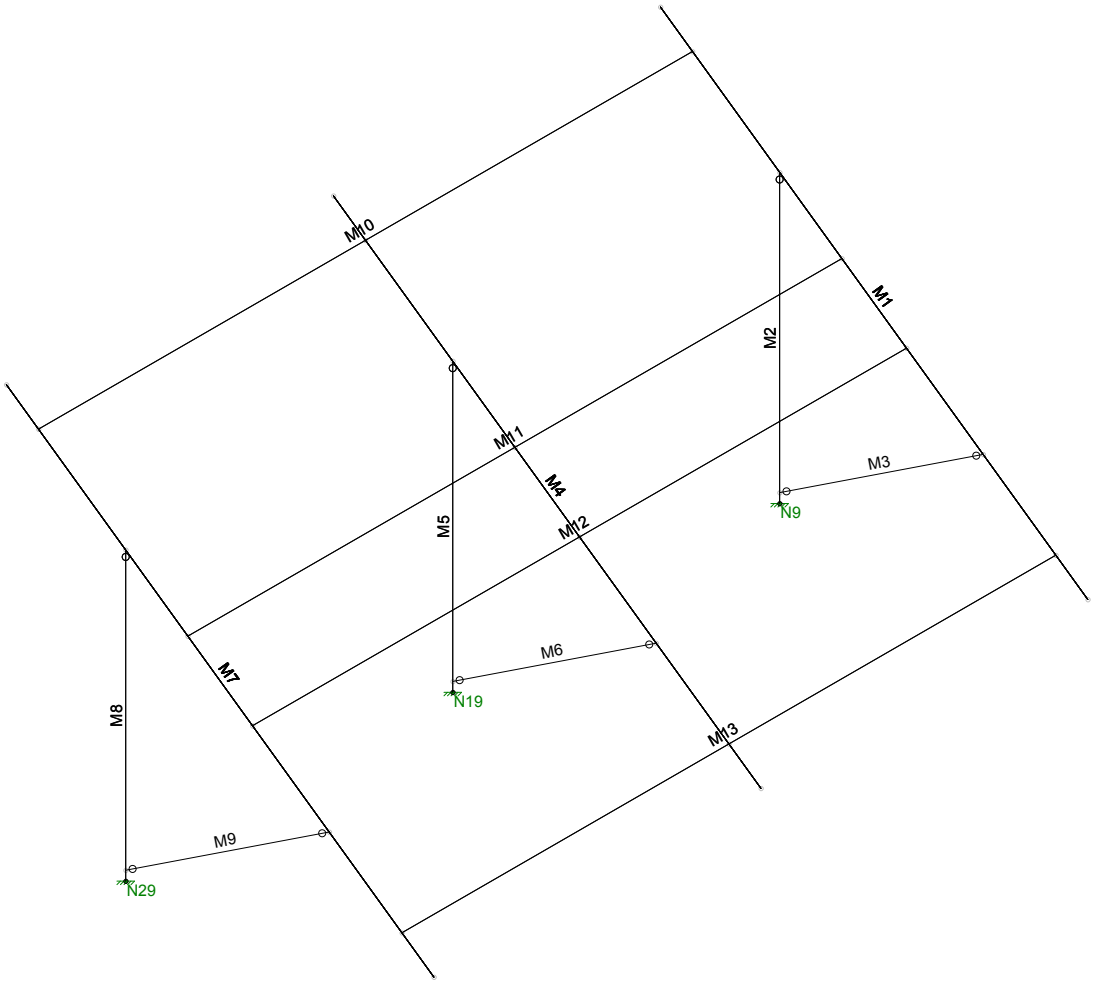



| | | |
|---|---|---|
| Schletter, Inc. | | 35° Tilt w/o Seismic Design |
| HCV | Standard FS Racking System | |
| | Representative Calculations - ASCE 7-05 | |

## 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.*

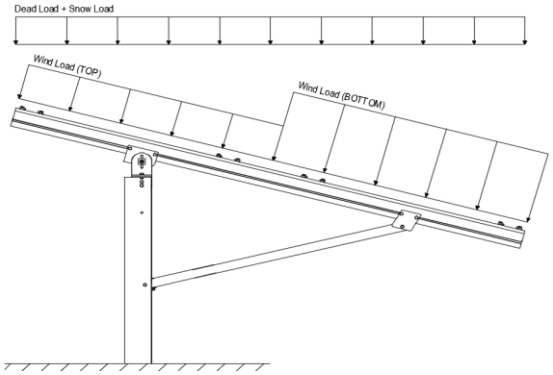
### 1.2 Construction

*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 - N/A

| | | | |
|---|---|---|---|
| $S_S$ = | 0.00 | R = | 1.25 |
| $S_{DS}$ = | 0.00 | $C_S$ = | 0 |
| $S_1$ = | 0.00 | ρ = | 1.3 |
| $S_{D1}$ = | 0.00 | Ω = | 1.25 |
| $T_a$ = | 0.00 | $C_d$ = | 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 |

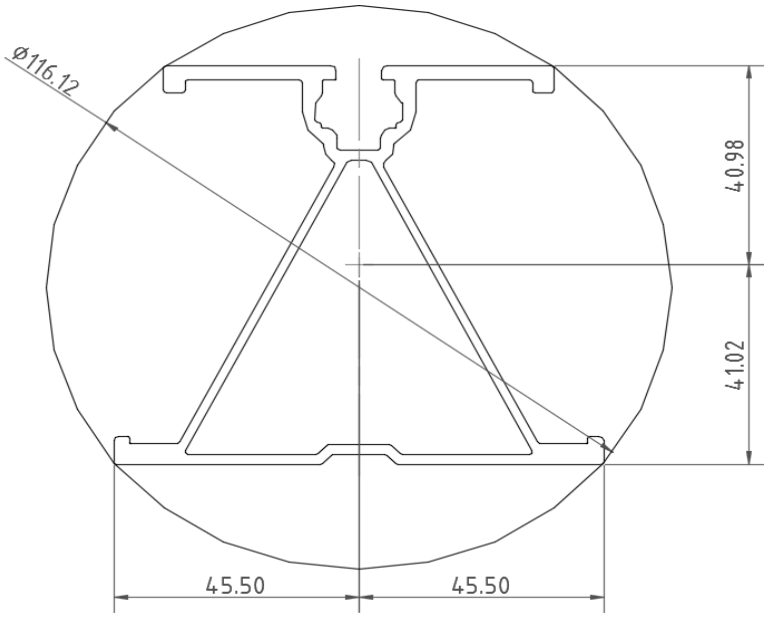
| **Struts** | Location |
|---|---|
| M3 | Outer |
| M6 | Inner |
| M9 | Outer |

## 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% | |

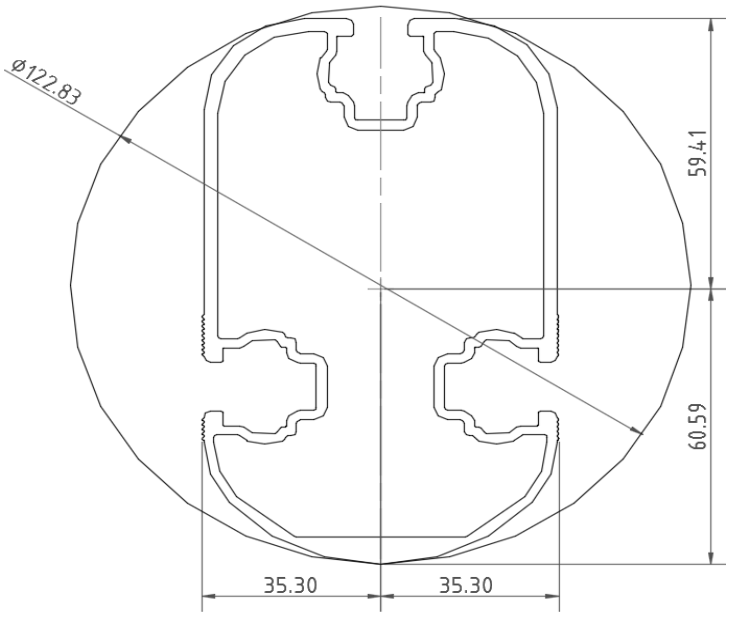


DETAIL VIEW

### 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% | |

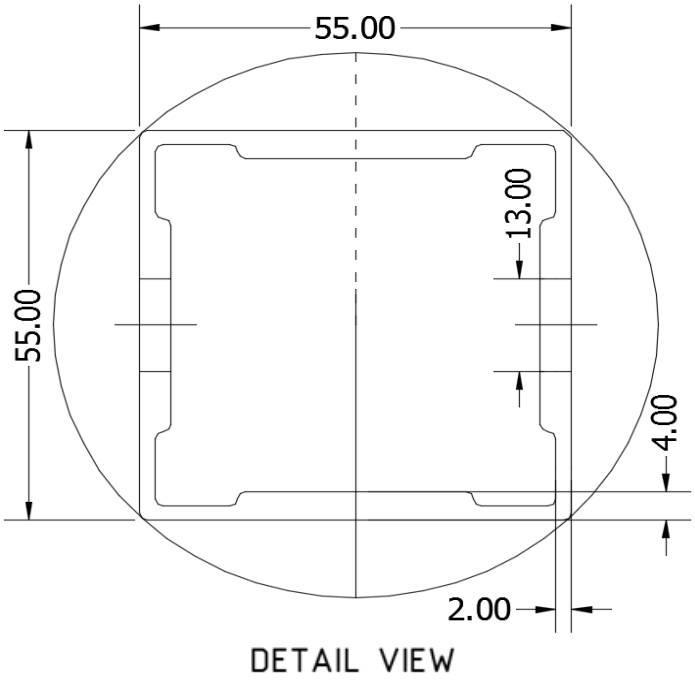


DETAIL VIEW

### 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).*

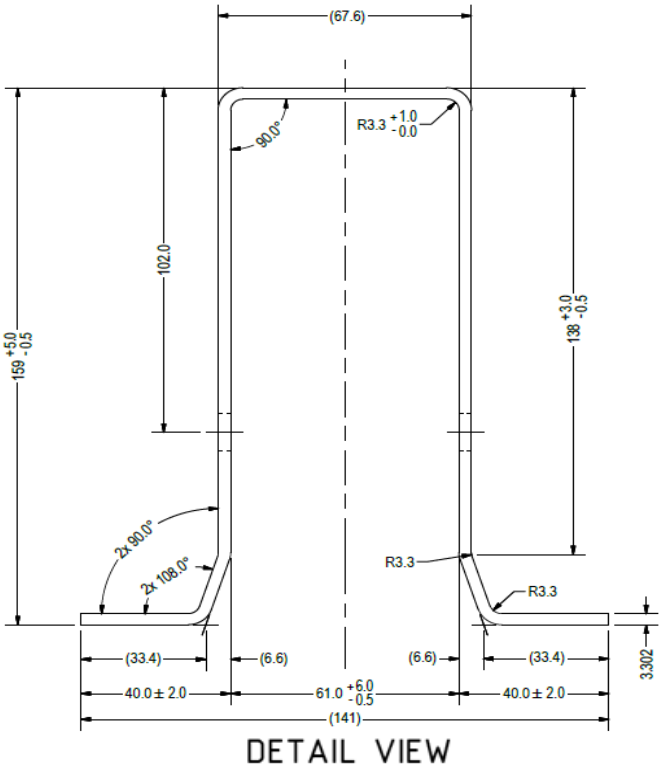
| | | |
|---|---|---|
| Strut Type = | **55x55** | |
| Aluminum Type = | 6105-T5 | |
| $F_{ty}$ = | 35 | ksi |
| $L_b$ = | 61.00 | in |
| $\Phi F_{ty\ AXIAL}$ = | 13.67 | ksi |
| $\Phi F_{ty\ BENDING}$ = | 28.22 | ksi |
| $S_y$ = | 0.60 | $in^3$ |
| $S_x$ = | 0.60 | $in^3$ |
| E = | 10100 | ksi |
| $I_y$ = | 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 |
| $\Phi$ = | 0.90 | |
| $\Phi F_{ty}$ = | 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 |

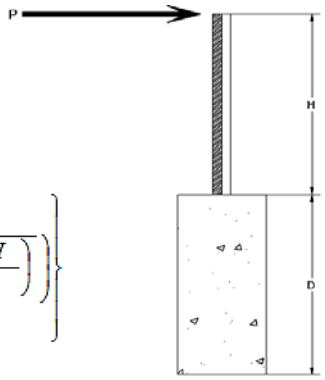
| | |
|---|---|
| Lateral Bearing @ Bottom = | $S_3$ |
| Lateral Bearing @ D/3 = | $S_1$ |
| Required Depth = | D |

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

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

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

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




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 |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.22 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 0.65 | ksf |
| Constant 2.34P/($S_1$B), A = | 5.59 | |
| Required Footing Depth, D = | 9.96 | ft |

| | | |
|---|---|---|
| 2nd Trial @ $D_2$ = | 6.61 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.44 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 1.32 | ksf |
| Constant 2.34P/($S_1$B), A = | 2.75 | |
| Required Footing Depth, D = | 6.20 | 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/($S_1$B), A = | 2.84 | |
| Required Footing Depth, D = | 6.33 | ft |

| | | |
|---|---|---|
| 4th Trial @ $D_4$ = | 6.37 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.42 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 1.27 | ksf |
| Constant 2.34P/($S_1$B), A = | 2.86 | |
| Required Footing Depth, D = | 6.35 | ft |

| | | |
|---|---|---|
| 5th Trial @ $D_5$ = | 6.36 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.42 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 1.27 | ksf |
| Constant 2.34P/($S_1$B), A = | 2.86 | |
| Required Footing Depth, D = | 6.50 | ft |

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

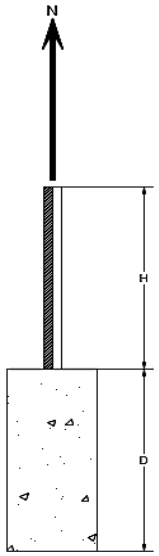
## 5.4 Uplifting Force Resistance

*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 |
| $\gamma_s$ = | 120.43 | pcf |
| $\alpha$ = | 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 |

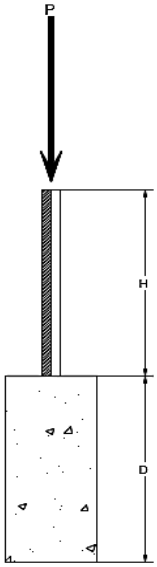
Weight of Concrete

| | | |
|---|---|---|
| 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.



