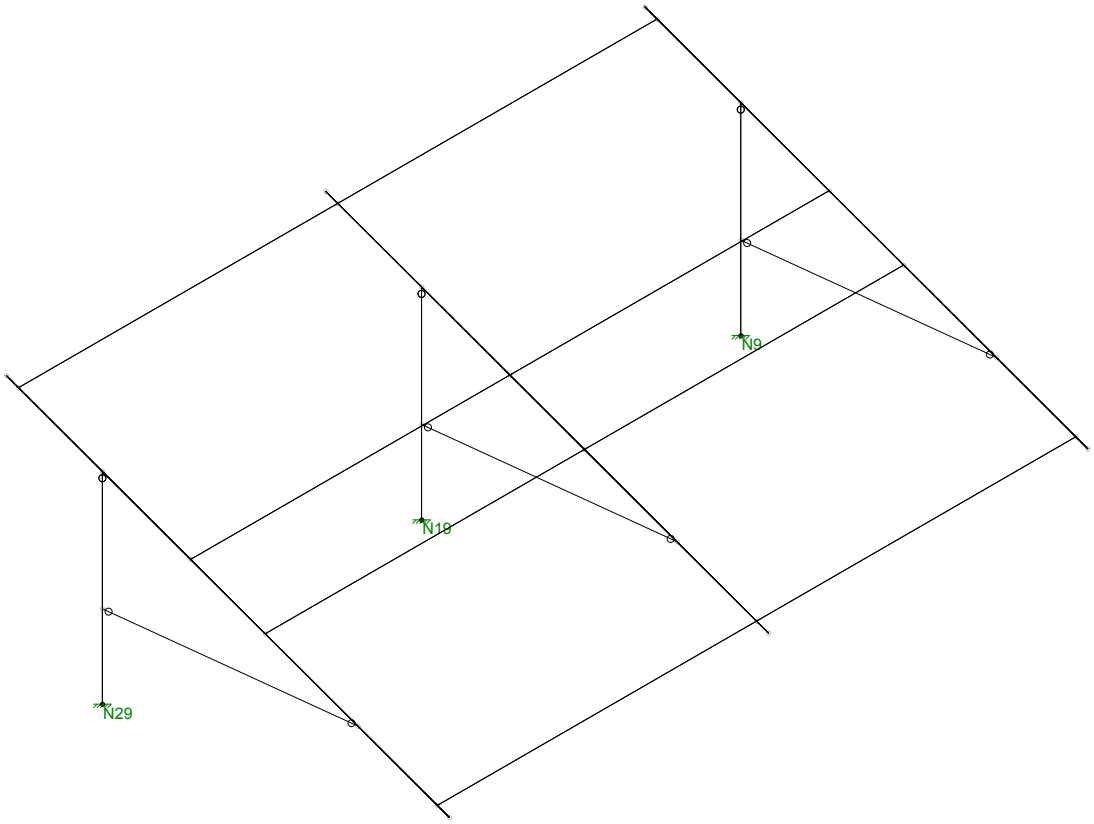



| | | |
|---|---|---|
| Schletter, Inc. | | 20° Tilt w/ Seismic Design |
| HCV | Standard FS Racking System | |
| | Representative Calculations - ASCE 7-05 | |

## 1. INTRODUCTION

### 1.1 Project Description

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

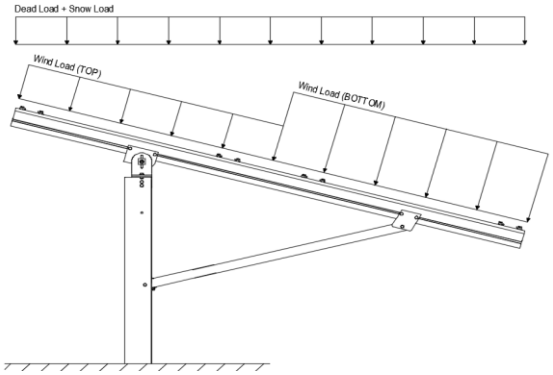
### 1.2 Construction

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

PV modules are required to meet the following specifications:

| | Maximum | | Minimum | |
|---|---|---|---|---|
| Height = | 2000 | mm | 1900 | mm |
| Width = | 1050 | mm | 970 | mm |
| Dead Load = | 3.00 | psf | 1.75 | psf |

| | |
|---|---|
| Modules Per Row = | 2 |
| Module Tilt = | 20° |
| 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, $P_s$ = | 20.62 | psf | *(ASCE 7-05, Eq. 7-2)* |
| $I_s$ = | 1.00 | | |
| $C_s$ = | 0.91 | | |
| $C_e$ = | 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

| | | | |
|---|---|---|---|
| $Cf+_{TOP}$ = | 1.05 | *(Pressure)* | *Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.* |
| $Cf+_{BOTTOM}$ = | 1.65 | | |
| $Cf-_{TOP}$ = | -2.12 | *(Suction)* | |
| $Cf-_{BOTTOM}$ = | -1 | | |

### 2.4 Seismic Loads

| | | | | |
|---|---|---|---|---|
| $S_S$ = | 2.50 | R = | 1.25 | *ASCE 7, Section 12.8.1.3: A maximum $S_s$ of 1.5 may be used to calculate the base shear, $C_s$, of structures under five stories and with a period, T, of 0.5 or less. Therefore, a $S_{ds}$ of 1.0 was used to calculate $C_s$.* |
| $S_{DS}$ = | 1.67 | $C_S$ = | 0.8 | |
| $S_1$ = | 1.00 | ρ = | 1.3 | |
| $S_{D1}$ = | 1.00 | Ω = | 1.25 | |
| $T_a$ = | 0.07 | $C_d$ = | 1.25 | |

### 2.5 Combination of Loads

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

Strength Design, LRFD

*Component stresses are checked using the following LRFD load combinations:*

| | | |
|---|---|---|
| 1.2D + 1.6S + 0.8W | | |
| 1.2D + 1.6W + 0.5S | | |
| 0.9D + 1.6W | M | |
| 1.54D + 1.3E + 0.2S | R | *(ASCE 7, Eq 2.3.2-1 through 2.3.2-7) & (ASCE 7, Section 12.4.3.2)* |
| 0.56D + 1.3E | R | |
| 1.54D + 1.25E + 0.2S | O | |
| 0.56D + 1.25E | O | |

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 | *(ASCE 7, Eq 2.4.1-1 through 2.4.1-8) & (ASCE 7, Section 12.4.3.2)* |
| 1.238D + 0.875E | O | |
| 1.1785D + 0.65625E + 0.75S | O | |
| 0.362D + 0.875E | O | |

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 |

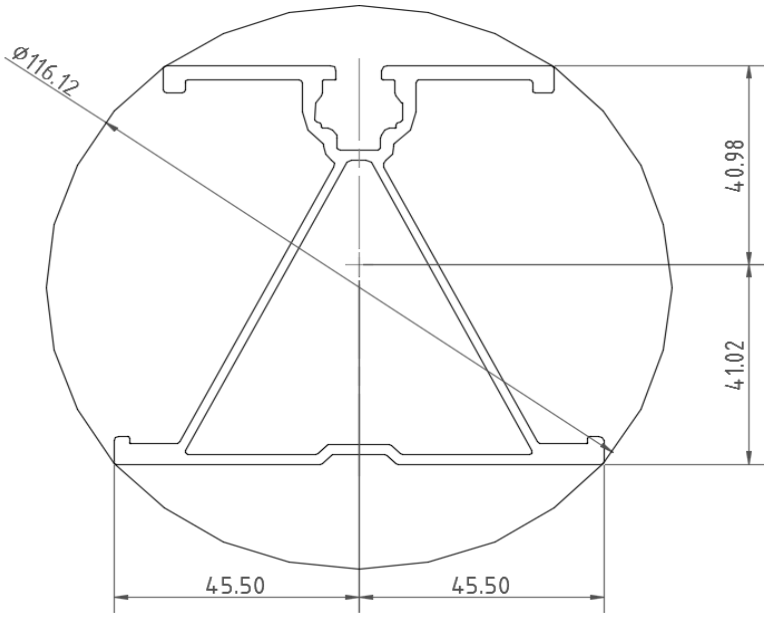
| **Struts** | Location |
|---|---|
| M3 | Outer |
| M6 | Inner |
| M9 | Outer |

## 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 |
| $L_b$ = | 78 | 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 |
| $M_y$ = | 0.865 | k-ft |
| $M_z$ = | 0.230 | k-ft |
| $M_{y\ allowable}$ = | 2.779 | k-ft |
| $M_{z\ allowable}$ = | 1.154 | k-ft |
| Utilization = | 51% | |

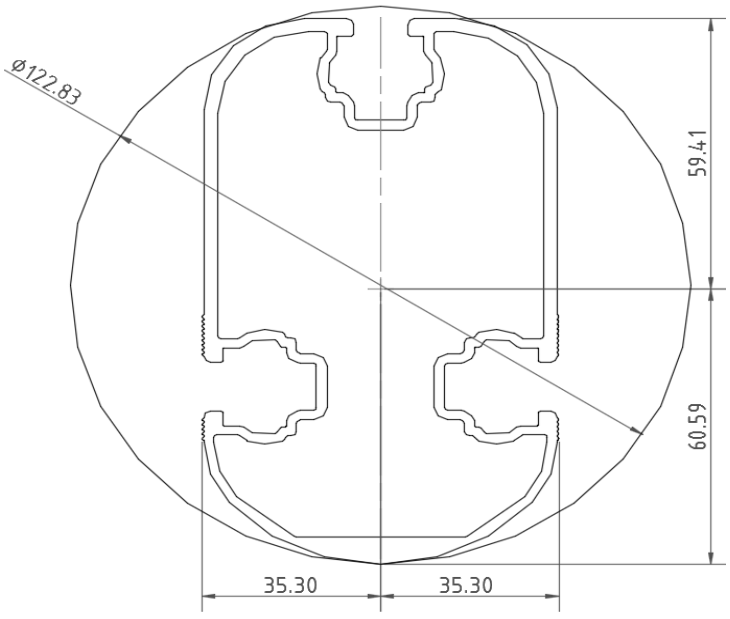


DETAIL VIEW

### 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 |
| $L_b$ = | 81.77 | in |
| $\Phi F_{ty\ AXIAL}$ = | 30.80 | ksi |
| $\Phi F_{ty\ STRONG\text{-}AXIS}$ = | 30.06 | 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 |
| $M_y$ = | 3.937 | k-ft |
| $M_z$ = | 0.000 | k-ft |
| $P_n$ = | 3.193 | k |
| $M_{y\ allowable}$ = | 4.960 | k-ft |
| $M_{z\ allowable}$ = | 3.472 | k-ft |
| $P_{n\ allowable}$ = | 59.439 | k |
| Utilization = | 85% | |

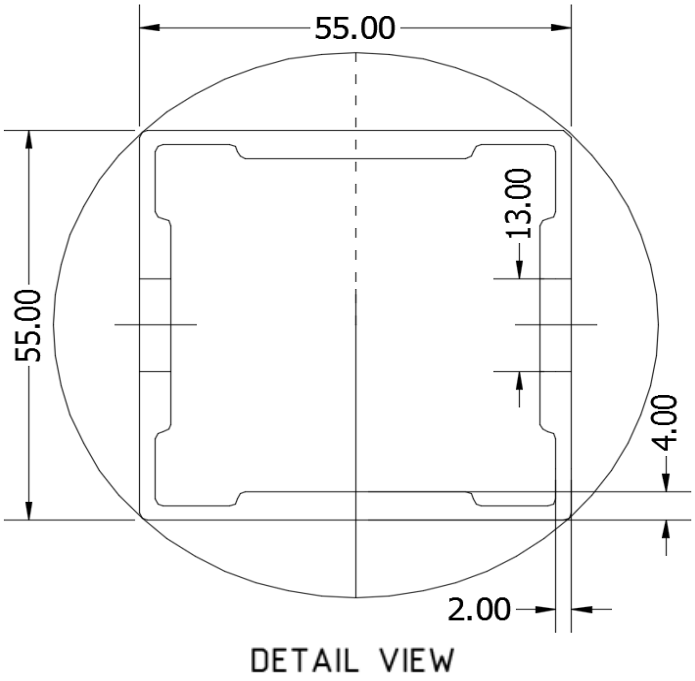


DETAIL VIEW

### 4.3 Strut Design

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

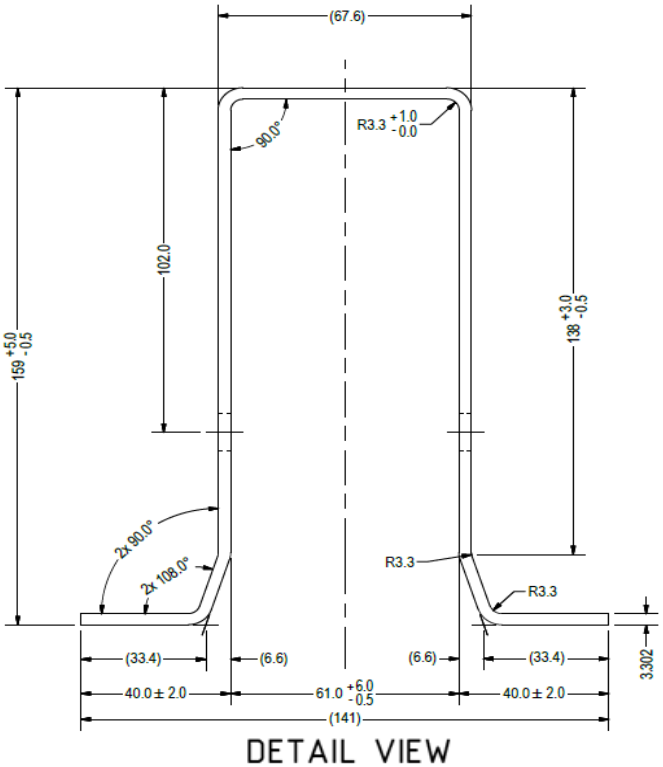
| | | |
|---|---|---|
| Strut Type = | **55x55** | |
| Aluminum Type = | 6105-T5 | |
| $F_{ty}$ = | 35 | ksi |
| $L_b$ = | 74.80 | in |
| $\Phi F_{ty\ AXIAL}$ = | 9.61 | ksi |
| $\Phi F_{ty\ BENDING}$ = | 28.22 | ksi |
| $S_y$ = | 0.60 | $in^3$ |
| $S_x$ = | 0.60 | $in^3$ |
| E = | 10100 | ksi |
| $I_y$ = | 0.67 | $in^4$ |
| $I_x$ = | 0.67 | $in^4$ |
| A = | 0.98 | $in^2$ |
| g = | 1.18 | lbs/ft |
| $M_y$ = | 0.008 | k-ft |
| $M_z$ = | 0.000 | k-ft |
| $P_n$ = | 7.388 | k |
| $M_{y\ allowable}$ = | 1.408 | k-ft |
| $M_{z\ allowable}$ = | 1.408 | k-ft |
| $P_{n\ allowable}$ = | 9.441 | k |
| Utilization = | 79% | |




### 4.4 Post Design

*Galvanized steel posts are a roll formed steel section, that are either ram driven into the ground or placed in a concrete foundation at a defined depth. Embedment depths will be provided on the structural drawings or through a geotechnical testing report. See Appendix A.4 for detailed member calculations. Section units are in (mm).*

| | | |
|---|---|---|
| Post Type = | **FG8** | |
| Steel Type = | J2340 | |
| $F_{ty}$ = | 60 | ksi |
| $L_b$ = | 72.67 | 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 |
| $M_y$ = | 15.508 | k-ft |
| $M_z$ = | 0.000 | k-ft |
| $P_r$ = | 5.668 | k |
| $M_{y\ allowable}$ = | 19.207 | k-ft |
| $M_{z\ allowable}$ = | 14.389 | k-ft |
| $P_c$ = | 38.013 | k |
| Utilization = | 98% | |



## 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 = | 6.43 | k |
| Maximum Lateral Load = | 2.93 | 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)*

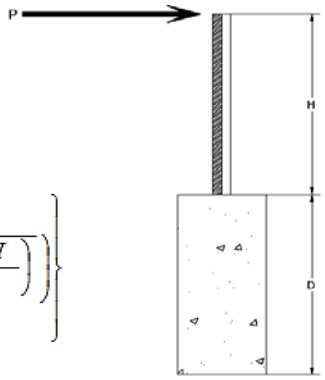
| | | |
|---|---|---|
| Lateral Force @ Top of Pole, P = | 1.54 | k |
| Height of Pole Above Grade, H = | 5.06 | ft |
| Diameter of Pole Footing, B = | 2.00 | ft |
| Lateral Soil Bearing Capacity, S = | 0.10 | ksf/ft |
| Isolated Pole Factor, F = | 2 | |
| First Trial Depth, D = | 3.25 | ft |
| Lateral 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 = | 1.54 | k |
| Height of Pole Above Grade, H = | 5.06 | ft |
| Diameter of Pole Footing, B = | 2.00 | ft |
| Lateral Soil Bearing Capacity, S = | 0.20 | ksf/ft |

| | | | | | |
|---|---|---|---|---|---|
| 1st Trial @ $D_1$ = | 3.25 | ft | 4th Trial @ $D_4$ = | 6.98 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.22 | ksf | Lateral Soil Bearing @ D/3, $S_1$ = | 0.47 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 0.65 | ksf | Lateral Soil Bearing @ D, $S_3$ = | 1.40 | ksf |
| Constant 2.34P/($S_1$B), A = | 8.33 | | Constant 2.34P/($S_1$B), A = | 3.87 | |
| Required Footing Depth, D = | 12.11 | ft | Required Footing Depth, D = | 6.95 | ft |
| 2nd Trial @ $D_2$ = | 7.68 | ft | 5th Trial @ $D_5$ = | 6.97 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.51 | ksf | Lateral Soil Bearing @ D/3, $S_1$ = | 0.46 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 1.54 | ksf | Lateral Soil Bearing @ D, $S_3$ = | 1.39 | ksf |
| Constant 2.34P/($S_1$B), A = | 3.52 | | Constant 2.34P/($S_1$B), A = | 3.88 | |
| Required Footing Depth, D = | 6.51 | ft | Required Footing Depth, D = | 7.00 | ft |
| 3rd Trial @ $D_3$ = | 7.09 | ft | | | |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.47 | ksf | | | |
| Lateral Soil Bearing @ D, $S_3$ = | 1.42 | ksf | | | |
| Constant 2.34P/($S_1$B), A = | 3.81 | | | | |
| Required Footing Depth, D = | 6.87 | ft | | | |

A 2ft diameter x 7ft deep footing unrestrained at ground level is required for the racking structure.

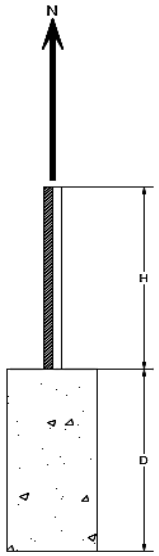
## 5.4 Uplifting Force Resistance

*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 = | 3.08 | 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 = | 1.99 | k |
| Required Concrete Volume, V = | 13.74 | $ft^3$ |
| Required Footing Depth, D = | 4.50 | ft |

| Iteration | z | dz | Qs | Side |
|---|---|---|---|---|
| 1 | 0.2 | 0.2 | 118.10 | 6.65 |
| 2 | 0.4 | 0.2 | 118.10 | 6.55 |
| 3 | 0.6 | 0.2 | 118.10 | 6.45 |
| 4 | 0.8 | 0.2 | 118.10 | 6.34 |
| 5 | 1 | 0.2 | 118.10 | 6.24 |
| 6 | 1.2 | 0.2 | 118.10 | 6.14 |
| 7 | 1.4 | 0.2 | 118.10 | 6.03 |
| 8 | 1.6 | 0.2 | 118.10 | 5.93 |
| 9 | 1.8 | 0.2 | 118.10 | 5.82 |
| 10 | 2 | 0.2 | 118.10 | 5.72 |
| 11 | 2.2 | 0.2 | 118.10 | 5.62 |
| 12 | 2.4 | 0.2 | 118.10 | 5.51 |
| 13 | 2.6 | 0.2 | 118.10 | 5.41 |
| 14 | 2.8 | 0.2 | 118.10 | 5.31 |
| 15 | 3 | 0.2 | 118.10 | 5.20 |
| 16 | 3.2 | 0.2 | 118.10 | 5.10 |
| 17 | 3.4 | 0.2 | 118.10 | 5.00 |
| 18 | 3.6 | 0.2 | 118.10 | 4.89 |
| 19 | 3.8 | 0.2 | 118.10 | 4.79 |
| 20 | 4 | 0.2 | 118.10 | 4.68 |
| 21 | 4.2 | 0.2 | 118.10 | 4.58 |
| 22 | 4.4 | 0.2 | 118.10 | 4.48 |
| 23 | 4.6 | 0.2 | 118.10 | 4.37 |
| 24 | 0 | 0.0 | 0.00 | 4.37 |
| 25 | 0 | 0.0 | 0.00 | 4.37 |
| 26 | 0 | 0.0 | 0.00 | 4.37 |
| 27 | 0 | 0.0 | 0.00 | 4.37 |
| 28 | 0 | 0.0 | 0.00 | 4.37 |
| 29 | 0 | 0.0 | 0.00 | 4.37 |
| 30 | 0 | 0.0 | 0.00 | 4.37 |
| 31 | 0 | 0.0 | 0.00 | 4.37 |
| 32 | 0 | 0.0 | 0.00 | 4.37 |
| 33 | 0 | 0.0 | 0.00 | 4.37 |
| 34 | 0 | 0.0 | 0.00 | 4.37 |
| Max | 4.6 | Sum | 1.09 | |

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




## 5.5 Compressive Force Resistance

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

| | | |
|---|---|---|
| Depth Below Grade, D = | 7.00 | ft |
| Footing Diameter, B = | 2.00 | ft |
| Compressive Force, P = | 3.77 | k |
| Footing Area = | 3.14 | $ft^2$ |
| Circumference = | 6.28 | ft |
| Skin Friction Area = | 25.13 | $ft^2$ |
| Concrete Weight = | 0.145 | kcf |

Bearing Pressure

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

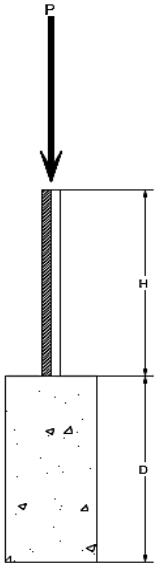
Weight of Concrete

| | | |
|---|---|---|
| Footing Volume | 21.99 | $ft^3$ |
| Weight | 3.19 | k |

Skin Friction Resistance

| | | |
|---|---|---|
| Skin Friction = | 0.15 | ksf |
| Resistance = | 3.77 | k |
| 1/3 Increase for Wind = | 1.33 | |
| Total Resistance = | 11.31 | k |
| Applied Force = | 6.96 | k |
| Utilization = | 62% | |

A 2ft diameter footing passes at a depth of 7ft.



