153.444	1	452.133	2	83.716	1	.304	3	.075	1	.753	2
106			min	6.3	15	-737.125	3	15.799	12	-.14	2	-.088	5	-1.241	3
107		16	max	152.712	1	450.565	2	83.716	1	.304	3	.127	1	.473	2
108			min	6.079	15	-738.301	3	15.799	12	-.14	2	-.05	5	-.783	3
109		17	max	151.981	1	448.997	2	83.716	1	.304	3	.179	1	.194	2
110			min	5.859	15	-739.477	3	15.799	12	-.14	2	-.014	5	-.324	3
111		18	max	.939	4	2.013	4	1.5	5	0	1	0	1	0	4
112			min	.221	15	.473	15	0	1	0	1	0	5	0	15
113		19	max	0	1	.002	2	0	15	0	1	0	1	0	1
114			min	0	1	-.005	3	0	1	0	1	0	1	0	1
115	M10	1	max	83.722	1	445.719	2	-5.42	15	.012	2	.213	1	.14	2
116			min	15.8	12	-741.776	3	-150.677	1	-.026	3	.007	15	-.304	3
117		2	max	83.722	1	324.94	2	-4.246	15	.012	2	.107	1	.2	3
118			min	15.8	12	-553.754	3	-122.118	1	-.026	3	.003	15	-.16	2
119		3	max	83.722	1	204.161	2	-3.071	15	.012	2	.04	2	.557	3
120			min	15.8	12	-365.731	3	-93.559	1	-.026	3	0	15	-.366	2
121		4	max	83.722	1	83.382	2	-1.897	15	.012	2	.007	10	.769	3
122			min	15.8	12	-177.709	3	-65	1	-.026	3	-.039	1	-.478	2
123		5	max	83.722	1	11.088	5	-.722	15	.012	2	-.003	15	.834	3
124			min	15.452	15	-37.397	2	-36.44	1	-.026	3	-.078	1	-.496	2
125		6	max	83.722	1	198.337	3	2.312	9	.012	2	-.003	15	.753	3
126			min	10.078	15	-158.176	2	-21.148	2	-.026	3	-.096	1	-.419	2
127		7	max	83.722	1	386.359	3	20.973	9	.012	2	-.002	15	.525	3
128			min	4.704	15	-278.955	2	-9.689	10	-.026	3	-.091	1	-.249	2
129		8	max	83.722	1	574.382	3	49.237	1	.012	2	0	15	.152	3
130			min	-.784	5	-399.734	2	-6.445	10	-.026	3	-.064	2	-.012	5
131		9	max	83.722	1	762.404	3	77.796	1	.012	2	.013	9	.372	2
132			min	-8.768	5	-520.513	2	-3.2	10	-.026	3	-.058	2	-.368	3
133		10	max	83.722	1	641.292	2	-.044	10	.026	3	.065	9	.824	2
134			min	15.8	12	-950.427	3	-106.355	1	-.004	14	-.043	2	-1.034	3
135		11	max	83.722	1	520.513	2	3.2	10	.026	3	.013	9	.372	2
136			min	11.94	15	-762.404	3	-77.796	1	-.012	2	-.058	2	-.368	3
137		12	max	83.722	1	399.734	2	6.445	10	.026	3	-.003	15	.152	3
138			min	6.566	15	-574.382	3	-49.237	1	-.012	2	-.064	2	.006	10

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	83.722	1	278.955	2	9.689	10	.026	3	-.004	15	.525	3
140			min	1.192	15	-386.359	3	-20.973	9	-.012	2	-.091	1	-.249	2
141		14	max	83.722	1	158.176	2	21.148	2	.026	3	-.004	15	.753	3
142			min	-6.022	5	-198.337	3	-2.312	9	-.012	2	-.096	1	-.419	2
143		15	max	83.722	1	37.397	2	36.44	1	.026	3	-.004	12	.834	3
144			min	-14.006	5	-10.314	3	1.333	15	-.012	2	-.078	1	-.496	2
145		16	max	83.722	1	177.709	3	65	1	.026	3	.007	10	.769	3
146			min	-21.99	5	-83.382	2	2.507	15	-.012	2	-.039	1	-.478	2
147		17	max	83.722	1	365.731	3	93.559	1	.026	3	.04	2	.557	3
148			min	-29.974	5	-204.161	2	3.682	15	-.012	2	0	15	-.366	2
149		18	max	83.722	1	553.754	3	122.118	1	.026	3	.107	1	.2	3
150			min	-37.958	5	-324.94	2	4.856	15	-.012	2	.003	15	-.16	2
151		19	max	83.722	1	741.776	3	150.677	1	.026	3	.213	1	.14	2
152			min	-45.943	5	-445.719	2	6.031	15	-.012	2	.008	15	-.304	3
153	M11	1	max	160.76	1	416.297	2	25.099	5	0	12	.25	1	.08	4
154			min	-191.654	3	-691.072	3	-158.69	1	-.006	2	-.11	5	-.279	3
155		2	max	160.76	1	295.518	2	26.915	5	0	12	.138	1	.185	3
156			min	-191.654	3	-503.049	3	-130.131	1	-.006	2	-.089	5	-.223	2
157		3	max	160.76	1	174.739	2	28.732	5	0	12	.054	2	.503	3
158			min	-191.654	3	-315.027	3	-101.572	1	-.006	2	-.068	5	-.406	2
159		4	max	160.76	1	53.96	2	30.549	5	0	12	.012	3	.675	3
160			min	-191.654	3	-127.004	3	-73.013	1	-.006	2	-.052	4	-.495	2
161		5	max	160.76	1	61.019	3	32.366	5	0	12	.003	3	.701	3
162			min	-191.654	3	-66.819	2	-44.454	1	-.006	2	-.066	1	-.49	2
163		6	max	160.76	1	249.041	3	34.183	5	0	12	.006	5	.58	3
164			min	-191.654	3	-187.598	2	-25.65	2	-.006	2	-.09	1	-.391	2
165		7	max	160.76	1	437.064	3	41.556	4	0	12	.033	5	.313	3
166			min	-191.654	3	-308.377	2	-14.049	2	-.006	2	-.091	1	-.198	2
167		8	max	160.76	1	625.086	3	49.635	4	0	12	.062	5	.088	2
168			min	-191.654	3	-429.156	2	-8.172	10	-.006	2	-.07	1	-.1	3
169		9	max	160.76	1	813.109	3	69.783	1	0	12	.094	4	.469	2
170			min	-191.654	3	-549.935	2	-4.928	10	-.006	2	-.066	2	-.659	3
171		10	max	160.76	1	603.481	1	46.558	11	.006	2	.142	4	.944	2
172			min	-191.654	3	-1001.132	3	-98.342	1	-.002	14	-.054	2	-1.364	3
173		11	max	160.76	1	549.935	2	29.18	5	.006	2	.005	9	.469	2
174			min	-191.654	3	-813.109	3	-69.783	1	0	5	-.091	5	-.659	3
175		12	max	160.76	1	429.156	2	30.997	5	.006	2	-.011	12	.088	2
176			min	-191.654	3	-625.086	3	-41.224	1	0	5	-.077	4	-.1	3
177		13	max	160.76	1	308.377	2	32.814	5	.006	2	-.008	12	.313	3
178			min	-191.654	3	-437.064	3	-16.264	9	0	5	-.091	1	-.198	2
179		14	max	160.76	1	187.598	2	35.508	4	.006	2	-.004	12	.58	3
180			min	-191.654	3	-249.041	3	2.396	9	0	5	-.09	1	-.391	2
181		15	max	160.76	1	66.819	2	44.454	1	.006	2	.011	5	.701	3
182			min	-191.654	3	-61.019	3	6.955	12	0	5	-.066	1	-.49	2
183		16	max	160.76	1	127.004	3	73.013	1	.006	2	.04	5	.675	3
184			min	-191.654	3	-53.96	2	8.129	12	0	5	-.022	9	-.495	2
185		17	max	160.76	1	315.027	3	101.572	1	.006	2	.077	4	.503	3
186			min	-191.654	3	-174.739	2	9.304	12	0	5	.014	12	-.406	2
187		18	max	160.76	1	503.049	3	130.131	1	.006	2	.138	1	.185	3
188			min	-191.654	3	-295.518	2	10.478	12	0	5	.022	12	-.223	2
189		19	max	160.76	1	691.072	3	158.69	1	.006	2	.25	1	.063	1
190			min	-191.654	3	-416.297	2	11.652	12	0	5	.03	12	-.279	3
191	M12	1	max	27.54	5	614.088	2	27.863	5	0	3	.265	1	.113	2
192			min	-19.947	1	-265.317	3	-162.078	1	-.006	1	-.118	5	.018	9
193		2	max	19.556	5	441	2	29.68	5	0	3	.15	1	.232	3
194			min	-19.947	1	-181.912	3	-133.519	1	-.006	1	-.096	5	-.297	2
195		3	max	11.572	5	267.912	2	31.496	5	0	3	.066	2	.341	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	-19.947	1	-98.508	3	-104.96	1	-.006	1	-.072	5	-.573	2
197		4	max	8.724	10	94.825	2	33.313	5	0	3	.02	2	.385	3
198			min	-19.947	1	-15.103	3	-76.401	1	-.006	1	-.054	4	-.714	2
199		5	max	8.724	10	68.301	3	35.13	5	0	3	-.001	10	.365	3
200			min	-19.947	1	-78.263	2	-47.842	1	-.006	1	-.061	1	-.72	2
201		6	max	8.724	10	151.706	3	36.947	5	0	3	.008	5	.279	3
202			min	-21.405	14	-251.351	2	-29.562	2	-.006	1	-.087	1	-.592	2
203		7	max	8.724	10	235.11	3	43.958	4	0	3	.037	5	.129	3
204			min	-26.942	4	-424.438	2	-17.961	2	-.006	1	-.091	1	-.329	2
205		8	max	8.724	10	318.515	3	52.038	4	0	3	.068	5	.068	2
206			min	-34.926	4	-597.526	2	-10.285	10	-.006	1	-.073	1	-.087	3
207		9	max	8.724	10	401.919	3	66.394	1	0	3	.102	4	.6	2
208			min	-42.91	4	-770.614	2	-7.041	10	-.006	1	-.072	2	-.367	3
209		10	max	8.724	10	943.702	2	77.554	14	0	12	.152	4	1.267	2
210			min	-50.894	4	-485.324	3	-94.953	1	-.006	1	-.064	2	-.712	3
211		11	max	32.2	5	770.614	2	32.18	5	.006	1	.003	9	.6	2
