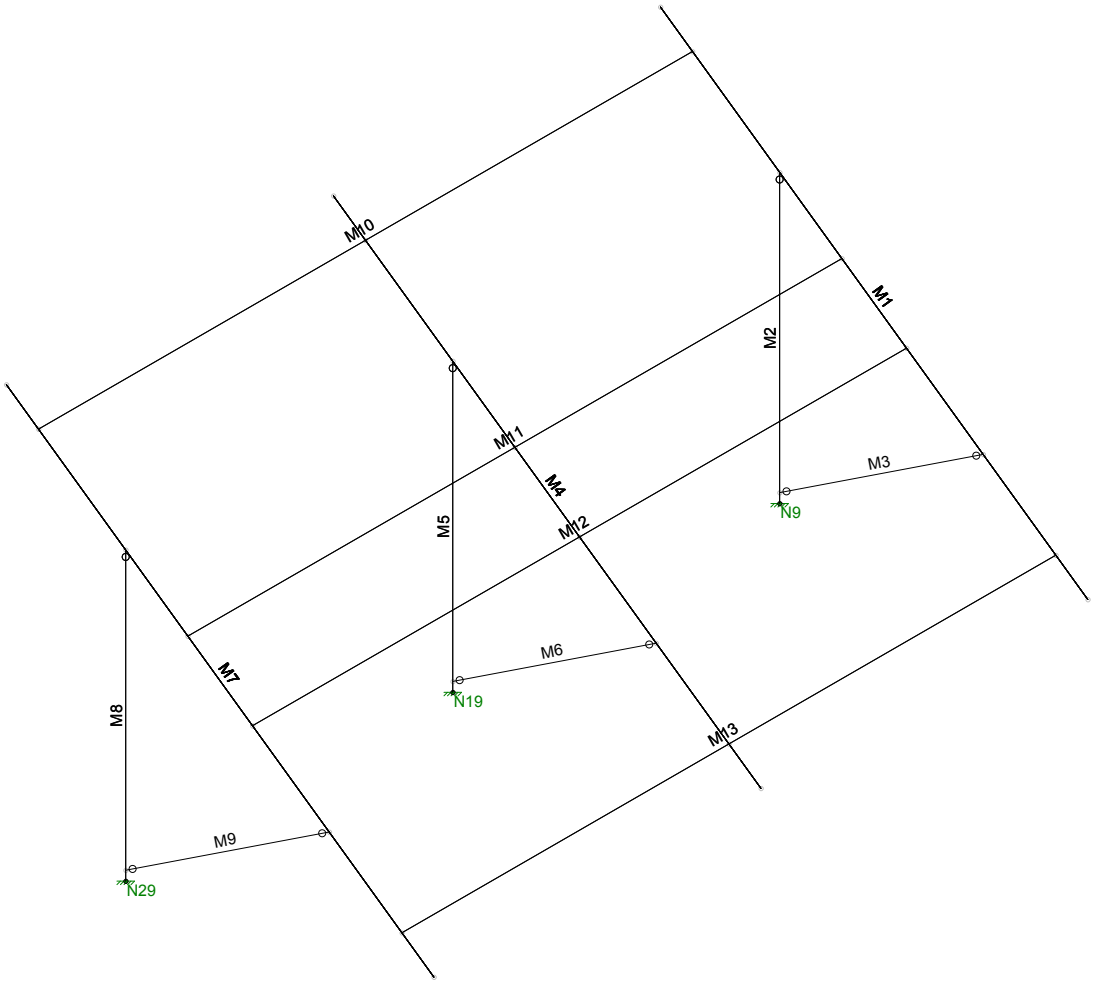


Schletter, Inc.		35° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

1. INTRODUCTION

1.1 Project Description

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

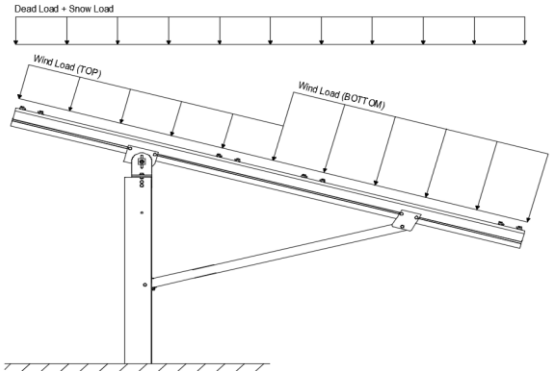
1.2 Construction

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

PV modules are required to meet the following specifications:

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

Modules Per Row =	2
Module Tilt =	35°
Maximum Height Above Grade =	3 ft



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

1.3 Technical Codes

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

2. LOAD ACTIONS

2.1 Permanent Loads

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

2.2 Snow Loads

Ground Snow Load, P_g =	30.00 psf	
Sloped Roof Snow Load, P_s =	14.43 psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00	
C_s =	0.64	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V =	120 mph	Exposure Category = C
Height <	15 ft	Importance Category = II

Peak Velocity Pressure, q_z = 22.61 psf *Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.2	*(Pressure)*
$Cf+_{BOTTOM}$ =	2	
$Cf-_{TOP}$ =	-2.4	*(Suction)*
$Cf-_{BOTTOM}$ =	-1.2	

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

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

Allowable Stress Design, ASD

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

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

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

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

3. STRUCTURAL ANALYSIS

3.1 RISA Results

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

3.2 RISA Components

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

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

Posts	Location
M2	Outer
M5	Inner
M8	Outer

Girders	Location
M1	Outer
M4	Inner
M7	Outer

Reactions	Location
N9	Outer
N19	Inner
N29	Outer

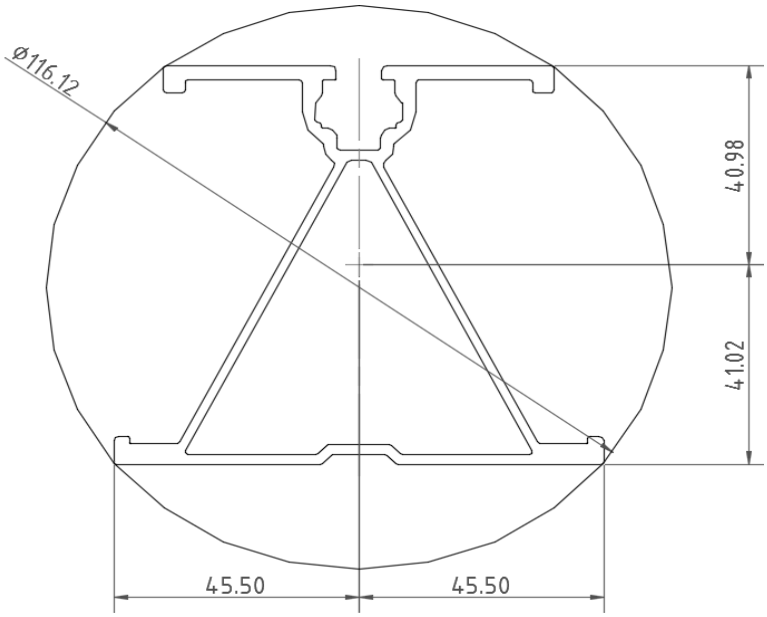
Struts	Location
M3	Outer
M6	Inner
M9	Outer

4. MEMBER DESIGN CALCULATIONS

4.1 Purlin Design

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

Purlin Type =	**S1.5**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	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 =	1.252	k-ft
M_z =	0.180	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	61%	

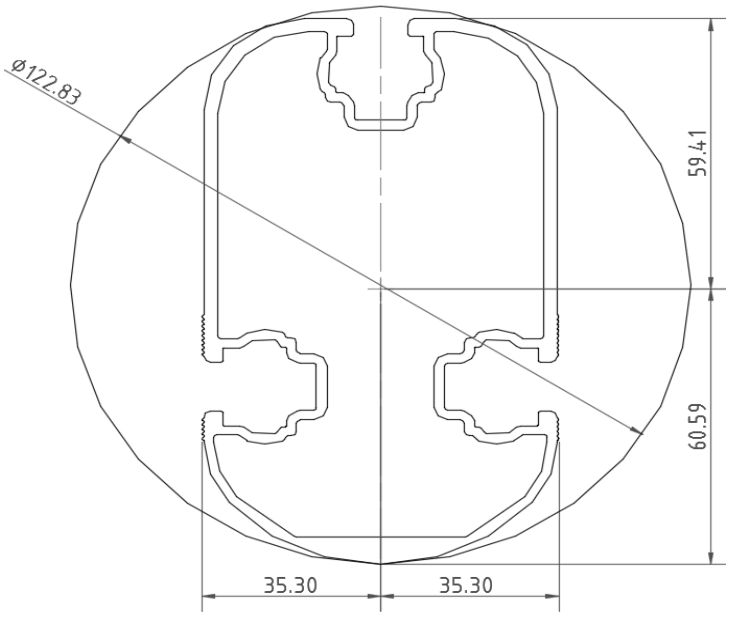


DETAIL VIEW

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 =	4.050	k-ft
M_z =	0.000	k-ft
P_n =	0.046	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	81%	

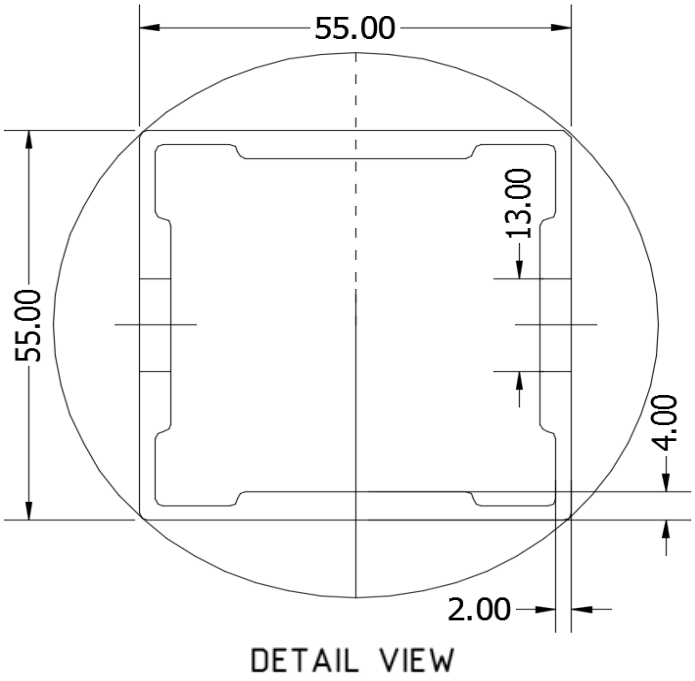


DETAIL VIEW

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).

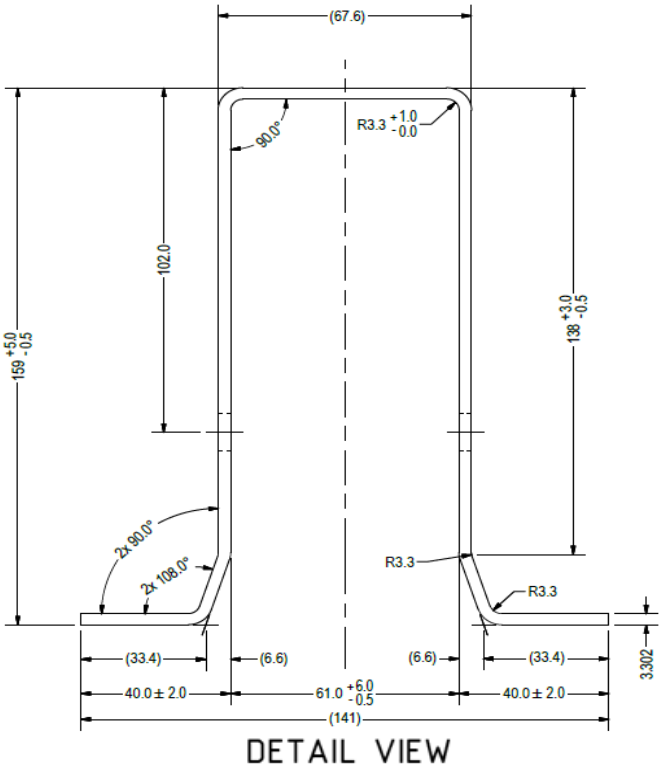
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	3.876	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	29%	



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 =	85.68	in
Φ =	0.90	
ΦF_{ty} =	54.00	ksi
S_y =	3.46	in^3
S_x =	1.55	in^3
E =	29000	ksi
I_y =	10.94	in^4
I_x =	4.31	in^4
A =	2.23	in^2
g =	7.59	lbs/ft
M_y =	15.814	k-ft
M_z =	0.000	k-ft
P_r =	-4.873	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	28.060	k
Utilization =	96%	



5. FOUNDATION DESIGN CALCULATIONS

5.1 Rammed Post Foundations

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

Maximum Tensile Load =	6.29	k
Maximum Lateral Load =	4.09	k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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

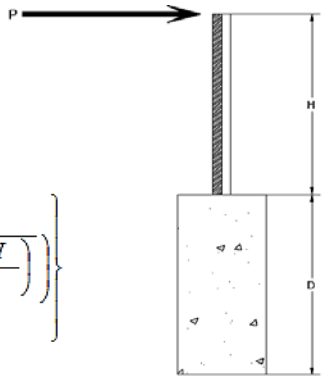
Lateral Force @ Top of Pole, P =	1.04	k
Height of Pole Above Grade, H =	7.14	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	1.04	k
Height of Pole Above Grade, H =	7.14	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	4th Trial @ D_4 =	6.37	ft
Lateral Soil Bearing @ D/3, S_1 =	0.22	ksf	Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	0.65	ksf	Lateral Soil Bearing @ D, S_3 =	1.27	ksf
Constant 2.34P/(S_1B), A =	5.59		Constant 2.34P/(S_1B), A =	2.86	
Required Footing Depth, D =	9.96	ft	Required Footing Depth, D =	6.35	ft
2nd Trial @ D_2 =	6.61	ft	5th Trial @ D_5 =	6.36	ft
Lateral Soil Bearing @ D/3, S_1 =	0.44	ksf	Lateral Soil Bearing @ D/3, S_1 =	0.42	ksf
Lateral Soil Bearing @ D, S_3 =	1.32	ksf	Lateral Soil Bearing @ D, S_3 =	1.27	ksf
Constant 2.34P/(S_1B), A =	2.75		Constant 2.34P/(S_1B), A =	2.86	
Required Footing Depth, D =	6.20	ft	Required Footing Depth, D =	6.50	ft
3rd Trial @ D_3 =	6.40	ft			
Lateral Soil Bearing @ D/3, S_1 =	0.43	ksf			
Lateral Soil Bearing @ D, S_3 =	1.28	ksf			
Constant 2.34P/(S_1B), A =	2.84				
Required Footing Depth, D =	6.33	ft			

A 2ft diameter x 6.5ft deep footing unrestrained at ground level is required for the racking structure.