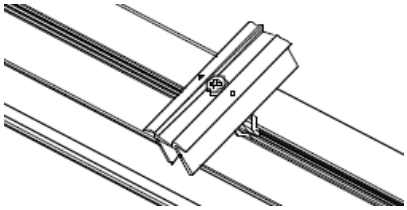
## 6. DESIGN OF JOINTS AND CONNECTIONS

### 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.*

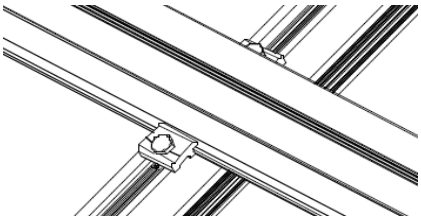
Fastening of Modules to Purlins

| | | |
|---|---|---|
| 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% |

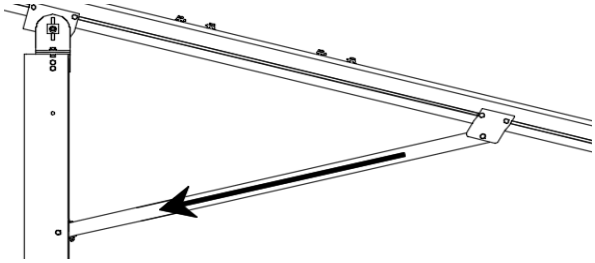


### 6.2 Strut Connections

*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)*

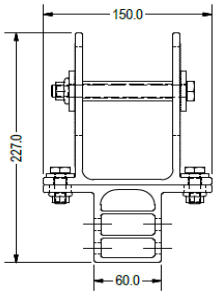


*A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.*

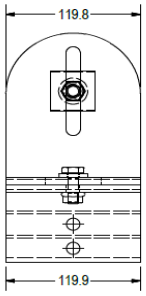
### 6.3 Girder to Post Connection

*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.*

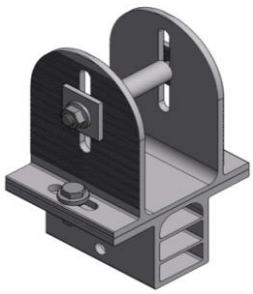
| | | |
|---|---|---|
| Maximum Tensile Load | = | 4.327 k |
| Allowable Load | = | 5.649 k |
| Utilization | = | 77% |



FRONT VIEW



SIDE VIEW



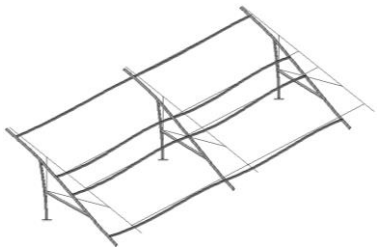
## 7. SEISMIC DESIGN

### 7.1 Seismic Drift - N/A

*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, $\Delta_{MAX}$ | = | 0 in |
| N/A | | |

*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 |
| $\varphi F_L$= | φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))] | $\varphi F_L$= | φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))] |
| $\varphi F_L$= | 28.4 ksi | $\varphi F_L$= | 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 |
| $\varphi F_L$= | φb[Bp-1.6Dp*b/t] | $\varphi F_L$= | φb[Bp-1.6Dp*b/t] |
| $\varphi F_L$= | 25.1 ksi | $\varphi F_L$= | 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 | | |
| $\varphi F_L$= | 1.17φyFcy | | |
| $\varphi F_L$= | 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 |
| $\varphi F_L$= | φb[Bbr-mDbr*h/t] | $\varphi F_L$= | 1.3φyFcy |
| $\varphi F_L$= | 43.2 ksi | $\varphi F_L$= | 43.2 ksi |
| $\varphi F_L$St= | 25.1 ksi | $\varphi F_L$Wk= | 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)
$\varphi F_L$ = φc[Bp-1.6Dp*b/t]
$\varphi F_L$ = 25.1 ksi

b/t = 37.0588
S1 = 12.21
S2 = 32.70
$\varphi F_L$ = (φck2*√(BpE))/(1.6b/t)
$\varphi F_L$ = 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
$\varphi F_L$ = φyFcy
$\varphi F_L$ = 33.25 ksi

$\varphi F_L$ = 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
$\varphi F_L$ = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
$\varphi F_L$ = 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
$\varphi F_L$ = φyFcy
$\varphi F_L$ = 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
$\varphi F_L$ = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
$\varphi F_L$ = 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
$\varphi F_L$ = φb[Bp-1.6Dp*b/t]
$\varphi F_L$ = 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

$\varphi F_L$= φb[Bt-Dt*√(Rb/t)]

$\varphi F_L$= 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

$\varphi F_L$= 1.3φyFcy

$\varphi F_L$= 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

$\varphi F_L$= 1.3φyFcy

$\varphi F_L$= 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)

$\varphi F_L$= φyFcy

$\varphi F_L$= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

$\varphi F_L$= φc[Bp-1.6Dp*b/t]

$\varphi F_L$= 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

$\varphi F_L$= φc[Bt-Dt*√(Rb/t)]

$\varphi F_L$= 30.80 ksi

$\varphi F_L$= 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 = 0.942 | J = 0.942 |
| 95.1963 | 95.1963 |
| $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$ | $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$ |
| 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 |
| $\varphi F_L$= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))] | $\varphi F_L$= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))] |
| $\varphi F_L$= 30.2 ksi | $\varphi F_L$= 30.2 |
| **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 |
| $\varphi F_L$= φb[Bp-1.6Dp*b/t] | $\varphi F_L$= φb[Bp-1.6Dp*b/t] |
| $\varphi F_L$= 28.2 ksi | $\varphi F_L$= 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 | |
| $\varphi F_L$= 1.17φyFcy | |
| $\varphi F_L$= 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 |
| $\varphi F_L$= 1.3φyFcy | $\varphi F_L$= 1.3φyFcy |
| $\varphi F_L$= 43.2 ksi | $\varphi F_L$= 43.2 ksi |
| $\varphi F_L$St= 28.2 ksi | $\varphi F_L$Wk= 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

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

$\varphi F_L$ = 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)

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

$\varphi F_L$ = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

$\varphi F_L$ = 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

$\varphi F_L = \varphi yFcy$

$\varphi F_L$ = 33.25 ksi

$\varphi F_L$ = 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 | | | | | | | | |

## 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 |

## 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... | 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 | | | | | | | | | | | | | | |

## Load Combinations (Continued)

| | Description | S... | P... | S... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | .009 | 3 | 5.63 | 3 |
| 2 | | min | -1343.992 | 3 | -1502.299 | 3 | -175.672 | 3 | -.296 | 3 | -.017 | 2 | -.114 | 10 |
| 3 | N19 | max | 3146.624 | 2 | 5403.943 | 2 | 0 | 1 | 0 | 3 | 0 | 3 | 9.365 | 3 |
| 4 | | min | -3144.649 | 3 | -4811.851 | 3 | 0 | 3 | 0 | 15 | 0 | 15 | -.455 | 10 |
| 5 | N29 | max | 1018.961 | 2 | 1935.612 | 2 | 175.672 | 3 | .296 | 3 | .017 | 2 | 5.63 | 3 |
| 6 | | min | -1343.992 | 3 | -1502.299 | 3 | -132.498 | 2 | -.193 | 2 | -.009 | 3 | -.114 | 10 |
| 7 | Totals: | max | 5184.547 | 2 | 9275.167 | 2 | 0 | 1 | | | | | | |
| 8 | | min | -5832.632 | 3 | -7816.449 | 3 | 0 | 3 | | | | | | |

