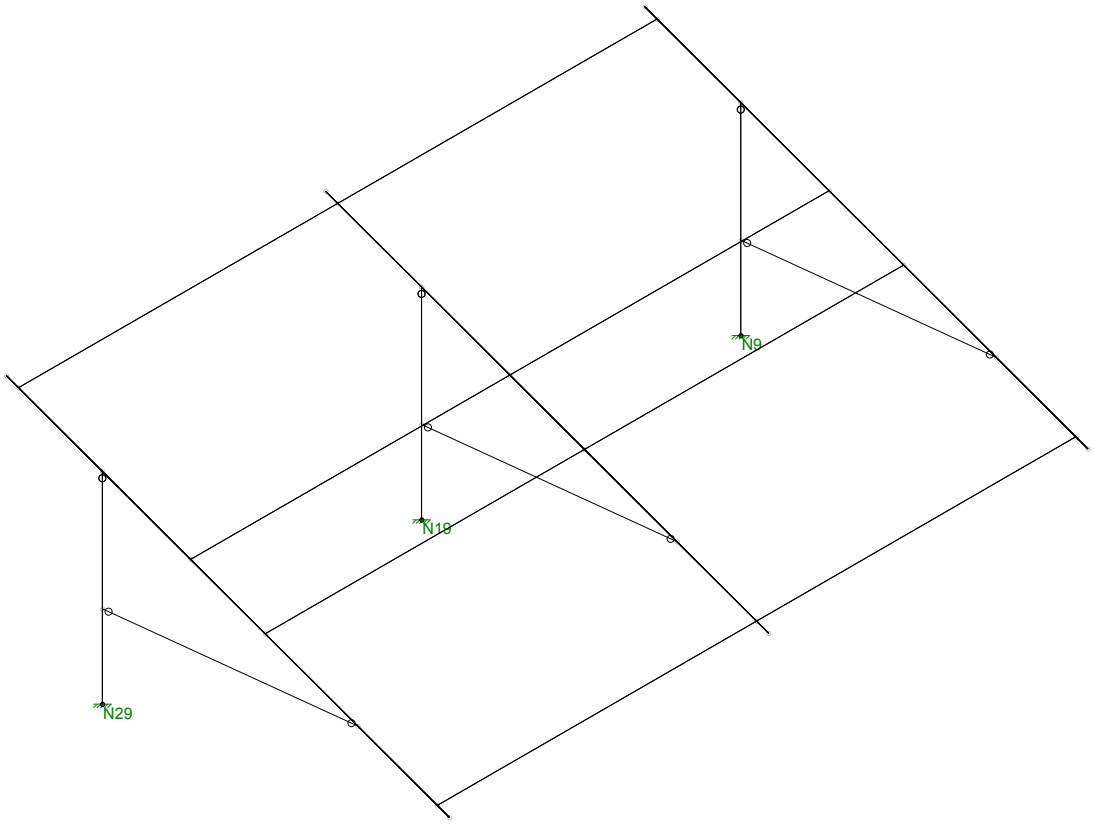



| | | |
|---|---|---|
| Schletter, Inc. | | 20° Tilt w/ Seismic Design |
| HCV | Standard FS Racking System | |
| | Representative Calculations - ASCE 7-10 | |

## 1. INTRODUCTION

### 1.1 Project Description

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

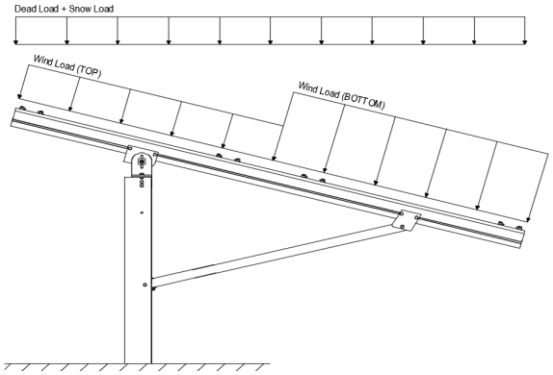
### 1.2 Construction

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

PV modules are required to meet the following specifications:

| | Maximum | | Minimum |
|---|---|---|---|
| Height = | 2000 mm | Height = | 1900 mm |
| Width = | 1050 mm | Width = | 970 mm |
| Dead Load = | 3.00 psf | Dead Load = | 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 7-10 - Chapter 26-31, Wind Loads
- ASCE 7-10 - Chapter 7, Snow Loads
- ASCE 7-10 - Chapter 2, Combination of Loads
- International Building Code, IBC, 2012, 2015
- Aluminum Design Manual, Eighth Edition, 2005

## 2. LOAD ACTIONS

### 2.1 Permanent Loads

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

### 2.2 Snow Loads

| | | |
|---|---|---|
| Ground Snow Load, $P_g$ = | 30.00 psf | |
| Sloped Roof Snow Load, $P_s$ = | 20.62 psf | *(ASCE 7-10, Eq. 7.4-1)* |
| $I_s$ = | 1.00 | |
| $C_s$ = | 0.91 | |
| $C_e$ = | 0.90 | |
| $C_t$ = | 1.20 | |

### 2.3 Wind Loads

| | | |
|---|---|---|
| Design Wind Speed, V = | 115 mph | Exposure Category = C |
| Height < | 15 ft | Importance Category = II |

Peak Velocity Pressure, $q_z$ = 20.76 psf *Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)*

Pressure Coefficients

| | | |
|---|---|---|
| $Cf+_{TOP}$ = | 1.05 | *(Pressure)* |
| $Cf+_{BOTTOM}$ = | 1.65 | |
| $Cf-_{TOP}$ = | -2.12 | *(Suction)* |
| $Cf-_{BOTTOM}$ = | -1 | |

*Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.*

### 2.4 Seismic Loads

| | | | |
|---|---|---|---|
| $S_S$ = | 2.50 | R = | 1.25 |
| $S_{DS}$ = | 1.67 | $C_S$ = | 0.8 |
| $S_1$ = | 1.00 | ρ = | 1.3 |
| $S_{D1}$ = | 1.00 | Ω = | 1.25 |
| $T_a$ = | 0.07 | $C_d$ = | 1.25 |

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

### 2.5 Combination of Loads

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

Strength Design, LRFD

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

| | | |
|---|---|---|
| 1.2D + 1.6S + 0.5W | | |
| 1.2D + 1.0W + 0.5S | | |
| 0.9D + 1.0W | M | |
| 1.54D + 1.3E + 0.2S | R | *(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 + 0.6W | | |
| 1.0D + 0.75L + 0.45W + 0.75S | | |
| 0.6D + 0.6W | 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 |

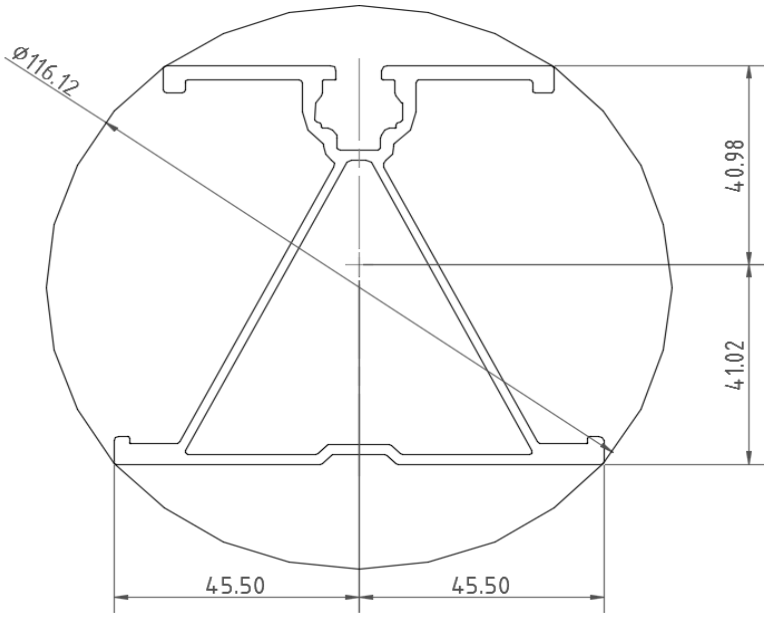
| **Struts** | Location |
|---|---|
| M3 | Outer |
| M6 | Inner |
| M9 | Outer |

## 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 |
| $L_b$ = | 96 | 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 |
| $M_y$ = | 0.946 | k-ft |
| $M_z$ = | 0.152 | k-ft |
| $M_{y\ allowable}$ = | 2.779 | k-ft |
| $M_{z\ allowable}$ = | 1.154 | k-ft |
| Utilization = | 47% | |

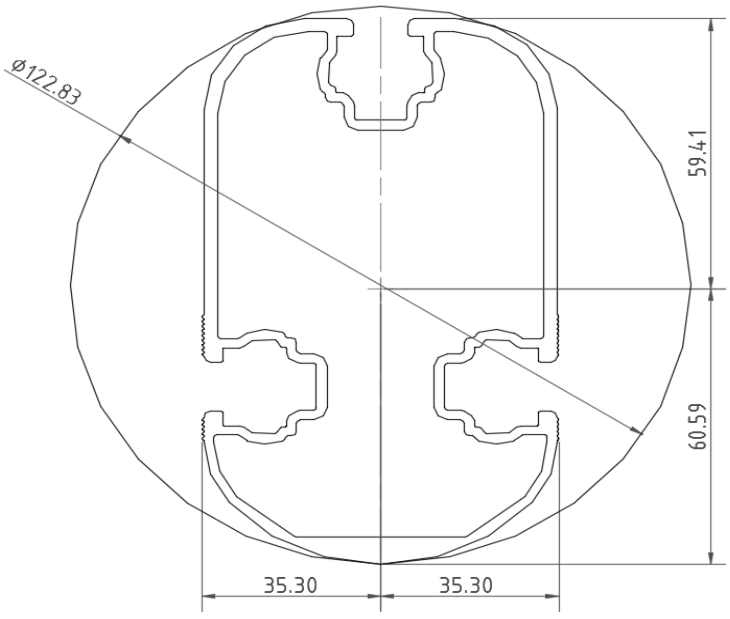


DETAIL VIEW

### 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 |
| $M_y$ = | 3.097 | k-ft |
| $M_z$ = | 0.000 | k-ft |
| $P_n$ = | 6.436 | k |
| $M_{y\ allowable}$ = | 4.960 | k-ft |
| $M_{z\ allowable}$ = | 3.472 | k-ft |
| $P_{n\ allowable}$ = | 59.439 | k |
| Utilization = | 73% | |

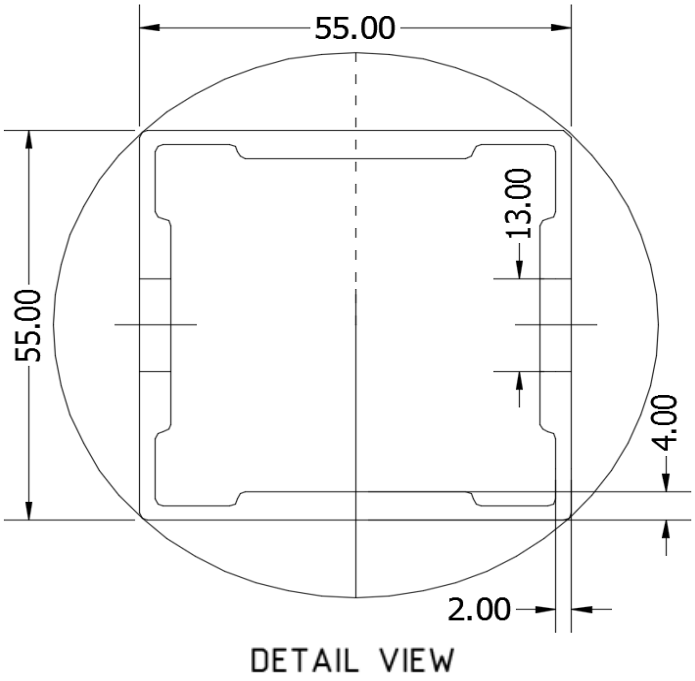


DETAIL VIEW

### 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).*

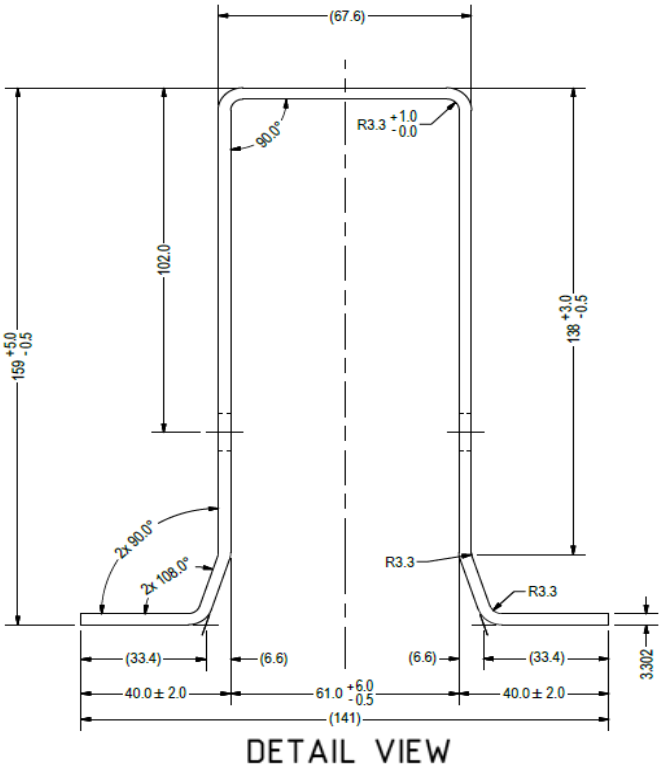
| | | |
|---|---|---|
| Strut Type = | **55x55** | |
| Aluminum Type = | 6105-T5 | |
| $F_{ty}$ = | 35 | ksi |
| $L_b$ = | 74.80 | in |
| $\Phi F_{ty\ AXIAL}$ = | 9.61 | ksi |
| $\Phi F_{ty\ BENDING}$ = | 28.22 | ksi |
| $S_y$ = | 0.60 | $in^3$ |
| $S_x$ = | 0.60 | $in^3$ |
| E = | 10100 | ksi |
| $I_y$ = | 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 |
| $P_n$ = | 6.460 | k |
| $M_{y\ allowable}$ = | 1.408 | k-ft |
| $M_{z\ allowable}$ = | 1.408 | k-ft |
| $P_{n\ allowable}$ = | 9.441 | k |
| Utilization = | 69% | |




### 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 |
| $M_y$ = | 15.822 | k-ft |
| $M_z$ = | 0.000 | k-ft |
| $P_r$ = | 5.739 | k |
| $M_{y\ allowable}$ = | 19.207 | k-ft |
| $M_{z\ allowable}$ = | 14.389 | k-ft |
| $P_c$ = | 38.013 | k |
| Utilization = | 100% | |



## 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 = | 4.46 | k |
| Maximum Lateral Load = | 2.11 | 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 = | 1.65 | 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 |

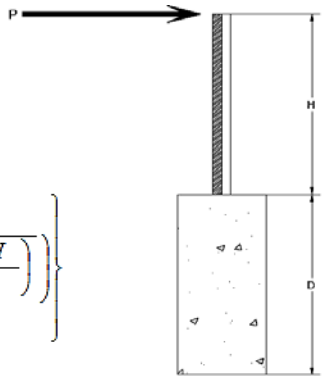
| | |
|---|---|
| Lateral Bearing @ Bottom = | $S_3$ |
| Lateral Bearing @ D/3 = | $S_1$ |
| Required Depth = | D |

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

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

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

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




Non-Constrained

| | | |
|---|---|---|
| Lateral Force @ Top of Pole, P = | 1.65 | 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 |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.22 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 0.65 | ksf |
| Constant 2.34P/($S_1$B), A = | 8.90 | |
| Required Footing Depth, D = | 12.75 | ft |

| | | |
|---|---|---|
| 2nd Trial @ $D_2$ = | 8.00 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.53 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 1.60 | ksf |
| Constant 2.34P/($S_1$B), A = | 3.62 | |
| Required Footing Depth, D = | 6.63 | ft |

| | | |
|---|---|---|
| 3rd Trial @ $D_3$ = | 7.31 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.49 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 1.46 | ksf |
| Constant 2.34P/($S_1$B), A = | 3.96 | |
| Required Footing Depth, D = | 7.05 | ft |

| | | |
|---|---|---|
| 4th Trial @ $D_4$ = | 7.18 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.48 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 1.44 | ksf |
| Constant 2.34P/($S_1$B), A = | 4.03 | |
| Required Footing Depth, D = | 7.14 | ft |

| | | |
|---|---|---|
| 5th Trial @ $D_5$ = | 7.16 | ft |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.48 | ksf |
| Lateral Soil Bearing @ D, $S_3$ = | 1.43 | ksf |
| Constant 2.34P/($S_1$B), A = | 4.04 | |
| Required Footing Depth, D = | 7.25 | ft |

A 2ft diameter x 7.25ft deep footing unrestrained at ground level is required for the racking structure.

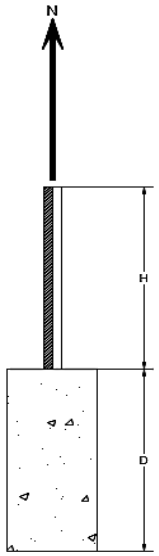
## 5.4 Uplifting Force Resistance

*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 = | 2.04 | 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 = | 1.33 | k |
| Required Concrete Volume, V = | 9.18 | $ft^3$ |
| Required Footing Depth, D = | 3.00 | ft |

| Iteration | z | dz | Qs | Side |
|---|---|---|---|---|
| 1 | 0.2 | 0.2 | 118.10 | 4.38 |
| 2 | 0.4 | 0.2 | 118.10 | 4.27 |
| 3 | 0.6 | 0.2 | 118.10 | 4.17 |
| 4 | 0.8 | 0.2 | 118.10 | 4.06 |
| 5 | 1 | 0.2 | 118.10 | 3.96 |
| 6 | 1.2 | 0.2 | 118.10 | 3.86 |
| 7 | 1.4 | 0.2 | 118.10 | 3.75 |
| 8 | 1.6 | 0.2 | 118.10 | 3.65 |
| 9 | 1.8 | 0.2 | 118.10 | 3.55 |
| 10 | 2 | 0.2 | 118.10 | 3.44 |
| 11 | 2.2 | 0.2 | 118.10 | 3.34 |
| 12 | 2.4 | 0.2 | 118.10 | 3.23 |
| 13 | 2.6 | 0.2 | 118.10 | 3.13 |
| 14 | 2.8 | 0.2 | 118.10 | 3.03 |
| 15 | 3 | 0.2 | 118.10 | 2.92 |
| 16 | 0 | 0.0 | 0.00 | 2.92 |
| 17 | 0 | 0.0 | 0.00 | 2.92 |
| 18 | 0 | 0.0 | 0.00 | 2.92 |
| 19 | 0 | 0.0 | 0.00 | 2.92 |
| 20 | 0 | 0.0 | 0.00 | 2.92 |
| 21 | 0 | 0.0 | 0.00 | 2.92 |
| 22 | 0 | 0.0 | 0.00 | 2.92 |
| 23 | 0 | 0.0 | 0.00 | 2.92 |
| 24 | 0 | 0.0 | 0.00 | 2.92 |
| 25 | 0 | 0.0 | 0.00 | 2.92 |
| 26 | 0 | 0.0 | 0.00 | 2.92 |
| 27 | 0 | 0.0 | 0.00 | 2.92 |
| 28 | 0 | 0.0 | 0.00 | 2.92 |
| 29 | 0 | 0.0 | 0.00 | 2.92 |
| 30 | 0 | 0.0 | 0.00 | 2.92 |
| 31 | 0 | 0.0 | 0.00 | 2.92 |
| 32 | 0 | 0.0 | 0.00 | 2.92 |
| 33 | 0 | 0.0 | 0.00 | 2.92 |
| 34 | 0 | 0.0 | 0.00 | 2.92 |
| Max | 3 | Sum | 0.71 | |

A 2ft diameter x 3ft 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 = | 7.25 | ft |
| Footing Diameter, B = | 2.00 | ft |
| Compressive Force, P = | 3.60 | k |
| Footing Area = | 3.14 | $ft^2$ |
| Circumference = | 6.28 | ft |
| Skin Friction Area = | 26.70 | $ft^2$ |
| Concrete Weight = | 0.145 | kcf |

Bearing Pressure

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

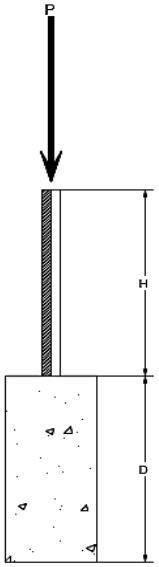
Weight of Concrete

| | | |
|---|---|---|
| Footing Volume | 22.78 | $ft^3$ |
| Weight | 3.30 | k |

Skin Friction Resistance

| | | |
|---|---|---|
| Skin Friction = | 0.15 | ksf |
| Resistance = | 4.01 | k |
| 1/3 Increase for Wind = | 1.33 | |
| Total Resistance = | 11.62 | k |
| Applied Force = | 6.91 | k |
| Utilization = | 59% | |

A 2ft diameter footing passes at a depth of 7.25ft.