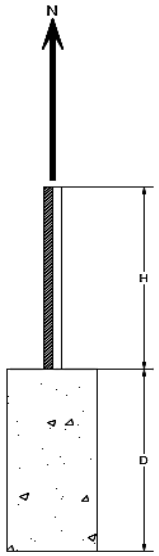
5.4 Uplifting Force Resistance

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 =	3.01	k
Footing Diameter, B =	2.00	ft
Factor of Safety =	2.50	
Cohesion =	208.85	psf
γ_s =	120.43	pcf
α =	0.45	
Required Concrete Weight, g =	1.98	k
Required Concrete Volume, V =	13.62	ft^3
Required Footing Depth, D =	4.50	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.51
2	0.4	0.2	118.10	6.41
3	0.6	0.2	118.10	6.31
4	0.8	0.2	118.10	6.20
5	1	0.2	118.10	6.10
6	1.2	0.2	118.10	6.00
7	1.4	0.2	118.10	5.89
8	1.6	0.2	118.10	5.79
9	1.8	0.2	118.10	5.68
10	2	0.2	118.10	5.58
11	2.2	0.2	118.10	5.48
12	2.4	0.2	118.10	5.37
13	2.6	0.2	118.10	5.27
14	2.8	0.2	118.10	5.17
15	3	0.2	118.10	5.06
16	3.2	0.2	118.10	4.96
17	3.4	0.2	118.10	4.86
18	3.6	0.2	118.10	4.75
19	3.8	0.2	118.10	4.65
20	4	0.2	118.10	4.54
21	4.2	0.2	118.10	4.44
22	4.4	0.2	118.10	4.34
23	0	0.0	0.00	4.34
24	0	0.0	0.00	4.34
25	0	0.0	0.00	4.34
26	0	0.0	0.00	4.34
27	0	0.0	0.00	4.34
28	0	0.0	0.00	4.34
29	0	0.0	0.00	4.34
30	0	0.0	0.00	4.34
31	0	0.0	0.00	4.34
32	0	0.0	0.00	4.34
33	0	0.0	0.00	4.34
34	0	0.0	0.00	4.34
Max	4.4	Sum	1.04	

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 =	6.50	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.25	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	21.99	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

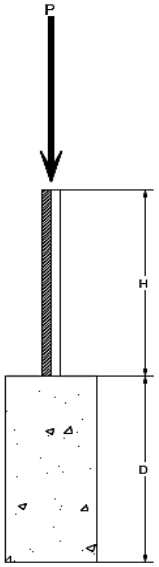
Weight of Concrete

Footing Volume	20.42	ft^3
Weight	2.96	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	3.30	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.68	k
Applied Force =	6.21	k
Utilization =	58%	

A 2ft diameter footing passes at a depth of 6.5ft.



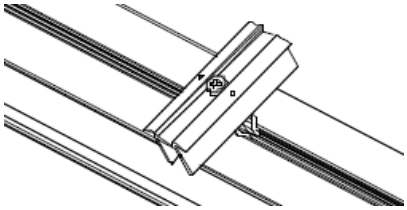
6. DESIGN OF JOINTS AND CONNECTIONS

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.

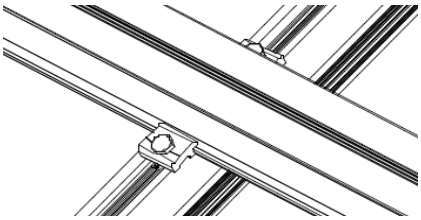
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.819 k
Allowable Uplift	=	1.214 k
Utilization	=	67%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.056 k
Allowable Uplift	=	2.180 k
Utilization	=	94%

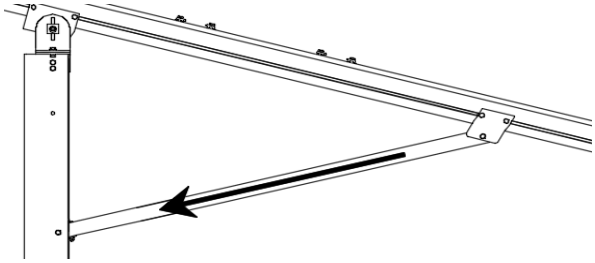


6.2 Strut Connections

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	=	3.876 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	44%

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

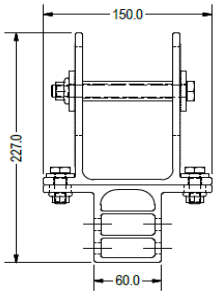


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

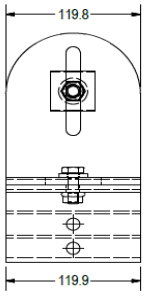
6.3 Girder to Post Connection

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.

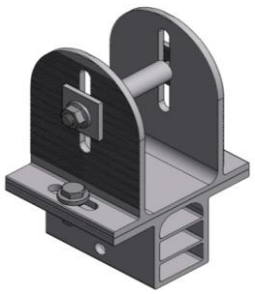
Maximum Tensile Load	=	4.327 k
Allowable Load	=	5.649 k
Utilization	=	77%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

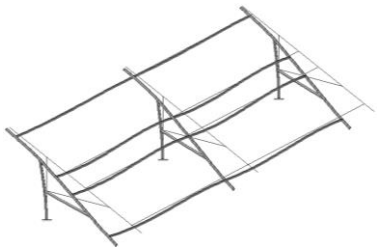
7.1 Seismic Drift

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}	=	77.78 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.556 in
Max Drift, Δ_{MAX}	=	0.485 in

0.485 ≤ 1.556, 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)

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

φF_L = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

φF_L = 28.2 ksi

3.4.10

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

φF_L = 33.25 ksi

φF_L = 13.67 ksi

A = 663.99 mm^2

1.03 in^2

P_{max} = 14.07 kips

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length =	85.68	in	
Pr =	-4.87	k	(LRFD Factored Load)
Mr (Strong) =	15.81	k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00	k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	123.28			
4.71√(E/Fy) =	103.55	=>	kL/r	> 4.71√(E/Fy)
Fcr =	16.52	ksi		
Fe =	18.83	ksi		
Pn =	36.831	k		

Torsional/Flexural Torsional Buckling:

Fcr =	12.5831	ksi
Fey =	48.0382	ksi
Fez =	16.1601	ksi
Pn =	28.0602	k

Bending (Strong Axis):

Yielding:				
Mn =	21.95	k-ft		
Flange Local Buckling:				
Mn =	19.207	k-ft		
Pr/Pc =	0.1323	<	0.2	
Utilization =	0.96	<	1.0	OK

Bending (Weak Axis):

Yielding:				
Mn =	14.65	k-ft		
Flange Local Buckling:				
Mn =	14.39	k-ft		
Pr/Pc =	0.132	<	0.2	
Utilization =	0.00	<	1.0	OK

Combined Forces

Utilization = 96%

APPENDIX B

B.1

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

Basic Load Cases

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

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

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

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

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

Member Distributed Loads (BLC 3 : Snow Load)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M10	Y	-32.97	-32.97	0	0
2	M11	Y	-32.97	-32.97	0	0
3	M12	Y	-32.97	-32.97	0	0
4	M13	Y	-32.97	-32.97	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	-75.661	-75.661	0	0
2	M11	y	-75.661	-75.661	0	0
3	M12	y	-126.102	-126.102	0	0
4	M13	y	-126.102	-126.102	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	151.323	151.323	0	0
2	M11	y	151.323	151.323	0	0
3	M12	y	75.661	75.661	0	0
4	M13	y	75.661	75.661	0	0

Member Distributed Loads (BLC 6 : Seismic - Lateral)

