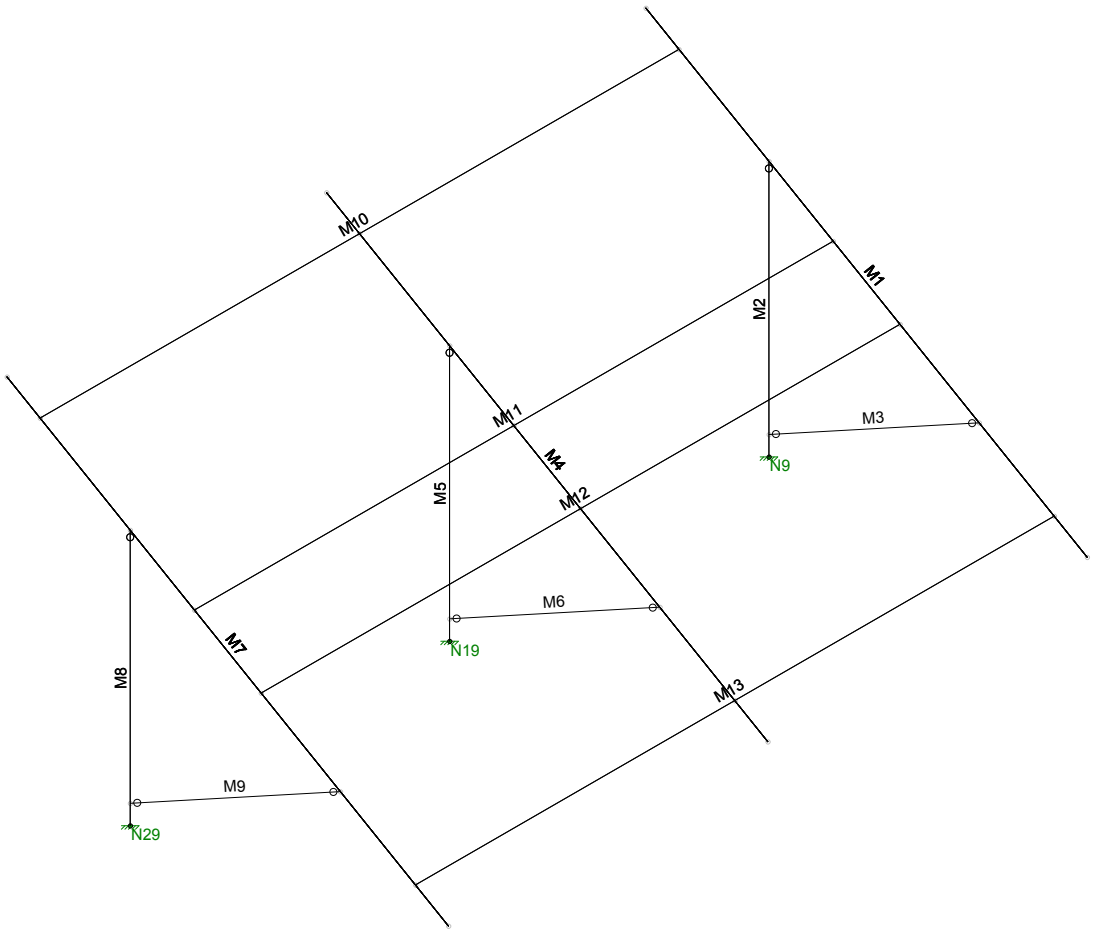


Schletter, Inc.		30° Tilt w/ Seismic Design
HCV	Standard FS Racking System	
	Representative Calculations - ASCE 7-05	

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.

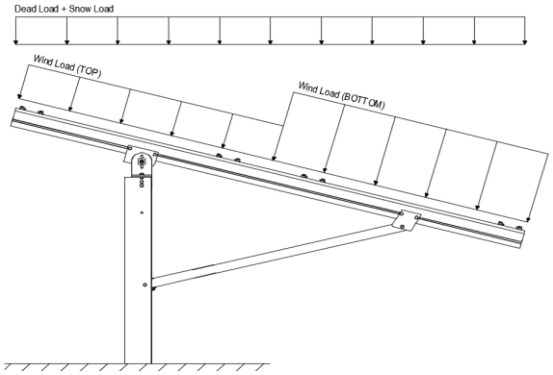
1.2 Construction

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 =	30°
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 =	16.49	psf	*(ASCE 7-05, Eq. 7-2)*
I_s =	1.00		
C_s =	0.73		
C_e =	0.90		
C_t =	1.20		

2.3 Wind Loads

Design Wind Speed, V =	110	mph	Exposure Category = C
Height <	15	ft	Importance Category = II
Peak Velocity Pressure, q_z =	19.00	psf	*Including the gust factor, G=0.85. (ASCE 7-05, Eq. 6-15)*

Pressure Coefficients

$Cf+_{TOP}$ =	1.15	*(Pressure)*	*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.*
$Cf+_{BOTTOM}$ =	1.85		
$Cf-_{TOP}$ =	-2.3	*(Suction)*	
$Cf-_{BOTTOM}$ =	-1.1		

2.4 Seismic Loads

S_S =	2.50	R =	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.*
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	

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

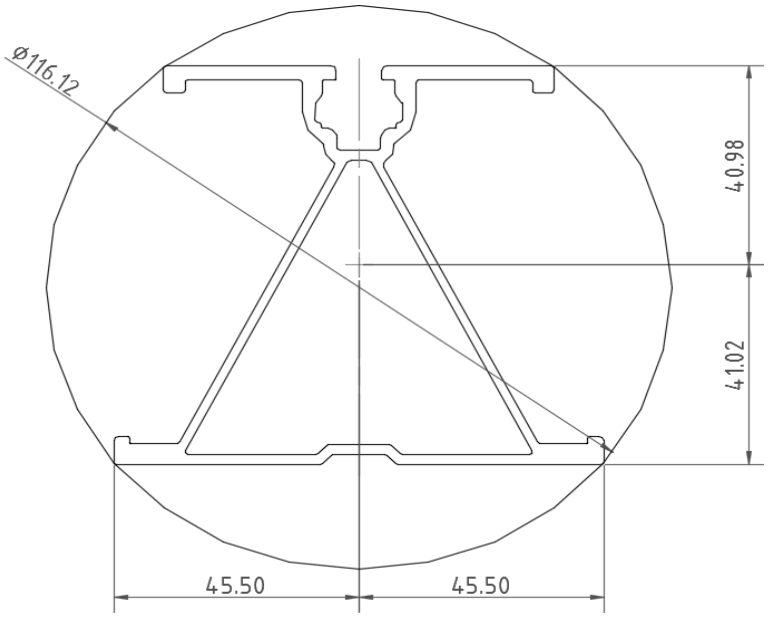
Struts	Location
M3	Outer
M6	Inner
M9	Outer

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 =	108	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 =	1.702	k-ft
M_z =	0.092	k-ft
$M_{y\ allowable}$ =	2.779	k-ft
$M_{z\ allowable}$ =	1.154	k-ft
Utilization =	69%	

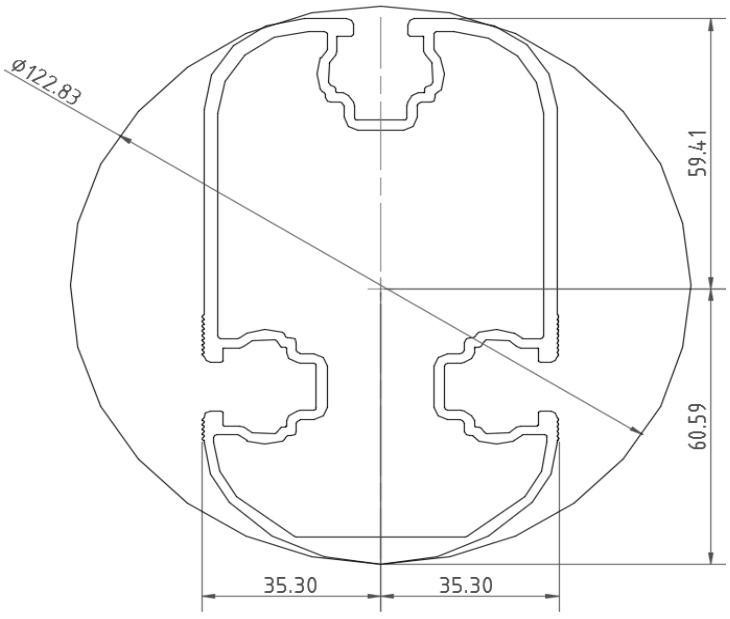


DETAIL VIEW

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 =	4.356	k-ft
M_z =	0.000	k-ft
P_n =	0.002	k
$M_{y\ allowable}$ =	5.026	k-ft
$M_{z\ allowable}$ =	3.472	k-ft
$P_{n\ allowable}$ =	59.439	k
Utilization =	87%	

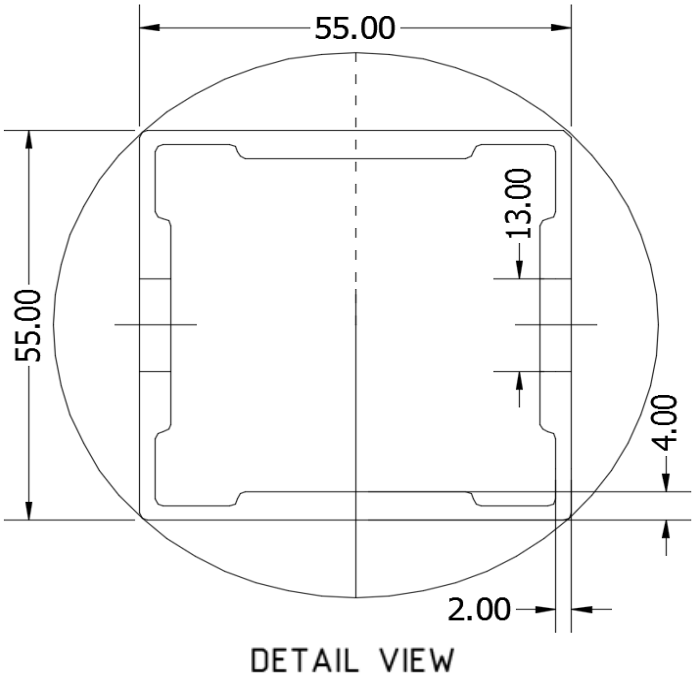


DETAIL VIEW

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).

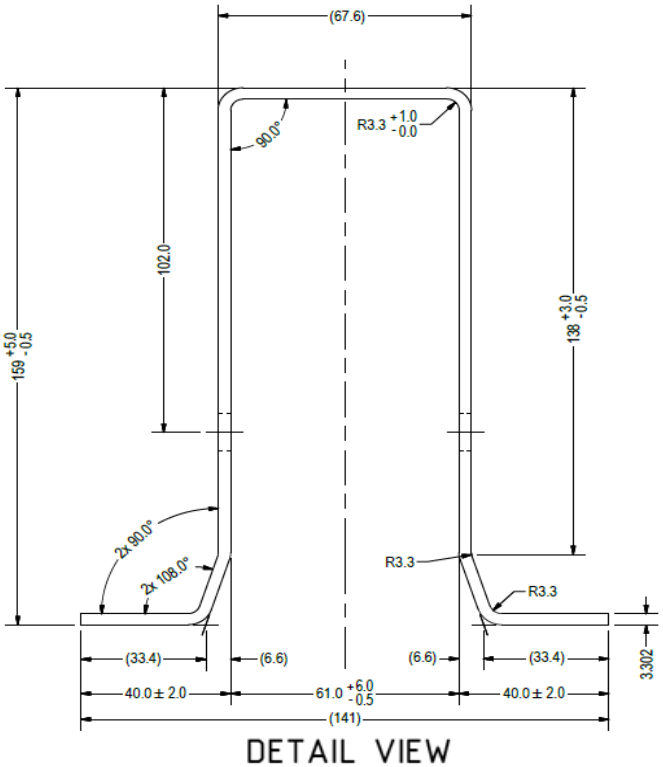
Strut Type =	**55x55**	
Aluminum Type =	6105-T5	
F_{ty} =	35	ksi
L_b =	61.00	in
$\Phi F_{ty\ AXIAL}$ =	13.67	ksi
$\Phi F_{ty\ BENDING}$ =	28.22	ksi
S_y =	0.60	in^3
S_x =	0.60	in^3
E =	10100	ksi
I_y =	0.67	in^4
I_x =	0.67	in^4
A =	0.98	in^2
g =	1.18	lbs/ft
M_y =	0.004	k-ft
M_z =	0.000	k-ft
P_n =	4.405	k
$M_{y\ allowable}$ =	1.408	k-ft
$M_{z\ allowable}$ =	1.408	k-ft
$P_{n\ allowable}$ =	13.425	k
Utilization =	33%	



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 =	79.31	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 =	13.722	k-ft
M_z =	0.000	k-ft
P_r =	-5.132	k
$M_{y\ allowable}$ =	19.207	k-ft
$M_{z\ allowable}$ =	14.389	k-ft
P_c =	32.325	k
Utilization =	83%	



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 =	6.63	k
Maximum Lateral Load =	3.84	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)

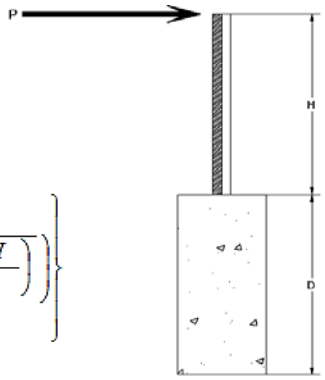
Lateral Force @ Top of Pole, P =	0.92	k
Height of Pole Above Grade, H =	6.61	ft
Diameter of Pole Footing, B =	2.00	ft
Lateral Soil Bearing Capacity, S =	0.10	ksf/ft
Isolated Pole Factor, F =	2	
First Trial Depth, D =	3.25	ft

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

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

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

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



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

Non-Constrained

Lateral Force @ Top of Pole, P =	0.92	k
Height of Pole Above Grade, H =	6.61	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 =	4.96		
Required Footing Depth, D =	8.95	ft	
2nd Trial @ D_2 =	6.10	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.41	ksf	
Lateral Soil Bearing @ D, S_3 =	1.22	ksf	
Constant 2.34P/(S_1B), A =	2.64		
Required Footing Depth, D =	5.88	ft	
3rd Trial @ D_3 =	5.99	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf	
Lateral Soil Bearing @ D, S_3 =	1.20	ksf	
Constant 2.34P/(S_1B), A =	2.69		
Required Footing Depth, D =	5.95	ft	
4th Trial @ D_4 =	5.97	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf	
Lateral Soil Bearing @ D, S_3 =	1.19	ksf	
Constant 2.34P/(S_1B), A =	2.70		
Required Footing Depth, D =	5.96	ft	
5th Trial @ D_5 =	5.97	ft	
Lateral Soil Bearing @ D/3, S_1 =	0.40	ksf	
Lateral Soil Bearing @ D, S_3 =	1.19	ksf	
Constant 2.34P/(S_1B), A =	2.70		
Required Footing Depth, D =	6.00	ft	

A 2ft diameter x 6ft deep footing unrestrained at ground level is required for the racking structure.