## 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 | 0 | 5 | 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 | 5 | 0 | 1 | 0 | 15 | 0 | 4 |
| 4 | | | min | -1.274 | 4 | -1.818 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 5 | | 3 | max | -7.907 | 15 | 314.183 | 3 | -3.52 | 15 | .041 | 3 | .117 | 1 | .285 | 2 |
| 6 | | | min | -132.388 | 1 | -654.057 | 2 | -62.385 | 1 | -.155 | 2 | .007 | 15 | -.134 | 3 |
| 7 | | 4 | max | -8.206 | 15 | 313.12 | 3 | -3.52 | 15 | .041 | 3 | .078 | 1 | .691 | 2 |
| 8 | | | min | -133.38 | 1 | -655.474 | 2 | -62.385 | 1 | -.155 | 2 | .005 | 15 | -.328 | 3 |
| 9 | | 5 | max | -8.506 | 15 | 312.057 | 3 | -3.52 | 15 | .041 | 3 | .04 | 3 | 1.098 | 2 |
| 10 | | | min | -134.373 | 1 | -656.892 | 2 | -62.385 | 1 | -.155 | 2 | .001 | 10 | -.522 | 3 |
| 11 | | 6 | max | 141.693 | 3 | 554.794 | 2 | -4.144 | 15 | .033 | 2 | .049 | 2 | 1.061 | 2 |
| 12 | | | min | -539.738 | 2 | -174.715 | 3 | -92.021 | 1 | -.049 | 3 | -.017 | 3 | -.538 | 3 |
| 13 | | 7 | max | 140.949 | 3 | 553.377 | 2 | -4.144 | 15 | .033 | 2 | .008 | 10 | .717 | 2 |
| 14 | | | min | -540.731 | 2 | -175.778 | 3 | -92.021 | 1 | -.049 | 3 | -.037 | 3 | -.429 | 3 |
| 15 | | 8 | max | 140.205 | 3 | 551.959 | 2 | -4.144 | 15 | .033 | 2 | -.004 | 15 | .374 | 2 |
| 16 | | | min | -541.723 | 2 | -176.841 | 3 | -92.021 | 1 | -.049 | 3 | -.075 | 1 | -.319 | 3 |
| 17 | | 9 | max | 88.639 | 3 | 117.443 | 3 | -5.847 | 15 | 0 | 15 | .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 | -5.847 | 15 | 0 | 15 | .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 | -5.847 | 15 | 0 | 15 | -.002 | 12 | .255 | 2 |
| 22 | | | min | -611.983 | 1 | -69.437 | 2 | -105.559 | 1 | -.093 | 2 | -.084 | 1 | -.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 | .004 | 15 | -.756 | 3 |
| 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 | -.112 | 3 | -1.256 | 3 |
| 27 | | 14 | max | 134.993 | 1 | 443.388 | 2 | 11.096 | 10 | .164 | 2 | .11 | 3 | 1.014 | 2 |
| 28 | | | min | 8.798 | 15 | -751.348 | 3 | -106.157 | 3 | -.339 | 3 | -.066 | 2 | -1.734 | 3 |
| 29 | | 15 | max | 134.001 | 1 | 441.971 | 2 | 11.096 | 10 | .164 | 2 | .044 | 3 | .74 | 2 |
| 30 | | | min | 8.499 | 15 | -752.411 | 3 | -106.157 | 3 | -.339 | 3 | -.075 | 1 | -1.268 | 3 |
| 31 | | 16 | max | 133.008 | 1 | 440.553 | 2 | 11.096 | 10 | .164 | 2 | -.005 | 15 | .466 | 2 |
| 32 | | | min | 8.199 | 15 | -753.474 | 3 | -106.157 | 3 | -.339 | 3 | -.1 | 1 | -.8 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | | 17 | max | 132.015 | 1 | 439.136 | 2 | 11.096 | 10 | .164 | 2 | -.007 | 15 | .193 | 2 |
| 34 | | | min | 7.9 | 15 | -754.537 | 3 | -106.157 | 3 | -.339 | 3 | -.125 | 1 | -.332 | 3 |
| 35 | | 18 | max | 1.274 | 4 | 1.819 | 4 | 0 | 1 | 0 | 1 | 0 | 15 | 0 | 4 |
| 36 | | | min | .299 | 15 | .428 | 15 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 15 |
| 37 | | 19 | max | 0 | 1 | .005 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 38 | | | min | 0 | 1 | -.009 | 3 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 1 |
| 39 | M4 | 1 | max | 0 | 1 | .014 | 2 | 0 | 1 | 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 | 4 |
| 42 | | | min | -1.274 | 4 | -1.817 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 43 | | 3 | max | 46.856 | 3 | 998.788 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | .709 | 2 |
| 44 | | | min | -259.892 | 1 | -1846.927 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | -.389 | 3 |
| 45 | | 4 | max | 46.111 | 3 | 997.725 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 1.856 | 2 |
| 46 | | | min | -260.884 | 1 | -1848.344 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | -1.009 | 3 |
| 47 | | 5 | max | 45.367 | 3 | 996.662 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 3.003 | 2 |
| 48 | | | min | -261.877 | 1 | -1849.762 | 2 | 0 | 1 | 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 | 0 | 1 | 0 | 1 | 0 | 1 | -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 | 0 | 1 | 0 | 1 | 0 | 1 | -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 | 0 | 1 | 0 | 1 | 0 | 1 | -.549 | 3 |
| 55 | | 9 | max | 831.348 | 3 | 209.5 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | .029 | 1 |
| 56 | | | min | -1657.55 | 2 | -179.194 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | -.277 | 3 |
| 57 | | 10 | max | 830.603 | 3 | 208.436 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | .125 | 2 |
| 58 | | | min | -1658.542 | 2 | -180.612 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | -.407 | 3 |
| 59 | | 11 | max | 829.859 | 3 | 207.373 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | .238 | 2 |
| 60 | | | min | -1659.535 | 2 | -182.029 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | -.536 | 3 |
| 61 | | 12 | max | 896.887 | 3 | 2144.884 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | .845 | 2 |
| 62 | | | min | -1777.948 | 2 | -1430.868 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | -1.443 | 3 |
| 63 | | 13 | max | 896.143 | 3 | 2143.821 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 1.733 | 2 |
| 64 | | | min | -1778.941 | 2 | -1432.285 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | -2.774 | 3 |
| 65 | | 14 | max | 263.614 | 1 | 1156.444 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 2.587 | 2 |
| 66 | | | min | -46.354 | 3 | -1809.616 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | -4.05 | 3 |
| 67 | | 15 | max | 262.621 | 1 | 1155.027 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1.87 | 2 |
| 68 | | | min | -47.098 | 3 | -1810.679 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | -2.927 | 3 |
| 69 | | 16 | max | 261.628 | 1 | 1153.609 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1.153 | 2 |
| 70 | | | min | -47.843 | 3 | -1811.742 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | -1.803 | 3 |
| 71 | | 17 | max | 260.636 | 1 | 1152.192 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | .438 | 2 |
| 72 | | | min | -48.587 | 3 | -1812.805 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | -.678 | 3 |
| 73 | | 18 | max | 1.274 | 4 | 1.82 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 4 |
| 74 | | | min | .299 | 15 | .428 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 75 | | 19 | max | 0 | 1 | .011 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 76 | | | min | 0 | 1 | -.017 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 77 | M7 | 1 | max | 0 | 1 | .006 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 78 | | | min | 0 | 1 | 0 | 3 | 0 | 5 | 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 | 4 | -1.818 | 4 | 0 | 5 | 0 | 1 | 0 | 15 | 0 | 15 |
| 81 | | 3 | max | -7.907 | 15 | 314.183 | 3 | 62.385 | 1 | .155 | 2 | -.007 | 15 | .285 | 2 |
| 82 | | | min | -132.388 | 1 | -654.057 | 2 | 3.52 | 15 | -.041 | 3 | -.117 | 1 | -.134 | 3 |
| 83 | | 4 | max | -8.206 | 15 | 313.12 | 3 | 62.385 | 1 | .155 | 2 | -.005 | 15 | .691 | 2 |
| 84 | | | min | -133.38 | 1 | -655.474 | 2 | 3.52 | 15 | -.041 | 3 | -.078 | 1 | -.328 | 3 |
| 85 | | 5 | max | -8.506 | 15 | 312.057 | 3 | 62.385 | 1 | .155 | 2 | -.001 | 10 | 1.098 | 2 |
| 86 | | | min | -134.373 | 1 | -656.892 | 2 | 3.52 | 15 | -.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 | 4.144 | 15 | -.033 | 2 | -.049 | 2 | -.538 | 3 |
| 89 | | 7 | max | 140.949 | 3 | 553.377 | 2 | 92.021 | 1 | .049 | 3 | .037 | 3 | .717 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | | | min | -540.731 | 2 | -175.778 | 3 | 4.144 | 15 | -.033 | 2 | -.008 | 10 | -.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 | 4.144 | 15 | -.033 | 2 | .004 | 15 | -.319 | 3 |
| 93 | | 9 | max | 88.639 | 3 | 117.443 | 3 | 105.559 | 1 | .093 | 2 | .006 | 10 | .17 | 2 |
| 94 | | | min | -609.997 | 1 | -66.602 | 2 | 5.847 | 15 | 0 | 15 | -.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 | 5.847 | 15 | 0 | 15 | -.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 | 5.847 | 15 | 0 | 15 | .002 | 12 | -.415 | 3 |
| 99 | | 12 | max | 31.004 | 3 | 806.671 | 3 | 261.889 | 3 | .147 | 2 | -.004 | 15 | .453 | 2 |
| 100 | | | min | -749.09 | 1 | -460.647 | 2 | -97.475 | 2 | -.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 | -97.475 | 2 | -.207 | 3 | -.091 | 2 | -1.256 | 3 |
| 103 | | 14 | max | 134.993 | 1 | 443.388 | 2 | 106.157 | 3 | .339 | 3 | .066 | 2 | 1.014 | 2 |
| 104 | | | min | 8.798 | 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 | 8.499 | 15 | -752.411 | 3 | -11.096 | 10 | -.164 | 2 | -.044 | 3 | -1.268 | 3 |
| 107 | | 16 | max | 133.008 | 1 | 440.553 | 2 | 106.157 | 3 | .339 | 3 | .1 | 1 | .466 | 2 |
| 108 | | | min | 8.199 | 15 | -753.474 | 3 | -11.096 | 10 | -.164 | 2 | .005 | 15 | -.8 | 3 |
| 109 | | 17 | max | 132.015 | 1 | 439.136 | 2 | 106.157 | 3 | .339 | 3 | .125 | 1 | .193 | 2 |
| 110 | | | min | 7.9 | 15 | -754.537 | 3 | -11.096 | 10 | -.164 | 2 | .007 | 15 | -.332 | 3 |
| 111 | | 18 | max | 1.274 | 4 | 1.819 | 4 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 4 |
| 112 | | | min | .299 | 15 | .428 | 15 | 0 | 1 | 0 | 1 | 0 | 15 | 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 | -7.301 | 15 | .014 | 2 | .142 | 1 | .164 | 2 |
| 116 | | | min | -11.097 | 10 | -756.591 | 3 | -130.052 | 1 | -.028 | 3 | .008 | 15 | -.339 | 3 |
| 117 | | 2 | max | 106.17 | 3 | 323.751 | 2 | -5.707 | 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 | -4.113 | 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 | -2.519 | 15 | .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 | -.765 | 15 | .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 | -.004 | 15 | .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 | -60.121 | 2 | -.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 | .002 | 10 | .257 | 3 |
| 138 | | | min | -11.097 | 10 | -537.701 | 3 | -71.669 | 1 | -.014 | 2 | -.078 | 3 | -.072 | 2 |
| 139 | | 13 | max | 106.17 | 3 | 237.273 | 2 | 32.457 | 3 | .028 | 3 | -.004 | 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 | 17.365 | 1 | 37.238 | 3 | .028 | 3 | 0 | 3 | .864 | 3 |
| 144 | | | min | -11.097 | 10 | .765 | 15 | -.142 | 10 | -.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 | -11.097 | 10 | -99.341 | 2 | 2.519 | 15 | -.014 | 2 | -.061 | 1 | -.461 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 147 | | 17 | max | 106.17 | 3 | 386.794 | 3 | 72.417 | 1 | .028 | 3 | .062 | 3 | .55 | 3 |
| 148 | | | min | -11.097 | 10 | -211.546 | 2 | 4.113 | 15 | -.014 | 2 | -.016 | 1 | -.34 | 2 |
| 149 | | 18 | max | 106.17 | 3 | 571.693 | 3 | 101.235 | 1 | .028 | 3 | .095 | 3 | .177 | 3 |
| 150 | | | min | -11.097 | 10 | -323.751 | 2 | 5.707 | 15 | -.014 | 2 | .001 | 10 | -.132 | 2 |
| 151 | | 19 | max | 106.17 | 3 | 756.591 | 3 | 130.052 | 1 | .028 | 3 | .142 | 1 | .164 | 2 |
| 152 | | | min | -11.097 | 10 | -435.956 | 2 | 7.301 | 15 | -.014 | 2 | .008 | 15 | -.339 | 3 |
| 153 | M11 | 1 | max | 142.681 | 2 | 388.597 | 2 | -7.683 | 15 | 0 | 10 | .17 | 1 | .054 | 2 |
| 154 | | | min | -205.996 | 3 | -692.121 | 3 | -136.187 | 1 | -.005 | 3 | .01 | 15 | -.296 | 3 |
| 155 | | 2 | max | 142.681 | 2 | 276.392 | 2 | -6.089 | 15 | 0 | 10 | .127 | 3 | .17 | 3 |
| 156 | | | min | -205.996 | 3 | -507.222 | 3 | -107.37 | 1 | -.005 | 3 | .002 | 10 | -.204 | 2 |
| 157 | | 3 | max | 142.681 | 2 | 164.187 | 2 | -4.496 | 15 | 0 | 10 | .087 | 3 | .493 | 3 |
| 158 | | | min | -205.996 | 3 | -322.323 | 3 | -78.552 | 1 | -.005 | 3 | -.009 | 2 | -.376 | 2 |
| 159 | | 4 | max | 142.681 | 2 | 51.982 | 2 | -2.902 | 15 | 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 | .1 | 10 | 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 | 8.151 | 2 | 0 | 10 | -.004 | 15 | .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 | -.004 | 15 | .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 | .002 | 10 | .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 | .04 | 1 | .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 | -67.769 | 14 | -.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 | 10 | -.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 | 10 | -.085 | 3 | -.052 | 3 |
| 177 | | 13 | max | 142.681 | 2 | 284.633 | 2 | 40.58 | 3 | .005 | 3 | -.004 | 15 | .345 | 3 |
| 178 | | | min | -205.996 | 3 | -417.273 | 3 | -36.717 | 1 | 0 | 10 | -.062 | 1 | -.188 | 2 |
| 179 | | 14 | max | 142.681 | 2 | 172.428 | 2 | 42.971 | 3 | .005 | 3 | -.004 | 15 | .597 | 3 |
| 180 | | | min | -205.996 | 3 | -232.374 | 3 | -8.151 | 2 | 0 | 10 | -.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 | 10 | -.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 | 2.902 | 15 | 0 | 10 | -.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 | 4.496 | 15 | 0 | 10 | -.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 | 6.089 | 15 | 0 | 10 | .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 | 7.683 | 15 | 0 | 10 | .01 | 15 | -.296 | 3 |