212			min	-19.947	1	-401.919	3	-66.394	1	0	5	-.099	5	-.367	3
213		12	max	24.216	5	597.526	2	33.997	5	.006	1	-.009	12	.068	2
214			min	-19.947	1	-318.515	3	-37.835	1	0	5	-.084	4	-.087	3
215		13	max	16.232	5	424.438	2	35.814	5	.006	1	-.007	12	.129	3
216			min	-19.947	1	-235.11	3	-15.089	9	0	5	-.091	1	-.329	2
217		14	max	8.724	10	251.351	2	38.935	4	.006	1	-.005	12	.279	3
218			min	-19.947	1	-151.706	3	3.312	12	0	5	-.087	1	-.592	2
219		15	max	8.724	10	78.263	2	47.842	1	.006	1	.012	5	.365	3
220			min	-19.947	1	-68.301	3	4.486	12	0	5	-.061	1	-.72	2
221		16	max	8.724	10	15.103	3	76.401	1	.006	1	.043	5	.385	3
222			min	-19.947	1	-94.825	2	5.66	12	0	5	-.019	9	-.714	2
223		17	max	8.724	10	98.508	3	104.96	1	.006	1	.083	4	.341	3
224			min	-23.089	14	-267.912	2	6.835	12	0	5	.007	12	-.573	2
225		18	max	8.724	10	181.912	3	133.519	1	.006	1	.15	1	.232	3
226			min	-30.266	4	-441	2	8.009	12	0	5	.012	12	-.297	2
227		19	max	8.724	10	265.317	3	162.078	1	.006	1	.265	1	.113	2
228			min	-38.25	4	-614.088	2	9.183	12	0	5	.019	12	-.025	5
229	M13	1	max	31.173	5	672.301	2	18.984	5	.01	3	.211	1	.174	2
230			min	-103.47	1	-304.672	3	-150.676	1	-.023	2	-.092	5	-.053	3
231		2	max	23.189	5	499.213	2	20.801	5	.01	3	.105	1	.152	3
232			min	-103.47	1	-221.267	3	-122.117	1	-.023	2	-.077	5	-.282	2
233		3	max	15.205	5	326.125	2	22.618	5	.01	3	.039	2	.291	3
234			min	-103.47	1	-137.863	3	-93.558	1	-.023	2	-.06	5	-.602	2
235		4	max	7.221	5	153.038	2	24.435	5	.01	3	.006	10	.366	3
236			min	-103.47	1	-54.458	3	-64.999	1	-.023	2	-.053	4	-.789	2
237		5	max	-.36	15	28.946	3	26.251	5	.01	3	-.003	12	.376	3
238			min	-103.47	1	-20.05	2	-36.439	1	-.023	2	-.08	1	-.841	2
239		6	max	-3.323	12	112.351	3	28.918	4	.01	3	0	15	.321	3
240			min	-103.47	1	-193.138	2	-21.254	2	-.023	2	-.097	1	-.758	2
241		7	max	-3.323	12	195.755	3	36.997	4	.01	3	.022	5	.201	3
242			min	-103.47	1	-366.226	2	-9.759	10	-.023	2	-.092	1	-.54	2
243		8	max	-3.323	12	279.16	3	49.238	1	.01	3	.046	5	.016	3
244			min	-103.47	1	-539.313	2	-6.515	10	-.023	2	-.066	2	-.188	2
245		9	max	-3.323	12	362.564	3	77.797	1	.01	3	.076	4	.299	2
246			min	-103.47	1	-712.401	2	-3.271	10	-.023	2	-.06	2	-.233	3
247		10	max	-3.323	12	885.489	2	77.597	14	.01	3	.12	4	.92	2
248			min	-103.47	1	-445.969	3	-106.356	1	-.023	2	-.045	2	-.548	3
249		11	max	22.293	5	712.401	2	22.15	5	.023	2	.012	9	.299	2
250			min	-103.47	1	-362.564	3	-77.797	1	-.01	3	-.069	5	-.233	3
251		12	max	14.309	5	539.313	2	23.967	5	.023	2	-.008	12	.016	3
252			min	-103.47	1	-279.16	3	-49.238	1	-.01	3	-.066	2	-.188	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	6.325	5	366.226	2	25.784	5	.023	2	-.007	12	.201	3
254			min	-103.47	1	-195.755	3	-21.018	9	-.01	3	-.092	1	-.54	2
255		14	max	-.959	15	193.138	2	27.601	5	.023	2	-.005	12	.321	3
256			min	-103.47	1	-112.351	3	-2.358	9	-.01	3	-.097	1	-.758	2
257		15	max	-3.323	12	20.05	2	36.439	1	.023	2	.011	5	.376	3
258			min	-103.47	1	-28.946	3	4.041	12	-.01	3	-.08	1	-.841	2
259		16	max	-3.323	12	54.458	3	64.999	1	.023	2	.035	5	.366	3
260			min	-103.47	1	-153.038	2	5.216	12	-.01	3	-.04	1	-.789	2
261		17	max	-3.323	12	137.863	3	93.558	1	.023	2	.061	4	.291	3
262			min	-103.47	1	-326.125	2	6.39	12	-.01	3	.001	9	-.602	2
263		18	max	-3.323	12	221.267	3	122.117	1	.023	2	.105	1	.152	3
264			min	-103.47	1	-499.213	2	7.564	12	-.01	3	.011	12	-.282	2
265		19	max	-3.323	12	304.672	3	150.676	1	.023	2	.211	1	.174	2
266			min	-103.47	1	-672.301	2	8.739	12	-.01	3	.017	12	-.053	3
267	M2	1	max	2171.649	2	899.443	3	138.339	2	.007	5	1.009	5	4.29	1
268			min	-1726.288	3	-608.402	2	-257.147	5	-.006	2	-.164	2	.48	15
269		2	max	2169.094	2	899.443	3	138.339	2	.007	5	.937	5	4.344	1
270			min	-1728.204	3	-608.402	2	-254.933	5	-.006	2	-.126	2	.458	15
271		3	max	2166.539	2	899.443	3	138.339	2	.007	5	.866	5	4.398	1
272			min	-1730.12	3	-608.402	2	-252.718	5	-.006	2	-.089	1	.436	15
273		4	max	1496.664	2	1013.413	1	99.916	2	.001	2	.796	5	4.265	1
274			min	-1491.665	3	97.781	15	-238.835	5	0	3	-.079	1	.412	15
275		5	max	1494.109	2	1013.413	1	99.916	2	.001	2	.729	5	3.981	1
276			min	-1493.581	3	97.781	15	-236.621	5	0	3	-.053	1	.384	15
277		6	max	1491.554	2	1013.413	1	99.916	2	.001	2	.663	5	3.696	1
278			min	-1495.497	3	97.781	15	-234.406	5	0	3	-.028	1	.357	15
279		7	max	1488.999	2	1013.413	1	99.916	2	.001	2	.6	4	3.412	1
280			min	-1497.413	3	97.781	15	-232.192	5	0	3	-.039	3	.329	15
281		8	max	1486.445	2	1013.413	1	99.916	2	.001	2	.538	4	3.128	1
282			min	-1499.33	3	97.781	15	-229.978	5	0	3	-.083	3	.302	15
283		9	max	1483.89	2	1013.413	1	99.916	2	.001	2	.476	4	2.843	1
284			min	-1501.246	3	97.781	15	-227.764	5	0	3	-.126	3	.274	15
285		10	max	1481.335	2	1013.413	1	99.916	2	.001	2	.415	4	2.559	1
286			min	-1503.162	3	97.781	15	-225.549	5	0	3	-.169	3	.247	15
287		11	max	1478.78	2	1013.413	1	99.916	2	.001	2	.355	4	2.275	1
288			min	-1505.078	3	97.781	15	-223.335	5	0	3	-.212	3	.219	15
289		12	max	1476.225	2	1013.413	1	99.916	2	.001	2	.295	4	1.99	1
290			min	-1506.994	3	97.781	15	-221.121	5	0	3	-.256	3	.192	15
291		13	max	1473.67	2	1013.413	1	99.916	2	.001	2	.236	4	1.706	1
292			min	-1508.91	3	97.781	15	-218.907	5	0	3	-.299	3	.165	15
293		14	max	1471.115	2	1013.413	1	99.916	2	.001	2	.203	2	1.422	1
294			min	-1510.827	3	97.781	15	-216.692	5	0	3	-.342	3	.137	15
295		15	max	1468.56	2	1013.413	1	99.916	2	.001	2	.231	2	1.137	1
296			min	-1512.743	3	97.781	15	-214.478	5	0	3	-.385	3	.11	15
297		16	max	1466.005	2	1013.413	1	99.916	2	.001	2	.259	2	.853	1
298			min	-1514.659	3	97.781	15	-212.264	5	0	3	-.429	3	.082	15
299		17	max	1463.451	2	1013.413	1	99.916	2	.001	2	.287	2	.569	1
300			min	-1516.575	3	97.781	15	-210.05	5	0	3	-.472	3	.055	15
301		18	max	1460.896	2	1013.413	1	99.916	2	.001	2	.315	2	.284	1
302			min	-1518.491	3	97.781	15	-207.836	5	0	3	-.515	3	.027	15
303		19	max	1458.341	2	1013.413	1	99.916	2	.001	2	.343	2	0	1
304			min	-1520.407	3	97.781	15	-205.621	5	0	3	-.559	3	0	1
305	M5	1	max	5852.561	2	2441.389	3	0	1	.007	4	1.05	4	6.881	1
306			min	-5158.575	3	-2489.373	2	-273.392	5	0	1	0	1	.225	15
307		2	max	5850.007	2	2441.389	3	0	1	.007	4	.974	4	7.292	1
308			min	-5160.491	3	-2489.373	2	-271.178	5	0	1	0	1	.228	15
309		3	max	5847.452	2	2441.389	3	0	1	.007	4	.898	4	7.702	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	-5162.407	3	-2489.373	2	-268.964	5	0	1	0	1	.231	15
311		4	max	4031.114	2	1807.369	1	0	1	0	1	.825	4	7.607	1
312			min	-4312.254	3	53.316	15	-255.672	4	0	4	0	1	.224	15
313		5	max	4028.559	2	1807.369	1	0	1	0	1	.754	4	7.099	1
314			min	-4314.171	3	53.316	15	-253.458	4	0	4	0	1	.209	15
315		6	max	4026.004	2	1807.369	1	0	1	0	1	.683	4	6.592	1