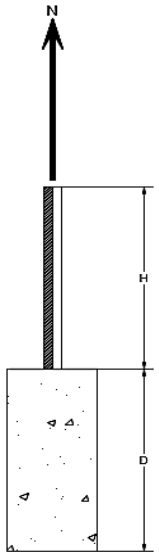
5.4 Uplifting Force Resistance

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 =	3.18	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 =	2.09	k
Required Concrete Volume, V =	14.41	ft^3
Required Footing Depth, D =	4.75	ft

Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.87
2	0.4	0.2	118.10	6.77
3	0.6	0.2	118.10	6.66
4	0.8	0.2	118.10	6.56
5	1	0.2	118.10	6.45
6	1.2	0.2	118.10	6.35
7	1.4	0.2	118.10	6.25
8	1.6	0.2	118.10	6.14
9	1.8	0.2	118.10	6.04
10	2	0.2	118.10	5.94
11	2.2	0.2	118.10	5.83
12	2.4	0.2	118.10	5.73
13	2.6	0.2	118.10	5.62
14	2.8	0.2	118.10	5.52
15	3	0.2	118.10	5.42
16	3.2	0.2	118.10	5.31
17	3.4	0.2	118.10	5.21
18	3.6	0.2	118.10	5.11
19	3.8	0.2	118.10	5.00
20	4	0.2	118.10	4.90
21	4.2	0.2	118.10	4.80
22	4.4	0.2	118.10	4.69
23	4.6	0.2	118.10	4.59
24	0	0.0	0.00	4.59
25	0	0.0	0.00	4.59
26	0	0.0	0.00	4.59
27	0	0.0	0.00	4.59
28	0	0.0	0.00	4.59
29	0	0.0	0.00	4.59
30	0	0.0	0.00	4.59
31	0	0.0	0.00	4.59
32	0	0.0	0.00	4.59
33	0	0.0	0.00	4.59
34	0	0.0	0.00	4.59
Max	4.6	Sum	1.09	

A 2ft diameter x 4.75ft 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 =	6.00	ft
Footing Diameter, B =	2.00	ft
Compressive Force, P =	3.91	k
Footing Area =	3.14	ft^2
Circumference =	6.28	ft
Skin Friction Area =	18.85	ft^2
Concrete Weight =	0.145	kcf

Bearing Pressure

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

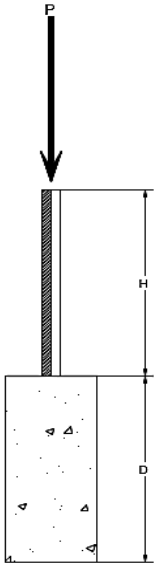
Weight of Concrete

Footing Volume	18.85	ft^3
Weight	2.73	k

Skin Friction Resistance

Skin Friction =	0.15	ksf
Resistance =	2.83	k
1/3 Increase for Wind =	1.33	
Total Resistance =	10.05	k
Applied Force =	6.65	k
Utilization =	66%	

A 2ft diameter footing passes at a depth of 6ft.



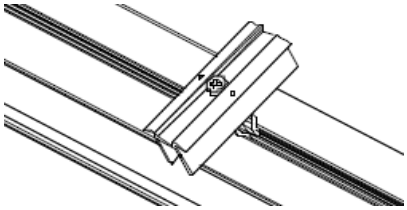
6. DESIGN OF JOINTS AND CONNECTIONS

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.

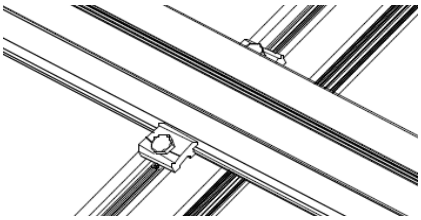
Fastening of Modules to Purlins

Maximum Uplifting Force	=	0.657 k
Allowable Uplift	=	1.214 k
Utilization	=	54%



Fastening of Purlins to Girders

Maximum Uplifting Force	=	2.108 k
Allowable Uplift	=	2.180 k
Utilization	=	97%

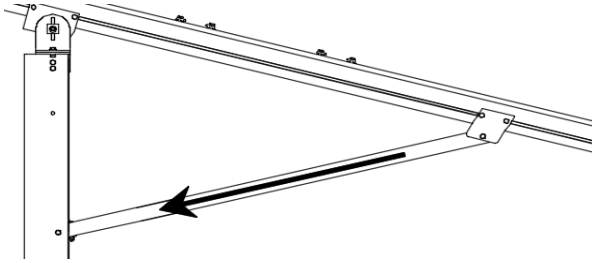


6.2 Strut Connections

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	=	4.405 k
M10 Bolt Shear Capacity	=	8.894 k
Utilization	=	50%

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

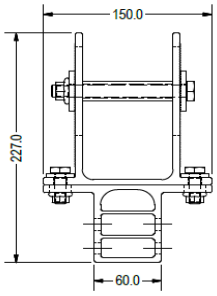


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

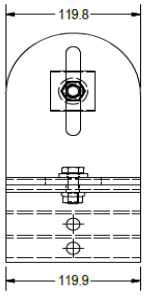
6.3 Girder to Post Connection

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.

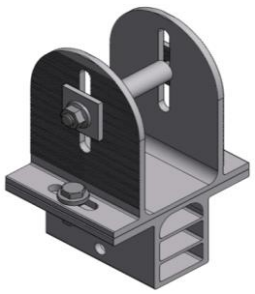
Maximum Tensile Load	=	4.460 k
Allowable Load	=	5.649 k
Utilization	=	79%



FRONT VIEW



SIDE VIEW



7. SEISMIC DESIGN

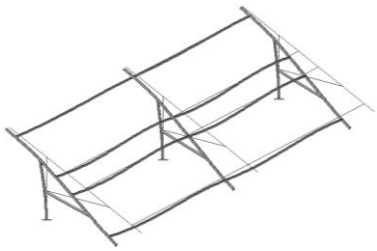
7.1 Seismic Drift

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}	=	74.11 in
Allowable Story Drift for All Other Structures, Δ	= {	$0.020h_{sx}$
		1.482 in
Max Drift, Δ_{MAX}	=	0.59 in

0.59 ≤ 1.482, 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 =	108 in	L_b =	108
J =	0.432	J =	0.432
	298.779		190.005
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$		$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$	
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=	27.7 ksi	φF_L=	28.9
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:	Weak Axis:
3.4.14	**3.4.14**
L_b = 61 in	L_b = 61
J = 1.98	J = 1.98
65.6618	65.6618
$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$	$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$
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= 30.8 ksi	φF_L= 30.8
3.4.16	**3.4.16**
b/t = 24.5	b/t = 24.5
$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$	$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$
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= 28.2 ksi	φF_L= 28.2 ksi
3.4.16.1 Not Used	**3.4.16.1**
Rb/t = 0.0	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 = 24.5	h/t = 24.5
$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$	$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$
S1 = 36.9	S1 = 36.9
m = 0.65	m = 0.65
C_0 = 27.5	C_0 = 27.5
Cc = 27.5	Cc = 27.5
$S2 = \frac{k_1 Bbr}{mDbr}$	$S2 = \frac{k_1 Bbr}{mDbr}$
S2 = 77.3	S2 = 77.3
φF_L= 1.3φyFcy	φF_L= 1.3φyFcy
φF_L= 43.2 ksi	φF_L= 43.2 ksi
φF_LSt= 28.2 ksi	φF_LWk= 28.2 ksi
Ix = 279836 mm^4	Iy = 279836 mm^4
0.672 in^4	0.672 in^4
y = 27.5 mm	x = 27.5 mm
Sx = 0.621 in^3	Sy = 0.621 in^3
M_{max}St = 1.460 k-ft	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 =	79.31 in	
Pr =	-5.13 k	(LRFD Factored Load)
Mr (Strong) =	13.72 k-ft	(LRFD Factored Load)
Mr (Weak) =	0.00 k-ft	(LRFD Factored Load)

Flexural Buckling:

kL/r =	114.11		
4.71√(E/Fy) =	103.55 =>	kL/r	> 4.71√(E/Fy)
Fcr =	19.28 ksi		
Fe =	21.98 ksi		
Pn =	42.988 k		

Torsional/Flexural Torsional Buckling:

Fcr =	14.4957 ksi
Fey =	56.0686 ksi
Fez =	18.5443 ksi
Pn =	32.3254 k

Bending (Strong Axis):

Yielding:

Mn = 21.95 k-ft

Flange Local Buckling:

Mn = 19.207 k-ft

Pr/Pc =	0.1194 <	0.2	
Utilization =	0.83 <	1.0	OK

Bending (Weak Axis):

Yielding:

Mn = 14.65 k-ft

Flange Local Buckling:

Mn = 14.39 k-ft

Pr/Pc =	0.119 <	0.2	
Utilization =	0.00 <	1.0	OK

Combined Forces

Utilization = 83%

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	-39.836	-39.836	0	0
2	M11	Y	-39.836	-39.836	0	0
3	M12	Y	-39.836	-39.836	0	0
4	M13	Y	-39.836	-39.836	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	-60.928	-60.928	0	0
2	M11	y	-60.928	-60.928	0	0
3	M12	y	-98.014	-98.014	0	0
4	M13	y	-98.014	-98.014	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	121.855	121.855	0	0
2	M11	y	121.855	121.855	0	0
3	M12	y	58.278	58.278	0	0
4	M13	y	58.278	58.278	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	835.778	2	2193.054	2	204.431	2	.268	2	.017	5	3.66	1
2		min	-1117.694	3	-1656.269	3	-311.764	5	-1.337	5	-.014	2	.497	15
3	N19	max	2905.974	2	6099.321	2	0	1	0	1	.018	4	7.206	3
4		min	-2952.443	3	-5084.691	3	-335.959	5	-1.398	4	0	10	.276	15
5	N29	max	835.778	2	2193.054	2	241.728	3	.359	3	.019	4	3.66	1
6		min	-1117.694	3	-1656.269	3	-348.107	4	-1.403	4	-.007	3	-.208	5
7	Totals:	max	4577.53	2	10485.429	2	0	1						
8		min	-5187.83	3	-8397.229	3	-973.128	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	.002	4	0	1	0	1	0	1
2			min	0	1	0	3	-.001	1	0	1	0	1	0	1
3		2	max	-.261	15	-.452	15	0	12	0	1	0	12	0	6
4			min	-1.11	6	-1.921	6	-1.499	5	0	1	0	5	0	15
5		3	max	-17.003	12	308.1	3	-14.928	12	.06	3	.218	1	.297	2
6			min	-178.749	1	-682.939	2	-126.33	1	-.217	2	.039	10	-.131	3
7		4	max	-17.435	12	306.976	3	-14.928	12	.06	3	.14	1	.722	2
8			min	-179.615	1	-684.437	2	-126.33	1	-.217	2	.02	10	-.322	3
9		5	max	-17.868	12	305.852	3	-14.928	12	.06	3	.061	1	1.147	2
10			min	-180.48	1	-685.936	2	-126.33	1	-.217	2	0	10	-.512	3
11		6	max	266.805	3	596.16	2	4.047	3	.053	2	.089	2	1.102	2
12			min	-870.689	2	-182.671	3	-174.307	1	-.065	3	-.034	3	-.523	3
13		7	max	266.156	3	594.661	2	4.047	3	.053	2	.009	10	.732	2
14			min	-871.555	2	-183.795	3	-174.307	1	-.065	3	-.065	4	-.409	3
15		8	max	265.507	3	593.163	2	4.047	3	.053	2	-.019	12	.364	2
16			min	-872.42	2	-184.919	3	-174.307	1	-.065	3	-.136	1	-.295	3
17		9	max	238.549	3	101.527	3	-5.094	12	.017	5	.079	1	.147	2
18			min	-986.887	1	-67.003	2	-187.305	1	-.159	2	0	10	-.242	3
19		10	max	237.9	3	100.403	3	-5.094	12	.017	5	.047	3	.189	2
20			min	-987.752	1	-68.501	2	-187.305	1	-.159	2	-.043	2	-.304	3
21		11	max	237.251	3	99.28	3	-5.094	12	.017	5	.043	3	.232	2
22			min	-988.617	1	-70	2	-187.305	1	-.159	2	-.153	1	-.366	3
23		12	max	206.388	3	811.807	3	114.556	2	.323	3	.129	1	.453	2
24			min	-1172.56	1	-510.499	2	-288.743	3	-.269	2	-.034	5	-.707	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	205.739	3	810.683	3	114.556	2	.323	3	.152	1	.77	2
26			min	-1173.425	1	-511.997	2	-288.743	3	-.269	2	-.151	3	-1.21	3
27		14	max	181.163	1	471.64	2	65.063	5	.214	2	.097	3	1.075	2
28			min	8.988	15	-733.96	3	-91.018	1	-.413	3	-.165	4	-1.692	3
29		15	max	180.297	1	470.141	2	63.563	5	.214	2	.051	3	.783	2
30			min	8.727	15	-735.084	3	-91.018	1	-.413	3	-.139	4	-1.236	3
31		16	max	179.432	1	468.643	2	62.063	5	.214	2	.005	3	.492	2
32			min	8.466	15	-736.208	3	-91.018	1	-.413	3	-.177	1	-.779	3
33		17	max	178.567	1	467.144	2	60.564	5	.214	2	-.026	15	.201	2
34			min	8.205	15	-737.332	3	-91.018	1	-.413	3	-.234	1	-.322	3
35		18	max	1.11	6	1.923	6	1.5	4	0	1	0	12	0	6
36			min	.261	15	.452	15	0	12	0	1	0	4	0	15
37		19	max	0	1	.003	2	.001	1	0	1	0	1	0	1
38			min	0	1	-.006	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	1	.016	2	.002	4	0	1	0	1	0	1
40			min	0	1	-.003	3	0	1	0	1	0	1	0	1
41		2	max	-.261	15	-.452	15	0	1	0	1	0	1	0	6
42			min	-1.11	6	-1.92	6	-1.499	5	0	1	0	5	0	15
43		3	max	.184	3	971.853	3	0	1	.038	4	.189	4	.752	2
44			min	-327.928	1	-1956.35	2	-93.077	5	0	1	0	1	-.379	3
45		4	max	-.465	3	970.729	3	0	1	.038	4	.131	4	1.966	2
46			min	-328.793	1	-1957.849	2	-94.576	5	0	1	0	1	-.982	3
47		5	max	-1.114	3	969.605	3	0	1	.038	4	.072	4	3.182	2
48			min	-329.659	1	-1959.347	2	-96.076	5	0	1	0	1	-1.584	3
49		6	max	1056.679	3	1806.291	2	0	1	0	1	0	1	3.016	2
50			min	-2438.066	2	-758.7	3	-82.904	4	-.032	4	-.026	5	-1.551	3
51		7	max	1056.03	3	1804.793	2	0	1	0	1	0	1	1.896	2
52			min	-2438.931	2	-759.824	3	-84.404	4	-.032	4	-.077	4	-1.08	3
53		8	max	1055.381	3	1803.294	2	0	1	0	1	0	1	.776	2
54			min	-2439.796	2	-760.948	3	-85.904	4	-.032	4	-.13	4	-.608	3
55		9	max	1059.122	3	253.262	3	0	1	.013	4	.084	5	.114	1
56			min	-2555.357	2	-210.776	2	-184.698	4	0	1	0	1	-.368	3
57		10	max	1058.473	3	252.138	3	0	1	.013	4	0	1	.237	1
58			min	-2556.222	2	-212.275	2	-186.197	4	0	1	-.031	4	-.525	3
59		11	max	1057.824	3	251.014	3	0	1	.013	4	0	1	.366	2
60			min	-2557.088	2	-213.773	2	-187.697	4	0	1	-.147	4	-.681	3
61		12	max	1069.376	3	2241.069	3	0	1	.139	4	0	1	1.041	2
62			min	-2740.722	1	-1599.505	2	-203.254	5	0	1	-.018	4	-1.633	3
63		13	max	1068.728	3	2239.945	3	0	1	.139	4	0	1	2.035	2
64			min	-2741.587	1	-1601.004	2	-204.754	5	0	1	-.144	4	-3.024	3
65		14	max	330.889	1	1331.1	2	63.031	5	0	1	0	1	2.989	2
66			min	2.108	3	-1941.827	3	0	1	-.097	4	-.133	5	-4.356	3
67		15	max	330.024	1	1329.601	2	61.532	5	0	1	0	1	2.163	2
68			min	1.459	3	-1942.951	3	0	1	-.097	4	-.094	5	-3.151	3
69		16	max	329.158	1	1328.102	2	60.032	5	0	1	0	1	1.338	2
70			min	.81	3	-1944.075	3	0	1	-.097	4	-.057	5	-1.945	3
71		17	max	328.293	1	1326.604	2	58.532	5	0	1	0	1	.514	2
72			min	.161	3	-1945.199	3	0	1	-.097	4	-.02	4	-.738	3
73		18	max	1.11	6	1.924	6	1.5	5	0	1	0	1	0	6
74			min	.261	15	.452	15	0	1	0	1	0	5	0	15
75		19	max	0	1	.008	2	0	1	0	1	0	1	0	1
76			min	0	1	-.015	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	1	.006	2	.003	4	0	1	0	1	0	1
78			min	0	1	0	3	0	12	0	1	0	1	0	1
79		2	max	-.261	15	-.452	15	.001	1	0	1	0	1	0	4
80			min	-1.11	4	-1.922	4	-1.499	5	0	1	0	5	0	15
81		3	max	12.988	5	308.1	3	126.33	1	.217	2	.089	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	-178.749	1	-682.939	2	-41.971	5	-.06	3	-.218	1	-.131	3
83		4	max	12.584	5	306.976	3	126.33	1	.217	2	.062	5	.722	2
84			min	-179.615	1	-684.437	2	-43.471	5	-.06	3	-.14	1	-.322	3
85		5	max	12.18	5	305.852	3	126.33	1	.217	2	.035	5	1.147	2
86			min	-180.48	1	-685.936	2	-44.971	5	-.06	3	-.061	1	-.512	3
87		6	max	266.805	3	596.16	2	174.307	1	.065	3	.034	3	1.102	2
88			min	-870.689	2	-182.671	3	-30.527	5	-.053	2	-.089	2	-.523	3
89		7	max	266.156	3	594.661	2	174.307	1	.065	3	.031	3	.732	2
90			min	-871.555	2	-183.795	3	-32.027	5	-.053	2	-.05	5	-.409	3
91		8	max	265.507	3	593.163	2	174.307	1	.065	3	.136	1	.364	2
92			min	-872.42	2	-184.919	3	-33.526	5	-.053	2	-.071	5	-.295	3
93		9	max	238.549	3	101.527	3	187.305	1	.159	2	.024	5	.147	2
94			min	-986.887	1	-67.003	2	-75.97	5	.015	15	-.079	1	-.242	3
95		10	max	237.9	3	100.403	3	187.305	1	.159	2	.043	2	.189	2
96			min	-987.752	1	-68.501	2	-77.47	5	.015	15	-.047	3	-.304	3
97		11	max	237.251	3	99.28	3	187.305	1	.159	2	.153	1	.232	2
98			min	-988.617	1	-70	2	-78.969	5	.015	15	-.072	5	-.366	3
99		12	max	206.388	3	811.807	3	288.743	3	.269	2	-.018	12	.453	2
100			min	-1172.56	1	-510.499	2	-176.445	5	-.323	3	-.129	1	-.707	3
101		13	max	205.739	3	810.683	3	288.743	3	.269	2	.151	3	.77	2
102			min	-1173.425	1	-511.997	2	-177.945	5	-.323	3	-.187	4	-1.21	3
103		14	max	181.163	1	471.64	2	101.553	4	.413	3	.069	2	1.075	2
104			min	9.987	15	-733.96	3	6.261	10	-.214	2	-.151	5	-1.692	3
105		15	max	180.297	1	470.141	2	100.053	4	.413	3	.121	1	.783	2
106			min	9.726	15	-735.084	3	6.261	10	-.214	2	-.102	5	-1.236	3
107		16	max	179.432	1	468.643	2	98.553	4	.413	3	.177	1	.492	2
108			min	9.465	15	-736.208	3	6.261	10	-.214	2	-.055	5	-.779	3
109		17	max	178.567	1	467.144	2	97.053	4	.413	3	.234	1	.201	2
110			min	9.204	15	-737.332	3	6.261	10	-.214	2	-.008	5	-.322	3
111		18	max	1.11	4	1.924	4	1.5	5	0	1	0	1	0	4
112			min	.261	15	.452	15	-.001	1	0	1	0	5	0	15
113		19	max	0	1	.003	2	0	15	0	1	0	1	0	1
114			min	0	1	-.006	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	94.085	4	463.862	2	-8.686	15	.012	2	.271	1	.214	2
116			min	6.259	10	-739.609	3	-176.977	1	-.024	3	.015	15	-.413	3
117		2	max	91.027	1	338.871	2	-6.899	15	.012	2	.113	1	.231	3
118			min	6.259	10	-549.281	3	-139.186	1	-.024	3	.007	15	-.188	2
119		3	max	91.027	1	213.879	2	-5.113	15	.012	2	.027	3	.685	3
120			min	6.259	10	-358.954	3	-101.395	1	-.024	3	-.011	9	-.464	2
121		4	max	91.027	1	88.887	2	-3.326	15	.012	2	.009	3	.949	3
122			min	6.259	10	-168.627	3	-63.605	1	-.024	3	-.09	1	-.615	2
123		5	max	91.027	1	21.7	3	-1.54	15	.012	2	-.005	12	1.022	3
124			min	6.259	10	-36.878	1	-25.814	1	-.024	3	-.135	1	-.642	2
125		6	max	91.027	1	212.027	3	11.977	1	.012	2	-.006	15	.906	3
126			min	6.259	10	-161.096	2	-11.389	3	-.024	3	-.142	1	-.543	2
127		7	max	91.027	1	402.355	3	49.768	1	.012	2	-.005	15	.598	3
128			min	6.259	10	-286.088	2	-8.71	3	-.024	3	-.111	1	-.32	2
129		8	max	91.027	1	592.682	3	87.559	1	.012	2	-.002	15	.101	3
130			min	-.349	15	-411.079	2	-6.031	3	-.024	3	-.042	1	-.018	5
131		9	max	91.027	1	783.009	3	125.35	1	.012	2	.064	1	.503	2
132			min	-10.467	5	-536.071	2	-3.351	3	-.024	3	-.041	3	-.587	3
133		10	max	91.027	1	973.336	3	163.141	1	.012	2	.209	1	1.101	2
134			min	6.259	10	-661.063	2	-92.056	14	-.024	3	-.043	3	-1.465	3
135		11	max	91.027	1	536.071	2	3.351	3	.024	3	.064	1	.503	2
136			min	6.259	10	-783.009	3	-125.35	1	-.012	2	-.041	3	-.587	3
137		12	max	91.027	1	411.079	2	6.031	3	.024	3	-.001	15	.101	3
138			min	6.259	10	-592.682	3	-87.559	1	-.012	2	-.042	1	.013	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	91.027	1	286.088	2	8.71	3	.024	3	-.005	15	.598	3
140			min	2.516	15	-402.355	3	-49.768	1	-.012	2	-.111	1	-.32	2
141		14	max	91.027	1	161.096	2	11.389	3	.024	3	-.007	15	.906	3
142			min	-6.245	5	-212.027	3	-11.977	1	-.012	2	-.142	1	-.543	2
143		15	max	91.027	1	36.878	1	25.814	1	.024	3	-.005	12	1.022	3
144			min	-16.51	5	-21.7	3	.537	15	-.012	2	-.135	1	-.642	2
145		16	max	91.027	1	168.627	3	63.605	1	.024	3	.009	3	.949	3
146			min	-26.775	5	-88.887	2	2.324	15	-.012	2	-.09	1	-.615	2
147		17	max	91.027	1	358.954	3	101.395	1	.024	3	.027	3	.685	3
148			min	-37.04	5	-213.879	2	4.11	15	-.012	2	-.011	9	-.464	2
149		18	max	91.027	1	549.281	3	139.186	1	.024	3	.113	1	.231	3