| 191 | M12 | 1 | max | 21.506 | 2 | 616.091 | 2 | -7.739 | 15 | 0 | 10 | .181 | 1 | .126 | 2 |
| 192 | | | min | -23.769 | 3 | -295.343 | 3 | -138.67 | 1 | -.005 | 3 | .01 | 15 | 0 | 15 |
| 193 | | 2 | max | 21.506 | 2 | 441.115 | 2 | -6.145 | 15 | 0 | 10 | .111 | 3 | .235 | 3 |
| 194 | | | min | -23.769 | 3 | -204.601 | 3 | -109.852 | 1 | -.005 | 3 | .005 | 15 | -.285 | 2 |
| 195 | | 3 | max | 21.506 | 2 | 266.139 | 2 | -4.551 | 15 | 0 | 10 | .074 | 3 | .359 | 3 |
| 196 | | | min | -23.769 | 3 | -113.86 | 3 | -81.035 | 1 | -.005 | 3 | 0 | 10 | -.56 | 2 |
| 197 | | 4 | max | 21.506 | 2 | 91.163 | 2 | -2.957 | 15 | 0 | 10 | .04 | 3 | .412 | 3 |
| 198 | | | min | -23.769 | 3 | -23.118 | 3 | -52.218 | 1 | -.005 | 3 | -.041 | 1 | -.699 | 2 |
| 199 | | 5 | max | 21.506 | 2 | 67.624 | 3 | -1.363 | 15 | 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 | 5.417 | 1 | 0 | 10 | -.004 | 15 | .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 | 34.234 | 1 | 0 | 10 | -.004 | 15 | .148 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 204 | | | min | -23.769 | 3 | -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 | 0 | 10 | .106 | 2 |
| 206 | | | min | -23.769 | 3 | -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 | .036 | 1 | .647 | 2 |
| 208 | | | min | -23.769 | 3 | -783.716 | 2 | -31.642 | 3 | -.005 | 3 | -.107 | 3 | -.38 | 3 |
| 209 | | 10 | max | 21.506 | 2 | 958.692 | 2 | 20.107 | 10 | 0 | 15 | .118 | 1 | 1.325 | 2 |
| 210 | | | min | -23.769 | 3 | -571.523 | 10 | -120.686 | 1 | -.005 | 3 | -.13 | 3 | -.751 | 3 |
| 211 | | 11 | max | 21.506 | 2 | 783.716 | 2 | 31.642 | 3 | .005 | 3 | .036 | 1 | .647 | 2 |
| 212 | | | min | -23.769 | 3 | -430.591 | 3 | -91.869 | 1 | 0 | 10 | -.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 | 10 | -.081 | 3 | -.081 | 3 |
| 215 | | 13 | max | 21.506 | 2 | 433.765 | 2 | 36.423 | 3 | .005 | 3 | -.004 | 15 | .148 | 3 |
| 216 | | | min | -23.769 | 3 | -249.107 | 3 | -34.234 | 1 | 0 | 10 | -.062 | 1 | -.3 | 2 |
| 217 | | 14 | max | 21.506 | 2 | 258.789 | 2 | 38.814 | 3 | .005 | 3 | -.004 | 15 | .307 | 3 |
| 218 | | | min | -23.769 | 3 | -158.366 | 3 | -5.417 | 1 | 0 | 10 | -.078 | 1 | -.569 | 2 |
| 219 | | 15 | max | 21.506 | 2 | 83.813 | 2 | 41.204 | 3 | .005 | 3 | .007 | 3 | .395 | 3 |
| 220 | | | min | -23.769 | 3 | -67.624 | 3 | 1.363 | 15 | 0 | 10 | -.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 | 2.957 | 15 | 0 | 10 | -.041 | 1 | -.699 | 2 |
| 223 | | 17 | max | 21.506 | 2 | 113.86 | 3 | 81.035 | 1 | .005 | 3 | .074 | 3 | .359 | 3 |
| 224 | | | min | -23.769 | 3 | -266.139 | 2 | 4.551 | 15 | 0 | 10 | 0 | 10 | -.56 | 2 |
| 225 | | 18 | max | 21.506 | 2 | 204.601 | 3 | 109.852 | 1 | .005 | 3 | .111 | 3 | .235 | 3 |
| 226 | | | min | -23.769 | 3 | -441.115 | 2 | 6.145 | 15 | 0 | 10 | .005 | 15 | -.285 | 2 |
| 227 | | 19 | max | 21.506 | 2 | 295.343 | 3 | 138.67 | 1 | .005 | 3 | .181 | 1 | .126 | 2 |
| 228 | | | min | -23.769 | 3 | -616.091 | 2 | 7.739 | 15 | 0 | 10 | .01 | 15 | 0 | 15 |
| 229 | M13 | 1 | max | -3.52 | 15 | 651.58 | 2 | -7.308 | 15 | .007 | 3 | .142 | 1 | .155 | 2 |
| 230 | | | min | -62.345 | 1 | -316.276 | 3 | -130.367 | 1 | -.019 | 2 | .008 | 15 | -.041 | 3 |
| 231 | | 2 | max | -3.52 | 15 | 476.604 | 2 | -5.714 | 15 | .007 | 3 | .091 | 3 | .169 | 3 |
| 232 | | | min | -62.345 | 1 | -225.534 | 3 | -101.55 | 1 | -.019 | 2 | .002 | 10 | -.284 | 2 |
| 233 | | 3 | max | -3.52 | 15 | 301.628 | 2 | -4.12 | 15 | .007 | 3 | .058 | 3 | .31 | 3 |
| 234 | | | min | -62.345 | 1 | -134.792 | 3 | -72.732 | 1 | -.019 | 2 | -.016 | 1 | -.587 | 2 |
| 235 | | 4 | max | -3.52 | 15 | 126.652 | 2 | -2.526 | 15 | .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 | -3.52 | 15 | 46.691 | 3 | -.113 | 10 | .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 | -3.52 | 15 | 137.433 | 3 | 13.72 | 1 | .007 | 3 | -.005 | 15 | .307 | 3 |
| 240 | | | min | -62.345 | 1 | -223.3 | 2 | -33.615 | 3 | -.019 | 2 | -.085 | 1 | -.678 | 2 |
| 241 | | 7 | max | -3.52 | 15 | 228.175 | 3 | 42.537 | 1 | .007 | 3 | -.004 | 15 | .164 | 3 |
| 242 | | | min | -62.345 | 1 | -398.276 | 2 | -31.224 | 3 | -.019 | 2 | -.063 | 1 | -.436 | 2 |
| 243 | | 8 | max | -3.52 | 15 | 318.916 | 3 | 71.354 | 1 | .007 | 3 | .001 | 10 | -.002 | 15 |
| 244 | | | min | -62.345 | 1 | -573.252 | 2 | -28.834 | 3 | -.019 | 2 | -.077 | 3 | -.06 | 1 |
| 245 | | 9 | max | -3.52 | 15 | 409.658 | 3 | 100.171 | 1 | .007 | 3 | .048 | 1 | .455 | 2 |
| 246 | | | min | -62.345 | 1 | -748.228 | 2 | -26.443 | 3 | -.019 | 2 | -.098 | 3 | -.332 | 3 |
| 247 | | 10 | max | -3.52 | 15 | 923.204 | 2 | -7.038 | 15 | 0 | 15 | .137 | 1 | 1.105 | 2 |
| 248 | | | min | -62.345 | 1 | 11.651 | 15 | -128.989 | 1 | -.019 | 2 | -.118 | 3 | -.686 | 3 |
| 249 | | 11 | max | -3.52 | 15 | 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 | -3.52 | 15 | 573.252 | 2 | 28.834 | 3 | .019 | 2 | .001 | 10 | -.002 | 15 |
| 252 | | | min | -62.345 | 1 | -318.916 | 3 | -71.354 | 1 | -.007 | 3 | -.077 | 3 | -.06 | 1 |
| 253 | | 13 | max | -3.52 | 15 | 398.276 | 2 | 31.224 | 3 | .019 | 2 | -.004 | 15 | .164 | 3 |
| 254 | | | min | -62.345 | 1 | -228.175 | 3 | -42.537 | 1 | -.007 | 3 | -.063 | 1 | -.436 | 2 |
| 255 | | 14 | max | -3.52 | 15 | 223.3 | 2 | 33.615 | 3 | .019 | 2 | -.005 | 15 | .307 | 3 |
| 256 | | | min | -62.345 | 1 | -137.433 | 3 | -13.72 | 1 | -.007 | 3 | -.085 | 1 | -.678 | 2 |
| 257 | | 15 | max | -3.52 | 15 | 48.324 | 2 | 36.006 | 3 | .019 | 2 | -.001 | 12 | .378 | 3 |
| 258 | | | min | -62.345 | 1 | -46.691 | 3 | .113 | 10 | -.007 | 3 | -.084 | 1 | -.784 | 2 |
| 259 | | 16 | max | -3.52 | 15 | 44.051 | 3 | 43.915 | 1 | .019 | 2 | .028 | 3 | .379 | 3 |
| 260 | | | min | -62.345 | 1 | -126.652 | 2 | 2.526 | 15 | -.007 | 3 | -.061 | 1 | -.753 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 261 | | 17 | max | -3.52 | 15 | 134.792 | 3 | 72.732 | 1 | .019 | 2 | .058 | 3 | .31 | 3 |
| 262 | | | min | -62.345 | 1 | -301.628 | 2 | 4.12 | 15 | -.007 | 3 | -.016 | 1 | -.587 | 2 |
| 263 | | 18 | max | -3.52 | 15 | 225.534 | 3 | 101.55 | 1 | .019 | 2 | .091 | 3 | .169 | 3 |
| 264 | | | min | -62.345 | 1 | -476.604 | 2 | 5.714 | 15 | -.007 | 3 | .002 | 10 | -.284 | 2 |
| 265 | | 19 | max | -3.52 | 15 | 316.276 | 3 | 130.367 | 1 | .019 | 2 | .142 | 1 | .155 | 2 |
| 266 | | | min | -62.345 | 1 | -651.58 | 2 | 7.308 | 15 | -.007 | 3 | .008 | 15 | -.041 | 3 |
| 267 | M2 | 1 | max | 1935.612 | 2 | 1343.529 | 3 | 132.55 | 2 | .009 | 3 | .296 | 3 | 5.63 | 3 |
| 268 | | | min | -1502.299 | 3 | -1019.016 | 2 | -175.612 | 3 | -.017 | 2 | -.193 | 2 | -.114 | 10 |
| 269 | | 2 | max | 1207.44 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .237 | 3 | 5.233 | 3 |
| 270 | | | min | -1222.585 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.147 | 2 | .017 | 10 |
| 271 | | 3 | max | 1204.334 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .184 | 3 | 4.926 | 3 |
| 272 | | | min | -1224.914 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.116 | 2 | .016 | 10 |
| 273 | | 4 | max | 1201.228 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .131 | 3 | 4.618 | 3 |
| 274 | | | min | -1227.244 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.085 | 2 | .015 | 10 |
| 275 | | 5 | max | 1198.122 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .078 | 3 | 4.31 | 3 |
| 276 | | | min | -1229.573 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.054 | 2 | .014 | 10 |
| 277 | | 6 | max | 1195.016 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .025 | 3 | 4.002 | 3 |
| 278 | | | min | -1231.903 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.025 | 1 | .013 | 10 |
| 279 | | 7 | max | 1191.91 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .008 | 2 | 3.694 | 3 |
| 280 | | | min | -1234.232 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.029 | 3 | .012 | 10 |
| 281 | | 8 | max | 1188.804 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .039 | 2 | 3.386 | 3 |
| 282 | | | min | -1236.562 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.082 | 3 | .011 | 10 |
| 283 | | 9 | max | 1185.698 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .07 | 2 | 3.078 | 3 |
| 284 | | | min | -1238.892 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.135 | 3 | .01 | 10 |
| 285 | | 10 | max | 1182.592 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .1 | 2 | 2.771 | 3 |
| 286 | | | min | -1241.221 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.188 | 3 | .009 | 10 |
| 287 | | 11 | max | 1179.485 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .131 | 2 | 2.463 | 3 |
| 288 | | | min | -1243.551 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.241 | 3 | .008 | 10 |
| 289 | | 12 | max | 1176.379 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .162 | 2 | 2.155 | 3 |
| 290 | | | min | -1245.88 | 3 | 2.882 | 10 | -155.832 | 3 | 0 | 3 | -.294 | 3 | .007 | 10 |
| 291 | | 13 | max | 1173.273 | 2 | 902.489 | 3 | 90.596 | 2 | 0 | 2 | .193 | 2 | 1.847 | 3 |
| 292 | | | min | -1248.21 | 3 | 2.882 | 10 | -155.832 | 3 | 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 | -155.832 | 3 | 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 | -155.832 | 3 | 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 | -155.832 | 3 | 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 | -155.832 | 3 | 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 | -155.832 | 3 | 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 | -155.832 | 3 | 0 | 3 | -.666 | 3 | 0 | 1 |
| 305 | M5 | 1 | max | 5403.943 | 2 | 3142.025 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 9.365 | 3 |
| 306 | | | min | -4811.851 | 3 | -3147.296 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | -.455 | 10 |
| 307 | | 2 | max | 3262.464 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 8.526 | 3 |
| 308 | | | min | -3749.104 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.062 | 10 |
| 309 | | 3 | max | 3259.358 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 8.025 | 3 |
| 310 | | | min | -3751.434 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.059 | 10 |
| 311 | | 4 | max | 3256.252 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 7.523 | 3 |
| 312 | | | min | -3753.763 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.055 | 10 |
| 313 | | 5 | max | 3253.146 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 7.022 | 3 |
| 314 | | | min | -3756.093 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.051 | 10 |
| 315 | | 6 | max | 3250.04 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 6.52 | 3 |
| 316 | | | min | -3758.423 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.048 | 10 |
| 317 | | 7 | max | 3246.934 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 6.018 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 318 | | | min | -3760.752 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.044 | 10 |
| 319 | | 8 | max | 3243.828 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 5.517 | 3 |
| 320 | | | min | -3763.082 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.04 | 10 |
| 321 | | 9 | max | 3240.721 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 5.015 | 3 |
| 322 | | | min | -3765.411 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.037 | 10 |
| 323 | | 10 | max | 3237.615 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 4.514 | 3 |
| 324 | | | min | -3767.741 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.033 | 10 |
| 325 | | 11 | max | 3234.509 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 4.012 | 3 |
| 326 | | | min | -3770.07 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.029 | 10 |
| 327 | | 12 | max | 3231.403 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 3.511 | 3 |
| 328 | | | min | -3772.4 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.026 | 10 |
| 329 | | 13 | max | 3228.297 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 3.009 | 3 |
| 330 | | | min | -3774.73 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.022 | 10 |
| 331 | | 14 | max | 3225.191 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 2.508 | 3 |
| 332 | | | min | -3777.059 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 0 | 1 | -.018 | 10 |
| 333 | | 15 | max | 3222.085 | 2 | 1470.321 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 2.006 | 3 |
| 334 | | | min | -3779.389 | 3 | -10.729 | 10 | 0 | 1 | 0 | 1 | 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 | 0 | 1 | 0 | 1 | 0 | 1 | -.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 | 0 | 1 | 0 | 1 | 0 | 1 | -.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 | 0 | 1 | 0 | 1 | 0 | 1 | -.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 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 343 | M8 | 1 | max | 1935.612 | 2 | 1343.529 | 3 | 175.612 | 3 | .017 | 2 | .193 | 2 | 5.63 | 3 |