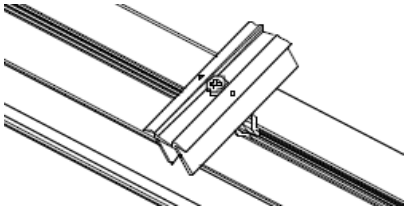
## 6. DESIGN OF JOINTS AND CONNECTIONS

### 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.*

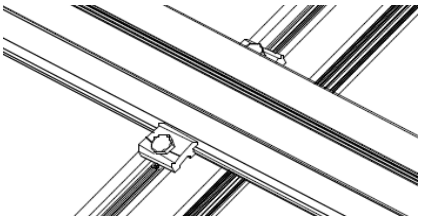
Fastening of Modules to Purlins

| | | |
|---|---|---|
| Maximum Uplifting Force | = | 0.849 k |
| Allowable Uplift | = | 1.214 k |
| Utilization | = | 70% |



Fastening of Purlins to Girders

| | | |
|---|---|---|
| Maximum Uplifting Force | = | 1.965 k |
| Allowable Uplift | = | 2.180 k |
| Utilization | = | 90% |

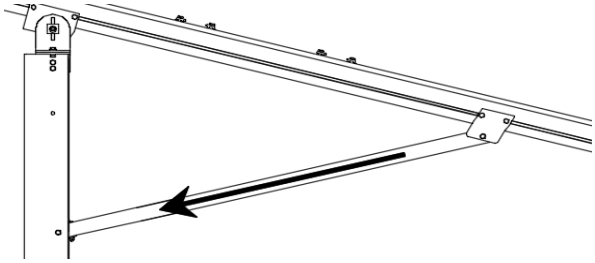


### 6.2 Strut Connections

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

| | | |
|---|---|---|
| Maximum Axial Load | = | 7.388 k |
| M10 Bolt Shear Capacity | = | 8.894 k |
| Utilization | = | 83% |

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

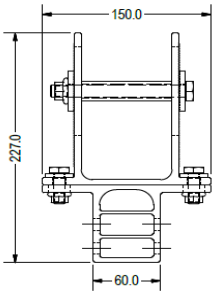


*A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.*

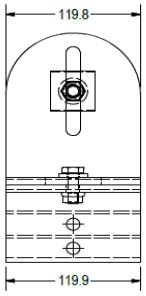
### 6.3 Girder to Post Connection

*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.*

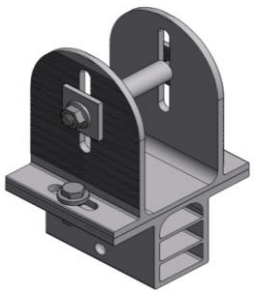
| | | |
|---|---|---|
| Maximum Tensile Load | = | 4.046 k |
| Allowable Load | = | 5.649 k |
| Utilization | = | 72% |



FRONT VIEW



SIDE VIEW



## 7. SEISMIC DESIGN

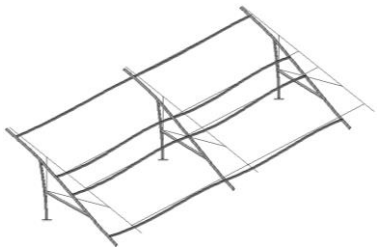
### 7.1 Seismic Drift

*The racking structure has been analyzed under seismic loading. The allowable story drift of the structure must fall within the limits provided by (ASCE 7, Table 12.12-1).*

| | | |
|---|---|---|
| Mean Height, $h_{sx}$ | = | 69.36 in |
| Allowable Story Drift for All Other Structures, Δ | = { | $0.020h_{sx}$ |
| | | 1.387 in |
| Max Drift, $\Delta_{MAX}$ | = | 0.626 in |

*0.626 ≤ 1.387, OK.*

*The racking structure's reaction to seismic loads is shown to the right. The deflections have been magnified to provide a clear portrayal of potential story drift.*



**APPENDIX A**

**A.1 Design of Aluminum Purlins - Aluminum Design Manual, 2005 Edition**

Purlin = **S1.5**

| Strong Axis: | | Weak Axis: | |
|---|---|---|---|
| **3.4.14** | | **3.4.14** | |
| $L_b$ = | 78 in | $L_b$ = | 78 |
| J = | 0.432 | J = | 0.432 |
| | 215.785 | | 137.226 |
| $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$ | | $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$ | |
| 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))] |
| $\varphi F_L$= | 28.6 ksi | $\varphi F_L$= | 29.6 |
| **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**

$L_b$ = 81.7717 in
J = 1.98
105.231

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

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))]
$\varphi F_L$ = 30.1 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**

$L_b$ = 81.7717
J = 1.98
114.202

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

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))]
$\varphi F_L$ = 29.9

**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

$\varphi F_L St$= 30.1 ksi

Ix = 1970917 $mm^4$

4.735 $in^4$

y = 61.046 mm

Sx = 1.970 $in^3$

$M_{max}St$ = 4.935 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:

**3.4.14**

$L_b$ = 74.8031 in

J = 0.942

116.737

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

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))]

$\varphi F_L$= 29.9 ksi

**3.4.16**

b/t = 24.5

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7

$\varphi F_L$= φb[Bp-1.6Dp*b/t]

$\varphi F_L$= 28.2 ksi

**3.4.16.1** Not Used

Rb/t = 0.0

$$S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$$

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

$\varphi F_L$= 1.17φyFcy

$\varphi F_L$= 38.9 ksi

**3.4.18**

h/t = 24.5

$$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$$

S1 = 36.9

m = 0.65

$C_0$ = 27.5

Cc = 27.5

$$S2 = \frac{k_1 Bbr}{mDbr}$$

S2 = 77.3

$\varphi F_L$= 1.3φyFcy

$\varphi F_L$= 43.2 ksi

$\varphi F_L$St= 28.2 ksi

Ix = 279836 $mm^4$

0.672 $in^4$

y = 27.5 mm

Sx = 0.621 $in^3$

$M_{max}$St = 1.460 k-ft

Weak Axis:

**3.4.14**

$L_b$ = 74.8031

J = 0.942

116.737

$$S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$$

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))]

$\varphi F_L$= 29.9

**3.4.16**

b/t = 24.5

$$S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$$

S1 = 12.2

$$S2 = \frac{k_1 Bp}{1.6Dp}$$

S2 = 46.7

$\varphi F_L$= φb[Bp-1.6Dp*b/t]

$\varphi F_L$= 28.2 ksi

**3.4.16.1**

N/A for Weak Direction

**3.4.18**

h/t = 24.5

$$S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$$

S1 = 36.9

m = 0.65

$C_0$ = 27.5

Cc = 27.5

$$S2 = \frac{k_1 Bbr}{mDbr}$$

S2 = 77.3

$\varphi F_L$= 1.3φyFcy

$\varphi F_L$= 43.2 ksi

$\varphi F_L$Wk= 28.2 ksi

Iy = 279836 $mm^4$

0.672 $in^4$

x = 27.5 mm

Sy = 0.621 $in^3$

$M_{max}$Wk = 1.460 k-ft

Compression

**3.4.7**

λ = 1.73045

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.82226

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

$\varphi F_L$ = 9.61085 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

$\varphi F_L$ = 9.61 ksi

A = 663.99 $mm^2$

1.03 $in^2$

$P_{max}$ = 9.89 kips

**A.4 Design of Galvanized Steel Posts**

Post Type = **FG8**

| | | | |
|---|---|---|---|
| Unbraced Length = | 72.67 | in | |
| Pr = | 5.67 | k | (LRFD Factored Load) |
| Mr (Strong) = | 15.51 | k-ft | (LRFD Factored Load) |
| Mr (Weak) = | 0.00 | k-ft | (LRFD Factored Load) |

Flexural Buckling:

| | | | | |
|---|---|---|---|---|
| kL/r = | 104.56 | | | |
| 4.71√(E/Fy) = | 103.55 | => | kL/r | > 4.71√(E/Fy) |
| Fcr = | 22.96 | ksi | | |
| Fe = | 26.18 | ksi | | |
| Pn = | 51.204 | k | | |

Torsional/Flexural Torsional Buckling:

| | | |
|---|---|---|
| Fcr = | 17.0464 | ksi |
| Fey = | 66.785 | ksi |
| Fez = | 21.7259 | ksi |
| Pn = | 38.0134 | k |

Bending (Strong Axis):

Yielding:

| | | |
|---|---|---|
| Mn = | 21.95 | k-ft |

Flange Local Buckling:

| | | |
|---|---|---|
| Mn = | 19.207 | k-ft |

| | | | | |
|---|---|---|---|---|
| Pr/Pc = | 0.1657 | < | 0.2 | |
| Utilization = | 0.98 | < | 1.0 | OK |

Bending (Weak Axis):

Yielding:

| | | |
|---|---|---|
| Mn = | 14.65 | k-ft |

Flange Local Buckling:

| | | |
|---|---|---|
| Mn = | 14.39 | k-ft |

| | | | | |
|---|---|---|---|---|
| Pr/Pc = | 0.166 | < | 0.2 | |
| Utilization = | 0.00 | < | 1.0 | OK |

Combined Forces

Utilization = 98%

**APPENDIX B**

**B.1**

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

## Basic Load Cases

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

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

| | Member Label | Direction | Start Magnitude[lb/ft,F] | End Magnitude[lb/ft,F] | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M10 | Y | -9.843 | -9.843 | 0 | 0 |
| 2 | M11 | Y | -9.843 | -9.843 | 0 | 0 |
| 3 | M12 | Y | -9.843 | -9.843 | 0 | 0 |
| 4 | M13 | Y | -9.843 | -9.843 | 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 | -5.454 | -5.454 | 0 | 0 |
| 2 | M11 | Y | -5.454 | -5.454 | 0 | 0 |
| 3 | M12 | Y | -5.454 | -5.454 | 0 | 0 |
| 4 | M13 | Y | -5.454 | -5.454 | 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 | -63.565 | -63.565 | 0 | 0 |
| 2 | M11 | Y | -63.565 | -63.565 | 0 | 0 |
| 3 | M12 | Y | -63.565 | -63.565 | 0 | 0 |
| 4 | M13 | Y | -63.565 | -63.565 | 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 | -77.887 | -77.887 | 0 | 0 |
| 2 | M11 | y | -77.887 | -77.887 | 0 | 0 |
| 3 | M12 | y | -122.393 | -122.393 | 0 | 0 |
| 4 | M13 | y | -122.393 | -122.393 | 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 | 157.257 | 157.257 | 0 | 0 |
| 2 | M11 | y | 157.257 | 157.257 | 0 | 0 |
| 3 | M12 | y | 74.178 | 74.178 | 0 | 0 |
| 4 | M13 | y | 74.178 | 74.178 | 0 | 0 |

## Member Distributed Loads (BLC 6 : Seismic - Lateral)

| | Member Label | Direction | Start Magnitude[lb/ft,F] | End Magnitude[lb/ft,F] | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M10 | Z | 7.874 | 7.874 | 0 | 0 |
| 2 | M11 | Z | 7.874 | 7.874 | 0 | 0 |
| 3 | M12 | Z | 7.874 | 7.874 | 0 | 0 |
| 4 | M13 | Z | 7.874 | 7.874 | 0 | 0 |
| 5 | M10 | Z | 0 | 0 | 0 | 0 |
| 6 | M11 | Z | 0 | 0 | 0 | 0 |
| 7 | M12 | Z | 0 | 0 | 0 | 0 |
| 8 | M13 | Z | 0 | 0 | 0 | 0 |

## Load Combinations

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

## Envelope Joint Reactions

| | Joint | | X [lb] | LC | Y [lb] | LC | Z [lb] | LC | MX [k-ft] | LC | MY [k-ft] | LC | MZ [k-ft] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N9 | max | 318.944 | 2 | 2380.812 | 2 | 115.047 | 1 | .182 | 1 | .003 | 5 | 8.805 | 1 |
| 2 | | min | -617.279 | 3 | -1790.411 | 3 | -274.194 | 5 | -1.112 | 5 | -.002 | 2 | -1.066 | 3 |
| 3 | N19 | max | 2211.704 | 2 | 5693.86 | 2 | 0 | 2 | 0 | 2 | .003 | 4 | 11.945 | 1 |
| 4 | | min | -2058.307 | 3 | -4941.436 | 3 | -287.733 | 5 | -1.152 | 4 | 0 | 3 | -.65 | 3 |
| 5 | N29 | max | 318.944 | 2 | 2380.812 | 2 | 120.012 | 3 | .138 | 3 | .003 | 4 | 8.805 | 1 |
| 6 | | min | -617.279 | 3 | -1790.411 | 3 | -297.37 | 4 | -1.16 | 4 | 0 | 3 | -1.066 | 3 |
| 7 | Totals: | max | 2849.591 | 2 | 10455.484 | 2 | 0 | 2 | | | | | | |
| 8 | | min | -3292.866 | 3 | -8522.257 | 3 | -843.764 | 5 | | | | | | |