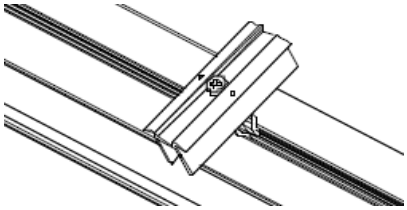
## 6. DESIGN OF JOINTS AND CONNECTIONS

### 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.*

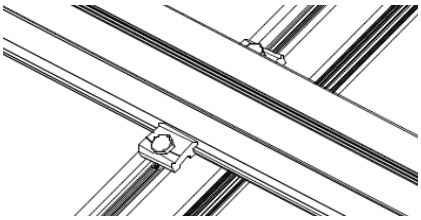
Fastening of Modules to Purlins

| | | |
|---|---|---|
| Maximum Uplifting Force | = | 0.480 k |
| Allowable Uplift | = | 1.214 k |
| Utilization | = | 40% |



Fastening of Purlins to Girders

| | | |
|---|---|---|
| Maximum Uplifting Force | = | 1.347 k |
| Allowable Uplift | = | 2.180 k |
| Utilization | = | 62% |

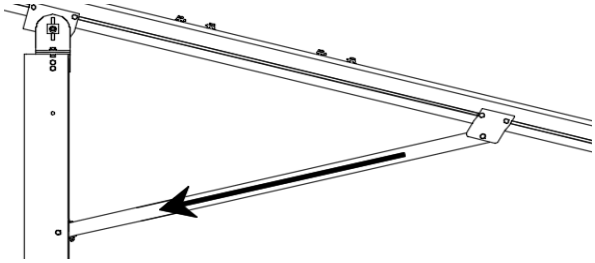


### 6.2 Strut Connections

*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 | = | 6.460 k |
| M10 Bolt Shear Capacity | = | 8.894 k |
| Utilization | = | 73% |

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

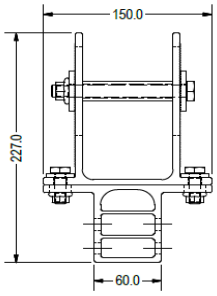


*A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.*

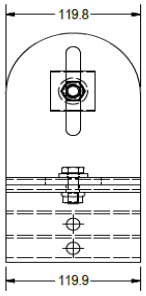
### 6.3 Girder to Post Connection

*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.*

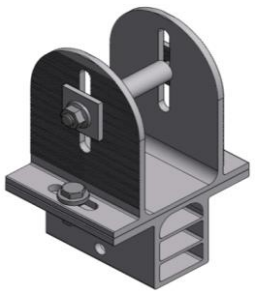
| | | |
|---|---|---|
| Maximum Tensile Load | = | 2.814 k |
| Allowable Load | = | 5.649 k |
| Utilization | = | 50% |



FRONT VIEW



SIDE VIEW



## 7. SEISMIC DESIGN

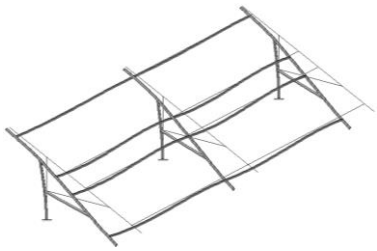
### 7.1 Seismic Drift

*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, $h_{sx}$ | = | 57.36 in |
| Allowable Story Drift for All Other Structures, Δ | = { | $0.020h_{sx}$ |
| | | 1.147 in |
| Max Drift, $\Delta_{MAX}$ | = | 0.663 in |

*0.663 ≤ 1.147, 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** | |
| $L_b$ = | 96 in | $L_b$ = | 96 |
| J = | 0.432 | J = | 0.432 |
| | 265.581 | | 168.894 |
| $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$ | | $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$ | |
| 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))] |
| $\varphi F_L$= | 28.0 ksi | $\varphi F_L$= | 29.1 |
| **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 in³ | Sy = | 0.599 in³ |
| $M_{max}$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 = | 5.74 | k | (LRFD Factored Load) |
| Mr (Strong) = | 15.82 | 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 = | 0.1678 | < | 0.2 | |
| Utilization = | 1.00 | < | 1.0 | OK |

Bending (Weak Axis):

Yielding:

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

Flange Local Buckling:

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

| | | | | |
|---|---|---|---|---|
| Pr/Pc = | 0.168 | < | 0.2 | |
| Utilization = | 0.00 | < | 1.0 | OK |

Combined Forces

Utilization = 100%

## 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 | -71.531 | -71.531 | 0 | 0 |
| 2 | M11 | y | -71.531 | -71.531 | 0 | 0 |
| 3 | M12 | y | -112.406 | -112.406 | 0 | 0 |
| 4 | M13 | y | -112.406 | -112.406 | 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 | 144.425 | 144.425 | 0 | 0 |
| 2 | M11 | y | 144.425 | 144.425 | 0 | 0 |
| 3 | M12 | y | 68.125 | 68.125 | 0 | 0 |
| 4 | M13 | y | 68.125 | 68.125 | 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 + 0.5W | Yes | Y | | 1 | 1.2 | 3 | 1.6 | 4 | .5 | | | | | | | | | | | | | | |
| 2 | LRFD 1.2D + 1.0W + 0.5S | Yes | Y | | 1 | 1.2 | 3 | .5 | 4 | 1 | | | | | | | | | | | | | | |
| 3 | LRFD 0.9D + 1.0W | Yes | Y | | 2 | .9 | | | | | 5 | 1 | | | | | | | | | | | | |
| 4 | LATERAL - LRFD 1.54D + 1.3E ... | Yes | Y | | 1 | 1.54 | 3 | .2 | | | 6 | 1.3 | | | | | | | | | | | | |
| 5 | LATERAL - LRFD 0.56D + 1.3E | Yes | Y | | 1 | .56 | | | | | 6 | 1.3 | | | | | | | | | | | | |
| 6 | LATERAL - LRFD 1.54D + 1.25... | Yes | Y | | 1 | 1.54 | 3 | .2 | | | 6 | 1.25 | | | | | | | | | | | | |
| 7 | LATERAL - LRFD 0.56D + 1.25E | Yes | Y | | 1 | .56 | | | | | 6 | 1.25 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ASD 1.0D + 1.0S | Yes | Y | | 1 | 1 | 3 | 1 | | | | | | | | | | | | | | | | |
| 10 | ASD 1.0D + 0.6W | Yes | Y | | 1 | 1 | | | 4 | .6 | | | | | | | | | | | | | | |
| 11 | ASD 1.0D + 0.75L + 0.45W + 0.... | Yes | Y | | 1 | 1 | 3 | .75 | 4 | .45 | | | | | | | | | | | | | | |
| 12 | ASD 0.6D + 0.6W | Yes | Y | | 2 | .6 | | | | | 5 | .6 | | | | | | | | | | | | |
| 13 | LATERAL - ASD 1.238D + 0.875E | Yes | Y | | 1 | 1.2... | | | | | 6 | .875 | | | | | | | | | | | | |
| 14 | LATERAL - ASD 1.1785D + 0.65... | Yes | Y | | 1 | 1.1... | 3 | .75 | | | 6 | .656 | | | | | | | | | | | | |
| 15 | LATERAL - ASD 0.362D + 0.875E | Yes | Y | | 1 | .362 | | | | | 6 | .875 | | | | | | | | | | | | |