| 344 | | | min | -1502.299 | 3 | -1019.016 | 2 | -132.55 | 2 | -.009 | 3 | -.296 | 3 | -.114 | 10 |
| 345 | | 2 | max | 1207.44 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .147 | 2 | 5.233 | 3 |
| 346 | | | min | -1222.585 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.237 | 3 | .017 | 10 |
| 347 | | 3 | max | 1204.334 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .116 | 2 | 4.926 | 3 |
| 348 | | | min | -1224.914 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.184 | 3 | .016 | 10 |
| 349 | | 4 | max | 1201.228 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .085 | 2 | 4.618 | 3 |
| 350 | | | min | -1227.244 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.131 | 3 | .015 | 10 |
| 351 | | 5 | max | 1198.122 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .054 | 2 | 4.31 | 3 |
| 352 | | | min | -1229.573 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.078 | 3 | .014 | 10 |
| 353 | | 6 | max | 1195.016 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .025 | 1 | 4.002 | 3 |
| 354 | | | min | -1231.903 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.025 | 3 | .013 | 10 |
| 355 | | 7 | max | 1191.91 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .029 | 3 | 3.694 | 3 |
| 356 | | | min | -1234.232 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.008 | 2 | .012 | 10 |
| 357 | | 8 | max | 1188.804 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .082 | 3 | 3.386 | 3 |
| 358 | | | min | -1236.562 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.039 | 2 | .011 | 10 |
| 359 | | 9 | max | 1185.698 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .135 | 3 | 3.078 | 3 |
| 360 | | | min | -1238.892 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.07 | 2 | .01 | 10 |
| 361 | | 10 | max | 1182.592 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .188 | 3 | 2.771 | 3 |
| 362 | | | min | -1241.221 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.1 | 2 | .009 | 10 |
| 363 | | 11 | max | 1179.485 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .241 | 3 | 2.463 | 3 |
| 364 | | | min | -1243.551 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.131 | 2 | .008 | 10 |
| 365 | | 12 | max | 1176.379 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .294 | 3 | 2.155 | 3 |
| 366 | | | min | -1245.88 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.162 | 2 | .007 | 10 |
| 367 | | 13 | max | 1173.273 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .347 | 3 | 1.847 | 3 |
| 368 | | | min | -1248.21 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.193 | 2 | .006 | 10 |
| 369 | | 14 | max | 1170.167 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .401 | 3 | 1.539 | 3 |
| 370 | | | min | -1250.539 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.224 | 2 | .005 | 10 |
| 371 | | 15 | max | 1167.061 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .454 | 3 | 1.231 | 3 |
| 372 | | | min | -1252.869 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.255 | 2 | .004 | 10 |
| 373 | | 16 | max | 1163.955 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .507 | 3 | .924 | 3 |
| 374 | | | min | -1255.199 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.286 | 2 | .003 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 375 | | 17 | max | 1160.849 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .56 | 3 | .616 | 3 |
| 376 | | | min | -1257.528 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.317 | 2 | .002 | 10 |
| 377 | | 18 | max | 1157.743 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .613 | 3 | .308 | 3 |
| 378 | | | min | -1259.858 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.348 | 2 | 0 | 10 |
| 379 | | 19 | max | 1154.637 | 2 | 902.489 | 3 | 155.832 | 3 | 0 | 3 | .666 | 3 | 0 | 1 |
| 380 | | | min | -1262.187 | 3 | 2.882 | 10 | -90.596 | 2 | 0 | 2 | -.379 | 2 | 0 | 1 |
| 381 | M3 | 1 | max | 1308.392 | 2 | 4.147 | 4 | 41.782 | 2 | .004 | 3 | .009 | 3 | 0 | 1 |
| 382 | | | min | -518.286 | 3 | .975 | 15 | -19.943 | 3 | -.005 | 2 | -.019 | 2 | 0 | 1 |
| 383 | | 2 | max | 1308.154 | 2 | 3.686 | 4 | 41.782 | 2 | .004 | 3 | .003 | 3 | 0 | 15 |
| 384 | | | min | -518.465 | 3 | .866 | 15 | -19.943 | 3 | -.005 | 2 | -.007 | 2 | -.001 | 4 |
| 385 | | 3 | max | 1307.916 | 2 | 3.225 | 4 | 41.782 | 2 | .004 | 3 | .006 | 2 | 0 | 15 |
| 386 | | | min | -518.643 | 3 | .758 | 15 | -19.943 | 3 | -.005 | 2 | -.003 | 3 | -.002 | 4 |
| 387 | | 4 | max | 1307.678 | 2 | 2.765 | 4 | 41.782 | 2 | .004 | 3 | .018 | 2 | 0 | 15 |
| 388 | | | min | -518.822 | 3 | .65 | 15 | -19.943 | 3 | -.005 | 2 | -.009 | 3 | -.003 | 4 |
| 389 | | 5 | max | 1307.44 | 2 | 2.304 | 4 | 41.782 | 2 | .004 | 3 | .03 | 2 | 0 | 15 |
| 390 | | | min | -519 | 3 | .542 | 15 | -19.943 | 3 | -.005 | 2 | -.014 | 3 | -.004 | 4 |
| 391 | | 6 | max | 1307.202 | 2 | 1.843 | 4 | 41.782 | 2 | .004 | 3 | .042 | 2 | -.001 | 15 |
| 392 | | | min | -519.179 | 3 | .433 | 15 | -19.943 | 3 | -.005 | 2 | -.02 | 3 | -.004 | 4 |
| 393 | | 7 | max | 1306.964 | 2 | 1.382 | 4 | 41.782 | 2 | .004 | 3 | .054 | 2 | -.001 | 15 |
| 394 | | | min | -519.357 | 3 | .325 | 15 | -19.943 | 3 | -.005 | 2 | -.026 | 3 | -.005 | 4 |
| 395 | | 8 | max | 1306.726 | 2 | .922 | 4 | 41.782 | 2 | .004 | 3 | .066 | 2 | -.001 | 15 |
| 396 | | | min | -519.536 | 3 | .217 | 15 | -19.943 | 3 | -.005 | 2 | -.032 | 3 | -.005 | 4 |
| 397 | | 9 | max | 1306.488 | 2 | .461 | 4 | 41.782 | 2 | .004 | 3 | .078 | 2 | -.001 | 15 |
| 398 | | | min | -519.714 | 3 | .108 | 15 | -19.943 | 3 | -.005 | 2 | -.038 | 3 | -.005 | 4 |
| 399 | | 10 | max | 1306.25 | 2 | 0 | 1 | 41.782 | 2 | .004 | 3 | .09 | 2 | -.001 | 15 |
| 400 | | | min | -519.893 | 3 | 0 | 1 | -19.943 | 3 | -.005 | 2 | -.043 | 3 | -.005 | 4 |
| 401 | | 11 | max | 1306.012 | 2 | -.108 | 15 | 41.782 | 2 | .004 | 3 | .103 | 2 | -.001 | 15 |
| 402 | | | min | -520.071 | 3 | -.461 | 4 | -19.943 | 3 | -.005 | 2 | -.049 | 3 | -.005 | 4 |
| 403 | | 12 | max | 1305.774 | 2 | -.217 | 15 | 41.782 | 2 | .004 | 3 | .115 | 2 | -.001 | 15 |
| 404 | | | min | -520.25 | 3 | -.922 | 4 | -19.943 | 3 | -.005 | 2 | -.055 | 3 | -.005 | 4 |
| 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 | 2 | -.061 | 3 | -.005 | 4 |
| 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 | 2 | -.067 | 3 | -.004 | 4 |
| 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 | 2 | -.072 | 3 | -.004 | 4 |
| 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 | 2 | -.078 | 3 | -.003 | 4 |
| 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 | 2 | -.084 | 3 | -.002 | 4 |
| 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 | 2 | -.09 | 3 | -.001 | 4 |
| 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 | 2 | -.096 | 3 | 0 | 1 |
| 419 | M6 | 1 | max | 3869.479 | 2 | 4.147 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 420 | | | min | -1956.611 | 3 | .975 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 421 | | 2 | max | 3869.241 | 2 | 3.686 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 422 | | | min | -1956.79 | 3 | .866 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 4 |
| 423 | | 3 | max | 3869.003 | 2 | 3.225 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 424 | | | min | -1956.968 | 3 | .758 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.002 | 4 |
| 425 | | 4 | max | 3868.765 | 2 | 2.765 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 426 | | | min | -1957.147 | 3 | .65 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.003 | 4 |
| 427 | | 5 | max | 3868.527 | 2 | 2.304 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 428 | | | min | -1957.325 | 3 | .542 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.004 | 4 |
| 429 | | 6 | max | 3868.289 | 2 | 1.843 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 430 | | | min | -1957.504 | 3 | .433 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.004 | 4 |
| 431 | | 7 | max | 3868.051 | 2 | 1.382 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 432 | | | min | -1957.682 | 3 | .325 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.005 | 4 |
| 433 | | 8 | max | 3867.813 | 2 | .922 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 434 | | | min | -1957.861 | 3 | .217 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.005 | 4 |
| 435 | | 9 | max | 3867.575 | 2 | .461 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 436 | | | min | -1958.039 | 3 | .108 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.005 | 4 |
| 437 | | 10 | max | 3867.337 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 438 | | | min | -1958.218 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | -.005 | 4 |
| 439 | | 11 | max | 3867.099 | 2 | -.108 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 440 | | | min | -1958.396 | 3 | -.461 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.005 | 4 |
| 441 | | 12 | max | 3866.861 | 2 | -.217 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 442 | | | min | -1958.575 | 3 | -.922 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.005 | 4 |
| 443 | | 13 | max | 3866.623 | 2 | -.325 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 444 | | | min | -1958.753 | 3 | -1.382 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.005 | 4 |
| 445 | | 14 | max | 3866.385 | 2 | -.433 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 446 | | | min | -1958.932 | 3 | -1.843 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.004 | 4 |
| 447 | | 15 | max | 3866.147 | 2 | -.542 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 448 | | | min | -1959.11 | 3 | -2.304 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.004 | 4 |
| 449 | | 16 | max | 3865.909 | 2 | -.65 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 450 | | | min | -1959.289 | 3 | -2.765 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.003 | 4 |
| 451 | | 17 | max | 3865.671 | 2 | -.758 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 452 | | | min | -1959.467 | 3 | -3.225 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.002 | 4 |
| 453 | | 18 | max | 3865.433 | 2 | -.866 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 454 | | | min | -1959.646 | 3 | -3.686 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 4 |
| 455 | | 19 | max | 3865.195 | 2 | -.975 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 456 | | | min | -1959.824 | 3 | -4.147 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 457 | M9 | 1 | max | 1308.392 | 2 | 4.147 | 4 | 19.943 | 3 | .005 | 2 | .019 | 2 | 0 | 1 |
| 458 | | | min | -518.286 | 3 | .975 | 15 | -41.782 | 2 | -.004 | 3 | -.009 | 3 | 0 | 1 |
| 459 | | 2 | max | 1308.154 | 2 | 3.686 | 4 | 19.943 | 3 | .005 | 2 | .007 | 2 | 0 | 15 |
| 460 | | | min | -518.465 | 3 | .866 | 15 | -41.782 | 2 | -.004 | 3 | -.003 | 3 | -.001 | 4 |
| 461 | | 3 | max | 1307.916 | 2 | 3.225 | 4 | 19.943 | 3 | .005 | 2 | .003 | 3 | 0 | 15 |
| 462 | | | min | -518.643 | 3 | .758 | 15 | -41.782 | 2 | -.004 | 3 | -.006 | 2 | -.002 | 4 |
| 463 | | 4 | max | 1307.678 | 2 | 2.765 | 4 | 19.943 | 3 | .005 | 2 | .009 | 3 | 0 | 15 |
| 464 | | | min | -518.822 | 3 | .65 | 15 | -41.782 | 2 | -.004 | 3 | -.018 | 2 | -.003 | 4 |
| 465 | | 5 | max | 1307.44 | 2 | 2.304 | 4 | 19.943 | 3 | .005 | 2 | .014 | 3 | 0 | 15 |
| 466 | | | min | -519 | 3 | .542 | 15 | -41.782 | 2 | -.004 | 3 | -.03 | 2 | -.004 | 4 |
| 467 | | 6 | max | 1307.202 | 2 | 1.843 | 4 | 19.943 | 3 | .005 | 2 | .02 | 3 | -.001 | 15 |
| 468 | | | min | -519.179 | 3 | .433 | 15 | -41.782 | 2 | -.004 | 3 | -.042 | 2 | -.004 | 4 |
| 469 | | 7 | max | 1306.964 | 2 | 1.382 | 4 | 19.943 | 3 | .005 | 2 | .026 | 3 | -.001 | 15 |
| 470 | | | min | -519.357 | 3 | .325 | 15 | -41.782 | 2 | -.004 | 3 | -.054 | 2 | -.005 | 4 |
| 471 | | 8 | max | 1306.726 | 2 | .922 | 4 | 19.943 | 3 | .005 | 2 | .032 | 3 | -.001 | 15 |
| 472 | | | min | -519.536 | 3 | .217 | 15 | -41.782 | 2 | -.004 | 3 | -.066 | 2 | -.005 | 4 |
| 473 | | 9 | max | 1306.488 | 2 | .461 | 4 | 19.943 | 3 | .005 | 2 | .038 | 3 | -.001 | 15 |
| 474 | | | min | -519.714 | 3 | .108 | 15 | -41.782 | 2 | -.004 | 3 | -.078 | 2 | -.005 | 4 |
| 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 | -.004 | 3 | -.09 | 2 | -.005 | 4 |
| 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 | -.004 | 3 | -.103 | 2 | -.005 | 4 |
| 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 | -.004 | 3 | -.115 | 2 | -.005 | 4 |
| 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 | -.004 | 3 | -.127 | 2 | -.005 | 4 |
| 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 | -.004 | 3 | -.139 | 2 | -.004 | 4 |
| 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 | -.004 | 3 | -.151 | 2 | -.004 | 4 |
| 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 | -.004 | 3 | -.163 | 2 | -.003 | 4 |