## 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 | .004 | 2 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 2 | | | min | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 3 | | 2 | max | 12.022 | 3 | 337.465 | 3 | 25.598 | 3 | .063 | 3 | .252 | 1 | .282 | 2 |
| 4 | | | min | -185.196 | 1 | -759.98 | 2 | -123.364 | 1 | -.188 | 2 | -.042 | 3 | -.124 | 3 |
| 5 | | 3 | max | 11.553 | 3 | 336.176 | 3 | 25.598 | 3 | .063 | 3 | .171 | 1 | .782 | 2 |
| 6 | | | min | -185.821 | 1 | -761.699 | 2 | -123.364 | 1 | -.188 | 2 | -.025 | 3 | -.345 | 3 |
| 7 | | 4 | max | 11.083 | 3 | 334.886 | 3 | 25.598 | 3 | .063 | 3 | .09 | 1 | 1.282 | 2 |
| 8 | | | min | -186.447 | 1 | -763.418 | 2 | -123.364 | 1 | -.188 | 2 | -.009 | 3 | -.566 | 3 |
| 9 | | 5 | max | 1281.48 | 3 | 689.488 | 2 | 36.714 | 3 | .007 | 3 | .12 | 1 | 1.516 | 2 |
| 10 | | | min | -3144.975 | 2 | -285.298 | 3 | -145.991 | 1 | -.059 | 2 | -.043 | 3 | -.671 | 3 |
| 11 | | 6 | max | 1281.011 | 3 | 687.769 | 2 | 36.714 | 3 | .007 | 3 | .031 | 2 | 1.064 | 2 |
| 12 | | | min | -3145.601 | 2 | -286.588 | 3 | -145.991 | 1 | -.059 | 2 | -.019 | 3 | -.484 | 3 |
| 13 | | 7 | max | 1280.541 | 3 | 686.05 | 2 | 36.714 | 3 | .007 | 3 | .005 | 3 | .614 | 2 |
| 14 | | | min | -3146.227 | 2 | -287.877 | 3 | -145.991 | 1 | -.059 | 2 | -.072 | 1 | -.295 | 3 |
| 15 | | 8 | max | 1280.072 | 3 | 684.331 | 2 | 36.714 | 3 | .007 | 3 | .029 | 3 | .164 | 2 |
| 16 | | | min | -3146.852 | 2 | -289.166 | 3 | -145.991 | 1 | -.059 | 2 | -.168 | 1 | -.106 | 3 |
| 17 | | 9 | max | 1296.293 | 3 | 23.268 | 1 | 59.721 | 3 | .012 | 5 | .101 | 1 | -.002 | 15 |
| 18 | | | min | -3278.577 | 2 | -3.561 | 3 | -199.552 | 1 | -.159 | 2 | -.009 | 3 | -.048 | 2 |
| 19 | | 10 | max | 1295.824 | 3 | 21.549 | 1 | 59.721 | 3 | .012 | 5 | .031 | 3 | -.002 | 15 |
| 20 | | | min | -3279.203 | 2 | -4.85 | 3 | -199.552 | 1 | -.159 | 2 | -.031 | 2 | -.062 | 2 |
| 21 | | 11 | max | 1295.354 | 3 | 19.829 | 1 | 59.721 | 3 | .012 | 5 | .07 | 3 | -.002 | 15 |
| 22 | | | min | -3279.828 | 2 | -6.14 | 3 | -199.552 | 1 | -.159 | 2 | -.161 | 1 | -.075 | 2 |
| 23 | | 12 | max | 1306.073 | 3 | 642.227 | 3 | -2.586 | 10 | .164 | 3 | .128 | 4 | .081 | 1 |
| 24 | | | min | -3404.697 | 2 | -427.898 | 1 | -168.542 | 4 | -.184 | 2 | .012 | 12 | -.221 | 3 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | | 13 | max | 1305.604 | 3 | 640.938 | 3 | -2.586 | 10 | .164 | 3 | .1 | 1 | .362 | 1 |
| 26 | | | min | -3405.323 | 2 | -429.617 | 1 | -170.128 | 4 | -.184 | 2 | -.034 | 3 | -.642 | 3 |
| 27 | | 14 | max | 1305.134 | 3 | 639.648 | 3 | -2.586 | 10 | .164 | 3 | .081 | 1 | .645 | 1 |
| 28 | | | min | -3405.948 | 2 | -431.336 | 1 | -171.713 | 4 | -.184 | 2 | -.106 | 5 | -1.062 | 3 |
| 29 | | 15 | max | 1304.665 | 3 | 638.359 | 3 | -2.586 | 10 | .164 | 3 | .069 | 2 | .928 | 1 |
| 30 | | | min | -3406.574 | 2 | -433.055 | 1 | -173.299 | 4 | -.184 | 2 | -.215 | 5 | -1.481 | 3 |
| 31 | | 16 | max | 186.376 | 1 | 427.777 | 1 | 56.868 | 5 | .08 | 1 | .013 | 3 | .706 | 1 |
| 32 | | | min | -13.232 | 3 | -673.34 | 3 | -120.256 | 1 | -.222 | 3 | -.161 | 4 | -1.13 | 3 |
| 33 | | 17 | max | 185.75 | 1 | 426.058 | 1 | 55.282 | 5 | .08 | 1 | .033 | 3 | .426 | 1 |
| 34 | | | min | -13.701 | 3 | -674.63 | 3 | -120.256 | 1 | -.222 | 3 | -.181 | 1 | -.688 | 3 |
| 35 | | 18 | max | 185.124 | 1 | 424.339 | 1 | 53.697 | 5 | .08 | 1 | .052 | 3 | .147 | 1 |
| 36 | | | min | -14.17 | 3 | -675.919 | 3 | -120.256 | 1 | -.222 | 3 | -.26 | 1 | -.245 | 3 |
| 37 | | 19 | max | 0 | 1 | 0 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 38 | | | min | 0 | 1 | -.001 | 2 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 39 | M4 | 1 | max | 0 | 1 | .006 | 2 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 40 | | | min | 0 | 1 | -.002 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 41 | | 2 | max | 44.537 | 10 | 787.049 | 3 | 0 | 1 | .019 | 4 | .203 | 4 | .473 | 2 |
| 42 | | | min | -144.231 | 1 | -1581.338 | 2 | -77.154 | 5 | 0 | 1 | 0 | 1 | -.24 | 3 |
| 43 | | 3 | max | 44.015 | 10 | 785.76 | 3 | 0 | 1 | .019 | 4 | .152 | 4 | 1.511 | 2 |
| 44 | | | min | -144.857 | 1 | -1583.057 | 2 | -78.74 | 5 | 0 | 1 | 0 | 1 | -.756 | 3 |
| 45 | | 4 | max | 43.494 | 10 | 784.471 | 3 | 0 | 1 | .019 | 4 | .1 | 4 | 2.55 | 2 |
| 46 | | | min | -145.483 | 1 | -1584.776 | 2 | -80.326 | 5 | 0 | 1 | 0 | 1 | -1.271 | 3 |
| 47 | | 5 | max | 3309.487 | 3 | 1632.583 | 2 | 0 | 1 | 0 | 1 | .027 | 4 | 2.999 | 2 |
| 48 | | | min | -6697.452 | 2 | -853.433 | 3 | -82.576 | 4 | -.005 | 4 | 0 | 1 | -1.485 | 3 |
| 49 | | 6 | max | 3309.017 | 3 | 1630.863 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1.929 | 2 |
| 50 | | | min | -6698.078 | 2 | -854.723 | 3 | -84.162 | 4 | -.005 | 4 | -.028 | 5 | -.925 | 3 |
| 51 | | 7 | max | 3308.548 | 3 | 1629.144 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | .859 | 2 |
| 52 | | | min | -6698.703 | 2 | -856.012 | 3 | -85.747 | 4 | -.005 | 4 | -.084 | 4 | -.363 | 3 |
| 53 | | 8 | max | 3308.079 | 3 | 1627.425 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | .199 | 3 |
| 54 | | | min | -6699.329 | 2 | -857.302 | 3 | -87.333 | 4 | -.005 | 4 | -.141 | 4 | -.209 | 2 |
| 55 | | 9 | max | 3246.383 | 3 | 33.33 | 3 | 0 | 1 | .01 | 4 | .14 | 4 | .468 | 3 |
| 56 | | | min | -6639.613 | 2 | -163.145 | 2 | -195.446 | 4 | 0 | 1 | 0 | 1 | -.698 | 2 |
| 57 | | 10 | max | 3245.914 | 3 | 32.041 | 3 | 0 | 1 | .01 | 4 | .011 | 5 | .446 | 3 |
| 58 | | | min | -6640.239 | 2 | -164.864 | 2 | -197.032 | 4 | 0 | 1 | 0 | 1 | -.591 | 2 |
| 59 | | 11 | max | 3245.445 | 3 | 30.751 | 3 | 0 | 1 | .01 | 4 | 0 | 1 | .426 | 3 |
| 60 | | | min | -6640.865 | 2 | -166.584 | 2 | -198.618 | 4 | 0 | 1 | -.119 | 4 | -.482 | 2 |
| 61 | | 12 | max | 3194.754 | 3 | 1912.575 | 3 | 0 | 1 | .089 | 4 | .158 | 5 | .043 | 1 |
| 62 | | | min | -6594.861 | 2 | -1478.369 | 2 | -189.06 | 5 | 0 | 1 | 0 | 1 | -.176 | 3 |
| 63 | | 13 | max | 3194.285 | 3 | 1911.286 | 3 | 0 | 1 | .089 | 4 | .033 | 5 | 1.013 | 1 |
| 64 | | | min | -6595.487 | 2 | -1480.088 | 2 | -190.646 | 5 | 0 | 1 | 0 | 1 | -1.43 | 3 |
| 65 | | 14 | max | 3193.815 | 3 | 1909.997 | 3 | 0 | 1 | .089 | 4 | 0 | 1 | 1.984 | 1 |
| 66 | | | min | -6596.113 | 2 | -1481.807 | 2 | -192.231 | 5 | 0 | 1 | -.092 | 4 | -2.684 | 3 |
| 67 | | 15 | max | 3193.346 | 3 | 1908.707 | 3 | 0 | 1 | .089 | 4 | 0 | 1 | 2.956 | 1 |
| 68 | | | min | -6596.738 | 2 | -1483.526 | 2 | -193.817 | 5 | 0 | 1 | -.219 | 4 | -3.937 | 3 |
| 69 | | 16 | max | 145.625 | 1 | 1374.783 | 1 | 43.793 | 5 | 0 | 1 | 0 | 1 | 2.25 | 1 |
| 70 | | | min | -43.272 | 10 | -1836.806 | 3 | 0 | 1 | -.079 | 4 | -.146 | 5 | -2.99 | 3 |
| 71 | | 17 | max | 145 | 1 | 1373.064 | 1 | 42.207 | 5 | 0 | 1 | 0 | 1 | 1.349 | 1 |
| 72 | | | min | -43.793 | 10 | -1838.096 | 3 | 0 | 1 | -.079 | 4 | -.118 | 4 | -1.784 | 3 |
| 73 | | 18 | max | 144.374 | 1 | 1371.344 | 1 | 40.622 | 5 | 0 | 1 | 0 | 1 | .448 | 1 |
| 74 | | | min | -44.315 | 10 | -1839.385 | 3 | 0 | 1 | -.079 | 4 | -.091 | 4 | -.578 | 3 |
| 75 | | 19 | max | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 76 | | | min | 0 | 1 | -.002 | 3 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 77 | M7 | 1 | max | 0 | 1 | .004 | 2 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 78 | | | min | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 79 | | 2 | max | 28.705 | 5 | 337.465 | 3 | 123.364 | 1 | .188 | 2 | .107 | 5 | .282 | 2 |
| 80 | | | min | -185.196 | 1 | -759.98 | 2 | -35.648 | 5 | -.063 | 3 | -.252 | 1 | -.124 | 3 |
| 81 | | 3 | max | 28.413 | 5 | 336.176 | 3 | 123.364 | 1 | .188 | 2 | .083 | 5 | .782 | 2 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82 | | | min | -185.821 | 1 | -761.699 | 2 | -37.234 | 5 | -.063 | 3 | -.171 | 1 | -.345 | 3 |
| 83 | | 4 | max | 28.121 | 5 | 334.886 | 3 | 123.364 | 1 | .188 | 2 | .058 | 5 | 1.282 | 2 |
| 84 | | | min | -186.447 | 1 | -763.418 | 2 | -38.82 | 5 | -.063 | 3 | -.09 | 1 | -.566 | 3 |
| 85 | | 5 | max | 1281.48 | 3 | 689.488 | 2 | 145.991 | 1 | .059 | 2 | .043 | 3 | 1.516 | 2 |
| 86 | | | min | -3144.975 | 2 | -285.298 | 3 | -39.102 | 5 | -.007 | 3 | -.12 | 1 | -.671 | 3 |
| 87 | | 6 | max | 1281.011 | 3 | 687.769 | 2 | 145.991 | 1 | .059 | 2 | .019 | 3 | 1.064 | 2 |
| 88 | | | min | -3145.601 | 2 | -286.588 | 3 | -40.687 | 5 | -.007 | 3 | -.031 | 2 | -.484 | 3 |
| 89 | | 7 | max | 1280.541 | 3 | 686.05 | 2 | 145.991 | 1 | .059 | 2 | .072 | 1 | .614 | 2 |
| 90 | | | min | -3146.227 | 2 | -287.877 | 3 | -42.273 | 5 | -.007 | 3 | -.046 | 5 | -.295 | 3 |
| 91 | | 8 | max | 1280.072 | 3 | 684.331 | 2 | 145.991 | 1 | .059 | 2 | .168 | 1 | .164 | 2 |
| 92 | | | min | -3146.852 | 2 | -289.166 | 3 | -43.859 | 5 | -.007 | 3 | -.074 | 5 | -.106 | 3 |
| 93 | | 9 | max | 1296.293 | 3 | 23.268 | 1 | 199.552 | 1 | .159 | 2 | .066 | 5 | -.003 | 15 |
| 94 | | | min | -3278.577 | 2 | -3.561 | 3 | -66.274 | 5 | .013 | 15 | -.101 | 1 | -.048 | 2 |
| 95 | | 10 | max | 1295.824 | 3 | 21.549 | 1 | 199.552 | 1 | .159 | 2 | .031 | 2 | -.004 | 15 |
| 96 | | | min | -3279.203 | 2 | -4.85 | 3 | -67.859 | 5 | .013 | 15 | -.031 | 3 | -.062 | 2 |
| 97 | | 11 | max | 1295.354 | 3 | 19.829 | 1 | 199.552 | 1 | .159 | 2 | .161 | 1 | -.004 | 15 |
| 98 | | | min | -3279.828 | 2 | -6.14 | 3 | -69.445 | 5 | .013 | 15 | -.07 | 3 | -.075 | 2 |
| 99 | | 12 | max | 1306.073 | 3 | 642.227 | 3 | 79.756 | 3 | .184 | 2 | .099 | 5 | .081 | 1 |
| 100 | | | min | -3404.697 | 2 | -427.898 | 1 | -159.552 | 5 | -.164 | 3 | -.119 | 1 | -.221 | 3 |
| 101 | | 13 | max | 1305.604 | 3 | 640.938 | 3 | 79.756 | 3 | .184 | 2 | .034 | 3 | .362 | 1 |
| 102 | | | min | -3405.323 | 2 | -429.617 | 1 | -161.138 | 5 | -.164 | 3 | -.1 | 1 | -.642 | 3 |
| 103 | | 14 | max | 1305.134 | 3 | 639.648 | 3 | 79.756 | 3 | .184 | 2 | .086 | 3 | .645 | 1 |
| 104 | | | min | -3405.948 | 2 | -431.336 | 1 | -162.723 | 5 | -.164 | 3 | -.124 | 4 | -1.062 | 3 |
| 105 | | 15 | max | 1304.665 | 3 | 638.359 | 3 | 79.756 | 3 | .184 | 2 | .138 | 3 | .928 | 1 |
| 106 | | | min | -3406.574 | 2 | -433.055 | 1 | -164.309 | 5 | -.164 | 3 | -.227 | 4 | -1.481 | 3 |
| 107 | | 16 | max | 186.376 | 1 | 427.777 | 1 | 120.256 | 1 | .222 | 3 | .102 | 1 | .706 | 1 |
| 108 | | | min | -13.232 | 3 | -673.34 | 3 | -29.686 | 3 | -.08 | 4 | -.137 | 5 | -1.13 | 3 |
| 109 | | 17 | max | 185.75 | 1 | 426.058 | 1 | 120.256 | 1 | .222 | 3 | .181 | 1 | .426 | 1 |
| 110 | | | min | -13.701 | 3 | -674.63 | 3 | -29.686 | 3 | -.08 | 4 | -.093 | 5 | -.688 | 3 |
| 111 | | 18 | max | 185.124 | 1 | 424.339 | 1 | 120.256 | 1 | .222 | 3 | .26 | 1 | .147 | 1 |
| 112 | | | min | -14.17 | 3 | -675.919 | 3 | -29.686 | 3 | -.08 | 4 | -.052 | 3 | -.245 | 3 |
| 113 | | 19 | max | 0 | 1 | 0 | 5 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 114 | | | min | 0 | 1 | -.001 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 115 | M10 | 1 | max | 120.282 | 1 | 423.951 | 1 | 14.609 | 3 | .005 | 1 | .3 | 1 | .08 | 4 |
| 116 | | | min | -29.69 | 3 | -677.211 | 3 | -184.938 | 1 | -.019 | 3 | -.062 | 3 | -.222 | 3 |
| 117 | | 2 | max | 120.282 | 1 | 300.685 | 1 | 16.156 | 3 | .005 | 1 | .177 | 1 | .203 | 3 |
| 118 | | | min | -29.69 | 3 | -499.742 | 3 | -156.453 | 1 | -.019 | 3 | -.051 | 3 | -.183 | 2 |
| 119 | | 3 | max | 120.282 | 1 | 177.419 | 1 | 17.703 | 3 | .005 | 1 | .096 | 2 | .5 | 3 |
| 120 | | | min | -29.69 | 3 | -322.273 | 3 | -127.967 | 1 | -.019 | 3 | -.039 | 3 | -.354 | 1 |
| 121 | | 4 | max | 120.282 | 1 | 54.154 | 1 | 19.25 | 3 | .005 | 1 | .033 | 2 | .668 | 3 |
| 122 | | | min | -29.69 | 3 | -144.804 | 3 | -99.481 | 1 | -.019 | 3 | -.026 | 3 | -.438 | 1 |
| 123 | | 5 | max | 120.282 | 1 | 32.665 | 3 | 20.797 | 3 | .005 | 1 | -.002 | 10 | .709 | 3 |
| 124 | | | min | -29.69 | 3 | -72.909 | 2 | -70.995 | 1 | -.019 | 3 | -.069 | 1 | -.433 | 1 |
| 125 | | 6 | max | 120.282 | 1 | 210.134 | 3 | 22.344 | 3 | .005 | 1 | .005 | 3 | .621 | 3 |
| 126 | | | min | -29.69 | 3 | -193.722 | 2 | -58.557 | 2 | -.019 | 3 | -.11 | 1 | -.338 | 1 |
| 127 | | 7 | max | 120.282 | 1 | 387.603 | 3 | 23.891 | 3 | .005 | 1 | .021 | 3 | .405 | 3 |
| 128 | | | min | -29.69 | 3 | -315.643 | 1 | -47.343 | 2 | -.019 | 3 | -.131 | 1 | -.155 | 1 |
| 129 | | 8 | max | 120.282 | 1 | 565.072 | 3 | 27.984 | 14 | .005 | 1 | .039 | 3 | .133 | 2 |
| 130 | | | min | -29.69 | 3 | -438.909 | 1 | -36.129 | 2 | -.019 | 3 | -.136 | 2 | -.013 | 5 |
| 131 | | 9 | max | 120.282 | 1 | 742.541 | 3 | 45.047 | 9 | .005 | 1 | .058 | 3 | .491 | 2 |
| 132 | | | min | -29.69 | 3 | -562.174 | 1 | -25.319 | 10 | -.019 | 3 | -.158 | 2 | -.411 | 3 |
| 133 | | 10 | max | 120.282 | 1 | 685.44 | 1 | 22.517 | 10 | .005 | 1 | .078 | 3 | .936 | 2 |
| 134 | | | min | -29.69 | 3 | -920.01 | 3 | -71.434 | 1 | -.019 | 3 | -.172 | 2 | -1.011 | 3 |
| 135 | | 11 | max | 120.282 | 1 | 562.174 | 1 | 25.319 | 10 | .019 | 3 | .058 | 3 | .491 | 2 |
| 136 | | | min | -29.69 | 3 | -742.541 | 3 | -45.047 | 9 | -.005 | 1 | -.158 | 2 | -.411 | 3 |
| 137 | | 12 | max | 120.282 | 1 | 438.909 | 1 | 36.129 | 2 | .019 | 3 | .039 | 3 | .133 | 2 |
| 138 | | | min | -29.69 | 3 | -565.072 | 3 | -26.543 | 9 | -.005 | 1 | -.136 | 2 | .013 | 15 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 139 | | 13 | max | 120.282 | 1 | 315.643 | 1 | 47.343 | 2 | .019 | 3 | .021 | 3 | .405 | 3 |
| 140 | | | min | -29.69 | 3 | -387.603 | 3 | -23.891 | 3 | -.005 | 1 | -.131 | 1 | -.155 | 1 |
| 141 | | 14 | max | 120.282 | 1 | 193.722 | 2 | 58.557 | 2 | .019 | 3 | .005 | 3 | .621 | 3 |
| 142 | | | min | -29.69 | 3 | -210.134 | 3 | -22.344 | 3 | -.005 | 1 | -.11 | 1 | -.338 | 1 |
| 143 | | 15 | max | 120.282 | 1 | 72.909 | 2 | 70.995 | 1 | .019 | 3 | .002 | 5 | .709 | 3 |
| 144 | | | min | -29.69 | 3 | -32.665 | 3 | -20.797 | 3 | -.005 | 1 | -.069 | 1 | -.433 | 1 |
| 145 | | 16 | max | 120.282 | 1 | 144.804 | 3 | 99.481 | 1 | .019 | 3 | .033 | 2 | .668 | 3 |
| 146 | | | min | -29.69 | 3 | -54.154 | 1 | -19.25 | 3 | -.005 | 1 | -.026 | 3 | -.438 | 1 |
| 147 | | 17 | max | 120.282 | 1 | 322.273 | 3 | 127.967 | 1 | .019 | 3 | .096 | 2 | .5 | 3 |
| 148 | | | min | -35.106 | 5 | -177.419 | 1 | -17.703 | 3 | -.005 | 1 | -.039 | 3 | -.354 | 1 |
| 149 | | 18 | max | 120.282 | 1 | 499.742 | 3 | 156.453 | 1 | .019 | 3 | .177 | 1 | .203 | 3 |
| 150 | | | min | -43.629 | 5 | -300.685 | 1 | -16.156 | 3 | -.005 | 1 | -.051 | 3 | -.183 | 2 |
| 151 | | 19 | max | 120.282 | 1 | 677.211 | 3 | 184.938 | 1 | .019 | 3 | .3 | 1 | .08 | 1 |
| 152 | | | min | -52.151 | 5 | -423.951 | 1 | -14.609 | 3 | -.005 | 1 | -.062 | 3 | -.222 | 3 |
| 153 | M11 | 1 | max | 169.801 | 1 | 446.478 | 1 | 54.127 | 5 | .009 | 3 | .357 | 1 | .072 | 4 |
| 154 | | | min | -139.165 | 3 | -651.836 | 3 | -198.374 | 1 | -.019 | 2 | -.196 | 5 | -.19 | 3 |
| 155 | | 2 | max | 169.801 | 1 | 323.212 | 1 | 55.697 | 5 | .009 | 3 | .224 | 1 | .217 | 3 |
| 156 | | | min | -139.165 | 3 | -474.367 | 3 | -169.888 | 1 | -.019 | 2 | -.157 | 5 | -.246 | 2 |
| 157 | | 3 | max | 169.801 | 1 | 199.946 | 1 | 57.267 | 5 | .009 | 3 | .124 | 2 | .495 | 3 |
| 158 | | | min | -139.165 | 3 | -296.898 | 3 | -141.402 | 1 | -.019 | 2 | -.116 | 5 | -.429 | 2 |
| 159 | | 4 | max | 169.801 | 1 | 76.681 | 1 | 58.836 | 5 | .009 | 3 | .054 | 2 | .646 | 3 |
| 160 | | | min | -139.165 | 3 | -119.429 | 3 | -112.916 | 1 | -.019 | 2 | -.076 | 4 | -.525 | 2 |
| 161 | | 5 | max | 169.801 | 1 | 58.04 | 3 | 60.406 | 5 | .009 | 3 | .004 | 10 | .668 | 3 |
| 162 | | | min | -139.165 | 3 | -47.896 | 2 | -84.43 | 1 | -.019 | 2 | -.051 | 1 | -.534 | 2 |