316			min	-4316.087	3	53.316	15	-251.244	4	0	4	0	1	.194	15
317		7	max	4023.449	2	1807.369	1	0	1	0	1	.613	4	6.085	1
318			min	-4318.003	3	53.316	15	-249.03	4	0	4	0	1	.18	15
319		8	max	4020.894	2	1807.369	1	0	1	0	1	.543	4	5.578	1
320			min	-4319.919	3	53.316	15	-246.815	4	0	4	0	1	.165	15
321		9	max	4018.339	2	1807.369	1	0	1	0	1	.474	4	5.071	1
322			min	-4321.835	3	53.316	15	-244.601	4	0	4	0	1	.15	15
323		10	max	4015.785	2	1807.369	1	0	1	0	1	.406	4	4.564	1
324			min	-4323.751	3	53.316	15	-242.387	4	0	4	0	1	.135	15
325		11	max	4013.23	2	1807.369	1	0	1	0	1	.338	4	4.057	1
326			min	-4325.668	3	53.316	15	-240.173	4	0	4	0	1	.12	15
327		12	max	4010.675	2	1807.369	1	0	1	0	1	.271	4	3.55	1
328			min	-4327.584	3	53.316	15	-237.959	4	0	4	0	1	.105	15
329		13	max	4008.12	2	1807.369	1	0	1	0	1	.205	4	3.043	1
330			min	-4329.5	3	53.316	15	-235.744	4	0	4	0	1	.09	15
331		14	max	4005.565	2	1807.369	1	0	1	0	1	.139	4	2.536	1
332			min	-4331.416	3	53.316	15	-233.53	4	0	4	0	1	.075	15
333		15	max	4003.01	2	1807.369	1	0	1	0	1	.074	4	2.028	1
334			min	-4333.332	3	53.316	15	-231.316	4	0	4	0	1	.06	15
335		16	max	4000.455	2	1807.369	1	0	1	0	1	.009	4	1.521	1
336			min	-4335.248	3	53.316	15	-229.102	4	0	4	0	1	.045	15
337		17	max	3997.9	2	1807.369	1	0	1	0	1	0	1	1.014	1
338			min	-4337.165	3	53.316	15	-226.887	4	0	4	-.055	4	.03	15
339		18	max	3995.345	2	1807.369	1	0	1	0	1	0	1	.507	1
340			min	-4339.081	3	53.316	15	-224.673	4	0	4	-.118	4	.015	15
341		19	max	3992.791	2	1807.369	1	0	1	0	1	0	1	0	1
342			min	-4340.997	3	53.316	15	-222.459	4	0	4	-.181	4	0	1
343	M8	1	max	2171.649	2	899.443	3	169.667	3	.008	4	1.047	4	4.29	1
344			min	-1726.288	3	-608.402	2	-280.177	4	-.003	3	-.22	3	-.254	5
345		2	max	2169.094	2	899.443	3	169.667	3	.008	4	.969	4	4.344	1
346			min	-1728.204	3	-608.402	2	-277.962	4	-.003	3	-.172	3	-.226	5
347		3	max	2166.539	2	899.443	3	169.667	3	.008	4	.891	4	4.398	1
348			min	-1730.12	3	-608.402	2	-275.748	4	-.003	3	-.124	3	-.199	5
349		4	max	1496.664	2	1013.413	1	154.211	3	0	3	.818	4	4.265	1
350			min	-1491.665	3	-42.74	5	-257.415	4	-.001	2	-.09	3	-.18	5
351		5	max	1494.109	2	1013.413	1	154.211	3	0	3	.746	4	3.981	1
352			min	-1493.581	3	-42.74	5	-255.201	4	-.001	2	-.047	3	-.168	5
353		6	max	1491.554	2	1013.413	1	154.211	3	0	3	.675	4	3.696	1
354			min	-1495.497	3	-42.74	5	-252.987	4	-.001	2	-.004	3	-.156	5
355		7	max	1488.999	2	1013.413	1	154.211	3	0	3	.604	4	3.412	1
356			min	-1497.413	3	-42.74	5	-250.773	4	-.001	2	-.006	2	-.144	5
357		8	max	1486.445	2	1013.413	1	154.211	3	0	3	.534	4	3.128	1
358			min	-1499.33	3	-42.74	5	-248.558	4	-.001	2	-.034	2	-.132	5
359		9	max	1483.89	2	1013.413	1	154.211	3	0	3	.466	5	2.843	1
360			min	-1501.246	3	-42.74	5	-246.344	4	-.001	2	-.062	2	-.12	5
361		10	max	1481.335	2	1013.413	1	154.211	3	0	3	.401	5	2.559	1
362			min	-1503.162	3	-42.74	5	-244.13	4	-.001	2	-.09	2	-.108	5
363		11	max	1478.78	2	1013.413	1	154.211	3	0	3	.336	5	2.275	1
364			min	-1505.078	3	-42.74	5	-241.916	4	-.001	2	-.118	2	-.096	5
365		12	max	1476.225	2	1013.413	1	154.211	3	0	3	.272	5	1.99	1
366			min	-1506.994	3	-42.74	5	-239.701	4	-.001	2	-.146	2	-.084	5

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	1473.67	2	1013.413	1	154.211	3	0	3	.299	3	1.706	1
368			min	-1508.91	3	-42.74	5	-237.487	4	-.001	2	-.174	2	-.072	5
369		14	max	1471.115	2	1013.413	1	154.211	3	0	3	.342	3	1.422	1
370			min	-1510.827	3	-42.74	5	-235.273	4	-.001	2	-.203	2	-.06	5
371		15	max	1468.56	2	1013.413	1	154.211	3	0	3	.385	3	1.137	1
372			min	-1512.743	3	-42.74	5	-233.059	4	-.001	2	-.231	2	-.048	5
373		16	max	1466.005	2	1013.413	1	154.211	3	0	3	.429	3	.853	1
374			min	-1514.659	3	-42.74	5	-230.845	4	-.001	2	-.259	2	-.036	5
375		17	max	1463.451	2	1013.413	1	154.211	3	0	3	.472	3	.569	1
376			min	-1516.575	3	-42.74	5	-228.63	4	-.001	2	-.287	2	-.024	5
377		18	max	1460.896	2	1013.413	1	154.211	3	0	3	.515	3	.284	1
378			min	-1518.491	3	-42.74	5	-226.416	4	-.001	2	-.315	2	-.012	5
379		19	max	1458.341	2	1013.413	1	154.211	3	0	3	.559	3	0	1
380			min	-1520.407	3	-42.74	5	-224.202	4	-.001	2	-.343	2	0	1
381	M3	1	max	1667.676	2	4.588	4	38.053	2	.012	3	.008	4	0	1
382			min	-606.131	3	1.079	15	-15.815	3	-.025	2	-.002	3	0	1
383		2	max	1667.501	2	4.078	4	38.053	2	.012	3	.014	2	0	15
384			min	-606.261	3	.959	15	-15.815	3	-.025	2	-.006	3	-.001	4
385		3	max	1667.327	2	3.569	4	38.053	2	.012	3	.025	2	0	15
386			min	-606.392	3	.839	15	-15.815	3	-.025	2	-.011	3	-.002	4
387		4	max	1667.153	2	3.059	4	38.053	2	.012	3	.036	2	0	15
388			min	-606.523	3	.719	15	-15.815	3	-.025	2	-.016	3	-.003	4
389		5	max	1666.978	2	2.549	4	38.053	2	.012	3	.048	2	0	15
390			min	-606.654	3	.599	15	-15.815	3	-.025	2	-.02	3	-.004	4
391		6	max	1666.804	2	2.039	4	38.053	2	.012	3	.059	2	-.001	15
392			min	-606.785	3	.479	15	-15.815	3	-.025	2	-.025	3	-.005	4
393		7	max	1666.629	2	1.529	4	38.053	2	.012	3	.07	2	-.001	15
394			min	-606.915	3	.36	15	-15.815	3	-.025	2	-.029	3	-.005	4
395		8	max	1666.455	2	1.02	4	38.053	2	.012	3	.081	2	-.001	15
396			min	-607.046	3	.24	15	-15.815	3	-.025	2	-.034	3	-.006	4
397		9	max	1666.281	2	.51	4	38.053	2	.012	3	.092	2	-.001	15
398			min	-607.177	3	.12	15	-15.815	3	-.025	2	-.039	3	-.006	4
399		10	max	1666.106	2	0	1	38.053	2	.012	3	.103	2	-.001	15
400			min	-607.308	3	0	1	-15.815	3	-.025	2	-.043	3	-.006	4
401		11	max	1665.932	2	-.12	15	38.053	2	.012	3	.114	2	-.001	15
402			min	-607.438	3	-.51	6	-15.815	3	-.025	2	-.048	3	-.006	4
403		12	max	1665.758	2	-.24	15	38.053	2	.012	3	.126	2	-.001	15
404			min	-607.569	3	-1.02	6	-15.815	3	-.025	2	-.053	3	-.006	4
405		13	max	1665.583	2	-.36	15	38.053	2	.012	3	.137	2	-.001	15
406			min	-607.7	3	-1.529	6	-15.815	3	-.025	2	-.057	3	-.005	4
407		14	max	1665.409	2	-.479	15	38.053	2	.012	3	.148	2	-.001	15
408			min	-607.831	3	-2.039	6	-15.815	3	-.025	2	-.062	3	-.005	4
409		15	max	1665.234	2	-.599	15	38.053	2	.012	3	.159	2	0	15
410			min	-607.962	3	-2.549	6	-15.815	3	-.025	2	-.066	3	-.004	4
411		16	max	1665.06	2	-.719	15	38.053	2	.012	3	.17	2	0	15
412			min	-608.092	3	-3.059	6	-15.815	3	-.025	2	-.071	3	-.003	4
413		17	max	1664.886	2	-.839	15	38.053	2	.012	3	.181	2	0	15
414			min	-608.223	3	-3.569	6	-15.815	3	-.025	2	-.076	3	-.002	4
415		18	max	1664.711	2	-.959	15	38.053	2	.012	3	.192	2	0	15
416			min	-608.354	3	-4.078	6	-15.815	3	-.025	2	-.08	3	-.001	4
417		19	max	1664.537	2	-1.079	15	38.053	2	.012	3	.203	2	0	1
418			min	-608.485	3	-4.588	6	-15.815	3	-.025	2	-.085	3	0	1
419	M6	1	max	4586.026	2	4.588	6	0	1	.003	5	.007	4	0	1
420			min	-2135.555	3	1.079	15	-13.426	4	0	1	0	1	0	1
421		2	max	4585.851	2	4.078	6	0	1	.003	5	.003	4	0	15
422			min	-2135.686	3	.959	15	-13.05	4	0	1	0	1	-.001	6