## Envelope Member Section Forces (Continued)

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | -.004 | 3 | -.175 | 2 | -.002 | 4 |
| 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 | -.004 | 3 | -.188 | 2 | -.001 | 4 |
| 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 | -.004 | 3 | -.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 | -.012 | 15 | .011 | 1 | 5.228e-3 | 3 | NC | 3 | NC | 1 |
| 2 | | | min | -.312 | 3 | -.289 | 1 | 0 | 15 | -1.336e-2 | 2 | 532.653 | 1 | NC | 1 |
| 3 | | 2 | max | -.002 | 10 | -.01 | 15 | .003 | 1 | 5.228e-3 | 3 | NC | 2 | NC | 1 |
| 4 | | | min | -.312 | 3 | -.231 | 1 | 0 | 15 | -1.336e-2 | 2 | 692.539 | 1 | NC | 1 |
| 5 | | 3 | max | -.002 | 10 | -.008 | 15 | 0 | 15 | 4.905e-3 | 3 | NC | 3 | NC | 1 |
| 6 | | | min | -.312 | 3 | -.173 | 1 | -.004 | 1 | -1.215e-2 | 2 | 932.643 | 9 | NC | 1 |
| 7 | | 4 | max | -.002 | 10 | -.006 | 15 | 0 | 15 | 4.408e-3 | 3 | NC | 3 | NC | 2 |
| 8 | | | min | -.312 | 3 | -.13 | 3 | -.007 | 1 | -1.029e-2 | 2 | 1079.989 | 2 | 9512.303 | 1 |
| 9 | | 5 | max | -.002 | 10 | -.004 | 15 | 0 | 15 | 3.912e-3 | 3 | NC | 3 | NC | 1 |
| 10 | | | min | -.312 | 3 | -.123 | 3 | -.007 | 1 | -8.43e-3 | 2 | 761.713 | 2 | NC | 1 |
| 11 | | 6 | max | -.002 | 10 | .004 | 10 | 0 | 15 | 4.058e-3 | 3 | NC | 1 | NC | 1 |
| 12 | | | min | -.312 | 3 | -.109 | 3 | -.005 | 1 | -7.904e-3 | 2 | 631.483 | 2 | NC | 1 |
| 13 | | 7 | max | -.002 | 10 | .021 | 2 | 0 | 3 | 4.647e-3 | 3 | NC | 5 | NC | 1 |
| 14 | | | min | -.312 | 3 | -.088 | 3 | -.003 | 2 | -8.301e-3 | 2 | 574.083 | 2 | NC | 1 |
| 15 | | 8 | max | -.002 | 10 | .033 | 2 | 0 | 3 | 5.237e-3 | 3 | NC | 5 | NC | 1 |
| 16 | | | min | -.312 | 3 | -.06 | 3 | 0 | 2 | -8.698e-3 | 2 | 547.593 | 2 | NC | 1 |
| 17 | | 9 | max | -.002 | 10 | .039 | 2 | 0 | 10 | 6.002e-3 | 3 | NC | 5 | NC | 1 |
| 18 | | | min | -.312 | 3 | -.029 | 3 | 0 | 3 | -8.548e-3 | 2 | 533.855 | 2 | NC | 1 |
| 19 | | 10 | max | -.002 | 10 | .051 | 1 | 0 | 2 | 7.078e-3 | 3 | NC | 5 | NC | 1 |
| 20 | | | min | -.312 | 3 | .002 | 15 | 0 | 3 | -7.432e-3 | 2 | 525.251 | 2 | NC | 1 |
| 21 | | 11 | max | -.001 | 10 | .064 | 1 | 0 | 3 | 8.153e-3 | 3 | NC | 5 | NC | 1 |
| 22 | | | min | -.312 | 3 | .003 | 15 | 0 | 2 | -6.315e-3 | 2 | 522.839 | 2 | NC | 1 |
| 23 | | 12 | max | -.001 | 10 | .093 | 3 | .003 | 3 | 6.949e-3 | 3 | NC | 4 | NC | 1 |
| 24 | | | min | -.312 | 3 | .004 | 15 | -.002 | 2 | -4.782e-3 | 2 | 527.448 | 2 | NC | 1 |
| 25 | | 13 | max | -.001 | 10 | .149 | 3 | .007 | 3 | 4.455e-3 | 3 | NC | 4 | NC | 1 |
| 26 | | | min | -.312 | 3 | .005 | 15 | -.004 | 2 | -3.013e-3 | 2 | 476.706 | 3 | NC | 1 |
| 27 | | 14 | max | -.001 | 10 | .222 | 3 | .007 | 3 | 2.106e-3 | 3 | NC | 4 | NC | 1 |
| 28 | | | min | -.312 | 3 | 0 | 10 | -.001 | 2 | -1.326e-3 | 2 | 378.011 | 3 | NC | 1 |
| 29 | | 15 | max | -.001 | 10 | .319 | 3 | .005 | 1 | 6.188e-3 | 3 | NC | 4 | NC | 1 |
| 30 | | | min | -.312 | 3 | -.021 | 10 | 0 | 15 | -3.296e-3 | 2 | 296.901 | 3 | NC | 1 |
| 31 | | 16 | max | -.001 | 10 | .434 | 3 | .006 | 1 | 1.027e-2 | 3 | NC | 4 | NC | 1 |
| 32 | | | min | -.312 | 3 | -.06 | 2 | 0 | 15 | -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 | 0 | 15 | -7.236e-3 | 2 | 193.877 | 3 | NC | 1 |
| 35 | | 18 | max | -.001 | 10 | .689 | 3 | 0 | 15 | 1.701e-2 | 3 | NC | 4 | NC | 1 |
| 36 | | | min | -.312 | 3 | -.161 | 2 | -.003 | 1 | -8.52e-3 | 2 | 163.222 | 3 | NC | 1 |
| 37 | | 19 | max | -.001 | 10 | .819 | 3 | 0 | 15 | 1.701e-2 | 3 | NC | 1 | NC | 1 |
| 38 | | | min | -.312 | 3 | -.212 | 2 | -.011 | 1 | -8.52e-3 | 2 | 140.956 | 3 | NC | 1 |
| 39 | M4 | 1 | max | 0 | 10 | -.02 | 15 | 0 | 1 | 0 | 1 | NC | 3 | NC | 1 |
| 40 | | | min | -.506 | 3 | -.651 | 2 | 0 | 1 | 0 | 1 | 373.603 | 1 | NC | 1 |
| 41 | | 2 | max | 0 | 10 | -.016 | 15 | 0 | 1 | 0 | 1 | NC | 2 | NC | 1 |
| 42 | | | min | -.506 | 3 | -.496 | 2 | 0 | 1 | 0 | 1 | 569.832 | 1 | NC | 1 |
| 43 | | 3 | max | 0 | 10 | -.013 | 15 | 0 | 1 | 0 | 1 | NC | 11 | NC | 1 |
| 44 | | | min | -.506 | 3 | -.342 | 2 | 0 | 1 | 0 | 1 | 817.756 | 9 | NC | 1 |
| 45 | | 4 | max | 0 | 10 | -.009 | 15 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 46 | | | min | -.506 | 3 | -.215 | 1 | 0 | 1 | 0 | 1 | 438.889 | 2 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | | 5 | max | 0 | 10 | -.006 | 15 | 0 | 1 | 0 | 1 | NC | 15 | NC | 1 |
| 48 | | | min | -.506 | 3 | -.185 | 3 | 0 | 1 | 0 | 1 | 315.241 | 2 | NC | 1 |
| 49 | | 6 | max | 0 | 10 | .007 | 10 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 50 | | | min | -.506 | 3 | -.176 | 3 | 0 | 1 | 0 | 1 | 266.839 | 2 | NC | 1 |
| 51 | | 7 | max | .001 | 10 | .038 | 2 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 52 | | | min | -.506 | 3 | -.144 | 3 | 0 | 1 | 0 | 1 | 248.618 | 2 | NC | 1 |
| 53 | | 8 | max | .002 | 10 | .05 | 2 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 54 | | | min | -.506 | 3 | -.097 | 3 | 0 | 1 | 0 | 1 | 242.923 | 2 | NC | 1 |
| 55 | | 9 | max | .002 | 10 | .054 | 2 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 56 | | | min | -.507 | 3 | -.043 | 3 | 0 | 1 | 0 | 1 | 241.165 | 2 | NC | 1 |
| 57 | | 10 | max | .002 | 10 | .072 | 1 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 58 | | | min | -.507 | 3 | .003 | 15 | 0 | 1 | 0 | 1 | 239.282 | 2 | NC | 1 |
| 59 | | 11 | max | .003 | 10 | .092 | 1 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 60 | | | min | -.507 | 3 | .005 | 15 | 0 | 1 | 0 | 1 | 238.158 | 2 | NC | 1 |
| 61 | | 12 | max | .003 | 10 | .147 | 3 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 62 | | | min | -.508 | 3 | .006 | 15 | 0 | 1 | 0 | 1 | 238.283 | 2 | NC | 1 |
| 63 | | 13 | max | .003 | 10 | .237 | 3 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 64 | | | min | -.508 | 3 | .007 | 15 | 0 | 1 | 0 | 1 | 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 | 0 | 1 | 0 | 1 | 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 | 0 | 1 | 0 | 1 | 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 | 0 | 1 | 0 | 1 | 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 | 0 | 1 | 0 | 1 | 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 | 0 | 1 | 0 | 1 | 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 | 0 | 1 | 0 | 1 | 83.235 | 3 | NC | 1 |
| 77 | M7 | 1 | max | -.002 | 10 | -.012 | 15 | 0 | 15 | 1.336e-2 | 2 | NC | 3 | NC | 1 |
| 78 | | | min | -.312 | 3 | -.289 | 1 | -.011 | 1 | -5.228e-3 | 3 | 532.653 | 1 | NC | 1 |
| 79 | | 2 | max | -.002 | 10 | -.01 | 15 | 0 | 15 | 1.336e-2 | 2 | NC | 2 | NC | 1 |
| 80 | | | min | -.312 | 3 | -.231 | 1 | -.003 | 1 | -5.228e-3 | 3 | 692.539 | 1 | NC | 1 |
| 81 | | 3 | max | -.002 | 10 | -.008 | 15 | .004 | 1 | 1.215e-2 | 2 | NC | 3 | NC | 1 |
| 82 | | | min | -.312 | 3 | -.173 | 1 | 0 | 15 | -4.905e-3 | 3 | 932.643 | 9 | NC | 1 |
| 83 | | 4 | max | -.002 | 10 | -.006 | 15 | .007 | 1 | 1.029e-2 | 2 | NC | 3 | NC | 2 |
| 84 | | | min | -.312 | 3 | -.13 | 3 | 0 | 15 | -4.408e-3 | 3 | 1079.989 | 2 | 9512.303 | 1 |
| 85 | | 5 | max | -.002 | 10 | -.004 | 15 | .007 | 1 | 8.43e-3 | 2 | NC | 3 | NC | 1 |
| 86 | | | min | -.312 | 3 | -.123 | 3 | 0 | 15 | -3.912e-3 | 3 | 761.713 | 2 | NC | 1 |
| 87 | | 6 | max | -.002 | 10 | .004 | 10 | .005 | 1 | 7.904e-3 | 2 | NC | 1 | NC | 1 |
| 88 | | | min | -.312 | 3 | -.109 | 3 | 0 | 15 | -4.058e-3 | 3 | 631.483 | 2 | NC | 1 |
| 89 | | 7 | max | -.002 | 10 | .021 | 2 | .003 | 2 | 8.301e-3 | 2 | NC | 5 | NC | 1 |
| 90 | | | min | -.312 | 3 | -.088 | 3 | 0 | 3 | -4.647e-3 | 3 | 574.083 | 2 | NC | 1 |
| 91 | | 8 | max | -.002 | 10 | .033 | 2 | 0 | 2 | 8.698e-3 | 2 | NC | 5 | NC | 1 |
| 92 | | | min | -.312 | 3 | -.06 | 3 | 0 | 3 | -5.237e-3 | 3 | 547.593 | 2 | NC | 1 |
| 93 | | 9 | max | -.002 | 10 | .039 | 2 | 0 | 3 | 8.548e-3 | 2 | NC | 5 | NC | 1 |
| 94 | | | min | -.312 | 3 | -.029 | 3 | 0 | 10 | -6.002e-3 | 3 | 533.855 | 2 | NC | 1 |
| 95 | | 10 | max | -.002 | 10 | .051 | 1 | 0 | 3 | 7.432e-3 | 2 | NC | 5 | NC | 1 |
| 96 | | | min | -.312 | 3 | .002 | 15 | 0 | 2 | -7.078e-3 | 3 | 525.251 | 2 | NC | 1 |
| 97 | | 11 | max | -.001 | 10 | .064 | 1 | 0 | 2 | 6.315e-3 | 2 | NC | 5 | NC | 1 |
| 98 | | | min | -.312 | 3 | .003 | 15 | 0 | 3 | -8.153e-3 | 3 | 522.839 | 2 | NC | 1 |
| 99 | | 12 | max | -.001 | 10 | .093 | 3 | .002 | 2 | 4.782e-3 | 2 | NC | 4 | NC | 1 |
| 100 | | | min | -.312 | 3 | .004 | 15 | -.003 | 3 | -6.949e-3 | 3 | 527.448 | 2 | NC | 1 |
| 101 | | 13 | max | -.001 | 10 | .149 | 3 | .004 | 2 | 3.013e-3 | 2 | NC | 4 | NC | 1 |
| 102 | | | min | -.312 | 3 | .005 | 15 | -.007 | 3 | -4.455e-3 | 3 | 476.706 | 3 | NC | 1 |
| 103 | | 14 | max | -.001 | 10 | .222 | 3 | .001 | 2 | 1.326e-3 | 2 | NC | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 104 | | | min | -.312 | 3 | 0 | 10 | -.007 | 3 | -2.106e-3 | 3 | 378.011 | 3 | NC | 1 |
| 105 | | 15 | max | -.001 | 10 | .319 | 3 | 0 | 15 | 3.296e-3 | 2 | NC | 4 | NC | 1 |
| 106 | | | min | -.312 | 3 | -.021 | 10 | -.005 | 1 | -6.188e-3 | 3 | 296.901 | 3 | NC | 1 |
| 107 | | 16 | max | -.001 | 10 | .434 | 3 | 0 | 15 | 5.266e-3 | 2 | NC | 4 | NC | 1 |
| 108 | | | min | -.312 | 3 | -.06 | 2 | -.006 | 1 | -1.027e-2 | 3 | 236.87 | 3 | NC | 1 |
| 109 | | 17 | max | -.001 | 10 | .559 | 3 | 0 | 15 | 7.236e-3 | 2 | NC | 4 | NC | 1 |
| 110 | | | min | -.312 | 3 | -.109 | 2 | -.004 | 1 | -1.435e-2 | 3 | 193.877 | 3 | NC | 1 |
| 111 | | 18 | max | -.001 | 10 | .689 | 3 | .003 | 1 | 8.52e-3 | 2 | NC | 4 | NC | 1 |
| 112 | | | min | -.312 | 3 | -.161 | 2 | 0 | 15 | -1.701e-2 | 3 | 163.222 | 3 | NC | 1 |
| 113 | | 19 | max | -.001 | 10 | .819 | 3 | .011 | 1 | 8.52e-3 | 2 | NC | 1 | NC | 1 |
| 114 | | | min | -.312 | 3 | -.212 | 2 | 0 | 15 | -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 | 0 | 10 | -.143 | 2 | .001 | 10 | -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 | 0 | 10 | -.223 | 2 | .003 | 10 | -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 | 0 | 10 | -.298 | 2 | .005 | 10 | -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 | 5 | NC | 5 |
| 122 | | | min | 0 | 10 | -.357 | 2 | .006 | 10 | -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 | 5 | NC | 5 |
| 124 | | | min | 0 | 10 | -.394 | 2 | .006 | 10 | -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 | 5 | NC | 5 |
| 126 | | | min | 0 | 10 | -.408 | 2 | .005 | 10 | -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 | 5 | NC | 5 |
| 128 | | | min | 0 | 10 | -.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 | 0 | 10 | -.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 | 4 | NC | 2 |
| 132 | | | min | 0 | 10 | -.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 | 4 | NC | 2 |
| 134 | | | min | 0 | 1 | -.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 | 4 | NC | 2 |
| 136 | | | min | 0 | 3 | -.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 | 4 | NC | 2 |
| 138 | | | min | 0 | 3 | -.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 | 5 | NC | 5 |
| 140 | | | min | 0 | 3 | -.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 | 5 | NC | 5 |
| 142 | | | min | 0 | 3 | -.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 | 5 | NC | 5 |
| 144 | | | min | 0 | 3 | -.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 | 5 | NC | 5 |
| 146 | | | min | 0 | 3 | -.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 | 4 | NC | 2 |
| 148 | | | min | 0 | 3 | -.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 | 4 | NC | 1 |
| 150 | | | min | 0 | 3 | -.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 | 0 | 3 | -.143 | 2 | .001 | 10 | -6.916e-3 | 2 | NC | 1 | NC | 1 |
| 153 | M11 | 1 | max | 0 | 2 | .068 | 1 | .312 | 3 | 6.066e-3 | 3 | NC | 1 | NC | 1 |
| 154 | | | min | -.001 | 3 | .004 | 15 | .001 | 10 | -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 | -.001 | 3 | -.011 | 10 | .003 | 10 | -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 | -.001 | 3 | -.055 | 2 | .005 | 10 | -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 | 4 |
| 160 | | | min | 0 | 3 | -.082 | 2 | .007 | 10 | -3.761e-4 | 10 | 802.331 | 3 | 3294.537 | 3 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 161 | | 5 | max | 0 | 2 | .293 | 3 | .395 | 3 | 7.518e-3 | 3 | NC | 4 | NC | 5 |
| 162 | | | min | 0 | 3 | -.087 | 2 | .007 | 10 | -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 | 0 | 3 | -.07 | 2 | .006 | 10 | -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 | 0 | 3 | -.037 | 2 | .004 | 10 | -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 | 0 | 3 | -.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 | 0 | 3 | .005 | 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 | 0 | 1 | .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 | 0 | 2 | .005 | 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 | 0 | 2 | -.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 | 0 | 2 | -.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 | 0 | 2 | -.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 | 4 | NC | 5 |
| 182 | | | min | 0 | 2 | -.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 | 4 | NC | 4 |
| 184 | | | min | 0 | 2 | -.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 | 4 | NC | 2 |
| 186 | | | min | 0 | 2 | -.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 | 0 | 2 | -.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 | 0 | 2 | .004 | 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 | 0 | 3 | -.04 | 3 | .002 | 10 | 1.532e-4 | 15 | NC | 1 | NC | 1 |
| 193 | | 2 | max | 0 | 2 | .009 | 3 | .321 | 3 | 4.658e-3 | 3 | NC | 4 | NC | 1 |
| 194 | | | min | 0 | 3 | -.046 | 2 | .002 | 10 | 1.593e-4 | 15 | 2032.335 | 2 | NC | 1 |
| 195 | | 3 | max | 0 | 2 | .048 | 3 | .341 | 3 | 4.985e-3 | 3 | NC | 4 | NC | 2 |
| 196 | | | min | 0 | 3 | -.115 | 2 | .003 | 10 | 1.653e-4 | 15 | 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 | 0 | 3 | -.158 | 2 | .005 | 10 | 1.663e-4 | 10 | 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 | 0 | 3 | -.169 | 2 | .005 | 10 | 1.378e-4 | 10 | 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 | 0 | 3 | -.146 | 2 | .005 | 10 | 1.093e-4 | 10 | 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 | 0 | 3 | -.096 | 2 | .003 | 10 | 8.084e-5 | 10 | 1267.534 | 2 | 1135.252 | 3 |
| 205 | | 8 | max | 0 | 2 | 0 | 4 | .484 | 3 | 6.622e-3 | 3 | NC | 4 | NC | 2 |
| 206 | | | min | 0 | 3 | -.032 | 2 | .001 | 10 | 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 | 0 | 3 | -.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 |
| 210 | | | min | 0 | 1 | -.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 | 0 | 2 | -.048 | 3 | 0 | 10 | 2.384e-5 | 10 | NC | 1 | 892.032 | 3 |
| 213 | | 12 | max | 0 | 3 | 0 | 4 | .484 | 3 | 6.622e-3 | 3 | NC | 4 | NC | 2 |
| 214 | | | min | 0 | 2 | -.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 | 0 | 2 | -.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 | 4 | NC | 5 |