| 163 | | 6 | max | 169.801 | 1 | 235.509 | 3 | 61.975 | 5 | .009 | 3 | .013 | 5 | .562 | 3 |
| 164 | | | min | -139.165 | 3 | -169.851 | 1 | -68.753 | 2 | -.019 | 2 | -.102 | 1 | -.456 | 2 |
| 165 | | 7 | max | 169.801 | 1 | 412.978 | 3 | 64.219 | 4 | .009 | 3 | .059 | 5 | .328 | 3 |
| 166 | | | min | -139.165 | 3 | -293.116 | 1 | -57.538 | 2 | -.019 | 2 | -.132 | 1 | -.291 | 2 |
| 167 | | 8 | max | 169.801 | 1 | 590.447 | 3 | 71.676 | 4 | .009 | 3 | .105 | 5 | -.009 | 9 |
| 168 | | | min | -139.165 | 3 | -416.382 | 1 | -46.324 | 2 | -.019 | 2 | -.145 | 2 | -.038 | 2 |
| 169 | | 9 | max | 169.801 | 1 | 767.916 | 3 | 79.132 | 4 | .009 | 3 | .153 | 5 | .315 | 1 |
| 170 | | | min | -139.165 | 3 | -539.647 | 1 | -35.11 | 2 | -.019 | 2 | -.174 | 2 | -.525 | 3 |
| 171 | | 10 | max | 169.801 | 1 | 945.385 | 3 | 58.56 | 5 | .019 | 2 | .202 | 4 | .749 | 1 |
| 172 | | | min | -139.165 | 3 | -662.913 | 1 | -27.271 | 10 | -.006 | 14 | -.195 | 2 | -1.144 | 3 |
| 173 | | 11 | max | 169.801 | 1 | 539.647 | 1 | 60.13 | 5 | .019 | 2 | .054 | 3 | .315 | 1 |
| 174 | | | min | -139.165 | 3 | -767.916 | 3 | -38.345 | 9 | -.009 | 3 | -.174 | 2 | -.525 | 3 |
| 175 | | 12 | max | 169.801 | 1 | 416.382 | 1 | 61.699 | 5 | .019 | 2 | .037 | 3 | .016 | 5 |
| 176 | | | min | -139.165 | 3 | -590.447 | 3 | -21.869 | 3 | -.009 | 3 | -.145 | 2 | -.038 | 2 |
| 177 | | 13 | max | 169.801 | 1 | 293.116 | 1 | 63.269 | 5 | .019 | 2 | .022 | 3 | .328 | 3 |
| 178 | | | min | -139.165 | 3 | -412.978 | 3 | -20.322 | 3 | -.009 | 3 | -.132 | 1 | -.291 | 2 |
| 179 | | 14 | max | 169.801 | 1 | 169.851 | 1 | 70.489 | 4 | .019 | 2 | .008 | 3 | .562 | 3 |
| 180 | | | min | -139.165 | 3 | -235.509 | 3 | -18.775 | 3 | -.009 | 3 | -.102 | 1 | -.456 | 2 |
| 181 | | 15 | max | 169.801 | 1 | 47.896 | 2 | 84.43 | 1 | .019 | 2 | .024 | 5 | .668 | 3 |
| 182 | | | min | -139.165 | 3 | -58.04 | 3 | -17.228 | 3 | -.009 | 3 | -.051 | 1 | -.534 | 2 |
| 183 | | 16 | max | 169.801 | 1 | 119.429 | 3 | 112.916 | 1 | .019 | 2 | .073 | 5 | .646 | 3 |
| 184 | | | min | -139.165 | 3 | -76.681 | 1 | -15.681 | 3 | -.009 | 3 | -.017 | 3 | -.525 | 2 |
| 185 | | 17 | max | 169.801 | 1 | 296.898 | 3 | 141.402 | 1 | .019 | 2 | .136 | 4 | .495 | 3 |
| 186 | | | min | -139.165 | 3 | -199.946 | 1 | -14.134 | 3 | -.009 | 3 | -.028 | 3 | -.429 | 2 |
| 187 | | 18 | max | 169.801 | 1 | 474.367 | 3 | 169.888 | 1 | .019 | 2 | .224 | 1 | .217 | 3 |
| 188 | | | min | -139.165 | 3 | -323.212 | 1 | -12.587 | 3 | -.009 | 3 | -.037 | 3 | -.246 | 2 |
| 189 | | 19 | max | 169.801 | 1 | 651.836 | 3 | 198.374 | 1 | .019 | 2 | .357 | 1 | .046 | 1 |
| 190 | | | min | -139.165 | 3 | -446.478 | 1 | -11.04 | 3 | -.009 | 3 | -.046 | 3 | -.19 | 3 |
| 191 | M12 | 1 | max | 23.243 | 3 | 656.604 | 2 | 48.669 | 5 | .004 | 3 | .382 | 1 | .1 | 2 |
| 192 | | | min | -51.796 | 1 | -288.086 | 3 | -204.348 | 1 | -.013 | 2 | -.177 | 5 | .015 | 15 |
| 193 | | 2 | max | 23.243 | 3 | 484.361 | 2 | 50.238 | 5 | .004 | 3 | .245 | 1 | .212 | 3 |
| 194 | | | min | -51.796 | 1 | -206.62 | 3 | -175.862 | 1 | -.013 | 2 | -.141 | 5 | -.312 | 2 |
| 195 | | 3 | max | 23.243 | 3 | 312.119 | 2 | 51.808 | 5 | .004 | 3 | .14 | 2 | .332 | 3 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 196 | | | min | -51.796 | 1 | -125.153 | 3 | -147.377 | 1 | -.013 | 2 | -.104 | 5 | -.6 | 2 |
| 197 | | 4 | max | 23.243 | 3 | 139.876 | 2 | 53.377 | 5 | .004 | 3 | .066 | 2 | .393 | 3 |
| 198 | | | min | -51.796 | 1 | -43.687 | 3 | -118.891 | 1 | -.013 | 2 | -.067 | 4 | -.763 | 2 |
| 199 | | 5 | max | 23.243 | 3 | 37.78 | 3 | 54.947 | 5 | .004 | 3 | .008 | 10 | .395 | 3 |
| 200 | | | min | -51.796 | 1 | -32.367 | 2 | -90.405 | 1 | -.013 | 2 | -.044 | 1 | -.802 | 2 |
| 201 | | 6 | max | 23.243 | 3 | 119.247 | 3 | 56.517 | 5 | .004 | 3 | .013 | 5 | .338 | 3 |
| 202 | | | min | -51.796 | 1 | -204.61 | 2 | -74.909 | 2 | -.013 | 2 | -.099 | 1 | -.716 | 2 |
| 203 | | 7 | max | 23.243 | 3 | 200.713 | 3 | 58.101 | 4 | .004 | 3 | .055 | 5 | .223 | 3 |
| 204 | | | min | -51.796 | 1 | -376.852 | 2 | -63.695 | 2 | -.013 | 2 | -.133 | 1 | -.506 | 2 |
| 205 | | 8 | max | 23.243 | 3 | 282.18 | 3 | 65.558 | 4 | .004 | 3 | .097 | 5 | .048 | 3 |
| 206 | | | min | -51.796 | 1 | -549.095 | 2 | -52.481 | 2 | -.013 | 2 | -.15 | 2 | -.172 | 2 |
| 207 | | 9 | max | 23.243 | 3 | 363.646 | 3 | 73.015 | 4 | .004 | 3 | .141 | 5 | .287 | 2 |
| 208 | | | min | -57.048 | 4 | -721.338 | 2 | -41.266 | 2 | -.013 | 2 | -.184 | 2 | -.185 | 3 |
| 209 | | 10 | max | 23.243 | 3 | 445.113 | 3 | 80.472 | 4 | .004 | 3 | .084 | 3 | .87 | 2 |
| 210 | | | min | -65.571 | 4 | -893.581 | 2 | -30.586 | 10 | -.013 | 2 | -.21 | 2 | -.477 | 3 |
| 211 | | 11 | max | 41.712 | 5 | 721.338 | 2 | 55.1 | 5 | .013 | 2 | .063 | 3 | .287 | 2 |
| 212 | | | min | -51.796 | 1 | -363.646 | 3 | -35.996 | 9 | -.004 | 3 | -.184 | 2 | -.185 | 3 |
| 213 | | 12 | max | 33.189 | 5 | 549.095 | 2 | 56.67 | 5 | .013 | 2 | .042 | 3 | .048 | 3 |
| 214 | | | min | -51.796 | 1 | -282.18 | 3 | -27.545 | 3 | -.004 | 3 | -.15 | 2 | -.172 | 2 |
| 215 | | 13 | max | 24.666 | 5 | 376.852 | 2 | 63.695 | 2 | .013 | 2 | .023 | 3 | .223 | 3 |
| 216 | | | min | -51.796 | 1 | -200.713 | 3 | -25.998 | 3 | -.004 | 3 | -.133 | 1 | -.506 | 2 |
| 217 | | 14 | max | 23.243 | 3 | 204.61 | 2 | 74.909 | 2 | .013 | 2 | .005 | 3 | .338 | 3 |
| 218 | | | min | -51.796 | 1 | -119.247 | 3 | -24.451 | 3 | -.004 | 3 | -.099 | 1 | -.716 | 2 |
| 219 | | 15 | max | 23.243 | 3 | 32.367 | 2 | 90.405 | 1 | .013 | 2 | .021 | 5 | .395 | 3 |
| 220 | | | min | -51.796 | 1 | -37.78 | 3 | -22.904 | 3 | -.004 | 3 | -.044 | 1 | -.802 | 2 |
| 221 | | 16 | max | 23.243 | 3 | 43.687 | 3 | 118.891 | 1 | .013 | 2 | .066 | 2 | .393 | 3 |
| 222 | | | min | -51.796 | 1 | -139.876 | 2 | -21.357 | 3 | -.004 | 3 | -.029 | 3 | -.763 | 2 |
| 223 | | 17 | max | 23.243 | 3 | 125.153 | 3 | 147.377 | 1 | .013 | 2 | .14 | 2 | .332 | 3 |
| 224 | | | min | -51.796 | 1 | -312.119 | 2 | -19.81 | 3 | -.004 | 3 | -.043 | 3 | -.6 | 2 |
| 225 | | 18 | max | 23.243 | 3 | 206.62 | 3 | 175.862 | 1 | .013 | 2 | .245 | 1 | .212 | 3 |
| 226 | | | min | -51.796 | 1 | -484.361 | 2 | -18.263 | 3 | -.004 | 3 | -.057 | 3 | -.312 | 2 |
| 227 | | 19 | max | 23.243 | 3 | 288.086 | 3 | 204.348 | 1 | .013 | 2 | .382 | 1 | .1 | 2 |
| 228 | | | min | -51.796 | 1 | -656.604 | 2 | -16.716 | 3 | -.004 | 3 | -.07 | 3 | -.018 | 5 |
| 229 | M13 | 1 | max | 33.964 | 5 | 759.534 | 2 | 28.999 | 5 | .012 | 3 | .293 | 1 | .188 | 2 |
| 230 | | | min | -123.24 | 1 | -338.782 | 3 | -184.1 | 1 | -.028 | 2 | -.119 | 5 | -.063 | 3 |
| 231 | | 2 | max | 25.6 | 3 | 587.291 | 2 | 30.569 | 5 | .012 | 3 | .17 | 1 | .152 | 3 |
| 232 | | | min | -123.24 | 1 | -257.316 | 3 | -155.614 | 1 | -.028 | 2 | -.098 | 5 | -.298 | 2 |
| 233 | | 3 | max | 25.6 | 3 | 415.049 | 2 | 32.138 | 5 | .012 | 3 | .091 | 2 | .309 | 3 |
| 234 | | | min | -123.24 | 1 | -175.849 | 3 | -127.128 | 1 | -.028 | 2 | -.075 | 5 | -.66 | 2 |
| 235 | | 4 | max | 25.6 | 3 | 242.806 | 2 | 33.708 | 5 | .012 | 3 | .028 | 2 | .406 | 3 |
| 236 | | | min | -123.24 | 1 | -94.383 | 3 | -98.642 | 1 | -.028 | 2 | -.059 | 4 | -.897 | 2 |
| 237 | | 5 | max | 25.6 | 3 | 70.563 | 2 | 35.278 | 5 | .012 | 3 | -.004 | 12 | .445 | 3 |
| 238 | | | min | -123.24 | 1 | -12.916 | 3 | -70.156 | 1 | -.028 | 2 | -.074 | 1 | -1.011 | 2 |
| 239 | | 6 | max | 25.6 | 3 | 68.55 | 3 | 36.847 | 5 | .012 | 3 | .008 | 3 | .425 | 3 |
| 240 | | | min | -123.24 | 1 | -101.68 | 2 | -58.218 | 2 | -.028 | 2 | -.115 | 1 | -.999 | 2 |
| 241 | | 7 | max | 25.6 | 3 | 150.017 | 3 | 41.3 | 4 | .012 | 3 | .027 | 5 | .346 | 3 |
| 242 | | | min | -123.24 | 1 | -273.922 | 2 | -47.004 | 2 | -.028 | 2 | -.134 | 1 | -.864 | 2 |
| 243 | | 8 | max | 25.6 | 3 | 231.483 | 3 | 48.756 | 4 | .012 | 3 | .055 | 5 | .208 | 3 |
| 244 | | | min | -123.24 | 1 | -446.165 | 2 | -35.79 | 2 | -.028 | 2 | -.14 | 2 | -.604 | 2 |
| 245 | | 9 | max | 25.6 | 3 | 312.95 | 3 | 56.332 | 14 | .012 | 3 | .085 | 5 | .012 | 3 |
| 246 | | | min | -123.24 | 1 | -618.408 | 2 | -25.221 | 10 | -.028 | 2 | -.162 | 2 | -.23 | 1 |
| 247 | | 10 | max | 25.6 | 3 | 790.651 | 2 | 71.413 | 14 | .012 | 3 | .12 | 4 | .29 | 2 |
| 248 | | | min | -123.24 | 1 | -394.416 | 3 | -72.273 | 1 | -.028 | 2 | -.175 | 2 | -.244 | 3 |
| 249 | | 11 | max | 25.6 | 3 | 618.408 | 2 | 33.805 | 5 | .028 | 2 | .057 | 3 | .012 | 3 |
| 250 | | | min | -123.24 | 1 | -312.95 | 3 | -45.594 | 9 | -.012 | 3 | -.162 | 2 | -.23 | 1 |
| 251 | | 12 | max | 25.6 | 3 | 446.165 | 2 | 35.79 | 2 | .028 | 2 | .04 | 3 | .208 | 3 |
| 252 | | | min | -123.24 | 1 | -231.483 | 3 | -27.089 | 9 | -.012 | 3 | -.14 | 2 | -.604 | 2 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 253 | | 13 | max | 25.6 | 3 | 273.922 | 2 | 47.004 | 2 | .028 | 2 | .024 | 3 | .346 | 3 |
| 254 | | | min | -123.24 | 1 | -150.017 | 3 | -21.802 | 3 | -.012 | 3 | -.134 | 1 | -.864 | 2 |
| 255 | | 14 | max | 25.6 | 3 | 101.68 | 2 | 58.218 | 2 | .028 | 2 | .008 | 3 | .425 | 3 |
| 256 | | | min | -123.24 | 1 | -68.55 | 3 | -20.255 | 3 | -.012 | 3 | -.115 | 1 | -.999 | 2 |
| 257 | | 15 | max | 25.6 | 3 | 12.916 | 3 | 70.156 | 1 | .028 | 2 | .018 | 5 | .445 | 3 |
| 258 | | | min | -123.24 | 1 | -70.563 | 2 | -18.708 | 3 | -.012 | 3 | -.074 | 1 | -1.011 | 2 |
| 259 | | 16 | max | 25.6 | 3 | 94.383 | 3 | 98.642 | 1 | .028 | 2 | .047 | 5 | .406 | 3 |
| 260 | | | min | -123.24 | 1 | -242.806 | 2 | -17.161 | 3 | -.012 | 3 | -.022 | 9 | -.897 | 2 |
| 261 | | 17 | max | 25.6 | 3 | 175.849 | 3 | 127.128 | 1 | .028 | 2 | .091 | 2 | .309 | 3 |
| 262 | | | min | -123.24 | 1 | -415.049 | 2 | -15.614 | 3 | -.012 | 3 | -.03 | 3 | -.66 | 2 |
| 263 | | 18 | max | 25.6 | 3 | 257.316 | 3 | 155.614 | 1 | .028 | 2 | .17 | 1 | .152 | 3 |
| 264 | | | min | -123.24 | 1 | -587.291 | 2 | -14.067 | 3 | -.012 | 3 | -.041 | 3 | -.298 | 2 |
| 265 | | 19 | max | 25.6 | 3 | 338.782 | 3 | 184.1 | 1 | .028 | 2 | .293 | 1 | .188 | 2 |
| 266 | | | min | -123.24 | 1 | -759.534 | 2 | -12.52 | 3 | -.012 | 3 | -.051 | 3 | -.063 | 3 |
| 267 | M2 | 1 | max | 2380.812 | 2 | 618.495 | 3 | 115.342 | 1 | .003 | 5 | 1.112 | 5 | 8.805 | 1 |
| 268 | | | min | -1790.411 | 3 | -309.36 | 2 | -274.342 | 5 | -.002 | 2 | -.182 | 1 | -1.066 | 3 |
| 269 | | 2 | max | 2378.254 | 2 | 618.495 | 3 | 115.342 | 1 | .003 | 5 | 1.035 | 5 | 8.801 | 1 |
| 270 | | | min | -1792.329 | 3 | -309.36 | 2 | -272.126 | 5 | -.002 | 2 | -.15 | 1 | -1.24 | 3 |
| 271 | | 3 | max | 2375.697 | 2 | 618.495 | 3 | 115.342 | 1 | .003 | 5 | .959 | 5 | 8.797 | 1 |
| 272 | | | min | -1794.247 | 3 | -309.36 | 2 | -269.909 | 5 | -.002 | 2 | -.117 | 1 | -1.414 | 3 |
| 273 | | 4 | max | 2373.139 | 2 | 618.495 | 3 | 115.342 | 1 | .003 | 5 | .884 | 5 | 8.793 | 1 |
| 274 | | | min | -1796.165 | 3 | -309.36 | 2 | -267.693 | 5 | -.002 | 2 | -.085 | 1 | -1.587 | 3 |
| 275 | | 5 | max | 2370.582 | 2 | 618.495 | 3 | 115.342 | 1 | .003 | 5 | .809 | 4 | 8.789 | 1 |
| 276 | | | min | -1798.083 | 3 | -309.36 | 2 | -265.476 | 5 | -.002 | 2 | -.052 | 1 | -1.761 | 3 |
| 277 | | 6 | max | 2368.024 | 2 | 618.495 | 3 | 115.342 | 1 | .003 | 5 | .739 | 4 | 8.853 | 2 |
| 278 | | | min | -1800.001 | 3 | -309.36 | 2 | -263.26 | 5 | -.002 | 2 | -.031 | 3 | -1.935 | 3 |
| 279 | | 7 | max | 2365.467 | 2 | 618.495 | 3 | 115.342 | 1 | .003 | 5 | .669 | 4 | 8.94 | 2 |
| 280 | | | min | -1801.92 | 3 | -309.36 | 2 | -261.043 | 5 | -.002 | 2 | -.064 | 3 | -2.109 | 3 |
| 281 | | 8 | max | 2362.909 | 2 | 618.495 | 3 | 115.342 | 1 | .003 | 5 | .6 | 4 | 9.027 | 2 |
| 282 | | | min | -1803.838 | 3 | -309.36 | 2 | -258.827 | 5 | -.002 | 2 | -.098 | 3 | -2.282 | 3 |
| 283 | | 9 | max | 2060.571 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .536 | 4 | 8.522 | 2 |
| 284 | | | min | -1660.874 | 3 | -785.988 | 3 | -248.837 | 5 | 0 | 3 | -.103 | 3 | -2.208 | 3 |
| 285 | | 10 | max | 2058.014 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .469 | 4 | 7.67 | 2 |
| 286 | | | min | -1662.792 | 3 | -785.988 | 3 | -246.621 | 5 | 0 | 3 | -.134 | 3 | -1.987 | 3 |
| 287 | | 11 | max | 2055.456 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .402 | 4 | 6.818 | 2 |
| 288 | | | min | -1664.71 | 3 | -785.988 | 3 | -244.404 | 5 | 0 | 3 | -.164 | 3 | -1.766 | 3 |
| 289 | | 12 | max | 2052.899 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .337 | 4 | 5.965 | 2 |
| 290 | | | min | -1666.628 | 3 | -785.988 | 3 | -242.188 | 5 | 0 | 3 | -.195 | 3 | -1.545 | 3 |
| 291 | | 13 | max | 2050.341 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .271 | 4 | 5.113 | 2 |
| 292 | | | min | -1668.546 | 3 | -785.988 | 3 | -239.971 | 5 | 0 | 3 | -.226 | 3 | -1.325 | 3 |
| 293 | | 14 | max | 2047.784 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .207 | 4 | 4.261 | 2 |
| 294 | | | min | -1670.465 | 3 | -785.988 | 3 | -237.755 | 5 | 0 | 3 | -.257 | 3 | -1.104 | 3 |
| 295 | | 15 | max | 2045.226 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .172 | 2 | 3.409 | 2 |
| 296 | | | min | -1672.383 | 3 | -785.988 | 3 | -235.538 | 5 | 0 | 3 | -.288 | 3 | -.883 | 3 |
| 297 | | 16 | max | 2042.669 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .196 | 2 | 2.557 | 2 |
| 298 | | | min | -1674.301 | 3 | -785.988 | 3 | -233.322 | 5 | 0 | 3 | -.318 | 3 | -.662 | 3 |
| 299 | | 17 | max | 2040.111 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .221 | 1 | 1.704 | 2 |
| 300 | | | min | -1676.219 | 3 | -785.988 | 3 | -231.105 | 5 | 0 | 3 | -.349 | 3 | -.442 | 3 |
| 301 | | 18 | max | 2037.554 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .247 | 1 | .852 | 2 |
| 302 | | | min | -1678.137 | 3 | -785.988 | 3 | -228.889 | 5 | 0 | 3 | -.38 | 3 | -.221 | 3 |
| 303 | | 19 | max | 2034.996 | 2 | 3034.205 | 2 | 90.695 | 1 | .002 | 2 | .272 | 1 | 0 | 1 |
| 304 | | | min | -1680.055 | 3 | -785.988 | 3 | -226.672 | 5 | 0 | 3 | -.411 | 3 | 0 | 1 |
| 305 | M5 | 1 | max | 5693.86 | 2 | 2062.714 | 3 | 0 | 1 | .003 | 4 | 1.152 | 4 | 11.945 | 1 |
| 306 | | | min | -4941.436 | 3 | -2178.341 | 2 | -287.98 | 5 | 0 | 1 | 0 | 1 | -.65 | 3 |
| 307 | | 2 | max | 5691.303 | 2 | 2062.714 | 3 | 0 | 1 | .003 | 4 | 1.072 | 4 | 12.339 | 1 |
| 308 | | | min | -4943.354 | 3 | -2178.341 | 2 | -285.764 | 5 | 0 | 1 | 0 | 1 | -1.229 | 3 |
| 309 | | 3 | max | 5688.745 | 2 | 2062.714 | 3 | 0 | 1 | .003 | 4 | .992 | 4 | 12.732 | 1 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 310 | | | min | -4945.272 | 3 | -2178.341 | 2 | -283.547 | 5 | 0 | 1 | 0 | 1 | -1.809 | 3 |
| 311 | | 4 | max | 5686.188 | 2 | 2062.714 | 3 | 0 | 1 | .003 | 4 | .913 | 4 | 13.125 | 1 |
| 312 | | | min | -4947.19 | 3 | -2178.341 | 2 | -281.331 | 5 | 0 | 1 | 0 | 1 | -2.388 | 3 |
| 313 | | 5 | max | 5683.63 | 2 | 2062.714 | 3 | 0 | 1 | .003 | 4 | .834 | 4 | 13.629 | 2 |
| 314 | | | min | -4949.108 | 3 | -2178.341 | 2 | -279.114 | 5 | 0 | 1 | 0 | 1 | -2.967 | 3 |
| 315 | | 6 | max | 5681.073 | 2 | 2062.714 | 3 | 0 | 1 | .003 | 4 | .756 | 4 | 14.241 | 2 |
| 316 | | | min | -4951.026 | 3 | -2178.341 | 2 | -276.898 | 5 | 0 | 1 | 0 | 1 | -3.547 | 3 |
| 317 | | 7 | max | 5678.515 | 2 | 2062.714 | 3 | 0 | 1 | .003 | 4 | .679 | 4 | 14.852 | 2 |
| 318 | | | min | -4952.944 | 3 | -2178.341 | 2 | -274.681 | 5 | 0 | 1 | 0 | 1 | -4.126 | 3 |
| 319 | | 8 | max | 5675.958 | 2 | 2062.714 | 3 | 0 | 1 | .003 | 4 | .602 | 4 | 15.464 | 2 |
| 320 | | | min | -4954.862 | 3 | -2178.341 | 2 | -272.465 | 5 | 0 | 1 | 0 | 1 | -4.705 | 3 |
| 321 | | 9 | max | 5080.446 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | .54 | 4 | 14.761 | 2 |