423		3	max	4585.677	2	3.569	6	0	1	.003	5	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	-2135.817	3	.839	15	-12.674	4	0	1	0	5	-.002	6
425		4	max	4585.502	2	3.059	6	0	1	.003	5	0	1	0	15
426			min	-2135.948	3	.719	15	-12.298	4	0	1	-.004	4	-.003	6
427		5	max	4585.328	2	2.549	6	0	1	.003	5	0	1	0	15
428			min	-2136.079	3	.599	15	-11.922	4	0	1	-.008	4	-.004	6
429		6	max	4585.154	2	2.039	6	0	1	.003	5	0	1	-.001	15
430			min	-2136.209	3	.479	15	-11.546	4	0	1	-.011	4	-.005	6
431		7	max	4584.979	2	1.529	6	0	1	.003	5	0	1	-.001	15
432			min	-2136.34	3	.36	15	-11.17	4	0	1	-.014	4	-.005	6
433		8	max	4584.805	2	1.02	6	0	1	.003	5	0	1	-.001	15
434			min	-2136.471	3	.24	15	-10.794	4	0	1	-.018	4	-.006	6
435		9	max	4584.63	2	.51	6	0	1	.003	5	0	1	-.001	15
436			min	-2136.602	3	.12	15	-10.418	4	0	1	-.021	4	-.006	6
437		10	max	4584.456	2	0	1	0	1	.003	5	0	1	-.001	15
438			min	-2136.733	3	0	1	-10.042	4	0	1	-.024	4	-.006	6
439		11	max	4584.282	2	-.12	15	0	1	.003	5	0	1	-.001	15
440			min	-2136.863	3	-.51	4	-9.666	4	0	1	-.027	4	-.006	6
441		12	max	4584.107	2	-.24	15	0	1	.003	5	0	1	-.001	15
442			min	-2136.994	3	-1.02	4	-9.291	4	0	1	-.029	4	-.006	6
443		13	max	4583.933	2	-.36	15	0	1	.003	5	0	1	-.001	15
444			min	-2137.125	3	-1.529	4	-8.915	4	0	1	-.032	4	-.005	6
445		14	max	4583.759	2	-.479	15	0	1	.003	5	0	1	-.001	15
446			min	-2137.256	3	-2.039	4	-8.539	4	0	1	-.035	4	-.005	6
447		15	max	4583.584	2	-.599	15	0	1	.003	5	0	1	0	15
448			min	-2137.386	3	-2.549	4	-8.163	4	0	1	-.037	4	-.004	6
449		16	max	4583.41	2	-.719	15	0	1	.003	5	0	1	0	15
450			min	-2137.517	3	-3.059	4	-7.787	4	0	1	-.039	4	-.003	6
451		17	max	4583.235	2	-.839	15	0	1	.003	5	0	1	0	15
452			min	-2137.648	3	-3.569	4	-7.411	4	0	1	-.042	4	-.002	6
453		18	max	4583.061	2	-.959	15	0	1	.003	5	0	1	0	15
454			min	-2137.779	3	-4.078	4	-7.035	4	0	1	-.044	4	-.001	6
455		19	max	4582.887	2	-1.079	15	0	1	.003	5	0	1	0	1
456			min	-2137.91	3	-4.588	4	-6.659	4	0	1	-.046	4	0	1
457	M9	1	max	1667.676	2	4.588	4	15.815	3	.025	2	.007	5	0	1
458			min	-606.131	3	1.079	15	-38.053	2	-.012	3	-.003	2	0	1
459		2	max	1667.501	2	4.078	4	15.815	3	.025	2	.006	3	0	15
460			min	-606.261	3	.959	15	-38.053	2	-.012	3	-.014	2	-.001	4
461		3	max	1667.327	2	3.569	4	15.815	3	.025	2	.011	3	0	15
462			min	-606.392	3	.839	15	-38.053	2	-.012	3	-.025	2	-.002	4
463		4	max	1667.153	2	3.059	4	15.815	3	.025	2	.016	3	0	15
464			min	-606.523	3	.719	15	-38.053	2	-.012	3	-.036	2	-.003	4
465		5	max	1666.978	2	2.549	4	15.815	3	.025	2	.02	3	0	15
466			min	-606.654	3	.599	15	-38.053	2	-.012	3	-.048	2	-.004	4
467		6	max	1666.804	2	2.039	4	15.815	3	.025	2	.025	3	-.001	15
468			min	-606.785	3	.479	15	-38.053	2	-.012	3	-.059	2	-.005	4
469		7	max	1666.629	2	1.529	4	15.815	3	.025	2	.029	3	-.001	15
470			min	-606.915	3	.36	15	-38.053	2	-.012	3	-.07	2	-.005	4
471		8	max	1666.455	2	1.02	4	15.815	3	.025	2	.034	3	-.001	15
472			min	-607.046	3	.24	15	-38.053	2	-.012	3	-.081	2	-.006	4
473		9	max	1666.281	2	.51	4	15.815	3	.025	2	.039	3	-.001	15
474			min	-607.177	3	.12	15	-38.053	2	-.012	3	-.092	2	-.006	4
475		10	max	1666.106	2	0	1	15.815	3	.025	2	.043	3	-.001	15
476			min	-607.308	3	0	1	-38.053	2	-.012	3	-.103	2	-.006	4
477		11	max	1665.932	2	-.12	15	15.815	3	.025	2	.048	3	-.001	15
478			min	-607.438	3	-.51	6	-38.053	2	-.012	3	-.114	2	-.006	4
479		12	max	1665.758	2	-.24	15	15.815	3	.025	2	.053	3	-.001	15
480			min	-607.569	3	-1.02	6	-38.053	2	-.012	3	-.126	2	-.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	1665.583	2	-.36	15	15.815	3	.025	2	.057	3	-.001	15
482			min	-607.7	3	-1.529	6	-38.053	2	-.012	3	-.137	2	-.005	4
483		14	max	1665.409	2	-.479	15	15.815	3	.025	2	.062	3	-.001	15
484			min	-607.831	3	-2.039	6	-38.053	2	-.012	3	-.148	2	-.005	4
485		15	max	1665.234	2	-.599	15	15.815	3	.025	2	.066	3	0	15
486			min	-607.962	3	-2.549	6	-38.053	2	-.012	3	-.159	2	-.004	4
487		16	max	1665.06	2	-.719	15	15.815	3	.025	2	.071	3	0	15
488			min	-608.092	3	-3.059	6	-38.053	2	-.012	3	-.17	2	-.003	4
489		17	max	1664.886	2	-.839	15	15.815	3	.025	2	.076	3	0	15
490			min	-608.223	3	-3.569	6	-38.053	2	-.012	3	-.181	2	-.002	4
491		18	max	1664.711	2	-.959	15	15.815	3	.025	2	.08	3	0	15
492			min	-608.354	3	-4.078	6	-38.053	2	-.012	3	-.192	2	-.001	4
493		19	max	1664.537	2	-1.079	15	15.815	3	.025	2	.085	3	0	1
494			min	-608.485	3	-4.588	6	-38.053	2	-.012	3	-.203	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	-.021	15	.053	3	.016	1	6.371e-3	3	NC	3	NC	3
2			min	-.215	1	-.566	2	-.343	5	-1.674e-2	2	229.087	1	529.178	5
3		2	max	-.021	15	.025	3	.005	1	6.371e-3	3	8224.807	12	NC	2
4			min	-.215	1	-.472	2	-.329	4	-1.674e-2	2	267.955	1	561.421	5
5		3	max	-.021	15	-.003	3	0	12	5.955e-3	3	4108.163	12	NC	1
6			min	-.214	1	-.378	2	-.315	4	-1.537e-2	2	322.767	1	600.095	5
7		4	max	-.021	15	-.018	12	0	12	5.318e-3	3	2868.469	15	NC	1
8			min	-.214	1	-.293	1	-.297	4	-1.327e-2	2	402.008	1	654.526	5
9		5	max	-.021	15	-.019	15	0	12	4.68e-3	3	3130.875	15	NC	1
10			min	-.214	1	-.219	1	-.276	4	-1.118e-2	2	516.682	1	729.294	5
11		6	max	-.021	15	-.016	15	0	3	4.551e-3	3	3428.774	15	NC	1
12			min	-.214	1	-.158	1	-.253	4	-1.029e-2	2	676.341	1	829.646	5
13		7	max	-.021	15	-.012	15	0	3	4.774e-3	3	4172.11	10	NC	1
14			min	-.214	1	-.109	1	-.23	4	-1.023e-2	2	897.471	1	959.262	5
15		8	max	-.021	15	-.009	15	0	3	4.997e-3	3	NC	10	NC	2
16			min	-.213	1	-.073	3	-.21	4	-1.017e-2	2	1066.344	3	1122.914	5
17		9	max	-.021	15	-.006	15	0	10	5.473e-3	3	NC	2	NC	2
18			min	-.213	1	-.07	3	-.191	4	-9.618e-3	2	1094.243	3	1325.197	5
19		10	max	-.021	15	.009	2	0	2	6.396e-3	3	NC	11	NC	2
20			min	-.212	1	-.063	3	-.173	4	-8.199e-3	2	1161.007	3	1623.31	5
21		11	max	-.021	15	.036	2	0	3	7.32e-3	3	NC	1	NC	2
22			min	-.212	1	-.051	3	-.154	4	-6.779e-3	2	1293.471	3	2082.547	5
23		12	max	-.021	15	.061	1	.003	3	6.096e-3	3	NC	9	NC	1
24			min	-.212	1	-.034	3	-.138	4	-4.948e-3	2	1552.146	3	2829.39	5
25		13	max	-.021	15	.083	1	.007	3	3.658e-3	3	NC	9	NC	1
26			min	-.211	1	-.006	3	-.121	4	-2.885e-3	2	1494.552	2	4354.357	5
27		14	max	-.021	15	.097	1	.007	3	1.355e-3	3	NC	9	NC	2
28			min	-.211	1	.01	15	-.107	4	-3.416e-3	4	1375.426	2	7608.339	5
29		15	max	-.021	15	.106	3	.005	1	5.014e-3	3	NC	4	NC	2
30			min	-.211	1	.013	15	-.099	5	-2.988e-3	4	1469.147	2	6879.671	1
31		16	max	-.021	15	.19	3	.007	1	8.674e-3	3	NC	4	NC	3
32			min	-.211	1	.015	15	-.094	5	-4.266e-3	2	976.71	3	6259.321	1
33		17	max	-.021	15	.285	3	.004	1	1.233e-2	3	NC	4	NC	2
34			min	-.211	1	.016	10	-.092	5	-5.948e-3	2	576.297	3	7133.245	1
35		18	max	-.021	15	.385	3	0	12	1.472e-2	3	NC	4	NC	1
36			min	-.211	1	0	10	-.092	4	-7.044e-3	2	403.503	3	NC	1
37		19	max	-.021	15	.485	3	-.002	12	1.472e-2	3	NC	1	NC	1