## Envelope Joint Reactions

| | Joint | | X [lb] | LC | Y [lb] | LC | Z [lb] | LC | MX [k-ft] | LC | MY [k-ft] | LC | MZ [k-ft] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N9 | max | 221.276 | 2 | 2311.78 | 1 | 149.881 | 1 | .23 | 1 | .004 | 5 | 8.571 | 1 |
| 2 | | min | -445.411 | 3 | -1179.081 | 3 | -318.533 | 5 | -1.312 | 5 | -.002 | 1 | -.451 | 3 |
| 3 | N19 | max | 1570.574 | 2 | 5788.008 | 1 | 0 | 12 | 0 | 3 | .004 | 4 | 13.911 | 1 |
| 4 | | min | -1435.462 | 3 | -3433.282 | 3 | -336.379 | 5 | -1.362 | 4 | 0 | 1 | -.469 | 3 |
| 5 | N29 | max | 221.276 | 2 | 2311.78 | 1 | 105.631 | 3 | .116 | 3 | .004 | 4 | 8.571 | 1 |
| 6 | | min | -445.411 | 3 | -1179.081 | 3 | -354.619 | 4 | -1.383 | 4 | 0 | 3 | -.451 | 3 |
| 7 | Totals: | max | 2013.125 | 2 | 10411.568 | 1 | 0 | 2 | | | | | | |
| 8 | | min | -2326.284 | 3 | -5791.444 | 3 | -985.37 | 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 | .003 | 1 | 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 | .868 | 3 | 216.851 | 3 | 15.414 | 3 | .047 | 3 | .296 | 1 | .232 | 1 |
| 4 | | | min | -199.273 | 1 | -616.634 | 1 | -144.865 | 1 | -.192 | 1 | -.021 | 3 | -.081 | 3 |
| 5 | | 3 | max | .398 | 3 | 215.562 | 3 | 15.414 | 3 | .047 | 3 | .201 | 1 | .638 | 1 |
| 6 | | | min | -199.899 | 1 | -618.353 | 1 | -144.865 | 1 | -.192 | 1 | -.011 | 3 | -.223 | 3 |
| 7 | | 4 | max | -.071 | 3 | 214.272 | 3 | 15.414 | 3 | .047 | 3 | .106 | 1 | 1.044 | 1 |
| 8 | | | min | -200.525 | 1 | -620.072 | 1 | -144.865 | 1 | -.192 | 1 | 0 | 3 | -.364 | 3 |
| 9 | | 5 | max | 818.367 | 3 | 570.166 | 1 | 24.654 | 3 | 0 | 3 | .145 | 1 | 1.232 | 1 |
| 10 | | | min | -2685.653 | 1 | -187.322 | 3 | -172.223 | 1 | -.05 | 1 | -.033 | 3 | -.43 | 3 |
| 11 | | 6 | max | 817.898 | 3 | 568.447 | 1 | 24.654 | 3 | 0 | 3 | .033 | 2 | .859 | 1 |
| 12 | | | min | -2686.279 | 1 | -188.611 | 3 | -172.223 | 1 | -.05 | 1 | -.018 | 5 | -.307 | 3 |
| 13 | | 7 | max | 817.429 | 3 | 566.728 | 1 | 24.654 | 3 | 0 | 3 | 0 | 12 | .486 | 1 |
| 14 | | | min | -2686.905 | 1 | -189.9 | 3 | -172.223 | 1 | -.05 | 1 | -.081 | 1 | -.183 | 3 |
| 15 | | 8 | max | 816.959 | 3 | 565.009 | 1 | 24.654 | 3 | 0 | 3 | .015 | 3 | .115 | 1 |
| 16 | | | min | -2687.53 | 1 | -191.19 | 3 | -172.223 | 1 | -.05 | 1 | -.194 | 1 | -.058 | 3 |
| 17 | | 9 | max | 819.602 | 3 | 18.186 | 1 | 40.923 | 3 | .013 | 5 | .11 | 4 | .002 | 3 |
| 18 | | | min | -2902.878 | 1 | -4.539 | 3 | -226.817 | 1 | -.15 | 2 | 0 | 12 | -.057 | 1 |
| 19 | | 10 | max | 819.133 | 3 | 16.467 | 1 | 40.923 | 3 | .013 | 5 | .028 | 3 | .005 | 3 |
| 20 | | | min | -2903.504 | 1 | -5.828 | 3 | -226.817 | 1 | -.15 | 2 | -.041 | 1 | -.068 | 1 |
| 21 | | 11 | max | 818.664 | 3 | 14.747 | 1 | 40.923 | 3 | .013 | 5 | .055 | 3 | .009 | 3 |
| 22 | | | min | -2904.13 | 1 | -7.118 | 3 | -226.817 | 1 | -.15 | 2 | -.19 | 1 | -.078 | 1 |
| 23 | | 12 | max | 818.118 | 3 | 444.737 | 3 | 5.121 | 10 | .153 | 3 | .144 | 4 | .077 | 1 |
| 24 | | | min | -3113.358 | 1 | -447.962 | 1 | -200.403 | 4 | -.235 | 1 | .016 | 12 | -.135 | 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 | 817.649 | 3 | 443.448 | 3 | 5.121 | 10 | .153 | 3 | .12 | 1 | .372 | 1 |
| 26 | | | min | -3113.984 | 1 | -449.681 | 1 | -201.989 | 4 | -.235 | 1 | -.026 | 3 | -.426 | 3 |
| 27 | | 14 | max | 817.179 | 3 | 442.158 | 3 | 5.121 | 10 | .153 | 3 | .105 | 1 | .667 | 1 |
| 28 | | | min | -3114.609 | 1 | -451.4 | 1 | -203.574 | 4 | -.235 | 1 | -.136 | 5 | -.717 | 3 |
| 29 | | 15 | max | 816.71 | 3 | 440.869 | 3 | 5.121 | 10 | .153 | 3 | .091 | 1 | .964 | 1 |
| 30 | | | min | -3115.235 | 1 | -453.119 | 1 | -205.16 | 4 | -.235 | 1 | -.266 | 5 | -1.007 | 3 |
| 31 | | 16 | max | 200.904 | 1 | 445.999 | 1 | 68.683 | 5 | .117 | 1 | .004 | 3 | .733 | 1 |
| 32 | | | min | -1.645 | 3 | -458.242 | 3 | -142.935 | 1 | -.194 | 3 | -.206 | 4 | -.768 | 3 |
| 33 | | 17 | max | 200.278 | 1 | 444.28 | 1 | 67.097 | 5 | .117 | 1 | .017 | 3 | .441 | 1 |
| 34 | | | min | -2.114 | 3 | -459.531 | 3 | -142.935 | 1 | -.194 | 3 | -.214 | 1 | -.467 | 3 |
| 35 | | 18 | max | 199.652 | 1 | 442.561 | 1 | 65.512 | 5 | .117 | 1 | .03 | 3 | .15 | 1 |
| 36 | | | min | -2.583 | 3 | -460.82 | 3 | -142.935 | 1 | -.194 | 3 | -.308 | 1 | -.165 | 3 |
| 37 | | 19 | max | 0 | 1 | 0 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 38 | | | min | 0 | 1 | 0 | 1 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 39 | M4 | 1 | max | 0 | 1 | .006 | 1 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 40 | | | min | 0 | 1 | -.001 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 41 | | 2 | max | 6.779 | 10 | 557.901 | 3 | 0 | 1 | .02 | 4 | .252 | 4 | .412 | 1 |
| 42 | | | min | -234.402 | 1 | -1388.269 | 1 | -95.242 | 5 | 0 | 1 | 0 | 1 | -.17 | 3 |
| 43 | | 3 | max | 6.258 | 10 | 556.612 | 3 | 0 | 1 | .02 | 4 | .189 | 4 | 1.324 | 1 |
| 44 | | | min | -235.028 | 1 | -1389.988 | 1 | -96.828 | 5 | 0 | 1 | 0 | 1 | -.536 | 3 |
| 45 | | 4 | max | 5.736 | 10 | 555.322 | 3 | 0 | 1 | .02 | 4 | .125 | 4 | 2.236 | 1 |
| 46 | | | min | -235.653 | 1 | -1391.707 | 1 | -98.413 | 5 | 0 | 1 | 0 | 1 | -.901 | 3 |
| 47 | | 5 | max | 2308.708 | 3 | 1418.752 | 1 | 0 | 1 | 0 | 1 | .036 | 4 | 2.633 | 1 |
| 48 | | | min | -6118.113 | 1 | -587.95 | 3 | -100.273 | 4 | -.009 | 4 | 0 | 1 | -1.055 | 3 |
| 49 | | 6 | max | 2308.239 | 3 | 1417.033 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1.703 | 1 |
| 50 | | | min | -6118.739 | 1 | -589.239 | 3 | -101.858 | 4 | -.009 | 4 | -.031 | 5 | -.669 | 3 |
| 51 | | 7 | max | 2307.769 | 3 | 1415.314 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | .774 | 1 |
| 52 | | | min | -6119.364 | 1 | -590.529 | 3 | -103.444 | 4 | -.009 | 4 | -.098 | 4 | -.282 | 3 |
| 53 | | 8 | max | 2307.3 | 3 | 1413.595 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | .106 | 3 |
| 54 | | | min | -6119.99 | 1 | -591.818 | 3 | -105.03 | 4 | -.009 | 4 | -.166 | 4 | -.154 | 1 |
| 55 | | 9 | max | 2266.334 | 3 | 26.281 | 3 | 0 | 1 | .011 | 4 | .165 | 4 | .292 | 3 |
| 56 | | | min | -6322.243 | 1 | -128.642 | 1 | -230.767 | 4 | 0 | 1 | 0 | 1 | -.589 | 1 |
| 57 | | 10 | max | 2265.865 | 3 | 24.992 | 3 | 0 | 1 | .011 | 4 | .014 | 5 | .275 | 3 |
| 58 | | | min | -6322.868 | 1 | -130.361 | 1 | -232.352 | 4 | 0 | 1 | 0 | 1 | -.504 | 1 |
| 59 | | 11 | max | 2265.396 | 3 | 23.702 | 3 | 0 | 1 | .011 | 4 | 0 | 1 | .259 | 3 |
| 60 | | | min | -6323.494 | 1 | -132.081 | 1 | -233.938 | 4 | 0 | 1 | -.14 | 4 | -.418 | 1 |
| 61 | | 12 | max | 2230.808 | 3 | 1326.781 | 3 | 0 | 1 | .106 | 4 | .179 | 5 | .075 | 1 |
| 62 | | | min | -6537.986 | 1 | -1519.855 | 1 | -228.698 | 5 | 0 | 1 | 0 | 1 | -.161 | 3 |
| 63 | | 13 | max | 2230.339 | 3 | 1325.491 | 3 | 0 | 1 | .106 | 4 | .028 | 5 | 1.073 | 1 |
| 64 | | | min | -6538.612 | 1 | -1521.574 | 1 | -230.283 | 5 | 0 | 1 | 0 | 1 | -1.031 | 3 |
| 65 | | 14 | max | 2229.87 | 3 | 1324.202 | 3 | 0 | 1 | .106 | 4 | 0 | 1 | 2.072 | 1 |
| 66 | | | min | -6539.238 | 1 | -1523.293 | 1 | -231.869 | 5 | 0 | 1 | -.123 | 4 | -1.9 | 3 |
| 67 | | 15 | max | 2229.401 | 3 | 1322.913 | 3 | 0 | 1 | .106 | 4 | 0 | 1 | 3.072 | 1 |
| 68 | | | min | -6539.863 | 1 | -1525.012 | 1 | -233.454 | 5 | 0 | 1 | -.276 | 5 | -2.769 | 3 |
| 69 | | 16 | max | 234.895 | 1 | 1424.717 | 1 | 51.874 | 5 | 0 | 1 | 0 | 1 | 2.34 | 1 |
| 70 | | | min | -6.292 | 10 | -1288.95 | 3 | 0 | 1 | -.1 | 4 | -.188 | 5 | -2.103 | 3 |
| 71 | | 17 | max | 234.27 | 1 | 1422.998 | 1 | 50.288 | 5 | 0 | 1 | 0 | 1 | 1.405 | 1 |
| 72 | | | min | -6.814 | 10 | -1290.239 | 3 | 0 | 1 | -.1 | 4 | -.154 | 4 | -1.257 | 3 |
| 73 | | 18 | max | 233.644 | 1 | 1421.278 | 1 | 48.703 | 5 | 0 | 1 | 0 | 1 | .472 | 1 |
| 74 | | | min | -7.335 | 10 | -1291.529 | 3 | 0 | 1 | -.1 | 4 | -.123 | 4 | -.41 | 3 |
| 75 | | 19 | max | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 76 | | | min | 0 | 1 | -.001 | 3 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 77 | M7 | 1 | max | 0 | 1 | .003 | 1 | 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 | 27.162 | 5 | 216.851 | 3 | 144.865 | 1 | .192 | 1 | .129 | 5 | .232 | 1 |
| 80 | | | min | -199.273 | 1 | -616.634 | 1 | -42.535 | 5 | -.047 | 3 | -.296 | 1 | -.081 | 3 |
| 81 | | 3 | max | 26.87 | 5 | 215.562 | 3 | 144.865 | 1 | .192 | 1 | .101 | 5 | .638 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82 | | | min | -199.899 | 1 | -618.353 | 1 | -44.121 | 5 | -.047 | 3 | -.201 | 1 | -.223 | 3 |
| 83 | | 4 | max | 26.578 | 5 | 214.272 | 3 | 144.865 | 1 | .192 | 1 | .071 | 5 | 1.044 | 1 |
| 84 | | | min | -200.525 | 1 | -620.072 | 1 | -45.707 | 5 | -.047 | 3 | -.106 | 1 | -.364 | 3 |
| 85 | | 5 | max | 818.367 | 3 | 570.166 | 1 | 172.223 | 1 | .05 | 1 | .033 | 3 | 1.232 | 1 |
| 86 | | | min | -2685.653 | 1 | -187.322 | 3 | -44.703 | 5 | -.005 | 5 | -.145 | 1 | -.43 | 3 |
| 87 | | 6 | max | 817.898 | 3 | 568.447 | 1 | 172.223 | 1 | .05 | 1 | .017 | 3 | .859 | 1 |
| 88 | | | min | -2686.279 | 1 | -188.611 | 3 | -46.288 | 5 | -.005 | 5 | -.033 | 2 | -.307 | 3 |
| 89 | | 7 | max | 817.429 | 3 | 566.728 | 1 | 172.223 | 1 | .05 | 1 | .081 | 1 | .486 | 1 |
| 90 | | | min | -2686.905 | 1 | -189.9 | 3 | -47.874 | 5 | -.005 | 5 | -.051 | 5 | -.183 | 3 |
| 91 | | 8 | max | 816.959 | 3 | 565.009 | 1 | 172.223 | 1 | .05 | 1 | .194 | 1 | .115 | 1 |
| 92 | | | min | -2687.53 | 1 | -191.19 | 3 | -49.459 | 5 | -.005 | 5 | -.083 | 5 | -.058 | 3 |
| 93 | | 9 | max | 819.602 | 3 | 18.186 | 1 | 226.817 | 1 | .15 | 2 | .08 | 5 | .002 | 3 |
| 94 | | | min | -2902.878 | 1 | -4.539 | 3 | -80.352 | 5 | .015 | 15 | -.108 | 1 | -.057 | 1 |
| 95 | | 10 | max | 819.133 | 3 | 16.467 | 1 | 226.817 | 1 | .15 | 2 | .041 | 1 | .005 | 3 |
| 96 | | | min | -2903.504 | 1 | -5.828 | 3 | -81.938 | 5 | .015 | 15 | -.028 | 3 | -.068 | 1 |
| 97 | | 11 | max | 818.664 | 3 | 14.747 | 1 | 226.817 | 1 | .15 | 2 | .19 | 1 | .009 | 3 |
| 98 | | | min | -2904.13 | 1 | -7.118 | 3 | -83.524 | 5 | .015 | 15 | -.055 | 3 | -.078 | 1 |
| 99 | | 12 | max | 818.118 | 3 | 444.737 | 3 | 77.42 | 3 | .235 | 1 | .107 | 5 | .077 | 1 |
| 100 | | | min | -3113.358 | 1 | -447.962 | 1 | -191.516 | 5 | -.153 | 3 | -.134 | 1 | -.135 | 3 |
| 101 | | 13 | max | 817.649 | 3 | 443.448 | 3 | 77.42 | 3 | .235 | 1 | .026 | 3 | .372 | 1 |
| 102 | | | min | -3113.984 | 1 | -449.681 | 1 | -193.102 | 5 | -.153 | 3 | -.12 | 1 | -.426 | 3 |
| 103 | | 14 | max | 817.179 | 3 | 442.158 | 3 | 77.42 | 3 | .235 | 1 | .076 | 3 | .667 | 1 |
| 104 | | | min | -3114.609 | 1 | -451.4 | 1 | -194.687 | 5 | -.153 | 3 | -.164 | 4 | -.717 | 3 |
| 105 | | 15 | max | 816.71 | 3 | 440.869 | 3 | 77.42 | 3 | .235 | 1 | .127 | 3 | .964 | 1 |
| 106 | | | min | -3115.235 | 1 | -453.119 | 1 | -196.273 | 5 | -.153 | 3 | -.289 | 4 | -1.007 | 3 |
| 107 | | 16 | max | 200.904 | 1 | 445.999 | 1 | 142.935 | 1 | .194 | 3 | .121 | 1 | .733 | 1 |
| 108 | | | min | -2.69 | 5 | -458.242 | 3 | -19.276 | 3 | -.117 | 1 | -.173 | 5 | -.768 | 3 |
| 109 | | 17 | max | 200.278 | 1 | 444.28 | 1 | 142.935 | 1 | .194 | 3 | .214 | 1 | .441 | 1 |
| 110 | | | min | -2.982 | 5 | -459.531 | 3 | -19.276 | 3 | -.117 | 1 | -.12 | 5 | -.467 | 3 |
| 111 | | 18 | max | 199.652 | 1 | 442.561 | 1 | 142.935 | 1 | .194 | 3 | .308 | 1 | .15 | 1 |
| 112 | | | min | -3.274 | 5 | -460.82 | 3 | -19.276 | 3 | -.117 | 1 | -.067 | 5 | -.165 | 3 |
| 113 | | 19 | max | 0 | 1 | 0 | 5 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 1 |
| 114 | | | min | 0 | 1 | 0 | 1 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 115 | M10 | 1 | max | 142.959 | 1 | 442.042 | 1 | 3.55 | 5 | .002 | 1 | .356 | 1 | .117 | 1 |
| 116 | | | min | -19.277 | 3 | -462.091 | 3 | -199.616 | 1 | -.011 | 3 | -.041 | 5 | -.194 | 3 |
| 117 | | 2 | max | 142.959 | 1 | 313.925 | 1 | 5.482 | 5 | .002 | 1 | .194 | 1 | .162 | 3 |
| 118 | | | min | -19.277 | 3 | -338.944 | 3 | -164.557 | 1 | -.011 | 3 | -.037 | 5 | -.219 | 1 |
| 119 | | 3 | max | 142.959 | 1 | 185.809 | 1 | 7.414 | 5 | .002 | 1 | .071 | 2 | .409 | 3 |
| 120 | | | min | -19.277 | 3 | -215.797 | 3 | -129.497 | 1 | -.011 | 3 | -.031 | 5 | -.441 | 1 |
| 121 | | 4 | max | 142.959 | 1 | 57.692 | 1 | 9.346 | 5 | .002 | 1 | .014 | 10 | .546 | 3 |
| 122 | | | min | -19.277 | 3 | -92.651 | 3 | -94.438 | 1 | -.011 | 3 | -.038 | 14 | -.549 | 1 |
| 123 | | 5 | max | 142.959 | 1 | 30.496 | 3 | 11.278 | 5 | .002 | 1 | -.006 | 10 | .573 | 3 |
| 124 | | | min | -19.277 | 3 | -70.425 | 1 | -59.378 | 1 | -.011 | 3 | -.104 | 1 | -.543 | 1 |
| 125 | | 6 | max | 142.959 | 1 | 153.643 | 3 | 13.21 | 5 | .002 | 1 | -.001 | 12 | .492 | 3 |
| 126 | | | min | -19.277 | 3 | -198.542 | 1 | -32.326 | 2 | -.011 | 3 | -.142 | 1 | -.424 | 1 |
| 127 | | 7 | max | 142.959 | 1 | 276.789 | 3 | 20.5 | 4 | .002 | 1 | .01 | 3 | .3 | 3 |
| 128 | | | min | -19.277 | 3 | -326.658 | 1 | -18.524 | 2 | -.011 | 3 | -.148 | 1 | -.19 | 1 |
| 129 | | 8 | max | 142.959 | 1 | 399.936 | 3 | 45.8 | 1 | .002 | 1 | .024 | 3 | .157 | 1 |
| 130 | | | min | -19.277 | 3 | -454.775 | 1 | -10.892 | 10 | -.011 | 3 | -.122 | 1 | -.015 | 5 |
| 131 | | 9 | max | 142.959 | 1 | 523.083 | 3 | 80.86 | 1 | .002 | 1 | .04 | 5 | .618 | 1 |
| 132 | | | min | -19.277 | 3 | -582.892 | 1 | -7.442 | 10 | -.011 | 3 | -.101 | 2 | -.411 | 3 |
| 133 | | 10 | max | 142.959 | 1 | 711.009 | 1 | 6.573 | 5 | .002 | 1 | .075 | 4 | 1.193 | 1 |
| 134 | | | min | -19.277 | 3 | -646.229 | 3 | -115.919 | 1 | -.011 | 3 | -.087 | 2 | -.93 | 3 |
| 135 | | 11 | max | 142.959 | 1 | 582.892 | 1 | 8.505 | 5 | .011 | 3 | .04 | 3 | .618 | 1 |
| 136 | | | min | -19.277 | 3 | -523.083 | 3 | -80.86 | 1 | -.002 | 4 | -.101 | 2 | -.411 | 3 |
| 137 | | 12 | max | 142.959 | 1 | 454.775 | 1 | 10.892 | 10 | .011 | 3 | .024 | 3 | .157 | 1 |
| 138 | | | min | -19.277 | 3 | -399.936 | 3 | -45.8 | 1 | -.002 | 4 | -.122 | 1 | 0 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 139 | | 13 | max | 142.959 | 1 | 326.658 | 1 | 18.524 | 2 | .011 | 3 | .01 | 3 | .3 | 3 |
| 140 | | | min | -19.277 | 3 | -276.789 | 3 | -16.469 | 9 | -.002 | 4 | -.148 | 1 | -.19 | 1 |
| 141 | | 14 | max | 142.959 | 1 | 198.542 | 1 | 32.326 | 2 | .011 | 3 | -.001 | 12 | .492 | 3 |
| 142 | | | min | -19.277 | 3 | -153.643 | 3 | -12.558 | 3 | -.002 | 4 | -.142 | 1 | -.424 | 1 |
| 143 | | 15 | max | 142.959 | 1 | 70.425 | 1 | 59.378 | 1 | .011 | 3 | .002 | 5 | .573 | 3 |
| 144 | | | min | -22.028 | 5 | -30.496 | 3 | -10.654 | 3 | -.002 | 4 | -.104 | 1 | -.543 | 1 |
| 145 | | 16 | max | 142.959 | 1 | 92.651 | 3 | 94.438 | 1 | .011 | 3 | .018 | 5 | .546 | 3 |
| 146 | | | min | -32.518 | 5 | -57.692 | 1 | -8.75 | 3 | -.002 | 4 | -.036 | 1 | -.549 | 1 |
| 147 | | 17 | max | 142.959 | 1 | 215.797 | 3 | 129.497 | 1 | .011 | 3 | .071 | 2 | .409 | 3 |
| 148 | | | min | -43.007 | 5 | -185.809 | 1 | -6.846 | 3 | -.002 | 4 | -.027 | 3 | -.441 | 1 |
| 149 | | 18 | max | 142.959 | 1 | 338.944 | 3 | 164.557 | 1 | .011 | 3 | .194 | 1 | .162 | 3 |
| 150 | | | min | -53.496 | 5 | -313.925 | 1 | -4.942 | 3 | -.002 | 4 | -.033 | 3 | -.219 | 1 |
| 151 | | 19 | max | 142.959 | 1 | 462.091 | 3 | 199.616 | 1 | .011 | 3 | .356 | 1 | .117 | 1 |
| 152 | | | min | -63.986 | 5 | -442.042 | 1 | -3.038 | 3 | -.002 | 4 | -.036 | 3 | -.194 | 3 |
| 153 | M11 | 1 | max | 204.169 | 1 | 461.728 | 1 | 49.075 | 5 | .005 | 3 | .408 | 1 | .093 | 4 |
| 154 | | | min | -118.149 | 3 | -454.016 | 3 | -209.455 | 1 | -.018 | 1 | -.224 | 5 | -.188 | 3 |
| 155 | | 2 | max | 204.169 | 1 | 333.611 | 1 | 51.007 | 5 | .005 | 3 | .237 | 1 | .161 | 3 |
| 156 | | | min | -118.149 | 3 | -330.87 | 3 | -174.396 | 1 | -.018 | 1 | -.18 | 5 | -.264 | 1 |
| 157 | | 3 | max | 204.169 | 1 | 205.494 | 1 | 52.939 | 5 | .005 | 3 | .098 | 1 | .4 | 3 |