| 322 | | | min | -4556.088 | 3 | -1647.853 | 3 | -266.833 | 4 | 0 | 4 | 0 | 1 | -4.628 | 3 |
| 323 | | 10 | max | 5077.889 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | .465 | 4 | 13.285 | 2 |
| 324 | | | min | -4558.006 | 3 | -1647.853 | 3 | -264.617 | 4 | 0 | 4 | 0 | 1 | -4.165 | 3 |
| 325 | | 11 | max | 5075.331 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | .391 | 4 | 11.809 | 2 |
| 326 | | | min | -4559.925 | 3 | -1647.853 | 3 | -262.4 | 4 | 0 | 4 | 0 | 1 | -3.703 | 3 |
| 327 | | 12 | max | 5072.774 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | .318 | 4 | 10.332 | 2 |
| 328 | | | min | -4561.843 | 3 | -1647.853 | 3 | -260.184 | 4 | 0 | 4 | 0 | 1 | -3.24 | 3 |
| 329 | | 13 | max | 5070.216 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | .245 | 4 | 8.856 | 2 |
| 330 | | | min | -4563.761 | 3 | -1647.853 | 3 | -257.967 | 4 | 0 | 4 | 0 | 1 | -2.777 | 3 |
| 331 | | 14 | max | 5067.659 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | .173 | 4 | 7.38 | 2 |
| 332 | | | min | -4565.679 | 3 | -1647.853 | 3 | -255.751 | 4 | 0 | 4 | 0 | 1 | -2.314 | 3 |
| 333 | | 15 | max | 5065.101 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | .101 | 4 | 5.904 | 2 |
| 334 | | | min | -4567.597 | 3 | -1647.853 | 3 | -253.534 | 4 | 0 | 4 | 0 | 1 | -1.851 | 3 |
| 335 | | 16 | max | 5062.544 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | .03 | 4 | 4.428 | 2 |
| 336 | | | min | -4569.515 | 3 | -1647.853 | 3 | -251.318 | 4 | 0 | 4 | 0 | 1 | -1.388 | 3 |
| 337 | | 17 | max | 5059.987 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 2.952 | 2 |
| 338 | | | min | -4571.433 | 3 | -1647.853 | 3 | -249.101 | 4 | 0 | 4 | -.04 | 5 | -.926 | 3 |
| 339 | | 18 | max | 5057.429 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1.476 | 2 |
| 340 | | | min | -4573.351 | 3 | -1647.853 | 3 | -246.885 | 4 | 0 | 4 | -.11 | 4 | -.463 | 3 |
| 341 | | 19 | max | 5054.872 | 2 | 5255.486 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 342 | | | min | -4575.269 | 3 | -1647.853 | 3 | -244.668 | 4 | 0 | 4 | -.179 | 4 | 0 | 1 |
| 343 | M8 | 1 | max | 2380.812 | 2 | 618.495 | 3 | 119.886 | 3 | .003 | 4 | 1.16 | 4 | 8.805 | 1 |
| 344 | | | min | -1790.411 | 3 | -309.36 | 2 | -297.875 | 4 | 0 | 3 | -.138 | 3 | -1.066 | 3 |
| 345 | | 2 | max | 2378.254 | 2 | 618.495 | 3 | 119.886 | 3 | .003 | 4 | 1.077 | 4 | 8.801 | 1 |
| 346 | | | min | -1792.329 | 3 | -309.36 | 2 | -295.658 | 4 | 0 | 3 | -.104 | 3 | -1.24 | 3 |
| 347 | | 3 | max | 2375.697 | 2 | 618.495 | 3 | 119.886 | 3 | .003 | 4 | .994 | 4 | 8.797 | 1 |
| 348 | | | min | -1794.247 | 3 | -309.36 | 2 | -293.442 | 4 | 0 | 3 | -.07 | 3 | -1.414 | 3 |
| 349 | | 4 | max | 2373.139 | 2 | 618.495 | 3 | 119.886 | 3 | .003 | 4 | .912 | 4 | 8.793 | 1 |
| 350 | | | min | -1796.165 | 3 | -309.36 | 2 | -291.225 | 4 | 0 | 3 | -.037 | 3 | -1.587 | 3 |
| 351 | | 5 | max | 2370.582 | 2 | 618.495 | 3 | 119.886 | 3 | .003 | 4 | .83 | 4 | 8.789 | 1 |
| 352 | | | min | -1798.083 | 3 | -309.36 | 2 | -289.009 | 4 | 0 | 3 | -.003 | 3 | -1.761 | 3 |
| 353 | | 6 | max | 2368.024 | 2 | 618.495 | 3 | 119.886 | 3 | .003 | 4 | .75 | 4 | 8.853 | 2 |
| 354 | | | min | -1800.001 | 3 | -309.36 | 2 | -286.792 | 4 | 0 | 3 | 0 | 10 | -1.935 | 3 |
| 355 | | 7 | max | 2365.467 | 2 | 618.495 | 3 | 119.886 | 3 | .003 | 4 | .669 | 4 | 8.94 | 2 |
| 356 | | | min | -1801.92 | 3 | -309.36 | 2 | -284.576 | 4 | 0 | 3 | -.027 | 2 | -2.109 | 3 |
| 357 | | 8 | max | 2362.909 | 2 | 618.495 | 3 | 119.886 | 3 | .003 | 4 | .59 | 4 | 9.027 | 2 |
| 358 | | | min | -1803.838 | 3 | -309.36 | 2 | -282.359 | 4 | 0 | 3 | -.059 | 2 | -2.282 | 3 |
| 359 | | 9 | max | 2060.571 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .532 | 4 | 8.522 | 2 |
| 360 | | | min | -1660.874 | 3 | -785.988 | 3 | -270.494 | 4 | -.002 | 2 | -.025 | 2 | -2.208 | 3 |
| 361 | | 10 | max | 2058.014 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .456 | 4 | 7.67 | 2 |
| 362 | | | min | -1662.792 | 3 | -785.988 | 3 | -268.277 | 4 | -.002 | 2 | -.049 | 2 | -1.987 | 3 |
| 363 | | 11 | max | 2055.456 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .384 | 5 | 6.818 | 2 |
| 364 | | | min | -1664.71 | 3 | -785.988 | 3 | -266.061 | 4 | -.002 | 2 | -.074 | 2 | -1.766 | 3 |
| 365 | | 12 | max | 2052.899 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .314 | 5 | 5.965 | 2 |
| 366 | | | min | -1666.628 | 3 | -785.988 | 3 | -263.844 | 4 | -.002 | 2 | -.098 | 2 | -1.545 | 3 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 367 | | 13 | max | 2050.341 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .244 | 5 | 5.113 | 2 |
| 368 | | | min | -1668.546 | 3 | -785.988 | 3 | -261.628 | 4 | -.002 | 2 | -.123 | 2 | -1.325 | 3 |
| 369 | | 14 | max | 2047.784 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .257 | 3 | 4.261 | 2 |
| 370 | | | min | -1670.465 | 3 | -785.988 | 3 | -259.411 | 4 | -.002 | 2 | -.147 | 2 | -1.104 | 3 |
| 371 | | 15 | max | 2045.226 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .288 | 3 | 3.409 | 2 |
| 372 | | | min | -1672.383 | 3 | -785.988 | 3 | -257.195 | 4 | -.002 | 2 | -.172 | 2 | -.883 | 3 |
| 373 | | 16 | max | 2042.669 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .318 | 3 | 2.557 | 2 |
| 374 | | | min | -1674.301 | 3 | -785.988 | 3 | -254.978 | 4 | -.002 | 2 | -.196 | 2 | -.662 | 3 |
| 375 | | 17 | max | 2040.111 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .349 | 3 | 1.704 | 2 |
| 376 | | | min | -1676.219 | 3 | -785.988 | 3 | -252.762 | 4 | -.002 | 2 | -.221 | 1 | -.442 | 3 |
| 377 | | 18 | max | 2037.554 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .38 | 3 | .852 | 2 |
| 378 | | | min | -1678.137 | 3 | -785.988 | 3 | -250.545 | 4 | -.002 | 2 | -.247 | 1 | -.221 | 3 |
| 379 | | 19 | max | 2034.996 | 2 | 3034.205 | 2 | 109.571 | 3 | 0 | 3 | .411 | 3 | 0 | 1 |
| 380 | | | min | -1680.055 | 3 | -785.988 | 3 | -248.329 | 4 | -.002 | 2 | -.272 | 1 | 0 | 1 |
| 381 | M3 | 1 | max | 3340.945 | 2 | 6.095 | 6 | 25.902 | 2 | .027 | 3 | .003 | 2 | 0 | 1 |
| 382 | | | min | -1415.202 | 3 | 1.433 | 15 | -11.039 | 3 | -.062 | 2 | -.001 | 3 | 0 | 1 |
| 383 | | 2 | max | 3340.891 | 2 | 5.418 | 6 | 25.902 | 2 | .027 | 3 | .012 | 2 | 0 | 15 |
| 384 | | | min | -1415.242 | 3 | 1.274 | 15 | -11.039 | 3 | -.062 | 2 | -.005 | 3 | -.002 | 6 |
| 385 | | 3 | max | 3340.837 | 2 | 4.741 | 6 | 25.902 | 2 | .027 | 3 | .021 | 2 | 0 | 15 |
| 386 | | | min | -1415.283 | 3 | 1.114 | 15 | -11.039 | 3 | -.062 | 2 | -.009 | 3 | -.004 | 6 |
| 387 | | 4 | max | 3340.784 | 2 | 4.064 | 6 | 25.902 | 2 | .027 | 3 | .031 | 2 | -.001 | 15 |
| 388 | | | min | -1415.323 | 3 | .955 | 15 | -11.039 | 3 | -.062 | 2 | -.013 | 3 | -.005 | 6 |
| 389 | | 5 | max | 3340.73 | 2 | 3.386 | 6 | 25.902 | 2 | .027 | 3 | .04 | 2 | -.002 | 15 |
| 390 | | | min | -1415.364 | 3 | .796 | 15 | -11.039 | 3 | -.062 | 2 | -.017 | 3 | -.007 | 6 |
| 391 | | 6 | max | 3340.676 | 2 | 2.709 | 6 | 25.902 | 2 | .027 | 3 | .049 | 2 | -.002 | 15 |
| 392 | | | min | -1415.404 | 3 | .637 | 15 | -11.039 | 3 | -.062 | 2 | -.021 | 3 | -.008 | 6 |
| 393 | | 7 | max | 3340.622 | 2 | 2.032 | 6 | 25.902 | 2 | .027 | 3 | .058 | 2 | -.002 | 15 |
| 394 | | | min | -1415.445 | 3 | .478 | 15 | -11.039 | 3 | -.062 | 2 | -.025 | 3 | -.009 | 6 |
| 395 | | 8 | max | 3340.568 | 2 | 1.355 | 6 | 25.902 | 2 | .027 | 3 | .068 | 2 | -.002 | 15 |
| 396 | | | min | -1415.485 | 3 | .318 | 15 | -11.039 | 3 | -.062 | 2 | -.029 | 3 | -.009 | 6 |
| 397 | | 9 | max | 3340.514 | 2 | .677 | 6 | 25.902 | 2 | .027 | 3 | .077 | 2 | -.002 | 15 |
| 398 | | | min | -1415.526 | 3 | .159 | 15 | -11.039 | 3 | -.062 | 2 | -.033 | 3 | -.01 | 6 |
| 399 | | 10 | max | 3340.46 | 2 | 0 | 1 | 25.902 | 2 | .027 | 3 | .086 | 2 | -.002 | 15 |
| 400 | | | min | -1415.566 | 3 | 0 | 1 | -11.039 | 3 | -.062 | 2 | -.037 | 3 | -.01 | 6 |
| 401 | | 11 | max | 3340.406 | 2 | -.159 | 15 | 25.902 | 2 | .027 | 3 | .095 | 2 | -.002 | 15 |
| 402 | | | min | -1415.607 | 3 | -.677 | 4 | -11.039 | 3 | -.062 | 2 | -.041 | 3 | -.01 | 6 |
| 403 | | 12 | max | 3340.352 | 2 | -.318 | 15 | 25.902 | 2 | .027 | 3 | .105 | 2 | -.002 | 15 |
| 404 | | | min | -1415.647 | 3 | -1.355 | 4 | -11.039 | 3 | -.062 | 2 | -.045 | 3 | -.009 | 6 |
| 405 | | 13 | max | 3340.298 | 2 | -.478 | 15 | 25.902 | 2 | .027 | 3 | .114 | 2 | -.002 | 15 |
| 406 | | | min | -1415.688 | 3 | -2.032 | 4 | -11.039 | 3 | -.062 | 2 | -.049 | 3 | -.009 | 6 |
| 407 | | 14 | max | 3340.244 | 2 | -.637 | 15 | 25.902 | 2 | .027 | 3 | .123 | 2 | -.002 | 15 |
| 408 | | | min | -1415.728 | 3 | -2.709 | 4 | -11.039 | 3 | -.062 | 2 | -.052 | 3 | -.008 | 6 |
| 409 | | 15 | max | 3340.19 | 2 | -.796 | 15 | 25.902 | 2 | .027 | 3 | .133 | 2 | -.002 | 15 |
| 410 | | | min | -1415.769 | 3 | -3.386 | 4 | -11.039 | 3 | -.062 | 2 | -.056 | 3 | -.007 | 6 |
| 411 | | 16 | max | 3340.136 | 2 | -.955 | 15 | 25.902 | 2 | .027 | 3 | .142 | 2 | -.001 | 15 |
| 412 | | | min | -1415.809 | 3 | -4.064 | 4 | -11.039 | 3 | -.062 | 2 | -.06 | 3 | -.005 | 6 |
| 413 | | 17 | max | 3340.082 | 2 | -1.114 | 15 | 25.902 | 2 | .027 | 3 | .151 | 2 | 0 | 15 |
| 414 | | | min | -1415.85 | 3 | -4.741 | 4 | -11.039 | 3 | -.062 | 2 | -.064 | 3 | -.004 | 6 |
| 415 | | 18 | max | 3340.028 | 2 | -1.274 | 15 | 25.902 | 2 | .027 | 3 | .16 | 2 | 0 | 15 |
| 416 | | | min | -1415.89 | 3 | -5.418 | 4 | -11.039 | 3 | -.062 | 2 | -.068 | 3 | -.002 | 6 |
| 417 | | 19 | max | 3339.974 | 2 | -1.433 | 15 | 25.902 | 2 | .027 | 3 | .17 | 2 | 0 | 1 |
| 418 | | | min | -1415.931 | 3 | -6.095 | 4 | -11.039 | 3 | -.062 | 2 | -.072 | 3 | 0 | 1 |
| 419 | M6 | 1 | max | 7388.392 | 2 | 6.095 | 6 | 0 | 1 | .013 | 4 | .002 | 4 | 0 | 1 |
| 420 | | | min | -3749.964 | 3 | 1.433 | 15 | -8.895 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 421 | | 2 | max | 7388.338 | 2 | 5.418 | 6 | 0 | 1 | .013 | 4 | 0 | 1 | 0 | 15 |
| 422 | | | min | -3750.004 | 3 | 1.274 | 15 | -8.435 | 4 | 0 | 1 | 0 | 4 | -.002 | 6 |
| 423 | | 3 | max | 7388.284 | 2 | 4.741 | 6 | 0 | 1 | .013 | 4 | 0 | 1 | 0 | 15 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 424 | | | min | -3750.045 | 3 | 1.114 | 15 | -7.976 | 4 | 0 | 1 | -.004 | 4 | -.004 | 6 |
| 425 | | 4 | max | 7388.23 | 2 | 4.064 | 6 | 0 | 1 | .013 | 4 | 0 | 1 | -.001 | 15 |
| 426 | | | min | -3750.085 | 3 | .955 | 15 | -7.516 | 4 | 0 | 1 | -.007 | 4 | -.005 | 6 |
| 427 | | 5 | max | 7388.176 | 2 | 3.386 | 6 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 428 | | | min | -3750.126 | 3 | .796 | 15 | -7.056 | 4 | 0 | 1 | -.009 | 4 | -.007 | 6 |
| 429 | | 6 | max | 7388.122 | 2 | 2.709 | 6 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 430 | | | min | -3750.166 | 3 | .637 | 15 | -6.596 | 4 | 0 | 1 | -.012 | 4 | -.008 | 6 |
| 431 | | 7 | max | 7388.068 | 2 | 2.032 | 6 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 432 | | | min | -3750.207 | 3 | .478 | 15 | -6.137 | 4 | 0 | 1 | -.014 | 4 | -.009 | 6 |
| 433 | | 8 | max | 7388.014 | 2 | 1.355 | 6 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 434 | | | min | -3750.247 | 3 | .318 | 15 | -5.677 | 4 | 0 | 1 | -.016 | 4 | -.009 | 6 |
| 435 | | 9 | max | 7387.961 | 2 | .677 | 6 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 436 | | | min | -3750.288 | 3 | .159 | 15 | -5.217 | 4 | 0 | 1 | -.018 | 4 | -.01 | 6 |
| 437 | | 10 | max | 7387.907 | 2 | 0 | 1 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 438 | | | min | -3750.328 | 3 | 0 | 1 | -4.757 | 4 | 0 | 1 | -.02 | 4 | -.01 | 6 |
| 439 | | 11 | max | 7387.853 | 2 | -.159 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 440 | | | min | -3750.369 | 3 | -.677 | 4 | -4.298 | 4 | 0 | 1 | -.021 | 4 | -.01 | 6 |
| 441 | | 12 | max | 7387.799 | 2 | -.318 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 442 | | | min | -3750.409 | 3 | -1.355 | 4 | -3.838 | 4 | 0 | 1 | -.023 | 4 | -.009 | 6 |
| 443 | | 13 | max | 7387.745 | 2 | -.478 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 444 | | | min | -3750.45 | 3 | -2.032 | 4 | -3.378 | 4 | 0 | 1 | -.024 | 4 | -.009 | 6 |
| 445 | | 14 | max | 7387.691 | 2 | -.637 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 446 | | | min | -3750.49 | 3 | -2.709 | 4 | -2.918 | 4 | 0 | 1 | -.025 | 4 | -.008 | 6 |
| 447 | | 15 | max | 7387.637 | 2 | -.796 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | -.002 | 15 |
| 448 | | | min | -3750.531 | 3 | -3.386 | 4 | -2.459 | 4 | 0 | 1 | -.026 | 4 | -.007 | 6 |
| 449 | | 16 | max | 7387.583 | 2 | -.955 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | -.001 | 15 |
| 450 | | | min | -3750.571 | 3 | -4.064 | 4 | -1.999 | 4 | 0 | 1 | -.027 | 4 | -.005 | 6 |
| 451 | | 17 | max | 7387.529 | 2 | -1.114 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | 0 | 15 |
| 452 | | | min | -3750.612 | 3 | -4.741 | 4 | -1.539 | 4 | 0 | 1 | -.028 | 4 | -.004 | 6 |
| 453 | | 18 | max | 7387.475 | 2 | -1.274 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | 0 | 15 |
| 454 | | | min | -3750.652 | 3 | -5.418 | 4 | -1.079 | 4 | 0 | 1 | -.028 | 4 | -.002 | 6 |
| 455 | | 19 | max | 7387.421 | 2 | -1.433 | 15 | 0 | 1 | .013 | 4 | 0 | 1 | 0 | 1 |
| 456 | | | min | -3750.693 | 3 | -6.095 | 4 | -.62 | 4 | 0 | 1 | -.028 | 4 | 0 | 1 |
| 457 | M9 | 1 | max | 3340.945 | 2 | 6.095 | 4 | 11.039 | 3 | .062 | 2 | .002 | 5 | 0 | 1 |
| 458 | | | min | -1415.202 | 3 | 1.433 | 15 | -25.902 | 2 | -.027 | 3 | -.003 | 2 | 0 | 1 |
| 459 | | 2 | max | 3340.891 | 2 | 5.418 | 4 | 11.039 | 3 | .062 | 2 | .005 | 3 | 0 | 15 |
| 460 | | | min | -1415.242 | 3 | 1.274 | 15 | -25.902 | 2 | -.027 | 3 | -.012 | 2 | -.002 | 4 |
| 461 | | 3 | max | 3340.837 | 2 | 4.741 | 4 | 11.039 | 3 | .062 | 2 | .009 | 3 | 0 | 15 |
| 462 | | | min | -1415.283 | 3 | 1.114 | 15 | -25.902 | 2 | -.027 | 3 | -.021 | 2 | -.004 | 4 |
| 463 | | 4 | max | 3340.784 | 2 | 4.064 | 4 | 11.039 | 3 | .062 | 2 | .013 | 3 | -.001 | 15 |
| 464 | | | min | -1415.323 | 3 | .955 | 15 | -25.902 | 2 | -.027 | 3 | -.031 | 2 | -.005 | 4 |
| 465 | | 5 | max | 3340.73 | 2 | 3.386 | 4 | 11.039 | 3 | .062 | 2 | .017 | 3 | -.002 | 15 |
| 466 | | | min | -1415.364 | 3 | .796 | 15 | -25.902 | 2 | -.027 | 3 | -.04 | 2 | -.007 | 4 |
| 467 | | 6 | max | 3340.676 | 2 | 2.709 | 4 | 11.039 | 3 | .062 | 2 | .021 | 3 | -.002 | 15 |
| 468 | | | min | -1415.404 | 3 | .637 | 15 | -25.902 | 2 | -.027 | 3 | -.049 | 2 | -.008 | 4 |
| 469 | | 7 | max | 3340.622 | 2 | 2.032 | 4 | 11.039 | 3 | .062 | 2 | .025 | 3 | -.002 | 15 |
| 470 | | | min | -1415.445 | 3 | .478 | 15 | -25.902 | 2 | -.027 | 3 | -.058 | 2 | -.009 | 4 |
| 471 | | 8 | max | 3340.568 | 2 | 1.355 | 4 | 11.039 | 3 | .062 | 2 | .029 | 3 | -.002 | 15 |
| 472 | | | min | -1415.485 | 3 | .318 | 15 | -25.902 | 2 | -.027 | 3 | -.068 | 2 | -.009 | 4 |
| 473 | | 9 | max | 3340.514 | 2 | .677 | 4 | 11.039 | 3 | .062 | 2 | .033 | 3 | -.002 | 15 |
| 474 | | | min | -1415.526 | 3 | .159 | 15 | -25.902 | 2 | -.027 | 3 | -.077 | 2 | -.01 | 4 |
| 475 | | 10 | max | 3340.46 | 2 | 0 | 1 | 11.039 | 3 | .062 | 2 | .037 | 3 | -.002 | 15 |
| 476 | | | min | -1415.566 | 3 | 0 | 1 | -25.902 | 2 | -.027 | 3 | -.086 | 2 | -.01 | 4 |
| 477 | | 11 | max | 3340.406 | 2 | -.159 | 15 | 11.039 | 3 | .062 | 2 | .041 | 3 | -.002 | 15 |
| 478 | | | min | -1415.607 | 3 | -.677 | 6 | -25.902 | 2 | -.027 | 3 | -.095 | 2 | -.01 | 4 |
| 479 | | 12 | max | 3340.352 | 2 | -.318 | 15 | 11.039 | 3 | .062 | 2 | .045 | 3 | -.002 | 15 |
| 480 | | | min | -1415.647 | 3 | -1.355 | 6 | -25.902 | 2 | -.027 | 3 | -.105 | 2 | -.009 | 4 |