38			min	-.211	1	-.014	10	-.093	4	-7.044e-3	2	310.517	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	-.011	15	.221	3	0	1	3.051e-4	4	NC	3	NC	1
40			min	-.379	1	-1.17	2	-.339	4	0	1	132.087	2	534.246	4
41		2	max	-.011	15	.147	3	0	1	3.051e-4	4	5733.349	15	NC	1
42			min	-.379	1	-.969	2	-.328	4	0	1	164.849	2	559.11	4
43		3	max	-.011	15	.073	3	0	1	1.376e-4	5	6933.312	15	NC	1
44			min	-.378	1	-.766	2	-.316	4	0	1	210.773	1	589.906	4
45		4	max	-.011	15	.004	3	0	1	0	1	8693.808	15	NC	1
46			min	-.378	1	-.573	2	-.298	4	-1.196e-4	4	285.564	1	639.509	4
47		5	max	-.011	15	-.011	15	0	1	0	1	NC	15	NC	1
48			min	-.378	1	-.404	2	-.277	4	-3.766e-4	4	416.599	1	712.448	4
49		6	max	-.011	15	-.009	15	0	1	0	1	NC	15	NC	1
50			min	-.378	1	-.287	1	-.253	4	-3.736e-4	4	432.939	3	813.801	4
51		7	max	-.011	15	-.006	15	0	1	0	1	NC	5	NC	1
52			min	-.377	1	-.2	1	-.23	4	-1.908e-4	4	411.025	3	945.987	4
53		8	max	-.011	15	-.004	15	0	1	0	1	NC	5	NC	1
54			min	-.376	1	-.132	1	-.209	4	-7.996e-6	4	406.984	3	1109.5	4
55		9	max	-.011	15	-.002	15	0	1	6.969e-5	4	NC	1	NC	1
56			min	-.375	1	-.105	3	-.192	4	0	1	411.443	3	1300.025	4
57		10	max	-.011	15	0	10	0	1	0	1	NC	4	NC	1
58			min	-.374	1	-.098	3	-.173	4	-3.854e-5	4	420.765	3	1591.507	4
59		11	max	-.011	15	.054	2	0	1	0	1	NC	4	NC	1
60			min	-.373	1	-.085	3	-.154	4	-1.468e-4	4	439.009	3	2035.242	4
61		12	max	-.011	15	.106	2	0	1	0	1	NC	5	NC	1
62			min	-.372	1	-.064	3	-.138	4	-9.438e-4	4	471.124	3	2684.405	4
63		13	max	-.011	15	.149	1	0	1	0	1	NC	5	NC	1
64			min	-.37	1	-.023	3	-.122	4	-2.13e-3	4	444.204	2	3949.785	4
65		14	max	-.011	15	.168	1	0	1	0	1	NC	5	NC	1
66			min	-.369	1	.005	15	-.11	4	-3.273e-3	4	426.277	2	6364.707	4
67		15	max	-.011	15	.198	3	0	1	0	1	NC	5	NC	1
68			min	-.369	1	.005	15	-.101	4	-2.482e-3	4	465.32	2	NC	1
69		16	max	-.011	15	.38	3	0	1	0	1	NC	5	NC	1
70			min	-.369	1	.004	15	-.096	4	-1.69e-3	4	576.12	2	NC	1
71		17	max	-.011	15	.588	3	0	1	0	1	NC	5	NC	1
72			min	-.37	1	-.007	10	-.093	4	-8.98e-4	4	364.585	3	NC	1
73		18	max	-.011	15	.806	3	0	1	0	1	NC	4	NC	1
74			min	-.37	1	-.076	2	-.091	4	-3.818e-4	4	229.124	3	NC	1
75		19	max	-.011	15	1.022	3	0	1	0	1	NC	1	NC	1
76			min	-.37	1	-.156	2	-.088	4	-3.818e-4	4	167.192	3	NC	1
77	M7	1	max	.009	5	.053	3	-.001	12	1.674e-2	2	NC	3	NC	3
78			min	-.215	1	-.566	2	-.348	4	-6.371e-3	3	229.087	1	510.47	4
79		2	max	.009	5	.025	3	0	12	1.674e-2	2	NC	5	NC	2
80			min	-.215	1	-.472	2	-.331	4	-6.371e-3	3	267.955	1	547.42	4
81		3	max	.009	5	.006	5	.005	1	1.537e-2	2	NC	5	NC	1
82			min	-.214	1	-.378	2	-.313	4	-5.955e-3	3	322.767	1	591.154	4
83		4	max	.009	5	.007	5	.009	1	1.327e-2	2	NC	5	NC	1
84			min	-.214	1	-.293	1	-.293	5	-5.318e-3	3	402.008	1	647.332	4
85		5	max	.009	5	.007	5	.009	1	1.118e-2	2	NC	5	NC	1
86			min	-.214	1	-.219	1	-.272	5	-4.68e-3	3	516.682	1	720.276	4
87		6	max	.009	5	.007	5	.007	1	1.029e-2	2	NC	4	NC	1
88			min	-.214	1	-.158	1	-.25	4	-4.551e-3	3	676.341	1	814.841	4
89		7	max	.009	5	.006	5	.003	2	1.023e-2	2	NC	4	NC	1
90			min	-.214	1	-.109	1	-.229	4	-4.774e-3	3	897.471	1	932.991	4
91		8	max	.009	5	.005	5	0	2	1.017e-2	2	NC	4	NC	2
92			min	-.213	1	-.073	3	-.21	4	-4.997e-3	3	1066.344	3	1081.129	4
93		9	max	.009	5	.004	5	0	3	9.618e-3	2	NC	2	NC	2
94			min	-.213	1	-.07	3	-.191	4	-5.473e-3	3	1094.243	3	1269.786	4
95		10	max	.009	5	.009	2	0	3	8.199e-3	2	NC	5	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	-.212	1	-.063	3	-.173	4	-6.396e-3	3	1161.007	3	1539.99	4
97		11	max	.009	5	.036	2	0	2	6.779e-3	2	NC	1	NC	2
98			min	-.212	1	-.051	3	-.154	4	-7.32e-3	3	1293.471	3	1950.612	4
99		12	max	.009	5	.061	1	.003	1	4.948e-3	2	NC	5	NC	1
100			min	-.212	1	-.034	3	-.137	4	-6.096e-3	3	1552.146	3	2627.578	4
101		13	max	.009	5	.083	1	.004	2	2.885e-3	2	NC	5	NC	1
102			min	-.211	1	-.006	3	-.12	4	-3.658e-3	3	1494.552	2	3882.309	4
103		14	max	.009	5	.097	1	.001	2	9.036e-4	2	NC	5	NC	2
104			min	-.211	1	-.005	5	-.108	4	-3.231e-3	5	1375.426	2	6008.013	4
105		15	max	.009	5	.106	3	0	10	2.585e-3	2	NC	5	NC	2
106			min	-.211	1	-.008	5	-.101	4	-5.014e-3	3	1469.147	2	6879.671	1
107		16	max	.009	5	.19	3	-.002	12	4.266e-3	2	NC	9	NC	3
108			min	-.211	1	-.012	5	-.097	4	-8.674e-3	3	976.71	3	6259.321	1
109		17	max	.009	5	.285	3	0	12	5.948e-3	2	NC	4	NC	2
110			min	-.211	1	-.016	5	-.094	4	-1.233e-2	3	576.297	3	7133.245	1
111		18	max	.009	5	.385	3	.004	1	7.044e-3	2	NC	4	NC	1
112			min	-.211	1	-.021	5	-.09	5	-1.472e-2	3	403.503	3	NC	1
113		19	max	.009	5	.485	3	.014	1	7.044e-3	2	NC	1	NC	1
114			min	-.211	1	-.026	5	-.088	5	-1.472e-2	3	310.517	3	NC	1
115	M10	1	max	0	1	.35	3	.211	1	1.336e-2	3	NC	1	NC	1
116			min	-.091	4	-.019	5	-.009	5	-3.445e-3	2	NC	1	NC	1
117		2	max	0	1	.491	3	.232	1	1.511e-2	3	NC	4	NC	2
118			min	-.091	4	-.042	2	-.006	5	-4.248e-3	2	1198.696	3	7892.882	1
119		3	max	0	1	.622	3	.264	1	1.686e-2	3	NC	4	NC	3
120			min	-.091	4	-.101	2	-.003	5	-5.051e-3	2	619.247	3	3167.407	1
121		4	max	0	1	.727	3	.298	1	1.861e-2	3	NC	4	NC	3
122			min	-.091	4	-.143	2	0	15	-5.853e-3	2	446.489	3	1927.148	1
123		5	max	0	1	.795	3	.328	1	2.036e-2	3	NC	4	NC	5
124			min	-.091	4	-.163	2	.003	15	-6.656e-3	2	377.594	3	1426.837	1
125		6	max	0	1	.825	3	.352	1	2.21e-2	3	NC	4	NC	5
126			min	-.091	4	-.158	2	.005	15	-7.459e-3	2	354.331	3	1192.017	1
127		7	max	0	1	.818	3	.366	1	2.385e-2	3	NC	4	NC	5
128			min	-.091	4	-.135	2	.006	15	-8.262e-3	2	359.132	3	1083.194	1
129		8	max	0	1	.787	3	.371	1	2.56e-2	3	NC	4	NC	5
130			min	-.091	4	-.099	2	.008	15	-9.064e-3	2	384.594	3	1045.421	1
131		9	max	0	1	.75	3	.371	1	2.735e-2	3	NC	4	NC	5
132			min	-.092	4	-.065	2	.009	15	-9.867e-3	2	420.887	3	1047.565	1
133		10	max	0	1	.73	3	.37	1	2.91e-2	3	NC	6	NC	5
134			min	-.092	4	-.048	2	.011	15	-1.067e-2	2	442.398	3	1042.957	2
135		11	max	0	12	.75	3	.371	1	2.735e-2	3	NC	6	NC	5
136			min	-.092	4	-.065	2	.013	15	-9.867e-3	2	420.887	3	1047.565	1
137		12	max	0	12	.787	3	.371	1	2.56e-2	3	NC	4	NC	5
138			min	-.092	4	-.099	2	.015	15	-9.064e-3	2	384.594	3	1045.421	1
139		13	max	0	12	.818	3	.366	1	2.385e-2	3	NC	4	NC	5
140			min	-.092	4	-.135	2	.017	15	-8.262e-3	2	359.132	3	1083.194	1
141		14	max	0	12	.825	3	.352	1	2.21e-2	3	NC	4	NC	5
142			min	-.092	4	-.158	2	.018	15	-7.459e-3	2	354.331	3	1192.017	1
143		15	max	0	12	.795	3	.328	1	2.036e-2	3	NC	4	NC	5
144			min	-.092	4	-.163	2	.019	15	-6.656e-3	2	377.594	3	1426.837	1
145		16	max	0	12	.727	3	.298	1	1.861e-2	3	NC	4	NC	3
146			min	-.092	4	-.143	2	.019	15	-5.853e-3	2	446.489	3	1927.148	1
147		17	max	0	12	.622	3	.264	1	1.686e-2	3	NC	13	NC	3
148			min	-.092	4	-.101	2	.02	15	-5.051e-3	2	619.247	3	3167.407	1
149		18	max	0	12	.491	3	.232	1	1.511e-2	3	NC	14	NC	2
150			min	-.092	4	-.042	2	.02	15	-4.248e-3	2	1198.696	3	7892.882	1