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

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	LRFD 1.2D + 1.6S + 0.8W	Yes	Y		1	1.2	3	1.6	4	.8														
2	LRFD 1.2D + 1.6W + 0.5S	Yes	Y		1	1.2	3	.5	4	1.6														
3	LRFD 0.9D + 1.6W	Yes	Y		2	.9					5	1.6												
4	LATERAL - LRFD 1.54D + 1.3E ...	Yes	Y		1	1.54	3	.2			6	1.3												
5	LATERAL - LRFD 0.56D + 1.3E	Yes	Y		1	.56					6	1.3												
6	LATERAL - LRFD 1.54D + 1.25...	Yes	Y		1	1.54	3	.2			6	1.25												
7	LATERAL - LRFD 0.56D + 1.25E	Yes	Y		1	.56					6	1.25												
8																								
9	ASD 1.0D + 1.0S	Yes	Y		1	1	3	1																
10	ASD 1.0D + 1.0W	Yes	Y		1	1			4	1														
11	ASD 1.0D + 0.75L + 0.75W + 0....	Yes	Y		1	1	3	.75	4	.75														
12	ASD 0.6D + 1.0W	Yes	Y		2	.6					5	1												
13	LATERAL - ASD 1.238D + 0.875E	Yes	Y		1	1.2...					6	.875												
14	LATERAL - ASD 1.1785D + 0.65...	Yes	Y		1	1.1...	3	.75			6	.656												
15	LATERAL - ASD 0.362D + 0.875E	Yes	Y		1	.362					6	.875												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	1018.961	2	1935.612	2	132.498	2	.193	2	.029	5	5.63	3
2		min	-1343.992	3	-1502.299	3	-266.34	5	-1.172	5	-.017	2	-.114	10
3	N19	max	3146.624	2	5403.943	2	0	1	0	3	.03	4	9.365	3
4		min	-3144.649	3	-4811.851	3	-282.364	5	-1.216	4	0	10	-.455	10
5	N29	max	1018.961	2	1935.612	2	175.672	3	.296	3	.03	4	5.63	3
6		min	-1343.992	3	-1502.299	3	-282.565	4	-1.206	4	-.009	3	-.248	5
7	Totals:	max	5184.547	2	9275.167	2	0	1						
8		min	-5832.632	3	-7816.449	3	-821.36	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	0	3	0	1	0	1	0	1	0	1
3		2	max	-.299	15	-.428	15	0	10	0	1	0	10	0	6
4			min	-1.274	6	-1.817	6	-1.499	5	0	1	0	5	0	15
5		3	max	-19.38	10	314.183	3	-7.751	10	.041	3	.119	4	.285	2
6			min	-132.388	1	-654.057	2	-62.385	1	-.155	2	.011	10	-.134	3
7		4	max	-20.207	10	313.12	3	-7.751	10	.041	3	.08	4	.691	2
8			min	-133.38	1	-655.474	2	-63.5	4	-.155	2	.006	10	-.328	3
9		5	max	-21.034	10	312.057	3	-7.751	10	.041	3	.04	4	1.098	2
10			min	-134.373	1	-656.892	2	-65	4	-.155	2	.001	10	-.522	3
11		6	max	141.693	3	554.794	2	-20.7	12	.033	2	.049	2	1.061	2
12			min	-539.738	2	-174.715	3	-92.021	1	-.049	3	-.026	5	-.538	3
13		7	max	140.949	3	553.377	2	-20.7	12	.033	2	.008	10	.717	2
14			min	-540.731	2	-175.778	3	-92.021	1	-.049	3	-.054	4	-.429	3
15		8	max	140.205	3	551.959	2	-20.7	12	.033	2	-.012	10	.374	2
16			min	-541.723	2	-176.841	3	-92.021	1	-.049	3	-.088	4	-.319	3
17		9	max	88.639	3	117.443	3	-15.36	10	.014	5	.068	3	.17	2
18			min	-609.997	1	-66.602	2	-105.559	1	-.093	2	-.006	10	-.271	3
19		10	max	87.894	3	116.379	3	-15.36	10	.014	5	.033	3	.212	2
20			min	-610.99	1	-68.02	2	-105.559	1	-.093	2	-.026	2	-.343	3
21		11	max	87.15	3	115.316	3	-15.36	10	.014	5	-.002	12	.255	2
22			min	-611.983	1	-69.437	2	-105.559	1	-.093	2	-.089	4	-.415	3
23		12	max	31.004	3	806.671	3	97.475	2	.207	3	.072	1	.453	2
24			min	-749.09	1	-460.647	2	-261.889	3	-.147	2	-.039	5	-.756	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	30.259	3	805.607	3	97.475	2	.207	3	.091	2	.74	2
26			min	-750.083	1	-462.064	2	-261.889	3	-.147	2	-.125	5	-1.256	3
27		14	max	134.993	1	443.388	2	51.14	5	.164	2	.11	3	1.014	2
28			min	4.399	15	-751.348	3	-106.157	3	-.339	3	-.104	4	-1.734	3
29		15	max	134.001	1	441.971	2	49.64	5	.164	2	.044	3	.74	2
30			min	4.099	15	-752.411	3	-106.157	3	-.339	3	-.081	4	-1.268	3
31		16	max	133.008	1	440.553	2	48.14	5	.164	2	-.014	12	.466	2
32			min	3.8	15	-753.474	3	-106.157	3	-.339	3	-.1	1	-.8	3
33		17	max	132.015	1	439.136	2	46.64	5	.164	2	-.004	15	.193	2
34			min	3.5	15	-754.537	3	-106.157	3	-.339	3	-.125	1	-.332	3
35		18	max	1.274	6	1.819	6	1.5	4	0	1	0	10	0	6
36			min	.299	15	.428	15	0	10	0	1	0	4	0	15
37		19	max	0	1	.005	2	0	1	0	1	0	1	0	1
38			min	0	1	-.009	3	0	15	0	1	0	1	0	1
39	M4	1	max	0	1	.014	2	.001	4	0	1	0	1	0	1
40			min	0	1	-.002	3	0	1	0	1	0	1	0	1
41		2	max	-.299	15	-.428	15	0	1	0	1	0	1	0	6
42			min	-1.274	4	-1.817	6	-1.499	5	0	1	0	5	0	15
43		3	max	46.856	3	998.788	3	0	1	.042	4	.138	4	.709	2
44			min	-259.892	1	-1846.927	2	-71.547	5	0	1	0	1	-.389	3
45		4	max	46.111	3	997.725	3	0	1	.042	4	.094	4	1.856	2
46			min	-260.884	1	-1848.344	2	-73.047	5	0	1	0	1	-1.009	3
47		5	max	45.367	3	996.662	3	0	1	.042	4	.048	4	3.003	2
48			min	-261.877	1	-1849.762	2	-74.547	5	0	1	0	1	-1.628	3
49		6	max	774.969	3	1747.547	2	0	1	0	1	0	1	2.831	2
50			min	-1543.977	2	-827.16	3	-56.696	4	-.035	4	-.027	5	-1.577	3
51		7	max	774.224	3	1746.13	2	0	1	0	1	0	1	1.747	2
52			min	-1544.97	2	-828.223	3	-58.195	4	-.035	4	-.062	4	-1.064	3
53		8	max	773.48	3	1744.712	2	0	1	0	1	0	1	.664	2
54			min	-1545.963	2	-829.286	3	-59.695	4	-.035	4	-.099	4	-.549	3
55		9	max	831.348	3	209.5	3	0	1	.009	4	.059	5	.029	1
56			min	-1657.55	2	-179.194	2	-136.186	4	0	1	0	1	-.277	3
57		10	max	830.603	3	208.436	3	0	1	.009	4	0	1	.125	2
58			min	-1658.542	2	-180.612	2	-137.686	4	0	1	-.026	4	-.407	3
59		11	max	829.859	3	207.373	3	0	1	.009	4	0	1	.238	2
60			min	-1659.535	2	-182.029	2	-139.185	4	0	1	-.112	4	-.536	3
61		12	max	896.887	3	2144.884	3	0	1	.121	4	0	1	.845	2
62			min	-1777.948	2	-1430.868	2	-149.985	4	0	1	-.032	4	-1.443	3
63		13	max	896.143	3	2143.821	3	0	1	.121	4	0	1	1.733	2
64			min	-1778.941	2	-1432.285	2	-151.485	4	0	1	-.126	4	-2.774	3
65		14	max	263.614	1	1156.444	2	54.315	5	0	1	0	1	2.587	2
66			min	-46.354	3	-1809.616	3	0	1	-.081	4	-.077	5	-4.05	3
67		15	max	262.621	1	1155.027	2	52.816	5	0	1	0	1	1.87	2
68			min	-47.098	3	-1810.679	3	0	1	-.081	4	-.044	5	-2.927	3
69		16	max	261.628	1	1153.609	2	51.316	5	0	1	0	1	1.153	2
70			min	-47.843	3	-1811.742	3	0	1	-.081	4	-.011	5	-1.803	3
71		17	max	260.636	1	1152.192	2	49.816	5	0	1	.02	4	.438	2
72			min	-48.587	3	-1812.805	3	0	1	-.081	4	0	1	-.678	3
73		18	max	1.274	6	1.82	6	1.5	5	0	1	0	1	0	6
74			min	.299	15	.428	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.011	2	0	1	0	1	0	1	0	1
76			min	0	1	-.017	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	0	3	0	10	0	1	0	1	0	1
79		2	max	-.299	15	-.428	15	0	1	0	1	0	1	0	4
80			min	-1.274	6	-1.818	4	-1.499	5	0	1	0	5	0	15
81		3	max	13.215	5	314.183	3	62.385	1	.155	2	.067	5	.285	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	-132.388	1	-654.057	2	-35.042	5	-.041	3	-.117	1	-.134	3
83		4	max	12.752	5	313.12	3	62.385	1	.155	2	.045	5	.691	2
84			min	-133.38	1	-655.474	2	-36.542	5	-.041	3	-.078	1	-.328	3
85		5	max	12.289	5	312.057	3	62.385	1	.155	2	.022	5	1.098	2
86			min	-134.373	1	-656.892	2	-38.042	5	-.041	3	-.04	3	-.522	3
87		6	max	141.693	3	554.794	2	92.021	1	.049	3	.017	3	1.061	2
88			min	-539.738	2	-174.715	3	-20.234	5	-.033	2	-.049	2	-.538	3
89		7	max	140.949	3	553.377	2	92.021	1	.049	3	.037	3	.717	2
90			min	-540.731	2	-175.778	3	-21.734	5	-.033	2	-.042	5	-.429	3
91		8	max	140.205	3	551.959	2	92.021	1	.049	3	.075	1	.374	2
92			min	-541.723	2	-176.841	3	-23.233	5	-.033	2	-.056	5	-.319	3
93		9	max	88.639	3	117.443	3	105.559	1	.093	2	.014	5	.17	2
94			min	-609.997	1	-66.602	2	-56.294	5	.009	9	-.068	3	-.271	3
95		10	max	87.894	3	116.379	3	105.559	1	.093	2	.026	2	.212	2
96			min	-610.99	1	-68.02	2	-57.794	5	.009	9	-.033	3	-.343	3
97		11	max	87.15	3	115.316	3	105.559	1	.093	2	.084	1	.255	2
98			min	-611.983	1	-69.437	2	-59.293	5	.009	9	-.058	5	-.415	3
99		12	max	31.004	3	806.671	3	261.889	3	.147	2	-.01	10	.453	2
100			min	-749.09	1	-460.647	2	-134.503	5	-.207	3	-.072	1	-.756	3
101		13	max	30.259	3	805.607	3	261.889	3	.147	2	.112	3	.74	2
102			min	-750.083	1	-462.064	2	-136.002	5	-.207	3	-.149	4	-1.256	3
103		14	max	134.993	1	443.388	2	106.157	3	.339	3	.066	2	1.014	2
104			min	13.199	15	-751.348	3	-11.096	10	-.164	2	-.11	3	-1.734	3
105		15	max	134.001	1	441.971	2	106.157	3	.339	3	.075	1	.74	2
106			min	12.9	15	-752.411	3	-11.096	10	-.164	2	-.057	5	-1.268	3
107		16	max	133.008	1	440.553	2	106.157	3	.339	3	.1	1	.466	2
108			min	12.6	15	-753.474	3	-11.096	10	-.164	2	-.021	5	-.8	3
109		17	max	132.015	1	439.136	2	106.157	3	.339	3	.125	1	.193	2
110			min	12.301	15	-754.537	3	-11.096	10	-.164	2	.01	15	-.332	3
111		18	max	1.274	6	1.82	4	1.5	5	0	1	0	1	0	4
112			min	.299	15	.428	15	0	1	0	1	0	5	0	15
113		19	max	0	1	.005	2	0	5	0	1	0	1	0	1
114			min	0	1	-.009	3	0	1	0	1	0	1	0	1
115	M10	1	max	106.17	3	435.956	2	-11.705	15	.014	2	.142	1	.164	2
116			min	-11.097	10	-756.591	3	-130.052	1	-.028	3	.013	10	-.339	3
117		2	max	106.17	3	323.751	2	-10.111	15	.014	2	.095	3	.177	3
118			min	-11.097	10	-571.693	3	-101.235	1	-.028	3	.001	10	-.132	2
119		3	max	106.17	3	211.546	2	-8.517	15	.014	2	.062	3	.55	3
120			min	-11.097	10	-386.794	3	-72.417	1	-.028	3	-.016	1	-.34	2
121		4	max	106.17	3	99.341	2	-4.261	10	.014	2	.03	3	.779	3
122			min	-11.097	10	-201.895	3	-43.6	1	-.028	3	-.061	1	-.461	2
123		5	max	106.17	3	14.343	5	.142	10	.014	2	0	3	.864	3
124			min	-11.097	10	-17.365	1	-37.238	3	-.028	3	-.084	1	-.495	2
125		6	max	106.17	3	167.903	3	14.035	1	.014	2	-.005	15	.806	3
126			min	-11.097	10	-125.068	2	-34.848	3	-.028	3	-.084	1	-.441	2
127		7	max	106.17	3	352.802	3	42.852	1	.014	2	-.007	10	.603	3
128			min	-11.097	10	-237.273	2	-32.457	3	-.028	3	-.062	1	-.3	2
129		8	max	106.17	3	537.701	3	71.669	1	.014	2	.002	10	.257	3
130			min	-11.097	10	-349.478	2	-30.066	3	-.028	3	-.078	3	-.072	2
131		9	max	106.17	3	722.6	3	100.487	1	.014	2	.05	1	.244	2
132			min	-11.097	10	-461.683	2	-27.676	3	-.028	3	-.101	3	-.233	3
133		10	max	106.17	3	573.888	2	129.304	1	.008	10	.139	1	.646	2
134			min	-11.097	10	-907.499	3	-74.972	14	-.028	3	-.122	3	-.867	3
135		11	max	106.17	3	461.683	2	27.676	3	.028	3	.05	1	.244	2
136			min	-11.097	10	-722.6	3	-100.487	1	-.014	2	-.101	3	-.233	3
137		12	max	106.17	3	349.478	2	30.066	3	.028	3	.008	5	.257	3
138			min	-11.097	10	-537.701	3	-71.669	1	-.014	2	-.078	3	-.072	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
139		13	max	106.17	3	237.273	2	32.457	3	.028	3	0	15	.603	3
140			min	-11.097	10	-352.802	3	-42.852	1	-.014	2	-.062	1	-.3	2
141		14	max	106.17	3	125.068	2	34.848	3	.028	3	-.005	15	.806	3
142			min	-11.097	10	-167.903	3	-14.035	1	-.014	2	-.084	1	-.441	2