| 158 | | | min | -118.149 | 3 | -207.723 | 3 | -139.336 | 1 | -.018 | 1 | -.134 | 5 | -.504 | 1 |
| 159 | | 4 | max | 204.169 | 1 | 77.378 | 1 | 54.871 | 5 | .005 | 3 | .025 | 2 | .53 | 3 |
| 160 | | | min | -118.149 | 3 | -84.576 | 3 | -104.277 | 1 | -.018 | 1 | -.092 | 4 | -.63 | 1 |
| 161 | | 5 | max | 204.169 | 1 | 38.57 | 3 | 56.803 | 5 | .005 | 3 | -.003 | 10 | .551 | 3 |
| 162 | | | min | -118.149 | 3 | -50.739 | 1 | -69.217 | 1 | -.018 | 1 | -.088 | 1 | -.641 | 1 |
| 163 | | 6 | max | 204.169 | 1 | 161.717 | 3 | 58.734 | 5 | .005 | 3 | .015 | 5 | .462 | 3 |
| 164 | | | min | -118.149 | 3 | -178.856 | 1 | -37.813 | 2 | -.018 | 1 | -.134 | 1 | -.539 | 1 |
| 165 | | 7 | max | 204.169 | 1 | 284.864 | 3 | 64.378 | 4 | .005 | 3 | .068 | 5 | .263 | 3 |
| 166 | | | min | -118.149 | 3 | -306.973 | 1 | -24.011 | 2 | -.018 | 1 | -.149 | 1 | -.323 | 1 |
| 167 | | 8 | max | 204.169 | 1 | 408.01 | 3 | 73.555 | 4 | .005 | 3 | .123 | 5 | .006 | 1 |
| 168 | | | min | -118.149 | 3 | -435.09 | 1 | -12.931 | 10 | -.018 | 1 | -.132 | 1 | -.045 | 3 |
| 169 | | 9 | max | 204.169 | 1 | 531.157 | 3 | 82.733 | 4 | .005 | 3 | .18 | 5 | .45 | 1 |
| 170 | | | min | -118.149 | 3 | -563.206 | 1 | -9.481 | 10 | -.018 | 1 | -.112 | 2 | -.462 | 3 |
| 171 | | 10 | max | 204.169 | 1 | 691.323 | 1 | 52.989 | 5 | .018 | 1 | .251 | 4 | 1.008 | 1 |
| 172 | | | min | -118.149 | 3 | -654.304 | 3 | -106.08 | 1 | -.007 | 14 | -.103 | 2 | -.989 | 3 |
| 173 | | 11 | max | 204.169 | 1 | 563.206 | 1 | 54.921 | 5 | .018 | 1 | .034 | 3 | .45 | 1 |
| 174 | | | min | -118.149 | 3 | -531.157 | 3 | -71.021 | 1 | -.005 | 3 | -.191 | 4 | -.462 | 3 |
| 175 | | 12 | max | 204.169 | 1 | 435.09 | 1 | 56.853 | 5 | .018 | 1 | .022 | 3 | .023 | 4 |
| 176 | | | min | -118.149 | 3 | -408.01 | 3 | -35.961 | 1 | -.005 | 3 | -.154 | 4 | -.045 | 3 |
| 177 | | 13 | max | 204.169 | 1 | 306.973 | 1 | 58.785 | 5 | .018 | 1 | .011 | 3 | .263 | 3 |
| 178 | | | min | -118.149 | 3 | -284.864 | 3 | -11.255 | 3 | -.005 | 3 | -.149 | 1 | -.323 | 1 |
| 179 | | 14 | max | 204.169 | 1 | 178.856 | 1 | 64.747 | 4 | .018 | 1 | .002 | 3 | .462 | 3 |
| 180 | | | min | -118.149 | 3 | -161.717 | 3 | -9.351 | 3 | -.005 | 3 | -.134 | 1 | -.539 | 1 |
| 181 | | 15 | max | 204.169 | 1 | 50.739 | 1 | 73.924 | 4 | .018 | 1 | .026 | 5 | .551 | 3 |
| 182 | | | min | -118.149 | 3 | -38.57 | 3 | -7.447 | 3 | -.005 | 3 | -.088 | 1 | -.641 | 1 |
| 183 | | 16 | max | 204.169 | 1 | 84.576 | 3 | 104.277 | 1 | .018 | 1 | .082 | 5 | .53 | 3 |
| 184 | | | min | -118.149 | 3 | -77.378 | 1 | -5.543 | 3 | -.005 | 3 | -.019 | 9 | -.63 | 1 |
| 185 | | 17 | max | 204.169 | 1 | 207.723 | 3 | 139.336 | 1 | .018 | 1 | .155 | 4 | .4 | 3 |
| 186 | | | min | -118.149 | 3 | -205.494 | 1 | -3.639 | 3 | -.005 | 3 | -.016 | 3 | -.504 | 1 |
| 187 | | 18 | max | 204.169 | 1 | 330.87 | 3 | 174.396 | 1 | .018 | 1 | .241 | 4 | .161 | 3 |
| 188 | | | min | -118.149 | 3 | -333.611 | 1 | -1.735 | 3 | -.005 | 3 | -.018 | 3 | -.264 | 1 |
| 189 | | 19 | max | 204.169 | 1 | 454.016 | 3 | 209.455 | 1 | .018 | 1 | .408 | 1 | .089 | 1 |
| 190 | | | min | -118.149 | 3 | -461.728 | 1 | .169 | 3 | -.005 | 3 | -.019 | 3 | -.188 | 3 |
| 191 | M12 | 1 | max | 29.078 | 5 | 544.306 | 1 | 44.778 | 5 | .003 | 3 | .434 | 1 | .103 | 2 |
| 192 | | | min | -52.544 | 1 | -188.392 | 3 | -214.5 | 1 | -.014 | 1 | -.205 | 5 | .019 | 15 |
| 193 | | 2 | max | 18.589 | 5 | 398.023 | 1 | 46.709 | 5 | .003 | 3 | .259 | 1 | .178 | 3 |
| 194 | | | min | -52.544 | 1 | -133.067 | 3 | -179.441 | 1 | -.014 | 1 | -.165 | 5 | -.324 | 1 |
| 195 | | 3 | max | 16.381 | 3 | 251.739 | 1 | 48.641 | 5 | .003 | 3 | .115 | 1 | .272 | 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 | -52.544 | 1 | -77.743 | 3 | -144.381 | 1 | -.014 | 1 | -.122 | 5 | -.612 | 1 |
| 197 | | 4 | max | 16.381 | 3 | 105.456 | 1 | 50.573 | 5 | .003 | 3 | .036 | 2 | .316 | 3 |
| 198 | | | min | -52.544 | 1 | -22.419 | 3 | -109.322 | 1 | -.014 | 1 | -.083 | 4 | -.771 | 1 |
| 199 | | 5 | max | 16.381 | 3 | 32.906 | 3 | 52.505 | 5 | .003 | 3 | 0 | 10 | .312 | 3 |
| 200 | | | min | -52.544 | 1 | -40.828 | 1 | -74.262 | 1 | -.014 | 1 | -.08 | 1 | -.8 | 1 |
| 201 | | 6 | max | 16.381 | 3 | 88.23 | 3 | 54.437 | 5 | .003 | 3 | .015 | 5 | .258 | 3 |
| 202 | | | min | -52.544 | 1 | -187.111 | 1 | -41.992 | 2 | -.014 | 1 | -.13 | 1 | -.698 | 1 |
| 203 | | 7 | max | 16.381 | 3 | 143.555 | 3 | 59.414 | 4 | .003 | 3 | .064 | 5 | .155 | 3 |
| 204 | | | min | -52.544 | 1 | -333.395 | 1 | -28.19 | 2 | -.014 | 1 | -.149 | 1 | -.467 | 1 |
| 205 | | 8 | max | 16.381 | 3 | 198.879 | 3 | 68.591 | 4 | .003 | 3 | .115 | 5 | .003 | 3 |
| 206 | | | min | -55.252 | 4 | -479.678 | 1 | -14.931 | 10 | -.014 | 1 | -.137 | 1 | -.106 | 1 |
| 207 | | 9 | max | 16.381 | 3 | 254.204 | 3 | 77.769 | 4 | .003 | 3 | .168 | 5 | .386 | 1 |
| 208 | | | min | -65.741 | 4 | -625.961 | 1 | -11.482 | 10 | -.014 | 1 | -.12 | 2 | -.199 | 3 |
| 209 | | 10 | max | 16.381 | 3 | 772.245 | 1 | 91.007 | 14 | .014 | 1 | .234 | 4 | 1.007 | 1 |
| 210 | | | min | -76.23 | 4 | -309.528 | 3 | -101.035 | 1 | -.006 | 14 | -.115 | 2 | -.449 | 3 |
| 211 | | 11 | max | 48.068 | 5 | 625.961 | 1 | 51.057 | 5 | .014 | 1 | .04 | 3 | .386 | 1 |
| 212 | | | min | -52.544 | 1 | -254.204 | 3 | -65.976 | 1 | -.003 | 3 | -.182 | 4 | -.199 | 3 |
| 213 | | 12 | max | 37.579 | 5 | 479.678 | 1 | 52.989 | 5 | .014 | 1 | .025 | 3 | .003 | 3 |
| 214 | | | min | -52.544 | 1 | -198.879 | 3 | -31.155 | 9 | -.003 | 3 | -.147 | 4 | -.106 | 1 |
| 215 | | 13 | max | 27.09 | 5 | 333.395 | 1 | 54.921 | 5 | .014 | 1 | .011 | 3 | .155 | 3 |
| 216 | | | min | -52.544 | 1 | -143.555 | 3 | -14.549 | 3 | -.003 | 3 | -.149 | 1 | -.467 | 1 |
| 217 | | 14 | max | 16.6 | 5 | 187.111 | 1 | 61.742 | 4 | .014 | 1 | 0 | 3 | .258 | 3 |
| 218 | | | min | -52.544 | 1 | -88.23 | 3 | -12.645 | 3 | -.003 | 3 | -.13 | 1 | -.698 | 1 |
| 219 | | 15 | max | 16.381 | 3 | 40.828 | 1 | 74.262 | 1 | .014 | 1 | .023 | 5 | .312 | 3 |
| 220 | | | min | -52.544 | 1 | -32.906 | 3 | -10.741 | 3 | -.003 | 3 | -.08 | 1 | -.8 | 1 |
| 221 | | 16 | max | 16.381 | 3 | 22.419 | 3 | 109.322 | 1 | .014 | 1 | .076 | 5 | .316 | 3 |
| 222 | | | min | -52.544 | 1 | -105.456 | 1 | -8.837 | 3 | -.003 | 3 | -.02 | 3 | -.771 | 1 |
| 223 | | 17 | max | 16.381 | 3 | 77.743 | 3 | 144.381 | 1 | .014 | 1 | .147 | 4 | .272 | 3 |
| 224 | | | min | -52.544 | 1 | -251.739 | 1 | -6.933 | 3 | -.003 | 3 | -.027 | 3 | -.612 | 1 |
| 225 | | 18 | max | 16.381 | 3 | 133.067 | 3 | 179.441 | 1 | .014 | 1 | .259 | 1 | .178 | 3 |
| 226 | | | min | -52.544 | 1 | -398.023 | 1 | -5.029 | 3 | -.003 | 3 | -.032 | 3 | -.324 | 1 |
| 227 | | 19 | max | 16.381 | 3 | 188.392 | 3 | 214.5 | 1 | .014 | 1 | .434 | 1 | .103 | 2 |
| 228 | | | min | -52.544 | 1 | -544.306 | 1 | -3.126 | 3 | -.003 | 3 | -.036 | 3 | -.022 | 5 |
| 229 | M13 | 1 | max | 40.827 | 5 | 617.136 | 1 | 27.458 | 5 | .008 | 3 | .345 | 1 | .192 | 1 |
| 230 | | | min | -144.702 | 1 | -218.188 | 3 | -198.029 | 1 | -.026 | 1 | -.143 | 5 | -.047 | 3 |
| 231 | | 2 | max | 30.338 | 5 | 470.852 | 1 | 29.39 | 5 | .008 | 3 | .184 | 1 | .122 | 3 |
| 232 | | | min | -144.702 | 1 | -162.863 | 3 | -162.97 | 1 | -.026 | 1 | -.118 | 5 | -.292 | 1 |
| 233 | | 3 | max | 19.848 | 5 | 324.569 | 1 | 31.321 | 5 | .008 | 3 | .065 | 2 | .242 | 3 |
| 234 | | | min | -144.702 | 1 | -107.539 | 3 | -127.91 | 1 | -.026 | 1 | -.091 | 5 | -.645 | 1 |
| 235 | | 4 | max | 15.414 | 3 | 178.285 | 1 | 33.253 | 5 | .008 | 3 | .012 | 10 | .313 | 3 |
| 236 | | | min | -144.702 | 1 | -52.215 | 3 | -92.851 | 1 | -.026 | 1 | -.075 | 4 | -.869 | 1 |
| 237 | | 5 | max | 15.414 | 3 | 32.002 | 1 | 35.185 | 5 | .008 | 3 | -.005 | 12 | .335 | 3 |
| 238 | | | min | -144.702 | 1 | 1.904 | 12 | -57.791 | 1 | -.026 | 1 | -.11 | 1 | -.962 | 1 |
| 239 | | 6 | max | 15.414 | 3 | 58.434 | 3 | 37.117 | 5 | .008 | 3 | .001 | 3 | .308 | 3 |
| 240 | | | min | -144.702 | 1 | -114.282 | 1 | -31.333 | 2 | -.026 | 1 | -.146 | 1 | -.926 | 1 |
| 241 | | 7 | max | 15.414 | 3 | 113.759 | 3 | 44.752 | 4 | .008 | 3 | .034 | 5 | .231 | 3 |
| 242 | | | min | -144.702 | 1 | -260.565 | 1 | -17.531 | 2 | -.026 | 1 | -.15 | 1 | -.759 | 1 |
| 243 | | 8 | max | 15.414 | 3 | 169.083 | 3 | 53.929 | 4 | .008 | 3 | .07 | 5 | .106 | 3 |
| 244 | | | min | -144.702 | 1 | -406.849 | 1 | -10.478 | 10 | -.026 | 1 | -.124 | 1 | -.462 | 1 |
| 245 | | 9 | max | 15.414 | 3 | 224.408 | 3 | 82.447 | 1 | .008 | 3 | .107 | 5 | .012 | 10 |
| 246 | | | min | -144.702 | 1 | -553.132 | 1 | -7.028 | 10 | -.026 | 1 | -.102 | 2 | -.069 | 3 |
| 247 | | 10 | max | 15.414 | 3 | 279.732 | 3 | 117.506 | 1 | .026 | 1 | .164 | 4 | .536 | 2 |
| 248 | | | min | -144.702 | 1 | -699.416 | 1 | -3.578 | 10 | -.01 | 14 | -.087 | 2 | -.293 | 3 |
| 249 | | 11 | max | 29.656 | 5 | 553.132 | 1 | 32.217 | 5 | .026 | 1 | .038 | 3 | .012 | 10 |
| 250 | | | min | -144.702 | 1 | -224.408 | 3 | -82.447 | 1 | -.008 | 3 | -.113 | 4 | -.069 | 3 |
| 251 | | 12 | max | 19.167 | 5 | 406.849 | 1 | 34.149 | 5 | .026 | 1 | .024 | 3 | .106 | 3 |
| 252 | | | min | -144.702 | 1 | -169.083 | 3 | -47.387 | 1 | -.008 | 3 | -.124 | 1 | -.462 | 1 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 253 | | 13 | max | 15.414 | 3 | 260.565 | 1 | 36.081 | 5 | .026 | 1 | .012 | 3 | .231 | 3 |
| 254 | | | min | -144.702 | 1 | -113.759 | 3 | -17.358 | 9 | -.008 | 3 | -.15 | 1 | -.759 | 1 |
| 255 | | 14 | max | 15.414 | 3 | 114.282 | 1 | 39.853 | 4 | .026 | 1 | .001 | 3 | .308 | 3 |
| 256 | | | min | -144.702 | 1 | -58.434 | 3 | -10.869 | 3 | -.008 | 3 | -.146 | 1 | -.926 | 1 |
| 257 | | 15 | max | 15.414 | 3 | 2.481 | 5 | 57.791 | 1 | .026 | 1 | .019 | 5 | .335 | 3 |
| 258 | | | min | -144.702 | 1 | -32.002 | 1 | -8.965 | 3 | -.008 | 3 | -.11 | 1 | -.962 | 1 |
| 259 | | 16 | max | 15.414 | 3 | 52.215 | 3 | 92.851 | 1 | .026 | 1 | .056 | 5 | .313 | 3 |
| 260 | | | min | -144.702 | 1 | -178.285 | 1 | -7.061 | 3 | -.008 | 3 | -.043 | 1 | -.869 | 1 |
| 261 | | 17 | max | 15.414 | 3 | 107.539 | 3 | 127.91 | 1 | .026 | 1 | .1 | 4 | .242 | 3 |
| 262 | | | min | -144.702 | 1 | -324.569 | 1 | -5.157 | 3 | -.008 | 3 | -.02 | 3 | -.645 | 1 |
| 263 | | 18 | max | 15.414 | 3 | 162.863 | 3 | 162.97 | 1 | .026 | 1 | .184 | 1 | .122 | 3 |
| 264 | | | min | -144.702 | 1 | -470.852 | 1 | -3.254 | 3 | -.008 | 3 | -.024 | 3 | -.292 | 1 |
| 265 | | 19 | max | 15.414 | 3 | 218.188 | 3 | 198.029 | 1 | .026 | 1 | .345 | 1 | .192 | 1 |
| 266 | | | min | -144.702 | 1 | -617.136 | 1 | -1.35 | 3 | -.008 | 3 | -.026 | 3 | -.047 | 3 |
| 267 | M2 | 1 | max | 2311.78 | 1 | 445.812 | 3 | 150.24 | 1 | .004 | 5 | 1.312 | 5 | 8.571 | 1 |
| 268 | | | min | -1179.081 | 3 | -215.257 | 2 | -318.726 | 5 | -.002 | 1 | -.23 | 1 | -.451 | 3 |
| 269 | | 2 | max | 2309.223 | 1 | 445.812 | 3 | 150.24 | 1 | .004 | 5 | 1.222 | 5 | 8.55 | 1 |
| 270 | | | min | -1180.999 | 3 | -215.257 | 2 | -316.51 | 5 | -.002 | 1 | -.187 | 1 | -.576 | 3 |
| 271 | | 3 | max | 2306.665 | 1 | 445.812 | 3 | 150.24 | 1 | .004 | 5 | 1.134 | 5 | 8.529 | 1 |
| 272 | | | min | -1182.917 | 3 | -215.257 | 2 | -314.293 | 5 | -.002 | 1 | -.145 | 1 | -.701 | 3 |
| 273 | | 4 | max | 2304.108 | 1 | 445.812 | 3 | 150.24 | 1 | .004 | 5 | 1.046 | 5 | 8.509 | 1 |
| 274 | | | min | -1184.835 | 3 | -215.257 | 2 | -312.077 | 5 | -.002 | 1 | -.103 | 1 | -.826 | 3 |
| 275 | | 5 | max | 2301.55 | 1 | 445.812 | 3 | 150.24 | 1 | .004 | 5 | .961 | 4 | 8.488 | 1 |
| 276 | | | min | -1186.753 | 3 | -215.257 | 2 | -309.86 | 5 | -.002 | 1 | -.061 | 1 | -.952 | 3 |
| 277 | | 6 | max | 2298.993 | 1 | 445.812 | 3 | 150.24 | 1 | .004 | 5 | .88 | 4 | 8.467 | 1 |
| 278 | | | min | -1188.671 | 3 | -215.257 | 2 | -307.644 | 5 | -.002 | 1 | -.033 | 3 | -1.077 | 3 |
| 279 | | 7 | max | 2296.435 | 1 | 445.812 | 3 | 150.24 | 1 | .004 | 5 | .8 | 4 | 8.447 | 1 |
| 280 | | | min | -1190.59 | 3 | -215.257 | 2 | -305.427 | 5 | -.002 | 1 | -.062 | 3 | -1.202 | 3 |
| 281 | | 8 | max | 2293.878 | 1 | 445.812 | 3 | 150.24 | 1 | .004 | 5 | .721 | 4 | 8.426 | 1 |
| 282 | | | min | -1192.508 | 3 | -215.257 | 2 | -303.211 | 5 | -.002 | 1 | -.092 | 3 | -1.327 | 3 |
| 283 | | 9 | max | 2042.532 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .643 | 4 | 7.919 | 1 |
| 284 | | | min | -1103.589 | 3 | -460.056 | 3 | -292.84 | 5 | 0 | 3 | -.097 | 3 | -1.292 | 3 |
| 285 | | 10 | max | 2039.974 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .565 | 4 | 7.127 | 1 |
| 286 | | | min | -1105.507 | 3 | -460.056 | 3 | -290.624 | 5 | 0 | 3 | -.125 | 3 | -1.163 | 3 |
| 287 | | 11 | max | 2037.417 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .488 | 4 | 6.335 | 1 |
| 288 | | | min | -1107.425 | 3 | -460.056 | 3 | -288.407 | 5 | 0 | 3 | -.152 | 3 | -1.034 | 3 |
| 289 | | 12 | max | 2034.859 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .411 | 4 | 5.544 | 1 |
| 290 | | | min | -1109.343 | 3 | -460.056 | 3 | -286.191 | 5 | 0 | 3 | -.179 | 3 | -.904 | 3 |
| 291 | | 13 | max | 2032.302 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .335 | 4 | 4.752 | 1 |
| 292 | | | min | -1111.261 | 3 | -460.056 | 3 | -283.974 | 5 | 0 | 3 | -.206 | 3 | -.775 | 3 |
| 293 | | 14 | max | 2029.744 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .26 | 4 | 3.96 | 1 |
| 294 | | | min | -1113.179 | 3 | -460.056 | 3 | -281.758 | 5 | 0 | 3 | -.233 | 3 | -.646 | 3 |
| 295 | | 15 | max | 2027.187 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .239 | 1 | 3.168 | 1 |
| 296 | | | min | -1115.097 | 3 | -460.056 | 3 | -279.541 | 5 | 0 | 3 | -.26 | 3 | -.517 | 3 |
| 297 | | 16 | max | 2024.629 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .273 | 1 | 2.376 | 1 |
| 298 | | | min | -1117.016 | 3 | -460.056 | 3 | -277.325 | 5 | 0 | 3 | -.288 | 3 | -.388 | 3 |
| 299 | | 17 | max | 2022.072 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .306 | 1 | 1.584 | 1 |
| 300 | | | min | -1118.934 | 3 | -460.056 | 3 | -275.108 | 5 | 0 | 3 | -.315 | 3 | -.258 | 3 |
| 301 | | 18 | max | 2019.514 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .34 | 1 | .792 | 1 |
| 302 | | | min | -1120.852 | 3 | -460.056 | 3 | -272.892 | 5 | 0 | 3 | -.342 | 3 | -.129 | 3 |
| 303 | | 19 | max | 2016.957 | 1 | 2819.664 | 1 | 120.447 | 1 | .002 | 1 | .374 | 1 | 0 | 1 |
| 304 | | | min | -1122.77 | 3 | -460.056 | 3 | -270.676 | 5 | 0 | 3 | -.369 | 3 | 0 | 1 |
| 305 | M5 | 1 | max | 5788.008 | 1 | 1437.624 | 3 | 0 | 1 | .004 | 4 | 1.362 | 4 | 13.911 | 1 |
| 306 | | | min | -3433.282 | 3 | -1544.181 | 2 | -336.736 | 5 | 0 | 1 | 0 | 1 | -.469 | 3 |
| 307 | | 2 | max | 5785.45 | 1 | 1437.624 | 3 | 0 | 1 | .004 | 4 | 1.268 | 4 | 14.219 | 1 |
| 308 | | | min | -3435.2 | 3 | -1544.181 | 2 | -334.519 | 5 | 0 | 1 | 0 | 1 | -.873 | 3 |
| 309 | | 3 | max | 5782.893 | 1 | 1437.624 | 3 | 0 | 1 | .004 | 4 | 1.174 | 4 | 14.526 | 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 | -3437.118 | 3 | -1544.181 | 2 | -332.303 | 5 | 0 | 1 | 0 | 1 | -1.277 | 3 |
| 311 | | 4 | max | 5780.335 | 1 | 1437.624 | 3 | 0 | 1 | .004 | 4 | 1.082 | 4 | 14.834 | 1 |
| 312 | | | min | -3439.036 | 3 | -1544.181 | 2 | -330.086 | 5 | 0 | 1 | 0 | 1 | -1.681 | 3 |
| 313 | | 5 | max | 5777.778 | 1 | 1437.624 | 3 | 0 | 1 | .004 | 4 | .99 | 4 | 15.142 | 1 |
| 314 | | | min | -3440.954 | 3 | -1544.181 | 2 | -327.87 | 5 | 0 | 1 | 0 | 1 | -2.084 | 3 |
| 315 | | 6 | max | 5775.22 | 1 | 1437.624 | 3 | 0 | 1 | .004 | 4 | .898 | 4 | 15.45 | 1 |
| 316 | | | min | -3442.872 | 3 | -1544.181 | 2 | -325.653 | 5 | 0 | 1 | 0 | 1 | -2.488 | 3 |
| 317 | | 7 | max | 5772.663 | 1 | 1437.624 | 3 | 0 | 1 | .004 | 4 | .807 | 4 | 15.758 | 1 |
| 318 | | | min | -3444.79 | 3 | -1544.181 | 2 | -323.437 | 5 | 0 | 1 | 0 | 1 | -2.892 | 3 |