151		19	max	0	12	.35	3	.211	1	1.336e-2	3	NC	1	NC	1
152			min	-.092	4	.006	10	.021	15	-3.445e-3	2	3419.805	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	.001	1	.046	2	.212	1	3.832e-3	1	NC	1	NC	1
154			min	-.148	4	-.045	3	-.009	5	-2.075e-4	5	NC	1	NC	1
155		2	max	0	1	.029	3	.227	1	4.237e-3	1	NC	4	NC	1
156			min	-.148	4	-.011	2	.004	15	-1.461e-4	5	2275.904	3	NC	1
157		3	max	0	1	.094	3	.256	1	4.642e-3	1	NC	4	NC	3
158			min	-.148	4	-.058	2	.009	15	-8.471e-5	5	1205.784	3	3835.772	1
159		4	max	0	1	.136	3	.289	1	5.048e-3	1	NC	4	NC	3
160			min	-.148	4	-.086	2	.01	15	-2.332e-5	5	926.832	3	2177.043	1
161		5	max	0	1	.146	3	.321	1	5.453e-3	1	NC	4	NC	3
162			min	-.148	4	-.09	2	.007	15	1.852e-5	15	877.893	3	1544.952	1
163		6	max	0	1	.123	3	.346	1	5.858e-3	1	NC	4	NC	5
164			min	-.148	4	-.071	2	.004	15	5.941e-5	15	997.563	3	1252.712	1
165		7	max	0	1	.073	3	.363	1	6.263e-3	1	NC	4	NC	5
166			min	-.148	4	-.034	2	0	15	1.003e-4	15	1421.553	3	1112.52	1
167		8	max	0	1	.016	1	.371	1	6.668e-3	1	NC	4	NC	4
168			min	-.148	4	0	15	0	15	1.412e-4	15	3140.985	3	1054.491	1
169		9	max	0	1	.054	2	.373	1	7.073e-3	1	NC	1	NC	5
170			min	-.148	4	-.051	3	.002	15	1.821e-4	15	NC	1	1043.086	1
171		10	max	0	1	.073	2	.372	1	7.479e-3	1	NC	4	NC	5
172			min	-.149	4	-.078	3	.011	15	2.23e-4	15	5097.087	3	1031.059	2
173		11	max	0	3	.054	2	.373	1	7.073e-3	1	NC	1	NC	15
174			min	-.149	4	-.051	3	.02	15	2.441e-4	15	NC	1	1043.086	1
175		12	max	0	3	.016	1	.371	1	6.668e-3	1	NC	4	NC	15
176			min	-.149	4	0	15	.024	15	2.652e-4	15	3140.985	3	1054.491	1
177		13	max	0	3	.073	3	.363	1	6.263e-3	1	NC	4	NC	5
178			min	-.149	4	-.034	2	.022	15	2.863e-4	15	1421.553	3	1112.52	1
179		14	max	0	3	.123	3	.346	1	5.858e-3	1	NC	5	NC	5
180			min	-.149	4	-.071	2	.019	15	3.074e-4	15	997.563	3	1252.712	1
181		15	max	0	3	.146	3	.321	1	5.453e-3	1	NC	5	NC	3
182			min	-.148	4	-.09	2	.014	15	3.285e-4	15	877.893	3	1544.952	1
183		16	max	0	3	.136	3	.289	1	5.048e-3	1	NC	5	NC	3
184			min	-.148	4	-.086	2	.01	15	3.496e-4	15	926.832	3	2177.043	1
185		17	max	0	3	.094	3	.256	1	4.642e-3	1	NC	5	NC	3
186			min	-.148	4	-.058	2	.008	15	3.707e-4	15	1205.784	3	3835.772	1
187		18	max	.001	3	.029	3	.227	1	4.237e-3	1	NC	4	NC	1
188			min	-.148	4	-.011	2	.011	15	3.918e-4	15	2275.904	3	NC	1
189		19	max	.001	3	.046	2	.212	1	3.832e-3	1	NC	1	NC	1
190			min	-.148	4	-.045	3	.021	15	4.129e-4	15	NC	1	NC	1
191	M12	1	max	0	10	.005	5	.213	1	4.826e-3	1	NC	1	NC	1
192			min	-.198	4	-.071	3	-.009	5	-1.671e-4	5	NC	1	NC	1
193		2	max	0	10	.004	5	.226	1	5.214e-3	1	NC	4	NC	1
194			min	-.198	4	-.127	2	.005	15	-1.055e-4	5	1798.828	2	NC	1
195		3	max	0	10	.008	3	.253	1	5.602e-3	1	NC	4	NC	3
196			min	-.198	4	-.207	2	.009	15	-4.395e-5	5	970.786	2	4170.606	1
197		4	max	0	10	.025	3	.287	1	5.99e-3	1	NC	5	NC	3
198			min	-.198	4	-.26	2	.01	15	4.083e-6	15	744.186	2	2286.075	1
199		5	max	0	10	.025	3	.319	1	6.377e-3	1	NC	5	NC	5
200			min	-.198	4	-.279	2	.007	15	4.511e-5	15	686.539	2	1590.603	1
201		6	max	0	10	.007	3	.345	1	6.765e-3	1	NC	5	NC	5
202			min	-.198	4	-.264	2	.003	15	8.614e-5	15	731.664	2	1272.562	1
203		7	max	0	10	-.002	15	.363	1	7.153e-3	1	NC	5	NC	5
204			min	-.198	4	-.221	2	0	15	1.272e-4	15	900.193	2	1118.8	1
205		8	max	0	10	-.002	15	.373	1	7.54e-3	1	NC	3	NC	4
206			min	-.198	4	-.162	2	-.002	5	1.682e-4	15	1308.808	2	1052.128	1
207		9	max	0	10	-.002	15	.375	1	7.928e-3	1	NC	4	NC	4
208			min	-.198	4	-.112	1	.001	15	2.092e-4	15	2273.479	2	1034.925	1
209		10	max	0	1	-.003	15	.375	1	8.316e-3	1	NC	4	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	-.198	4	-.107	3	.011	15	2.503e-4	15	3444.654	2	1018.955	2
211		11	max	0	1	-.004	15	.375	1	7.928e-3	1	NC	4	NC	15
212			min	-.198	4	-.112	1	.021	15	2.713e-4	15	2273.479	2	1034.925	1
213		12	max	0	1	-.006	15	.373	1	7.54e-3	1	NC	3	NC	15
214			min	-.198	4	-.162	2	.025	15	2.924e-4	15	1308.808	2	1052.128	1
215		13	max	0	1	-.008	15	.363	1	7.153e-3	1	NC	5	NC	15
216			min	-.198	4	-.221	2	.024	15	3.135e-4	15	900.193	2	1118.8	1
217		14	max	0	1	.007	3	.345	1	6.765e-3	1	NC	5	NC	5
218			min	-.198	4	-.264	2	.019	15	3.346e-4	15	731.664	2	1272.562	1
219		15	max	0	1	.025	3	.319	1	6.377e-3	1	NC	5	NC	4
220			min	-.198	4	-.279	2	.014	15	3.354e-4	12	686.539	2	1590.603	1
221		16	max	0	1	.025	3	.287	1	5.99e-3	1	NC	5	NC	3
222			min	-.198	4	-.26	2	.009	15	3.316e-4	12	744.186	2	2286.075	1
223		17	max	0	1	.008	3	.253	1	5.602e-3	1	NC	5	NC	3
224			min	-.198	4	-.207	2	.008	15	3.279e-4	12	970.786	2	4170.606	1
225		18	max	0	1	-.009	15	.226	1	5.214e-3	1	NC	4	NC	1
226			min	-.198	4	-.127	2	.011	15	3.241e-4	12	1798.828	2	NC	1
227		19	max	0	1	-.007	15	.213	1	4.826e-3	1	NC	1	NC	1
228			min	-.198	4	-.071	3	.021	15	3.204e-4	12	NC	1	NC	1
229	M13	1	max	0	12	.016	3	.215	1	1.265e-2	2	NC	1	NC	1
230			min	-.324	4	-.439	2	-.009	5	-3.716e-3	3	NC	1	NC	1
231		2	max	0	12	.074	3	.237	1	1.425e-2	2	NC	4	NC	2
232			min	-.324	4	-.596	2	.004	15	-4.398e-3	3	1075.141	2	7512.191	1
233		3	max	0	12	.126	3	.27	1	1.586e-2	2	NC	5	NC	3
234			min	-.324	4	-.739	2	.009	15	-5.08e-3	3	560.856	2	3050.643	1
235		4	max	0	12	.164	3	.305	1	1.746e-2	2	NC	5	NC	3
236			min	-.324	4	-.854	2	.011	15	-5.762e-3	3	405.363	2	1866.046	1
237		5	max	0	12	.185	3	.336	1	1.906e-2	2	NC	5	NC	5
238			min	-.324	4	-.931	2	.009	15	-6.444e-3	3	341.453	2	1385.055	1
239		6	max	0	12	.188	3	.36	1	2.067e-2	2	NC	5	NC	5
240			min	-.324	4	-.969	2	.007	15	-7.126e-3	3	317.115	2	1158.142	1
241		7	max	0	12	.176	3	.374	1	2.227e-2	2	NC	5	NC	5
242			min	-.324	4	-.971	2	.004	15	-7.808e-3	3	315.963	2	1052.218	1
243		8	max	0	12	.154	3	.38	1	2.387e-2	2	NC	5	NC	5
244			min	-.324	4	-.948	2	.003	15	-8.49e-3	3	330.546	2	1014.595	1
245		9	max	0	12	.132	3	.38	1	2.548e-2	2	NC	5	NC	5
246			min	-.324	4	-.916	2	.005	15	-9.172e-3	3	352.712	2	1015.447	1
247		10	max	0	1	.122	3	.379	1	2.708e-2	2	NC	5	NC	5
248			min	-.324	4	-.899	2	.011	15	-9.854e-3	3	365.812	2	1004.766	2
249		11	max	0	1	.132	3	.38	1	2.548e-2	2	NC	5	NC	5
250			min	-.324	4	-.916	2	.018	15	-9.172e-3	3	352.712	2	1015.447	1
251		12	max	0	1	.154	3	.38	1	2.387e-2	2	NC	5	NC	5
252			min	-.324	4	-.948	2	.02	15	-8.49e-3	3	330.546	2	1014.595	1
253		13	max	0	1	.176	3	.374	1	2.227e-2	2	NC	5	NC	5
254			min	-.324	4	-.971	2	.019	15	-7.808e-3	3	315.963	2	1052.218	1
255		14	max	0	1	.188	3	.36	1	2.067e-2	2	NC	5	NC	5
256			min	-.324	4	-.969	2	.016	15	-7.126e-3	3	317.115	2	1158.142	1
257		15	max	0	1	.185	3	.336	1	1.906e-2	2	NC	5	NC	4
258			min	-.324	4	-.931	2	.013	15	-6.444e-3	3	341.453	2	1385.055	1
259		16	max	0	1	.164	3	.305	1	1.746e-2	2	NC	5	NC	3
260			min	-.324	4	-.854	2	.01	15	-5.762e-3	3	405.363	2	1866.046	1
261		17	max	0	1	.126	3	.27	1	1.586e-2	2	NC	5	NC	3
262			min	-.324	4	-.739	2	.009	15	-5.08e-3	3	560.856	2	3050.643	1