143		15	max	106.17	3	20.295	4	37.238	3	.028	3	0	3	.864	3
144			min	-11.705	5	6.319	10	-5.103	5	-.014	2	-.084	1	-.495	2
145		16	max	106.17	3	201.895	3	43.6	1	.028	3	.03	3	.779	3
146			min	-19.689	5	-99.341	2	-2.637	5	-.014	2	-.061	1	-.461	2
147		17	max	106.17	3	386.794	3	72.417	1	.028	3	.062	3	.55	3
148			min	-27.673	5	-211.546	2	-.286	15	-.014	2	-.019	4	-.34	2
149		18	max	106.17	3	571.693	3	101.235	1	.028	3	.095	3	.177	3
150			min	-35.657	5	-323.751	2	1.308	15	-.014	2	-.015	5	-.132	2
151		19	max	106.17	3	756.591	3	130.052	1	.028	3	.142	1	.164	2
152			min	-43.641	5	-435.956	2	2.902	15	-.014	2	-.013	5	-.339	3
153	M11	1	max	142.681	2	388.597	2	12.916	5	0	10	.17	1	.095	4
154			min	-205.996	3	-692.121	3	-136.187	1	-.005	3	-.073	5	-.296	3
155		2	max	142.681	2	276.392	2	15.382	5	0	10	.127	3	.17	3
156			min	-205.996	3	-507.222	3	-107.37	1	-.005	3	-.062	5	-.204	2
157		3	max	142.681	2	164.187	2	17.848	5	0	10	.087	3	.493	3
158			min	-205.996	3	-322.323	3	-78.552	1	-.005	3	-.049	5	-.376	2
159		4	max	142.681	2	51.982	2	20.314	5	0	10	.049	3	.671	3
160			min	-205.996	3	-137.424	3	-49.735	1	-.005	3	-.047	1	-.46	2
161		5	max	142.681	2	47.475	3	22.78	5	0	10	.013	3	.706	3
162			min	-205.996	3	-60.223	2	-45.361	3	-.005	3	-.074	1	-.457	2
163		6	max	142.681	2	232.374	3	26.587	4	0	10	0	5	.597	3
164			min	-205.996	3	-172.428	2	-42.971	3	-.005	3	-.079	1	-.366	2
165		7	max	142.681	2	417.273	3	36.717	1	0	10	.022	5	.345	3
166			min	-205.996	3	-284.633	2	-40.58	3	-.005	3	-.062	1	-.188	2
167		8	max	142.681	2	602.172	3	65.534	1	0	10	.044	5	.077	2
168			min	-205.996	3	-396.838	2	-38.189	3	-.005	3	-.085	3	-.052	3
169		9	max	142.681	2	787.071	3	94.352	1	0	10	.077	4	.429	2
170			min	-205.996	3	-509.043	2	-35.799	3	-.005	3	-.113	3	-.592	3
171		10	max	142.681	2	621.248	2	123.169	1	0	10	.124	1	.868	2
172			min	-205.996	3	-971.97	3	-58.703	2	-.005	3	-.14	3	-1.276	3
173		11	max	142.681	2	509.043	2	35.799	3	.005	3	.04	1	.429	2
174			min	-205.996	3	-787.071	3	-94.352	1	0	5	-.113	3	-.592	3
175		12	max	142.681	2	396.838	2	38.189	3	.005	3	.002	10	.077	2
176			min	-205.996	3	-602.172	3	-65.534	1	0	5	-.085	3	-.052	3
177		13	max	142.681	2	284.633	2	40.58	3	.005	3	-.007	10	.345	3
178			min	-205.996	3	-417.273	3	-36.717	1	0	5	-.062	1	-.188	2
179		14	max	142.681	2	172.428	2	42.971	3	.005	3	-.01	15	.597	3
180			min	-205.996	3	-232.374	3	-8.151	2	0	5	-.079	1	-.366	2
181		15	max	142.681	2	60.223	2	45.361	3	.005	3	.013	3	.706	3
182			min	-205.996	3	-47.475	3	-.1	10	0	5	-.074	1	-.457	2
183		16	max	142.681	2	137.424	3	49.735	1	.005	3	.049	3	.671	3
184			min	-205.996	3	-51.982	2	4.304	10	0	5	-.047	1	-.46	2
185		17	max	142.681	2	322.323	3	78.552	1	.005	3	.087	3	.493	3
186			min	-205.996	3	-164.187	2	8.707	10	0	5	-.009	2	-.376	2
187		18	max	142.681	2	507.222	3	107.37	1	.005	3	.127	3	.17	3
188			min	-205.996	3	-276.392	2	13.11	10	0	5	.002	10	-.204	2
189		19	max	142.681	2	692.121	3	136.187	1	.005	3	.17	1	.054	2
190			min	-205.996	3	-388.597	2	17.513	10	0	5	.013	10	-.296	3
191	M12	1	max	31.522	5	616.091	2	18.612	5	0	10	.181	1	.126	2
192			min	-23.769	3	-295.343	3	-138.67	1	-.005	3	-.093	5	.012	9
193		2	max	23.538	5	441.115	2	21.078	5	0	10	.111	3	.235	3
194			min	-23.769	3	-204.601	3	-109.852	1	-.005	3	-.077	5	-.285	2
195		3	max	21.506	2	266.139	2	23.544	5	0	10	.074	3	.359	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	-23.769	3	-113.86	3	-81.035	1	-.005	3	-.06	5	-.56	2
197		4	max	21.506	2	91.163	2	26.009	5	0	10	.04	3	.412	3
198			min	-23.769	3	-23.118	3	-52.218	1	-.005	3	-.051	4	-.699	2
199		5	max	21.506	2	67.624	3	28.475	5	0	10	.007	3	.395	3
200			min	-23.769	3	-83.813	2	-41.204	3	-.005	3	-.071	1	-.702	2
201		6	max	21.506	2	158.366	3	32.078	4	0	10	.004	5	.307	3
202			min	-23.769	3	-258.789	2	-38.814	3	-.005	3	-.078	1	-.569	2
203		7	max	21.506	2	249.107	3	41.801	4	0	10	.029	5	.148	3
204			min	-24.212	14	-433.765	2	-36.423	3	-.005	3	-.062	1	-.3	2
205		8	max	21.506	2	339.849	3	63.052	1	0	10	.056	5	.106	2
206			min	-32.088	4	-608.741	2	-34.032	3	-.005	3	-.081	3	-.081	3
207		9	max	21.506	2	430.591	3	91.869	1	0	10	.093	4	.647	2
208			min	-40.072	4	-783.716	2	-31.642	3	-.005	3	-.107	3	-.38	3
209		10	max	21.506	2	958.692	2	82.729	14	0	2	.144	4	1.325	2
210			min	-48.056	4	-571.523	10	-120.686	1	-.005	3	-.13	3	-.751	3
211		11	max	26.799	5	783.716	2	31.642	3	.005	3	.036	1	.647	2
212			min	-23.769	3	-430.591	3	-91.869	1	0	5	-.107	3	-.38	3
213		12	max	21.506	2	608.741	2	34.032	3	.005	3	0	10	.106	2
214			min	-23.769	3	-339.849	3	-63.052	1	0	5	-.081	3	-.081	3
215		13	max	21.506	2	433.765	2	36.423	3	.005	3	-.007	10	.148	3
216			min	-23.769	3	-249.107	3	-34.234	1	0	5	-.062	1	-.3	2
217		14	max	21.506	2	258.789	2	38.814	3	.005	3	-.01	10	.307	3
218			min	-23.769	3	-158.366	3	-5.417	1	0	5	-.078	1	-.569	2
219		15	max	21.506	2	83.813	2	41.204	3	.005	3	.007	5	.395	3
220			min	-23.769	3	-67.624	3	1.909	10	0	5	-.071	1	-.702	2
221		16	max	21.506	2	23.118	3	52.218	1	.005	3	.04	3	.412	3
222			min	-23.769	3	-91.163	2	6.312	10	0	5	-.041	1	-.699	2
223		17	max	21.506	2	113.86	3	81.035	1	.005	3	.074	3	.359	3
224			min	-28.899	4	-266.139	2	10.715	10	0	5	0	10	-.56	2
225		18	max	21.506	2	204.601	3	109.852	1	.005	3	.114	4	.235	3
226			min	-36.883	4	-441.115	2	15.118	10	0	5	.009	10	-.285	2
227		19	max	21.506	2	295.343	3	138.67	1	.005	3	.181	1	.126	2
228			min	-44.867	4	-616.091	2	19.522	10	0	5	.023	10	-.043	5
229	M13	1	max	32.011	5	651.58	2	14.143	5	.007	3	.142	1	.155	2
230			min	-62.345	1	-316.276	3	-130.367	1	-.019	2	-.082	5	-.041	3
231		2	max	24.027	5	476.604	2	16.609	5	.007	3	.091	3	.169	3
232			min	-62.345	1	-225.534	3	-101.55	1	-.019	2	-.07	5	-.284	2
233		3	max	16.043	5	301.628	2	19.075	5	.007	3	.058	3	.31	3
234			min	-62.345	1	-134.792	3	-72.732	1	-.019	2	-.059	4	-.587	2
235		4	max	8.059	5	126.652	2	21.541	5	.007	3	.028	3	.379	3
236			min	-62.345	1	-44.051	3	-43.915	1	-.019	2	-.061	1	-.753	2
237		5	max	.215	15	46.691	3	24.006	5	.007	3	-.001	12	.378	3
238			min	-62.345	1	-48.324	2	-36.006	3	-.019	2	-.084	1	-.784	2
239		6	max	-5.159	15	137.433	3	29.512	4	.007	3	-.002	15	.307	3
240			min	-62.345	1	-223.3	2	-33.615	3	-.019	2	-.085	1	-.678	2
241		7	max	-7.749	10	228.175	3	42.537	1	.007	3	.019	5	.164	3
242			min	-62.345	1	-398.276	2	-31.224	3	-.019	2	-.063	1	-.436	2
243		8	max	-7.749	10	318.916	3	71.354	1	.007	3	.042	5	-.007	15
244			min	-62.345	1	-573.252	2	-28.834	3	-.019	2	-.077	3	-.06	1
245		9	max	-7.749	10	409.658	3	100.171	1	.007	3	.079	4	.455	2
246			min	-62.345	1	-748.228	2	-26.443	3	-.019	2	-.098	3	-.332	3
247		10	max	-7.749	10	923.204	2	84.472	14	0	15	.137	1	1.105	2
248			min	-62.345	1	-114.193	14	-128.989	1	-.019	2	-.118	3	-.686	3
249		11	max	20.773	5	748.228	2	26.443	3	.019	2	.048	1	.455	2
250			min	-62.345	1	-409.658	3	-100.171	1	-.007	3	-.098	3	-.332	3
251		12	max	12.789	5	573.252	2	28.834	3	.019	2	.001	10	.004	5
252			min	-62.345	1	-318.916	3	-71.354	1	-.007	3	-.077	3	-.06	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
253		13	max	4.805	5	398.276	2	31.224	3	.019	2	-.007	10	.164	3
254			min	-62.345	1	-228.175	3	-42.537	1	-.007	3	-.063	1	-.436	2
255		14	max	-1.97	15	223.3	2	33.615	3	.019	2	-.008	15	.307	3
256			min	-62.345	1	-137.433	3	-13.72	1	-.007	3	-.085	1	-.678	2
257		15	max	-7.344	15	48.324	2	36.006	3	.019	2	.008	5	.378	3
258			min	-62.345	1	-46.691	3	.113	10	-.007	3	-.084	1	-.784	2
259		16	max	-7.749	10	44.051	3	43.915	1	.019	2	.03	5	.379	3
260			min	-62.345	1	-126.652	2	4.516	10	-.007	3	-.061	1	-.753	2
261		17	max	-7.749	10	134.792	3	72.732	1	.019	2	.058	3	.31	3
262			min	-62.345	1	-301.628	2	8.919	10	-.007	3	-.016	1	-.587	2
263		18	max	-7.749	10	225.534	3	101.55	1	.019	2	.094	4	.169	3
264			min	-62.345	1	-476.604	2	13.322	10	-.007	3	.002	10	-.284	2
265		19	max	-7.749	10	316.276	3	130.367	1	.019	2	.145	4	.155	2
266			min	-62.345	1	-651.58	2	17.726	10	-.007	3	.014	10	-.041	3
267	M2	1	max	1935.612	2	1343.529	3	132.55	2	.029	5	1.172	5	5.63	3
268			min	-1502.299	3	-1019.016	2	-266.356	5	-.017	2	-.193	2	-.114	10
269		2	max	1207.44	2	902.489	3	90.596	2	0	2	1.06	5	5.233	3
270			min	-1222.585	3	2.882	10	-239.639	5	0	3	-.147	2	.017	10
271		3	max	1204.334	2	902.489	3	90.596	2	0	2	.978	5	4.926	3
272			min	-1224.914	3	2.882	10	-236.947	5	0	3	-.116	2	.016	10
273		4	max	1201.228	2	902.489	3	90.596	2	0	2	.898	5	4.618	3
274			min	-1227.244	3	2.882	10	-234.255	5	0	3	-.085	2	.015	10
275		5	max	1198.122	2	902.489	3	90.596	2	0	2	.819	5	4.31	3
276			min	-1229.573	3	2.882	10	-231.563	5	0	3	-.054	2	.014	10
277		6	max	1195.016	2	902.489	3	90.596	2	0	2	.74	4	4.002	3
278			min	-1231.903	3	2.882	10	-228.872	5	0	3	-.025	1	.013	10
279		7	max	1191.91	2	902.489	3	90.596	2	0	2	.664	4	3.694	3
280			min	-1234.232	3	2.882	10	-226.18	5	0	3	-.029	3	.012	10
281		8	max	1188.804	2	902.489	3	90.596	2	0	2	.589	4	3.386	3
282			min	-1236.562	3	2.882	10	-223.488	5	0	3	-.082	3	.011	10
283		9	max	1185.698	2	902.489	3	90.596	2	0	2	.516	4	3.078	3
284			min	-1238.892	3	2.882	10	-220.796	5	0	3	-.135	3	.01	10
285		10	max	1182.592	2	902.489	3	90.596	2	0	2	.443	4	2.771	3
286			min	-1241.221	3	2.882	10	-218.104	5	0	3	-.188	3	.009	10
287		11	max	1179.485	2	902.489	3	90.596	2	0	2	.37	4	2.463	3
288			min	-1243.551	3	2.882	10	-215.412	5	0	3	-.241	3	.008	10
289		12	max	1176.379	2	902.489	3	90.596	2	0	2	.299	4	2.155	3
290			min	-1245.88	3	2.882	10	-212.72	5	0	3	-.294	3	.007	10
291		13	max	1173.273	2	902.489	3	90.596	2	0	2	.229	4	1.847	3
292			min	-1248.21	3	2.882	10	-210.028	5	0	3	-.347	3	.006	10
293		14	max	1170.167	2	902.489	3	90.596	2	0	2	.224	2	1.539	3
294			min	-1250.539	3	2.882	10	-207.336	5	0	3	-.401	3	.005	10
295		15	max	1167.061	2	902.489	3	90.596	2	0	2	.255	2	1.231	3
296			min	-1252.869	3	2.882	10	-204.644	5	0	3	-.454	3	.004	10
297		16	max	1163.955	2	902.489	3	90.596	2	0	2	.286	2	.924	3
298			min	-1255.199	3	2.882	10	-201.952	5	0	3	-.507	3	.003	10
299		17	max	1160.849	2	902.489	3	90.596	2	0	2	.317	2	.616	3
300			min	-1257.528	3	2.882	10	-199.26	5	0	3	-.56	3	.002	10
301		18	max	1157.743	2	902.489	3	90.596	2	0	2	.348	2	.308	3
302			min	-1259.858	3	2.882	10	-196.568	5	0	3	-.613	3	0	10