| 319 | | 8 | max | 5770.105 | 1 | 1437.624 | 3 | 0 | 1 | .004 | 4 | .717 | 4 | 16.066 | 1 |
| 320 | | | min | -3446.709 | 3 | -1544.181 | 2 | -321.22 | 5 | 0 | 1 | 0 | 1 | -3.296 | 3 |
| 321 | | 9 | max | 5258.31 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | .643 | 4 | 15.221 | 1 |
| 322 | | | min | -3175.041 | 3 | -1153.956 | 3 | -317.641 | 4 | 0 | 4 | 0 | 1 | -3.241 | 3 |
| 323 | | 10 | max | 5255.753 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | .554 | 4 | 13.699 | 1 |
| 324 | | | min | -3176.959 | 3 | -1153.956 | 3 | -315.424 | 4 | 0 | 4 | 0 | 1 | -2.917 | 3 |
| 325 | | 11 | max | 5253.196 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | .465 | 4 | 12.176 | 1 |
| 326 | | | min | -3178.877 | 3 | -1153.956 | 3 | -313.208 | 4 | 0 | 4 | 0 | 1 | -2.593 | 3 |
| 327 | | 12 | max | 5250.638 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | .378 | 4 | 10.654 | 1 |
| 328 | | | min | -3180.795 | 3 | -1153.956 | 3 | -310.991 | 4 | 0 | 4 | 0 | 1 | -2.269 | 3 |
| 329 | | 13 | max | 5248.081 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | .291 | 4 | 9.132 | 1 |
| 330 | | | min | -3182.713 | 3 | -1153.956 | 3 | -308.775 | 4 | 0 | 4 | 0 | 1 | -1.945 | 3 |
| 331 | | 14 | max | 5245.523 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | .204 | 4 | 7.61 | 1 |
| 332 | | | min | -3184.632 | 3 | -1153.956 | 3 | -306.558 | 4 | 0 | 4 | 0 | 1 | -1.621 | 3 |
| 333 | | 15 | max | 5242.966 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | .118 | 4 | 6.088 | 1 |
| 334 | | | min | -3186.55 | 3 | -1153.956 | 3 | -304.342 | 4 | 0 | 4 | 0 | 1 | -1.296 | 3 |
| 335 | | 16 | max | 5240.408 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | .033 | 4 | 4.566 | 1 |
| 336 | | | min | -3188.468 | 3 | -1153.956 | 3 | -302.125 | 4 | 0 | 4 | 0 | 1 | -.972 | 3 |
| 337 | | 17 | max | 5237.851 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 3.044 | 1 |
| 338 | | | min | -3190.386 | 3 | -1153.956 | 3 | -299.909 | 4 | 0 | 4 | -.052 | 5 | -.648 | 3 |
| 339 | | 18 | max | 5235.293 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1.522 | 1 |
| 340 | | | min | -3192.304 | 3 | -1153.956 | 3 | -297.693 | 4 | 0 | 4 | -.135 | 4 | -.324 | 3 |
| 341 | | 19 | max | 5232.736 | 1 | 5419.246 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 342 | | | min | -3194.222 | 3 | -1153.956 | 3 | -295.476 | 4 | 0 | 4 | -.218 | 4 | 0 | 1 |
| 343 | M8 | 1 | max | 2311.78 | 1 | 445.812 | 3 | 105.565 | 3 | .004 | 4 | 1.383 | 4 | 8.571 | 1 |
| 344 | | | min | -1179.081 | 3 | -215.257 | 2 | -355.314 | 4 | 0 | 3 | -.116 | 3 | -.451 | 3 |
| 345 | | 2 | max | 2309.223 | 1 | 445.812 | 3 | 105.565 | 3 | .004 | 4 | 1.283 | 4 | 8.55 | 1 |
| 346 | | | min | -1180.999 | 3 | -215.257 | 2 | -353.098 | 4 | 0 | 3 | -.086 | 3 | -.576 | 3 |
| 347 | | 3 | max | 2306.665 | 1 | 445.812 | 3 | 105.565 | 3 | .004 | 4 | 1.185 | 4 | 8.529 | 1 |
| 348 | | | min | -1182.917 | 3 | -215.257 | 2 | -350.881 | 4 | 0 | 3 | -.056 | 3 | -.701 | 3 |
| 349 | | 4 | max | 2304.108 | 1 | 445.812 | 3 | 105.565 | 3 | .004 | 4 | 1.086 | 4 | 8.509 | 1 |
| 350 | | | min | -1184.835 | 3 | -215.257 | 2 | -348.665 | 4 | 0 | 3 | -.027 | 3 | -.826 | 3 |
| 351 | | 5 | max | 2301.55 | 1 | 445.812 | 3 | 105.565 | 3 | .004 | 4 | .989 | 4 | 8.488 | 1 |
| 352 | | | min | -1186.753 | 3 | -215.257 | 2 | -346.448 | 4 | 0 | 3 | .002 | 12 | -.952 | 3 |
| 353 | | 6 | max | 2298.993 | 1 | 445.812 | 3 | 105.565 | 3 | .004 | 4 | .892 | 4 | 8.467 | 1 |
| 354 | | | min | -1188.671 | 3 | -215.257 | 2 | -344.232 | 4 | 0 | 3 | -.004 | 10 | -1.077 | 3 |
| 355 | | 7 | max | 2296.435 | 1 | 445.812 | 3 | 105.565 | 3 | .004 | 4 | .795 | 4 | 8.447 | 1 |
| 356 | | | min | -1190.59 | 3 | -215.257 | 2 | -342.016 | 4 | 0 | 3 | -.035 | 2 | -1.202 | 3 |
| 357 | | 8 | max | 2293.878 | 1 | 445.812 | 3 | 105.565 | 3 | .004 | 4 | .7 | 4 | 8.426 | 1 |
| 358 | | | min | -1192.508 | 3 | -215.257 | 2 | -339.799 | 4 | 0 | 3 | -.069 | 2 | -1.327 | 3 |
| 359 | | 9 | max | 2042.532 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .632 | 4 | 7.919 | 1 |
| 360 | | | min | -1103.589 | 3 | -460.056 | 3 | -326.566 | 4 | -.002 | 1 | -.037 | 2 | -1.292 | 3 |
| 361 | | 10 | max | 2039.974 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .54 | 4 | 7.127 | 1 |
| 362 | | | min | -1105.507 | 3 | -460.056 | 3 | -324.349 | 4 | -.002 | 1 | -.07 | 1 | -1.163 | 3 |
| 363 | | 11 | max | 2037.417 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .456 | 5 | 6.335 | 1 |
| 364 | | | min | -1107.425 | 3 | -460.056 | 3 | -322.133 | 4 | -.002 | 1 | -.103 | 1 | -1.034 | 3 |
| 365 | | 12 | max | 2034.859 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .372 | 5 | 5.544 | 1 |
| 366 | | | min | -1109.343 | 3 | -460.056 | 3 | -319.916 | 4 | -.002 | 1 | -.137 | 1 | -.904 | 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 | 2032.302 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .29 | 5 | 4.752 | 1 |
| 368 | | | min | -1111.261 | 3 | -460.056 | 3 | -317.7 | 4 | -.002 | 1 | -.171 | 1 | -.775 | 3 |
| 369 | | 14 | max | 2029.744 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .233 | 3 | 3.96 | 1 |
| 370 | | | min | -1113.179 | 3 | -460.056 | 3 | -315.483 | 4 | -.002 | 1 | -.205 | 1 | -.646 | 3 |
| 371 | | 15 | max | 2027.187 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .26 | 3 | 3.168 | 1 |
| 372 | | | min | -1115.097 | 3 | -460.056 | 3 | -313.267 | 4 | -.002 | 1 | -.239 | 1 | -.517 | 3 |
| 373 | | 16 | max | 2024.629 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .288 | 3 | 2.376 | 1 |
| 374 | | | min | -1117.016 | 3 | -460.056 | 3 | -311.05 | 4 | -.002 | 1 | -.273 | 1 | -.388 | 3 |
| 375 | | 17 | max | 2022.072 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .315 | 3 | 1.584 | 1 |
| 376 | | | min | -1118.934 | 3 | -460.056 | 3 | -308.834 | 4 | -.002 | 1 | -.306 | 1 | -.258 | 3 |
| 377 | | 18 | max | 2019.514 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .342 | 3 | .792 | 1 |
| 378 | | | min | -1120.852 | 3 | -460.056 | 3 | -306.617 | 4 | -.002 | 1 | -.34 | 1 | -.129 | 3 |
| 379 | | 19 | max | 2016.957 | 1 | 2819.664 | 1 | 96.784 | 3 | 0 | 3 | .369 | 3 | 0 | 1 |
| 380 | | | min | -1122.77 | 3 | -460.056 | 3 | -304.401 | 4 | -.002 | 1 | -.374 | 1 | 0 | 1 |
| 381 | M3 | 1 | max | 2742.169 | 1 | 6.095 | 4 | 28.5 | 1 | .023 | 3 | .004 | 4 | 0 | 1 |
| 382 | | | min | -911.666 | 3 | 1.433 | 15 | -9.211 | 3 | -.067 | 1 | 0 | 3 | 0 | 1 |
| 383 | | 2 | max | 2742.115 | 1 | 5.418 | 4 | 28.5 | 1 | .023 | 3 | .013 | 1 | 0 | 15 |
| 384 | | | min | -911.707 | 3 | 1.274 | 15 | -9.211 | 3 | -.067 | 1 | -.004 | 3 | -.002 | 4 |
| 385 | | 3 | max | 2742.061 | 1 | 4.741 | 4 | 28.5 | 1 | .023 | 3 | .023 | 1 | 0 | 15 |
| 386 | | | min | -911.747 | 3 | 1.114 | 15 | -9.211 | 3 | -.067 | 1 | -.008 | 3 | -.004 | 4 |
| 387 | | 4 | max | 2742.007 | 1 | 4.064 | 4 | 28.5 | 1 | .023 | 3 | .034 | 1 | -.001 | 15 |
| 388 | | | min | -911.788 | 3 | .955 | 15 | -9.211 | 3 | -.067 | 1 | -.011 | 3 | -.005 | 4 |
| 389 | | 5 | max | 2741.953 | 1 | 3.386 | 4 | 28.5 | 1 | .023 | 3 | .044 | 1 | -.002 | 15 |
| 390 | | | min | -911.828 | 3 | .796 | 15 | -9.211 | 3 | -.067 | 1 | -.014 | 3 | -.007 | 4 |
| 391 | | 6 | max | 2741.899 | 1 | 2.709 | 4 | 28.5 | 1 | .023 | 3 | .054 | 1 | -.002 | 15 |
| 392 | | | min | -911.869 | 3 | .637 | 15 | -9.211 | 3 | -.067 | 1 | -.017 | 3 | -.008 | 4 |
| 393 | | 7 | max | 2741.845 | 1 | 2.032 | 4 | 28.5 | 1 | .023 | 3 | .064 | 1 | -.002 | 15 |
| 394 | | | min | -911.909 | 3 | .478 | 15 | -9.211 | 3 | -.067 | 1 | -.021 | 3 | -.009 | 4 |
| 395 | | 8 | max | 2741.791 | 1 | 1.355 | 4 | 28.5 | 1 | .023 | 3 | .074 | 1 | -.002 | 15 |
| 396 | | | min | -911.95 | 3 | .318 | 15 | -9.211 | 3 | -.067 | 1 | -.024 | 3 | -.009 | 4 |
| 397 | | 9 | max | 2741.737 | 1 | .677 | 4 | 28.5 | 1 | .023 | 3 | .085 | 1 | -.002 | 15 |
| 398 | | | min | -911.99 | 3 | .159 | 15 | -9.211 | 3 | -.067 | 1 | -.027 | 3 | -.01 | 4 |
| 399 | | 10 | max | 2741.683 | 1 | 0 | 1 | 28.5 | 1 | .023 | 3 | .095 | 1 | -.002 | 15 |
| 400 | | | min | -912.031 | 3 | 0 | 1 | -9.211 | 3 | -.067 | 1 | -.031 | 3 | -.01 | 4 |
| 401 | | 11 | max | 2741.629 | 1 | -.159 | 15 | 28.5 | 1 | .023 | 3 | .105 | 1 | -.002 | 15 |
| 402 | | | min | -912.071 | 3 | -.677 | 6 | -9.211 | 3 | -.067 | 1 | -.034 | 3 | -.01 | 4 |
| 403 | | 12 | max | 2741.575 | 1 | -.318 | 15 | 28.5 | 1 | .023 | 3 | .115 | 1 | -.002 | 15 |
| 404 | | | min | -912.112 | 3 | -1.355 | 6 | -9.211 | 3 | -.067 | 1 | -.037 | 3 | -.009 | 4 |
| 405 | | 13 | max | 2741.521 | 1 | -.478 | 15 | 28.5 | 1 | .023 | 3 | .125 | 1 | -.002 | 15 |
| 406 | | | min | -912.152 | 3 | -2.032 | 6 | -9.211 | 3 | -.067 | 1 | -.04 | 3 | -.009 | 4 |
| 407 | | 14 | max | 2741.467 | 1 | -.637 | 15 | 28.5 | 1 | .023 | 3 | .136 | 1 | -.002 | 15 |
| 408 | | | min | -912.193 | 3 | -2.709 | 6 | -9.211 | 3 | -.067 | 1 | -.044 | 3 | -.008 | 4 |
| 409 | | 15 | max | 2741.413 | 1 | -.796 | 15 | 28.5 | 1 | .023 | 3 | .146 | 1 | -.002 | 15 |
| 410 | | | min | -912.233 | 3 | -3.386 | 6 | -9.211 | 3 | -.067 | 1 | -.047 | 3 | -.007 | 4 |
| 411 | | 16 | max | 2741.359 | 1 | -.955 | 15 | 28.5 | 1 | .023 | 3 | .156 | 1 | -.001 | 15 |
| 412 | | | min | -912.274 | 3 | -4.064 | 6 | -9.211 | 3 | -.067 | 1 | -.05 | 3 | -.005 | 4 |
| 413 | | 17 | max | 2741.305 | 1 | -1.114 | 15 | 28.5 | 1 | .023 | 3 | .166 | 1 | 0 | 15 |
| 414 | | | min | -912.314 | 3 | -4.741 | 6 | -9.211 | 3 | -.067 | 1 | -.054 | 3 | -.004 | 4 |
| 415 | | 18 | max | 2741.251 | 1 | -1.274 | 15 | 28.5 | 1 | .023 | 3 | .176 | 1 | 0 | 15 |
| 416 | | | min | -912.355 | 3 | -5.418 | 6 | -9.211 | 3 | -.067 | 1 | -.057 | 3 | -.002 | 4 |
| 417 | | 19 | max | 2741.197 | 1 | -1.433 | 15 | 28.5 | 1 | .023 | 3 | .186 | 1 | 0 | 1 |
| 418 | | | min | -912.395 | 3 | -6.095 | 6 | -9.211 | 3 | -.067 | 1 | -.06 | 3 | 0 | 1 |
| 419 | M6 | 1 | max | 6459.574 | 1 | 6.095 | 6 | 0 | 1 | .015 | 4 | .003 | 4 | 0 | 1 |
| 420 | | | min | -2614.714 | 3 | 1.433 | 15 | -9.946 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 421 | | 2 | max | 6459.52 | 1 | 5.418 | 6 | 0 | 1 | .015 | 4 | 0 | 1 | 0 | 15 |
| 422 | | | min | -2614.755 | 3 | 1.274 | 15 | -9.486 | 4 | 0 | 1 | 0 | 4 | -.002 | 6 |
| 423 | | 3 | max | 6459.466 | 1 | 4.741 | 6 | 0 | 1 | .015 | 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 | -2614.795 | 3 | 1.114 | 15 | -9.026 | 4 | 0 | 1 | -.004 | 4 | -.004 | 6 |
| 425 | | 4 | max | 6459.412 | 1 | 4.064 | 6 | 0 | 1 | .015 | 4 | 0 | 1 | -.001 | 15 |
| 426 | | | min | -2614.836 | 3 | .955 | 15 | -8.567 | 4 | 0 | 1 | -.007 | 4 | -.005 | 6 |
| 427 | | 5 | max | 6459.358 | 1 | 3.386 | 6 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 428 | | | min | -2614.876 | 3 | .796 | 15 | -8.107 | 4 | 0 | 1 | -.01 | 4 | -.007 | 6 |
| 429 | | 6 | max | 6459.304 | 1 | 2.709 | 6 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 430 | | | min | -2614.917 | 3 | .637 | 15 | -7.647 | 4 | 0 | 1 | -.013 | 4 | -.008 | 6 |
| 431 | | 7 | max | 6459.25 | 1 | 2.032 | 6 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 432 | | | min | -2614.957 | 3 | .478 | 15 | -7.187 | 4 | 0 | 1 | -.016 | 4 | -.009 | 6 |
| 433 | | 8 | max | 6459.196 | 1 | 1.355 | 6 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 434 | | | min | -2614.998 | 3 | .318 | 15 | -6.728 | 4 | 0 | 1 | -.018 | 4 | -.009 | 6 |
| 435 | | 9 | max | 6459.142 | 1 | .677 | 6 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 436 | | | min | -2615.038 | 3 | .159 | 15 | -6.268 | 4 | 0 | 1 | -.02 | 4 | -.01 | 6 |
| 437 | | 10 | max | 6459.088 | 1 | 0 | 1 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 438 | | | min | -2615.079 | 3 | 0 | 1 | -5.808 | 4 | 0 | 1 | -.022 | 4 | -.01 | 6 |
| 439 | | 11 | max | 6459.034 | 1 | -.159 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 440 | | | min | -2615.119 | 3 | -.677 | 4 | -5.348 | 4 | 0 | 1 | -.024 | 4 | -.01 | 6 |
| 441 | | 12 | max | 6458.98 | 1 | -.318 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 442 | | | min | -2615.16 | 3 | -1.355 | 4 | -4.889 | 4 | 0 | 1 | -.026 | 4 | -.009 | 6 |
| 443 | | 13 | max | 6458.926 | 1 | -.478 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 444 | | | min | -2615.2 | 3 | -2.032 | 4 | -4.429 | 4 | 0 | 1 | -.028 | 4 | -.009 | 6 |
| 445 | | 14 | max | 6458.872 | 1 | -.637 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 446 | | | min | -2615.241 | 3 | -2.709 | 4 | -3.969 | 4 | 0 | 1 | -.029 | 4 | -.008 | 6 |
| 447 | | 15 | max | 6458.818 | 1 | -.796 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | -.002 | 15 |
| 448 | | | min | -2615.281 | 3 | -3.386 | 4 | -3.509 | 4 | 0 | 1 | -.031 | 4 | -.007 | 6 |
| 449 | | 16 | max | 6458.764 | 1 | -.955 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | -.001 | 15 |
| 450 | | | min | -2615.322 | 3 | -4.064 | 4 | -3.05 | 4 | 0 | 1 | -.032 | 4 | -.005 | 6 |
| 451 | | 17 | max | 6458.71 | 1 | -1.114 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | 0 | 15 |
| 452 | | | min | -2615.362 | 3 | -4.741 | 4 | -2.59 | 4 | 0 | 1 | -.033 | 4 | -.004 | 6 |
| 453 | | 18 | max | 6458.656 | 1 | -1.274 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | 0 | 15 |
| 454 | | | min | -2615.403 | 3 | -5.418 | 4 | -2.13 | 4 | 0 | 1 | -.034 | 4 | -.002 | 6 |
| 455 | | 19 | max | 6458.602 | 1 | -1.433 | 15 | 0 | 1 | .015 | 4 | 0 | 1 | 0 | 1 |
| 456 | | | min | -2615.443 | 3 | -6.095 | 4 | -1.67 | 4 | 0 | 1 | -.035 | 4 | 0 | 1 |
| 457 | M9 | 1 | max | 2742.169 | 1 | 6.095 | 6 | 9.211 | 3 | .067 | 1 | .003 | 5 | 0 | 1 |
| 458 | | | min | -911.666 | 3 | 1.433 | 15 | -28.5 | 1 | -.023 | 3 | -.003 | 1 | 0 | 1 |
| 459 | | 2 | max | 2742.115 | 1 | 5.418 | 6 | 9.211 | 3 | .067 | 1 | .004 | 3 | 0 | 15 |
| 460 | | | min | -911.707 | 3 | 1.274 | 15 | -28.5 | 1 | -.023 | 3 | -.013 | 1 | -.002 | 6 |
| 461 | | 3 | max | 2742.061 | 1 | 4.741 | 6 | 9.211 | 3 | .067 | 1 | .008 | 3 | 0 | 15 |
| 462 | | | min | -911.747 | 3 | 1.114 | 15 | -28.5 | 1 | -.023 | 3 | -.023 | 1 | -.004 | 6 |
| 463 | | 4 | max | 2742.007 | 1 | 4.064 | 6 | 9.211 | 3 | .067 | 1 | .011 | 3 | -.001 | 15 |
| 464 | | | min | -911.788 | 3 | .955 | 15 | -28.5 | 1 | -.023 | 3 | -.034 | 1 | -.005 | 6 |
| 465 | | 5 | max | 2741.953 | 1 | 3.386 | 6 | 9.211 | 3 | .067 | 1 | .014 | 3 | -.002 | 15 |
| 466 | | | min | -911.828 | 3 | .796 | 15 | -28.5 | 1 | -.023 | 3 | -.044 | 1 | -.007 | 6 |
| 467 | | 6 | max | 2741.899 | 1 | 2.709 | 6 | 9.211 | 3 | .067 | 1 | .017 | 3 | -.002 | 15 |
| 468 | | | min | -911.869 | 3 | .637 | 15 | -28.5 | 1 | -.023 | 3 | -.054 | 1 | -.008 | 6 |
| 469 | | 7 | max | 2741.845 | 1 | 2.032 | 6 | 9.211 | 3 | .067 | 1 | .021 | 3 | -.002 | 15 |
| 470 | | | min | -911.909 | 3 | .478 | 15 | -28.5 | 1 | -.023 | 3 | -.064 | 1 | -.009 | 6 |
| 471 | | 8 | max | 2741.791 | 1 | 1.355 | 6 | 9.211 | 3 | .067 | 1 | .024 | 3 | -.002 | 15 |
| 472 | | | min | -911.95 | 3 | .318 | 15 | -28.5 | 1 | -.023 | 3 | -.074 | 1 | -.009 | 6 |
| 473 | | 9 | max | 2741.737 | 1 | .677 | 6 | 9.211 | 3 | .067 | 1 | .027 | 3 | -.002 | 15 |
| 474 | | | min | -911.99 | 3 | .159 | 15 | -28.5 | 1 | -.023 | 3 | -.085 | 1 | -.01 | 6 |
| 475 | | 10 | max | 2741.683 | 1 | 0 | 1 | 9.211 | 3 | .067 | 1 | .031 | 3 | -.002 | 15 |
| 476 | | | min | -912.031 | 3 | 0 | 1 | -28.5 | 1 | -.023 | 3 | -.095 | 1 | -.01 | 6 |
| 477 | | 11 | max | 2741.629 | 1 | -.159 | 15 | 9.211 | 3 | .067 | 1 | .034 | 3 | -.002 | 15 |
| 478 | | | min | -912.071 | 3 | -.677 | 4 | -28.5 | 1 | -.023 | 3 | -.105 | 1 | -.01 | 6 |
| 479 | | 12 | max | 2741.575 | 1 | -.318 | 15 | 9.211 | 3 | .067 | 1 | .037 | 3 | -.002 | 15 |
| 480 | | | min | -912.112 | 3 | -1.355 | 4 | -28.5 | 1 | -.023 | 3 | -.115 | 1 | -.009 | 6 |