263		18	max	0	1	.074	3	.237	1	1.425e-2	2	NC	5	NC	2
264			min	-.324	4	-.596	2	.012	15	-4.398e-3	3	1075.141	2	7512.191	1
265		19	max	0	1	.016	3	.215	1	1.265e-2	2	NC	1	NC	1
266			min	-.324	4	-.439	2	.021	15	-3.716e-3	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	5	1.668e-3	2	NC	1	NC	1
270			min	0	2	0	1	0	2	-1.97e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.002	5	3.336e-3	2	NC	1	NC	1
272			min	0	2	-.004	1	0	2	-3.94e-3	5	NC	1	NC	1
273		4	max	0	3	0	15	.005	5	3.906e-3	2	NC	3	NC	1
274			min	0	2	-.008	1	0	2	-4.746e-3	5	7220.366	1	NC	1
275		5	max	0	3	-.002	15	.008	5	3.585e-3	2	NC	4	NC	1
276			min	0	2	-.015	1	-.001	2	-4.606e-3	5	4034.578	1	7493.841	5
277		6	max	0	3	-.002	15	.012	5	3.265e-3	2	NC	5	NC	1
278			min	0	2	-.023	1	-.002	2	-4.467e-3	5	2593.994	1	4936.211	5
279		7	max	0	3	-.003	15	.017	5	2.944e-3	2	NC	5	NC	1
280			min	0	2	-.033	1	-.002	2	-4.328e-3	5	1820.618	1	3525.943	5
281		8	max	0	3	-.005	15	.023	5	2.623e-3	2	NC	15	NC	1
282			min	0	2	-.045	1	-.003	2	-4.188e-3	5	1356.615	1	2664.143	5
283		9	max	0	3	-.006	15	.029	5	2.303e-3	2	NC	15	NC	1
284			min	0	2	-.057	1	-.003	1	-4.049e-3	5	1055.859	1	2097.954	5
285		10	max	0	3	-.007	15	.036	5	1.982e-3	2	8417.979	15	NC	1
286			min	0	2	-.071	1	-.003	1	-3.91e-3	5	849.467	1	1705.377	5
287		11	max	0	3	-.009	15	.043	5	1.661e-3	2	6977.425	15	NC	1
288			min	0	2	-.086	1	-.004	1	-3.77e-3	5	701.523	1	1421.676	5
289		12	max	0	3	-.01	15	.05	5	1.34e-3	2	5903.343	15	NC	1
290			min	0	2	-.102	1	-.004	1	-3.631e-3	5	591.787	1	1209.863	5
291		13	max	0	3	-.012	15	.058	5	1.02e-3	2	5080.561	15	NC	1
292			min	-.001	2	-.119	1	-.004	1	-3.491e-3	5	508.082	1	1047.45	5
293		14	max	.001	3	-.014	15	.066	5	6.989e-4	2	4436.057	15	NC	1
294			min	-.001	2	-.137	1	-.004	1	-3.354e-3	4	442.745	1	920.157	5
295		15	max	.001	3	-.015	15	.074	5	3.782e-4	2	3921.632	15	NC	1
296			min	-.001	2	-.155	1	-.004	1	-3.246e-3	4	390.751	1	818.552	5
297		16	max	.001	3	-.017	15	.082	5	3.9e-4	3	3504.558	15	NC	1
298			min	-.001	2	-.174	1	-.003	1	-3.137e-3	4	348.704	1	736.216	5
299		17	max	.001	3	-.019	15	.091	4	5.581e-4	3	3161.849	15	NC	1
300			min	-.001	2	-.193	1	-.003	1	-3.029e-3	4	314.231	1	668.267	4
301		18	max	.001	3	-.021	15	.099	4	7.261e-4	3	2876.981	15	NC	1
302			min	-.001	2	-.212	1	-.004	3	-2.92e-3	4	285.632	1	611.36	4
303		19	max	.001	3	-.023	15	.108	4	8.942e-4	3	2637.848	15	NC	1
304			min	-.001	2	-.232	1	-.007	3	-2.812e-3	4	261.667	1	563.669	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	4	0	1	NC	1	NC	1
308			min	0	2	-.001	1	0	1	-2.06e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.002	4	0	1	NC	1	NC	1
310			min	0	2	-.006	1	0	1	-4.12e-3	4	NC	1	NC	1
311		4	max	0	3	0	15	.005	4	0	1	NC	4	NC	1
312			min	0	2	-.014	1	0	1	-4.956e-3	4	4418.606	1	NC	1
313		5	max	.001	3	0	15	.008	4	0	1	NC	4	NC	1
314			min	-.001	2	-.025	1	0	1	-4.8e-3	4	2411.453	1	7213.136	4
315		6	max	.001	3	-.001	15	.013	4	0	1	NC	5	NC	1
316			min	-.001	2	-.04	1	0	1	-4.644e-3	4	1530.198	1	4753.727	4
317		7	max	.001	3	-.002	15	.018	4	0	1	NC	5	NC	1
318			min	-.001	2	-.057	1	0	1	-4.488e-3	4	1065.078	1	3397.587	4
319		8	max	.002	3	-.002	15	.024	4	0	1	NC	5	NC	1
320			min	-.002	2	-.077	1	0	1	-4.332e-3	4	789.093	1	2568.866	4
321		9	max	.002	3	-.003	15	.03	4	0	1	NC	5	NC	1
322			min	-.002	2	-.099	1	0	1	-4.175e-3	4	611.591	1	2024.42	4
323		10	max	.002	3	-.004	15	.037	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	-.124	1	0	1	-4.019e-3	4	490.483	1	1646.939	4
325		11	max	.002	3	-.005	15	.044	4	0	1	NC	15	NC	1
326			min	-.002	2	-.15	1	0	1	-3.863e-3	4	404.057	1	1374.174	4
327		12	max	.003	3	-.005	15	.052	4	0	1	NC	15	NC	1
328			min	-.003	2	-.178	1	0	1	-3.707e-3	4	340.177	1	1170.559	4
329		13	max	.003	3	-.006	15	.06	4	0	1	9666.009	15	NC	1
330			min	-.003	2	-.208	1	0	1	-3.551e-3	4	291.59	1	1014.469	4
331		14	max	.003	3	-.007	15	.068	4	0	1	8422.588	15	NC	1
332			min	-.003	2	-.239	1	0	1	-3.395e-3	4	253.755	1	892.176	4
333		15	max	.003	3	-.008	15	.076	4	0	1	7433.158	15	NC	1
334			min	-.003	2	-.271	1	0	1	-3.238e-3	4	223.707	1	794.612	4
335		16	max	.003	3	-.009	15	.085	4	0	1	6633.077	15	NC	1
336			min	-.003	2	-.304	1	0	1	-3.082e-3	4	199.449	1	715.607	4
337		17	max	.004	3	-.01	15	.093	4	0	1	5977.152	15	NC	1
338			min	-.004	2	-.337	1	0	1	-2.926e-3	4	179.59	1	650.824	4
339		18	max	.004	3	-.011	15	.101	4	0	1	5433.029	15	NC	1
340			min	-.004	2	-.371	1	0	1	-2.77e-3	4	163.136	1	597.147	4
341		19	max	.004	3	-.012	15	.11	4	0	1	4977.077	15	NC	1
342			min	-.004	2	-.406	1	0	1	-2.614e-3	4	149.364	1	552.295	4
343	M8	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
344			min	0	1	0	1	0	1	0	1	NC	1	NC	1
345		2	max	0	3	0	5	0	4	7.025e-4	3	NC	1	NC	1
346			min	0	2	0	1	0	3	-2.201e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.002	4	1.405e-3	3	NC	1	NC	1
348			min	0	2	-.004	1	0	3	-4.403e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.005	4	1.627e-3	3	NC	3	NC	1
350			min	0	2	-.008	1	0	3	-5.284e-3	4	7220.366	1	NC	1
351		5	max	0	3	0	5	.008	4	1.459e-3	3	NC	4	NC	1
352			min	0	2	-.015	1	-.001	3	-5.095e-3	4	4034.578	1	7250.994	4
353		6	max	0	3	.001	5	.013	4	1.291e-3	3	NC	4	NC	1
354			min	0	2	-.023	1	-.002	3	-4.905e-3	4	2593.994	1	4781.632	4
355		7	max	0	3	.002	5	.018	4	1.123e-3	3	NC	4	NC	1
356			min	0	2	-.033	1	-.003	3	-4.715e-3	4	1820.618	1	3419.374	4
357		8	max	0	3	.002	5	.023	4	9.547e-4	3	NC	4	NC	1
358			min	0	2	-.045	1	-.003	3	-4.525e-3	4	1356.615	1	2586.644	4
359		9	max	0	3	.003	5	.03	4	7.866e-4	3	NC	5	NC	1
360			min	0	2	-.057	1	-.004	3	-4.335e-3	4	1055.859	1	2039.436	4
361		10	max	0	3	.003	5	.037	4	6.185e-4	3	NC	5	NC	1
362			min	0	2	-.071	1	-.004	3	-4.146e-3	4	849.467	1	1659.976	4
363		11	max	0	3	.004	5	.044	4	4.504e-4	3	NC	5	NC	1
364			min	0	2	-.086	1	-.004	3	-3.956e-3	4	701.523	1	1385.753	4
365		12	max	0	3	.005	5	.051	4	2.823e-4	3	NC	5	NC	1
366			min	0	2	-.102	1	-.004	3	-3.766e-3	4	591.787	1	1181.037	4
367		13	max	0	3	.005	5	.059	4	1.143e-4	3	NC	5	NC	1
368			min	-.001	2	-.119	1	-.004	3	-3.576e-3	4	508.082	1	1024.104	4
369		14	max	.001	3	.006	5	.067	4	-3.267e-5	12	NC	7	NC	1
370			min	-.001	2	-.137	1	-.003	3	-3.386e-3	4	442.745	1	901.16	4
371		15	max	.001	3	.007	5	.075	4	5.701e-5	9	NC	15	NC	1
372			min	-.001	2	-.155	1	-.002	3	-3.202e-3	5	390.751	1	803.094	4
373		16	max	.001	3	.008	5	.084	4	1.556e-4	1	NC	15	NC	1
374			min	-.001	2	-.174	1	0	3	-3.044e-3	5	348.704	1	723.701	4
375		17	max	.001	3	.009	5	.092	4	4.307e-4	1	9849.921	15	NC	1
376			min	-.001	2	-.193	1	0	10	-2.886e-3	5	314.231	1	658.625	4
377		18	max	.001	3	.01	5	.1	4	7.058e-4	1	8974.521	15	NC	1
378			min	-.001	2	-.212	1	0	10	-2.729e-3	5	285.632	1	604.734	4
379		19	max	.001	3	.01	5	.108	4	9.809e-4	1	8237.949	15	NC	1