## Envelope Member Section Forces (Continued)

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 481 | | 13 | max | 3340.298 | 2 | -.478 | 15 | 11.039 | 3 | .062 | 2 | .049 | 3 | -.002 | 15 |
| 482 | | | min | -1415.688 | 3 | -2.032 | 6 | -25.902 | 2 | -.027 | 3 | -.114 | 2 | -.009 | 4 |
| 483 | | 14 | max | 3340.244 | 2 | -.637 | 15 | 11.039 | 3 | .062 | 2 | .052 | 3 | -.002 | 15 |
| 484 | | | min | -1415.728 | 3 | -2.709 | 6 | -25.902 | 2 | -.027 | 3 | -.123 | 2 | -.008 | 4 |
| 485 | | 15 | max | 3340.19 | 2 | -.796 | 15 | 11.039 | 3 | .062 | 2 | .056 | 3 | -.002 | 15 |
| 486 | | | min | -1415.769 | 3 | -3.386 | 6 | -25.902 | 2 | -.027 | 3 | -.133 | 2 | -.007 | 4 |
| 487 | | 16 | max | 3340.136 | 2 | -.955 | 15 | 11.039 | 3 | .062 | 2 | .06 | 3 | -.001 | 15 |
| 488 | | | min | -1415.809 | 3 | -4.064 | 6 | -25.902 | 2 | -.027 | 3 | -.142 | 2 | -.005 | 4 |
| 489 | | 17 | max | 3340.082 | 2 | -1.114 | 15 | 11.039 | 3 | .062 | 2 | .064 | 3 | 0 | 15 |
| 490 | | | min | -1415.85 | 3 | -4.741 | 6 | -25.902 | 2 | -.027 | 3 | -.151 | 2 | -.004 | 4 |
| 491 | | 18 | max | 3340.028 | 2 | -1.274 | 15 | 11.039 | 3 | .062 | 2 | .068 | 3 | 0 | 15 |
| 492 | | | min | -1415.89 | 3 | -5.418 | 6 | -25.902 | 2 | -.027 | 3 | -.16 | 2 | -.002 | 4 |
| 493 | | 19 | max | 3339.974 | 2 | -1.433 | 15 | 11.039 | 3 | .062 | 2 | .072 | 3 | 0 | 1 |
| 494 | | | min | -1415.931 | 3 | -6.095 | 6 | -25.902 | 2 | -.027 | 3 | -.17 | 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 | .112 | 3 | .449 | 3 | .01 | 1 | 1.047e-2 | 3 | 1091.916 | 15 | NC | 1 |
| 2 | | | min | -.527 | 2 | -1.579 | 2 | -.532 | 4 | -2.582e-2 | 2 | 70.51 | 2 | 305.454 | 5 |
| 3 | | 2 | max | .112 | 3 | .382 | 3 | .001 | 3 | 1.006e-2 | 3 | 1164.213 | 15 | NC | 2 |
| 4 | | | min | -.527 | 2 | -1.389 | 2 | -.514 | 4 | -2.46e-2 | 2 | 77.871 | 2 | 318.406 | 4 |
| 5 | | 3 | max | .112 | 3 | .316 | 3 | .003 | 3 | 9.262e-3 | 3 | 1309.844 | 12 | NC | 3 |
| 6 | | | min | -.527 | 2 | -1.203 | 2 | -.49 | 4 | -2.22e-2 | 2 | 86.732 | 2 | 336.292 | 4 |
| 7 | | 4 | max | .112 | 3 | .256 | 3 | .004 | 3 | 8.46e-3 | 3 | 1998.415 | 12 | NC | 3 |
| 8 | | | min | -.527 | 2 | -1.03 | 2 | -.462 | 4 | -1.98e-2 | 2 | 97.057 | 2 | 360.835 | 4 |
| 9 | | 5 | max | .112 | 3 | .205 | 3 | .004 | 3 | 7.856e-3 | 3 | 3616.438 | 12 | NC | 3 |
| 10 | | | min | -.527 | 2 | -.876 | 2 | -.43 | 4 | -1.786e-2 | 2 | 108.469 | 2 | 392.757 | 4 |
| 11 | | 6 | max | .112 | 3 | .164 | 3 | .003 | 3 | 7.762e-3 | 3 | NC | 12 | NC | 2 |
| 12 | | | min | -.525 | 2 | -.746 | 2 | -.396 | 4 | -1.711e-2 | 2 | 120.45 | 2 | 432.63 | 4 |
| 13 | | 7 | max | .111 | 3 | .131 | 3 | .002 | 3 | 7.669e-3 | 3 | NC | 3 | NC | 1 |
| 14 | | | min | -.524 | 2 | -.632 | 2 | -.364 | 4 | -1.636e-2 | 2 | 133.31 | 2 | 480.517 | 4 |
| 15 | | 8 | max | .111 | 3 | .103 | 3 | 0 | 1 | 7.576e-3 | 3 | 5834.023 | 12 | NC | 1 |
| 16 | | | min | -.523 | 2 | -.528 | 2 | -.334 | 4 | -1.56e-2 | 2 | 147.767 | 2 | 534.077 | 5 |
| 17 | | 9 | max | .11 | 3 | .076 | 3 | 0 | 10 | 7.7e-3 | 3 | 3452.336 | 12 | NC | 1 |
| 18 | | | min | -.522 | 2 | -.427 | 2 | -.307 | 4 | -1.42e-2 | 2 | 165.286 | 2 | 594.693 | 5 |
| 19 | | 10 | max | .11 | 3 | .049 | 3 | .001 | 2 | 8.029e-3 | 3 | 2455.158 | 12 | NC | 1 |
| 20 | | | min | -.52 | 2 | -.324 | 2 | -.277 | 4 | -1.217e-2 | 2 | 187.763 | 2 | 677.318 | 5 |
| 21 | | 11 | max | .109 | 3 | .022 | 3 | .001 | 1 | 8.359e-3 | 3 | 2524.349 | 15 | NC | 1 |
| 22 | | | min | -.519 | 2 | -.221 | 2 | -.247 | 4 | -1.014e-2 | 2 | 217.638 | 2 | 790.138 | 5 |
| 23 | | 12 | max | .109 | 3 | -.003 | 12 | .003 | 3 | 7.517e-3 | 3 | 2884.226 | 15 | NC | 1 |
| 24 | | | min | -.518 | 2 | -.116 | 2 | -.218 | 4 | -7.961e-3 | 2 | 259.423 | 2 | 945.743 | 5 |
| 25 | | 13 | max | .108 | 3 | -.001 | 15 | .007 | 3 | 5.432e-3 | 3 | 3365.981 | 15 | NC | 1 |
| 26 | | | min | -.516 | 2 | -.028 | 3 | -.186 | 4 | -5.613e-3 | 2 | 320.411 | 2 | 1209.56 | 5 |
| 27 | | 14 | max | .108 | 3 | .089 | 1 | .01 | 3 | 3.346e-3 | 3 | 4042.818 | 15 | NC | 1 |
| 28 | | | min | -.515 | 2 | -.042 | 3 | -.152 | 4 | -3.405e-3 | 4 | 412.385 | 2 | 1679.201 | 5 |
| 29 | | 15 | max | .107 | 3 | .176 | 2 | .009 | 3 | 1.26e-3 | 3 | 5060.237 | 15 | NC | 1 |
| 30 | | | min | -.513 | 2 | -.039 | 3 | -.123 | 4 | -4.041e-3 | 4 | 556.591 | 2 | 2536.526 | 5 |
| 31 | | 16 | max | .107 | 3 | .251 | 2 | .009 | 1 | 3.574e-3 | 3 | 6755.411 | 15 | NC | 1 |
| 32 | | | min | -.513 | 2 | -.013 | 3 | -.101 | 5 | -3.532e-3 | 4 | 790.566 | 2 | 4084.542 | 5 |
| 33 | | 17 | max | .107 | 3 | .316 | 2 | .011 | 1 | 6.403e-3 | 3 | NC | 15 | NC | 2 |
| 34 | | | min | -.513 | 2 | .019 | 12 | -.086 | 5 | -2.889e-3 | 4 | 1236.925 | 2 | 7318.635 | 5 |
| 35 | | 18 | max | .107 | 3 | .374 | 2 | .006 | 1 | 9.232e-3 | 3 | NC | 5 | NC | 1 |
| 36 | | | min | -.513 | 2 | .034 | 15 | -.075 | 4 | -3.612e-3 | 1 | 2475.767 | 3 | NC | 1 |
| 37 | | 19 | max | .107 | 3 | .431 | 2 | 0 | 3 | 1.067e-2 | 3 | NC | 1 | NC | 1 |
| 38 | | | min | -.513 | 2 | .041 | 15 | -.069 | 4 | -4.131e-3 | 1 | NC | 1 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | M4 | 1 | max | .201 | 3 | .832 | 3 | 0 | 1 | 9.415e-4 | 4 | 2048.009 | 15 | NC | 1 |
| 40 | | | min | -.837 | 2 | -2.62 | 2 | -.531 | 4 | 0 | 1 | 45.11 | 2 | 306.072 | 4 |
| 41 | | 2 | max | .201 | 3 | .712 | 3 | 0 | 1 | 8.184e-4 | 4 | 2252.079 | 15 | NC | 1 |
| 42 | | | min | -.837 | 2 | -2.303 | 2 | -.515 | 4 | 0 | 1 | 50.176 | 2 | 316.93 | 4 |
| 43 | | 3 | max | .201 | 3 | .596 | 3 | 0 | 1 | 5.772e-4 | 5 | 2496.451 | 15 | NC | 1 |
| 44 | | | min | -.837 | 2 | -1.993 | 2 | -.492 | 4 | 0 | 1 | 56.368 | 2 | 334.034 | 4 |
| 45 | | 4 | max | .201 | 3 | .492 | 3 | 0 | 1 | 3.375e-4 | 5 | 2779.552 | 15 | NC | 1 |
| 46 | | | min | -.837 | 2 | -1.706 | 2 | -.463 | 4 | 0 | 1 | 63.628 | 2 | 358.528 | 4 |
| 47 | | 5 | max | .201 | 3 | .408 | 3 | 0 | 1 | 1.837e-4 | 5 | 7286.867 | 12 | NC | 1 |
| 48 | | | min | -.837 | 2 | -1.459 | 2 | -.43 | 4 | 0 | 1 | 71.549 | 2 | 391.138 | 4 |
| 49 | | 6 | max | .199 | 3 | .347 | 3 | 0 | 1 | 2.512e-4 | 5 | 7710.234 | 12 | NC | 1 |
| 50 | | | min | -.834 | 2 | -1.259 | 2 | -.396 | 4 | 0 | 1 | 79.574 | 2 | 431.946 | 4 |
| 51 | | 7 | max | .198 | 3 | .301 | 3 | 0 | 1 | 3.186e-4 | 5 | 3767.975 | 15 | NC | 1 |
| 52 | | | min | -.831 | 2 | -1.089 | 2 | -.363 | 4 | 0 | 1 | 87.966 | 2 | 480.417 | 4 |
| 53 | | 8 | max | .197 | 3 | .26 | 3 | 0 | 1 | 3.866e-4 | 4 | 4179.506 | 15 | NC | 1 |
| 54 | | | min | -.828 | 2 | -.933 | 2 | -.333 | 4 | 0 | 1 | 97.439 | 2 | 534.279 | 4 |
| 55 | | 9 | max | .195 | 3 | .216 | 3 | 0 | 1 | 3.512e-4 | 4 | 4707.684 | 15 | NC | 1 |
| 56 | | | min | -.826 | 2 | -.772 | 2 | -.307 | 4 | 0 | 1 | 109.523 | 2 | 592.554 | 4 |
| 57 | | 10 | max | .194 | 3 | .164 | 3 | 0 | 1 | 2.181e-4 | 5 | 5435.878 | 15 | NC | 1 |
| 58 | | | min | -.823 | 2 | -.6 | 2 | -.277 | 4 | 0 | 1 | 126.294 | 2 | 677.29 | 4 |
| 59 | | 11 | max | .193 | 3 | .105 | 3 | 0 | 1 | 8.562e-5 | 5 | 6487.489 | 15 | NC | 1 |
| 60 | | | min | -.82 | 2 | -.419 | 2 | -.247 | 4 | 0 | 1 | 150.576 | 2 | 792.218 | 4 |
| 61 | | 12 | max | .191 | 3 | .039 | 3 | 0 | 1 | 0 | 1 | 8123.949 | 15 | NC | 1 |
| 62 | | | min | -.818 | 2 | -.23 | 2 | -.219 | 4 | -5.326e-4 | 4 | 188.388 | 2 | 936.064 | 4 |
| 63 | | 13 | max | .19 | 3 | 0 | 15 | 0 | 1 | 0 | 1 | NC | 15 | NC | 1 |
| 64 | | | min | -.815 | 2 | -.041 | 2 | -.187 | 4 | -1.664e-3 | 4 | 251.66 | 2 | 1183.606 | 4 |
| 65 | | 14 | max | .189 | 3 | .137 | 1 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 66 | | | min | -.812 | 2 | -.067 | 3 | -.154 | 4 | -2.795e-3 | 4 | 320.247 | 3 | 1633.718 | 4 |
| 67 | | 15 | max | .188 | 3 | .277 | 2 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 68 | | | min | -.81 | 2 | -.067 | 3 | -.125 | 4 | -3.926e-3 | 4 | 320.12 | 3 | 2465.967 | 4 |
| 69 | | 16 | max | .187 | 3 | .376 | 2 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 70 | | | min | -.809 | 2 | -.007 | 3 | -.103 | 4 | -3.142e-3 | 4 | 370.091 | 3 | 3993.934 | 4 |
| 71 | | 17 | max | .187 | 3 | .44 | 2 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 72 | | | min | -.809 | 2 | .01 | 15 | -.087 | 4 | -2.134e-3 | 4 | 512.56 | 3 | 7306.374 | 4 |
| 73 | | 18 | max | .187 | 3 | .484 | 2 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 74 | | | min | -.809 | 2 | .011 | 15 | -.076 | 4 | -1.126e-3 | 4 | 994.879 | 3 | NC | 1 |
| 75 | | 19 | max | .187 | 3 | .522 | 2 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 76 | | | min | -.809 | 2 | .012 | 15 | -.068 | 4 | -6.113e-4 | 4 | NC | 1 | NC | 1 |
| 77 | M7 | 1 | max | .112 | 3 | .449 | 3 | .002 | 3 | 2.582e-2 | 2 | NC | 5 | NC | 1 |
| 78 | | | min | -.527 | 2 | -1.579 | 2 | -.536 | 4 | -1.047e-2 | 3 | 70.51 | 2 | 301.489 | 4 |
| 79 | | 2 | max | .112 | 3 | .382 | 3 | .007 | 1 | 2.46e-2 | 2 | NC | 5 | NC | 2 |
| 80 | | | min | -.527 | 2 | -1.389 | 2 | -.511 | 4 | -1.006e-2 | 3 | 77.871 | 2 | 318.063 | 4 |
| 81 | | 3 | max | .112 | 3 | .316 | 3 | .016 | 1 | 2.22e-2 | 2 | NC | 5 | NC | 3 |
| 82 | | | min | -.527 | 2 | -1.203 | 2 | -.484 | 4 | -9.262e-3 | 3 | 86.732 | 2 | 338.514 | 4 |
| 83 | | 4 | max | .112 | 3 | .256 | 3 | .018 | 1 | 1.98e-2 | 2 | NC | 5 | NC | 3 |
| 84 | | | min | -.527 | 2 | -1.03 | 2 | -.455 | 4 | -8.46e-3 | 3 | 97.057 | 2 | 363.912 | 4 |
| 85 | | 5 | max | .112 | 3 | .205 | 3 | .015 | 1 | 1.786e-2 | 2 | NC | 5 | NC | 3 |
| 86 | | | min | -.527 | 2 | -.876 | 2 | -.424 | 4 | -7.856e-3 | 3 | 108.469 | 2 | 395.313 | 4 |
| 87 | | 6 | max | .112 | 3 | .164 | 3 | .01 | 1 | 1.711e-2 | 2 | NC | 5 | NC | 2 |
| 88 | | | min | -.525 | 2 | -.746 | 2 | -.393 | 4 | -7.762e-3 | 3 | 120.45 | 2 | 432.772 | 4 |
| 89 | | 7 | max | .111 | 3 | .131 | 3 | .003 | 2 | 1.636e-2 | 2 | NC | 3 | NC | 1 |
| 90 | | | min | -.524 | 2 | -.632 | 2 | -.363 | 4 | -7.669e-3 | 3 | 133.31 | 2 | 476.737 | 4 |
| 91 | | 8 | max | .111 | 3 | .103 | 3 | 0 | 10 | 1.56e-2 | 2 | NC | 5 | NC | 1 |
| 92 | | | min | -.523 | 2 | -.528 | 2 | -.334 | 4 | -7.576e-3 | 3 | 147.767 | 2 | 527.897 | 4 |
| 93 | | 9 | max | .11 | 3 | .076 | 3 | 0 | 3 | 1.42e-2 | 2 | NC | 5 | NC | 1 |
| 94 | | | min | -.522 | 2 | -.427 | 2 | -.306 | 4 | -7.7e-3 | 3 | 165.286 | 2 | 588.042 | 4 |
| 95 | | 10 | max | .11 | 3 | .049 | 3 | .001 | 3 | 1.217e-2 | 2 | NC | 5 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96 | | | min | -.52 | 2 | -.324 | 2 | -.278 | 4 | -8.029e-3 | 3 | 187.763 | 2 | 668.229 | 4 |
| 97 | | 11 | max | .109 | 3 | .022 | 3 | 0 | 3 | 1.014e-2 | 2 | NC | 5 | NC | 1 |
| 98 | | | min | -.519 | 2 | -.221 | 2 | -.248 | 4 | -8.359e-3 | 3 | 217.638 | 2 | 778.184 | 4 |
| 99 | | 12 | max | .109 | 3 | .003 | 5 | .004 | 1 | 7.961e-3 | 2 | NC | 5 | NC | 1 |
| 100 | | | min | -.518 | 2 | -.116 | 2 | -.217 | 4 | -7.517e-3 | 3 | 259.423 | 2 | 935.769 | 4 |
| 101 | | 13 | max | .108 | 3 | 0 | 5 | .005 | 1 | 5.613e-3 | 2 | NC | 5 | NC | 1 |
| 102 | | | min | -.516 | 2 | -.028 | 3 | -.184 | 4 | -5.432e-3 | 3 | 320.411 | 2 | 1197.955 | 4 |
| 103 | | 14 | max | .108 | 3 | .089 | 1 | .004 | 2 | 3.265e-3 | 2 | NC | 5 | NC | 1 |
| 104 | | | min | -.515 | 2 | -.042 | 3 | -.151 | 4 | -3.346e-3 | 3 | 412.385 | 2 | 1647.957 | 4 |
| 105 | | 15 | max | .107 | 3 | .176 | 2 | 0 | 10 | 9.165e-4 | 2 | NC | 4 | NC | 1 |
| 106 | | | min | -.513 | 2 | -.039 | 3 | -.124 | 4 | -3.826e-3 | 5 | 556.591 | 2 | 2416.07 | 4 |
| 107 | | 16 | max | .107 | 3 | .251 | 2 | -.003 | 10 | 1.579e-3 | 1 | NC | 4 | NC | 1 |
| 108 | | | min | -.513 | 2 | -.013 | 3 | -.104 | 4 | -3.574e-3 | 3 | 790.566 | 2 | 3649.345 | 4 |
| 109 | | 17 | max | .107 | 3 | .316 | 2 | -.001 | 12 | 2.596e-3 | 1 | NC | 4 | NC | 2 |
| 110 | | | min | -.513 | 2 | -.014 | 5 | -.089 | 4 | -6.403e-3 | 3 | 1236.925 | 2 | 5921.705 | 4 |
| 111 | | 18 | max | .107 | 3 | .374 | 2 | 0 | 12 | 3.612e-3 | 1 | NC | 4 | NC | 1 |
| 112 | | | min | -.513 | 2 | -.02 | 5 | -.077 | 4 | -9.232e-3 | 3 | 2475.767 | 3 | NC | 1 |
| 113 | | 19 | max | .107 | 3 | .431 | 2 | .008 | 1 | 4.131e-3 | 1 | NC | 1 | NC | 1 |
| 114 | | | min | -.513 | 2 | -.026 | 5 | -.065 | 5 | -1.067e-2 | 3 | NC | 1 | NC | 1 |
| 115 | M10 | 1 | max | 0 | 1 | .403 | 2 | .513 | 2 | 7.248e-3 | 3 | NC | 1 | NC | 1 |
| 116 | | | min | -.071 | 4 | -.023 | 5 | -.107 | 3 | -7.286e-4 | 5 | NC | 1 | NC | 1 |
| 117 | | 2 | max | 0 | 1 | .372 | 2 | .541 | 1 | 8.443e-3 | 3 | NC | 4 | NC | 3 |
| 118 | | | min | -.071 | 4 | -.016 | 5 | -.11 | 3 | -6.285e-4 | 5 | 1664.198 | 3 | 5570.628 | 1 |
| 119 | | 3 | max | 0 | 1 | .348 | 2 | .584 | 1 | 9.639e-3 | 3 | NC | 4 | NC | 3 |
| 120 | | | min | -.071 | 4 | -.01 | 5 | -.117 | 3 | -5.285e-4 | 5 | 868.945 | 3 | 2200.99 | 1 |
| 121 | | 4 | max | 0 | 1 | .358 | 3 | .633 | 1 | 1.083e-2 | 3 | NC | 4 | NC | 5 |
| 122 | | | min | -.071 | 4 | -.006 | 5 | -.127 | 3 | -4.284e-4 | 5 | 636.524 | 3 | 1299.162 | 1 |
| 123 | | 5 | max | 0 | 1 | .396 | 3 | .682 | 1 | 1.203e-2 | 3 | NC | 4 | NC | 5 |
| 124 | | | min | -.071 | 4 | -.002 | 5 | -.139 | 3 | -3.284e-4 | 5 | 550.428 | 3 | 924.315 | 1 |
| 125 | | 6 | max | 0 | 1 | .406 | 3 | .725 | 1 | 1.323e-2 | 3 | NC | 4 | NC | 5 |
| 126 | | | min | -.071 | 4 | 0 | 15 | -.153 | 3 | -2.284e-4 | 5 | 532.683 | 3 | 736.384 | 1 |
| 127 | | 7 | max | 0 | 1 | .407 | 2 | .759 | 1 | 1.442e-2 | 3 | NC | 2 | NC | 5 |
| 128 | | | min | -.071 | 4 | .003 | 15 | -.165 | 3 | -1.283e-4 | 5 | 563.109 | 3 | 634.442 | 1 |
| 129 | | 8 | max | 0 | 1 | .45 | 2 | .782 | 2 | 1.562e-2 | 3 | NC | 4 | NC | 5 |
| 130 | | | min | -.071 | 4 | .005 | 15 | -.177 | 3 | -2.828e-5 | 5 | 637.048 | 3 | 579.508 | 1 |
| 131 | | 9 | max | 0 | 1 | .487 | 2 | .802 | 2 | 1.681e-2 | 3 | NC | 4 | NC | 5 |
| 132 | | | min | -.071 | 4 | .008 | 15 | -.184 | 3 | 4.337e-5 | 15 | 740.618 | 3 | 540.106 | 2 |
| 133 | | 10 | max | 0 | 1 | .503 | 2 | .809 | 2 | 1.801e-2 | 3 | NC | 4 | NC | 5 |
| 134 | | | min | -.071 | 4 | .012 | 15 | -.187 | 3 | 1.11e-4 | 15 | 804.768 | 3 | 527.148 | 2 |
| 135 | | 11 | max | 0 | 3 | .487 | 2 | .802 | 2 | 1.681e-2 | 3 | NC | 4 | NC | 5 |
| 136 | | | min | -.071 | 4 | .015 | 15 | -.184 | 3 | 1.971e-4 | 15 | 740.618 | 3 | 540.106 | 2 |
| 137 | | 12 | max | 0 | 3 | .45 | 2 | .782 | 2 | 1.562e-2 | 3 | NC | 4 | NC | 5 |
| 138 | | | min | -.071 | 4 | .016 | 15 | -.177 | 3 | 2.832e-4 | 15 | 637.048 | 3 | 579.508 | 1 |
| 139 | | 13 | max | 0 | 3 | .407 | 2 | .759 | 1 | 1.442e-2 | 3 | NC | 2 | NC | 5 |
| 140 | | | min | -.071 | 4 | .017 | 15 | -.165 | 3 | 3.693e-4 | 15 | 563.109 | 3 | 634.442 | 1 |
| 141 | | 14 | max | 0 | 3 | .406 | 3 | .725 | 1 | 1.323e-2 | 3 | NC | 5 | NC | 5 |
| 142 | | | min | -.071 | 4 | .018 | 15 | -.153 | 3 | 4.554e-4 | 15 | 532.683 | 3 | 736.384 | 1 |
| 143 | | 15 | max | 0 | 3 | .396 | 3 | .682 | 1 | 1.203e-2 | 3 | NC | 5 | NC | 5 |
| 144 | | | min | -.071 | 4 | .019 | 15 | -.139 | 3 | 5.415e-4 | 15 | 550.428 | 3 | 924.315 | 1 |
| 145 | | 16 | max | 0 | 3 | .358 | 3 | .633 | 1 | 1.083e-2 | 3 | NC | 5 | NC | 5 |
| 146 | | | min | -.071 | 4 | .022 | 15 | -.127 | 3 | 6.276e-4 | 15 | 636.524 | 3 | 1299.162 | 1 |
| 147 | | 17 | max | 0 | 3 | .348 | 2 | .584 | 1 | 9.639e-3 | 3 | NC | 5 | NC | 3 |
| 148 | | | min | -.071 | 4 | .025 | 15 | -.117 | 3 | 7.137e-4 | 15 | 868.945 | 3 | 2200.99 | 1 |
| 149 | | 18 | max | 0 | 3 | .372 | 2 | .541 | 1 | 8.443e-3 | 3 | NC | 4 | NC | 3 |
| 150 | | | min | -.071 | 4 | .031 | 15 | -.11 | 3 | 7.997e-4 | 15 | 1664.198 | 3 | 5570.628 | 1 |
| 151 | | 19 | max | 0 | 3 | .403 | 2 | .513 | 2 | 7.248e-3 | 3 | NC | 1 | NC | 1 |
| 152 | | | min | -.071 | 4 | .037 | 15 | -.107 | 3 | 8.858e-4 | 15 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 153 | M11 | 1 | max | .001 | 1 | .009 | 3 | .518 | 2 | 1.331e-2 | 2 | NC | 1 | NC | 1 |
| 154 | | | min | -.232 | 4 | -.167 | 2 | -.109 | 3 | -3.367e-3 | 3 | NC | 1 | NC | 1 |