150			min	-47.306	5	-338.871	2	5.897	15	-.012	2	.002	15	-.188	2
151		19	max	91.027	1	739.609	3	176.977	1	.024	3	.271	1	.214	2
152			min	-57.571	5	-463.862	2	7.683	15	-.012	2	.009	15	-.413	3
153	M11	1	max	224.38	1	437.261	2	15.168	5	0	15	.309	1	.122	1
154			min	-281.745	3	-714.17	3	-183.427	1	-.004	1	-.108	5	-.435	3
155		2	max	224.38	1	312.269	2	17.931	5	0	15	.145	1	.184	3
156			min	-281.745	3	-523.843	3	-145.636	1	-.004	1	-.091	5	-.264	2
157		3	max	224.38	1	187.277	2	20.695	5	0	15	.047	3	.612	3
158			min	-281.745	3	-333.515	3	-107.845	1	-.004	1	-.072	5	-.514	2
159		4	max	224.38	1	62.286	2	23.459	5	0	15	.024	3	.851	3
160			min	-281.745	3	-143.188	3	-70.054	1	-.004	1	-.071	1	-.639	2
161		5	max	224.38	1	47.139	3	26.222	5	0	15	.004	3	.899	3
162			min	-281.745	3	-62.706	2	-32.263	1	-.004	1	-.122	1	-.639	2
163		6	max	224.38	1	237.466	3	31.189	4	0	15	.002	5	.756	3
164			min	-281.745	3	-187.698	2	-16.426	3	-.004	1	-.135	1	-.514	2
165		7	max	224.38	1	427.793	3	43.318	1	0	15	.033	5	.424	3
166			min	-281.745	3	-312.689	2	-13.747	3	-.004	1	-.111	1	-.263	2
167		8	max	224.38	1	618.121	3	81.109	1	0	15	.066	5	.112	2
168			min	-281.745	3	-437.681	2	-11.067	3	-.004	1	-.049	1	-.099	3
169		9	max	224.38	1	808.448	3	118.9	1	0	15	.117	4	.612	2
170			min	-281.745	3	-562.673	2	-8.388	3	-.004	1	-.051	3	-.812	3
171		10	max	224.38	1	998.775	3	156.691	1	.004	1	.189	4	1.237	2
172			min	-281.745	3	-687.664	2	-73.633	14	-.004	3	-.058	3	-1.716	3
173		11	max	224.38	1	562.673	2	19.355	5	.004	1	.051	1	.612	2
174			min	-281.745	3	-808.448	3	-118.9	1	0	5	-.092	5	-.812	3
175		12	max	224.38	1	437.681	2	22.118	5	.004	1	-.017	10	.112	2
176			min	-281.745	3	-618.121	3	-81.109	1	0	5	-.081	4	-.099	3
177		13	max	224.38	1	312.689	2	24.882	5	.004	1	-.019	12	.424	3
178			min	-281.745	3	-427.793	3	-43.318	1	0	5	-.111	1	-.263	2
179		14	max	224.38	1	187.698	2	27.645	5	.004	1	-.009	12	.756	3
180			min	-281.745	3	-237.466	3	-5.945	9	0	5	-.135	1	-.514	2
181		15	max	224.38	1	62.706	2	37.191	4	.004	1	.007	5	.899	3
182			min	-281.745	3	-47.139	3	7.811	10	0	5	-.122	1	-.639	2
183		16	max	224.38	1	143.188	3	70.054	1	.004	1	.039	5	.851	3
184			min	-281.745	3	-62.286	2	12.746	10	0	5	-.071	1	-.639	2
185		17	max	224.38	1	333.515	3	107.845	1	.004	1	.076	4	.612	3
186			min	-281.745	3	-187.277	2	15.711	12	0	5	.007	9	-.514	2
187		18	max	224.38	1	523.843	3	145.636	1	.004	1	.145	1	.184	3
188			min	-281.745	3	-312.269	2	17.497	12	0	5	.03	10	-.264	2
189		19	max	224.38	1	714.17	3	183.427	1	.004	1	.309	1	.122	1
190			min	-281.745	3	-437.261	2	19.283	12	0	5	.055	10	-.435	3
191	M12	1	max	40.875	5	657.211	2	19.132	5	0	15	.326	1	.212	2
192			min	-23.32	9	-287.945	3	-186.269	1	-.004	1	-.125	5	.03	12
193		2	max	31.035	2	472.882	2	21.896	5	0	15	.159	1	.291	3
194			min	-23.32	9	-199.341	3	-148.478	1	-.004	1	-.105	5	-.353	2
195		3	max	31.035	2	288.553	2	24.659	5	0	15	.033	3	.446	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	-23.32	9	-110.737	3	-110.687	1	-.004	1	-.081	5	-.734	2
197		4	max	31.035	2	104.223	2	27.423	5	0	15	.014	3	.512	3
198			min	-23.32	9	-22.133	3	-72.896	1	-.004	1	-.072	4	-.93	2
199		5	max	31.035	2	66.471	3	30.187	5	0	15	-.002	12	.49	3
200			min	-23.32	9	-80.106	2	-35.106	1	-.004	1	-.117	1	-.943	2
201		6	max	31.035	2	155.075	3	34.845	4	0	15	.005	5	.379	3
202			min	-23.348	14	-264.435	2	-12.897	3	-.004	1	-.133	1	-.77	2
203		7	max	31.035	2	243.679	3	46.429	4	0	15	.04	5	.18	3
204			min	-28.95	4	-448.764	2	-10.218	3	-.004	1	-.111	1	-.414	2
205		8	max	31.035	2	332.283	3	78.267	1	0	15	.077	5	.127	2
206			min	-39.215	4	-633.094	2	-7.538	3	-.004	1	-.052	1	-.108	3
207		9	max	31.035	2	420.887	3	116.058	1	0	15	.131	4	.853	2
208			min	-49.48	4	-817.423	2	-4.859	3	-.004	1	-.044	3	-.484	3
209		10	max	31.035	2	509.491	3	153.849	1	0	15	.207	4	1.762	2
210			min	-59.745	4	-1001.752	2	-2.18	3	-.004	1	-.048	3	-.95	3
211		11	max	35.676	5	817.423	2	23.544	5	.004	1	.045	1	.853	2
212			min	-23.32	9	-420.887	3	-116.058	1	0	5	-.107	5	-.484	3
213		12	max	31.035	2	633.094	2	26.308	5	.004	1	-.019	10	.127	2
214			min	-23.32	9	-332.283	3	-78.267	1	0	5	-.092	4	-.108	3
215		13	max	31.035	2	448.764	2	29.072	5	.004	1	-.019	12	.18	3
216			min	-23.32	9	-243.679	3	-40.476	1	0	5	-.111	1	-.414	2
217		14	max	31.035	2	264.435	2	31.835	5	.004	1	-.011	12	.379	3
218			min	-23.32	9	-155.075	3	-4.951	9	0	5	-.133	1	-.77	2
219		15	max	31.035	2	80.106	2	41.778	4	.004	1	.009	5	.49	3
220			min	-23.32	9	-66.471	3	9.675	10	0	5	-.117	1	-.943	2
221		16	max	31.035	2	22.133	3	72.896	1	.004	1	.045	5	.512	3
222			min	-26.06	14	-104.223	2	11.723	12	0	5	-.063	1	-.93	2
223		17	max	31.035	2	110.737	3	110.687	1	.004	1	.088	4	.446	3
224			min	-34.23	4	-288.553	2	13.509	12	0	5	.011	9	-.734	2
225		18	max	31.035	2	199.341	3	148.478	1	.004	1	.159	1	.291	3
226			min	-44.495	4	-472.882	2	15.295	12	0	5	.035	12	-.353	2
227		19	max	31.035	2	287.945	3	186.269	1	.004	1	.326	1	.212	2
228			min	-54.76	4	-657.211	2	17.081	12	0	5	.052	12	-.041	5
229	M13	1	max	38.926	5	680.464	2	13.797	5	.007	3	.269	1	.217	2
230			min	-126.231	1	-310.379	3	-176.819	1	-.02	2	-.106	5	-.06	3
231		2	max	28.66	5	496.135	2	16.561	5	.007	3	.111	1	.207	3
232			min	-126.231	1	-221.775	3	-139.028	1	-.02	2	-.091	5	-.372	2
233		3	max	18.395	5	311.806	2	19.325	5	.007	3	.027	3	.384	3
234			min	-126.231	1	-133.171	3	-101.237	1	-.02	2	-.077	4	-.776	2
235		4	max	8.13	5	127.477	2	22.088	5	.007	3	.009	3	.473	3
236			min	-126.231	1	-44.567	3	-63.446	1	-.02	2	-.091	1	-.995	2
237		5	max	-1.193	15	44.037	3	24.852	5	.007	3	-.004	12	.473	3
238			min	-126.231	1	-56.853	2	-25.655	1	-.02	2	-.136	1	-1.031	2
239		6	max	-8.102	15	132.641	3	31.384	4	.007	3	-.002	15	.385	3
240			min	-126.231	1	-241.182	2	-11.427	3	-.02	2	-.143	1	-.881	2
241		7	max	-14.928	12	221.245	3	49.927	1	.007	3	.026	5	.208	3
242			min	-126.231	1	-425.511	2	-8.747	3	-.02	2	-.112	1	-.548	2
243		8	max	-14.928	12	309.849	3	87.718	1	.007	3	.058	5	-.006	15
244			min	-126.231	1	-609.84	2	-6.068	3	-.02	2	-.043	1	-.058	3
245		9	max	-14.928	12	398.453	3	125.508	1	.007	3	.111	4	.672	2
246			min	-126.231	1	-794.17	2	-3.389	3	-.02	2	-.041	3	-.412	3
247		10	max	-14.928	12	487.057	3	163.299	1	.007	3	.208	1	1.558	2
248			min	-126.231	1	-978.499	2	-.709	3	-.02	2	-.043	3	-.855	3
249		11	max	26.44	5	794.17	2	16.994	5	.02	2	.064	1	.672	2
250			min	-126.231	1	-398.453	3	-125.508	1	-.007	3	-.081	5	-.412	3
251		12	max	16.175	5	609.84	2	19.757	5	.02	2	-.017	10	.004	5
252			min	-126.231	1	-309.849	3	-87.718	1	-.007	3	-.07	4	-.058	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
253		13	max	5.91	5	425.511	2	22.521	5	.02	2	-.019	12	.208	3
254			min	-126.231	1	-221.245	3	-49.927	1	-.007	3	-.112	1	-.548	2
255		14	max	-2.68	15	241.182	2	25.284	5	.02	2	-.012	15	.385	3
256			min	-126.231	1	-132.641	3	-12.136	1	-.007	3	-.143	1	-.881	2
257		15	max	-9.589	15	56.853	2	33.207	4	.02	2	.009	5	.473	3
258			min	-126.231	1	-44.037	3	7.239	10	-.007	3	-.136	1	-1.031	2
259		16	max	-14.928	12	44.567	3	63.446	1	.02	2	.038	5	.473	3
260			min	-126.231	1	-127.477	2	10.766	12	-.007	3	-.091	1	-.995	2
261		17	max	-14.928	12	133.171	3	101.237	1	.02	2	.071	5	.384	3
262			min	-126.231	1	-311.806	2	12.552	12	-.007	3	-.011	9	-.776	2
263		18	max	-14.928	12	221.775	3	139.028	1	.02	2	.129	4	.207	3
264			min	-126.231	1	-496.135	2	14.338	12	-.007	3	.027	10	-.372	2
265		19	max	-14.928	12	310.379	3	176.819	1	.02	2	.269	1	.217	2
266			min	-126.231	1	-680.464	2	16.124	12	-.007	3	.046	12	-.06	3
267	M2	1	max	2193.054	2	1117.059	3	204.577	2	.017	5	1.337	5	3.66	1
268			min	-1656.269	3	-835.366	2	-311.807	5	-.014	2	-.268	2	.497	15
269		2	max	2190.216	2	1117.059	3	204.577	2	.017	5	1.24	5	3.755	1
270			min	-1658.397	3	-835.366	2	-309.348	5	-.014	2	-.205	2	.475	15
271		3	max	1499.334	1	731.209	1	145.113	2	.001	2	1.136	5	3.646	1
272			min	-1391.972	3	90.065	15	-287.846	5	0	3	-.167	2	.449	15
273		4	max	1496.497	1	731.209	1	145.113	2	.001	2	1.047	5	3.418	1
274			min	-1394.1	3	90.065	15	-285.387	5	0	3	-.122	2	.421	15
275		5	max	1493.659	1	731.209	1	145.113	2	.001	2	.959	5	3.19	1
276			min	-1396.228	3	90.065	15	-282.928	5	0	3	-.081	1	.393	15
277		6	max	1490.822	1	731.209	1	145.113	2	.001	2	.871	5	2.962	1
278			min	-1398.357	3	90.065	15	-280.468	5	0	3	-.041	1	.365	15
279		7	max	1487.984	1	731.209	1	145.113	2	.001	2	.788	4	2.734	1
280			min	-1400.485	3	90.065	15	-278.009	5	0	3	-.046	3	.337	15
281		8	max	1485.147	1	731.209	1	145.113	2	.001	2	.706	4	2.506	1
282			min	-1402.613	3	90.065	15	-275.55	5	0	3	-.113	3	.309	15
283		9	max	1482.309	1	731.209	1	145.113	2	.001	2	.625	4	2.278	1
284			min	-1404.741	3	90.065	15	-273.091	5	0	3	-.18	3	.281	15
285		10	max	1479.472	1	731.209	1	145.113	2	.001	2	.545	4	2.051	1
286			min	-1406.869	3	90.065	15	-270.632	5	0	3	-.247	3	.253	15
287		11	max	1476.635	1	731.209	1	145.113	2	.001	2	.465	4	1.823	1
288			min	-1408.997	3	90.065	15	-268.173	5	0	3	-.314	3	.225	15
289		12	max	1473.797	1	731.209	1	145.113	2	.001	2	.386	4	1.595	1
290			min	-1411.125	3	90.065	15	-265.714	5	0	3	-.381	3	.196	15
291		13	max	1470.96	1	731.209	1	145.113	2	.001	2	.309	4	1.367	1
292			min	-1413.253	3	90.065	15	-263.255	5	0	3	-.448	3	.168	15
293		14	max	1468.122	1	731.209	1	145.113	2	.001	2	.331	2	1.139	1
294			min	-1415.381	3	90.065	15	-260.796	5	0	3	-.515	3	.14	15
295		15	max	1465.285	1	731.209	1	145.113	2	.001	2	.376	2	.911	1
296			min	-1417.509	3	90.065	15	-258.336	5	0	3	-.582	3	.112	15
297		16	max	1462.447	1	731.209	1	145.113	2	.001	2	.421	2	.684	1
298			min	-1419.637	3	90.065	15	-255.877	5	0	3	-.649	3	.084	15
299		17	max	1459.61	1	731.209	1	145.113	2	.001	2	.466	2	.456	1
300			min	-1421.765	3	90.065	15	-253.418	5	0	3	-.715	3	.056	15
301		18	max	1456.772	1	731.209	1	145.113	2	.001	2	.511	2	.228	1
302			min	-1423.894	3	90.065	15	-250.959	5	0	3	-.782	3	.028	15
303		19	max	1453.935	1	731.209	1	145.113	2	.001	2	.557	2	0	1
304			min	-1426.022	3	90.065	15	-248.5	5	0	3	-.849	3	0	1
305	M5	1	max	6099.321	2	2948.51	3	0	1	.018	4	1.398	4	7.206	3
306			min	-5084.691	3	-2904.163	2	-336.05	5	0	1	0	1	.276	15
307		2	max	6096.484	2	2948.51	3	0	1	.018	4	1.294	4	6.757	1
308			min	-5086.819	3	-2904.163	2	-333.591	5	0	1	0	1	.28	15