380			min	-.001	2	-.232	1	-.001	2	-2.571e-3	5	261.667	1	559.735	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	.005	1	0	15	.003	5	1.557e-3	2	NC	1	NC	1
382			min	0	15	-.002	1	0	2	-1.271e-3	5	NC	1	NC	1
383		2	max	.004	1	-.002	15	.02	5	1.849e-3	2	NC	1	NC	3
384			min	0	15	-.019	1	-.014	2	-1.289e-3	5	NC	1	4638.784	2
385		3	max	.004	1	-.004	15	.036	5	2.14e-3	2	NC	1	NC	4
386			min	0	15	-.035	1	-.027	2	-1.308e-3	5	NC	1	2346.073	2
387		4	max	.004	1	-.005	15	.053	5	2.432e-3	2	NC	1	NC	4
388			min	0	15	-.052	1	-.039	2	-1.327e-3	5	NC	1	1591.912	2
389		5	max	.003	3	-.007	15	.07	5	2.724e-3	2	NC	1	NC	4
390			min	0	15	-.068	1	-.05	2	-1.345e-3	5	NC	1	1223.195	2
391		6	max	.004	3	-.009	15	.086	5	3.016e-3	2	NC	1	NC	4
392			min	0	10	-.084	1	-.061	2	-1.364e-3	5	NC	1	1009.616	2
393		7	max	.004	3	-.01	15	.103	5	3.308e-3	2	NC	1	NC	4
394			min	0	10	-.101	1	-.07	2	-1.396e-3	3	NC	1	874.758	2
395		8	max	.004	3	-.012	15	.119	5	3.6e-3	2	NC	1	9852.683	13
396			min	0	10	-.117	1	-.078	2	-1.533e-3	3	NC	1	786.294	2
397		9	max	.004	3	-.013	15	.135	5	3.892e-3	2	NC	1	8974.56	13
398			min	0	10	-.133	1	-.084	2	-1.67e-3	3	NC	1	728.606	2
399		10	max	.004	3	-.015	15	.15	5	4.184e-3	2	NC	1	8424.747	13
400			min	0	2	-.149	1	-.088	2	-1.807e-3	3	NC	1	693.758	2
401		11	max	.005	3	-.017	15	.165	5	4.476e-3	2	NC	1	8138.756	13
402			min	-.002	2	-.164	1	-.09	2	-1.944e-3	3	NC	1	678.069	2
403		12	max	.005	3	-.018	15	.18	5	4.767e-3	2	NC	1	8095.681	13
404			min	-.002	2	-.18	1	-.089	2	-2.081e-3	3	NC	1	680.874	2
405		13	max	.005	3	-.019	15	.194	5	5.059e-3	2	NC	1	8314.741	13
406			min	-.003	2	-.196	1	-.085	2	-2.218e-3	3	NC	1	704.543	2
407		14	max	.005	3	-.021	15	.207	5	5.351e-3	2	NC	1	8869.919	13
408			min	-.003	2	-.211	1	-.079	2	-2.355e-3	3	NC	1	709.197	14
409		15	max	.005	3	-.022	15	.22	5	5.643e-3	2	NC	1	9940.393	13
410			min	-.004	2	-.227	1	-.069	2	-2.492e-3	3	NC	1	646.681	14
411		16	max	.006	3	-.024	15	.232	5	5.935e-3	2	NC	1	NC	4
412			min	-.004	2	-.242	1	-.056	2	-2.628e-3	3	NC	1	592.225	14
413		17	max	.006	3	-.025	15	.243	5	6.227e-3	2	NC	1	NC	4
414			min	-.005	2	-.257	1	-.039	2	-2.765e-3	3	NC	1	544.344	14
415		18	max	.006	3	-.026	15	.254	4	6.519e-3	2	NC	1	NC	4
416			min	-.005	2	-.273	1	-.018	2	-2.902e-3	3	NC	1	501.905	14
417		19	max	.006	3	-.028	15	.267	4	6.811e-3	2	NC	1	NC	1
418			min	-.006	2	-.288	1	0	3	-3.039e-3	3	NC	1	464.026	14
419	M6	1	max	.008	1	0	15	.003	4	0	1	NC	1	NC	1
420			min	0	15	-.004	1	0	1	-1.334e-3	4	NC	1	NC	1
421		2	max	.007	1	-.001	15	.021	4	0	1	NC	1	NC	1
422			min	0	15	-.033	1	0	1	-1.373e-3	4	NC	1	NC	1
423		3	max	.006	3	-.002	15	.038	4	0	1	NC	1	NC	1
424			min	0	15	-.062	1	0	1	-1.413e-3	4	NC	1	NC	1
425		4	max	.007	3	-.003	15	.055	4	0	1	NC	1	NC	1
426			min	0	15	-.091	1	0	1	-1.453e-3	4	NC	1	7702.933	4
427		5	max	.008	3	-.004	15	.073	4	0	1	NC	1	NC	1
428			min	0	10	-.12	1	0	1	-1.493e-3	4	NC	1	5814.774	4
429		6	max	.008	3	-.005	15	.09	4	0	1	NC	1	NC	1
430			min	-.001	2	-.149	1	0	1	-1.533e-3	4	NC	1	4728.013	4
431		7	max	.009	3	-.006	15	.107	4	0	1	NC	1	NC	1
432			min	-.003	2	-.178	1	0	1	-1.572e-3	4	NC	1	4044.873	4
433		8	max	.01	3	-.007	15	.123	4	0	1	NC	1	NC	1
434			min	-.004	2	-.206	1	0	1	-1.612e-3	4	NC	1	3597.193	4
435		9	max	.011	3	-.008	15	.14	4	0	1	NC	1	NC	1
436			min	-.006	2	-.235	1	0	1	-1.652e-3	4	NC	1	3303.578	4
437		10	max	.011	3	-.009	15	.155	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	-.007	2	-.263	1	0	1	-1.692e-3	4	NC	1	3122.267	4
439		11	max	.012	3	-.01	15	.171	4	0	1	NC	1	NC	1
440			min	-.009	2	-.292	1	0	1	-1.732e-3	4	NC	1	3033.085	4
441		12	max	.013	3	-.01	15	.185	4	0	1	NC	1	NC	1
442			min	-.01	2	-.32	1	0	1	-1.771e-3	4	NC	1	3030.668	4
443		13	max	.013	3	-.011	15	.199	4	0	1	NC	1	NC	1
444			min	-.012	2	-.348	1	0	1	-1.811e-3	4	NC	1	3123.891	4
445		14	max	.014	3	-.012	15	.213	4	0	1	NC	1	NC	1
446			min	-.014	2	-.376	1	0	1	-1.851e-3	4	NC	1	3341.802	4
447		15	max	.015	3	-.013	15	.225	4	0	1	NC	1	NC	1
448			min	-.015	2	-.404	1	0	1	-1.891e-3	4	NC	1	3752.923	4
449		16	max	.016	3	-.013	15	.237	4	0	1	NC	1	NC	1
450			min	-.017	2	-.432	1	0	1	-1.931e-3	4	NC	1	4526.331	4
451		17	max	.016	3	-.014	15	.248	4	0	1	NC	1	NC	1
452			min	-.018	2	-.46	1	0	1	-1.97e-3	4	NC	1	6178.655	4
453		18	max	.017	3	-.015	15	.258	4	0	1	NC	1	NC	1
454			min	-.02	2	-.488	1	0	1	-2.01e-3	4	NC	1	NC	1
455		19	max	.018	3	-.015	15	.267	4	0	1	NC	1	NC	1
456			min	-.021	2	-.516	1	0	1	-2.05e-3	4	NC	1	NC	1
457	M9	1	max	.005	1	0	5	.003	4	5.744e-4	3	NC	1	NC	1
458			min	0	5	-.002	1	0	3	-1.557e-3	2	NC	1	NC	1
459		2	max	.004	1	0	5	.022	4	7.114e-4	3	NC	1	NC	3
460			min	0	5	-.019	1	-.006	3	-1.849e-3	2	NC	1	4638.784	2
461		3	max	.004	1	0	5	.04	4	8.483e-4	3	NC	1	NC	5
462			min	0	5	-.035	1	-.012	3	-2.14e-3	2	NC	1	2346.073	2
463		4	max	.004	1	.001	5	.059	4	9.852e-4	3	NC	1	NC	15
464			min	0	5	-.052	1	-.017	3	-2.432e-3	2	NC	1	1591.912	2
465		5	max	.003	3	.002	5	.077	4	1.122e-3	3	NC	1	8315.873	15
466			min	0	5	-.068	1	-.022	3	-2.724e-3	2	NC	1	1223.195	2
467		6	max	.004	3	.002	5	.095	4	1.259e-3	3	NC	1	6761.042	15
468			min	0	5	-.084	1	-.027	3	-3.016e-3	2	NC	1	1009.616	2
469		7	max	.004	3	.003	5	.113	4	1.396e-3	3	NC	1	5783.477	15
470			min	0	5	-.101	1	-.031	3	-3.308e-3	2	NC	1	874.758	2
471		8	max	.004	3	.003	5	.13	4	1.533e-3	3	NC	1	5142.661	15
472			min	0	5	-.117	1	-.034	3	-3.6e-3	2	NC	1	786.294	2
473		9	max	.004	3	.004	5	.146	4	1.67e-3	3	NC	1	4722.158	15
474			min	0	10	-.133	1	-.037	3	-3.892e-3	2	NC	1	728.606	2
475		10	max	.004	3	.004	5	.162	4	1.807e-3	3	NC	1	4462.216	15
476			min	0	2	-.149	1	-.038	3	-4.184e-3	2	NC	1	693.758	2
477		11	max	.005	3	.005	5	.178	4	1.944e-3	3	NC	1	4333.944	15
478			min	-.002	2	-.164	1	-.039	3	-4.476e-3	2	NC	1	678.069	2
479		12	max	.005	3	.006	5	.192	4	2.081e-3	3	NC	1	4329.614	15
480			min	-.002	2	-.18	1	-.039	3	-4.767e-3	2	NC	1	680.874	2
481		13	max	.005	3	.007	5	.206	4	2.218e-3	3	NC	1	4461.835	15
482			min	-.003	2	-.196	1	-.038	3	-5.059e-3	2	9698.648	5	704.543	2
483		14	max	.005	3	.007	5	.218	4	2.355e-3	3	NC	1	4771.997	15
484			min	-.003	2	-.211	1	-.035	3	-5.351e-3	2	8616.085	5	755.902	2
485		15	max	.005	3	.008	5	.23	4	2.492e-3	3	NC	1	5357.795	15
486			min	-.004	2	-.227	1	-.031	3	-5.643e-3	2	7714.704	5	850.665	2
487		16	max	.006	3	.009	5	.24	4	2.628e-3	3	NC	1	6460.338	15
488			min	-.004	2	-.242	1	-.026	3	-5.935e-3	2	6958.706	5	1027.318	2
489		17	max	.006	3	.01	5	.249	4	2.765e-3	3	NC	1	8816.398	15
490			min	-.005	2	-.257	1	-.019	3	-6.227e-3	2	6320.87	5	1403.194	2
491		18	max	.006	3	.011	5	.257	4	2.902e-3	3	NC	1	NC	5
492			min	-.005	2	-.273	1	-.01	3	-6.519e-3	2	5780.191	5	2567.598	2
493		19	max	.006	3	.012	5	.263	5	3.039e-3	3	NC	1	NC	1
494			min	-.006	2	-.288	1	-.008	1	-6.811e-3	2	5320.265	5	NC	1