| 155 | | 2 | max | 0 | 1 | .083 | 3 | .538 | 1 | 1.449e-2 | 2 | NC | 4 | NC | 3 |
| 156 | | | min | -.232 | 4 | -.244 | 2 | -.115 | 3 | -3.915e-3 | 3 | 2021.496 | 2 | 6711.35 | 4 |
| 157 | | 3 | max | 0 | 1 | .149 | 3 | .577 | 1 | 1.567e-2 | 2 | NC | 5 | NC | 3 |
| 158 | | | min | -.232 | 4 | -.311 | 2 | -.123 | 3 | -4.464e-3 | 3 | 1079.736 | 2 | 2629.366 | 1 |
| 159 | | 4 | max | 0 | 1 | .195 | 3 | .625 | 1 | 1.685e-2 | 2 | NC | 5 | 9865.114 | 12 |
| 160 | | | min | -.232 | 4 | -.361 | 2 | -.134 | 3 | -5.013e-3 | 3 | 802.757 | 2 | 1446.407 | 1 |
| 161 | | 5 | max | 0 | 1 | .215 | 3 | .676 | 1 | 1.803e-2 | 2 | NC | 5 | NC | 15 |
| 162 | | | min | -.232 | 4 | -.389 | 2 | -.147 | 3 | -5.562e-3 | 3 | 700.379 | 2 | 986.125 | 1 |
| 163 | | 6 | max | 0 | 1 | .207 | 3 | .722 | 1 | 1.921e-2 | 2 | NC | 5 | NC | 5 |
| 164 | | | min | -.232 | 4 | -.396 | 2 | -.16 | 3 | -6.111e-3 | 3 | 680.259 | 2 | 763.107 | 1 |
| 165 | | 7 | max | 0 | 1 | .177 | 3 | .76 | 1 | 2.039e-2 | 2 | NC | 5 | NC | 5 |
| 166 | | | min | -.232 | 4 | -.384 | 2 | -.172 | 3 | -6.66e-3 | 3 | 717.797 | 2 | 643.736 | 1 |
| 167 | | 8 | max | 0 | 1 | .133 | 3 | .789 | 2 | 2.157e-2 | 2 | NC | 5 | NC | 5 |
| 168 | | | min | -.232 | 4 | -.36 | 2 | -.182 | 3 | -7.209e-3 | 3 | 805.754 | 2 | 577.058 | 2 |
| 169 | | 9 | max | 0 | 1 | .092 | 3 | .811 | 2 | 2.275e-2 | 2 | NC | 5 | NC | 5 |
| 170 | | | min | -.232 | 4 | -.335 | 2 | -.189 | 3 | -7.757e-3 | 3 | 925.196 | 2 | 532.879 | 2 |
| 171 | | 10 | max | 0 | 1 | .072 | 3 | .819 | 2 | 2.393e-2 | 2 | NC | 5 | NC | 5 |
| 172 | | | min | -.233 | 4 | -.323 | 2 | -.192 | 3 | -8.306e-3 | 3 | 997.313 | 2 | 518.716 | 2 |
| 173 | | 11 | max | 0 | 3 | .092 | 3 | .811 | 2 | 2.275e-2 | 2 | NC | 5 | 9209.442 | 15 |
| 174 | | | min | -.233 | 4 | -.335 | 2 | -.189 | 3 | -7.757e-3 | 3 | 925.196 | 2 | 532.879 | 2 |
| 175 | | 12 | max | 0 | 3 | .133 | 3 | .789 | 2 | 2.157e-2 | 2 | NC | 5 | 8234.914 | 15 |
| 176 | | | min | -.233 | 4 | -.36 | 2 | -.182 | 3 | -7.209e-3 | 3 | 805.754 | 2 | 577.058 | 2 |
| 177 | | 13 | max | 0 | 3 | .177 | 3 | .76 | 1 | 2.039e-2 | 2 | NC | 5 | NC | 15 |
| 178 | | | min | -.232 | 4 | -.384 | 2 | -.172 | 3 | -6.66e-3 | 3 | 717.797 | 2 | 643.736 | 1 |
| 179 | | 14 | max | 0 | 3 | .207 | 3 | .722 | 1 | 1.921e-2 | 2 | NC | 5 | NC | 5 |
| 180 | | | min | -.232 | 4 | -.396 | 2 | -.16 | 3 | -6.111e-3 | 3 | 680.259 | 2 | 763.107 | 1 |
| 181 | | 15 | max | 0 | 3 | .215 | 3 | .676 | 1 | 1.803e-2 | 2 | NC | 5 | NC | 5 |
| 182 | | | min | -.232 | 4 | -.389 | 2 | -.147 | 3 | -5.562e-3 | 3 | 700.379 | 2 | 986.125 | 1 |
| 183 | | 16 | max | 0 | 3 | .195 | 3 | .625 | 1 | 1.685e-2 | 2 | NC | 5 | NC | 4 |
| 184 | | | min | -.232 | 4 | -.361 | 2 | -.134 | 3 | -5.013e-3 | 3 | 802.757 | 2 | 1446.407 | 1 |
| 185 | | 17 | max | 0 | 3 | .149 | 3 | .577 | 1 | 1.567e-2 | 2 | NC | 5 | NC | 3 |
| 186 | | | min | -.232 | 4 | -.311 | 2 | -.123 | 3 | -4.464e-3 | 3 | 1079.736 | 2 | 2629.366 | 1 |
| 187 | | 18 | max | 0 | 3 | .083 | 3 | .538 | 1 | 1.449e-2 | 2 | NC | 5 | NC | 3 |
| 188 | | | min | -.232 | 4 | -.244 | 2 | -.115 | 3 | -3.915e-3 | 3 | 2021.496 | 2 | 7699 | 1 |
| 189 | | 19 | max | 0 | 3 | .009 | 3 | .518 | 2 | 1.331e-2 | 2 | NC | 1 | NC | 1 |
| 190 | | | min | -.232 | 4 | -.167 | 2 | -.109 | 3 | -3.367e-3 | 3 | NC | 1 | NC | 1 |
| 191 | M12 | 1 | max | 0 | 3 | .09 | 3 | .522 | 2 | 1.294e-2 | 2 | NC | 1 | NC | 1 |
| 192 | | | min | -.321 | 4 | -.479 | 2 | -.111 | 3 | -3.446e-3 | 3 | NC | 1 | NC | 1 |
| 193 | | 2 | max | 0 | 3 | .153 | 3 | .538 | 1 | 1.377e-2 | 2 | NC | 4 | NC | 2 |
| 194 | | | min | -.321 | 4 | -.61 | 2 | -.113 | 3 | -3.691e-3 | 3 | 1191.997 | 2 | 7544.496 | 4 |
| 195 | | 3 | max | 0 | 3 | .207 | 3 | .576 | 1 | 1.46e-2 | 2 | NC | 5 | NC | 3 |
| 196 | | | min | -.321 | 4 | -.729 | 2 | -.12 | 3 | -3.935e-3 | 3 | 625.847 | 2 | 2842.438 | 1 |
| 197 | | 4 | max | 0 | 3 | .248 | 3 | .624 | 1 | 1.543e-2 | 2 | NC | 5 | NC | 12 |
| 198 | | | min | -.321 | 4 | -.823 | 2 | -.131 | 3 | -4.18e-3 | 3 | 454.462 | 2 | 1508.93 | 1 |
| 199 | | 5 | max | 0 | 3 | .273 | 3 | .676 | 1 | 1.626e-2 | 2 | NC | 5 | NC | 5 |
| 200 | | | min | -.321 | 4 | -.885 | 2 | -.144 | 3 | -4.424e-3 | 3 | 384.124 | 2 | 1008.441 | 1 |
| 201 | | 6 | max | 0 | 3 | .282 | 3 | .724 | 1 | 1.709e-2 | 2 | NC | 5 | NC | 5 |
| 202 | | | min | -.321 | 4 | -.916 | 2 | -.159 | 3 | -4.669e-3 | 3 | 357.614 | 2 | 770.273 | 1 |
| 203 | | 7 | max | 0 | 3 | .277 | 3 | .763 | 1 | 1.793e-2 | 2 | NC | 5 | NC | 5 |
| 204 | | | min | -.321 | 4 | -.916 | 2 | -.172 | 3 | -4.913e-3 | 3 | 356.881 | 2 | 643.819 | 1 |
| 205 | | 8 | max | 0 | 3 | .263 | 3 | .795 | 2 | 1.876e-2 | 2 | NC | 5 | NC | 5 |
| 206 | | | min | -.32 | 4 | -.897 | 2 | -.184 | 3 | -5.158e-3 | 3 | 373.655 | 2 | 572.486 | 2 |
| 207 | | 9 | max | 0 | 3 | .247 | 3 | .819 | 2 | 1.959e-2 | 2 | NC | 5 | NC | 5 |
| 208 | | | min | -.32 | 4 | -.871 | 2 | -.193 | 3 | -5.402e-3 | 3 | 398.776 | 2 | 526.492 | 2 |
| 209 | | 10 | max | 0 | 1 | .239 | 3 | .827 | 2 | 2.042e-2 | 2 | NC | 5 | NC | 5 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 210 | | | min | -.32 | 4 | -.857 | 2 | -.196 | 3 | -5.647e-3 | 3 | 413.565 | 2 | 511.731 | 2 |
| 211 | | 11 | max | 0 | 1 | .247 | 3 | .819 | 2 | 1.959e-2 | 2 | NC | 5 | 9509.806 | 15 |
| 212 | | | min | -.32 | 4 | -.871 | 2 | -.193 | 3 | -5.402e-3 | 3 | 398.776 | 2 | 526.492 | 2 |
| 213 | | 12 | max | 0 | 1 | .263 | 3 | .795 | 2 | 1.876e-2 | 2 | NC | 5 | 8464.724 | 15 |
| 214 | | | min | -.32 | 4 | -.897 | 2 | -.184 | 3 | -5.158e-3 | 3 | 373.655 | 2 | 572.486 | 2 |
| 215 | | 13 | max | 0 | 1 | .277 | 3 | .763 | 1 | 1.793e-2 | 2 | NC | 5 | NC | 15 |
| 216 | | | min | -.32 | 4 | -.916 | 2 | -.172 | 3 | -4.913e-3 | 3 | 356.881 | 2 | 643.819 | 1 |
| 217 | | 14 | max | 0 | 1 | .282 | 3 | .724 | 1 | 1.709e-2 | 2 | NC | 5 | NC | 5 |
| 218 | | | min | -.32 | 4 | -.916 | 2 | -.159 | 3 | -4.669e-3 | 3 | 357.614 | 2 | 770.273 | 1 |
| 219 | | 15 | max | 0 | 1 | .273 | 3 | .676 | 1 | 1.626e-2 | 2 | NC | 5 | NC | 5 |
| 220 | | | min | -.32 | 4 | -.885 | 2 | -.144 | 3 | -4.424e-3 | 3 | 384.124 | 2 | 1008.441 | 1 |
| 221 | | 16 | max | 0 | 1 | .248 | 3 | .624 | 1 | 1.543e-2 | 2 | NC | 5 | NC | 4 |
| 222 | | | min | -.32 | 4 | -.823 | 2 | -.131 | 3 | -4.18e-3 | 3 | 454.462 | 2 | 1508.93 | 1 |
| 223 | | 17 | max | 0 | 1 | .207 | 3 | .576 | 1 | 1.46e-2 | 2 | NC | 5 | NC | 3 |
| 224 | | | min | -.32 | 4 | -.729 | 2 | -.12 | 3 | -3.935e-3 | 3 | 625.847 | 2 | 2842.438 | 1 |
| 225 | | 18 | max | 0 | 1 | .153 | 3 | .538 | 1 | 1.377e-2 | 2 | NC | 5 | NC | 2 |
| 226 | | | min | -.32 | 4 | -.61 | 2 | -.113 | 3 | -3.691e-3 | 3 | 1191.997 | 2 | 9077.7 | 1 |
| 227 | | 19 | max | 0 | 1 | .09 | 3 | .522 | 2 | 1.294e-2 | 2 | NC | 1 | NC | 1 |
| 228 | | | min | -.32 | 4 | -.479 | 2 | -.111 | 3 | -3.446e-3 | 3 | NC | 1 | NC | 1 |
| 229 | M13 | 1 | max | 0 | 3 | .416 | 3 | .527 | 2 | 2.411e-2 | 2 | NC | 1 | NC | 1 |
| 230 | | | min | -.524 | 4 | -1.486 | 2 | -.112 | 3 | -8.518e-3 | 3 | NC | 1 | NC | 1 |
| 231 | | 2 | max | 0 | 3 | .506 | 3 | .557 | 1 | 2.59e-2 | 2 | NC | 5 | NC | 3 |
| 232 | | | min | -.524 | 4 | -1.71 | 2 | -.118 | 3 | -9.252e-3 | 3 | 696.19 | 2 | 5006.849 | 1 |
| 233 | | 3 | max | 0 | 3 | .591 | 3 | .602 | 1 | 2.768e-2 | 2 | NC | 5 | NC | 3 |
| 234 | | | min | -.524 | 4 | -1.923 | 2 | -.128 | 3 | -9.985e-3 | 3 | 357.593 | 2 | 2035.917 | 1 |
| 235 | | 4 | max | 0 | 3 | .662 | 3 | .653 | 1 | 2.947e-2 | 2 | NC | 5 | NC | 15 |
| 236 | | | min | -.524 | 4 | -2.108 | 2 | -.139 | 3 | -1.072e-2 | 3 | 250.99 | 2 | 1219.625 | 1 |
| 237 | | 5 | max | 0 | 3 | .718 | 3 | .704 | 1 | 3.126e-2 | 2 | NC | 15 | NC | 15 |
| 238 | | | min | -.524 | 4 | -2.257 | 2 | -.153 | 3 | -1.145e-2 | 3 | 202.568 | 2 | 875.277 | 1 |
| 239 | | 6 | max | 0 | 3 | .755 | 3 | .748 | 1 | 3.305e-2 | 2 | NC | 15 | NC | 5 |
| 240 | | | min | -.524 | 4 | -2.364 | 2 | -.166 | 3 | -1.219e-2 | 3 | 177.822 | 2 | 701.068 | 1 |
| 241 | | 7 | max | 0 | 3 | .774 | 3 | .783 | 1 | 3.484e-2 | 2 | 9634.726 | 15 | NC | 5 |
| 242 | | | min | -.524 | 4 | -2.43 | 2 | -.179 | 3 | -1.292e-2 | 3 | 165.34 | 2 | 606.025 | 1 |
| 243 | | 8 | max | 0 | 3 | .78 | 3 | .809 | 2 | 3.663e-2 | 2 | 9041.709 | 15 | NC | 5 |
| 244 | | | min | -.524 | 4 | -2.461 | 2 | -.19 | 3 | -1.365e-2 | 3 | 160.095 | 2 | 552.856 | 2 |
| 245 | | 9 | max | 0 | 3 | .777 | 3 | .83 | 2 | 3.842e-2 | 2 | 8778.196 | 15 | NC | 5 |
| 246 | | | min | -.524 | 4 | -2.467 | 2 | -.198 | 3 | -1.439e-2 | 3 | 159.058 | 2 | 515.18 | 2 |
| 247 | | 10 | max | 0 | 1 | .773 | 3 | .837 | 2 | 4.02e-2 | 2 | 8713.1 | 15 | NC | 5 |
| 248 | | | min | -.524 | 4 | -2.465 | 2 | -.201 | 3 | -1.512e-2 | 3 | 159.431 | 2 | 503.138 | 2 |
| 249 | | 11 | max | 0 | 1 | .777 | 3 | .83 | 2 | 3.842e-2 | 2 | 8651.44 | 15 | NC | 15 |
| 250 | | | min | -.524 | 4 | -2.467 | 2 | -.198 | 3 | -1.439e-2 | 3 | 159.058 | 2 | 515.18 | 2 |
| 251 | | 12 | max | 0 | 1 | .78 | 3 | .809 | 2 | 3.663e-2 | 2 | 8608.452 | 15 | NC | 15 |
| 252 | | | min | -.524 | 4 | -2.461 | 2 | -.19 | 3 | -1.365e-2 | 3 | 160.095 | 2 | 552.856 | 2 |
| 253 | | 13 | max | 0 | 1 | .774 | 3 | .783 | 1 | 3.484e-2 | 2 | 8745.139 | 15 | NC | 5 |
| 254 | | | min | -.524 | 4 | -2.43 | 2 | -.179 | 3 | -1.292e-2 | 3 | 165.34 | 2 | 606.025 | 1 |
| 255 | | 14 | max | 0 | 1 | .755 | 3 | .748 | 1 | 3.305e-2 | 2 | 9214.647 | 15 | NC | 5 |
| 256 | | | min | -.524 | 4 | -2.364 | 2 | -.166 | 3 | -1.219e-2 | 3 | 177.822 | 2 | 701.068 | 1 |
| 257 | | 15 | max | 0 | 1 | .718 | 3 | .704 | 1 | 3.126e-2 | 2 | NC | 15 | NC | 5 |
| 258 | | | min | -.524 | 4 | -2.257 | 2 | -.153 | 3 | -1.145e-2 | 3 | 202.568 | 2 | 875.277 | 1 |
| 259 | | 16 | max | 0 | 1 | .662 | 3 | .653 | 1 | 2.947e-2 | 2 | NC | 15 | NC | 4 |
| 260 | | | min | -.523 | 4 | -2.108 | 2 | -.139 | 3 | -1.072e-2 | 3 | 250.99 | 2 | 1219.625 | 1 |
| 261 | | 17 | max | 0 | 1 | .591 | 3 | .602 | 1 | 2.768e-2 | 2 | NC | 5 | NC | 3 |
| 262 | | | min | -.523 | 4 | -1.923 | 2 | -.128 | 3 | -9.985e-3 | 3 | 357.593 | 2 | 2035.917 | 1 |
| 263 | | 18 | max | 0 | 1 | .506 | 3 | .557 | 1 | 2.59e-2 | 2 | NC | 5 | NC | 3 |
| 264 | | | min | -.523 | 4 | -1.71 | 2 | -.118 | 3 | -9.252e-3 | 3 | 696.19 | 2 | 5006.849 | 1 |
| 265 | | 19 | max | 0 | 1 | .416 | 3 | .527 | 2 | 2.411e-2 | 2 | NC | 1 | NC | 1 |
| 266 | | | min | -.523 | 4 | -1.486 | 2 | -.112 | 3 | -8.518e-3 | 3 | NC | 1 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 267 | M2 | 1 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 268 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 269 | | 2 | max | 0 | 3 | 0 | 3 | 0 | 5 | 5.119e-4 | 2 | NC | 1 | NC | 1 |
| 270 | | | min | 0 | 2 | -.002 | 1 | 0 | 1 | -7.927e-4 | 5 | NC | 1 | NC | 1 |
| 271 | | 3 | max | 0 | 3 | 0 | 3 | .002 | 5 | 1.024e-3 | 2 | NC | 3 | NC | 1 |
| 272 | | | min | 0 | 2 | -.008 | 1 | 0 | 1 | -1.585e-3 | 5 | 8013.142 | 1 | NC | 1 |
| 273 | | 4 | max | 0 | 3 | .002 | 3 | .005 | 5 | 1.536e-3 | 2 | NC | 3 | NC | 1 |
| 274 | | | min | 0 | 2 | -.017 | 1 | 0 | 1 | -2.378e-3 | 5 | 3563.359 | 1 | NC | 1 |
| 275 | | 5 | max | 0 | 3 | .004 | 3 | .009 | 5 | 2.048e-3 | 2 | NC | 3 | NC | 1 |
| 276 | | | min | 0 | 2 | -.03 | 1 | -.001 | 1 | -3.171e-3 | 5 | 2005.091 | 1 | 6773.4 | 5 |
| 277 | | 6 | max | 0 | 3 | .007 | 3 | .014 | 5 | 2.56e-3 | 2 | NC | 5 | NC | 1 |
| 278 | | | min | 0 | 2 | -.047 | 1 | -.002 | 1 | -3.963e-3 | 5 | 1283.563 | 1 | 4458.991 | 5 |
| 279 | | 7 | max | 0 | 3 | .01 | 3 | .019 | 5 | 3.071e-3 | 2 | NC | 15 | NC | 1 |
| 280 | | | min | 0 | 2 | -.068 | 1 | -.002 | 1 | -4.756e-3 | 5 | 891.506 | 1 | 3183.602 | 5 |
| 281 | | 8 | max | 0 | 3 | .015 | 3 | .025 | 5 | 3.583e-3 | 2 | 8000.166 | 15 | NC | 1 |
| 282 | | | min | 0 | 2 | -.093 | 1 | -.003 | 1 | -5.549e-3 | 5 | 655.098 | 1 | 2404.827 | 5 |
| 283 | | 9 | max | 0 | 3 | .02 | 3 | .032 | 5 | 3.493e-3 | 2 | 6235.838 | 15 | NC | 1 |
| 284 | | | min | 0 | 2 | -.121 | 1 | -.003 | 1 | -5.745e-3 | 5 | 500.664 | 1 | 1893.497 | 5 |
| 285 | | 10 | max | 0 | 3 | .027 | 3 | .039 | 5 | 3.048e-3 | 2 | 5017.184 | 15 | NC | 1 |
| 286 | | | min | -.001 | 2 | -.153 | 1 | -.004 | 1 | -5.592e-3 | 5 | 395.417 | 1 | 1538.836 | 5 |
| 287 | | 11 | max | 0 | 3 | .034 | 3 | .047 | 5 | 2.604e-3 | 2 | 4141.459 | 15 | NC | 1 |
| 288 | | | min | -.001 | 2 | -.189 | 1 | -.004 | 1 | -5.438e-3 | 5 | 321.207 | 1 | 1282.401 | 5 |
| 289 | | 12 | max | .001 | 3 | .043 | 3 | .056 | 5 | 2.159e-3 | 2 | 3491.094 | 15 | NC | 1 |
| 290 | | | min | -.001 | 2 | -.227 | 1 | -.005 | 1 | -5.284e-3 | 5 | 267.072 | 1 | 1090.854 | 5 |
| 291 | | 13 | max | .001 | 3 | .052 | 3 | .064 | 5 | 1.715e-3 | 2 | 2994.841 | 15 | NC | 1 |
| 292 | | | min | -.001 | 2 | -.268 | 1 | -.005 | 1 | -5.131e-3 | 5 | 226.435 | 1 | 943.939 | 5 |
| 293 | | 14 | max | .001 | 3 | .061 | 3 | .073 | 5 | 1.27e-3 | 2 | 2607.552 | 15 | NC | 1 |
| 294 | | | min | -.002 | 2 | -.311 | 1 | -.005 | 1 | -4.977e-3 | 5 | 195.184 | 1 | 828.769 | 5 |
| 295 | | 15 | max | .001 | 3 | .071 | 3 | .082 | 4 | 8.256e-4 | 2 | 2299.556 | 15 | NC | 1 |
| 296 | | | min | -.002 | 2 | -.355 | 1 | -.005 | 1 | -4.823e-3 | 5 | 170.659 | 1 | 736.058 | 4 |
| 297 | | 16 | max | .001 | 3 | .081 | 3 | .092 | 4 | 3.811e-4 | 2 | 2050.64 | 15 | NC | 1 |
| 298 | | | min | -.002 | 2 | -.402 | 1 | -.005 | 1 | -4.696e-3 | 4 | 151.072 | 1 | 660.83 | 4 |
| 299 | | 17 | max | .001 | 3 | .092 | 3 | .101 | 4 | 3.447e-4 | 3 | 1846.72 | 15 | NC | 1 |
| 300 | | | min | -.002 | 2 | -.449 | 1 | -.005 | 1 | -4.591e-3 | 4 | 135.198 | 1 | 599.041 | 4 |
| 301 | | 18 | max | .002 | 3 | .102 | 3 | .111 | 4 | 5.726e-4 | 3 | 1677.685 | 15 | NC | 1 |
| 302 | | | min | -.002 | 2 | -.497 | 2 | -.006 | 3 | -4.486e-3 | 4 | 122.11 | 2 | 547.728 | 4 |
| 303 | | 19 | max | .002 | 3 | .113 | 3 | .12 | 4 | 8.005e-4 | 3 | 1536.163 | 15 | NC | 1 |
| 304 | | | min | -.002 | 2 | -.546 | 2 | -.009 | 3 | -4.381e-3 | 4 | 111.207 | 2 | 504.719 | 4 |
| 305 | M5 | 1 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 306 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 307 | | 2 | max | 0 | 3 | 0 | 12 | 0 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 308 | | | min | 0 | 2 | -.002 | 1 | 0 | 1 | -8.135e-4 | 4 | NC | 1 | NC | 1 |
| 309 | | 3 | max | 0 | 3 | 0 | 3 | .002 | 4 | 0 | 1 | NC | 3 | NC | 1 |
| 310 | | | min | 0 | 2 | -.01 | 1 | 0 | 1 | -1.627e-3 | 4 | 5997.65 | 1 | NC | 1 |
| 311 | | 4 | max | 0 | 3 | .002 | 3 | .005 | 4 | 0 | 1 | NC | 3 | NC | 1 |
| 312 | | | min | 0 | 2 | -.023 | 1 | 0 | 1 | -2.44e-3 | 4 | 2604.687 | 1 | NC | 1 |
| 313 | | 5 | max | .001 | 3 | .004 | 3 | .009 | 4 | 0 | 1 | NC | 3 | NC | 1 |
| 314 | | | min | -.001 | 2 | -.042 | 1 | 0 | 1 | -3.254e-3 | 4 | 1440.834 | 1 | 6544.17 | 4 |
| 315 | | 6 | max | .001 | 3 | .007 | 3 | .014 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 316 | | | min | -.001 | 2 | -.067 | 1 | 0 | 1 | -4.067e-3 | 4 | 909.165 | 1 | 4309.742 | 4 |
| 317 | | 7 | max | .002 | 3 | .012 | 3 | .02 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 318 | | | min | -.002 | 2 | -.097 | 1 | 0 | 1 | -4.881e-3 | 4 | 623.294 | 1 | 3078.254 | 4 |
| 319 | | 8 | max | .002 | 3 | .019 | 3 | .026 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 320 | | | min | -.002 | 2 | -.134 | 1 | 0 | 1 | -5.694e-3 | 4 | 452.461 | 1 | 2326.204 | 4 |
| 321 | | 9 | max | .002 | 3 | .028 | 3 | .033 | 4 | 0 | 1 | NC | 15 | NC | 1 |
| 322 | | | min | -.002 | 2 | -.178 | 1 | 0 | 1 | -5.896e-3 | 4 | 341.475 | 1 | 1832.326 | 4 |
| 323 | | 10 | max | .002 | 3 | .04 | 3 | .041 | 4 | 0 | 1 | NC | 15 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 324 | | | min | -.003 | 2 | -.228 | 1 | 0 | 1 | -5.738e-3 | 4 | 266.614 | 1 | 1489.697 | 4 |
| 325 | | 11 | max | .003 | 3 | .053 | 3 | .049 | 4 | 0 | 1 | 8616.326 | 15 | NC | 1 |