309		3	max	3993.811	2	1340.174	1	0	1	0	1	1.184	4	6.682	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	-4129.852	3	54.339	15	-311.877	4	0	4	0	1	.271	15
311		4	max	3990.974	2	1340.174	1	0	1	0	1	1.087	4	6.264	1
312			min	-4131.98	3	54.339	15	-309.418	4	0	4	0	1	.254	15
313		5	max	3988.136	2	1340.174	1	0	1	0	1	.991	4	5.846	1
314			min	-4134.108	3	54.339	15	-306.959	4	0	4	0	1	.237	15
315		6	max	3985.299	2	1340.174	1	0	1	0	1	.896	4	5.429	1
316			min	-4136.236	3	54.339	15	-304.5	4	0	4	0	1	.22	15
317		7	max	3982.461	2	1340.174	1	0	1	0	1	.801	4	5.011	1
318			min	-4138.364	3	54.339	15	-302.041	4	0	4	0	1	.203	15
319		8	max	3979.624	2	1340.174	1	0	1	0	1	.708	4	4.594	1
320			min	-4140.492	3	54.339	15	-299.582	4	0	4	0	1	.186	15
321		9	max	3976.786	2	1340.174	1	0	1	0	1	.615	4	4.176	1
322			min	-4142.62	3	54.339	15	-297.122	4	0	4	0	1	.169	15
323		10	max	3973.949	2	1340.174	1	0	1	0	1	.523	4	3.758	1
324			min	-4144.748	3	54.339	15	-294.663	4	0	4	0	1	.152	15
325		11	max	3971.111	2	1340.174	1	0	1	0	1	.431	4	3.341	1
326			min	-4146.876	3	54.339	15	-292.204	4	0	4	0	1	.135	15
327		12	max	3968.274	2	1340.174	1	0	1	0	1	.34	4	2.923	1
328			min	-4149.005	3	54.339	15	-289.745	4	0	4	0	1	.119	15
329		13	max	3965.437	2	1340.174	1	0	1	0	1	.251	4	2.506	1
330			min	-4151.133	3	54.339	15	-287.286	4	0	4	0	1	.102	15
331		14	max	3962.599	2	1340.174	1	0	1	0	1	.161	4	2.088	1
332			min	-4153.261	3	54.339	15	-284.827	4	0	4	0	1	.085	15
333		15	max	3959.762	2	1340.174	1	0	1	0	1	.073	4	1.67	1
334			min	-4155.389	3	54.339	15	-282.368	4	0	4	0	1	.068	15
335		16	max	3956.924	2	1340.174	1	0	1	0	1	0	1	1.253	1
336			min	-4157.517	3	54.339	15	-279.909	4	0	4	-.015	5	.051	15
337		17	max	3954.087	2	1340.174	1	0	1	0	1	0	1	.835	1
338			min	-4159.645	3	54.339	15	-277.449	4	0	4	-.101	4	.034	15
339		18	max	3951.249	2	1340.174	1	0	1	0	1	0	1	.418	1
340			min	-4161.773	3	54.339	15	-274.99	4	0	4	-.187	4	.017	15
341		19	max	3948.412	2	1340.174	1	0	1	0	1	0	1	0	1
342			min	-4163.901	3	54.339	15	-272.531	4	0	4	-.273	4	0	1
343	M8	1	max	2193.054	2	1117.059	3	241.581	3	.019	4	1.403	4	3.66	1
344			min	-1656.269	3	-835.366	2	-348.269	4	-.007	3	-.359	3	-.208	5
345		2	max	2190.216	2	1117.059	3	241.581	3	.019	4	1.295	4	3.755	1
346			min	-1658.397	3	-835.366	2	-345.81	4	-.007	3	-.284	3	-.181	5
347		3	max	1499.334	1	731.209	1	214.843	3	0	3	1.182	4	3.646	1
348			min	-1391.972	3	-32.943	5	-316.732	4	-.001	2	-.222	3	-.164	5
349		4	max	1496.497	1	731.209	1	214.843	3	0	3	1.084	4	3.418	1
350			min	-1394.1	3	-32.943	5	-314.273	4	-.001	2	-.155	3	-.154	5
351		5	max	1493.659	1	731.209	1	214.843	3	0	3	.987	4	3.19	1
352			min	-1396.228	3	-32.943	5	-311.814	4	-.001	2	-.088	3	-.144	5
353		6	max	1490.822	1	731.209	1	214.843	3	0	3	.89	4	2.962	1
354			min	-1398.357	3	-32.943	5	-309.355	4	-.001	2	-.021	3	-.133	5
355		7	max	1487.984	1	731.209	1	214.843	3	0	3	.794	4	2.734	1
356			min	-1400.485	3	-32.943	5	-306.896	4	-.001	2	-.014	2	-.123	5
357		8	max	1485.147	1	731.209	1	214.843	3	0	3	.699	4	2.506	1
358			min	-1402.613	3	-32.943	5	-304.436	4	-.001	2	-.059	2	-.113	5
359		9	max	1482.309	1	731.209	1	214.843	3	0	3	.607	5	2.278	1
360			min	-1404.741	3	-32.943	5	-301.977	4	-.001	2	-.104	2	-.103	5
361		10	max	1479.472	1	731.209	1	214.843	3	0	3	.519	5	2.051	1
362			min	-1406.869	3	-32.943	5	-299.518	4	-.001	2	-.15	2	-.092	5
363		11	max	1476.635	1	731.209	1	214.843	3	0	3	.432	5	1.823	1
364			min	-1408.997	3	-32.943	5	-297.059	4	-.001	2	-.195	2	-.082	5
365		12	max	1473.797	1	731.209	1	214.843	3	0	3	.381	3	1.595	1
366			min	-1411.125	3	-32.943	5	-294.6	4	-.001	2	-.24	2	-.072	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	1470.96	1	731.209	1	214.843	3	0	3	.448	3	1.367	1
368			min	-1413.253	3	-32.943	5	-292.141	4	-.001	2	-.285	2	-.062	5
369		14	max	1468.122	1	731.209	1	214.843	3	0	3	.515	3	1.139	1
370			min	-1415.381	3	-32.943	5	-289.682	4	-.001	2	-.331	2	-.051	5
371		15	max	1465.285	1	731.209	1	214.843	3	0	3	.582	3	.911	1
372			min	-1417.509	3	-32.943	5	-287.223	4	-.001	2	-.376	2	-.041	5
373		16	max	1462.447	1	731.209	1	214.843	3	0	3	.649	3	.684	1
374			min	-1419.637	3	-32.943	5	-284.764	4	-.001	2	-.421	2	-.031	5
375		17	max	1459.61	1	731.209	1	214.843	3	0	3	.715	3	.456	1
376			min	-1421.765	3	-32.943	5	-282.304	4	-.001	2	-.466	2	-.021	5
377		18	max	1456.772	1	731.209	1	214.843	3	0	3	.782	3	.228	1
378			min	-1423.894	3	-32.943	5	-279.845	4	-.001	2	-.511	2	-.01	5
379		19	max	1453.935	1	731.209	1	214.843	3	0	3	.849	3	0	1
380			min	-1426.022	3	-32.943	5	-277.386	4	-.001	2	-.557	2	0	1
381	M3	1	max	1506.47	2	4.384	4	59.045	2	.011	3	.021	5	0	1
382			min	-566.615	3	1.031	15	-27.11	3	-.02	2	-.007	2	0	1
383		2	max	1506.262	2	3.897	4	59.045	2	.011	3	.016	4	0	15
384			min	-566.771	3	.916	15	-27.11	3	-.02	2	-.005	3	-.001	4
385		3	max	1506.054	2	3.41	4	59.045	2	.011	3	.028	2	0	15
386			min	-566.927	3	.802	15	-27.11	3	-.02	2	-.013	3	-.002	4
387		4	max	1505.846	2	2.923	4	59.045	2	.011	3	.045	2	0	15
388			min	-567.083	3	.687	15	-27.11	3	-.02	2	-.021	3	-.003	4
389		5	max	1505.638	2	2.436	4	59.045	2	.011	3	.062	2	0	15
390			min	-567.239	3	.573	15	-27.11	3	-.02	2	-.029	3	-.004	4
391		6	max	1505.43	2	1.949	4	59.045	2	.011	3	.079	2	-.001	15
392			min	-567.395	3	.458	15	-27.11	3	-.02	2	-.037	3	-.005	4
393		7	max	1505.222	2	1.461	4	59.045	2	.011	3	.097	2	-.001	15
394			min	-567.551	3	.344	15	-27.11	3	-.02	2	-.045	3	-.005	4
395		8	max	1505.014	2	.974	4	59.045	2	.011	3	.114	2	-.001	15
396			min	-567.707	3	.229	15	-27.11	3	-.02	2	-.053	3	-.005	4
397		9	max	1504.806	2	.487	4	59.045	2	.011	3	.131	2	-.001	15
398			min	-567.863	3	.115	15	-27.11	3	-.02	2	-.061	3	-.006	4
399		10	max	1504.598	2	0	1	59.045	2	.011	3	.148	2	-.001	15
400			min	-568.019	3	0	1	-27.11	3	-.02	2	-.069	3	-.006	4
401		11	max	1504.39	2	-.115	15	59.045	2	.011	3	.166	2	-.001	15
402			min	-568.175	3	-.487	6	-27.11	3	-.02	2	-.077	3	-.006	4
403		12	max	1504.182	2	-.229	15	59.045	2	.011	3	.183	2	-.001	15
404			min	-568.331	3	-.974	6	-27.11	3	-.02	2	-.084	3	-.005	4
405		13	max	1503.974	2	-.344	15	59.045	2	.011	3	.2	2	-.001	15
406			min	-568.488	3	-1.461	6	-27.11	3	-.02	2	-.092	3	-.005	4
407		14	max	1503.766	2	-.458	15	59.045	2	.011	3	.217	2	-.001	15
408			min	-568.644	3	-1.949	6	-27.11	3	-.02	2	-.1	3	-.005	4
409		15	max	1503.557	2	-.573	15	59.045	2	.011	3	.234	2	0	15
410			min	-568.8	3	-2.436	6	-27.11	3	-.02	2	-.108	3	-.004	4
411		16	max	1503.349	2	-.687	15	59.045	2	.011	3	.252	2	0	15
412			min	-568.956	3	-2.923	6	-27.11	3	-.02	2	-.116	3	-.003	4
413		17	max	1503.141	2	-.802	15	59.045	2	.011	3	.269	2	0	15
414			min	-569.112	3	-3.41	6	-27.11	3	-.02	2	-.124	3	-.002	4
415		18	max	1502.933	2	-.916	15	59.045	2	.011	3	.286	2	0	15
416			min	-569.268	3	-3.897	6	-27.11	3	-.02	2	-.132	3	-.001	4
417		19	max	1502.725	2	-1.031	15	59.045	2	.011	3	.303	2	0	1
418			min	-569.424	3	-4.384	6	-27.11	3	-.02	2	-.14	3	0	1
419	M6	1	max	4405.413	2	4.384	4	0	1	0	1	.021	4	0	1
420			min	-2021.271	3	1.031	15	-22.918	4	0	4	0	1	0	1
421		2	max	4405.205	2	3.897	4	0	1	0	1	.015	4	0	15
422			min	-2021.427	3	.916	15	-22.543	4	0	4	0	1	-.001	4
423		3	max	4404.997	2	3.41	4	0	1	0	1	.008	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	-2021.583	3	.802	15	-22.168	4	0	4	0	1	-.002	4
425		4	max	4404.789	2	2.923	4	0	1	0	1	.002	4	0	15
426			min	-2021.739	3	.687	15	-21.793	4	0	4	0	1	-.003	4
427		5	max	4404.581	2	2.436	4	0	1	0	1	0	1	0	15
428			min	-2021.896	3	.573	15	-21.418	4	0	4	-.005	4	-.004	4
429		6	max	4404.373	2	1.949	4	0	1	0	1	0	1	-.001	15
430			min	-2022.052	3	.458	15	-21.043	4	0	4	-.011	4	-.005	4
431		7	max	4404.165	2	1.461	4	0	1	0	1	0	1	-.001	15
432			min	-2022.208	3	.344	15	-20.667	4	0	4	-.017	4	-.005	4
433		8	max	4403.957	2	.974	4	0	1	0	1	0	1	-.001	15
434			min	-2022.364	3	.229	15	-20.292	4	0	4	-.023	4	-.005	4
435		9	max	4403.749	2	.487	4	0	1	0	1	0	1	-.001	15
436			min	-2022.52	3	.115	15	-19.917	4	0	4	-.029	4	-.006	4
437		10	max	4403.541	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2022.676	3	0	1	-19.542	4	0	4	-.034	4	-.006	4
439		11	max	4403.333	2	-.115	15	0	1	0	1	0	1	-.001	15
440			min	-2022.832	3	-.487	6	-19.167	4	0	4	-.04	4	-.006	4
441		12	max	4403.125	2	-.229	15	0	1	0	1	0	1	-.001	15
442			min	-2022.988	3	-.974	6	-18.792	4	0	4	-.046	4	-.005	4
443		13	max	4402.917	2	-.344	15	0	1	0	1	0	1	-.001	15
444			min	-2023.144	3	-1.461	6	-18.417	4	0	4	-.051	4	-.005	4
445		14	max	4402.709	2	-.458	15	0	1	0	1	0	1	-.001	15
446			min	-2023.3	3	-1.949	6	-18.041	4	0	4	-.056	4	-.005	4
447		15	max	4402.5	2	-.573	15	0	1	0	1	0	1	0	15
448			min	-2023.456	3	-2.436	6	-17.666	4	0	4	-.062	4	-.004	4
449		16	max	4402.292	2	-.687	15	0	1	0	1	0	1	0	15
450			min	-2023.612	3	-2.923	6	-17.291	4	0	4	-.067	4	-.003	4
451		17	max	4402.084	2	-.802	15	0	1	0	1	0	1	0	15
452			min	-2023.768	3	-3.41	6	-16.916	4	0	4	-.072	4	-.002	4
453		18	max	4401.876	2	-.916	15	0	1	0	1	0	1	0	15
454			min	-2023.924	3	-3.897	6	-16.541	4	0	4	-.077	4	-.001	4
455		19	max	4401.668	2	-1.031	15	0	1	0	1	0	1	0	1
456			min	-2024.08	3	-4.384	6	-16.166	4	0	4	-.081	4	0	1
457	M9	1	max	1506.47	2	4.384	6	27.11	3	.02	2	.022	4	0	1
458			min	-566.615	3	1.031	15	-59.045	2	-.011	3	-.003	3	0	1
459		2	max	1506.262	2	3.897	6	27.11	3	.02	2	.015	5	0	15
460			min	-566.771	3	.916	15	-59.045	2	-.011	3	-.011	2	-.001	6
461		3	max	1506.054	2	3.41	6	27.11	3	.02	2	.013	3	0	15
462			min	-566.927	3	.802	15	-59.045	2	-.011	3	-.028	2	-.002	6
463		4	max	1505.846	2	2.923	6	27.11	3	.02	2	.021	3	0	15
464			min	-567.083	3	.687	15	-59.045	2	-.011	3	-.045	2	-.003	6
465		5	max	1505.638	2	2.436	6	27.11	3	.02	2	.029	3	0	15
466			min	-567.239	3	.573	15	-59.045	2	-.011	3	-.062	2	-.004	6
467		6	max	1505.43	2	1.949	6	27.11	3	.02	2	.037	3	-.001	15
468			min	-567.395	3	.458	15	-59.045	2	-.011	3	-.079	2	-.005	6
469		7	max	1505.222	2	1.461	6	27.11	3	.02	2	.045	3	-.001	15
470			min	-567.551	3	.344	15	-59.045	2	-.011	3	-.097	2	-.005	6
471		8	max	1505.014	2	.974	6	27.11	3	.02	2	.053	3	-.001	15
472			min	-567.707	3	.229	15	-59.045	2	-.011	3	-.114	2	-.005	6
473		9	max	1504.806	2	.487	6	27.11	3	.02	2	.061	3	-.001	15
474			min	-567.863	3	.115	15	-59.045	2	-.011	3	-.131	2	-.006	6