## Envelope Member Section Forces (Continued)

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 481 | | 13 | max | 2741.521 | 1 | -.478 | 15 | 9.211 | 3 | .067 | 1 | .04 | 3 | -.002 | 15 |
| 482 | | | min | -912.152 | 3 | -2.032 | 4 | -28.5 | 1 | -.023 | 3 | -.125 | 1 | -.009 | 6 |
| 483 | | 14 | max | 2741.467 | 1 | -.637 | 15 | 9.211 | 3 | .067 | 1 | .044 | 3 | -.002 | 15 |
| 484 | | | min | -912.193 | 3 | -2.709 | 4 | -28.5 | 1 | -.023 | 3 | -.136 | 1 | -.008 | 6 |
| 485 | | 15 | max | 2741.413 | 1 | -.796 | 15 | 9.211 | 3 | .067 | 1 | .047 | 3 | -.002 | 15 |
| 486 | | | min | -912.233 | 3 | -3.386 | 4 | -28.5 | 1 | -.023 | 3 | -.146 | 1 | -.007 | 6 |
| 487 | | 16 | max | 2741.359 | 1 | -.955 | 15 | 9.211 | 3 | .067 | 1 | .05 | 3 | -.001 | 15 |
| 488 | | | min | -912.274 | 3 | -4.064 | 4 | -28.5 | 1 | -.023 | 3 | -.156 | 1 | -.005 | 6 |
| 489 | | 17 | max | 2741.305 | 1 | -1.114 | 15 | 9.211 | 3 | .067 | 1 | .054 | 3 | 0 | 15 |
| 490 | | | min | -912.314 | 3 | -4.741 | 4 | -28.5 | 1 | -.023 | 3 | -.166 | 1 | -.004 | 6 |
| 491 | | 18 | max | 2741.251 | 1 | -1.274 | 15 | 9.211 | 3 | .067 | 1 | .057 | 3 | 0 | 15 |
| 492 | | | min | -912.355 | 3 | -5.418 | 4 | -28.5 | 1 | -.023 | 3 | -.176 | 1 | -.002 | 6 |
| 493 | | 19 | max | 2741.197 | 1 | -1.433 | 15 | 9.211 | 3 | .067 | 1 | .06 | 3 | 0 | 1 |
| 494 | | | min | -912.395 | 3 | -6.095 | 4 | -28.5 | 1 | -.023 | 3 | -.186 | 1 | 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 | .062 | 3 | .264 | 3 | .012 | 1 | 8.56e-3 | 3 | 1611.781 | 12 | NC | 1 |
| 2 | | | min | -.507 | 1 | -1.459 | 1 | -.685 | 4 | -2.758e-2 | 1 | 76.414 | 1 | 232.399 | 5 |
| 3 | | 2 | max | .062 | 3 | .223 | 3 | 0 | 3 | 8.254e-3 | 3 | 2216.409 | 12 | NC | 2 |
| 4 | | | min | -.507 | 1 | -1.29 | 1 | -.66 | 4 | -2.633e-2 | 1 | 84.063 | 1 | 242.347 | 4 |
| 5 | | 3 | max | .062 | 3 | .184 | 3 | .002 | 3 | 7.655e-3 | 3 | 3486.841 | 12 | NC | 3 |
| 6 | | | min | -.507 | 1 | -1.124 | 1 | -.629 | 4 | -2.389e-2 | 1 | 93.207 | 1 | 256.068 | 4 |
| 7 | | 4 | max | .062 | 3 | .147 | 3 | .002 | 3 | 7.056e-3 | 3 | 7309.662 | 12 | NC | 3 |
| 8 | | | min | -.507 | 1 | -.969 | 1 | -.591 | 4 | -2.145e-2 | 1 | 103.829 | 1 | 274.732 | 4 |
| 9 | | 5 | max | .062 | 3 | .117 | 3 | .003 | 3 | 6.624e-3 | 3 | NC | 3 | NC | 3 |
| 10 | | | min | -.507 | 1 | -.83 | 1 | -.55 | 4 | -1.951e-2 | 1 | 115.608 | 1 | 298.889 | 4 |
| 11 | | 6 | max | .062 | 3 | .093 | 3 | .002 | 3 | 6.619e-3 | 3 | NC | 12 | NC | 2 |
| 12 | | | min | -.505 | 1 | -.71 | 1 | -.506 | 4 | -1.887e-2 | 1 | 128.135 | 1 | 329.087 | 4 |
| 13 | | 7 | max | .061 | 3 | .074 | 3 | .001 | 3 | 6.614e-3 | 3 | 6051.518 | 12 | NC | 1 |
| 14 | | | min | -.504 | 1 | -.603 | 1 | -.463 | 4 | -1.823e-2 | 1 | 141.797 | 1 | 365.546 | 4 |
| 15 | | 8 | max | .061 | 3 | .058 | 3 | 0 | 1 | 6.609e-3 | 3 | 4319.397 | 12 | NC | 1 |
| 16 | | | min | -.503 | 1 | -.504 | 1 | -.423 | 4 | -1.758e-2 | 1 | 157.394 | 1 | 407.052 | 5 |
| 17 | | 9 | max | .061 | 3 | .043 | 3 | 0 | 10 | 6.834e-3 | 3 | 3398.317 | 12 | NC | 1 |
| 18 | | | min | -.502 | 1 | -.407 | 1 | -.387 | 4 | -1.632e-2 | 1 | 176.486 | 1 | 454.408 | 5 |
| 19 | | 10 | max | .06 | 3 | .027 | 3 | .001 | 1 | 7.278e-3 | 3 | 2798.031 | 12 | NC | 1 |
| 20 | | | min | -.501 | 1 | -.308 | 1 | -.348 | 4 | -1.446e-2 | 1 | 201.157 | 1 | 518.863 | 5 |
| 21 | | 11 | max | .06 | 3 | .012 | 3 | .001 | 1 | 7.721e-3 | 3 | 2460.294 | 15 | NC | 1 |
| 22 | | | min | -.5 | 1 | -.209 | 1 | -.308 | 4 | -1.261e-2 | 1 | 234.254 | 1 | 606.999 | 5 |
| 23 | | 12 | max | .06 | 3 | -.003 | 12 | .003 | 3 | 7.003e-3 | 3 | 2816.607 | 15 | NC | 1 |
| 24 | | | min | -.499 | 1 | -.108 | 1 | -.27 | 4 | -1.021e-2 | 1 | 281.127 | 1 | 729.024 | 5 |
| 25 | | 13 | max | .059 | 3 | -.001 | 15 | .006 | 3 | 5.052e-3 | 3 | 3296.038 | 15 | NC | 1 |
| 26 | | | min | -.497 | 1 | -.018 | 3 | -.227 | 4 | -7.217e-3 | 1 | 350.576 | 1 | 932.928 | 5 |
| 27 | | 14 | max | .059 | 3 | .086 | 1 | .009 | 3 | 3.102e-3 | 3 | 3971.674 | 15 | NC | 1 |
| 28 | | | min | -.496 | 1 | -.025 | 3 | -.185 | 4 | -4.404e-3 | 4 | 456.965 | 1 | 1291.46 | 5 |
| 29 | | 15 | max | .059 | 3 | .17 | 1 | .009 | 3 | 1.151e-3 | 3 | 4987.862 | 15 | NC | 1 |
| 30 | | | min | -.495 | 1 | -.021 | 3 | -.147 | 4 | -4.992e-3 | 4 | 626.136 | 1 | 1940.213 | 5 |
| 31 | | 16 | max | .059 | 3 | .239 | 1 | .009 | 1 | 3.155e-3 | 3 | 6675.531 | 15 | NC | 2 |
| 32 | | | min | -.495 | 1 | -.002 | 3 | -.118 | 4 | -4.419e-3 | 4 | 901.376 | 1 | 3111.169 | 5 |
| 33 | | 17 | max | .059 | 3 | .297 | 1 | .012 | 1 | 5.623e-3 | 3 | NC | 15 | NC | 2 |
| 34 | | | min | -.495 | 1 | .018 | 12 | -.097 | 5 | -3.752e-3 | 1 | 1423.641 | 1 | 5562.36 | 5 |
| 35 | | 18 | max | .059 | 3 | .348 | 1 | .006 | 1 | 8.091e-3 | 3 | NC | 5 | NC | 2 |
| 36 | | | min | -.495 | 1 | .034 | 15 | -.084 | 4 | -5.245e-3 | 1 | 2910.694 | 1 | 9406.51 | 1 |
| 37 | | 19 | max | .059 | 3 | .396 | 1 | 0 | 12 | 9.349e-3 | 3 | NC | 1 | NC | 1 |
| 38 | | | min | -.495 | 1 | .042 | 15 | -.076 | 4 | -6.006e-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 | .141 | 3 | .592 | 3 | 0 | 1 | 7.58e-4 | 4 | 1577.621 | 15 | NC | 1 |
| 40 | | | min | -.918 | 1 | -2.713 | 1 | -.683 | 4 | 0 | 1 | 43.284 | 1 | 232.709 | 4 |
| 41 | | 2 | max | .141 | 3 | .506 | 3 | 0 | 1 | 6.273e-4 | 4 | 1736.059 | 15 | NC | 1 |
| 42 | | | min | -.918 | 1 | -2.399 | 1 | -.662 | 4 | 0 | 1 | 47.877 | 1 | 241.297 | 4 |
| 43 | | 3 | max | .141 | 3 | .422 | 3 | 0 | 1 | 3.723e-4 | 5 | 1926.119 | 15 | NC | 1 |
| 44 | | | min | -.917 | 1 | -2.091 | 1 | -.631 | 4 | 0 | 1 | 53.44 | 1 | 254.474 | 4 |
| 45 | | 4 | max | .141 | 3 | .347 | 3 | 0 | 1 | 1.184e-4 | 5 | 3698.592 | 12 | NC | 1 |
| 46 | | | min | -.917 | 1 | -1.803 | 1 | -.593 | 4 | 0 | 1 | 59.941 | 1 | 273.107 | 4 |
| 47 | | 5 | max | .141 | 3 | .285 | 3 | 0 | 1 | 0 | 1 | NC | 3 | NC | 1 |
| 48 | | | min | -.917 | 1 | -1.551 | 1 | -.55 | 4 | -3.845e-5 | 4 | 67.101 | 1 | 297.773 | 4 |
| 49 | | 6 | max | .14 | 3 | .241 | 3 | 0 | 1 | 7.726e-5 | 5 | 5891.582 | 12 | NC | 1 |
| 50 | | | min | -.914 | 1 | -1.34 | 1 | -.506 | 4 | 0 | 1 | 74.555 | 1 | 328.624 | 4 |
| 51 | | 7 | max | .139 | 3 | .206 | 3 | 0 | 1 | 1.88e-4 | 5 | 3205.482 | 12 | NC | 1 |
| 52 | | | min | -.912 | 1 | -1.155 | 1 | -.462 | 4 | 0 | 1 | 82.585 | 1 | 365.454 | 4 |
| 53 | | 8 | max | .138 | 3 | .176 | 3 | 0 | 1 | 2.991e-4 | 4 | 3246.68 | 15 | NC | 1 |
| 54 | | | min | -.909 | 1 | -.982 | 1 | -.423 | 4 | 0 | 1 | 91.835 | 1 | 406.947 | 4 |
| 55 | | 9 | max | .137 | 3 | .144 | 3 | 0 | 1 | 2.79e-4 | 4 | 3659.489 | 15 | NC | 1 |
| 56 | | | min | -.907 | 1 | -.806 | 1 | -.387 | 4 | 0 | 1 | 103.641 | 1 | 452.743 | 4 |
| 57 | | 10 | max | .136 | 3 | .108 | 3 | 0 | 1 | 1.351e-4 | 5 | 4224.705 | 15 | NC | 1 |
| 58 | | | min | -.904 | 1 | -.621 | 1 | -.348 | 4 | 0 | 1 | 119.893 | 1 | 518.592 | 4 |
| 59 | | 11 | max | .135 | 3 | .067 | 3 | 0 | 1 | 0 | 1 | 5034.811 | 15 | NC | 1 |
| 60 | | | min | -.902 | 1 | -.428 | 1 | -.307 | 4 | -1.07e-5 | 4 | 143.31 | 1 | 608.183 | 4 |
| 61 | | 12 | max | .134 | 3 | .021 | 3 | 0 | 1 | 0 | 1 | 6283.501 | 15 | NC | 1 |
| 62 | | | min | -.899 | 1 | -.227 | 1 | -.271 | 4 | -7.375e-4 | 4 | 179.673 | 1 | 722.438 | 4 |
| 63 | | 13 | max | .133 | 3 | 0 | 15 | 0 | 1 | 0 | 1 | 8348.357 | 15 | NC | 1 |
| 64 | | | min | -.896 | 1 | -.031 | 2 | -.229 | 4 | -2.082e-3 | 4 | 240.442 | 1 | 916.363 | 4 |
| 65 | | 14 | max | .133 | 3 | .155 | 1 | 0 | 1 | 0 | 1 | NC | 15 | NC | 1 |
| 66 | | | min | -.894 | 1 | -.049 | 3 | -.186 | 4 | -3.427e-3 | 4 | 348.502 | 1 | 1265.23 | 4 |
| 67 | | 15 | max | .132 | 3 | .305 | 1 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 68 | | | min | -.891 | 1 | -.047 | 3 | -.149 | 4 | -4.772e-3 | 4 | 442.32 | 3 | 1907.049 | 4 |
| 69 | | 16 | max | .132 | 3 | .409 | 1 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 70 | | | min | -.891 | 1 | -.003 | 3 | -.12 | 4 | -3.775e-3 | 4 | 513.236 | 3 | 3090.368 | 4 |
| 71 | | 17 | max | .132 | 3 | .477 | 1 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 72 | | | min | -.891 | 1 | .014 | 15 | -.099 | 4 | -2.504e-3 | 4 | 712.024 | 3 | 5675.564 | 4 |
| 73 | | 18 | max | .132 | 3 | .523 | 1 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 74 | | | min | -.891 | 1 | .015 | 15 | -.085 | 4 | -1.232e-3 | 4 | 1382.651 | 3 | NC | 1 |
| 75 | | 19 | max | .132 | 3 | .561 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 76 | | | min | -.891 | 1 | .016 | 15 | -.074 | 4 | -5.84e-4 | 4 | NC | 1 | NC | 1 |
| 77 | M7 | 1 | max | .062 | 3 | .264 | 3 | .001 | 3 | 2.758e-2 | 1 | NC | 5 | NC | 1 |
| 78 | | | min | -.507 | 1 | -1.459 | 1 | -.69 | 4 | -8.56e-3 | 3 | 76.414 | 1 | 229.091 | 4 |
| 79 | | 2 | max | .062 | 3 | .223 | 3 | .008 | 1 | 2.633e-2 | 1 | NC | 5 | NC | 2 |
| 80 | | | min | -.507 | 1 | -1.29 | 1 | -.657 | 4 | -8.254e-3 | 3 | 84.063 | 1 | 242.049 | 4 |
| 81 | | 3 | max | .062 | 3 | .184 | 3 | .019 | 1 | 2.389e-2 | 1 | NC | 5 | NC | 3 |
| 82 | | | min | -.507 | 1 | -1.124 | 1 | -.621 | 4 | -7.655e-3 | 3 | 93.207 | 1 | 257.827 | 4 |
| 83 | | 4 | max | .062 | 3 | .147 | 3 | .021 | 1 | 2.145e-2 | 1 | NC | 5 | NC | 3 |
| 84 | | | min | -.507 | 1 | -.969 | 1 | -.582 | 4 | -7.056e-3 | 3 | 103.829 | 1 | 277.223 | 4 |
| 85 | | 5 | max | .062 | 3 | .117 | 3 | .019 | 1 | 1.951e-2 | 1 | NC | 3 | NC | 3 |
| 86 | | | min | -.507 | 1 | -.83 | 1 | -.542 | 4 | -6.624e-3 | 3 | 115.608 | 1 | 301.055 | 4 |
| 87 | | 6 | max | .062 | 3 | .093 | 3 | .012 | 1 | 1.887e-2 | 1 | NC | 5 | NC | 2 |
| 88 | | | min | -.505 | 1 | -.71 | 1 | -.501 | 4 | -6.619e-3 | 3 | 128.135 | 1 | 329.406 | 4 |
| 89 | | 7 | max | .061 | 3 | .074 | 3 | .004 | 1 | 1.823e-2 | 1 | NC | 5 | NC | 1 |
| 90 | | | min | -.504 | 1 | -.603 | 1 | -.462 | 4 | -6.614e-3 | 3 | 141.797 | 1 | 362.761 | 4 |
| 91 | | 8 | max | .061 | 3 | .058 | 3 | 0 | 10 | 1.758e-2 | 1 | NC | 5 | NC | 1 |
| 92 | | | min | -.503 | 1 | -.504 | 1 | -.424 | 4 | -6.609e-3 | 3 | 157.394 | 1 | 401.956 | 4 |
| 93 | | 9 | max | .061 | 3 | .043 | 3 | 0 | 3 | 1.632e-2 | 1 | NC | 5 | NC | 1 |
| 94 | | | min | -.502 | 1 | -.407 | 1 | -.387 | 4 | -6.834e-3 | 3 | 176.486 | 1 | 448.773 | 4 |
| 95 | | 10 | max | .06 | 3 | .027 | 3 | 0 | 3 | 1.446e-2 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96 | | | min | -.501 | 1 | -.308 | 1 | -.348 | 4 | -7.278e-3 | 3 | 201.157 | 1 | 511.23 | 4 |
| 97 | | 11 | max | .06 | 3 | .012 | 3 | 0 | 3 | 1.261e-2 | 1 | NC | 5 | NC | 1 |
| 98 | | | min | -.5 | 1 | -.209 | 1 | -.308 | 4 | -7.721e-3 | 3 | 234.254 | 1 | 597.147 | 4 |
| 99 | | 12 | max | .06 | 3 | .002 | 5 | .005 | 1 | 1.021e-2 | 1 | NC | 5 | NC | 1 |
| 100 | | | min | -.499 | 1 | -.108 | 1 | -.268 | 4 | -7.003e-3 | 3 | 281.127 | 1 | 721.005 | 4 |
| 101 | | 13 | max | .059 | 3 | 0 | 5 | .007 | 1 | 7.217e-3 | 1 | NC | 5 | NC | 1 |
| 102 | | | min | -.497 | 1 | -.018 | 3 | -.224 | 4 | -5.052e-3 | 3 | 350.576 | 1 | 924.629 | 4 |
| 103 | | 14 | max | .059 | 3 | .086 | 1 | .005 | 1 | 4.227e-3 | 1 | NC | 5 | NC | 1 |
| 104 | | | min | -.496 | 1 | -.025 | 3 | -.183 | 4 | -3.39e-3 | 5 | 456.965 | 1 | 1270.106 | 4 |
| 105 | | 15 | max | .059 | 3 | .17 | 1 | .001 | 2 | 1.238e-3 | 1 | NC | 5 | NC | 1 |
| 106 | | | min | -.495 | 1 | -.021 | 3 | -.148 | 4 | -4.644e-3 | 5 | 626.136 | 1 | 1853.431 | 4 |
| 107 | | 16 | max | .059 | 3 | .239 | 1 | -.001 | 10 | 2.26e-3 | 1 | NC | 4 | NC | 2 |
| 108 | | | min | -.495 | 1 | -.008 | 5 | -.122 | 4 | -3.812e-3 | 5 | 901.376 | 1 | 2784.64 | 4 |
| 109 | | 17 | max | .059 | 3 | .297 | 1 | -.002 | 12 | 3.752e-3 | 1 | NC | 4 | NC | 2 |
| 110 | | | min | -.495 | 1 | -.013 | 5 | -.103 | 4 | -5.623e-3 | 3 | 1423.641 | 1 | 4499.139 | 4 |
| 111 | | 18 | max | .059 | 3 | .348 | 1 | 0 | 12 | 5.245e-3 | 1 | NC | 4 | NC | 2 |
| 112 | | | min | -.495 | 1 | -.018 | 5 | -.087 | 4 | -8.091e-3 | 3 | 2910.694 | 1 | 9188.418 | 4 |
| 113 | | 19 | max | .059 | 3 | .396 | 1 | .01 | 1 | 6.006e-3 | 1 | NC | 1 | NC | 1 |
| 114 | | | min | -.495 | 1 | -.023 | 5 | -.071 | 4 | -9.349e-3 | 3 | 4433.271 | 5 | NC | 1 |
| 115 | M10 | 1 | max | .001 | 1 | .372 | 1 | .495 | 1 | 6.202e-3 | 1 | NC | 1 | NC | 1 |
| 116 | | | min | -.079 | 4 | -.021 | 5 | -.059 | 3 | -6.981e-4 | 5 | NC | 1 | NC | 1 |
| 117 | | 2 | max | 0 | 1 | .309 | 1 | .539 | 1 | 6.068e-3 | 1 | NC | 4 | NC | 3 |
| 118 | | | min | -.079 | 4 | -.011 | 5 | -.059 | 3 | -5.937e-4 | 5 | 1889.969 | 3 | 4409.596 | 1 |
| 119 | | 3 | max | 0 | 1 | .282 | 3 | .607 | 1 | 6.896e-3 | 3 | NC | 4 | NC | 3 |
| 120 | | | min | -.079 | 4 | -.005 | 5 | -.064 | 3 | -4.893e-4 | 5 | 991.817 | 3 | 1716.147 | 1 |
| 121 | | 4 | max | 0 | 1 | .349 | 3 | .684 | 1 | 7.762e-3 | 3 | NC | 4 | NC | 3 |
| 122 | | | min | -.079 | 4 | -.001 | 5 | -.073 | 3 | -3.85e-4 | 5 | 736.969 | 3 | 1018.318 | 1 |
| 123 | | 5 | max | 0 | 1 | .382 | 3 | .756 | 1 | 8.628e-3 | 3 | NC | 4 | NC | 5 |
| 124 | | | min | -.079 | 4 | 0 | 15 | -.084 | 3 | -2.806e-4 | 5 | 653.46 | 3 | 735.615 | 1 |
| 125 | | 6 | max | 0 | 1 | .38 | 3 | .816 | 1 | 9.495e-3 | 3 | NC | 4 | NC | 5 |
| 126 | | | min | -.079 | 4 | .003 | 15 | -.096 | 3 | -1.762e-4 | 5 | 658.132 | 3 | 598.793 | 1 |
| 127 | | 7 | max | 0 | 1 | .359 | 1 | .858 | 1 | 1.036e-2 | 3 | NC | 1 | NC | 5 |
| 128 | | | min | -.079 | 4 | .005 | 15 | -.109 | 3 | -7.183e-5 | 5 | 740.17 | 3 | 529.251 | 1 |
| 129 | | 8 | max | 0 | 1 | .44 | 1 | .882 | 1 | 1.123e-2 | 3 | NC | 4 | NC | 5 |
| 130 | | | min | -.079 | 4 | .008 | 15 | -.12 | 3 | 1.501e-5 | 15 | 919.493 | 3 | 496.585 | 1 |
| 131 | | 9 | max | 0 | 1 | .511 | 1 | .89 | 1 | 1.209e-2 | 3 | NC | 5 | NC | 5 |
| 132 | | | min | -.079 | 4 | .012 | 15 | -.128 | 3 | 8.543e-5 | 15 | 1208.872 | 3 | 485.58 | 1 |
| 133 | | 10 | max | 0 | 1 | .542 | 1 | .891 | 1 | 1.296e-2 | 3 | NC | 5 | NC | 5 |
| 134 | | | min | -.079 | 4 | .016 | 15 | -.132 | 3 | 1.558e-4 | 15 | 1130.824 | 1 | 484.657 | 1 |
| 135 | | 11 | max | 0 | 3 | .511 | 1 | .89 | 1 | 1.209e-2 | 3 | NC | 5 | NC | 15 |
| 136 | | | min | -.079 | 4 | .018 | 15 | -.128 | 3 | 2.38e-4 | 15 | 1208.872 | 3 | 485.58 | 1 |
| 137 | | 12 | max | 0 | 3 | .44 | 1 | .882 | 1 | 1.123e-2 | 3 | NC | 4 | NC | 15 |
| 138 | | | min | -.079 | 4 | .018 | 15 | -.12 | 3 | 3.201e-4 | 15 | 919.493 | 3 | 496.585 | 1 |
| 139 | | 13 | max | 0 | 3 | .359 | 1 | .858 | 1 | 1.036e-2 | 3 | NC | 1 | NC | 15 |
| 140 | | | min | -.079 | 4 | .017 | 15 | -.109 | 3 | 4.022e-4 | 15 | 740.17 | 3 | 529.251 | 1 |
| 141 | | 14 | max | 0 | 3 | .38 | 3 | .816 | 1 | 9.495e-3 | 3 | NC | 5 | NC | 5 |
| 142 | | | min | -.079 | 4 | .015 | 15 | -.096 | 3 | 4.843e-4 | 15 | 658.132 | 3 | 598.793 | 1 |
| 143 | | 15 | max | 0 | 3 | .382 | 3 | .756 | 1 | 8.628e-3 | 3 | NC | 5 | NC | 5 |
| 144 | | | min | -.079 | 4 | .015 | 15 | -.084 | 3 | 5.664e-4 | 15 | 653.46 | 3 | 735.615 | 1 |
| 145 | | 16 | max | 0 | 3 | .349 | 3 | .684 | 1 | 7.762e-3 | 3 | NC | 5 | NC | 3 |
| 146 | | | min | -.079 | 4 | .017 | 15 | -.073 | 3 | 6.485e-4 | 15 | 736.969 | 3 | 1018.318 | 1 |
| 147 | | 17 | max | 0 | 3 | .282 | 3 | .607 | 1 | 6.896e-3 | 3 | NC | 5 | NC | 3 |
| 148 | | | min | -.079 | 4 | .021 | 15 | -.064 | 3 | 7.307e-4 | 15 | 991.817 | 3 | 1716.147 | 1 |
| 149 | | 18 | max | 0 | 3 | .309 | 1 | .539 | 1 | 6.068e-3 | 1 | NC | 5 | NC | 3 |
| 150 | | | min | -.079 | 4 | .028 | 15 | -.059 | 3 | 8.128e-4 | 15 | 1889.969 | 3 | 4409.596 | 1 |
| 151 | | 19 | max | 0 | 3 | .372 | 1 | .495 | 1 | 6.202e-3 | 1 | NC | 1 | NC | 1 |
| 152 | | | min | -.079 | 4 | .038 | 15 | -.059 | 3 | 8.949e-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 | .002 | 1 | .004 | 3 | .499 | 1 | 1.28e-2 | 1 | NC | 1 | NC | 1 |