303		19	max	1154.637	2	902.489	3	90.596	2	0	2	.379	2	0	1
304			min	-1262.187	3	2.882	10	-193.876	5	0	3	-.666	3	0	1
305	M5	1	max	5403.943	2	3142.025	3	0	1	.03	4	1.216	4	9.365	3
306			min	-4811.851	3	-3147.296	2	-282.396	5	0	1	0	1	-.455	10
307		2	max	3262.464	2	1470.321	3	0	1	0	1	1.099	4	8.526	3
308			min	-3749.104	3	-10.729	10	-254.864	4	0	4	0	1	-.062	10
309		3	max	3259.358	2	1470.321	3	0	1	0	1	1.012	4	8.025	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
310			min	-3751.434	3	-10.729	10	-252.172	4	0	4	0	1	-.059	10
311		4	max	3256.252	2	1470.321	3	0	1	0	1	.927	4	7.523	3
312			min	-3753.763	3	-10.729	10	-249.48	4	0	4	0	1	-.055	10
313		5	max	3253.146	2	1470.321	3	0	1	0	1	.842	4	7.022	3
314			min	-3756.093	3	-10.729	10	-246.788	4	0	4	0	1	-.051	10
315		6	max	3250.04	2	1470.321	3	0	1	0	1	.758	4	6.52	3
316			min	-3758.423	3	-10.729	10	-244.096	4	0	4	0	1	-.048	10
317		7	max	3246.934	2	1470.321	3	0	1	0	1	.676	4	6.018	3
318			min	-3760.752	3	-10.729	10	-241.404	4	0	4	0	1	-.044	10
319		8	max	3243.828	2	1470.321	3	0	1	0	1	.594	4	5.517	3
320			min	-3763.082	3	-10.729	10	-238.712	4	0	4	0	1	-.04	10
321		9	max	3240.721	2	1470.321	3	0	1	0	1	.513	4	5.015	3
322			min	-3765.411	3	-10.729	10	-236.02	4	0	4	0	1	-.037	10
323		10	max	3237.615	2	1470.321	3	0	1	0	1	.433	4	4.514	3
324			min	-3767.741	3	-10.729	10	-233.328	4	0	4	0	1	-.033	10
325		11	max	3234.509	2	1470.321	3	0	1	0	1	.354	4	4.012	3
326			min	-3770.07	3	-10.729	10	-230.636	4	0	4	0	1	-.029	10
327		12	max	3231.403	2	1470.321	3	0	1	0	1	.275	4	3.511	3
328			min	-3772.4	3	-10.729	10	-227.945	4	0	4	0	1	-.026	10
329		13	max	3228.297	2	1470.321	3	0	1	0	1	.198	4	3.009	3
330			min	-3774.73	3	-10.729	10	-225.253	4	0	4	0	1	-.022	10
331		14	max	3225.191	2	1470.321	3	0	1	0	1	.122	4	2.508	3
332			min	-3777.059	3	-10.729	10	-222.561	4	0	4	0	1	-.018	10
333		15	max	3222.085	2	1470.321	3	0	1	0	1	.046	4	2.006	3
334			min	-3779.389	3	-10.729	10	-219.869	4	0	4	0	1	-.015	10
335		16	max	3218.979	2	1470.321	3	0	1	0	1	0	1	1.505	3
336			min	-3781.718	3	-10.729	10	-217.177	4	0	4	-.028	5	-.011	10
337		17	max	3215.873	2	1470.321	3	0	1	0	1	0	1	1.003	3
338			min	-3784.048	3	-10.729	10	-214.485	4	0	4	-.102	4	-.007	10
339		18	max	3212.767	2	1470.321	3	0	1	0	1	0	1	.502	3
340			min	-3786.377	3	-10.729	10	-211.793	4	0	4	-.175	4	-.004	10
341		19	max	3209.661	2	1470.321	3	0	1	0	1	0	1	0	1
342			min	-3788.707	3	-10.729	10	-209.101	4	0	4	-.246	4	0	1
343	M8	1	max	1935.612	2	1343.529	3	175.612	3	.03	4	1.206	4	5.63	3
344			min	-1502.299	3	-1019.016	2	-282.623	4	-.009	3	-.296	3	-.248	5
345		2	max	1207.44	2	902.489	3	155.832	3	0	3	1.088	4	5.233	3
346			min	-1222.585	3	-38.933	5	-252.059	4	0	2	-.237	3	-.226	5
347		3	max	1204.334	2	902.489	3	155.832	3	0	3	1.002	4	4.926	3
348			min	-1224.914	3	-38.933	5	-249.367	4	0	2	-.184	3	-.212	5
349		4	max	1201.228	2	902.489	3	155.832	3	0	3	.918	4	4.618	3
350			min	-1227.244	3	-38.933	5	-246.675	4	0	2	-.131	3	-.199	5
351		5	max	1198.122	2	902.489	3	155.832	3	0	3	.834	4	4.31	3
352			min	-1229.573	3	-38.933	5	-243.983	4	0	2	-.078	3	-.186	5
353		6	max	1195.016	2	902.489	3	155.832	3	0	3	.751	4	4.002	3
354			min	-1231.903	3	-38.933	5	-241.291	4	0	2	-.025	3	-.173	5
355		7	max	1191.91	2	902.489	3	155.832	3	0	3	.67	4	3.694	3
356			min	-1234.232	3	-38.933	5	-238.599	4	0	2	-.008	2	-.159	5
357		8	max	1188.804	2	902.489	3	155.832	3	0	3	.589	4	3.386	3
358			min	-1236.562	3	-38.933	5	-235.907	4	0	2	-.039	2	-.146	5
359		9	max	1185.698	2	902.489	3	155.832	3	0	3	.509	4	3.078	3
360			min	-1238.892	3	-38.933	5	-233.215	4	0	2	-.07	2	-.133	5
361		10	max	1182.592	2	902.489	3	155.832	3	0	3	.432	5	2.771	3
362			min	-1241.221	3	-38.933	5	-230.523	4	0	2	-.1	2	-.12	5
363		11	max	1179.485	2	902.489	3	155.832	3	0	3	.356	5	2.463	3
364			min	-1243.551	3	-38.933	5	-227.831	4	0	2	-.131	2	-.106	5
365		12	max	1176.379	2	902.489	3	155.832	3	0	3	.294	3	2.155	3
366			min	-1245.88	3	-38.933	5	-225.14	4	0	2	-.162	2	-.093	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	1173.273	2	902.489	3	155.832	3	0	3	.347	3	1.847	3
368			min	-1248.21	3	-38.933	5	-222.448	4	0	2	-.193	2	-.08	5
369		14	max	1170.167	2	902.489	3	155.832	3	0	3	.401	3	1.539	3
370			min	-1250.539	3	-38.933	5	-219.756	4	0	2	-.224	2	-.066	5
371		15	max	1167.061	2	902.489	3	155.832	3	0	3	.454	3	1.231	3
372			min	-1252.869	3	-38.933	5	-217.064	4	0	2	-.255	2	-.053	5
373		16	max	1163.955	2	902.489	3	155.832	3	0	3	.507	3	.924	3
374			min	-1255.199	3	-38.933	5	-214.372	4	0	2	-.286	2	-.04	5
375		17	max	1160.849	2	902.489	3	155.832	3	0	3	.56	3	.616	3
376			min	-1257.528	3	-38.933	5	-211.68	4	0	2	-.317	2	-.027	5
377		18	max	1157.743	2	902.489	3	155.832	3	0	3	.613	3	.308	3
378			min	-1259.858	3	-38.933	5	-208.988	4	0	2	-.348	2	-.013	5
379		19	max	1154.637	2	902.489	3	155.832	3	0	3	.666	3	0	1
380			min	-1262.187	3	-38.933	5	-206.296	4	0	2	-.379	2	0	1
381	M3	1	max	1308.392	2	4.147	6	41.782	2	.004	3	.038	5	0	1
382			min	-518.286	3	.975	15	-24.295	5	-.005	4	-.019	2	0	1
383		2	max	1308.154	2	3.686	6	41.782	2	.004	3	.031	5	0	15
384			min	-518.465	3	.866	15	-23.922	5	-.005	4	-.007	2	-.001	6
385		3	max	1307.916	2	3.225	6	41.782	2	.004	3	.025	4	0	15
386			min	-518.643	3	.758	15	-23.548	5	-.005	4	-.003	3	-.002	6
387		4	max	1307.678	2	2.765	6	41.782	2	.004	3	.019	4	0	15
388			min	-518.822	3	.65	15	-23.175	5	-.005	4	-.009	3	-.003	6
389		5	max	1307.44	2	2.304	6	41.782	2	.004	3	.03	2	0	15
390			min	-519	3	.542	15	-22.802	5	-.005	4	-.014	3	-.004	6
391		6	max	1307.202	2	1.843	6	41.782	2	.004	3	.042	2	-.001	15
392			min	-519.179	3	.433	15	-22.428	5	-.005	4	-.02	3	-.004	6
393		7	max	1306.964	2	1.382	6	41.782	2	.004	3	.054	2	-.001	15
394			min	-519.357	3	.325	15	-22.055	5	-.005	4	-.026	3	-.005	6
395		8	max	1306.726	2	.922	6	41.782	2	.004	3	.066	2	-.001	15
396			min	-519.536	3	.217	15	-21.682	5	-.005	4	-.032	3	-.005	6
397		9	max	1306.488	2	.461	6	41.782	2	.004	3	.078	2	-.001	15
398			min	-519.714	3	.108	15	-21.308	5	-.005	4	-.038	3	-.005	6
399		10	max	1306.25	2	0	1	41.782	2	.004	3	.09	2	-.001	15
400			min	-519.893	3	0	1	-20.935	5	-.005	4	-.043	3	-.005	6
401		11	max	1306.012	2	-.108	15	41.782	2	.004	3	.103	2	-.001	15
402			min	-520.071	3	-.461	4	-20.562	5	-.005	4	-.049	3	-.005	6
403		12	max	1305.774	2	-.217	15	41.782	2	.004	3	.115	2	-.001	15
404			min	-520.25	3	-.922	4	-20.188	5	-.005	4	-.055	3	-.005	6
405		13	max	1305.536	2	-.325	15	41.782	2	.004	3	.127	2	-.001	15
406			min	-520.428	3	-1.382	4	-19.943	3	-.005	4	-.061	3	-.005	6
407		14	max	1305.298	2	-.433	15	41.782	2	.004	3	.139	2	-.001	15
408			min	-520.607	3	-1.843	4	-19.943	3	-.005	4	-.067	3	-.004	6
409		15	max	1305.06	2	-.542	15	41.782	2	.004	3	.151	2	0	15
410			min	-520.785	3	-2.304	4	-19.943	3	-.005	4	-.072	3	-.004	6
411		16	max	1304.822	2	-.65	15	41.782	2	.004	3	.163	2	0	15
412			min	-520.964	3	-2.765	4	-19.943	3	-.005	4	-.078	3	-.003	6
413		17	max	1304.584	2	-.758	15	41.782	2	.004	3	.175	2	0	15
414			min	-521.142	3	-3.225	4	-19.943	3	-.005	4	-.084	3	-.002	6
415		18	max	1304.346	2	-.866	15	41.782	2	.004	3	.188	2	0	15
416			min	-521.321	3	-3.686	4	-19.943	3	-.005	4	-.09	3	-.001	6
417		19	max	1304.108	2	-.975	15	41.782	2	.004	3	.2	2	0	1
418			min	-521.499	3	-4.147	4	-19.943	3	-.005	4	-.096	3	0	1
419	M6	1	max	3869.479	2	4.147	6	0	1	0	1	.039	4	0	1
420			min	-1956.611	3	.975	15	-27.036	4	-.004	4	0	1	0	1
421		2	max	3869.241	2	3.686	6	0	1	0	1	.032	4	0	15
422			min	-1956.79	3	.866	15	-26.663	4	-.004	4	0	1	-.001	6
423		3	max	3869.003	2	3.225	6	0	1	0	1	.024	4	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	-1956.968	3	.758	15	-26.29	4	-.004	4	0	1	-.002	6
425		4	max	3868.765	2	2.765	6	0	1	0	1	.016	4	0	15
426			min	-1957.147	3	.65	15	-25.916	4	-.004	4	0	1	-.003	6
427		5	max	3868.527	2	2.304	6	0	1	0	1	.009	4	0	15
428			min	-1957.325	3	.542	15	-25.543	4	-.004	4	0	1	-.004	6
429		6	max	3868.289	2	1.843	6	0	1	0	1	.001	4	-.001	15
430			min	-1957.504	3	.433	15	-25.17	4	-.004	4	0	1	-.004	6
431		7	max	3868.051	2	1.382	6	0	1	0	1	0	1	-.001	15
432			min	-1957.682	3	.325	15	-24.796	4	-.004	4	-.006	4	-.005	6
433		8	max	3867.813	2	.922	6	0	1	0	1	0	1	-.001	15
434			min	-1957.861	3	.217	15	-24.423	4	-.004	4	-.013	4	-.005	6
435		9	max	3867.575	2	.461	6	0	1	0	1	0	1	-.001	15
436			min	-1958.039	3	.108	15	-24.05	4	-.004	4	-.02	4	-.005	6
437		10	max	3867.337	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-1958.218	3	0	1	-23.676	4	-.004	4	-.027	4	-.005	6
439		11	max	3867.099	2	-.108	15	0	1	0	1	0	1	-.001	15
440			min	-1958.396	3	-.461	4	-23.303	4	-.004	4	-.034	4	-.005	6
441		12	max	3866.861	2	-.217	15	0	1	0	1	0	1	-.001	15
442			min	-1958.575	3	-.922	4	-22.93	4	-.004	4	-.04	4	-.005	6
443		13	max	3866.623	2	-.325	15	0	1	0	1	0	1	-.001	15
444			min	-1958.753	3	-1.382	4	-22.556	4	-.004	4	-.047	4	-.005	6
445		14	max	3866.385	2	-.433	15	0	1	0	1	0	1	-.001	15
446			min	-1958.932	3	-1.843	4	-22.183	4	-.004	4	-.054	4	-.004	6
447		15	max	3866.147	2	-.542	15	0	1	0	1	0	1	0	15
448			min	-1959.11	3	-2.304	4	-21.81	4	-.004	4	-.06	4	-.004	6
449		16	max	3865.909	2	-.65	15	0	1	0	1	0	1	0	15
450			min	-1959.289	3	-2.765	4	-21.436	4	-.004	4	-.066	4	-.003	6
451		17	max	3865.671	2	-.758	15	0	1	0	1	0	1	0	15
452			min	-1959.467	3	-3.225	4	-21.063	4	-.004	4	-.072	4	-.002	6
453		18	max	3865.433	2	-.866	15	0	1	0	1	0	1	0	15
454			min	-1959.646	3	-3.686	4	-20.69	4	-.004	4	-.078	4	-.001	6
455		19	max	3865.195	2	-.975	15	0	1	0	1	0	1	0	1
456			min	-1959.824	3	-4.147	4	-20.317	4	-.004	4	-.084	4	0	1
457	M9	1	max	1308.392	2	4.147	6	19.943	3	.005	2	.04	4	0	1
458			min	-518.286	3	.975	15	-41.782	2	-.005	5	-.009	3	0	1
459		2	max	1308.154	2	3.686	6	19.943	3	.005	2	.032	4	0	15
460			min	-518.465	3	.866	15	-41.782	2	-.005	5	-.003	3	-.001	6
461		3	max	1307.916	2	3.225	6	19.943	3	.005	2	.024	5	0	15
462			min	-518.643	3	.758	15	-41.782	2	-.005	5	-.006	2	-.002	6
463		4	max	1307.678	2	2.765	6	19.943	3	.005	2	.017	5	0	15
464			min	-518.822	3	.65	15	-41.782	2	-.005	5	-.018	2	-.003	6
465		5	max	1307.44	2	2.304	6	19.943	3	.005	2	.014	3	0	15
466			min	-519	3	.542	15	-41.782	2	-.005	5	-.03	2	-.004	6
467		6	max	1307.202	2	1.843	6	19.943	3	.005	2	.02	3	-.001	15