475		10	max	1504.598	2	0	1	27.11	3	.02	2	.069	3	-.001	15
476			min	-568.019	3	0	1	-59.045	2	-.011	3	-.148	2	-.006	6
477		11	max	1504.39	2	-.115	15	27.11	3	.02	2	.077	3	-.001	15
478			min	-568.175	3	-.487	4	-59.045	2	-.011	3	-.166	2	-.006	6
479		12	max	1504.182	2	-.229	15	27.11	3	.02	2	.084	3	-.001	15
480			min	-568.331	3	-.974	4	-59.045	2	-.011	3	-.183	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	1503.974	2	-.344	15	27.11	3	.02	2	.092	3	-.001	15
482			min	-568.488	3	-1.461	4	-59.045	2	-.011	3	-.2	2	-.005	6
483		14	max	1503.766	2	-.458	15	27.11	3	.02	2	.1	3	-.001	15
484			min	-568.644	3	-1.949	4	-59.045	2	-.011	3	-.217	2	-.005	6
485		15	max	1503.557	2	-.573	15	27.11	3	.02	2	.108	3	0	15
486			min	-568.8	3	-2.436	4	-59.045	2	-.011	3	-.234	2	-.004	6
487		16	max	1503.349	2	-.687	15	27.11	3	.02	2	.116	3	0	15
488			min	-568.956	3	-2.923	4	-59.045	2	-.011	3	-.252	2	-.003	6
489		17	max	1503.141	2	-.802	15	27.11	3	.02	2	.124	3	0	15
490			min	-569.112	3	-3.41	4	-59.045	2	-.011	3	-.269	2	-.002	6
491		18	max	1502.933	2	-.916	15	27.11	3	.02	2	.132	3	0	15
492			min	-569.268	3	-3.897	4	-59.045	2	-.011	3	-.286	2	-.001	6
493		19	max	1502.725	2	-1.031	15	27.11	3	.02	2	.14	3	0	1
494			min	-569.424	3	-4.384	4	-59.045	2	-.011	3	-.303	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	-.025	15	-.032	12	.021	1	8.391e-3	3	NC	3	NC	3
2			min	-.206	1	-.459	1	-.488	5	-2.124e-2	2	273.477	1	408.442	5
3		2	max	-.025	15	-.03	15	.006	1	8.391e-3	3	NC	12	NC	2
4			min	-.206	1	-.38	1	-.468	4	-2.124e-2	2	326.171	1	436.307	5
5		3	max	-.025	15	-.026	15	0	12	7.923e-3	3	7807.034	12	NC	1
6			min	-.206	1	-.301	1	-.449	4	-1.954e-2	2	404.121	1	469.988	5
7		4	max	-.025	15	-.021	15	-.001	12	7.206e-3	3	5425.404	12	NC	1
8			min	-.206	1	-.225	1	-.424	4	-1.693e-2	2	524.617	1	517.1	5
9		5	max	-.025	15	-.017	15	0	12	6.489e-3	3	NC	10	NC	1
10			min	-.206	1	-.156	1	-.395	4	-1.432e-2	2	716.035	1	582.066	5
11		6	max	-.025	15	-.013	15	0	3	6.662e-3	3	8665.689	2	NC	1
12			min	-.206	1	-.101	1	-.364	4	-1.363e-2	2	1017.629	1	670.3	5
13		7	max	-.025	15	-.009	15	.001	3	7.45e-3	3	5791.634	11	NC	2
14			min	-.205	1	-.091	3	-.333	4	-1.427e-2	2	1282.134	14	786.507	5
15		8	max	-.025	15	.002	10	0	3	8.238e-3	3	NC	11	NC	2
16			min	-.205	1	-.079	3	-.305	4	-1.491e-2	2	1533.644	14	938.063	5
17		9	max	-.025	15	.02	2	0	10	9.232e-3	3	NC	12	NC	2
18			min	-.205	1	-.062	3	-.28	4	-1.463e-2	2	1341.285	2	1134.655	5
19		10	max	-.025	15	.039	2	0	2	1.059e-2	3	NC	1	NC	2
20			min	-.204	1	-.043	3	-.255	4	-1.271e-2	2	1120.352	2	1436.463	5
21		11	max	-.025	15	.064	1	.001	3	1.195e-2	3	6655.686	12	NC	2
22			min	-.204	1	-.019	3	-.231	4	-1.08e-2	2	980.334	2	1930.057	5
23		12	max	-.025	15	.088	1	.005	3	9.956e-3	3	8928.057	9	NC	2
24			min	-.204	1	.006	12	-.21	4	-8.043e-3	2	889.337	2	2806.395	5
25		13	max	-.025	15	.107	1	.01	3	6.073e-3	3	NC	9	NC	2
26			min	-.203	1	.011	15	-.19	4	-4.804e-3	2	845.287	2	4847.615	5
27		14	max	-.025	15	.115	1	.009	3	2.384e-3	3	NC	9	NC	2
28			min	-.203	1	.015	15	-.174	4	-5.096e-3	4	860.646	2	6664.634	1
29		15	max	-.025	15	.181	3	.008	1	7.36e-3	3	NC	6	NC	2
30			min	-.203	1	.018	15	-.165	5	-4.516e-3	4	586.707	3	4979.056	1
31		16	max	-.025	15	.276	3	.01	1	1.234e-2	3	NC	4	NC	3
32			min	-.203	1	.005	10	-.161	5	-6.837e-3	2	414.461	3	4561.276	1
33		17	max	-.025	15	.381	3	.006	1	1.731e-2	3	NC	4	NC	2
34			min	-.203	1	-.016	10	-.16	4	-9.41e-3	2	312.349	3	5259.363	1
35		18	max	-.025	15	.491	3	0	10	2.056e-2	3	NC	4	NC	2
36			min	-.203	1	-.043	2	-.162	4	-1.109e-2	2	248.643	3	9741.893	1
37		19	max	-.025	15	.601	3	-.004	10	2.056e-2	3	NC	1	NC	1
38			min	-.203	1	-.08	2	-.166	4	-1.109e-2	2	206.562	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	-.015	15	.033	3	0	1	1.908e-4	4	NC	3	NC	1
40			min	-.378	1	-1.014	2	-.485	4	0	1	153.377	1	410.85	4
41		2	max	-.015	15	-.018	12	0	1	1.908e-4	4	4756.918	15	NC	1
42			min	-.378	1	-.813	2	-.468	4	0	1	193.231	1	433.172	4
43		3	max	-.015	15	-.021	15	0	1	0	1	5800.996	15	NC	1
44			min	-.378	1	-.629	1	-.45	4	-1.049e-4	4	261.319	1	460.705	4
45		4	max	-.015	15	-.016	15	0	1	0	1	7363.697	15	NC	1
46			min	-.378	1	-.456	1	-.425	4	-5.584e-4	4	394.487	1	503.613	4
47		5	max	-.015	15	-.011	15	0	1	0	1	9739.164	15	NC	1
48			min	-.377	1	-.304	1	-.396	4	-1.012e-3	4	671.837	3	566.334	4
49		6	max	-.015	15	-.008	15	0	1	0	1	NC	15	NC	1
50			min	-.377	1	-.186	1	-.364	4	-9.706e-4	4	625.321	3	654.208	4
51		7	max	-.015	15	-.005	15	0	1	0	1	NC	5	NC	1
52			min	-.376	1	-.174	3	-.333	4	-5.874e-4	4	567.814	2	770.899	4
53		8	max	-.015	15	.003	10	0	1	0	1	NC	5	NC	1
54			min	-.375	1	-.152	3	-.305	4	-2.041e-4	4	467.51	2	920.43	4
55		9	max	-.015	15	.034	2	0	1	0	1	NC	5	NC	1
56			min	-.374	1	-.122	3	-.28	4	-1.462e-5	4	409.623	2	1104.628	4
57		10	max	-.015	15	.074	2	0	1	0	1	NC	4	NC	1
58			min	-.373	1	-.087	3	-.255	4	-1.678e-4	4	365.36	2	1393.543	4
59		11	max	-.015	15	.122	1	0	1	0	1	NC	4	NC	1
60			min	-.373	1	-.044	3	-.231	4	-3.21e-4	4	332.37	2	1858.182	4
61		12	max	-.015	15	.168	1	0	1	0	1	NC	5	NC	1
62			min	-.372	1	.005	12	-.21	4	-1.448e-3	4	308.107	2	2602.028	4
63		13	max	-.015	15	.201	1	0	1	0	1	NC	5	NC	1
64			min	-.371	1	.008	15	-.191	4	-3.126e-3	4	296.025	2	4173.329	4
65		14	max	-.015	15	.208	1	0	1	0	1	NC	5	NC	1
66			min	-.37	1	.009	15	-.177	4	-4.741e-3	4	303.03	2	7483.533	4
67		15	max	-.015	15	.369	3	0	1	0	1	NC	5	NC	1
68			min	-.37	1	.008	15	-.169	4	-3.57e-3	4	342.339	2	NC	1
69		16	max	-.015	15	.587	3	0	1	0	1	NC	5	NC	1
70			min	-.37	1	-.008	10	-.165	4	-2.398e-3	4	242.172	3	NC	1
71		17	max	-.015	15	.831	3	0	1	0	1	NC	5	NC	1
72			min	-.37	1	-.082	2	-.162	4	-1.227e-3	4	167.98	3	NC	1
73		18	max	-.015	15	1.085	3	0	1	0	1	NC	4	NC	1
74			min	-.37	1	-.188	2	-.161	4	-4.637e-4	4	127.402	3	NC	1
75		19	max	-.015	15	1.339	3	0	1	0	1	NC	1	NC	1
76			min	-.37	1	-.293	2	-.159	4	-4.637e-4	4	102.667	3	NC	1
77	M7	1	max	.009	5	.001	15	-.003	12	2.124e-2	2	NC	3	NC	3
78			min	-.206	1	-.459	1	-.498	4	-8.391e-3	3	273.477	1	390.265	4
79		2	max	.009	5	.002	5	0	12	2.124e-2	2	NC	5	NC	2
80			min	-.206	1	-.38	1	-.472	4	-8.391e-3	3	326.171	1	422.403	4
81		3	max	.009	5	.003	5	.006	1	1.954e-2	2	NC	5	NC	1
82			min	-.206	1	-.301	1	-.445	4	-7.923e-3	3	404.121	1	460.847	4
83		4	max	.009	5	.004	5	.012	1	1.693e-2	2	NC	5	NC	1
84			min	-.206	1	-.225	1	-.418	5	-7.206e-3	3	524.617	1	509.595	4
85		5	max	.009	5	.005	5	.012	1	1.432e-2	2	NC	5	NC	1
86			min	-.206	1	-.156	1	-.389	5	-6.489e-3	3	716.035	1	572.528	4
87		6	max	.009	5	.005	5	.01	1	1.363e-2	2	NC	4	NC	1
88			min	-.206	1	-.101	1	-.359	4	-6.662e-3	3	1017.629	1	654.294	4
89		7	max	.009	5	.005	5	.005	2	1.427e-2	2	NC	4	NC	2
90			min	-.205	1	-.091	3	-.331	4	-7.45e-3	3	1393.58	9	757.593	4
91		8	max	.009	5	.004	5	.001	2	1.491e-2	2	NC	4	NC	2
92			min	-.205	1	-.079	3	-.305	4	-8.238e-3	3	1710.044	2	890.736	4
93		9	max	.009	5	.02	2	0	3	1.463e-2	2	NC	4	NC	2
94			min	-.205	1	-.062	3	-.28	4	-9.232e-3	3	1341.285	2	1068.784	4
95		10	max	.009	5	.039	2	0	3	1.271e-2	2	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
96			min	-.204	1	-.043	3	-.255	4	-1.059e-2	3	1120.352	2	1332.068	4
97		11	max	.009	5	.064	1	0	2	1.08e-2	2	NC	5	NC	2
98			min	-.204	1	-.019	3	-.231	4	-1.195e-2	3	980.334	2	1751.468	4
99		12	max	.009	5	.088	1	.004	1	8.043e-3	2	NC	5	NC	2
100			min	-.204	1	-.001	5	-.208	4	-9.956e-3	3	889.337	2	2494.682	4
101		13	max	.009	5	.107	1	.006	2	4.804e-3	2	NC	5	NC	2
102			min	-.203	1	-.003	5	-.188	4	-6.073e-3	3	845.287	2	3957.216	4
103		14	max	.009	5	.115	1	.003	2	1.692e-3	2	NC	5	NC	2
104			min	-.203	1	-.006	5	-.175	4	-4.71e-3	5	860.646	2	6466.526	4
105		15	max	.009	5	.181	3	0	10	4.265e-3	2	NC	5	NC	2
106			min	-.203	1	-.009	5	-.169	4	-7.36e-3	3	586.707	3	4979.056	1
107		16	max	.009	5	.276	3	-.002	10	6.837e-3	2	NC	7	NC	3
108			min	-.203	1	-.013	5	-.166	4	-1.234e-2	3	414.461	3	4561.276	1
109		17	max	.009	5	.381	3	0	12	9.41e-3	2	NC	4	NC	2
110			min	-.203	1	-.018	5	-.163	4	-1.731e-2	3	312.349	3	5259.363	1
111		18	max	.009	5	.491	3	.006	1	1.109e-2	2	NC	4	NC	2
112			min	-.203	1	-.043	2	-.159	4	-2.056e-2	3	248.643	3	9741.893	1
113		19	max	.009	5	.601	3	.019	1	1.109e-2	2	NC	1	NC	1
114			min	-.203	1	-.08	2	-.157	5	-2.056e-2	3	206.562	3	NC	1
115	M10	1	max	0	1	.453	3	.203	1	1.475e-2	3	NC	1	NC	1
116			min	-.161	4	-.031	10	-.009	5	-5.042e-3	2	NC	1	NC	1
117		2	max	0	1	.707	3	.242	1	1.689e-2	3	NC	4	NC	2
118			min	-.161	4	-.165	2	-.005	5	-6.057e-3	2	851.54	3	5492.729	1
119		3	max	0	1	.943	3	.3	1	1.904e-2	3	NC	4	NC	5
120			min	-.161	4	-.287	2	0	15	-7.072e-3	2	440.601	3	2224.062	1
121		4	max	0	1	1.127	3	.357	1	2.118e-2	3	NC	5	NC	5
122			min	-.161	4	-.372	2	.004	15	-8.087e-3	2	320.614	3	1400.738	1
123		5	max	0	1	1.236	3	.4	1	2.332e-2	3	NC	5	NC	5
124			min	-.161	4	-.41	2	.008	15	-9.102e-3	2	275.816	3	1094.089	1
125		6	max	0	1	1.266	3	.423	1	2.547e-2	3	NC	4	NC	5
126			min	-.161	4	-.397	2	.01	15	-1.012e-2	2	265.788	3	983.378	1
127		7	max	0	1	1.225	3	.423	1	2.761e-2	3	NC	4	NC	5
128			min	-.161	4	-.342	2	.012	15	-1.113e-2	2	279.93	3	982.796	1
129		8	max	0	1	1.137	3	.406	1	2.975e-2	3	NC	4	NC	5
130			min	-.161	4	-.263	2	.013	15	-1.215e-2	2	315.632	3	1065.419	1
131		9	max	0	1	1.043	3	.382	1	3.19e-2	3	NC	4	NC	5
132			min	-.161	4	-.186	2	.014	15	-1.316e-2	2	365.906	3	1203.561	1
133		10	max	0	1	.997	3	.37	1	3.404e-2	3	NC	9	NC	5
134			min	-.161	4	-.151	2	.015	15	-1.418e-2	2	396.965	3	1293.829	1
135		11	max	0	10	1.043	3	.382	1	3.19e-2	3	NC	9	NC	5
136			min	-.161	4	-.186	2	.018	15	-1.316e-2	2	365.906	3	1203.561	1
137		12	max	0	10	1.137	3	.406	1	2.975e-2	3	NC	4	NC	5
138			min	-.161	4	-.263	2	.021	15	-1.215e-2	2	315.632	3	1065.419	1
139		13	max	0	10	1.225	3	.423	1	2.761e-2	3	NC	4	NC	5
140			min	-.161	4	-.342	2	.024	15	-1.113e-2	2	279.93	3	982.796	1
141		14	max	0	10	1.266	3	.423	1	2.547e-2	3	NC	4	NC	5
142			min	-.161	4	-.397	2	.027	15	-1.012e-2	2	265.788	3	983.378	1
143		15	max	0	10	1.236	3	.4	1	2.332e-2	3	NC	4	NC	5
144			min	-.161	4	-.41	2	.028	15	-9.102e-3	2	275.816	3	1094.089	1
145		16	max	0	10	1.127	3	.357	1	2.118e-2	3	NC	4	NC	5
146			min	-.161	4	-.372	2	.028	15	-8.087e-3	2	320.614	3	1400.738	1
147		17	max	0	10	.943	3	.3	1	1.904e-2	3	NC	4	NC	5
148			min	-.161	4	-.287	2	.027	15	-7.072e-3	2	440.601	3	2224.062	1