| 154 | | | min | -.288 | 4 | -.157 | 1 | -.06 | 3 | -1.989e-3 | 3 | NC | 1 | NC | 1 |
| 155 | | 2 | max | .001 | 1 | .09 | 3 | .532 | 1 | 1.42e-2 | 1 | NC | 4 | NC | 3 |
| 156 | | | min | -.288 | 4 | -.28 | 1 | -.065 | 3 | -2.402e-3 | 3 | 1562.575 | 1 | 4710.011 | 4 |
| 157 | | 3 | max | .001 | 1 | .167 | 3 | .595 | 1 | 1.559e-2 | 1 | NC | 5 | NC | 3 |
| 158 | | | min | -.288 | 4 | -.387 | 1 | -.072 | 3 | -2.815e-3 | 3 | 835.611 | 1 | 2004.448 | 1 |
| 159 | | 4 | max | .001 | 1 | .22 | 3 | .671 | 1 | 1.698e-2 | 1 | NC | 5 | NC | 12 |
| 160 | | | min | -.288 | 4 | -.463 | 1 | -.082 | 3 | -3.228e-3 | 3 | 628.128 | 1 | 1120.21 | 1 |
| 161 | | 5 | max | 0 | 1 | .239 | 3 | .745 | 1 | 1.838e-2 | 1 | NC | 5 | NC | 12 |
| 162 | | | min | -.288 | 4 | -.5 | 1 | -.092 | 3 | -3.641e-3 | 3 | 560.279 | 1 | 780.529 | 1 |
| 163 | | 6 | max | 0 | 1 | .225 | 3 | .809 | 1 | 1.977e-2 | 1 | NC | 5 | NC | 5 |
| 164 | | | min | -.288 | 4 | -.497 | 1 | -.104 | 3 | -4.054e-3 | 3 | 564.576 | 1 | 619.666 | 1 |
| 165 | | 7 | max | 0 | 1 | .183 | 3 | .856 | 1 | 2.117e-2 | 1 | NC | 5 | NC | 5 |
| 166 | | | min | -.288 | 4 | -.461 | 1 | -.115 | 3 | -4.467e-3 | 3 | 631.073 | 1 | 537.545 | 1 |
| 167 | | 8 | max | 0 | 1 | .125 | 3 | .885 | 1 | 2.256e-2 | 1 | NC | 5 | NC | 7 |
| 168 | | | min | -.288 | 4 | -.406 | 1 | -.125 | 3 | -4.88e-3 | 3 | 771.949 | 1 | 497.24 | 1 |
| 169 | | 9 | max | 0 | 1 | .069 | 3 | .898 | 1 | 2.396e-2 | 1 | NC | 5 | NC | 5 |
| 170 | | | min | -.288 | 4 | -.351 | 1 | -.132 | 3 | -5.293e-3 | 3 | 988.726 | 1 | 481.489 | 1 |
| 171 | | 10 | max | 0 | 1 | .044 | 3 | .9 | 1 | 2.535e-2 | 1 | NC | 5 | NC | 5 |
| 172 | | | min | -.289 | 4 | -.326 | 1 | -.135 | 3 | -5.706e-3 | 3 | 1139.683 | 1 | 478.724 | 1 |
| 173 | | 11 | max | 0 | 3 | .069 | 3 | .898 | 1 | 2.396e-2 | 1 | NC | 5 | 6486.387 | 15 |
| 174 | | | min | -.289 | 4 | -.351 | 1 | -.132 | 3 | -5.293e-3 | 3 | 988.726 | 1 | 481.489 | 1 |
| 175 | | 12 | max | 0 | 3 | .125 | 3 | .885 | 1 | 2.256e-2 | 1 | NC | 5 | 5709.691 | 15 |
| 176 | | | min | -.289 | 4 | -.406 | 1 | -.125 | 3 | -4.88e-3 | 3 | 771.949 | 1 | 497.24 | 1 |
| 177 | | 13 | max | 0 | 3 | .183 | 3 | .856 | 1 | 2.117e-2 | 1 | NC | 5 | 7280.397 | 15 |
| 178 | | | min | -.288 | 4 | -.461 | 1 | -.115 | 3 | -4.467e-3 | 3 | 631.073 | 1 | 537.545 | 1 |
| 179 | | 14 | max | 0 | 3 | .225 | 3 | .809 | 1 | 1.977e-2 | 1 | NC | 15 | NC | 5 |
| 180 | | | min | -.288 | 4 | -.497 | 1 | -.104 | 3 | -4.054e-3 | 3 | 564.576 | 1 | 619.666 | 1 |
| 181 | | 15 | max | 0 | 3 | .239 | 3 | .745 | 1 | 1.838e-2 | 1 | NC | 15 | NC | 5 |
| 182 | | | min | -.288 | 4 | -.5 | 1 | -.092 | 3 | -3.641e-3 | 3 | 560.279 | 1 | 780.529 | 1 |
| 183 | | 16 | max | 0 | 3 | .22 | 3 | .671 | 1 | 1.698e-2 | 1 | NC | 15 | NC | 4 |
| 184 | | | min | -.288 | 4 | -.463 | 1 | -.082 | 3 | -3.228e-3 | 3 | 628.128 | 1 | 1120.21 | 1 |
| 185 | | 17 | max | 0 | 3 | .167 | 3 | .595 | 1 | 1.559e-2 | 1 | NC | 7 | NC | 3 |
| 186 | | | min | -.288 | 4 | -.387 | 1 | -.072 | 3 | -2.815e-3 | 3 | 835.611 | 1 | 2004.448 | 1 |
| 187 | | 18 | max | 0 | 3 | .09 | 3 | .532 | 1 | 1.42e-2 | 1 | NC | 5 | NC | 3 |
| 188 | | | min | -.288 | 4 | -.28 | 1 | -.065 | 3 | -2.402e-3 | 3 | 1562.575 | 1 | 5853.801 | 1 |
| 189 | | 19 | max | 0 | 3 | .004 | 3 | .499 | 1 | 1.28e-2 | 1 | NC | 1 | NC | 1 |
| 190 | | | min | -.288 | 4 | -.157 | 1 | -.06 | 3 | -1.989e-3 | 3 | NC | 1 | NC | 1 |
| 191 | M12 | 1 | max | 0 | 3 | .051 | 3 | .503 | 1 | 1.24e-2 | 1 | NC | 1 | NC | 1 |
| 192 | | | min | -.406 | 4 | -.457 | 1 | -.061 | 3 | -1.957e-3 | 3 | NC | 1 | NC | 1 |
| 193 | | 2 | max | 0 | 3 | .118 | 3 | .53 | 1 | 1.35e-2 | 1 | NC | 5 | NC | 2 |
| 194 | | | min | -.406 | 4 | -.639 | 1 | -.062 | 3 | -2.191e-3 | 3 | 1053.402 | 1 | 5217.276 | 4 |
| 195 | | 3 | max | 0 | 3 | .175 | 3 | .591 | 1 | 1.461e-2 | 1 | NC | 5 | NC | 3 |
| 196 | | | min | -.406 | 4 | -.802 | 1 | -.068 | 3 | -2.426e-3 | 3 | 556.636 | 1 | 2177.097 | 1 |
| 197 | | 4 | max | 0 | 3 | .215 | 3 | .666 | 1 | 1.572e-2 | 1 | NC | 5 | NC | 3 |
| 198 | | | min | -.406 | 4 | -.927 | 1 | -.077 | 3 | -2.66e-3 | 3 | 408.615 | 1 | 1174.141 | 1 |
| 199 | | 5 | max | 0 | 3 | .235 | 3 | .742 | 1 | 1.682e-2 | 1 | NC | 5 | NC | 12 |
| 200 | | | min | -.406 | 4 | -1.004 | 1 | -.088 | 3 | -2.895e-3 | 3 | 350.898 | 1 | 801.897 | 1 |
| 201 | | 6 | max | 0 | 3 | .236 | 3 | .808 | 1 | 1.793e-2 | 1 | NC | 5 | NC | 5 |
| 202 | | | min | -.406 | 4 | -1.032 | 1 | -.101 | 3 | -3.13e-3 | 3 | 333.92 | 1 | 628.196 | 1 |
| 203 | | 7 | max | 0 | 3 | .221 | 3 | .859 | 1 | 1.904e-2 | 1 | NC | 5 | NC | 5 |
| 204 | | | min | -.406 | 4 | -1.017 | 1 | -.114 | 3 | -3.364e-3 | 3 | 343.044 | 1 | 539.653 | 1 |
| 205 | | 8 | max | 0 | 3 | .197 | 3 | .89 | 1 | 2.014e-2 | 1 | NC | 5 | NC | 5 |
| 206 | | | min | -.406 | 4 | -.973 | 1 | -.126 | 3 | -3.599e-3 | 3 | 372.242 | 1 | 495.552 | 1 |
| 207 | | 9 | max | 0 | 3 | .173 | 3 | .905 | 1 | 2.125e-2 | 1 | NC | 5 | NC | 5 |
| 208 | | | min | -.406 | 4 | -.923 | 1 | -.134 | 3 | -3.833e-3 | 3 | 412.071 | 1 | 477.464 | 1 |
| 209 | | 10 | max | 0 | 1 | .161 | 3 | .908 | 1 | 2.236e-2 | 1 | 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 | -.406 | 4 | -.898 | 1 | -.138 | 3 | -4.068e-3 | 3 | 435.428 | 1 | 473.791 | 1 |
| 211 | | 11 | max | 0 | 1 | .173 | 3 | .905 | 1 | 2.125e-2 | 1 | NC | 5 | 6669.044 | 15 |
| 212 | | | min | -.406 | 4 | -.923 | 1 | -.134 | 3 | -3.833e-3 | 3 | 412.071 | 1 | 477.464 | 1 |
| 213 | | 12 | max | 0 | 1 | .197 | 3 | .89 | 1 | 2.014e-2 | 1 | NC | 15 | 5851.296 | 15 |
| 214 | | | min | -.406 | 4 | -.973 | 1 | -.126 | 3 | -3.599e-3 | 3 | 372.242 | 1 | 495.552 | 1 |
| 215 | | 13 | max | 0 | 1 | .221 | 3 | .859 | 1 | 1.904e-2 | 1 | NC | 15 | 7336.367 | 15 |
| 216 | | | min | -.406 | 4 | -1.017 | 1 | -.114 | 3 | -3.364e-3 | 3 | 343.044 | 1 | 539.653 | 1 |
| 217 | | 14 | max | 0 | 1 | .236 | 3 | .808 | 1 | 1.793e-2 | 1 | NC | 15 | NC | 15 |
| 218 | | | min | -.406 | 4 | -1.032 | 1 | -.101 | 3 | -3.13e-3 | 3 | 333.92 | 1 | 628.196 | 1 |
| 219 | | 15 | max | 0 | 1 | .235 | 3 | .742 | 1 | 1.682e-2 | 1 | NC | 15 | NC | 5 |
| 220 | | | min | -.406 | 4 | -1.004 | 1 | -.088 | 3 | -2.895e-3 | 3 | 350.898 | 1 | 801.897 | 1 |
| 221 | | 16 | max | 0 | 1 | .215 | 3 | .666 | 1 | 1.572e-2 | 1 | NC | 15 | NC | 3 |
| 222 | | | min | -.406 | 4 | -.927 | 1 | -.077 | 3 | -2.66e-3 | 3 | 408.615 | 1 | 1174.141 | 1 |
| 223 | | 17 | max | 0 | 1 | .175 | 3 | .591 | 1 | 1.461e-2 | 1 | NC | 5 | NC | 3 |
| 224 | | | min | -.406 | 4 | -.802 | 1 | -.068 | 3 | -2.426e-3 | 3 | 556.636 | 1 | 2177.097 | 1 |
| 225 | | 18 | max | 0 | 1 | .118 | 3 | .53 | 1 | 1.35e-2 | 1 | NC | 5 | NC | 2 |
| 226 | | | min | -.406 | 4 | -.639 | 1 | -.062 | 3 | -2.191e-3 | 3 | 1053.402 | 1 | 6563.823 | 5 |
| 227 | | 19 | max | 0 | 1 | .051 | 3 | .503 | 1 | 1.24e-2 | 1 | NC | 1 | NC | 1 |
| 228 | | | min | -.406 | 4 | -.457 | 1 | -.061 | 3 | -1.957e-3 | 3 | NC | 1 | NC | 1 |
| 229 | M13 | 1 | max | 0 | 3 | .244 | 3 | .507 | 1 | 2.141e-2 | 1 | NC | 1 | NC | 1 |
| 230 | | | min | -.674 | 4 | -1.376 | 1 | -.062 | 3 | -5.175e-3 | 3 | NC | 1 | NC | 1 |
| 231 | | 2 | max | 0 | 3 | .335 | 3 | .556 | 1 | 2.346e-2 | 1 | NC | 5 | NC | 3 |
| 232 | | | min | -.674 | 4 | -1.671 | 1 | -.066 | 3 | -5.814e-3 | 3 | 651.572 | 1 | 3962.842 | 1 |
| 233 | | 3 | max | 0 | 3 | .418 | 3 | .628 | 1 | 2.551e-2 | 1 | NC | 5 | NC | 3 |
| 234 | | | min | -.674 | 4 | -1.948 | 1 | -.073 | 3 | -6.454e-3 | 3 | 335.819 | 1 | 1593.991 | 1 |
| 235 | | 4 | max | 0 | 3 | .487 | 3 | .707 | 1 | 2.755e-2 | 1 | NC | 15 | NC | 12 |
| 236 | | | min | -.674 | 4 | -2.185 | 1 | -.083 | 3 | -7.093e-3 | 3 | 237.322 | 1 | 961.348 | 1 |
| 237 | | 5 | max | 0 | 3 | .536 | 3 | .781 | 1 | 2.96e-2 | 1 | 8893.711 | 15 | NC | 12 |
| 238 | | | min | -.674 | 4 | -2.368 | 1 | -.095 | 3 | -7.732e-3 | 3 | 193.445 | 1 | 701.01 | 1 |
| 239 | | 6 | max | 0 | 3 | .564 | 3 | .842 | 1 | 3.164e-2 | 1 | 7636.223 | 15 | NC | 5 |
| 240 | | | min | -.674 | 4 | -2.492 | 1 | -.107 | 3 | -8.372e-3 | 3 | 171.983 | 1 | 573.939 | 1 |
| 241 | | 7 | max | 0 | 3 | .573 | 3 | .884 | 1 | 3.369e-2 | 1 | 6986.589 | 15 | NC | 5 |
| 242 | | | min | -.674 | 4 | -2.559 | 1 | -.119 | 3 | -9.011e-3 | 3 | 162.314 | 1 | 509.108 | 1 |
| 243 | | 8 | max | 0 | 3 | .568 | 3 | .908 | 1 | 3.574e-2 | 1 | 6690.716 | 15 | NC | 5 |
| 244 | | | min | -.674 | 4 | -2.578 | 1 | -.13 | 3 | -9.65e-3 | 3 | 159.668 | 1 | 478.674 | 1 |
| 245 | | 9 | max | 0 | 3 | .557 | 3 | .917 | 1 | 3.778e-2 | 1 | 6603.655 | 15 | NC | 5 |
| 246 | | | min | -.674 | 4 | -2.57 | 1 | -.138 | 3 | -1.029e-2 | 3 | 160.834 | 1 | 468.513 | 1 |
| 247 | | 10 | max | 0 | 1 | .55 | 3 | .918 | 1 | 3.983e-2 | 1 | 6599.493 | 15 | NC | 5 |
| 248 | | | min | -.674 | 4 | -2.559 | 1 | -.141 | 3 | -1.093e-2 | 3 | 162.229 | 1 | 467.725 | 1 |
| 249 | | 11 | max | 0 | 1 | .557 | 3 | .917 | 1 | 3.778e-2 | 1 | 6499.327 | 15 | 9329.875 | 15 |
| 250 | | | min | -.674 | 4 | -2.57 | 1 | -.138 | 3 | -1.029e-2 | 3 | 160.834 | 1 | 468.513 | 1 |
| 251 | | 12 | max | 0 | 1 | .568 | 3 | .908 | 1 | 3.574e-2 | 1 | 6361.049 | 15 | 8868.145 | 15 |
| 252 | | | min | -.674 | 4 | -2.578 | 1 | -.13 | 3 | -9.65e-3 | 3 | 159.668 | 1 | 478.674 | 1 |
| 253 | | 13 | max | 0 | 1 | .573 | 3 | .884 | 1 | 3.369e-2 | 1 | 6345.975 | 15 | NC | 15 |
| 254 | | | min | -.673 | 4 | -2.559 | 1 | -.119 | 3 | -9.011e-3 | 3 | 162.314 | 1 | 509.108 | 1 |
| 255 | | 14 | max | 0 | 1 | .564 | 3 | .842 | 1 | 3.164e-2 | 1 | 6579.047 | 15 | NC | 5 |
| 256 | | | min | -.673 | 4 | -2.492 | 1 | -.107 | 3 | -8.372e-3 | 3 | 171.983 | 1 | 573.939 | 1 |
| 257 | | 15 | max | 0 | 1 | .536 | 3 | .781 | 1 | 2.96e-2 | 1 | 7221.752 | 15 | NC | 5 |
| 258 | | | min | -.673 | 4 | -2.368 | 1 | -.095 | 3 | -7.732e-3 | 3 | 193.445 | 1 | 701.01 | 1 |
| 259 | | 16 | max | 0 | 1 | .487 | 3 | .707 | 1 | 2.755e-2 | 1 | 8620.243 | 15 | NC | 4 |
| 260 | | | min | -.673 | 4 | -2.185 | 1 | -.083 | 3 | -7.093e-3 | 3 | 237.322 | 1 | 961.348 | 1 |
| 261 | | 17 | max | 0 | 1 | .418 | 3 | .628 | 1 | 2.551e-2 | 1 | NC | 15 | NC | 3 |
| 262 | | | min | -.673 | 4 | -1.948 | 1 | -.073 | 3 | -6.454e-3 | 3 | 335.819 | 1 | 1593.991 | 1 |
| 263 | | 18 | max | 0 | 1 | .335 | 3 | .556 | 1 | 2.346e-2 | 1 | NC | 5 | NC | 3 |
| 264 | | | min | -.673 | 4 | -1.671 | 1 | -.066 | 3 | -5.814e-3 | 3 | 651.572 | 1 | 3962.842 | 1 |
| 265 | | 19 | max | .001 | 1 | .244 | 3 | .507 | 1 | 2.141e-2 | 1 | NC | 1 | NC | 1 |
| 266 | | | min | -.673 | 4 | -1.376 | 1 | -.062 | 3 | -5.175e-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 | 5.527e-4 | 1 | NC | 1 | NC | 1 |
| 270 | | | min | 0 | 1 | -.002 | 1 | 0 | 1 | -9.977e-4 | 5 | NC | 1 | NC | 1 |
| 271 | | 3 | max | 0 | 3 | 0 | 3 | .003 | 5 | 1.105e-3 | 1 | NC | 2 | NC | 1 |
| 272 | | | min | 0 | 1 | -.007 | 1 | 0 | 1 | -1.995e-3 | 5 | 8224.782 | 1 | NC | 1 |
| 273 | | 4 | max | 0 | 3 | 0 | 3 | .006 | 5 | 1.658e-3 | 1 | NC | 3 | NC | 1 |
| 274 | | | min | 0 | 1 | -.017 | 1 | 0 | 1 | -2.993e-3 | 5 | 3662.571 | 1 | 9904.323 | 5 |
| 275 | | 5 | max | 0 | 3 | .002 | 3 | .011 | 5 | 2.211e-3 | 1 | NC | 3 | NC | 1 |
| 276 | | | min | 0 | 1 | -.029 | 1 | -.002 | 1 | -3.991e-3 | 5 | 2063.034 | 1 | 5736.783 | 5 |
| 277 | | 6 | max | 0 | 3 | .003 | 3 | .016 | 5 | 2.763e-3 | 1 | NC | 3 | NC | 1 |
| 278 | | | min | 0 | 1 | -.046 | 1 | -.002 | 1 | -4.989e-3 | 5 | 1321.819 | 1 | 3775.143 | 5 |
| 279 | | 7 | max | 0 | 3 | .005 | 3 | .023 | 5 | 3.316e-3 | 1 | NC | 3 | NC | 1 |
| 280 | | | min | 0 | 1 | -.066 | 1 | -.003 | 1 | -5.986e-3 | 5 | 918.818 | 1 | 2694.352 | 5 |
| 281 | | 8 | max | 0 | 3 | .007 | 3 | .03 | 5 | 3.869e-3 | 1 | NC | 12 | NC | 1 |
| 282 | | | min | 0 | 1 | -.09 | 1 | -.004 | 1 | -6.984e-3 | 5 | 675.686 | 1 | 2034.511 | 5 |
| 283 | | 9 | max | 0 | 3 | .01 | 3 | .038 | 5 | 3.752e-3 | 1 | NC | 12 | NC | 1 |
| 284 | | | min | 0 | 1 | -.117 | 1 | -.004 | 1 | -7.234e-3 | 5 | 516.812 | 1 | 1601.329 | 5 |
| 285 | | 10 | max | 0 | 3 | .014 | 3 | .047 | 5 | 3.241e-3 | 1 | 7665.876 | 12 | NC | 1 |
| 286 | | | min | -.001 | 1 | -.149 | 1 | -.005 | 1 | -7.045e-3 | 5 | 408.473 | 1 | 1300.941 | 5 |
| 287 | | 11 | max | 0 | 3 | .018 | 3 | .056 | 5 | 2.731e-3 | 1 | 5915.182 | 12 | NC | 1 |
| 288 | | | min | -.001 | 1 | -.183 | 1 | -.005 | 1 | -6.856e-3 | 5 | 332.021 | 1 | 1083.798 | 5 |
| 289 | | 12 | max | 0 | 3 | .023 | 3 | .066 | 5 | 2.22e-3 | 1 | 4718.778 | 12 | NC | 1 |
| 290 | | | min | -.001 | 1 | -.22 | 1 | -.006 | 1 | -6.667e-3 | 5 | 276.21 | 1 | 921.633 | 5 |
| 291 | | 13 | max | 0 | 3 | .027 | 3 | .076 | 4 | 1.71e-3 | 1 | 3868.398 | 12 | NC | 1 |
| 292 | | | min | -.001 | 1 | -.259 | 1 | -.006 | 1 | -6.478e-3 | 5 | 234.288 | 1 | 797.118 | 4 |
| 293 | | 14 | max | 0 | 3 | .033 | 3 | .087 | 4 | 1.235e-3 | 2 | 3243.757 | 12 | NC | 1 |
| 294 | | | min | -.001 | 1 | -.3 | 1 | -.006 | 1 | -6.289e-3 | 5 | 202.03 | 1 | 698.598 | 4 |
| 295 | | 15 | max | 0 | 3 | .038 | 3 | .098 | 4 | 7.952e-4 | 2 | 2772.227 | 12 | NC | 1 |
| 296 | | | min | -.002 | 1 | -.343 | 1 | -.006 | 1 | -6.1e-3 | 5 | 176.702 | 1 | 619.954 | 4 |
| 297 | | 16 | max | 0 | 3 | .044 | 3 | .109 | 4 | 3.553e-4 | 2 | 2407.966 | 12 | NC | 1 |
| 298 | | | min | -.002 | 1 | -.388 | 1 | -.005 | 1 | -5.948e-3 | 4 | 156.464 | 1 | 556.193 | 4 |
| 299 | | 17 | max | 0 | 3 | .05 | 3 | .12 | 4 | 3.002e-4 | 3 | 2121.122 | 12 | NC | 1 |
| 300 | | | min | -.002 | 1 | -.433 | 1 | -.005 | 1 | -5.832e-3 | 4 | 140.056 | 1 | 503.82 | 4 |
| 301 | | 18 | max | .001 | 3 | .056 | 3 | .132 | 4 | 4.932e-4 | 3 | 1891.52 | 12 | NC | 1 |
| 302 | | | min | -.002 | 1 | -.479 | 1 | -.006 | 3 | -5.715e-3 | 4 | 126.582 | 1 | 460.319 | 4 |
| 303 | | 19 | max | .001 | 3 | .062 | 3 | .143 | 4 | 6.863e-4 | 3 | 1705.225 | 12 | NC | 1 |
| 304 | | | min | -.002 | 1 | -.526 | 1 | -.009 | 3 | -5.598e-3 | 4 | 115.398 | 1 | 423.848 | 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 | 1 | -.003 | 1 | 0 | 1 | -1.031e-3 | 4 | NC | 1 | NC | 1 |
| 309 | | 3 | max | 0 | 3 | 0 | 3 | .003 | 4 | 0 | 1 | NC | 3 | NC | 1 |
| 310 | | | min | 0 | 1 | -.012 | 1 | 0 | 1 | -2.062e-3 | 4 | 5124.699 | 1 | NC | 1 |
| 311 | | 4 | max | 0 | 3 | .001 | 3 | .006 | 4 | 0 | 1 | NC | 3 | NC | 1 |
| 312 | | | min | 0 | 1 | -.027 | 1 | 0 | 1 | -3.092e-3 | 4 | 2242.735 | 1 | 9545.58 | 4 |
| 313 | | 5 | max | 0 | 3 | .003 | 3 | .011 | 4 | 0 | 1 | NC | 3 | NC | 1 |
| 314 | | | min | -.001 | 1 | -.049 | 1 | 0 | 1 | -4.123e-3 | 4 | 1247.409 | 1 | 5531.612 | 4 |
| 315 | | 6 | max | 0 | 3 | .005 | 3 | .017 | 4 | 0 | 1 | NC | 3 | NC | 1 |
| 316 | | | min | -.002 | 1 | -.077 | 1 | 0 | 1 | -5.154e-3 | 4 | 790.709 | 1 | 3641.832 | 4 |
| 317 | | 7 | max | .001 | 3 | .009 | 3 | .023 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 318 | | | min | -.002 | 1 | -.111 | 1 | 0 | 1 | -6.185e-3 | 4 | 544.303 | 1 | 2600.451 | 4 |
| 319 | | 8 | max | .001 | 3 | .013 | 3 | .031 | 4 | 0 | 1 | NC | 15 | NC | 1 |
| 320 | | | min | -.002 | 1 | -.153 | 1 | 0 | 1 | -7.215e-3 | 4 | 396.62 | 1 | 1964.582 | 4 |
| 321 | | 9 | max | .001 | 3 | .02 | 3 | .039 | 4 | 0 | 1 | NC | 15 | NC | 1 |
| 322 | | | min | -.002 | 1 | -.202 | 1 | 0 | 1 | -7.471e-3 | 4 | 300.494 | 1 | 1547.035 | 4 |
| 323 | | 10 | max | .002 | 3 | .028 | 3 | .048 | 4 | 0 | 1 | 8222.334 | 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 | 1 | -.258 | 1 | 0 | 1 | -7.27e-3 | 4 | 235.441 | 1 | 1257.417 | 4 |
| 325 | | 11 | max | .002 | 3 | .037 | 3 | .058 | 4 | 0 | 1 | 6656.702 | 15 | NC | 1 |
| 326 | | | min | -.003 | 1 | -.319 | 1 | 0 | 1 | -7.07e-3 | 4 | 189.973 | 1 | 1048.083 | 4 |