## Envelope Member Section Deflections (Continued)

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 218 | | | min | 0 | 2 | -.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 | 4 | NC | 5 |
| 220 | | | min | 0 | 2 | -.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 | 4 | NC | 2 |
| 222 | | | min | 0 | 2 | -.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 | 4 | NC | 2 |
| 224 | | | min | 0 | 2 | -.115 | 2 | .003 | 10 | 1.653e-4 | 15 | 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 | 0 | 2 | -.046 | 2 | .002 | 10 | 1.593e-4 | 15 | 2032.335 | 2 | NC | 1 |
| 227 | | 19 | max | 0 | 3 | .037 | 2 | .312 | 3 | 4.33e-3 | 3 | NC | 1 | NC | 1 |
| 228 | | | min | 0 | 2 | -.04 | 3 | .002 | 10 | 1.532e-4 | 15 | NC | 1 | NC | 1 |
| 229 | M13 | 1 | max | 0 | 15 | -.009 | 15 | .312 | 3 | 8.734e-3 | 2 | NC | 1 | NC | 1 |
| 230 | | | min | 0 | 1 | -.211 | 1 | .002 | 10 | 4.179e-5 | 3 | NC | 1 | NC | 1 |
| 231 | | 2 | max | 0 | 15 | -.011 | 15 | .325 | 3 | 1.006e-2 | 2 | NC | 4 | NC | 1 |
| 232 | | | min | 0 | 1 | -.316 | 2 | .004 | 10 | -4.451e-4 | 3 | 1350.51 | 2 | NC | 1 |
| 233 | | 3 | max | 0 | 15 | -.013 | 15 | .347 | 3 | 1.139e-2 | 2 | NC | 5 | NC | 2 |
| 234 | | | min | 0 | 1 | -.428 | 2 | .006 | 10 | -9.32e-4 | 3 | 712.777 | 2 | 4707.977 | 1 |
| 235 | | 4 | max | 0 | 15 | -.014 | 12 | .375 | 3 | 1.272e-2 | 2 | NC | 5 | NC | 5 |
| 236 | | | min | 0 | 1 | -.511 | 2 | .008 | 10 | -1.419e-3 | 3 | 526.031 | 2 | 2677.65 | 3 |
| 237 | | 5 | max | 0 | 15 | -.01 | 12 | .405 | 3 | 1.405e-2 | 2 | NC | 5 | NC | 5 |
| 238 | | | min | 0 | 1 | -.559 | 2 | .008 | 10 | -1.906e-3 | 3 | 457.235 | 2 | 1805.566 | 3 |
| 239 | | 6 | max | 0 | 15 | -.016 | 15 | .435 | 3 | 1.538e-2 | 2 | NC | 5 | NC | 5 |
| 240 | | | min | 0 | 1 | -.57 | 2 | .008 | 10 | -2.393e-3 | 3 | 443.978 | 2 | 1363.152 | 3 |
| 241 | | 7 | max | 0 | 15 | -.016 | 15 | .463 | 3 | 1.671e-2 | 2 | NC | 5 | NC | 5 |
| 242 | | | min | 0 | 1 | -.549 | 2 | .006 | 10 | -2.88e-3 | 3 | 470.121 | 2 | 1114.616 | 3 |
| 243 | | 8 | max | 0 | 15 | -.016 | 15 | .485 | 3 | 1.804e-2 | 2 | NC | 5 | NC | 2 |
| 244 | | | min | 0 | 1 | -.508 | 2 | .003 | 10 | -3.367e-3 | 3 | 531.806 | 2 | 970.786 | 3 |
| 245 | | 9 | max | 0 | 15 | -.015 | 15 | .5 | 3 | 1.937e-2 | 2 | NC | 5 | NC | 2 |
| 246 | | | min | 0 | 1 | -.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 | 0 | 1 | -.443 | 2 | 0 | 10 | -4.34e-3 | 3 | 669.698 | 2 | 868.499 | 3 |
| 249 | | 11 | max | 0 | 1 | -.015 | 15 | .5 | 3 | 1.937e-2 | 2 | NC | 5 | NC | 2 |
| 250 | | | min | 0 | 15 | -.464 | 2 | 0 | 10 | -3.853e-3 | 3 | 617.233 | 2 | 893.691 | 3 |
| 251 | | 12 | max | 0 | 1 | -.016 | 15 | .485 | 3 | 1.804e-2 | 2 | NC | 5 | NC | 2 |
| 252 | | | min | 0 | 15 | -.508 | 2 | .003 | 10 | -3.367e-3 | 3 | 531.806 | 2 | 970.786 | 3 |
| 253 | | 13 | max | 0 | 1 | -.016 | 15 | .463 | 3 | 1.671e-2 | 2 | NC | 5 | NC | 5 |
| 254 | | | min | 0 | 15 | -.549 | 2 | .006 | 10 | -2.88e-3 | 3 | 470.121 | 2 | 1114.616 | 3 |
| 255 | | 14 | max | 0 | 1 | -.016 | 15 | .435 | 3 | 1.538e-2 | 2 | NC | 5 | NC | 5 |
| 256 | | | min | 0 | 15 | -.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 | 5 |
| 258 | | | min | 0 | 15 | -.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 | 5 |
| 260 | | | min | 0 | 15 | -.511 | 2 | .008 | 10 | -1.419e-3 | 3 | 526.031 | 2 | 2677.65 | 3 |
| 261 | | 17 | max | 0 | 1 | -.013 | 15 | .347 | 3 | 1.139e-2 | 2 | NC | 5 | NC | 2 |
| 262 | | | min | 0 | 15 | -.428 | 2 | .006 | 10 | -9.32e-4 | 3 | 712.777 | 2 | 4707.977 | 1 |
| 263 | | 18 | max | 0 | 1 | -.011 | 15 | .325 | 3 | 1.006e-2 | 2 | NC | 4 | NC | 1 |
| 264 | | | min | 0 | 15 | -.316 | 2 | .004 | 10 | -4.451e-4 | 3 | 1350.51 | 2 | NC | 1 |
| 265 | | 19 | max | 0 | 1 | -.009 | 15 | .312 | 3 | 8.734e-3 | 2 | NC | 1 | NC | 1 |
| 266 | | | min | 0 | 15 | -.211 | 1 | .002 | 10 | 4.179e-5 | 3 | NC | 1 | NC | 1 |
| 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 | 3 | 3.363e-3 | 2 | NC | 1 | NC | 1 |
| 270 | | | min | 0 | 2 | -.002 | 3 | 0 | 2 | -1.651e-3 | 3 | NC | 1 | NC | 1 |
| 271 | | 3 | max | 0 | 3 | 0 | 10 | 0 | 3 | 3.093e-3 | 2 | NC | 1 | NC | 1 |
| 272 | | | min | 0 | 2 | -.007 | 3 | 0 | 2 | -1.458e-3 | 3 | NC | 1 | NC | 1 |
| 273 | | 4 | max | 0 | 3 | 0 | 10 | .002 | 3 | 2.823e-3 | 2 | NC | 1 | NC | 1 |
| 274 | | | min | 0 | 2 | -.015 | 3 | -.001 | 2 | -1.266e-3 | 3 | 4761.591 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 275 | | 5 | max | 0 | 3 | 0 | 10 | .003 | 3 | 2.553e-3 | 2 | NC | 2 | NC | 1 |
| 276 | | | min | 0 | 2 | -.027 | 3 | -.002 | 2 | -1.074e-3 | 3 | 2756.908 | 3 | NC | 1 |
| 277 | | 6 | max | 0 | 3 | 0 | 10 | .004 | 3 | 2.283e-3 | 2 | NC | 2 | NC | 1 |
| 278 | | | min | 0 | 2 | -.041 | 3 | -.003 | 2 | -8.814e-4 | 3 | 1810.048 | 3 | NC | 1 |
| 279 | | 7 | max | 0 | 3 | 0 | 10 | .006 | 3 | 2.013e-3 | 2 | NC | 2 | NC | 1 |
| 280 | | | min | 0 | 2 | -.057 | 3 | -.004 | 2 | -6.892e-4 | 3 | 1287.642 | 3 | 9436.945 | 3 |
| 281 | | 8 | max | 0 | 3 | 0 | 10 | .007 | 3 | 1.743e-3 | 2 | NC | 2 | NC | 1 |
| 282 | | | min | 0 | 2 | -.076 | 3 | -.004 | 2 | -4.969e-4 | 3 | 968.377 | 3 | 7799.676 | 3 |
| 283 | | 9 | max | 0 | 3 | 0 | 10 | .008 | 3 | 1.474e-3 | 2 | NC | 2 | NC | 1 |
| 284 | | | min | 0 | 2 | -.097 | 3 | -.005 | 2 | -3.046e-4 | 3 | 758.826 | 3 | 6726.433 | 3 |
| 285 | | 10 | max | 0 | 3 | 0 | 10 | .009 | 3 | 1.204e-3 | 2 | NC | 5 | NC | 1 |
| 286 | | | min | 0 | 2 | -.12 | 3 | -.006 | 2 | -1.124e-4 | 3 | 613.708 | 3 | 6017.534 | 3 |
| 287 | | 11 | max | 0 | 3 | 0 | 10 | .009 | 3 | 9.337e-4 | 2 | NC | 5 | NC | 1 |
| 288 | | | min | 0 | 2 | -.145 | 3 | -.006 | 2 | 1.833e-6 | 15 | 508.942 | 3 | 5568.073 | 3 |
| 289 | | 12 | max | 0 | 3 | 0 | 10 | .01 | 3 | 6.638e-4 | 2 | NC | 5 | NC | 1 |
| 290 | | | min | 0 | 2 | -.171 | 3 | -.007 | 2 | -3.546e-5 | 9 | 430.766 | 3 | 5326.131 | 3 |
| 291 | | 13 | max | 0 | 3 | 0 | 10 | .009 | 3 | 4.645e-4 | 3 | NC | 10 | NC | 1 |
| 292 | | | min | 0 | 2 | -.199 | 3 | -.007 | 2 | -9.29e-5 | 9 | 370.844 | 3 | 5277.071 | 3 |
| 293 | | 14 | max | .001 | 3 | 0 | 10 | .009 | 3 | 6.567e-4 | 3 | NC | 10 | NC | 1 |
| 294 | | | min | -.001 | 2 | -.227 | 3 | -.006 | 2 | -1.503e-4 | 9 | 323.873 | 3 | 5445.85 | 3 |
| 295 | | 15 | max | .001 | 3 | 0 | 10 | .007 | 3 | 8.49e-4 | 3 | NC | 10 | NC | 1 |
| 296 | | | min | -.001 | 2 | -.257 | 3 | -.006 | 2 | -3.177e-4 | 1 | 286.375 | 3 | 5916.895 | 3 |
| 297 | | 16 | max | .001 | 3 | 0 | 10 | .005 | 3 | 1.041e-3 | 3 | NC | 10 | NC | 1 |
| 298 | | | min | -.001 | 2 | -.288 | 3 | -.005 | 1 | -5.203e-4 | 1 | 255.964 | 3 | 6920.784 | 3 |
| 299 | | 17 | max | .001 | 3 | 0 | 10 | .002 | 3 | 1.234e-3 | 3 | NC | 10 | NC | 1 |
| 300 | | | min | -.001 | 2 | -.319 | 3 | -.004 | 1 | -7.229e-4 | 1 | 230.968 | 3 | 9180.74 | 3 |
| 301 | | 18 | max | .001 | 3 | 0 | 10 | 0 | 15 | 1.426e-3 | 3 | NC | 10 | NC | 1 |
| 302 | | | min | -.001 | 2 | -.351 | 3 | -.003 | 1 | -9.557e-4 | 2 | 210.186 | 3 | NC | 1 |
| 303 | | 19 | max | .001 | 3 | 0 | 10 | .002 | 2 | 1.618e-3 | 3 | NC | 10 | NC | 1 |
| 304 | | | min | -.001 | 2 | -.382 | 3 | -.007 | 3 | -1.226e-3 | 2 | 192.735 | 3 | NC | 1 |
| 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 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 308 | | | min | 0 | 2 | -.003 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 309 | | 3 | max | 0 | 3 | 0 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 310 | | | min | 0 | 2 | -.012 | 3 | 0 | 1 | 0 | 1 | 6244.802 | 3 | NC | 1 |
| 311 | | 4 | max | 0 | 3 | 0 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 312 | | | min | 0 | 2 | -.025 | 3 | 0 | 1 | 0 | 1 | 2900.402 | 3 | NC | 1 |
| 313 | | 5 | max | 0 | 3 | 0 | 10 | 0 | 1 | 0 | 1 | NC | 2 | NC | 1 |
| 314 | | | min | 0 | 2 | -.044 | 3 | 0 | 1 | 0 | 1 | 1683.322 | 3 | NC | 1 |
| 315 | | 6 | max | .001 | 3 | .001 | 10 | 0 | 1 | 0 | 1 | NC | 2 | NC | 1 |
| 316 | | | min | -.001 | 2 | -.067 | 3 | 0 | 1 | 0 | 1 | 1106.581 | 3 | NC | 1 |
| 317 | | 7 | max | .001 | 3 | .001 | 10 | 0 | 1 | 0 | 1 | NC | 2 | NC | 1 |
| 318 | | | min | -.001 | 2 | -.094 | 3 | 0 | 1 | 0 | 1 | 787.81 | 3 | NC | 1 |
| 319 | | 8 | max | .002 | 3 | .002 | 10 | 0 | 1 | 0 | 1 | NC | 2 | NC | 1 |
| 320 | | | min | -.002 | 2 | -.124 | 3 | 0 | 1 | 0 | 1 | 592.779 | 3 | NC | 1 |
| 321 | | 9 | max | .002 | 3 | .002 | 10 | 0 | 1 | 0 | 1 | NC | 2 | NC | 1 |
| 322 | | | min | -.002 | 2 | -.159 | 3 | 0 | 1 | 0 | 1 | 464.673 | 3 | NC | 1 |
| 323 | | 10 | max | .002 | 3 | .002 | 10 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 324 | | | min | -.002 | 2 | -.196 | 3 | 0 | 1 | 0 | 1 | 375.909 | 3 | NC | 1 |
| 325 | | 11 | max | .002 | 3 | .003 | 10 | 0 | 1 | 0 | 1 | NC | 10 | NC | 1 |
| 326 | | | min | -.002 | 2 | -.236 | 3 | 0 | 1 | 0 | 1 | 311.802 | 3 | NC | 1 |
| 327 | | 12 | max | .003 | 3 | .003 | 10 | 0 | 1 | 0 | 1 | NC | 10 | NC | 1 |
| 328 | | | min | -.002 | 2 | -.279 | 3 | 0 | 1 | 0 | 1 | 263.95 | 3 | NC | 1 |
| 329 | | 13 | max | .003 | 3 | .003 | 10 | 0 | 1 | 0 | 1 | NC | 10 | NC | 1 |
| 330 | | | min | -.003 | 2 | -.324 | 3 | 0 | 1 | 0 | 1 | 227.262 | 3 | NC | 1 |
| 331 | | 14 | max | .003 | 3 | .004 | 10 | 0 | 1 | 0 | 1 | NC | 10 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 332 | | | min | -.003 | 2 | -.371 | 3 | 0 | 1 | 0 | 1 | 198.498 | 3 | NC | 1 |
| 333 | | 15 | max | .003 | 3 | .004 | 10 | 0 | 1 | 0 | 1 | NC | 10 | NC | 1 |
| 334 | | | min | -.003 | 2 | -.42 | 3 | 0 | 1 | 0 | 1 | 175.531 | 3 | NC | 1 |
| 335 | | 16 | max | .004 | 3 | .005 | 10 | 0 | 1 | 0 | 1 | NC | 10 | NC | 1 |
| 336 | | | min | -.003 | 2 | -.47 | 3 | 0 | 1 | 0 | 1 | 156.903 | 3 | NC | 1 |
| 337 | | 17 | max | .004 | 3 | .005 | 10 | 0 | 1 | 0 | 1 | NC | 10 | NC | 1 |
| 338 | | | min | -.003 | 2 | -.52 | 3 | 0 | 1 | 0 | 1 | 141.589 | 3 | NC | 1 |
| 339 | | 18 | max | .004 | 3 | .006 | 10 | 0 | 1 | 0 | 1 | NC | 10 | NC | 1 |
| 340 | | | min | -.004 | 2 | -.572 | 3 | 0 | 1 | 0 | 1 | 128.855 | 3 | NC | 1 |
| 341 | | 19 | max | .004 | 3 | .006 | 10 | 0 | 1 | 0 | 1 | NC | 10 | NC | 1 |
| 342 | | | min | -.004 | 2 | -.624 | 3 | 0 | 1 | 0 | 1 | 118.163 | 3 | NC | 1 |
| 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 | 10 | 0 | 2 | 1.651e-3 | 3 | NC | 1 | NC | 1 |
| 346 | | | min | 0 | 2 | -.002 | 3 | 0 | 3 | -3.363e-3 | 2 | NC | 1 | NC | 1 |
| 347 | | 3 | max | 0 | 3 | 0 | 10 | 0 | 2 | 1.458e-3 | 3 | NC | 1 | NC | 1 |
| 348 | | | min | 0 | 2 | -.007 | 3 | 0 | 3 | -3.093e-3 | 2 | NC | 1 | NC | 1 |
| 349 | | 4 | max | 0 | 3 | 0 | 10 | .001 | 2 | 1.266e-3 | 3 | NC | 1 | NC | 1 |
| 350 | | | min | 0 | 2 | -.015 | 3 | -.002 | 3 | -2.823e-3 | 2 | 4761.591 | 3 | NC | 1 |
| 351 | | 5 | max | 0 | 3 | 0 | 10 | .002 | 2 | 1.074e-3 | 3 | NC | 2 | NC | 1 |
| 352 | | | min | 0 | 2 | -.027 | 3 | -.003 | 3 | -2.553e-3 | 2 | 2756.908 | 3 | NC | 1 |
| 353 | | 6 | max | 0 | 3 | 0 | 10 | .003 | 2 | 8.814e-4 | 3 | NC | 2 | NC | 1 |
| 354 | | | min | 0 | 2 | -.041 | 3 | -.004 | 3 | -2.283e-3 | 2 | 1810.048 | 3 | NC | 1 |
| 355 | | 7 | max | 0 | 3 | 0 | 10 | .004 | 2 | 6.892e-4 | 3 | NC | 2 | NC | 1 |
| 356 | | | min | 0 | 2 | -.057 | 3 | -.006 | 3 | -2.013e-3 | 2 | 1287.642 | 3 | 9436.945 | 3 |
| 357 | | 8 | max | 0 | 3 | 0 | 10 | .004 | 2 | 4.969e-4 | 3 | NC | 2 | NC | 1 |
| 358 | | | min | 0 | 2 | -.076 | 3 | -.007 | 3 | -1.743e-3 | 2 | 968.377 | 3 | 7799.676 | 3 |
| 359 | | 9 | max | 0 | 3 | 0 | 10 | .005 | 2 | 3.046e-4 | 3 | NC | 2 | NC | 1 |
| 360 | | | min | 0 | 2 | -.097 | 3 | -.008 | 3 | -1.474e-3 | 2 | 758.826 | 3 | 6726.433 | 3 |
| 361 | | 10 | max | 0 | 3 | 0 | 10 | .006 | 2 | 1.124e-4 | 3 | NC | 5 | NC | 1 |
| 362 | | | min | 0 | 2 | -.12 | 3 | -.009 | 3 | -1.204e-3 | 2 | 613.708 | 3 | 6017.534 | 3 |
| 363 | | 11 | max | 0 | 3 | 0 | 10 | .006 | 2 | -1.833e-6 | 15 | NC | 5 | NC | 1 |