149		18	max	0	10	.707	3	.242	1	1.689e-2	3	NC	13	NC	2
150			min	-.161	4	-.165	2	.026	15	-6.057e-3	2	851.54	3	5492.729	1
151		19	max	0	10	.453	3	.203	1	1.475e-2	3	NC	1	NC	1
152			min	-.161	4	-.031	10	.025	15	-5.042e-3	2	3628.008	4	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
153	M11	1	max	.002	1	.073	1	.204	1	3.778e-3	3	NC	1	NC	1
154			min	-.223	4	-.009	3	-.009	5	-1.88e-4	5	NC	1	NC	1
155		2	max	.002	1	.148	3	.233	1	4.11e-3	3	NC	4	NC	2
156			min	-.223	4	-.058	2	.011	15	-1.22e-4	5	1372.763	3	7136.933	4
157		3	max	.001	1	.292	3	.285	1	4.443e-3	3	NC	4	NC	3
158			min	-.223	4	-.158	2	.02	15	-5.601e-5	5	716.703	3	2672.211	1
159		4	max	.001	1	.389	3	.34	1	4.776e-3	3	NC	5	NC	15
160			min	-.223	4	-.218	2	.02	15	-1.142e-6	15	542.602	3	1583.428	1
161		5	max	.001	1	.419	3	.385	1	5.109e-3	3	NC	5	NC	15
162			min	-.223	4	-.228	2	.015	15	4.275e-5	15	504.04	3	1192.154	1
163		6	max	0	1	.38	3	.411	1	5.442e-3	3	NC	5	NC	5
164			min	-.223	4	-.188	2	.008	15	8.665e-5	15	555.36	3	1043.53	1
165		7	max	0	1	.281	3	.416	1	5.775e-3	3	NC	4	NC	5
166			min	-.223	4	-.108	2	0	15	1.305e-4	15	743.363	3	1020.326	1
167		8	max	0	1	.151	3	.403	1	6.108e-3	3	NC	4	NC	5
168			min	-.223	4	-.009	10	-.003	5	1.744e-4	15	1351.372	3	1084.336	1
169		9	max	0	1	.102	1	.383	1	6.441e-3	3	NC	2	NC	5
170			min	-.223	4	.003	15	0	15	2.183e-4	15	5649.373	3	1203.88	1
171		10	max	0	1	.139	1	.372	1	6.774e-3	3	NC	3	NC	5
172			min	-.223	4	-.027	3	.015	15	2.622e-4	15	3277.975	1	1283.414	1
173		11	max	0	3	.102	1	.383	1	6.441e-3	3	NC	2	NC	15
174			min	-.223	4	.005	15	.031	15	2.828e-4	15	5649.373	3	1203.88	1
175		12	max	0	3	.151	3	.403	1	6.108e-3	3	NC	4	9083.77	15
176			min	-.223	4	-.009	10	.037	15	3.034e-4	15	1351.372	3	1084.336	1
177		13	max	0	3	.281	3	.416	1	5.775e-3	3	NC	5	NC	15
178			min	-.223	4	-.108	2	.035	15	3.24e-4	15	743.363	3	1020.326	1
179		14	max	.001	3	.38	3	.411	1	5.442e-3	3	NC	5	NC	5
180			min	-.223	4	-.188	2	.028	15	3.446e-4	15	555.36	3	1043.53	1
181		15	max	.001	3	.419	3	.385	1	5.109e-3	3	NC	15	NC	5
182			min	-.223	4	-.228	2	.019	15	3.652e-4	15	504.04	3	1192.154	1
183		16	max	.002	3	.389	3	.34	1	4.776e-3	3	NC	15	NC	4
184			min	-.223	4	-.218	2	.01	15	3.858e-4	15	542.602	3	1583.428	1
185		17	max	.002	3	.292	3	.285	1	4.443e-3	3	NC	15	NC	3
186			min	-.223	4	-.158	2	.006	15	4.063e-4	15	716.703	3	2672.211	1
187		18	max	.002	3	.148	3	.233	1	4.11e-3	3	NC	5	NC	2
188			min	-.223	4	-.058	2	.01	15	4.269e-4	15	1372.763	3	7545.919	1
189		19	max	.002	3	.073	1	.204	1	3.778e-3	3	NC	1	NC	1
190			min	-.223	4	-.009	3	.025	15	4.475e-4	15	NC	1	NC	1
191	M12	1	max	0	2	.012	2	.205	1	4.135e-3	1	NC	1	NC	1
192			min	-.289	4	-.069	3	-.009	5	-1.443e-4	5	NC	1	NC	1
193		2	max	0	2	.031	3	.229	1	4.505e-3	1	NC	4	NC	2
194			min	-.289	4	-.172	2	.013	15	-7.614e-5	5	1176.028	2	6706.451	4
195		3	max	0	2	.107	3	.279	1	4.874e-3	1	NC	5	NC	10
196			min	-.289	4	-.328	2	.022	15	-1.396e-5	15	634.334	2	2918.586	1
197		4	max	0	2	.149	3	.334	1	5.244e-3	1	NC	5	9543.534	15
198			min	-.289	4	-.428	2	.021	15	3.136e-5	15	490.547	2	1673.506	1
199		5	max	0	2	.151	3	.38	1	5.613e-3	1	NC	5	NC	15
200			min	-.289	4	-.455	2	.015	15	7.668e-5	15	462.016	2	1236.779	1
201		6	max	0	2	.115	3	.407	1	5.982e-3	1	NC	5	NC	5
202			min	-.289	4	-.409	2	.006	15	1.22e-4	15	512.905	2	1068.626	1
203		7	max	0	2	.049	3	.414	1	6.352e-3	1	NC	5	NC	5
204			min	-.289	4	-.303	2	-.002	15	1.673e-4	15	686.065	2	1033.838	1
205		8	max	0	2	-.001	15	.403	1	6.721e-3	1	NC	4	NC	4
206			min	-.289	4	-.165	2	-.008	5	2.126e-4	15	1220.757	2	1088.202	1
207		9	max	0	2	0	15	.385	1	7.091e-3	1	NC	4	NC	4
208			min	-.289	4	-.101	3	-.002	15	2.58e-4	15	4289.36	2	1198.119	1
209		10	max	0	1	.019	2	.375	1	7.46e-3	1	NC	1	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	-.289	4	-.133	3	.015	15	3.033e-4	15	3350.147	3	1272.138	1
211		11	max	0	9	-.003	15	.385	1	7.091e-3	1	NC	4	9782.875	15
212			min	-.289	4	-.101	3	.033	15	3.223e-4	15	4289.36	2	1198.119	1
213		12	max	0	9	-.006	15	.403	1	6.721e-3	1	NC	5	8080.321	15
214			min	-.289	4	-.165	2	.04	15	3.412e-4	15	1220.757	2	1088.202	1
215		13	max	0	9	.049	3	.414	1	6.352e-3	1	NC	5	9568.603	15
216			min	-.289	4	-.303	2	.037	15	3.602e-4	15	686.065	2	1033.838	1
217		14	max	0	9	.115	3	.407	1	5.982e-3	1	NC	5	NC	5
218			min	-.289	4	-.409	2	.029	15	3.791e-4	15	512.905	2	1068.626	1
219		15	max	0	9	.151	3	.38	1	5.613e-3	1	NC	15	NC	5
220			min	-.289	4	-.455	2	.018	15	3.981e-4	15	462.016	2	1236.779	1
221		16	max	0	9	.149	3	.334	1	5.244e-3	1	NC	15	NC	4
222			min	-.289	4	-.428	2	.009	15	4.171e-4	15	490.547	2	1673.506	1
223		17	max	0	9	.107	3	.279	1	4.874e-3	1	NC	5	NC	4
224			min	-.289	4	-.328	2	.004	15	4.36e-4	15	634.334	2	2918.586	1
225		18	max	0	9	.031	3	.229	1	4.505e-3	1	NC	5	NC	2
226			min	-.289	4	-.172	2	.008	15	4.55e-4	15	1176.028	2	8963.51	1
227		19	max	0	9	.012	2	.205	1	4.135e-3	1	NC	1	NC	1
228			min	-.289	4	-.069	3	.025	15	4.74e-4	15	NC	1	NC	1
229	M13	1	max	0	12	.002	5	.206	1	1.104e-2	2	NC	1	NC	1
230			min	-.463	4	-.353	1	-.009	5	-1.897e-3	3	NC	1	NC	1
231		2	max	0	12	.032	3	.247	1	1.282e-2	2	NC	5	NC	2
232			min	-.463	4	-.572	2	.013	15	-2.515e-3	3	847.887	2	5324.29	1
233		3	max	0	12	.115	3	.306	1	1.46e-2	2	NC	5	NC	10
234			min	-.463	4	-.799	2	.022	15	-3.133e-3	3	448.847	2	2173.767	1
235		4	max	0	12	.169	3	.363	1	1.637e-2	2	NC	5	8600.407	15
236			min	-.463	4	-.965	2	.024	15	-3.751e-3	3	333.647	2	1373.708	1
237		5	max	0	12	.185	3	.407	1	1.815e-2	2	NC	5	NC	15
238			min	-.463	4	-1.053	2	.02	15	-4.368e-3	3	293.561	2	1074.331	1
239		6	max	0	12	.164	3	.43	1	1.993e-2	2	NC	5	NC	5
240			min	-.463	4	-1.061	2	.013	15	-4.986e-3	3	290.464	2	965.521	1
241		7	max	0	12	.114	3	.43	1	2.171e-2	2	NC	5	NC	5
242			min	-.463	4	-1	2	.006	15	-5.604e-3	3	316.368	2	963.706	1
243		8	max	0	12	.048	3	.413	1	2.349e-2	2	NC	5	NC	5
244			min	-.463	4	-.897	2	.002	15	-6.222e-3	3	372.681	2	1042.131	1
245		9	max	0	12	-.012	12	.39	1	2.527e-2	2	NC	5	NC	5
246			min	-.463	4	-.793	2	.003	15	-6.84e-3	3	454.528	2	1173.369	1
247		10	max	0	1	-.024	15	.378	1	2.705e-2	2	NC	5	NC	5
248			min	-.462	4	-.747	1	.015	15	-7.457e-3	3	507.804	2	1258.834	1
249		11	max	0	1	-.012	12	.39	1	2.527e-2	2	NC	5	NC	15
250			min	-.462	4	-.793	2	.029	15	-6.84e-3	3	454.528	2	1173.369	1
251		12	max	0	1	.048	3	.413	1	2.349e-2	2	NC	15	NC	15
252			min	-.462	4	-.897	2	.033	15	-6.222e-3	3	372.681	2	1042.131	1
253		13	max	0	1	.114	3	.43	1	2.171e-2	2	NC	15	NC	15
254			min	-.462	4	-1	2	.031	15	-5.604e-3	3	316.368	2	963.706	1
255		14	max	0	1	.164	3	.43	1	1.993e-2	2	NC	15	NC	5
256			min	-.462	4	-1.061	2	.024	15	-4.986e-3	3	290.464	2	965.521	1
257		15	max	0	1	.185	3	.407	1	1.815e-2	2	NC	15	NC	5
258			min	-.462	4	-1.053	2	.016	15	-4.368e-3	3	293.561	2	1074.331	1
259		16	max	0	1	.169	3	.363	1	1.637e-2	2	NC	15	NC	4
260			min	-.462	4	-.965	2	.008	15	-3.751e-3	3	333.647	2	1373.708	1
261		17	max	0	1	.115	3	.306	1	1.46e-2	2	NC	7	NC	4
262			min	-.462	4	-.799	2	.005	15	-3.133e-3	3	448.847	2	2173.767	1
263		18	max	0	1	.032	3	.247	1	1.282e-2	2	NC	5	NC	2
264			min	-.462	4	-.572	2	.01	15	-2.515e-3	3	847.887	2	5324.29	1
265		19	max	.001	1	-.028	15	.206	1	1.104e-2	2	NC	1	NC	1
266			min	-.462	4	-.353	1	.025	15	-1.897e-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	4.331e-3	2	NC	1	NC	1
270			min	0	2	-.001	3	0	2	-5.208e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.004	5	5.623e-3	2	NC	1	NC	1
272			min	0	2	-.004	1	0	2	-6.976e-3	5	NC	1	NC	1
273		4	max	0	3	-.001	15	.008	5	5.172e-3	2	NC	2	NC	1
274			min	0	2	-.009	1	-.001	2	-6.771e-3	5	7534.385	1	8844.341	5
275		5	max	0	3	-.002	15	.013	5	4.721e-3	2	NC	4	NC	1
276			min	0	2	-.016	1	-.002	2	-6.567e-3	5	4277.853	1	5129.697	5
277		6	max	0	3	-.003	15	.02	5	4.27e-3	2	NC	5	NC	1
278			min	0	2	-.024	1	-.003	2	-6.362e-3	5	2778.953	1	3379.277	5
279		7	max	0	3	-.004	15	.028	5	3.819e-3	2	NC	5	NC	1
280			min	0	2	-.034	1	-.004	2	-6.157e-3	5	1964.099	1	2414.218	5
281		8	max	0	3	-.006	15	.037	5	3.368e-3	2	NC	15	NC	1
282			min	0	1	-.046	1	-.005	2	-5.952e-3	5	1470.515	1	1824.085	5
283		9	max	0	3	-.007	15	.047	5	2.917e-3	2	9136.876	15	NC	1
284			min	0	1	-.059	1	-.006	2	-5.748e-3	5	1148.754	1	1436.667	5
285		10	max	0	3	-.009	15	.058	5	2.466e-3	2	7386.94	15	NC	1
286			min	0	1	-.073	1	-.007	2	-5.543e-3	5	926.807	1	1168.012	5
287		11	max	0	3	-.011	15	.069	5	2.015e-3	2	6124.401	15	NC	9
288			min	0	1	-.088	1	-.007	1	-5.338e-3	5	767.159	1	973.953	5
289		12	max	0	3	-.013	15	.081	5	1.564e-3	2	5182.674	15	NC	9
290			min	0	1	-.104	1	-.008	1	-5.133e-3	5	648.36	1	829.075	5
291		13	max	0	3	-.015	15	.094	5	1.112e-3	2	4460.913	15	NC	9
292			min	-.001	1	-.121	1	-.008	1	-4.944e-3	4	557.483	1	717.981	5
293		14	max	.001	3	-.017	15	.107	5	6.613e-4	2	3895.539	15	NC	9
294			min	-.001	1	-.138	1	-.008	1	-4.786e-3	4	486.409	1	630.941	5
295		15	max	.001	3	-.02	15	.12	5	6.912e-4	3	3444.14	15	NC	9
296			min	-.001	1	-.157	1	-.007	1	-4.627e-3	4	429.738	1	561.479	5
297		16	max	.001	3	-.022	15	.133	5	9.645e-4	3	3078.148	15	NC	1
298			min	-.001	1	-.175	1	-.007	1	-4.469e-3	4	383.842	1	505.21	5
299		17	max	.001	3	-.024	15	.147	4	1.238e-3	3	2777.352	15	NC	1
300			min	-.001	1	-.194	1	-.005	1	-4.31e-3	4	346.157	1	458.67	4
301		18	max	.001	3	-.027	15	.16	4	1.511e-3	3	2527.285	15	NC	1
302			min	-.001	1	-.214	1	-.004	3	-4.152e-3	4	314.855	1	419.643	4
303		19	max	.001	3	-.029	15	.174	4	1.784e-3	3	2317.349	15	NC	1
304			min	-.002	1	-.233	1	-.009	3	-3.994e-3	4	288.595	1	386.944	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	-.002	3	0	1	-5.525e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.004	4	0	1	NC	2	NC	1
310			min	0	2	-.008	3	0	1	-7.387e-3	4	8724.752	3	NC	1
311		4	max	0	3	0	15	.008	4	0	1	NC	4	NC	1
312			min	0	2	-.016	3	0	1	-7.148e-3	4	4187.434	3	8470.007	4
313		5	max	.001	3	-.001	15	.014	4	0	1	NC	5	NC	1
314			min	-.001	2	-.028	1	0	1	-6.909e-3	4	2403.01	1	4916.489	4
315		6	max	.001	3	-.002	15	.021	4	0	1	NC	5	NC	1
316			min	-.001	2	-.043	1	0	1	-6.669e-3	4	1551.066	1	3241.668	4
317		7	max	.002	3	-.003	15	.029	4	0	1	NC	5	NC	1
318			min	-.002	2	-.062	1	0	1	-6.43e-3	4	1091.914	1	2318.122	4
319		8	max	.002	3	-.003	15	.038	4	0	1	NC	5	NC	1
320			min	-.002	2	-.083	1	0	1	-6.191e-3	4	815.313	1	1753.295	4