468			min	-519.179	3	.433	15	-41.782	2	-.005	5	-.042	2	-.004	6
469		7	max	1306.964	2	1.382	6	19.943	3	.005	2	.026	3	-.001	15
470			min	-519.357	3	.325	15	-41.782	2	-.005	5	-.054	2	-.005	6
471		8	max	1306.726	2	.922	6	19.943	3	.005	2	.032	3	-.001	15
472			min	-519.536	3	.217	15	-41.782	2	-.005	5	-.066	2	-.005	6
473		9	max	1306.488	2	.461	6	19.943	3	.005	2	.038	3	-.001	15
474			min	-519.714	3	.108	15	-41.782	2	-.005	5	-.078	2	-.005	6
475		10	max	1306.25	2	0	1	19.943	3	.005	2	.043	3	-.001	15
476			min	-519.893	3	0	1	-41.782	2	-.005	5	-.09	2	-.005	6
477		11	max	1306.012	2	-.108	15	19.943	3	.005	2	.049	3	-.001	15
478			min	-520.071	3	-.461	4	-41.782	2	-.005	5	-.103	2	-.005	6
479		12	max	1305.774	2	-.217	15	19.943	3	.005	2	.055	3	-.001	15
480			min	-520.25	3	-.922	4	-41.782	2	-.005	5	-.115	2	-.005	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	1305.536	2	-.325	15	19.943	3	.005	2	.061	3	-.001	15
482			min	-520.428	3	-1.382	4	-41.782	2	-.005	5	-.127	2	-.005	6
483		14	max	1305.298	2	-.433	15	19.943	3	.005	2	.067	3	-.001	15
484			min	-520.607	3	-1.843	4	-41.782	2	-.005	5	-.139	2	-.004	6
485		15	max	1305.06	2	-.542	15	19.943	3	.005	2	.072	3	0	15
486			min	-520.785	3	-2.304	4	-41.782	2	-.005	5	-.151	2	-.004	6
487		16	max	1304.822	2	-.65	15	19.943	3	.005	2	.078	3	0	15
488			min	-520.964	3	-2.765	4	-41.782	2	-.005	5	-.163	2	-.003	6
489		17	max	1304.584	2	-.758	15	19.943	3	.005	2	.084	3	0	15
490			min	-521.142	3	-3.225	4	-41.782	2	-.005	5	-.175	2	-.002	6
491		18	max	1304.346	2	-.866	15	19.943	3	.005	2	.09	3	0	15
492			min	-521.321	3	-3.686	4	-41.782	2	-.005	5	-.188	2	-.001	6
493		19	max	1304.108	2	-.975	15	19.943	3	.005	2	.096	3	0	1
494			min	-521.499	3	-4.147	4	-41.782	2	-.005	5	-.2	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	-.002	10	-.027	15	.011	1	5.228e-3	3	NC	3	NC	1
2			min	-.312	3	-.289	1	-.378	5	-1.336e-2	2	532.653	1	675.139	5
3		2	max	-.002	10	-.023	15	.003	1	5.228e-3	3	NC	2	NC	1
4			min	-.312	3	-.231	1	-.365	4	-1.336e-2	2	692.539	1	725.806	5
5		3	max	-.002	10	-.019	15	0	10	4.905e-3	3	NC	3	NC	1
6			min	-.312	3	-.173	1	-.352	4	-1.215e-2	2	871.144	14	788.314	5
7		4	max	-.002	10	-.016	15	-.001	10	4.408e-3	3	NC	3	NC	2
8			min	-.312	3	-.13	3	-.335	4	-1.029e-2	2	1000.144	14	879.166	5
9		5	max	-.002	10	-.012	15	-.002	10	3.912e-3	3	NC	3	NC	1
10			min	-.312	3	-.123	3	-.315	4	-8.43e-3	2	761.713	2	1009.472	5
11		6	max	-.002	10	.004	10	0	12	4.058e-3	3	NC	1	NC	1
12			min	-.312	3	-.109	3	-.294	4	-7.904e-3	2	631.483	2	1194.08	5
13		7	max	-.002	10	.021	2	0	3	4.647e-3	3	NC	5	NC	1
14			min	-.312	3	-.088	3	-.274	4	-8.301e-3	2	574.083	2	1447.87	5
15		8	max	-.002	10	.033	2	0	3	5.237e-3	3	NC	5	NC	1
16			min	-.312	3	-.06	3	-.255	4	-8.698e-3	2	547.593	2	1796.894	5
17		9	max	-.002	10	.039	2	0	10	6.002e-3	3	NC	5	NC	1
18			min	-.312	3	-.029	3	-.239	4	-8.548e-3	2	533.855	2	2279.881	5
19		10	max	-.002	10	.051	1	0	2	7.078e-3	3	NC	5	NC	1
20			min	-.312	3	.005	12	-.224	4	-7.432e-3	2	525.251	2	3113.969	5
21		11	max	-.001	10	.064	1	0	3	8.153e-3	3	NC	5	NC	1
22			min	-.312	3	.009	15	-.209	4	-6.315e-3	2	522.839	2	4768.59	5
23		12	max	-.001	10	.093	3	.003	3	6.949e-3	3	NC	5	NC	1
24			min	-.312	3	.012	15	-.196	4	-4.782e-3	2	527.448	2	8966.935	5
25		13	max	-.001	10	.149	3	.007	3	4.455e-3	3	NC	5	NC	1
26			min	-.312	3	.012	10	-.184	4	-3.334e-3	4	476.706	3	NC	1
27		14	max	-.001	10	.222	3	.007	3	2.106e-3	3	NC	5	NC	1
28			min	-.312	3	0	10	-.176	4	-4.356e-3	4	378.011	3	NC	1
29		15	max	-.001	10	.319	3	.005	1	6.188e-3	3	NC	5	NC	1
30			min	-.312	3	-.021	10	-.174	5	-3.706e-3	4	296.901	3	NC	1
31		16	max	-.001	10	.434	3	.006	1	1.027e-2	3	NC	5	NC	1
32			min	-.312	3	-.06	2	-.174	5	-5.266e-3	2	236.87	3	NC	1
33		17	max	-.001	10	.559	3	.004	1	1.435e-2	3	NC	4	NC	1
34			min	-.312	3	-.109	2	-.176	4	-7.236e-3	2	193.877	3	NC	1
35		18	max	-.001	10	.689	3	0	10	1.701e-2	3	NC	4	NC	1
36			min	-.312	3	-.161	2	-.179	4	-8.52e-3	2	163.222	3	NC	1
37		19	max	-.001	10	.819	3	-.001	10	1.701e-2	3	NC	1	NC	1
38			min	-.312	3	-.212	2	-.183	4	-8.52e-3	2	140.956	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	0	10	-.02	15	0	1	1.991e-4	4	NC	3	NC	1
40			min	-.506	3	-.651	2	-.375	4	0	1	373.603	1	676.442	4
41		2	max	0	10	-.016	15	0	1	1.991e-4	4	NC	2	NC	1
42			min	-.506	3	-.496	2	-.365	4	0	1	569.832	1	715.658	4
43		3	max	0	10	-.013	15	0	1	0	1	NC	11	NC	1
44			min	-.506	3	-.342	2	-.353	4	-1.321e-4	4	817.756	9	765.068	4
45		4	max	0	10	-.009	15	0	1	0	1	NC	1	NC	1
46			min	-.506	3	-.215	1	-.336	4	-6.4e-4	4	438.889	2	845.699	4
47		5	max	0	10	-.006	15	0	1	0	1	NC	15	NC	1
48			min	-.506	3	-.185	3	-.316	4	-1.148e-3	4	315.241	2	968.22	4
49		6	max	0	10	.007	10	0	1	0	1	NC	5	NC	1
50			min	-.506	3	-.176	3	-.294	4	-1.108e-3	4	266.839	2	1146.815	4
51		7	max	.001	10	.038	2	0	1	0	1	NC	5	NC	1
52			min	-.506	3	-.144	3	-.273	4	-6.88e-4	4	248.618	2	1393.781	4
53		8	max	.002	10	.05	2	0	1	0	1	NC	5	NC	1
54			min	-.506	3	-.097	3	-.255	4	-2.684e-4	4	242.923	2	1725.285	4
55		9	max	.002	10	.054	2	0	1	0	1	NC	4	NC	1
56			min	-.507	3	-.043	3	-.24	4	-4.137e-5	4	241.165	2	2153.445	4
57		10	max	.002	10	.072	1	0	1	0	1	NC	4	NC	1
58			min	-.507	3	.003	15	-.224	4	-1.548e-4	4	239.282	2	2897.88	4
59		11	max	.003	10	.092	1	0	1	0	1	NC	4	NC	1
60			min	-.507	3	.005	15	-.208	4	-2.682e-4	4	238.158	2	4296.501	4
61		12	max	.003	10	.147	3	0	1	0	1	NC	5	NC	1
62			min	-.508	3	.006	15	-.196	4	-1.239e-3	4	238.283	2	7087.964	4
63		13	max	.003	10	.237	3	0	1	0	1	NC	5	NC	1
64			min	-.508	3	.007	15	-.185	4	-2.695e-3	4	243.306	2	NC	1
65		14	max	.004	10	.365	3	0	1	0	1	NC	5	NC	1
66			min	-.508	3	-.006	10	-.179	4	-4.097e-3	4	260.143	2	NC	1
67		15	max	.004	10	.547	3	0	1	0	1	NC	5	NC	1
68			min	-.508	3	-.057	2	-.178	4	-3.118e-3	4	214.019	3	NC	1
69		16	max	.004	10	.77	3	0	1	0	1	NC	5	NC	1
70			min	-.508	3	-.153	2	-.178	4	-2.139e-3	4	157.819	3	NC	1
71		17	max	.004	10	1.018	3	0	1	0	1	NC	5	NC	1
72			min	-.508	3	-.266	2	-.178	4	-1.16e-3	4	122.155	3	NC	1
73		18	max	.004	10	1.275	3	0	1	0	1	NC	4	NC	1
74			min	-.508	3	-.384	2	-.178	4	-5.212e-4	4	98.984	3	NC	1
75		19	max	.004	10	1.531	3	0	1	0	1	NC	1	NC	1
76			min	-.508	3	-.502	2	-.177	4	-5.212e-4	4	83.235	3	NC	1
77	M7	1	max	.014	5	.003	5	-.002	10	1.336e-2	2	NC	3	NC	1
78			min	-.312	3	-.289	1	-.384	4	-5.228e-3	3	532.653	1	643.552	4
79		2	max	.014	5	.004	5	0	10	1.336e-2	2	NC	2	NC	1
80			min	-.312	3	-.231	1	-.367	4	-5.228e-3	3	692.539	1	701.56	4
81		3	max	.014	5	.004	5	.004	1	1.215e-2	2	NC	3	NC	1
82			min	-.312	3	-.173	1	-.349	4	-4.905e-3	3	932.643	9	772.463	4
83		4	max	.014	5	.005	5	.007	1	1.029e-2	2	NC	3	NC	2
84			min	-.312	3	-.13	3	-.331	5	-4.408e-3	3	1079.989	2	865.977	4
85		5	max	.013	5	.005	5	.007	1	8.43e-3	2	NC	3	NC	1
86			min	-.312	3	-.123	3	-.311	5	-3.912e-3	3	761.713	2	991.475	4
87		6	max	.013	5	.005	5	.005	1	7.904e-3	2	NC	1	NC	1
88			min	-.312	3	-.109	3	-.291	4	-4.058e-3	3	631.483	2	1160.955	4
89		7	max	.014	5	.021	2	.003	2	8.301e-3	2	NC	4	NC	1
90			min	-.312	3	-.088	3	-.273	4	-4.647e-3	3	574.083	2	1384.118	4
91		8	max	.014	5	.033	2	0	2	8.698e-3	2	NC	4	NC	1
92			min	-.312	3	-.06	3	-.255	4	-5.237e-3	3	547.593	2	1685.748	4
93		9	max	.014	5	.039	2	0	3	8.548e-3	2	NC	5	NC	1
94			min	-.312	3	-.029	3	-.239	4	-6.002e-3	3	533.855	2	2112.762	4
95		10	max	.014	5	.051	1	0	3	7.432e-3	2	NC	5	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
96			min	-.312	3	-.001	5	-.224	4	-7.078e-3	3	525.251	2	2807.93	4
97		11	max	.013	5	.064	1	0	2	6.315e-3	2	NC	5	NC	1
98			min	-.312	3	-.003	5	-.209	4	-8.153e-3	3	522.839	2	4095.228	4
99		12	max	.013	5	.093	3	.002	2	4.782e-3	2	NC	5	NC	1
100			min	-.312	3	-.005	5	-.195	4	-6.949e-3	3	527.448	2	7068.396	4
101		13	max	.013	5	.149	3	.004	2	3.013e-3	2	NC	5	NC	1
102			min	-.312	3	-.007	5	-.184	4	-4.455e-3	3	476.706	3	NC	1
103		14	max	.013	5	.222	3	.001	2	1.326e-3	2	NC	5	NC	1
104			min	-.312	3	-.01	5	-.178	4	-4.122e-3	5	378.011	3	NC	1
105		15	max	.013	5	.319	3	0	10	3.296e-3	2	NC	9	NC	1
106			min	-.312	3	-.021	10	-.177	4	-6.188e-3	3	296.901	3	NC	1
107		16	max	.013	5	.434	3	-.001	10	5.266e-3	2	NC	9	NC	1
108			min	-.312	3	-.06	2	-.178	4	-1.027e-2	3	236.87	3	NC	1
109		17	max	.013	5	.559	3	0	10	7.236e-3	2	NC	4	NC	1
110			min	-.312	3	-.109	2	-.178	4	-1.435e-2	3	193.877	3	NC	1
111		18	max	.013	5	.689	3	.003	1	8.52e-3	2	NC	4	NC	1
112			min	-.312	3	-.161	2	-.177	4	-1.701e-2	3	163.222	3	NC	1
113		19	max	.013	5	.819	3	.011	1	8.52e-3	2	NC	1	NC	1
114			min	-.312	3	-.212	2	-.178	5	-1.701e-2	3	140.956	3	NC	1
115	M10	1	max	0	3	.644	3	.312	3	1.742e-2	3	NC	1	NC	1
116			min	-.178	4	-.143	2	-.013	5	-6.916e-3	2	NC	1	NC	1
117		2	max	0	3	.806	3	.325	3	1.931e-2	3	NC	4	NC	1
118			min	-.178	4	-.223	2	-.012	5	-7.904e-3	2	1034.685	3	NC	1
119		3	max	0	3	.961	3	.347	3	2.12e-2	3	NC	4	NC	2
120			min	-.178	4	-.298	2	-.009	5	-8.893e-3	2	530.316	3	4803.283	1
121		4	max	0	3	1.089	3	.375	3	2.308e-2	3	NC	4	NC	4
122			min	-.178	4	-.357	2	-.004	5	-9.881e-3	2	377.208	3	2692.332	3
123		5	max	0	3	1.181	3	.406	3	2.497e-2	3	NC	4	NC	5
124			min	-.178	4	-.394	2	0	15	-1.087e-2	2	312.77	3	1803.53	3
125		6	max	0	3	1.232	3	.436	3	2.686e-2	3	NC	4	NC	5
126			min	-.178	4	-.408	2	.004	15	-1.186e-2	2	285.724	3	1355.686	3
127		7	max	0	3	1.245	3	.464	3	2.874e-2	3	NC	4	NC	5
128			min	-.178	4	-.401	2	.003	10	-1.285e-2	2	279.661	3	1105.183	3
129		8	max	0	3	1.229	3	.487	3	3.063e-2	3	NC	4	NC	2
130			min	-.178	4	-.379	2	0	10	-1.383e-2	2	287.132	3	960.596	3
131		9	max	0	3	1.202	3	.503	3	3.252e-2	3	NC	13	NC	2
132			min	-.178	4	-.355	2	-.002	10	-1.482e-2	2	301.229	3	883.195	3
133		10	max	0	1	1.186	3	.508	3	3.441e-2	3	NC	9	NC	2
134			min	-.178	4	-.343	2	-.004	10	-1.581e-2	2	309.9	3	857.903	3
135		11	max	0	10	1.202	3	.503	3	3.252e-2	3	NC	14	NC	2
136			min	-.178	4	-.355	2	-.002	10	-1.482e-2	2	301.229	3	883.195	3
137		12	max	0	10	1.229	3	.487	3	3.063e-2	3	NC	14	NC	2
138			min	-.178	4	-.379	2	0	10	-1.383e-2	2	287.132	3	960.596	3
139		13	max	0	10	1.245	3	.464	3	2.874e-2	3	NC	14	NC	5
140			min	-.178	4	-.401	2	.003	10	-1.285e-2	2	279.661	3	1105.183	3
141		14	max	0	10	1.232	3	.436	3	2.686e-2	3	NC	14	NC	5
142			min	-.178	4	-.408	2	.005	10	-1.186e-2	2	285.724	3	1355.686	3
143		15	max	0	10	1.181	3	.406	3	2.497e-2	3	NC	14	NC	5