| 326 | | | min | -.003 | 2 | -.283 | 1 | 0 | 1 | -5.58e-3 | 4 | 214.496 | 1 | 1241.983 | 4 |
| 327 | | 12 | max | .003 | 3 | .067 | 3 | .057 | 4 | 0 | 1 | 7139.774 | 15 | NC | 1 |
| 328 | | | min | -.003 | 2 | -.343 | 1 | 0 | 1 | -5.422e-3 | 4 | 176.912 | 1 | 1056.996 | 4 |
| 329 | | 13 | max | .003 | 3 | .083 | 3 | .066 | 4 | 0 | 1 | 6036.064 | 15 | NC | 1 |
| 330 | | | min | -.003 | 2 | -.408 | 2 | 0 | 1 | -5.264e-3 | 4 | 148.732 | 2 | 915.165 | 4 |
| 331 | | 14 | max | .003 | 3 | .101 | 3 | .075 | 4 | 0 | 1 | 5190.452 | 15 | NC | 1 |
| 332 | | | min | -.004 | 2 | -.477 | 2 | 0 | 1 | -5.106e-3 | 4 | 127.087 | 2 | 804.036 | 4 |
| 333 | | 15 | max | .003 | 3 | .119 | 3 | .085 | 4 | 0 | 1 | 4528.985 | 15 | NC | 1 |
| 334 | | | min | -.004 | 2 | -.55 | 2 | 0 | 1 | -4.948e-3 | 4 | 110.303 | 2 | 715.383 | 4 |
| 335 | | 16 | max | .004 | 3 | .138 | 3 | .094 | 4 | 0 | 1 | 4002.248 | 15 | NC | 1 |
| 336 | | | min | -.004 | 2 | -.625 | 2 | 0 | 1 | -4.79e-3 | 4 | 97.039 | 2 | 643.582 | 4 |
| 337 | | 17 | max | .004 | 3 | .158 | 3 | .104 | 4 | 0 | 1 | 3576.443 | 15 | NC | 1 |
| 338 | | | min | -.004 | 2 | -.702 | 2 | 0 | 1 | -4.632e-3 | 4 | 86.388 | 2 | 584.694 | 4 |
| 339 | | 18 | max | .004 | 3 | .178 | 3 | .113 | 4 | 0 | 1 | 3227.721 | 15 | NC | 1 |
| 340 | | | min | -.005 | 2 | -.781 | 2 | 0 | 1 | -4.474e-3 | 4 | 77.717 | 2 | 535.885 | 4 |
| 341 | | 19 | max | .004 | 3 | .198 | 3 | .123 | 4 | 0 | 1 | 2938.98 | 15 | NC | 1 |
| 342 | | | min | -.005 | 2 | -.86 | 2 | 0 | 1 | -4.316e-3 | 4 | 70.576 | 2 | 495.078 | 4 |
| 343 | M8 | 1 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 344 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 345 | | 2 | max | 0 | 3 | 0 | 3 | 0 | 4 | 2.201e-4 | 3 | NC | 1 | NC | 1 |
| 346 | | | min | 0 | 2 | -.002 | 1 | 0 | 3 | -8.768e-4 | 4 | NC | 1 | NC | 1 |
| 347 | | 3 | max | 0 | 3 | 0 | 3 | .002 | 4 | 4.403e-4 | 3 | NC | 3 | NC | 1 |
| 348 | | | min | 0 | 2 | -.008 | 1 | 0 | 3 | -1.754e-3 | 4 | 8013.142 | 1 | NC | 1 |
| 349 | | 4 | max | 0 | 3 | .002 | 3 | .005 | 4 | 6.604e-4 | 3 | NC | 3 | NC | 1 |
| 350 | | | min | 0 | 2 | -.017 | 1 | 0 | 3 | -2.63e-3 | 4 | 3563.359 | 1 | NC | 1 |
| 351 | | 5 | max | 0 | 3 | .004 | 3 | .009 | 4 | 8.805e-4 | 3 | NC | 3 | NC | 1 |
| 352 | | | min | 0 | 2 | -.03 | 1 | 0 | 3 | -3.507e-3 | 4 | 2005.091 | 1 | 6515.622 | 4 |
| 353 | | 6 | max | 0 | 3 | .007 | 3 | .014 | 4 | 1.101e-3 | 3 | NC | 4 | NC | 1 |
| 354 | | | min | 0 | 2 | -.047 | 1 | -.001 | 3 | -4.384e-3 | 4 | 1283.563 | 1 | 4294.949 | 4 |
| 355 | | 7 | max | 0 | 3 | .01 | 3 | .02 | 4 | 1.321e-3 | 3 | NC | 5 | NC | 1 |
| 356 | | | min | 0 | 2 | -.068 | 1 | -.001 | 3 | -5.261e-3 | 4 | 891.506 | 1 | 3070.608 | 4 |
| 357 | | 8 | max | 0 | 3 | .015 | 3 | .026 | 4 | 1.541e-3 | 3 | NC | 5 | NC | 1 |
| 358 | | | min | 0 | 2 | -.093 | 1 | -.002 | 3 | -6.138e-3 | 4 | 655.098 | 1 | 2322.71 | 4 |
| 359 | | 9 | max | 0 | 3 | .02 | 3 | .033 | 4 | 1.479e-3 | 3 | NC | 5 | NC | 1 |
| 360 | | | min | 0 | 2 | -.121 | 1 | -.002 | 3 | -6.316e-3 | 4 | 500.664 | 1 | 1831.401 | 4 |
| 361 | | 10 | max | 0 | 3 | .027 | 3 | .041 | 4 | 1.251e-3 | 3 | NC | 5 | NC | 1 |
| 362 | | | min | -.001 | 2 | -.153 | 1 | -.002 | 3 | -6.084e-3 | 4 | 395.417 | 1 | 1490.24 | 4 |
| 363 | | 11 | max | 0 | 3 | .034 | 3 | .049 | 4 | 1.023e-3 | 3 | NC | 7 | NC | 1 |
| 364 | | | min | -.001 | 2 | -.189 | 1 | -.002 | 3 | -5.851e-3 | 4 | 321.207 | 1 | 1243.401 | 4 |
| 365 | | 12 | max | .001 | 3 | .043 | 3 | .057 | 4 | 7.95e-4 | 3 | NC | 15 | NC | 1 |
| 366 | | | min | -.001 | 2 | -.227 | 1 | -.001 | 3 | -5.619e-3 | 4 | 267.072 | 1 | 1058.972 | 4 |
| 367 | | 13 | max | .001 | 3 | .052 | 3 | .066 | 4 | 5.67e-4 | 3 | 9909.604 | 15 | NC | 1 |
| 368 | | | min | -.001 | 2 | -.268 | 1 | 0 | 3 | -5.387e-3 | 4 | 226.435 | 1 | 917.52 | 4 |
| 369 | | 14 | max | .001 | 3 | .061 | 3 | .075 | 4 | 3.391e-4 | 3 | 8800.543 | 15 | NC | 1 |
| 370 | | | min | -.002 | 2 | -.311 | 1 | 0 | 3 | -5.155e-3 | 4 | 195.184 | 1 | 806.664 | 4 |
| 371 | | 15 | max | .001 | 3 | .071 | 3 | .084 | 4 | 1.112e-4 | 3 | 7897.309 | 15 | NC | 1 |
| 372 | | | min | -.002 | 2 | -.355 | 1 | 0 | 12 | -4.923e-3 | 4 | 170.659 | 1 | 718.223 | 4 |
| 373 | | 16 | max | .001 | 3 | .081 | 3 | .094 | 4 | 6.202e-6 | 9 | 7150.764 | 15 | NC | 1 |
| 374 | | | min | -.002 | 2 | -.402 | 1 | .002 | 10 | -4.691e-3 | 4 | 151.072 | 1 | 646.6 | 4 |
| 375 | | 17 | max | .001 | 3 | .092 | 3 | .103 | 4 | 2.35e-4 | 1 | 6526.043 | 15 | NC | 1 |
| 376 | | | min | -.002 | 2 | -.449 | 1 | .001 | 10 | -4.488e-3 | 5 | 135.198 | 1 | 587.869 | 4 |
| 377 | | 18 | max | .002 | 3 | .102 | 3 | .113 | 4 | 6.532e-4 | 1 | 5997.679 | 15 | NC | 1 |
| 378 | | | min | -.002 | 2 | -.497 | 2 | 0 | 10 | -4.307e-3 | 5 | 122.11 | 2 | 539.211 | 4 |
| 379 | | 19 | max | .002 | 3 | .113 | 3 | .122 | 4 | 1.071e-3 | 1 | 5546.747 | 15 | NC | 1 |
| 380 | | | min | -.002 | 2 | -.546 | 2 | 0 | 10 | -4.127e-3 | 5 | 111.207 | 2 | 498.554 | 4 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 381 | M3 | 1 | max | .102 | 1 | .002 | 3 | .028 | 5 | 1.417e-3 | 4 | NC | 1 | NC | 1 |
| 382 | | | min | -.017 | 3 | -.011 | 1 | -.003 | 1 | -1.327e-4 | 3 | NC | 1 | NC | 1 |
| 383 | | 2 | max | .101 | 1 | .015 | 3 | .054 | 5 | 1.359e-3 | 4 | NC | 1 | NC | 3 |
| 384 | | | min | -.016 | 3 | -.071 | 2 | -.019 | 2 | -5.206e-4 | 3 | 6234.857 | 3 | 4537.86 | 2 |
| 385 | | 3 | max | .1 | 1 | .027 | 3 | .079 | 5 | 2.041e-3 | 2 | NC | 1 | NC | 4 |
| 386 | | | min | -.015 | 3 | -.13 | 2 | -.034 | 2 | -9.085e-4 | 3 | 3112.557 | 3 | 2295.511 | 2 |
| 387 | | 4 | max | .098 | 1 | .04 | 3 | .105 | 5 | 2.926e-3 | 2 | NC | 1 | NC | 4 |
| 388 | | | min | -.015 | 3 | -.189 | 2 | -.049 | 2 | -1.296e-3 | 3 | 2069.881 | 3 | 1557.9 | 2 |
| 389 | | 5 | max | .097 | 1 | .052 | 3 | .131 | 5 | 3.811e-3 | 2 | NC | 1 | NC | 4 |
| 390 | | | min | -.014 | 3 | -.248 | 2 | -.063 | 2 | -1.684e-3 | 3 | 1547.276 | 3 | 1197.268 | 2 |
| 391 | | 6 | max | .096 | 1 | .065 | 3 | .156 | 5 | 4.696e-3 | 2 | NC | 1 | NC | 4 |
| 392 | | | min | -.014 | 3 | -.307 | 2 | -.076 | 2 | -2.072e-3 | 3 | 1232.833 | 3 | 988.373 | 2 |
| 393 | | 7 | max | .095 | 1 | .078 | 3 | .181 | 5 | 5.582e-3 | 2 | NC | 1 | NC | 6 |
| 394 | | | min | -.013 | 3 | -.366 | 2 | -.087 | 2 | -2.46e-3 | 3 | 1022.582 | 3 | 856.478 | 2 |
| 395 | | 8 | max | .094 | 1 | .091 | 3 | .205 | 5 | 6.467e-3 | 2 | NC | 5 | 9202.328 | 6 |
| 396 | | | min | -.013 | 3 | -.425 | 2 | -.096 | 2 | -2.848e-3 | 3 | 871.964 | 3 | 769.967 | 2 |
| 397 | | 9 | max | .092 | 1 | .104 | 3 | .229 | 5 | 7.352e-3 | 2 | NC | 5 | 8602.079 | 6 |
| 398 | | | min | -.012 | 3 | -.483 | 2 | -.103 | 2 | -3.236e-3 | 3 | 758.698 | 3 | 713.565 | 2 |
| 399 | | 10 | max | .091 | 1 | .118 | 3 | .253 | 5 | 8.237e-3 | 2 | NC | 5 | 8288.769 | 6 |
| 400 | | | min | -.011 | 3 | -.541 | 2 | -.108 | 2 | -3.624e-3 | 3 | 670.403 | 3 | 679.516 | 2 |
| 401 | | 11 | max | .09 | 1 | .131 | 3 | .276 | 5 | 9.122e-3 | 2 | NC | 5 | 8222.582 | 6 |
| 402 | | | min | -.011 | 3 | -.599 | 2 | -.11 | 2 | -4.012e-3 | 3 | 599.648 | 3 | 664.221 | 2 |
| 403 | | 12 | max | .089 | 1 | .145 | 3 | .298 | 5 | 1.001e-2 | 2 | NC | 5 | 8403.614 | 6 |
| 404 | | | min | -.01 | 3 | -.657 | 2 | -.108 | 2 | -4.4e-3 | 3 | 541.703 | 3 | 667.036 | 2 |
| 405 | | 13 | max | .088 | 1 | .159 | 3 | .32 | 5 | 1.089e-2 | 2 | NC | 1 | 8874.35 | 6 |
| 406 | | | min | -.01 | 3 | -.714 | 2 | -.103 | 2 | -4.788e-3 | 3 | 493.411 | 3 | 616.636 | 14 |
| 407 | | 14 | max | .086 | 1 | .173 | 3 | .341 | 5 | 1.178e-2 | 2 | NC | 1 | 9742.284 | 6 |
| 408 | | | min | -.009 | 3 | -.771 | 2 | -.095 | 2 | -5.176e-3 | 3 | 452.586 | 3 | 558.591 | 14 |
| 409 | | 15 | max | .085 | 1 | .187 | 3 | .361 | 5 | 1.266e-2 | 2 | NC | 1 | NC | 4 |
| 410 | | | min | -.008 | 3 | -.828 | 2 | -.082 | 2 | -5.564e-3 | 3 | 417.662 | 3 | 508.355 | 14 |
| 411 | | 16 | max | .084 | 1 | .202 | 3 | .38 | 5 | 1.355e-2 | 2 | NC | 1 | NC | 4 |
| 412 | | | min | -.008 | 3 | -.885 | 2 | -.065 | 2 | -5.952e-3 | 3 | 387.492 | 3 | 464.412 | 14 |
| 413 | | 17 | max | .083 | 1 | .216 | 3 | .399 | 5 | 1.443e-2 | 2 | NC | 1 | NC | 4 |
| 414 | | | min | -.007 | 3 | -.941 | 2 | -.044 | 2 | -6.339e-3 | 3 | 361.212 | 3 | 425.627 | 14 |
| 415 | | 18 | max | .082 | 1 | .231 | 3 | .418 | 4 | 1.532e-2 | 2 | NC | 1 | NC | 4 |
| 416 | | | min | -.007 | 3 | -.998 | 2 | -.018 | 2 | -6.727e-3 | 3 | 338.162 | 3 | 391.132 | 14 |
| 417 | | 19 | max | .08 | 1 | .245 | 3 | .439 | 4 | 1.62e-2 | 2 | NC | 1 | NC | 1 |
| 418 | | | min | -.006 | 3 | -1.054 | 2 | -.004 | 3 | -7.115e-3 | 3 | 317.827 | 3 | 360.256 | 14 |
| 419 | M6 | 1 | max | .148 | 1 | .004 | 3 | .029 | 4 | 1.43e-3 | 4 | NC | 1 | NC | 1 |
| 420 | | | min | -.022 | 3 | -.017 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 421 | | 2 | max | .146 | 1 | .029 | 3 | .055 | 4 | 1.24e-3 | 4 | NC | 1 | NC | 1 |
| 422 | | | min | -.02 | 3 | -.114 | 2 | 0 | 1 | 0 | 1 | 3092.425 | 3 | NC | 1 |
| 423 | | 3 | max | .143 | 1 | .054 | 3 | .082 | 4 | 1.049e-3 | 4 | NC | 1 | NC | 1 |
| 424 | | | min | -.019 | 3 | -.211 | 2 | 0 | 1 | 0 | 1 | 1545.013 | 3 | NC | 1 |
| 425 | | 4 | max | .14 | 1 | .079 | 3 | .108 | 4 | 8.579e-4 | 4 | NC | 1 | NC | 1 |
| 426 | | | min | -.017 | 3 | -.308 | 2 | 0 | 1 | 0 | 1 | 1028.737 | 3 | 7115.01 | 4 |
| 427 | | 5 | max | .138 | 1 | .104 | 3 | .134 | 4 | 6.671e-4 | 4 | NC | 1 | NC | 1 |
| 428 | | | min | -.016 | 3 | -.404 | 2 | 0 | 1 | 0 | 1 | 770.282 | 3 | 5453.297 | 4 |
| 429 | | 6 | max | .135 | 1 | .13 | 3 | .16 | 4 | 4.762e-4 | 4 | NC | 1 | NC | 1 |
| 430 | | | min | -.014 | 3 | -.501 | 2 | 0 | 1 | 0 | 1 | 614.987 | 3 | 4498.352 | 4 |
| 431 | | 7 | max | .133 | 1 | .155 | 3 | .185 | 4 | 2.854e-4 | 4 | NC | 1 | NC | 1 |
| 432 | | | min | -.013 | 3 | -.597 | 2 | 0 | 1 | 0 | 1 | 511.297 | 3 | 3901.616 | 4 |
| 433 | | 8 | max | .13 | 1 | .181 | 3 | .21 | 4 | 9.453e-5 | 4 | NC | 5 | NC | 1 |
| 434 | | | min | -.011 | 3 | -.693 | 2 | 0 | 1 | 0 | 1 | 437.118 | 3 | 3515.966 | 4 |
| 435 | | 9 | max | .127 | 1 | .207 | 3 | .235 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 436 | | | min | -.009 | 3 | -.789 | 2 | 0 | 1 | -1.046e-4 | 5 | 381.402 | 3 | 3270.626 | 4 |
| 437 | | 10 | max | .125 | 1 | .233 | 3 | .259 | 4 | 0 | 1 | NC | 5 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 438 | | | min | -.008 | 3 | -.885 | 2 | 0 | 1 | -2.94e-4 | 5 | 338.011 | 3 | 3130.008 | 4 |
| 439 | | 11 | max | .122 | 1 | .259 | 3 | .282 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 440 | | | min | -.006 | 3 | -.98 | 2 | 0 | 1 | -4.835e-4 | 5 | 303.263 | 3 | 3078.121 | 4 |
| 441 | | 12 | max | .12 | 1 | .285 | 3 | .305 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 442 | | | min | -.005 | 3 | -1.075 | 2 | 0 | 1 | -6.729e-4 | 5 | 274.813 | 3 | 3113.072 | 4 |
| 443 | | 13 | max | .117 | 1 | .312 | 3 | .326 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 444 | | | min | -.003 | 3 | -1.17 | 2 | 0 | 1 | -8.623e-4 | 5 | 251.099 | 3 | 3247.464 | 4 |
| 445 | | 14 | max | .114 | 1 | .338 | 3 | .347 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 446 | | | min | -.002 | 3 | -1.264 | 2 | 0 | 1 | -1.052e-3 | 5 | 231.038 | 3 | 3515.567 | 4 |
| 447 | | 15 | max | .112 | 1 | .365 | 3 | .368 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 448 | | | min | 0 | 3 | -1.359 | 2 | 0 | 1 | -1.241e-3 | 4 | 213.857 | 3 | 3995.186 | 4 |
| 449 | | 16 | max | .109 | 1 | .392 | 3 | .387 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 450 | | | min | 0 | 12 | -1.453 | 2 | 0 | 1 | -1.432e-3 | 4 | 198.988 | 3 | 4876.059 | 4 |
| 451 | | 17 | max | .106 | 1 | .419 | 3 | .405 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 452 | | | min | .002 | 12 | -1.547 | 2 | 0 | 1 | -1.623e-3 | 4 | 186.006 | 3 | 6735.8 | 4 |
| 453 | | 18 | max | .104 | 1 | .447 | 3 | .423 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 454 | | | min | .003 | 12 | -1.641 | 2 | 0 | 1 | -1.814e-3 | 4 | 174.585 | 3 | NC | 1 |
| 455 | | 19 | max | .101 | 1 | .474 | 3 | .44 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 456 | | | min | .003 | 15 | -1.735 | 2 | 0 | 1 | -2.005e-3 | 4 | 164.472 | 3 | NC | 1 |
| 457 | M9 | 1 | max | .102 | 1 | .002 | 3 | .029 | 4 | 1.376e-3 | 4 | NC | 1 | NC | 1 |
| 458 | | | min | -.017 | 3 | -.011 | 1 | -.002 | 3 | -2.708e-4 | 2 | NC | 1 | NC | 1 |
| 459 | | 2 | max | .101 | 1 | .015 | 3 | .057 | 4 | 1.178e-3 | 5 | NC | 1 | NC | 3 |
| 460 | | | min | -.016 | 3 | -.071 | 2 | -.009 | 3 | -1.156e-3 | 2 | 6234.857 | 3 | 4537.86 | 2 |
| 461 | | 3 | max | .1 | 1 | .027 | 3 | .086 | 4 | 9.828e-4 | 5 | NC | 1 | NC | 13 |
| 462 | | | min | -.015 | 3 | -.13 | 2 | -.015 | 3 | -2.041e-3 | 2 | 3112.557 | 3 | 2295.511 | 2 |
| 463 | | 4 | max | .098 | 1 | .04 | 3 | .114 | 4 | 1.296e-3 | 3 | NC | 1 | 9244.479 | 15 |
| 464 | | | min | -.015 | 3 | -.189 | 2 | -.022 | 3 | -2.926e-3 | 2 | 2069.881 | 3 | 1557.9 | 2 |
| 465 | | 5 | max | .097 | 1 | .052 | 3 | .142 | 4 | 1.684e-3 | 3 | NC | 1 | 7084.666 | 15 |
| 466 | | | min | -.014 | 3 | -.248 | 2 | -.028 | 3 | -3.811e-3 | 2 | 1547.276 | 3 | 1197.268 | 2 |
| 467 | | 6 | max | .096 | 1 | .065 | 3 | .169 | 4 | 2.072e-3 | 3 | NC | 1 | 5842.234 | 15 |
| 468 | | | min | -.014 | 3 | -.307 | 2 | -.033 | 3 | -4.696e-3 | 2 | 1232.833 | 3 | 988.373 | 2 |
| 469 | | 7 | max | .095 | 1 | .078 | 3 | .196 | 4 | 2.46e-3 | 3 | NC | 1 | 5064.745 | 15 |
| 470 | | | min | -.013 | 3 | -.366 | 2 | -.038 | 3 | -5.582e-3 | 2 | 1022.582 | 3 | 856.478 | 2 |
| 471 | | 8 | max | .094 | 1 | .091 | 3 | .222 | 4 | 2.848e-3 | 3 | NC | 5 | 4561.16 | 15 |
| 472 | | | min | -.013 | 3 | -.425 | 2 | -.042 | 3 | -6.467e-3 | 2 | 871.964 | 3 | 769.967 | 2 |
| 473 | | 9 | max | .092 | 1 | .104 | 3 | .247 | 4 | 3.236e-3 | 3 | NC | 5 | 4239.509 | 15 |
| 474 | | | min | -.012 | 3 | -.483 | 2 | -.045 | 3 | -7.352e-3 | 2 | 758.698 | 3 | 713.565 | 2 |
| 475 | | 10 | max | .091 | 1 | .118 | 3 | .271 | 4 | 3.624e-3 | 3 | NC | 5 | 4053.455 | 15 |
| 476 | | | min | -.011 | 3 | -.541 | 2 | -.047 | 3 | -8.237e-3 | 2 | 670.403 | 3 | 679.516 | 2 |
| 477 | | 11 | max | .09 | 1 | .131 | 3 | .295 | 4 | 4.012e-3 | 3 | NC | 7 | 3982.041 | 15 |
| 478 | | | min | -.011 | 3 | -.599 | 2 | -.048 | 3 | -9.122e-3 | 2 | 599.648 | 3 | 664.221 | 2 |
| 479 | | 12 | max | .089 | 1 | .145 | 3 | .317 | 4 | 4.4e-3 | 3 | NC | 9 | 4022.512 | 15 |
| 480 | | | min | -.01 | 3 | -.657 | 2 | -.047 | 3 | -1.001e-2 | 2 | 541.703 | 3 | 667.036 | 2 |
| 481 | | 13 | max | .088 | 1 | .159 | 3 | .338 | 4 | 4.788e-3 | 3 | NC | 1 | 4190.74 | 15 |
| 482 | | | min | -.01 | 3 | -.714 | 2 | -.045 | 3 | -1.089e-2 | 2 | 493.411 | 3 | 690.288 | 2 |
| 483 | | 14 | max | .086 | 1 | .173 | 3 | .357 | 4 | 5.176e-3 | 3 | NC | 1 | 4530.349 | 15 |
| 484 | | | min | -.009 | 3 | -.771 | 2 | -.042 | 3 | -1.178e-2 | 2 | 452.586 | 3 | 740.674 | 2 |
| 485 | | 15 | max | .085 | 1 | .187 | 3 | .375 | 4 | 5.564e-3 | 3 | NC | 1 | 5140.626 | 15 |
| 486 | | | min | -.008 | 3 | -.828 | 2 | -.037 | 3 | -1.266e-2 | 2 | 417.662 | 3 | 833.597 | 2 |
| 487 | | 16 | max | .084 | 1 | .202 | 3 | .392 | 4 | 5.952e-3 | 3 | NC | 1 | 6263.89 | 15 |
| 488 | | | min | -.008 | 3 | -.885 | 2 | -.03 | 3 | -1.355e-2 | 2 | 387.492 | 3 | 1006.784 | 2 |
| 489 | | 17 | max | .083 | 1 | .216 | 3 | .407 | 4 | 6.339e-3 | 3 | NC | 1 | 8638.022 | 15 |
| 490 | | | min | -.007 | 3 | -.941 | 2 | -.02 | 3 | -1.443e-2 | 2 | 361.212 | 3 | 1375.248 | 2 |
| 491 | | 18 | max | .082 | 1 | .231 | 3 | .421 | 4 | 6.727e-3 | 3 | NC | 1 | NC | 5 |
| 492 | | | min | -.007 | 3 | -.998 | 2 | -.009 | 3 | -1.532e-2 | 2 | 338.162 | 3 | 2516.636 | 2 |
| 493 | | 19 | max | .08 | 1 | .245 | 3 | .433 | 4 | 7.115e-3 | 3 | NC | 1 | NC | 1 |
| 494 | | | min | -.006 | 3 | -1.054 | 2 | -.016 | 1 | -1.62e-2 | 2 | 317.827 | 3 | NC | 1 |