| 327 | | 12 | max | .002 | 3 | .047 | 3 | .068 | 4 | 0 | 1 | 5519.128 | 15 | NC | 1 |
| 328 | | | min | -.003 | 1 | -.386 | 1 | 0 | 1 | -6.87e-3 | 4 | 157.067 | 1 | 891.801 | 4 |
| 329 | | 13 | max | .002 | 3 | .059 | 3 | .079 | 4 | 0 | 1 | 4668.191 | 15 | NC | 1 |
| 330 | | | min | -.003 | 1 | -.458 | 1 | 0 | 1 | -6.67e-3 | 4 | 132.539 | 1 | 772.012 | 4 |
| 331 | | 14 | max | .002 | 3 | .071 | 3 | .089 | 4 | 0 | 1 | 4015.834 | 15 | NC | 1 |
| 332 | | | min | -.004 | 1 | -.533 | 1 | 0 | 1 | -6.47e-3 | 4 | 113.793 | 1 | 678.179 | 4 |
| 333 | | 15 | max | .002 | 3 | .084 | 3 | .101 | 4 | 0 | 1 | 3505.255 | 15 | NC | 1 |
| 334 | | | min | -.004 | 1 | -.612 | 1 | 0 | 1 | -6.27e-3 | 4 | 99.161 | 1 | 603.346 | 4 |
| 335 | | 16 | max | .003 | 3 | .097 | 3 | .112 | 4 | 0 | 1 | 3098.477 | 15 | NC | 1 |
| 336 | | | min | -.004 | 1 | -.693 | 1 | 0 | 1 | -6.07e-3 | 4 | 87.53 | 1 | 542.757 | 4 |
| 337 | | 17 | max | .003 | 3 | .111 | 3 | .123 | 4 | 0 | 1 | 2769.503 | 15 | NC | 1 |
| 338 | | | min | -.005 | 1 | -.776 | 1 | 0 | 1 | -5.87e-3 | 4 | 78.144 | 1 | 493.081 | 4 |
| 339 | | 18 | max | .003 | 3 | .125 | 3 | .134 | 4 | 0 | 1 | 2499.979 | 15 | NC | 1 |
| 340 | | | min | -.005 | 1 | -.861 | 1 | 0 | 1 | -5.67e-3 | 4 | 70.469 | 1 | 451.924 | 4 |
| 341 | | 19 | max | .003 | 3 | .139 | 3 | .145 | 4 | 0 | 1 | 2276.736 | 15 | NC | 1 |
| 342 | | | min | -.005 | 1 | -.946 | 1 | 0 | 1 | -5.469e-3 | 4 | 64.122 | 1 | 417.53 | 4 |
| 343 | M8 | 1 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 344 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 345 | | 2 | max | 0 | 3 | 0 | 5 | 0 | 4 | 1.853e-4 | 3 | NC | 1 | NC | 1 |
| 346 | | | min | 0 | 1 | -.002 | 1 | 0 | 3 | -1.123e-3 | 4 | NC | 1 | NC | 1 |
| 347 | | 3 | max | 0 | 3 | 0 | 5 | .003 | 4 | 3.706e-4 | 3 | NC | 2 | NC | 1 |
| 348 | | | min | 0 | 1 | -.007 | 1 | 0 | 3 | -2.246e-3 | 4 | 8224.782 | 1 | NC | 1 |
| 349 | | 4 | max | 0 | 3 | 0 | 3 | .006 | 4 | 5.559e-4 | 3 | NC | 3 | NC | 1 |
| 350 | | | min | 0 | 1 | -.017 | 1 | 0 | 3 | -3.37e-3 | 4 | 3662.571 | 1 | 9420.691 | 4 |
| 351 | | 5 | max | 0 | 3 | .002 | 3 | .011 | 4 | 7.412e-4 | 3 | NC | 3 | NC | 1 |
| 352 | | | min | 0 | 1 | -.029 | 1 | 0 | 3 | -4.493e-3 | 4 | 2063.034 | 1 | 5466.683 | 4 |
| 353 | | 6 | max | 0 | 3 | .003 | 3 | .017 | 4 | 9.265e-4 | 3 | NC | 3 | NC | 1 |
| 354 | | | min | 0 | 1 | -.046 | 1 | 0 | 3 | -5.616e-3 | 4 | 1321.819 | 1 | 3603.919 | 4 |
| 355 | | 7 | max | 0 | 3 | .005 | 3 | .024 | 4 | 1.112e-3 | 3 | NC | 3 | NC | 1 |
| 356 | | | min | 0 | 1 | -.066 | 1 | -.001 | 3 | -6.739e-3 | 4 | 918.818 | 1 | 2576.9 | 4 |
| 357 | | 8 | max | 0 | 3 | .007 | 3 | .031 | 4 | 1.297e-3 | 3 | NC | 5 | NC | 1 |
| 358 | | | min | 0 | 1 | -.09 | 1 | -.001 | 3 | -7.863e-3 | 4 | 675.686 | 1 | 1949.546 | 4 |
| 359 | | 9 | max | 0 | 3 | .01 | 3 | .039 | 4 | 1.244e-3 | 3 | NC | 5 | NC | 1 |
| 360 | | | min | 0 | 1 | -.117 | 1 | -.001 | 3 | -8.086e-3 | 4 | 516.812 | 1 | 1537.409 | 4 |
| 361 | | 10 | max | 0 | 3 | .014 | 3 | .048 | 4 | 1.051e-3 | 3 | NC | 5 | NC | 1 |
| 362 | | | min | -.001 | 1 | -.149 | 1 | -.001 | 3 | -7.78e-3 | 4 | 408.473 | 1 | 1251.198 | 4 |
| 363 | | 11 | max | 0 | 3 | .018 | 3 | .058 | 4 | 8.58e-4 | 3 | NC | 5 | NC | 1 |
| 364 | | | min | -.001 | 1 | -.183 | 1 | -.001 | 3 | -7.475e-3 | 4 | 332.021 | 1 | 1044.125 | 4 |
| 365 | | 12 | max | 0 | 3 | .023 | 3 | .068 | 4 | 6.65e-4 | 3 | NC | 7 | NC | 1 |
| 366 | | | min | -.001 | 1 | -.22 | 1 | 0 | 3 | -7.17e-3 | 4 | 276.21 | 1 | 889.425 | 4 |
| 367 | | 13 | max | 0 | 3 | .027 | 3 | .079 | 4 | 4.72e-4 | 3 | NC | 15 | NC | 1 |
| 368 | | | min | -.001 | 1 | -.259 | 1 | 0 | 3 | -6.864e-3 | 4 | 234.288 | 1 | 770.795 | 4 |
| 369 | | 14 | max | 0 | 3 | .033 | 3 | .089 | 4 | 2.789e-4 | 3 | NC | 15 | NC | 1 |
| 370 | | | min | -.001 | 1 | -.3 | 1 | 0 | 12 | -6.559e-3 | 4 | 202.03 | 1 | 677.849 | 4 |
| 371 | | 15 | max | 0 | 3 | .038 | 3 | .1 | 4 | 8.588e-5 | 3 | 9838.279 | 15 | NC | 1 |
| 372 | | | min | -.002 | 1 | -.343 | 1 | 0 | 12 | -6.253e-3 | 4 | 176.702 | 1 | 603.721 | 4 |
| 373 | | 16 | max | 0 | 3 | .044 | 3 | .112 | 4 | 7.801e-8 | 9 | 8949.698 | 15 | NC | 1 |
| 374 | | | min | -.002 | 1 | -.388 | 1 | 0 | 10 | -5.948e-3 | 4 | 156.464 | 1 | 543.715 | 4 |
| 375 | | 17 | max | 0 | 3 | .05 | 3 | .123 | 4 | 3.318e-4 | 1 | 8201.607 | 15 | NC | 1 |
| 376 | | | min | -.002 | 1 | -.433 | 1 | 0 | 10 | -5.682e-3 | 5 | 140.056 | 1 | 494.537 | 4 |
| 377 | | 18 | max | .001 | 3 | .056 | 3 | .134 | 4 | 8.423e-4 | 1 | 7565.102 | 15 | NC | 1 |
| 378 | | | min | -.002 | 1 | -.479 | 1 | 0 | 10 | -5.453e-3 | 5 | 126.582 | 1 | 453.821 | 4 |
| 379 | | 19 | max | .001 | 3 | .062 | 3 | .145 | 4 | 1.353e-3 | 1 | 7018.637 | 15 | NC | 1 |
| 380 | | | min | -.002 | 1 | -.526 | 1 | 0 | 10 | -5.224e-3 | 5 | 115.398 | 1 | 419.832 | 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 | .099 | 1 | .001 | 3 | .033 | 5 | 1.647e-3 | 4 | NC | 1 | NC | 1 |
| 382 | | | min | -.008 | 3 | -.011 | 1 | -.004 | 1 | -1.238e-4 | 3 | NC | 1 | NC | 1 |
| 383 | | 2 | max | .098 | 1 | .008 | 3 | .065 | 5 | 1.62e-3 | 4 | NC | 1 | NC | 3 |
| 384 | | | min | -.008 | 3 | -.067 | 1 | -.021 | 1 | -4.5e-4 | 3 | NC | 1 | 4131.22 | 1 |
| 385 | | 3 | max | .097 | 1 | .014 | 3 | .098 | 5 | 2.165e-3 | 1 | NC | 1 | NC | 4 |
| 386 | | | min | -.008 | 3 | -.124 | 1 | -.038 | 1 | -7.762e-4 | 3 | 5881.547 | 3 | 2089.641 | 1 |
| 387 | | 4 | max | .095 | 1 | .021 | 3 | .13 | 5 | 3.129e-3 | 1 | NC | 1 | NC | 4 |
| 388 | | | min | -.007 | 3 | -.18 | 1 | -.054 | 1 | -1.102e-3 | 3 | 3902.66 | 3 | 1418.078 | 1 |
| 389 | | 5 | max | .094 | 1 | .028 | 3 | .162 | 5 | 4.092e-3 | 1 | NC | 1 | NC | 4 |
| 390 | | | min | -.007 | 3 | -.236 | 1 | -.07 | 1 | -1.429e-3 | 3 | 2908.794 | 3 | 1089.74 | 1 |
| 391 | | 6 | max | .093 | 1 | .035 | 3 | .194 | 5 | 5.055e-3 | 1 | NC | 1 | NC | 4 |
| 392 | | | min | -.006 | 3 | -.292 | 1 | -.083 | 1 | -1.755e-3 | 3 | 2309.469 | 3 | 899.551 | 1 |
| 393 | | 7 | max | .092 | 1 | .042 | 3 | .226 | 5 | 6.019e-3 | 1 | NC | 1 | NC | 4 |
| 394 | | | min | -.006 | 3 | -.348 | 1 | -.095 | 1 | -2.081e-3 | 3 | 1907.855 | 3 | 779.465 | 1 |
| 395 | | 8 | max | .091 | 1 | .049 | 3 | .257 | 5 | 6.982e-3 | 1 | NC | 5 | NC | 4 |
| 396 | | | min | -.006 | 3 | -.404 | 1 | -.105 | 1 | -2.407e-3 | 3 | 1619.589 | 3 | 700.697 | 1 |
| 397 | | 9 | max | .09 | 1 | .056 | 3 | .287 | 5 | 7.945e-3 | 1 | NC | 5 | NC | 4 |
| 398 | | | min | -.005 | 3 | -.459 | 1 | -.112 | 1 | -2.734e-3 | 3 | 1402.478 | 3 | 649.338 | 1 |
| 399 | | 10 | max | .089 | 1 | .064 | 3 | .317 | 5 | 8.909e-3 | 1 | NC | 5 | NC | 4 |
| 400 | | | min | -.005 | 3 | -.514 | 1 | -.117 | 1 | -3.06e-3 | 3 | 1233.063 | 3 | 618.325 | 1 |
| 401 | | 11 | max | .088 | 1 | .072 | 3 | .347 | 5 | 9.872e-3 | 1 | NC | 5 | NC | 4 |
| 402 | | | min | -.005 | 3 | -.569 | 1 | -.119 | 1 | -3.386e-3 | 3 | 1097.256 | 3 | 604.383 | 1 |
| 403 | | 12 | max | .086 | 1 | .08 | 3 | .376 | 5 | 1.084e-2 | 1 | NC | 5 | NC | 4 |
| 404 | | | min | -.004 | 3 | -.624 | 1 | -.117 | 1 | -3.712e-3 | 3 | 986.075 | 3 | 559.967 | 14 |
| 405 | | 13 | max | .085 | 1 | .088 | 3 | .404 | 5 | 1.18e-2 | 1 | NC | 1 | NC | 4 |
| 406 | | | min | -.004 | 3 | -.678 | 1 | -.111 | 1 | -4.039e-3 | 3 | 893.519 | 3 | 500.572 | 14 |
| 407 | | 14 | max | .084 | 1 | .096 | 3 | .431 | 5 | 1.276e-2 | 1 | NC | 1 | NC | 4 |
| 408 | | | min | -.003 | 3 | -.732 | 1 | -.102 | 1 | -4.365e-3 | 3 | 815.42 | 3 | 449.919 | 14 |
| 409 | | 15 | max | .083 | 1 | .104 | 3 | .457 | 5 | 1.373e-2 | 1 | NC | 1 | NC | 4 |
| 410 | | | min | -.003 | 3 | -.786 | 1 | -.087 | 1 | -4.691e-3 | 3 | 748.79 | 3 | 406.213 | 14 |
| 411 | | 16 | max | .082 | 1 | .113 | 3 | .483 | 5 | 1.469e-2 | 1 | NC | 1 | NC | 4 |
| 412 | | | min | -.003 | 3 | -.84 | 1 | -.069 | 1 | -5.017e-3 | 3 | 691.43 | 3 | 368.135 | 14 |
| 413 | | 17 | max | .081 | 1 | .122 | 3 | .508 | 5 | 1.565e-2 | 1 | NC | 1 | NC | 4 |
| 414 | | | min | -.002 | 3 | -.894 | 1 | -.045 | 1 | -5.343e-3 | 3 | 641.681 | 3 | 334.695 | 14 |
| 415 | | 18 | max | .08 | 1 | .13 | 3 | .534 | 4 | 1.662e-2 | 1 | NC | 1 | NC | 4 |
| 416 | | | min | -.002 | 3 | -.947 | 1 | -.018 | 2 | -5.67e-3 | 3 | 598.27 | 3 | 305.129 | 14 |
| 417 | | 19 | max | .079 | 1 | .139 | 3 | .562 | 4 | 1.758e-2 | 1 | NC | 1 | NC | 1 |
| 418 | | | min | -.002 | 3 | -1.001 | 1 | -.003 | 3 | -5.996e-3 | 3 | 560.204 | 3 | 278.841 | 14 |
| 419 | M6 | 1 | max | .169 | 1 | .003 | 3 | .034 | 4 | 1.646e-3 | 4 | NC | 1 | NC | 1 |
| 420 | | | min | -.015 | 3 | -.02 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 421 | | 2 | max | .166 | 1 | .02 | 3 | .067 | 4 | 1.424e-3 | 4 | NC | 1 | NC | 1 |
| 422 | | | min | -.014 | 3 | -.123 | 1 | 0 | 1 | 0 | 1 | 4498.019 | 3 | NC | 1 |
| 423 | | 3 | max | .164 | 1 | .037 | 3 | .101 | 4 | 1.201e-3 | 4 | NC | 1 | NC | 1 |
| 424 | | | min | -.013 | 3 | -.226 | 1 | 0 | 1 | 0 | 1 | 2246.473 | 3 | 9343.196 | 4 |
| 425 | | 4 | max | .161 | 1 | .055 | 3 | .134 | 4 | 9.784e-4 | 4 | NC | 1 | NC | 1 |
| 426 | | | min | -.012 | 3 | -.33 | 1 | 0 | 1 | 0 | 1 | 1494.96 | 3 | 6298.599 | 4 |
| 427 | | 5 | max | .158 | 1 | .072 | 3 | .167 | 4 | 7.558e-4 | 4 | NC | 1 | NC | 1 |
| 428 | | | min | -.011 | 3 | -.433 | 1 | 0 | 1 | 0 | 1 | 1118.539 | 3 | 4818.716 | 4 |
| 429 | | 6 | max | .156 | 1 | .089 | 3 | .2 | 4 | 5.332e-4 | 4 | NC | 1 | NC | 1 |
| 430 | | | min | -.01 | 3 | -.536 | 1 | 0 | 1 | 0 | 1 | 892.222 | 3 | 3967.478 | 4 |
| 431 | | 7 | max | .153 | 1 | .107 | 3 | .233 | 4 | 3.106e-4 | 4 | NC | 1 | NC | 1 |
| 432 | | | min | -.009 | 3 | -.639 | 1 | 0 | 1 | 0 | 1 | 741.012 | 3 | 3434.614 | 4 |
| 433 | | 8 | max | .15 | 1 | .125 | 3 | .265 | 4 | 8.797e-5 | 4 | NC | 5 | NC | 1 |
| 434 | | | min | -.008 | 3 | -.741 | 1 | 0 | 1 | 0 | 1 | 632.768 | 3 | 3089.1 | 4 |
| 435 | | 9 | max | .148 | 1 | .143 | 3 | .296 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 436 | | | min | -.007 | 3 | -.843 | 1 | 0 | 1 | -1.476e-4 | 5 | 551.42 | 3 | 2867.821 | 4 |
| 437 | | 10 | max | .145 | 1 | .161 | 3 | .327 | 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 | -.006 | 3 | -.946 | 1 | 0 | 1 | -3.681e-4 | 5 | 488.037 | 3 | 2738.917 | 4 |
| 439 | | 11 | max | .142 | 1 | .18 | 3 | .356 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 440 | | | min | -.005 | 3 | -1.047 | 1 | 0 | 1 | -5.886e-4 | 5 | 437.262 | 3 | 2687.87 | 4 |
| 441 | | 12 | max | .14 | 1 | .198 | 3 | .386 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 442 | | | min | -.004 | 3 | -1.149 | 1 | 0 | 1 | -8.09e-4 | 5 | 395.683 | 3 | 2712.541 | 4 |
| 443 | | 13 | max | .137 | 1 | .217 | 3 | .414 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 444 | | | min | -.002 | 3 | -1.25 | 1 | 0 | 1 | -1.029e-3 | 5 | 361.026 | 3 | 2823.384 | 4 |
| 445 | | 14 | max | .134 | 1 | .236 | 3 | .441 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 446 | | | min | -.001 | 3 | -1.351 | 1 | 0 | 1 | -1.25e-3 | 5 | 331.715 | 3 | 3049.52 | 4 |
| 447 | | 15 | max | .132 | 1 | .255 | 3 | .468 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 448 | | | min | 0 | 3 | -1.452 | 1 | 0 | 1 | -1.47e-3 | 5 | 306.624 | 3 | 3457.437 | 4 |
| 449 | | 16 | max | .129 | 1 | .274 | 3 | .493 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 450 | | | min | 0 | 3 | -1.553 | 1 | 0 | 1 | -1.693e-3 | 4 | 284.927 | 3 | 4209.555 | 4 |
| 451 | | 17 | max | .126 | 1 | .293 | 3 | .517 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 452 | | | min | .001 | 12 | -1.654 | 1 | 0 | 1 | -1.916e-3 | 4 | 266.003 | 3 | 5800.609 | 4 |
| 453 | | 18 | max | .124 | 1 | .313 | 3 | .541 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 454 | | | min | .002 | 12 | -1.754 | 1 | 0 | 1 | -2.138e-3 | 4 | 249.377 | 3 | NC | 1 |
| 455 | | 19 | max | .121 | 1 | .332 | 3 | .563 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 456 | | | min | .003 | 12 | -1.855 | 1 | 0 | 1 | -2.361e-3 | 4 | 234.679 | 3 | NC | 1 |
| 457 | M9 | 1 | max | .099 | 1 | .001 | 3 | .034 | 4 | 1.579e-3 | 4 | NC | 1 | NC | 1 |
| 458 | | | min | -.008 | 3 | -.011 | 1 | -.001 | 3 | -2.749e-4 | 2 | NC | 1 | NC | 1 |
| 459 | | 2 | max | .098 | 1 | .008 | 3 | .071 | 4 | 1.345e-3 | 5 | NC | 1 | NC | 3 |
| 460 | | | min | -.008 | 3 | -.067 | 1 | -.007 | 3 | -1.202e-3 | 1 | NC | 1 | 4131.22 | 1 |
| 461 | | 3 | max | .097 | 1 | .014 | 3 | .107 | 4 | 1.113e-3 | 5 | NC | 1 | NC | 12 |
| 462 | | | min | -.008 | 3 | -.124 | 1 | -.013 | 3 | -2.165e-3 | 1 | 5881.547 | 3 | 2089.641 | 1 |
| 463 | | 4 | max | .095 | 1 | .021 | 3 | .143 | 4 | 1.102e-3 | 3 | NC | 1 | 7985.889 | 15 |
| 464 | | | min | -.007 | 3 | -.18 | 1 | -.018 | 3 | -3.129e-3 | 1 | 3902.66 | 3 | 1418.078 | 1 |
| 465 | | 5 | max | .094 | 1 | .028 | 3 | .179 | 4 | 1.429e-3 | 3 | NC | 1 | 6110.976 | 15 |
| 466 | | | min | -.007 | 3 | -.236 | 1 | -.023 | 3 | -4.092e-3 | 1 | 2908.794 | 3 | 1089.74 | 1 |
| 467 | | 6 | max | .093 | 1 | .035 | 3 | .214 | 4 | 1.755e-3 | 3 | NC | 1 | 5031.414 | 15 |
| 468 | | | min | -.006 | 3 | -.292 | 1 | -.028 | 3 | -5.055e-3 | 1 | 2309.469 | 3 | 899.551 | 1 |
| 469 | | 7 | max | .092 | 1 | .042 | 3 | .248 | 4 | 2.081e-3 | 3 | NC | 1 | 4354.709 | 15 |
| 470 | | | min | -.006 | 3 | -.348 | 1 | -.032 | 3 | -6.019e-3 | 1 | 1907.855 | 3 | 779.465 | 1 |
| 471 | | 8 | max | .091 | 1 | .049 | 3 | .281 | 4 | 2.407e-3 | 3 | NC | 5 | 3915.063 | 15 |
| 472 | | | min | -.006 | 3 | -.404 | 1 | -.035 | 3 | -6.982e-3 | 1 | 1619.589 | 3 | 700.697 | 1 |
| 473 | | 9 | max | .09 | 1 | .056 | 3 | .314 | 4 | 2.734e-3 | 3 | NC | 5 | 3632.559 | 15 |
| 474 | | | min | -.005 | 3 | -.459 | 1 | -.038 | 3 | -7.945e-3 | 1 | 1402.478 | 3 | 649.338 | 1 |
| 475 | | 10 | max | .089 | 1 | .064 | 3 | .345 | 4 | 3.06e-3 | 3 | NC | 5 | 3466.794 | 15 |
| 476 | | | min | -.005 | 3 | -.514 | 1 | -.04 | 3 | -8.909e-3 | 1 | 1233.063 | 3 | 618.325 | 1 |
| 477 | | 11 | max | .088 | 1 | .072 | 3 | .375 | 4 | 3.386e-3 | 3 | NC | 5 | 3399.272 | 15 |
| 478 | | | min | -.005 | 3 | -.569 | 1 | -.04 | 3 | -9.872e-3 | 1 | 1097.256 | 3 | 604.383 | 1 |
| 479 | | 12 | max | .086 | 1 | .08 | 3 | .403 | 4 | 3.712e-3 | 3 | NC | 5 | 3427.098 | 15 |
| 480 | | | min | -.004 | 3 | -.624 | 1 | -.04 | 3 | -1.084e-2 | 1 | 986.075 | 3 | 606.921 | 1 |
| 481 | | 13 | max | .085 | 1 | .088 | 3 | .43 | 4 | 4.039e-3 | 3 | NC | 1 | 3563.201 | 15 |
| 482 | | | min | -.004 | 5 | -.678 | 1 | -.038 | 3 | -1.18e-2 | 1 | 893.519 | 3 | 628.055 | 1 |
| 483 | | 14 | max | .084 | 1 | .096 | 3 | .456 | 4 | 4.365e-3 | 3 | NC | 1 | 3843.902 | 15 |
| 484 | | | min | -.004 | 5 | -.732 | 1 | -.035 | 3 | -1.276e-2 | 1 | 815.42 | 3 | 673.875 | 1 |
| 485 | | 15 | max | .083 | 1 | .104 | 3 | .479 | 4 | 4.691e-3 | 3 | NC | 1 | 4352.289 | 15 |
| 486 | | | min | -.004 | 5 | -.786 | 1 | -.031 | 3 | -1.373e-2 | 1 | 748.79 | 3 | 758.393 | 1 |
| 487 | | 16 | max | .082 | 1 | .113 | 3 | .501 | 4 | 5.017e-3 | 3 | NC | 1 | 5291.468 | 15 |
| 488 | | | min | -.004 | 5 | -.84 | 1 | -.025 | 3 | -1.469e-2 | 1 | 691.43 | 3 | 915.928 | 1 |
| 489 | | 17 | max | .081 | 1 | .122 | 3 | .52 | 4 | 5.343e-3 | 3 | NC | 1 | 7280.229 | 15 |
| 490 | | | min | -.004 | 5 | -.894 | 1 | -.018 | 3 | -1.565e-2 | 1 | 641.681 | 3 | 1251.105 | 1 |
| 491 | | 18 | max | .08 | 1 | .13 | 3 | .538 | 4 | 5.67e-3 | 3 | NC | 1 | NC | 12 |
| 492 | | | min | -.004 | 5 | -.947 | 1 | -.008 | 3 | -1.662e-2 | 1 | 598.27 | 3 | 2289.401 | 1 |
| 493 | | 19 | max | .079 | 1 | .139 | 3 | .553 | 4 | 5.996e-3 | 3 | NC | 1 | NC | 1 |
| 494 | | | min | -.004 | 5 | -1.001 | 1 | -.02 | 1 | -1.758e-2 | 1 | 560.204 | 3 | NC | 1 |