| 364 | | | min | 0 | 2 | -.145 | 3 | -.009 | 3 | -9.337e-4 | 2 | 508.942 | 3 | 5568.073 | 3 |
| 365 | | 12 | max | 0 | 3 | 0 | 10 | .007 | 2 | 3.546e-5 | 9 | NC | 5 | NC | 1 |
| 366 | | | min | 0 | 2 | -.171 | 3 | -.01 | 3 | -6.638e-4 | 2 | 430.766 | 3 | 5326.131 | 3 |
| 367 | | 13 | max | 0 | 3 | 0 | 10 | .007 | 2 | 9.29e-5 | 9 | NC | 10 | NC | 1 |
| 368 | | | min | 0 | 2 | -.199 | 3 | -.009 | 3 | -4.645e-4 | 3 | 370.844 | 3 | 5277.071 | 3 |
| 369 | | 14 | max | .001 | 3 | 0 | 10 | .006 | 2 | 1.503e-4 | 9 | NC | 10 | NC | 1 |
| 370 | | | min | -.001 | 2 | -.227 | 3 | -.009 | 3 | -6.567e-4 | 3 | 323.873 | 3 | 5445.85 | 3 |
| 371 | | 15 | max | .001 | 3 | 0 | 10 | .006 | 2 | 3.177e-4 | 1 | NC | 10 | NC | 1 |
| 372 | | | min | -.001 | 2 | -.257 | 3 | -.007 | 3 | -8.49e-4 | 3 | 286.375 | 3 | 5916.895 | 3 |
| 373 | | 16 | max | .001 | 3 | 0 | 10 | .005 | 1 | 5.203e-4 | 1 | NC | 10 | NC | 1 |
| 374 | | | min | -.001 | 2 | -.288 | 3 | -.005 | 3 | -1.041e-3 | 3 | 255.964 | 3 | 6920.784 | 3 |
| 375 | | 17 | max | .001 | 3 | 0 | 10 | .004 | 1 | 7.229e-4 | 1 | NC | 10 | NC | 1 |
| 376 | | | min | -.001 | 2 | -.319 | 3 | -.002 | 3 | -1.234e-3 | 3 | 230.968 | 3 | 9180.74 | 3 |
| 377 | | 18 | max | .001 | 3 | 0 | 10 | .003 | 1 | 9.557e-4 | 2 | NC | 10 | NC | 1 |
| 378 | | | min | -.001 | 2 | -.351 | 3 | 0 | 15 | -1.426e-3 | 3 | 210.186 | 3 | NC | 1 |
| 379 | | 19 | max | .001 | 3 | 0 | 10 | .007 | 3 | 1.226e-3 | 2 | NC | 10 | NC | 1 |
| 380 | | | min | -.001 | 2 | -.382 | 3 | -.002 | 2 | -1.618e-3 | 3 | 192.735 | 3 | NC | 1 |
| 381 | M3 | 1 | max | 0 | 3 | 0 | 10 | 0 | 3 | 1.884e-3 | 2 | NC | 1 | NC | 1 |
| 382 | | | min | 0 | 2 | 0 | 3 | 0 | 2 | -9.015e-4 | 3 | NC | 1 | NC | 1 |
| 383 | | 2 | max | 0 | 3 | 0 | 15 | .005 | 3 | 1.938e-3 | 2 | NC | 1 | NC | 3 |
| 384 | | | min | 0 | 2 | -.019 | 3 | -.01 | 2 | -9.428e-4 | 3 | NC | 1 | 5911.918 | 2 |
| 385 | | 3 | max | .001 | 3 | -.001 | 15 | .011 | 3 | 1.992e-3 | 2 | NC | 1 | NC | 4 |
| 386 | | | min | 0 | 2 | -.038 | 3 | -.021 | 2 | -9.841e-4 | 3 | NC | 1 | 2936.46 | 2 |
| 387 | | 4 | max | .001 | 3 | -.002 | 10 | .016 | 3 | 2.046e-3 | 2 | NC | 1 | NC | 4 |
| 388 | | | min | -.001 | 2 | -.057 | 3 | -.031 | 2 | -1.025e-3 | 3 | NC | 1 | 1960.645 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 389 | | 5 | max | .001 | 3 | -.003 | 10 | .021 | 3 | 2.101e-3 | 2 | NC | 1 | NC | 4 |
| 390 | | | min | -.002 | 2 | -.076 | 3 | -.041 | 2 | -1.067e-3 | 3 | NC | 1 | 1484.851 | 2 |
| 391 | | 6 | max | .002 | 3 | -.003 | 10 | .026 | 3 | 2.155e-3 | 2 | NC | 1 | NC | 4 |
| 392 | | | min | -.002 | 2 | -.095 | 3 | -.051 | 2 | -1.108e-3 | 3 | NC | 1 | 1209.645 | 2 |
| 393 | | 7 | max | .002 | 3 | -.004 | 10 | .03 | 3 | 2.209e-3 | 2 | NC | 1 | NC | 4 |
| 394 | | | min | -.003 | 2 | -.114 | 3 | -.059 | 2 | -1.149e-3 | 3 | NC | 1 | 1035.683 | 2 |
| 395 | | 8 | max | .002 | 3 | -.004 | 10 | .034 | 3 | 2.263e-3 | 2 | NC | 1 | NC | 4 |
| 396 | | | min | -.003 | 2 | -.132 | 3 | -.066 | 2 | -1.191e-3 | 3 | NC | 1 | 920.905 | 2 |
| 397 | | 9 | max | .002 | 3 | -.004 | 10 | .037 | 3 | 2.317e-3 | 2 | NC | 1 | NC | 5 |
| 398 | | | min | -.004 | 2 | -.151 | 3 | -.072 | 2 | -1.232e-3 | 3 | NC | 1 | 844.908 | 2 |
| 399 | | 10 | max | .002 | 3 | -.005 | 10 | .039 | 3 | 2.371e-3 | 2 | NC | 1 | NC | 5 |
| 400 | | | min | -.004 | 2 | -.169 | 3 | -.077 | 2 | -1.273e-3 | 3 | NC | 1 | 797.185 | 2 |
| 401 | | 11 | max | .002 | 3 | -.005 | 10 | .04 | 3 | 2.425e-3 | 2 | NC | 1 | NC | 5 |
| 402 | | | min | -.004 | 2 | -.188 | 3 | -.079 | 2 | -1.315e-3 | 3 | NC | 1 | 772.622 | 2 |
| 403 | | 12 | max | .003 | 3 | -.005 | 10 | .041 | 3 | 2.479e-3 | 2 | NC | 1 | NC | 5 |
| 404 | | | min | -.005 | 2 | -.206 | 3 | -.079 | 2 | -1.356e-3 | 3 | NC | 1 | 769.795 | 2 |
| 405 | | 13 | max | .003 | 3 | -.005 | 10 | .04 | 3 | 2.533e-3 | 2 | NC | 1 | NC | 5 |
| 406 | | | min | -.005 | 2 | -.225 | 3 | -.076 | 2 | -1.397e-3 | 3 | NC | 1 | 790.812 | 2 |
| 407 | | 14 | max | .003 | 3 | -.005 | 10 | .037 | 3 | 2.587e-3 | 2 | NC | 1 | NC | 5 |
| 408 | | | min | -.006 | 2 | -.243 | 3 | -.071 | 2 | -1.439e-3 | 3 | NC | 1 | 842.767 | 2 |
| 409 | | 15 | max | .003 | 3 | -.005 | 10 | .034 | 3 | 2.641e-3 | 2 | NC | 1 | NC | 4 |
| 410 | | | min | -.006 | 2 | -.261 | 3 | -.063 | 2 | -1.48e-3 | 3 | NC | 1 | 942.48 | 2 |
| 411 | | 16 | max | .003 | 3 | -.005 | 10 | .029 | 3 | 2.695e-3 | 2 | NC | 1 | NC | 4 |
| 412 | | | min | -.007 | 2 | -.279 | 3 | -.052 | 2 | -1.521e-3 | 3 | NC | 1 | 1131.533 | 2 |
| 413 | | 17 | max | .003 | 3 | -.005 | 10 | .022 | 3 | 2.749e-3 | 2 | NC | 1 | NC | 4 |
| 414 | | | min | -.007 | 2 | -.298 | 3 | -.037 | 2 | -1.563e-3 | 3 | NC | 1 | 1537.053 | 2 |
| 415 | | 18 | max | .004 | 3 | -.004 | 10 | .013 | 3 | 2.803e-3 | 2 | NC | 1 | NC | 4 |
| 416 | | | min | -.008 | 2 | -.316 | 3 | -.018 | 2 | -1.604e-3 | 3 | NC | 1 | 2798.03 | 2 |
| 417 | | 19 | max | .004 | 3 | -.004 | 10 | .006 | 1 | 2.857e-3 | 2 | NC | 1 | NC | 1 |
| 418 | | | min | -.008 | 2 | -.334 | 3 | 0 | 15 | -1.645e-3 | 3 | NC | 1 | NC | 1 |
| 419 | M6 | 1 | max | .001 | 3 | 0 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 420 | | | min | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 421 | | 2 | max | .002 | 3 | 0 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 422 | | | min | -.002 | 2 | -.031 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 423 | | 3 | max | .003 | 3 | -.001 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 424 | | | min | -.003 | 2 | -.061 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 425 | | 4 | max | .003 | 3 | -.002 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 426 | | | min | -.004 | 2 | -.091 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 427 | | 5 | max | .004 | 3 | -.003 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 428 | | | min | -.006 | 2 | -.122 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 429 | | 6 | max | .004 | 3 | -.003 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 430 | | | min | -.007 | 2 | -.152 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 431 | | 7 | max | .005 | 3 | -.004 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 432 | | | min | -.008 | 2 | -.182 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 433 | | 8 | max | .006 | 3 | -.004 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 434 | | | min | -.009 | 2 | -.212 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 435 | | 9 | max | .006 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 436 | | | min | -.011 | 2 | -.242 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 437 | | 10 | max | .007 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 438 | | | min | -.012 | 2 | -.272 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 439 | | 11 | max | .008 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 440 | | | min | -.013 | 2 | -.301 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 441 | | 12 | max | .008 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 442 | | | min | -.015 | 2 | -.331 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 443 | | 13 | max | .009 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 444 | | | min | -.016 | 2 | -.361 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 445 | | 14 | max | .01 | 3 | -.006 | 10 | 0 | 1 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 446 | | | min | -.017 | 2 | -.391 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 447 | | 15 | max | .01 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 448 | | | min | -.019 | 2 | -.42 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 449 | | 16 | max | .011 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 450 | | | min | -.02 | 2 | -.45 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 451 | | 17 | max | .012 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 452 | | | min | -.021 | 2 | -.479 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 453 | | 18 | max | .012 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 454 | | | min | -.022 | 2 | -.509 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 455 | | 19 | max | .013 | 3 | -.005 | 10 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 456 | | | min | -.024 | 2 | -.538 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 457 | M9 | 1 | max | 0 | 3 | 0 | 10 | 0 | 2 | 9.015e-4 | 3 | NC | 1 | NC | 1 |
| 458 | | | min | 0 | 2 | 0 | 3 | 0 | 3 | -1.884e-3 | 2 | NC | 1 | NC | 1 |
| 459 | | 2 | max | 0 | 3 | 0 | 15 | .01 | 2 | 9.428e-4 | 3 | NC | 1 | NC | 3 |
| 460 | | | min | 0 | 2 | -.019 | 3 | -.005 | 3 | -1.938e-3 | 2 | NC | 1 | 5911.918 | 2 |
| 461 | | 3 | max | .001 | 3 | -.001 | 15 | .021 | 2 | 9.841e-4 | 3 | NC | 1 | NC | 4 |
| 462 | | | min | 0 | 2 | -.038 | 3 | -.011 | 3 | -1.992e-3 | 2 | NC | 1 | 2936.46 | 2 |
| 463 | | 4 | max | .001 | 3 | -.002 | 10 | .031 | 2 | 1.025e-3 | 3 | NC | 1 | NC | 4 |
| 464 | | | min | -.001 | 2 | -.057 | 3 | -.016 | 3 | -2.046e-3 | 2 | NC | 1 | 1960.645 | 2 |
| 465 | | 5 | max | .001 | 3 | -.003 | 10 | .041 | 2 | 1.067e-3 | 3 | NC | 1 | NC | 4 |
| 466 | | | min | -.002 | 2 | -.076 | 3 | -.021 | 3 | -2.101e-3 | 2 | NC | 1 | 1484.851 | 2 |
| 467 | | 6 | max | .002 | 3 | -.003 | 10 | .051 | 2 | 1.108e-3 | 3 | NC | 1 | NC | 4 |
| 468 | | | min | -.002 | 2 | -.095 | 3 | -.026 | 3 | -2.155e-3 | 2 | NC | 1 | 1209.645 | 2 |
| 469 | | 7 | max | .002 | 3 | -.004 | 10 | .059 | 2 | 1.149e-3 | 3 | NC | 1 | NC | 4 |
| 470 | | | min | -.003 | 2 | -.114 | 3 | -.03 | 3 | -2.209e-3 | 2 | NC | 1 | 1035.683 | 2 |
| 471 | | 8 | max | .002 | 3 | -.004 | 10 | .066 | 2 | 1.191e-3 | 3 | NC | 1 | NC | 4 |
| 472 | | | min | -.003 | 2 | -.132 | 3 | -.034 | 3 | -2.263e-3 | 2 | NC | 1 | 920.905 | 2 |
| 473 | | 9 | max | .002 | 3 | -.004 | 10 | .072 | 2 | 1.232e-3 | 3 | NC | 1 | NC | 5 |
| 474 | | | min | -.004 | 2 | -.151 | 3 | -.037 | 3 | -2.317e-3 | 2 | NC | 1 | 844.908 | 2 |
| 475 | | 10 | max | .002 | 3 | -.005 | 10 | .077 | 2 | 1.273e-3 | 3 | NC | 1 | NC | 5 |
| 476 | | | min | -.004 | 2 | -.169 | 3 | -.039 | 3 | -2.371e-3 | 2 | NC | 1 | 797.185 | 2 |
| 477 | | 11 | max | .002 | 3 | -.005 | 10 | .079 | 2 | 1.315e-3 | 3 | NC | 1 | NC | 5 |
| 478 | | | min | -.004 | 2 | -.188 | 3 | -.04 | 3 | -2.425e-3 | 2 | NC | 1 | 772.622 | 2 |
| 479 | | 12 | max | .003 | 3 | -.005 | 10 | .079 | 2 | 1.356e-3 | 3 | NC | 1 | NC | 5 |
| 480 | | | min | -.005 | 2 | -.206 | 3 | -.041 | 3 | -2.479e-3 | 2 | NC | 1 | 769.795 | 2 |
| 481 | | 13 | max | .003 | 3 | -.005 | 10 | .076 | 2 | 1.397e-3 | 3 | NC | 1 | NC | 5 |
| 482 | | | min | -.005 | 2 | -.225 | 3 | -.04 | 3 | -2.533e-3 | 2 | NC | 1 | 790.812 | 2 |
| 483 | | 14 | max | .003 | 3 | -.005 | 10 | .071 | 2 | 1.439e-3 | 3 | NC | 1 | NC | 5 |
| 484 | | | min | -.006 | 2 | -.243 | 3 | -.037 | 3 | -2.587e-3 | 2 | NC | 1 | 842.767 | 2 |
| 485 | | 15 | max | .003 | 3 | -.005 | 10 | .063 | 2 | 1.48e-3 | 3 | NC | 1 | NC | 4 |
| 486 | | | min | -.006 | 2 | -.261 | 3 | -.034 | 3 | -2.641e-3 | 2 | NC | 1 | 942.48 | 2 |
| 487 | | 16 | max | .003 | 3 | -.005 | 10 | .052 | 2 | 1.521e-3 | 3 | NC | 1 | NC | 4 |
| 488 | | | min | -.007 | 2 | -.279 | 3 | -.029 | 3 | -2.695e-3 | 2 | NC | 1 | 1131.533 | 2 |
| 489 | | 17 | max | .003 | 3 | -.005 | 10 | .037 | 2 | 1.563e-3 | 3 | NC | 1 | NC | 4 |
| 490 | | | min | -.007 | 2 | -.298 | 3 | -.022 | 3 | -2.749e-3 | 2 | NC | 1 | 1537.053 | 2 |
| 491 | | 18 | max | .004 | 3 | -.004 | 10 | .018 | 2 | 1.604e-3 | 3 | NC | 1 | NC | 4 |
| 492 | | | min | -.008 | 2 | -.316 | 3 | -.013 | 3 | -2.803e-3 | 2 | NC | 1 | 2798.03 | 2 |
| 493 | | 19 | max | .004 | 3 | -.004 | 10 | 0 | 15 | 1.645e-3 | 3 | NC | 1 | NC | 1 |
| 494 | | | min | -.008 | 2 | -.334 | 3 | -.006 | 1 | -2.857e-3 | 2 | NC | 1 | NC | 1 |