321		9	max	.002	3	-.004	15	.049	4	0	1	NC	15	NC	1
322			min	-.002	2	-.106	1	0	1	-5.951e-3	4	635.684	1	1382.444	4
323		10	max	.002	3	-.005	15	.06	4	0	1	NC	15	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324			min	-.002	2	-.131	1	0	1	-5.712e-3	4	512.12	1	1125.268	4
325		11	max	.002	3	-.007	15	.072	4	0	1	NC	15	NC	1
326			min	-.002	2	-.159	1	0	1	-5.473e-3	4	423.427	1	939.504	4
327		12	max	.003	3	-.008	15	.084	4	0	1	8704.372	15	NC	1
328			min	-.003	2	-.188	1	0	1	-5.234e-3	4	357.536	1	800.836	4
329		13	max	.003	3	-.009	15	.097	4	0	1	7485.508	15	NC	1
330			min	-.003	2	-.219	1	0	1	-4.994e-3	4	307.199	1	694.535	4
331		14	max	.003	3	-.01	15	.11	4	0	1	6532.021	15	NC	1
332			min	-.003	2	-.251	1	0	1	-4.755e-3	4	267.875	1	611.285	4
333		15	max	.003	3	-.012	15	.124	4	0	1	5771.604	15	NC	1
334			min	-.003	2	-.285	1	0	1	-4.516e-3	4	236.548	1	544.892	4
335		16	max	.004	3	-.013	15	.137	4	0	1	5155.651	15	NC	1
336			min	-.004	2	-.319	1	0	1	-4.276e-3	4	211.197	1	491.159	4
337		17	max	.004	3	-.014	15	.151	4	0	1	4649.838	15	NC	1
338			min	-.004	2	-.354	1	0	1	-4.037e-3	4	190.395	1	447.129	4
339		18	max	.004	3	-.016	15	.164	4	0	1	4229.633	15	NC	1
340			min	-.004	2	-.389	1	0	1	-3.798e-3	4	173.127	1	410.686	4
341		19	max	.004	3	-.017	15	.177	4	0	1	3877.087	15	NC	1
342			min	-.004	2	-.424	1	0	1	-3.558e-3	4	158.648	1	380.272	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	2.023e-3	3	NC	1	NC	1
346			min	0	2	-.001	3	0	3	-5.854e-3	4	NC	1	NC	1
347		3	max	0	3	0	5	.004	4	2.587e-3	3	NC	1	NC	1
348			min	0	2	-.004	1	0	3	-7.809e-3	4	NC	1	NC	1
349		4	max	0	3	0	5	.008	4	2.314e-3	3	NC	2	NC	1
350			min	0	2	-.009	1	-.002	3	-7.525e-3	4	7534.385	1	8456.832	4
351		5	max	0	3	0	5	.014	4	2.041e-3	3	NC	4	NC	1
352			min	0	2	-.016	1	-.003	3	-7.242e-3	4	4277.853	1	4912.564	4
353		6	max	0	3	.001	5	.021	4	1.768e-3	3	NC	4	NC	1
354			min	0	2	-.024	1	-.004	3	-6.958e-3	4	2778.953	1	3241.144	4
355		7	max	0	3	.002	5	.029	4	1.494e-3	3	NC	4	NC	1
356			min	0	2	-.034	1	-.006	3	-6.675e-3	4	1964.099	1	2319.109	4
357		8	max	0	3	.002	5	.038	4	1.221e-3	3	NC	5	NC	1
358			min	0	1	-.046	1	-.007	3	-6.392e-3	4	1470.515	1	1755.047	4
359		9	max	0	3	.003	5	.049	4	9.48e-4	3	NC	5	NC	1
360			min	0	1	-.059	1	-.008	3	-6.108e-3	4	1148.754	1	1384.618	4
361		10	max	0	3	.003	5	.06	4	6.748e-4	3	NC	5	NC	1
362			min	0	1	-.073	1	-.009	3	-5.825e-3	4	926.807	1	1127.698	4
363		11	max	0	3	.004	5	.071	4	4.016e-4	3	NC	5	NC	9
364			min	0	1	-.088	1	-.009	3	-5.542e-3	4	767.159	1	942.103	4
365		12	max	0	3	.005	5	.084	4	1.284e-4	3	NC	5	NC	9
366			min	0	1	-.104	1	-.009	3	-5.258e-3	4	648.36	1	803.558	4
367		13	max	0	3	.006	5	.097	4	-3.298e-5	9	NC	5	NC	9
368			min	-.001	1	-.121	1	-.009	3	-4.975e-3	4	557.483	1	697.357	4
369		14	max	.001	3	.006	5	.11	4	1.011e-4	9	NC	5	NC	9
370			min	-.001	1	-.138	1	-.008	3	-4.701e-3	5	486.409	1	614.195	4
371		15	max	.001	3	.007	5	.123	4	2.351e-4	9	NC	7	NC	9
372			min	-.001	1	-.157	1	-.006	3	-4.467e-3	5	429.738	1	547.89	4
373		16	max	.001	3	.008	5	.136	4	5.638e-4	1	NC	15	NC	1
374			min	-.001	1	-.175	1	-.004	3	-4.232e-3	5	383.842	1	494.248	4
375		17	max	.001	3	.009	5	.149	4	9.505e-4	1	NC	15	NC	1
376			min	-.001	1	-.194	1	0	3	-3.998e-3	5	346.157	1	450.317	4
377		18	max	.001	3	.01	5	.163	4	1.337e-3	1	9529.661	15	NC	1
378			min	-.001	1	-.214	1	0	10	-3.763e-3	5	314.855	1	413.983	4
379		19	max	.001	3	.011	5	.175	4	1.724e-3	1	8742.384	15	NC	1
380			min	-.002	1	-.233	1	-.003	2	-3.528e-3	5	288.595	1	383.691	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	.002	3	0	15	.002	5	2.744e-3	2	NC	1	NC	1
382			min	0	15	0	1	0	2	-2.87e-3	5	NC	1	NC	1
383		2	max	.002	3	-.002	15	.025	5	2.978e-3	2	NC	1	NC	4
384			min	0	10	-.015	1	-.019	2	-2.847e-3	5	NC	1	3340.839	2
385		3	max	.002	3	-.004	15	.048	5	3.211e-3	2	NC	1	NC	4
386			min	0	10	-.029	1	-.037	2	-2.824e-3	5	NC	1	1680.558	2
387		4	max	.002	3	-.006	15	.072	5	3.444e-3	2	NC	1	NC	4
388			min	0	2	-.043	1	-.054	2	-2.801e-3	5	NC	1	1134.794	2
389		5	max	.003	3	-.007	15	.096	5	3.678e-3	2	NC	1	NC	4
390			min	-.001	2	-.057	1	-.071	2	-2.777e-3	5	NC	1	868.107	2
391		6	max	.003	3	-.009	15	.119	5	3.911e-3	2	NC	1	NC	4
392			min	-.002	2	-.071	1	-.086	2	-2.754e-3	5	NC	1	713.645	2
393		7	max	.003	3	-.011	15	.143	5	4.144e-3	2	NC	1	NC	6
394			min	-.002	2	-.085	1	-.1	2	-2.731e-3	5	NC	1	616.041	2
395		8	max	.003	3	-.013	15	.166	5	4.378e-3	2	NC	1	9151.713	6
396			min	-.003	2	-.099	1	-.111	2	-2.708e-3	5	NC	1	551.864	2
397		9	max	.003	3	-.014	15	.189	5	4.611e-3	2	NC	1	7856.685	6
398			min	-.003	2	-.112	1	-.12	2	-2.685e-3	5	NC	1	509.776	2
399		10	max	.003	3	-.016	15	.212	5	4.844e-3	2	NC	1	7030.927	13
400			min	-.004	2	-.126	1	-.126	2	-2.662e-3	5	NC	1	483.989	2
401		11	max	.004	3	-.018	15	.234	5	5.078e-3	2	NC	1	6606.211	13
402			min	-.004	2	-.139	1	-.129	2	-2.639e-3	5	NC	1	471.773	2
403		12	max	.004	3	-.019	15	.255	5	5.311e-3	2	NC	1	6409.24	13
404			min	-.005	2	-.153	1	-.129	2	-2.615e-3	5	NC	1	472.541	2
405		13	max	.004	3	-.021	15	.276	5	5.544e-3	2	NC	1	6435.046	13
406			min	-.005	2	-.166	1	-.124	2	-2.702e-3	3	NC	1	487.826	2
407		14	max	.004	3	-.022	15	.295	5	5.778e-3	2	NC	1	6723.36	13
408			min	-.006	2	-.179	1	-.115	2	-2.828e-3	3	NC	1	489.508	14
409		15	max	.004	3	-.024	15	.314	5	6.011e-3	2	NC	1	7391.096	13
410			min	-.006	2	-.192	1	-.101	2	-2.953e-3	3	NC	1	446.067	14
411		16	max	.005	3	-.025	15	.332	5	6.244e-3	2	NC	1	8742.971	13
412			min	-.007	2	-.205	1	-.082	2	-3.079e-3	3	NC	1	408.36	14
413		17	max	.005	3	-.027	15	.349	5	6.478e-3	2	NC	1	NC	6
414			min	-.007	2	-.218	1	-.058	2	-3.205e-3	3	NC	1	375.321	14
415		18	max	.005	3	-.028	15	.365	4	6.711e-3	2	NC	1	NC	4
416			min	-.008	2	-.231	1	-.028	2	-3.33e-3	3	NC	1	346.138	14
417		19	max	.005	3	-.03	15	.382	4	6.944e-3	2	NC	1	NC	1
418			min	-.008	2	-.244	1	0	12	-3.456e-3	3	NC	1	320.178	14
419	M6	1	max	.004	3	0	15	.002	4	0	1	NC	1	NC	1
420			min	0	15	-.002	1	0	1	-3.054e-3	4	NC	1	NC	1
421		2	max	.004	3	-.001	15	.026	4	0	1	NC	1	NC	1
422			min	0	10	-.027	1	0	1	-3.053e-3	4	NC	1	NC	1
423		3	max	.005	3	-.002	15	.051	4	0	1	NC	1	NC	1
424			min	-.002	2	-.053	1	0	1	-3.052e-3	4	NC	1	9094.136	4
425		4	max	.006	3	-.004	15	.076	4	0	1	NC	1	NC	1
426			min	-.003	2	-.079	1	0	1	-3.052e-3	4	NC	1	5873.401	4
427		5	max	.006	3	-.005	15	.101	4	0	1	NC	1	NC	1
428			min	-.005	2	-.104	1	0	1	-3.051e-3	4	NC	1	4326.221	4
429		6	max	.007	3	-.006	15	.126	4	0	1	NC	1	NC	1
430			min	-.006	2	-.13	1	0	1	-3.05e-3	4	NC	1	3442.8	4
431		7	max	.008	3	-.007	15	.151	4	0	1	NC	1	NC	1
432			min	-.008	2	-.155	1	0	1	-3.049e-3	4	NC	1	2889.619	4
433		8	max	.008	3	-.008	15	.175	4	0	1	NC	1	NC	1
434			min	-.009	2	-.18	1	0	1	-3.049e-3	4	NC	1	2526.075	4
435		9	max	.009	3	-.009	15	.199	4	0	1	NC	1	NC	1
436			min	-.011	2	-.205	1	0	1	-3.048e-3	4	NC	1	2284.043	4
437		10	max	.01	3	-.01	15	.222	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	-.23	1	0	1	-3.047e-3	4	NC	1	2128.132	4
439		11	max	.01	3	-.011	15	.244	4	0	1	NC	1	NC	1
440			min	-.014	2	-.255	1	0	1	-3.046e-3	4	NC	1	2040.325	4
441		12	max	.011	3	-.012	15	.266	4	0	1	NC	1	NC	1
442			min	-.015	2	-.28	1	0	1	-3.045e-3	4	NC	1	2013.918	4
443		13	max	.012	3	-.013	15	.286	4	0	1	NC	1	NC	1
444			min	-.017	2	-.305	1	0	1	-3.045e-3	4	NC	1	2052.247	4
445		14	max	.013	3	-.014	15	.306	4	0	1	NC	1	NC	1
446			min	-.018	2	-.33	1	0	1	-3.044e-3	4	NC	1	2171.885	4
447		15	max	.013	3	-.015	15	.324	4	0	1	NC	1	NC	1
448			min	-.02	2	-.355	1	0	1	-3.043e-3	4	NC	1	2414.343	4
449		16	max	.014	3	-.016	15	.341	4	0	1	NC	1	NC	1
450			min	-.021	2	-.379	1	0	1	-3.042e-3	4	NC	1	2883.8	4
451		17	max	.015	3	-.016	15	.356	4	0	1	NC	1	NC	1
452			min	-.023	2	-.404	1	0	1	-3.041e-3	4	NC	1	3900.229	4
453		18	max	.015	3	-.017	15	.37	4	0	1	NC	1	NC	1
454			min	-.024	2	-.428	1	0	1	-3.041e-3	4	NC	1	7073.807	4
455		19	max	.016	3	-.018	15	.383	4	0	1	NC	1	NC	1
456			min	-.026	2	-.453	1	0	1	-3.04e-3	4	NC	1	NC	1
457	M9	1	max	.002	3	0	5	.002	4	1.195e-3	3	NC	1	NC	1
458			min	0	5	0	1	0	3	-3.269e-3	4	NC	1	NC	1
459		2	max	.002	3	0	5	.028	4	1.321e-3	3	NC	1	NC	4
460			min	0	5	-.015	1	-.009	3	-3.274e-3	4	NC	1	3340.839	2
461		3	max	.002	3	0	5	.054	4	1.446e-3	3	NC	1	NC	15
462			min	0	10	-.029	1	-.018	3	-3.28e-3	4	NC	1	1680.558	2
463		4	max	.002	3	.001	5	.08	4	1.572e-3	3	NC	1	8853.805	15
464			min	0	2	-.043	1	-.026	3	-3.444e-3	2	NC	1	1134.794	2
465		5	max	.003	3	.001	5	.106	4	1.697e-3	3	NC	1	6515.308	15
466			min	-.001	2	-.057	1	-.034	3	-3.678e-3	2	NC	1	868.107	2
467		6	max	.003	3	.002	5	.132	4	1.823e-3	3	NC	1	5180.741	15
468			min	-.002	2	-.071	1	-.041	3	-3.911e-3	2	NC	1	713.645	2
469		7	max	.003	3	.002	5	.158	4	1.949e-3	3	NC	1	4345.375	15
470			min	-.002	2	-.085	1	-.048	3	-4.144e-3	2	NC	1	616.041	2
471		8	max	.003	3	.003	5	.183	4	2.074e-3	3	NC	1	3796.481	15
472			min	-.003	2	-.099	1	-.053	3	-4.378e-3	2	NC	1	551.864	2
473		9	max	.003	3	.003	5	.207	4	2.2e-3	3	NC	1	3431.005	15
474			min	-.003	2	-.112	1	-.058	3	-4.611e-3	2	NC	1	509.776	2
475		10	max	.003	3	.004	5	.231	4	2.325e-3	3	NC	1	3195.398	15
476			min	-.004	2	-.126	1	-.061	3	-4.844e-3	2	NC	1	483.989	2
477		11	max	.004	3	.004	5	.253	4	2.451e-3	3	NC	1	3062.373	15
478			min	-.004	2	-.139	1	-.062	3	-5.078e-3	2	NC	1	471.773	2
479		12	max	.004	3	.005	5	.275	4	2.577e-3	3	NC	1	3021.703	15
480			min	-.005	2	-.153	1	-.062	3	-5.311e-3	2	NC	1	472.541	2
481		13	max	.004	3	.006	5	.294	4	2.702e-3	3	NC	1	3078.273	15
482			min	-.005	2	-.166	1	-.06	3	-5.544e-3	2	NC	1	487.826	2
483		14	max	.004	3	.006	5	.313	4	2.828e-3	3	NC	1	3256.833	15
484			min	-.006	2	-.179	1	-.056	3	-5.778e-3	2	9809.035	5	522.246	2
485		15	max	.004	3	.007	5	.329	4	2.953e-3	3	NC	1	3619.517	15
486			min	-.006	2	-.192	1	-.05	3	-6.011e-3	2	8756.865	5	586.515	2
487		16	max	.005	3	.008	5	.344	4	3.079e-3	3	NC	1	4322.353	15
488			min	-.007	2	-.205	1	-.042	3	-6.244e-3	2	7877.633	5	706.954	2
489		17	max	.005	3	.009	5	.357	4	3.205e-3	3	NC	1	5844.635	15
490			min	-.007	2	-.218	1	-.031	3	-6.478e-3	2	7138.484	5	963.87	2
491		18	max	.005	3	.01	5	.368	4	3.33e-3	3	NC	1	NC	15
492			min	-.008	2	-.231	1	-.017	3	-6.711e-3	2	6514.116	5	1760.711	2
493		19	max	.005	3	.011	5	.377	5	3.456e-3	3	NC	1	NC	1
494			min	-.008	2	-.244	1	-.011	1	-6.944e-3	2	5984.819	5	NC	1