144			min	-.178	4	-.394	2	.006	10	-1.087e-2	2	312.77	3	1803.53	3
145		16	max	0	10	1.089	3	.375	3	2.308e-2	3	NC	14	NC	5
146			min	-.178	4	-.357	2	.006	10	-9.881e-3	2	377.208	3	2692.332	3
147		17	max	0	10	.961	3	.347	3	2.12e-2	3	NC	14	NC	2
148			min	-.178	4	-.298	2	.005	10	-8.893e-3	2	530.316	3	4803.283	1
149		18	max	0	10	.806	3	.325	3	1.931e-2	3	NC	9	NC	1
150			min	-.178	4	-.223	2	.003	10	-7.904e-3	2	1034.685	3	NC	1
151		19	max	0	10	.644	3	.312	3	1.742e-2	3	NC	1	NC	1
152			min	-.178	4	-.143	2	.001	10	-6.916e-3	2	2380.389	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	0	2	.068	1	.312	3	6.066e-3	3	NC	1	NC	1
154			min	-.203	4	-.003	5	-.013	5	-3.795e-4	10	NC	1	NC	1
155		2	max	0	2	.146	3	.318	3	6.429e-3	3	NC	4	NC	1
156			min	-.204	4	-.011	10	0	15	-3.784e-4	10	2035.333	3	NC	1
157		3	max	0	2	.221	3	.337	3	6.792e-3	3	NC	4	NC	2
158			min	-.204	4	-.055	2	.004	15	-3.772e-4	10	1066.663	3	6053.549	1
159		4	max	0	2	.272	3	.363	3	7.155e-3	3	NC	4	NC	5
160			min	-.204	4	-.082	2	.006	15	-3.761e-4	10	802.331	3	3294.537	3
161		5	max	0	2	.293	3	.395	3	7.518e-3	3	NC	4	NC	5
162			min	-.204	4	-.087	2	.005	15	-3.749e-4	10	731.621	3	2037.481	3
163		6	max	0	2	.28	3	.427	3	7.881e-3	3	NC	4	NC	5
164			min	-.204	4	-.07	2	.003	15	-3.738e-4	10	775.863	3	1458.624	3
165		7	max	0	2	.238	3	.458	3	8.244e-3	3	NC	4	NC	5
166			min	-.204	4	-.037	2	.002	15	-3.726e-4	10	958.183	3	1151.893	3
167		8	max	0	2	.181	3	.484	3	8.607e-3	3	NC	1	NC	2
168			min	-.204	4	-.004	10	0	10	-3.714e-4	10	1421.901	3	980.563	3
169		9	max	0	2	.127	3	.501	3	8.97e-3	3	NC	2	NC	2
170			min	-.204	4	.004	15	-.002	10	-3.703e-4	10	2624.017	3	890.433	3
171		10	max	0	1	.102	3	.507	3	9.333e-3	3	NC	4	NC	2
172			min	-.204	4	.005	15	-.003	10	-3.691e-4	10	4320.562	3	861.107	3
173		11	max	0	3	.127	3	.501	3	8.97e-3	3	NC	2	NC	2
174			min	-.204	4	.006	15	-.002	10	-3.703e-4	10	2624.017	3	890.433	3
175		12	max	0	3	.181	3	.484	3	8.607e-3	3	NC	1	NC	2
176			min	-.204	4	-.004	10	0	10	-3.714e-4	10	1421.901	3	980.563	3
177		13	max	0	3	.238	3	.458	3	8.244e-3	3	NC	4	NC	5
178			min	-.204	4	-.037	2	.004	10	-3.726e-4	10	958.183	3	1151.893	3
179		14	max	0	3	.28	3	.427	3	7.881e-3	3	NC	4	NC	5
180			min	-.204	4	-.07	2	.006	10	-3.738e-4	10	775.863	3	1458.624	3
181		15	max	0	3	.293	3	.395	3	7.518e-3	3	NC	5	NC	4
182			min	-.204	4	-.087	2	.007	10	-3.749e-4	10	731.621	3	2037.481	3
183		16	max	0	3	.272	3	.363	3	7.155e-3	3	NC	5	NC	4
184			min	-.204	4	-.082	2	.007	10	-3.761e-4	10	802.331	3	3294.537	3
185		17	max	.001	3	.221	3	.337	3	6.792e-3	3	NC	5	NC	2
186			min	-.204	4	-.055	2	.005	10	-3.772e-4	10	1066.663	3	6053.549	1
187		18	max	.001	3	.146	3	.318	3	6.429e-3	3	NC	4	NC	1
188			min	-.204	4	-.011	10	.003	10	-3.784e-4	10	2035.333	3	NC	1
189		19	max	.001	3	.068	1	.312	3	6.066e-3	3	NC	1	NC	1
190			min	-.204	4	.01	15	.001	10	-3.795e-4	10	NC	1	NC	1
191	M12	1	max	0	2	.037	2	.312	3	4.33e-3	3	NC	1	NC	1
192			min	-.245	4	-.04	3	-.014	5	-2.096e-4	5	NC	1	NC	1
193		2	max	0	2	.009	3	.321	3	4.658e-3	3	NC	4	NC	1
194			min	-.245	4	-.046	2	0	15	-1.506e-4	5	2032.335	2	NC	1
195		3	max	0	2	.048	3	.341	3	4.985e-3	3	NC	4	NC	2
196			min	-.245	4	-.115	2	.003	10	-9.161e-5	5	1104.035	2	5775.596	3
197		4	max	0	2	.069	3	.368	3	5.313e-3	3	NC	4	NC	2
198			min	-.245	4	-.158	2	.005	10	-3.263e-5	5	860.156	2	2989.584	3
199		5	max	0	2	.071	3	.399	3	5.64e-3	3	NC	4	NC	5
200			min	-.245	4	-.169	2	.005	10	1.048e-5	15	817.812	2	1927.983	3
201		6	max	0	2	.055	3	.431	3	5.967e-3	3	NC	4	NC	5
202			min	-.245	4	-.146	2	.003	15	4.99e-5	15	921.204	2	1414.919	3
203		7	max	0	2	.024	3	.46	3	6.295e-3	3	NC	4	NC	2
204			min	-.245	4	-.096	2	0	15	8.084e-5	10	1267.534	2	1135.252	3
205		8	max	0	2	.002	4	.484	3	6.622e-3	3	NC	4	NC	2
206			min	-.245	4	-.032	2	0	15	5.234e-5	10	2439.462	2	976.373	3
207		9	max	0	2	.026	2	.501	3	6.95e-3	3	NC	1	NC	2
208			min	-.245	4	-.048	3	0	10	2.384e-5	10	NC	1	892.032	3
209		10	max	0	1	.052	2	.507	3	7.277e-3	3	NC	1	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
210			min	-.245	4	-.063	3	-.002	10	-4.653e-6	10	7456.198	3	864.523	3
211		11	max	0	3	.026	2	.501	3	6.95e-3	3	NC	1	NC	2
212			min	-.245	4	-.048	3	0	10	2.384e-5	10	NC	1	892.032	3
213		12	max	0	3	0	9	.484	3	6.622e-3	3	NC	4	NC	2
214			min	-.245	4	-.032	2	.001	10	5.234e-5	10	2439.462	2	976.373	3
215		13	max	0	3	.024	3	.46	3	6.295e-3	3	NC	4	NC	2
216			min	-.245	4	-.096	2	.003	10	8.084e-5	10	1267.534	2	1135.252	3
217		14	max	0	3	.055	3	.431	3	5.967e-3	3	NC	5	NC	5
218			min	-.245	4	-.146	2	.005	10	1.093e-4	10	921.204	2	1414.919	3
219		15	max	0	3	.071	3	.399	3	5.64e-3	3	NC	5	NC	4
220			min	-.245	4	-.169	2	.005	10	1.378e-4	10	817.812	2	1927.983	3
221		16	max	0	3	.069	3	.368	3	5.313e-3	3	NC	5	NC	2
222			min	-.245	4	-.158	2	.005	10	1.663e-4	10	860.156	2	2989.584	3
223		17	max	0	3	.048	3	.341	3	4.985e-3	3	NC	5	NC	2
224			min	-.245	4	-.115	2	.003	10	1.948e-4	10	1104.035	2	5775.596	3
225		18	max	0	3	.009	3	.321	3	4.658e-3	3	NC	4	NC	1
226			min	-.245	4	-.046	2	.002	10	2.233e-4	10	2032.335	2	NC	1
227		19	max	0	3	.037	2	.312	3	4.33e-3	3	NC	1	NC	1
228			min	-.245	4	-.04	3	.002	10	2.518e-4	10	NC	1	NC	1
229	M13	1	max	0	10	.004	5	.312	3	8.734e-3	2	NC	1	NC	1
230			min	-.361	4	-.211	1	-.014	5	4.179e-5	3	NC	1	NC	1
231		2	max	0	10	.002	5	.325	3	1.006e-2	2	NC	4	NC	1
232			min	-.361	4	-.316	2	0	15	-4.451e-4	3	1350.51	2	NC	1
233		3	max	0	10	0	15	.347	3	1.139e-2	2	NC	5	NC	2
234			min	-.361	4	-.428	2	.006	10	-9.32e-4	3	712.777	2	4707.977	1
235		4	max	0	10	-.003	15	.375	3	1.272e-2	2	NC	5	NC	10
236			min	-.361	4	-.511	2	.008	10	-1.419e-3	3	526.031	2	2677.65	3
237		5	max	0	10	-.005	15	.405	3	1.405e-2	2	NC	5	NC	5
238			min	-.361	4	-.559	2	.008	15	-1.906e-3	3	457.235	2	1805.566	3
239		6	max	0	10	-.008	15	.435	3	1.538e-2	2	NC	5	NC	5
240			min	-.361	4	-.57	2	.006	15	-2.393e-3	3	443.978	2	1363.152	3
241		7	max	0	10	-.01	15	.463	3	1.671e-2	2	NC	5	NC	5
242			min	-.361	4	-.549	2	.004	15	-2.88e-3	3	470.121	2	1114.616	3
243		8	max	0	10	-.012	15	.485	3	1.804e-2	2	NC	5	NC	2
244			min	-.361	4	-.508	2	.003	10	-3.367e-3	3	531.806	2	970.786	3
245		9	max	0	10	-.014	15	.5	3	1.937e-2	2	NC	5	NC	2
246			min	-.361	4	-.464	2	0	10	-3.853e-3	3	617.233	2	893.691	3
247		10	max	0	1	-.015	15	.506	3	2.07e-2	2	NC	3	NC	2
248			min	-.361	4	-.443	2	0	10	-4.34e-3	3	669.698	2	868.499	3
249		11	max	0	1	-.017	15	.5	3	1.937e-2	2	NC	5	NC	2
250			min	-.361	4	-.464	2	0	10	-3.853e-3	3	617.233	2	893.691	3
251		12	max	0	1	-.019	15	.485	3	1.804e-2	2	NC	5	NC	2
252			min	-.361	4	-.508	2	.003	10	-3.367e-3	3	531.806	2	970.786	3
253		13	max	0	1	-.022	15	.463	3	1.671e-2	2	NC	5	NC	5
254			min	-.361	4	-.549	2	.006	10	-2.88e-3	3	470.121	2	1114.616	3
255		14	max	0	1	-.016	12	.435	3	1.538e-2	2	NC	5	NC	5
256			min	-.361	4	-.57	2	.008	10	-2.393e-3	3	443.978	2	1363.152	3
257		15	max	0	1	-.01	12	.405	3	1.405e-2	2	NC	5	NC	4
258			min	-.361	4	-.559	2	.008	10	-1.906e-3	3	457.235	2	1805.566	3
259		16	max	0	1	-.014	12	.375	3	1.272e-2	2	NC	5	NC	4
260			min	-.361	4	-.511	2	.008	10	-1.419e-3	3	526.031	2	2677.65	3
261		17	max	0	1	-.026	15	.347	3	1.139e-2	2	NC	5	NC	2
262			min	-.361	4	-.428	2	.006	10	-9.32e-4	3	712.777	2	4707.977	1
263		18	max	0	1	-.025	15	.325	3	1.006e-2	2	NC	4	NC	1
264			min	-.361	4	-.316	2	.004	10	-4.451e-4	3	1350.51	2	NC	1
265		19	max	0	1	-.022	15	.312	3	8.734e-3	2	NC	1	NC	1
266			min	-.361	4	-.211	1	.002	10	4.179e-5	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	10	0	5	3.363e-3	2	NC	1	NC	1
270			min	0	2	-.002	3	0	2	-5.644e-3	5	NC	1	NC	1
271		3	max	0	3	0	10	.004	5	3.093e-3	2	NC	1	NC	1
272			min	0	2	-.007	3	0	2	-5.479e-3	5	NC	1	NC	1
273		4	max	0	3	0	10	.008	5	2.823e-3	2	NC	1	NC	1
274			min	0	2	-.015	3	-.001	2	-5.314e-3	5	4761.591	3	9373.96	5
275		5	max	0	3	0	10	.014	5	2.553e-3	2	NC	2	NC	1
276			min	0	2	-.027	3	-.002	2	-5.149e-3	5	2756.908	3	5441.911	5
277		6	max	0	3	0	10	.021	5	2.283e-3	2	NC	2	NC	1
278			min	0	2	-.041	3	-.003	2	-4.984e-3	5	1810.048	3	3588.2	5
279		7	max	0	3	0	10	.029	5	2.013e-3	2	NC	2	NC	1
280			min	0	2	-.057	3	-.004	2	-4.819e-3	5	1287.642	3	2565.639	5
281		8	max	0	3	0	10	.038	5	1.743e-3	2	NC	2	NC	1
282			min	0	2	-.076	3	-.004	2	-4.654e-3	5	968.377	3	1940.394	5
283		9	max	0	3	0	10	.048	5	1.474e-3	2	NC	2	NC	1
284			min	0	2	-.097	3	-.005	2	-4.489e-3	5	758.826	3	1529.666	5
285		10	max	0	3	0	10	.059	5	1.204e-3	2	NC	10	NC	1
286			min	0	2	-.12	3	-.006	2	-4.323e-3	5	613.708	3	1244.971	5
287		11	max	0	3	0	10	.071	5	9.337e-4	2	NC	10	NC	1
288			min	0	2	-.145	3	-.006	2	-4.169e-3	4	508.942	3	1039.27	5
289		12	max	0	3	0	10	.083	5	6.638e-4	2	NC	10	NC	1
290			min	0	2	-.171	3	-.007	2	-4.024e-3	4	430.766	3	885.682	5
291		13	max	0	3	0	10	.096	5	4.645e-4	3	NC	10	NC	1
292			min	0	2	-.199	3	-.007	2	-3.88e-3	4	370.844	3	767.917	5
293		14	max	.001	3	0	10	.109	5	6.567e-4	3	NC	10	NC	1
294			min	-.001	2	-.227	3	-.006	2	-3.736e-3	4	323.873	3	675.624	5
295		15	max	.001	3	0	10	.122	5	8.49e-4	3	NC	10	NC	1
296			min	-.001	2	-.257	3	-.006	2	-3.592e-3	4	286.375	3	601.99	5
297		16	max	.001	3	0	10	.136	5	1.041e-3	3	NC	10	NC	1
298			min	-.001	2	-.288	3	-.005	1	-3.448e-3	4	255.964	3	542.35	5
299		17	max	.001	3	0	10	.149	4	1.234e-3	3	NC	10	NC	1
300			min	-.001	2	-.319	3	-.004	1	-3.304e-3	4	230.968	3	493.079	4
301		18	max	.001	3	0	10	.163	4	1.426e-3	3	NC	10	NC	1
302			min	-.001	2	-.351	3	-.003	1	-3.16e-3	4	210.186	3	452.15	4
303		19	max	.001	3	0	10	.176	4	1.618e-3	3	NC	10	NC	1
304			min	-.001	2	-.382	3	-.007	3	-3.016e-3	4	192.735	3	417.906	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	10	0	4	0	1	NC	1	NC	1
308			min	0	2	-.003	3	0	1	-5.918e-3	4	NC	1	NC	1
309		3	max	0	3	0	10	.004	4	0	1	NC	1	NC	1
310			min	0	2	-.012	3	0	1	-5.728e-3	4	6244.802	3	NC	1
311		4	max	0	3	0	10	.008	4	0	1	NC	1	NC	1
312			min	0	2	-.025	3	0	1	-5.537e-3	4	2900.402	3	9039.225	4
313		5	max	0	3	0	10	.014	4	0	1	NC	2	NC	1
314			min	0	2	-.044	3	0	1	-5.346e-3	4	1683.322	3	5251.276	4
315		6	max	.001	3	.001	10	.021	4	0	1	NC	2	NC	1
316			min	-.001	2	-.067	3	0	1	-5.155e-3	4	1106.581	3	3465.053	4
317		7	max	.001	3	.001	10	.03	4	0	1	NC	2	NC	1
318			min	-.001	2	-.094	3	0	1	-4.965e-3	4	787.81	3	2479.512	4
319		8	max	.002	3	.002	10	.039	4	0	1	NC	2	NC	1
320			min	-.002	2	-.124	3	0	1	-4.774e-3	4	592.779	3	1876.806	4
321		9	max	.002	3	.002	10	.05	4	0	1	NC	2	NC	1
322			min	-.002	2	-.159	3	0	1	-4.583e-3	4	464.673	3	1480.837	4
323		10	max	.002	3	.002	10	.061	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	-.196	3	0	1	-4.393e-3	4	375.909	3	1206.355	4
325		11	max	.002	3	.003	10	.073	4	0	1	NC	10	NC	1
326			min	-.002	2	-.236	3	0	1	-4.202e-3	4	311.802	3	1008.037	4
327		12	max	.003	3	.003	10	.086	4	0	1	NC	10	NC	1
328			min	-.002	2	-.279	3	0	1	-4.011e-3	4	263.95	3	859.976	4
329		13	max	.003	3	.003	10	.099	4	0	1	NC	10	NC	1
330			min	-.003	2	-.324	3	0	1	-3.82e-3	4	227.262	3	746.474	4
331		14	max	.003	3	.004	10	.112	4	0	1	NC	10	NC	1
332			min	-.003	2	-.371	3	0	1	-3.63e-3	4	198.498	3	657.556	4
333		15	max	.003	3	.004	10	.126	4	0	1	NC	10	NC	1
334			min	-.003	2	-.42	3	0	1	-3.439e-3	4	175.531	3	586.654	4
335		16	max	.004	3	.005	10	.139	4	0	1	NC	10	NC	1
336			min	-.003	2	-.47	3	0	1	-3.248e-3	4	156.903	3	529.272	4
337		17	max	.004	3	.005	10	.153	4	0	1	NC	10	NC	1
338			min	-.003	2	-.52	3	0	1	-3.057e-3	4	141.589	3	482.259	4
339		18	max	.004	3	.006	10	.166	4	0	1	NC	10	NC	1
340			min	-.004	2	-.572	3	0	1	-2.867e-3	4	128.855	3	443.352	4
341		19	max	.004	3	.006	10	.179	4	0	1	NC	10	NC	1
342			min	-.004	2	-.624	3	0	1	-2.676e-3	4	118.163	3	410.895	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	1.651e-3	3	NC	1	NC	1
346			min	0	2	-.002	3	0	3	-6.014e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	1.458e-3	3	NC	1	NC	1
348			min	0	2	-.007	3	0	3	-5.811e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.008	4	1.266e-3	3	NC	1	NC	1
350			min	0	2	-.015	3	-.002	3	-5.609e-3	4	4761.591	3	9123.522	4
351		5	max	0	3	.001	5	.014	4	1.074e-3	3	NC	2	NC	1
352			min	0	2	-.027	3	-.003	3	-5.406e-3	4	2756.908	3	5300.777	4
353		6	max	0	3	.002	5	.021	4	8.814e-4	3	NC	2	NC	1
354			min	0	2	-.041	3	-.004	3	-5.204e-3	4	1810.048	3	3497.869	4
355		7	max	0	3	.002	5	.029	4	6.892e-4	3	NC	2	NC	1
356			min	0	2	-.057	3	-.006	3	-5.001e-3	4	1287.642	3	2503.027	4
357		8	max	0	3	.003	5	.039	4	4.969e-4	3	NC	2	NC	1
358			min	0	2	-.076	3	-.007	3	-4.799e-3	4	968.377	3	1894.593	4
359		9	max	0	3	.004	5	.049	4	3.046e-4	3	NC	2	NC	1
360			min	0	2	-.097	3	-.008	3	-4.596e-3	4	758.826	3	1494.841	4
361		10	max	0	3	.005	5	.061	4	1.124e-4	3	NC	5	NC	1
362			min	0	2	-.12	3	-.009	3	-4.394e-3	4	613.708	3	1217.725	4
363		11	max	0	3	.006	5	.072	4	-2.198e-5	9	NC	5	NC	1
364			min	0	2	-.145	3	-.009	3	-4.191e-3	4	508.942	3	1017.495	4
365		12	max	0	3	.007	5	.085	4	3.546e-5	9	NC	7	NC	1
366			min	0	2	-.171	3	-.01	3	-3.989e-3	4	430.766	3	868.001	4
367		13	max	0	3	.009	5	.098	4	9.29e-5	9	NC	10	NC	1
368			min	0	2	-.199	3	-.009	3	-3.804e-3	5	370.844	3	753.397	4
369		14	max	.001	3	.01	5	.111	4	1.503e-4	9	NC	10	NC	1
370			min	-.001	2	-.227	3	-.009	3	-3.624e-3	5	323.873	3	663.61	4
371		15	max	.001	3	.011	5	.124	4	3.177e-4	1	NC	10	NC	1
372			min	-.001	2	-.257	3	-.007	3	-3.444e-3	5	286.375	3	592.01	4
373		16	max	.001	3	.012	5	.138	4	5.203e-4	1	NC	10	NC	1
374			min	-.001	2	-.288	3	-.005	3	-3.264e-3	5	255.964	3	534.058	4
375		17	max	.001	3	.014	5	.151	4	7.229e-4	1	NC	10	NC	1
376			min	-.001	2	-.319	3	-.002	3	-3.084e-3	5	230.968	3	486.574	4
377		18	max	.001	3	.015	5	.165	4	9.557e-4	2	NC	10	NC	1
378			min	-.001	2	-.351	3	0	10	-2.904e-3	5	210.186	3	447.272	4
379		19	max	.001	3	.017	5	.178	4	1.226e-3	2	NC	10	NC	1
380			min	-.001	2	-.382	3	-.002	2	-2.724e-3	5	192.735	3	414.48	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	0	3	0	10	0	5	1.884e-3	2	NC	1	NC	1
382			min	0	2	0	3	0	2	-2.934e-3	5	NC	1	NC	1
383		2	max	0	3	0	10	.018	5	1.938e-3	2	NC	1	NC	3
384			min	0	2	-.019	3	-.01	2	-2.877e-3	5	NC	1	5911.918	2
385		3	max	.001	3	-.001	10	.036	5	1.992e-3	2	NC	1	NC	4
386			min	0	2	-.038	3	-.021	2	-2.82e-3	5	NC	1	2936.46	2
387		4	max	.001	3	-.002	10	.055	5	2.046e-3	2	NC	1	NC	4
388			min	-.001	2	-.057	3	-.031	2	-2.763e-3	5	NC	1	1960.645	2
389		5	max	.001	3	-.003	10	.074	5	2.101e-3	2	NC	1	NC	4
390			min	-.002	2	-.076	3	-.041	2	-2.706e-3	5	NC	1	1484.851	2
391		6	max	.002	3	-.003	10	.093	5	2.155e-3	2	NC	1	NC	4
392			min	-.002	2	-.095	3	-.051	2	-2.649e-3	5	NC	1	1209.645	2
393		7	max	.002	3	-.004	10	.112	5	2.209e-3	2	NC	1	NC	13
394			min	-.003	2	-.114	3	-.059	2	-2.592e-3	5	NC	1	1035.683	2
395		8	max	.002	3	-.004	10	.132	5	2.263e-3	2	NC	1	9434.375	13
396			min	-.003	2	-.132	3	-.066	2	-2.535e-3	5	NC	1	920.905	2
397		9	max	.002	3	-.004	10	.151	5	2.317e-3	2	NC	1	7866.42	13
398			min	-.004	2	-.151	3	-.072	2	-2.478e-3	5	NC	1	844.908	2
399		10	max	.002	3	-.005	10	.17	5	2.371e-3	2	NC	1	6860.915	13
400			min	-.004	2	-.169	3	-.077	2	-2.42e-3	5	NC	1	797.185	2
401		11	max	.002	3	-.005	10	.188	5	2.425e-3	2	NC	1	6225.939	13
402			min	-.004	2	-.188	3	-.079	2	-2.363e-3	5	NC	1	731.821	14
403		12	max	.003	3	-.005	10	.206	5	2.479e-3	2	NC	1	5865.977	13
404			min	-.005	2	-.206	3	-.079	2	-2.306e-3	5	NC	1	661.169	14
405		13	max	.003	3	-.005	10	.223	5	2.533e-3	2	NC	1	5743.717	13
406			min	-.005	2	-.225	3	-.076	2	-2.249e-3	5	NC	1	603.052	14
407		14	max	.003	3	-.005	10	.239	5	2.587e-3	2	NC	1	5871.619	13
408			min	-.006	2	-.243	3	-.071	2	-2.192e-3	5	NC	1	554.538	14
409		15	max	.003	3	-.005	10	.255	5	2.641e-3	2	NC	1	6331.985	13
410			min	-.006	2	-.261	3	-.063	2	-2.135e-3	5	NC	1	513.538	14
411		16	max	.003	3	-.005	10	.269	5	2.695e-3	2	NC	1	7363.102	13
412			min	-.007	2	-.279	3	-.052	2	-2.078e-3	5	NC	1	478.525	14
413		17	max	.003	3	-.005	10	.282	5	2.749e-3	2	NC	1	9723.471	13
414			min	-.007	2	-.298	3	-.037	2	-2.021e-3	5	NC	1	448.355	14
415		18	max	.004	3	-.004	10	.295	4	2.803e-3	2	NC	1	NC	4
416			min	-.008	2	-.316	3	-.018	2	-1.964e-3	5	NC	1	422.16	14
417		19	max	.004	3	-.004	10	.306	4	2.857e-3	2	NC	1	NC	1
418			min	-.008	2	-.334	3	.002	12	-1.907e-3	5	NC	1	399.263	14
419	M6	1	max	.001	3	0	10	0	4	0	1	NC	1	NC	1
420			min	0	2	0	3	0	1	-3.083e-3	4	NC	1	NC	1
421		2	max	.002	3	0	10	.019	4	0	1	NC	1	NC	1
422			min	-.002	2	-.031	3	0	1	-3.035e-3	4	NC	1	NC	1
423		3	max	.003	3	-.001	10	.038	4	0	1	NC	1	NC	1
424			min	-.003	2	-.061	3	0	1	-2.987e-3	4	NC	1	NC	1
425		4	max	.003	3	-.002	10	.057	4	0	1	NC	1	NC	1
426			min	-.004	2	-.091	3	0	1	-2.938e-3	4	NC	1	NC	1
427		5	max	.004	3	-.003	10	.077	4	0	1	NC	1	NC	1
428			min	-.006	2	-.122	3	0	1	-2.89e-3	4	NC	1	7191.044	4
429		6	max	.004	3	-.003	10	.097	4	0	1	NC	1	NC	1
430			min	-.007	2	-.152	3	0	1	-2.842e-3	4	NC	1	5324.626	4
431		7	max	.005	3	-.004	10	.117	4	0	1	NC	1	NC	1
432			min	-.008	2	-.182	3	0	1	-2.793e-3	4	NC	1	4218.564	4
433		8	max	.006	3	-.004	10	.137	4	0	1	NC	1	NC	1
434			min	-.009	2	-.212	3	0	1	-2.745e-3	4	NC	1	3517.392	4
435		9	max	.006	3	-.005	10	.157	4	0	1	NC	1	NC	1
436			min	-.011	2	-.242	3	0	1	-2.697e-3	4	NC	1	3056.954	4
437		10	max	.007	3	-.005	10	.176	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	-.012	2	-.272	3	0	1	-2.648e-3	4	NC	1	2754.038	4
439		11	max	.008	3	-.005	10	.195	4	0	1	NC	1	NC	1
440			min	-.013	2	-.301	3	0	1	-2.6e-3	4	NC	1	2564.954	4
441		12	max	.008	3	-.005	10	.213	4	0	1	NC	1	NC	1
442			min	-.015	2	-.331	3	0	1	-2.552e-3	4	NC	1	2468.584	4
443		13	max	.009	3	-.005	10	.23	4	0	1	NC	1	NC	1
444			min	-.016	2	-.361	3	0	1	-2.503e-3	4	NC	1	2460.232	4
445		14	max	.01	3	-.006	10	.246	4	0	1	NC	1	NC	1
446			min	-.017	2	-.391	3	0	1	-2.455e-3	4	NC	1	2552.739	4
447		15	max	.01	3	-.005	10	.261	4	0	1	NC	1	NC	1
448			min	-.019	2	-.42	3	0	1	-2.407e-3	4	NC	1	2788.015	4
449		16	max	.011	3	-.005	10	.275	4	0	1	NC	1	NC	1
450			min	-.02	2	-.45	3	0	1	-2.358e-3	4	NC	1	3277.549	4
451		17	max	.012	3	-.005	10	.287	4	0	1	NC	1	NC	1
452			min	-.021	2	-.479	3	0	1	-2.31e-3	4	NC	1	4369.28	4
453		18	max	.012	3	-.005	10	.298	4	0	1	NC	1	NC	1
454			min	-.022	2	-.509	3	0	1	-2.262e-3	4	NC	1	7821.038	4
455		19	max	.013	3	-.005	10	.307	4	0	1	NC	1	NC	1
456			min	-.024	2	-.538	3	0	1	-2.214e-3	4	NC	1	NC	1
457	M9	1	max	0	3	0	5	0	4	9.015e-4	3	NC	1	NC	1
458			min	0	2	0	3	0	3	-3.14e-3	4	NC	1	NC	1
459		2	max	0	3	0	5	.019	4	9.428e-4	3	NC	1	NC	3
460			min	0	2	-.019	3	-.005	3	-3.084e-3	4	NC	1	5911.918	2
461		3	max	.001	3	.001	5	.038	4	9.841e-4	3	NC	1	NC	4
462			min	0	2	-.038	3	-.011	3	-3.028e-3	4	NC	1	2936.46	2
463		4	max	.001	3	.002	5	.058	4	1.025e-3	3	NC	1	NC	5
464			min	-.001	2	-.057	3	-.016	3	-2.972e-3	4	NC	1	1960.645	2
465		5	max	.001	3	.002	5	.078	4	1.067e-3	3	NC	1	NC	15
466			min	-.002	2	-.076	3	-.021	3	-2.916e-3	4	NC	1	1484.851	2
467		6	max	.002	3	.003	5	.099	4	1.108e-3	3	NC	1	8664.911	15
468			min	-.002	2	-.095	3	-.026	3	-2.86e-3	4	NC	1	1209.645	2
469		7	max	.002	3	.004	5	.119	4	1.149e-3	3	NC	1	6817.797	15
470			min	-.003	2	-.114	3	-.03	3	-2.804e-3	4	NC	1	1035.683	2
471		8	max	.002	3	.004	5	.139	4	1.191e-3	3	NC	1	5654.602	15
472			min	-.003	2	-.132	3	-.034	3	-2.748e-3	4	NC	1	920.905	2
473		9	max	.002	3	.005	5	.159	4	1.232e-3	3	NC	1	4893.904	15
474			min	-.004	2	-.151	3	-.037	3	-2.691e-3	4	NC	1	844.908	2
475		10	max	.002	3	.006	5	.178	4	1.273e-3	3	NC	1	4475.474	9
476			min	-.004	2	-.169	3	-.039	3	-2.635e-3	4	NC	1	797.185	2
477		11	max	.002	3	.007	5	.197	4	1.315e-3	3	NC	1	4336.5	9
478			min	-.004	2	-.188	3	-.04	3	-2.579e-3	4	9554.37	5	772.622	2
479		12	max	.003	3	.007	5	.215	4	1.356e-3	3	NC	1	4319.646	9
480			min	-.005	2	-.206	3	-.041	3	-2.523e-3	4	8447.789	5	769.795	2
481		13	max	.003	3	.008	5	.232	4	1.397e-3	3	NC	1	4436.651	9
482			min	-.005	2	-.225	3	-.04	3	-2.533e-3	2	7534.439	5	790.812	2
483		14	max	.003	3	.009	5	.247	4	1.439e-3	3	NC	1	4727.213	9
484			min	-.006	2	-.243	3	-.037	3	-2.587e-3	2	6771.779	5	842.767	2
485		15	max	.003	3	.01	5	.262	4	1.48e-3	3	NC	1	5285.572	9
486			min	-.006	2	-.261	3	-.034	3	-2.641e-3	2	6128.981	5	942.48	2
487		16	max	.003	3	.011	5	.274	4	1.521e-3	3	NC	1	6344.748	9
488			min	-.007	2	-.279	3	-.029	3	-2.695e-3	2	5583.108	5	1131.533	2
489		17	max	.003	3	.012	5	.286	4	1.563e-3	3	NC	1	8617.244	9
490			min	-.007	2	-.298	3	-.022	3	-2.749e-3	2	5116.727	5	1537.053	2
491		18	max	.004	3	.013	5	.295	4	1.604e-3	3	NC	1	NC	9
492			min	-.008	2	-.316	3	-.013	3	-2.803e-3	2	4716.354	5	2798.03	2
493		19	max	.004	3	.014	5	.303	4	1.645e-3	3	NC	1	NC	1
494			min	-.008	2	-.334	3	-.006	1	-2.857e-3	2	4371.411	5	NC	1