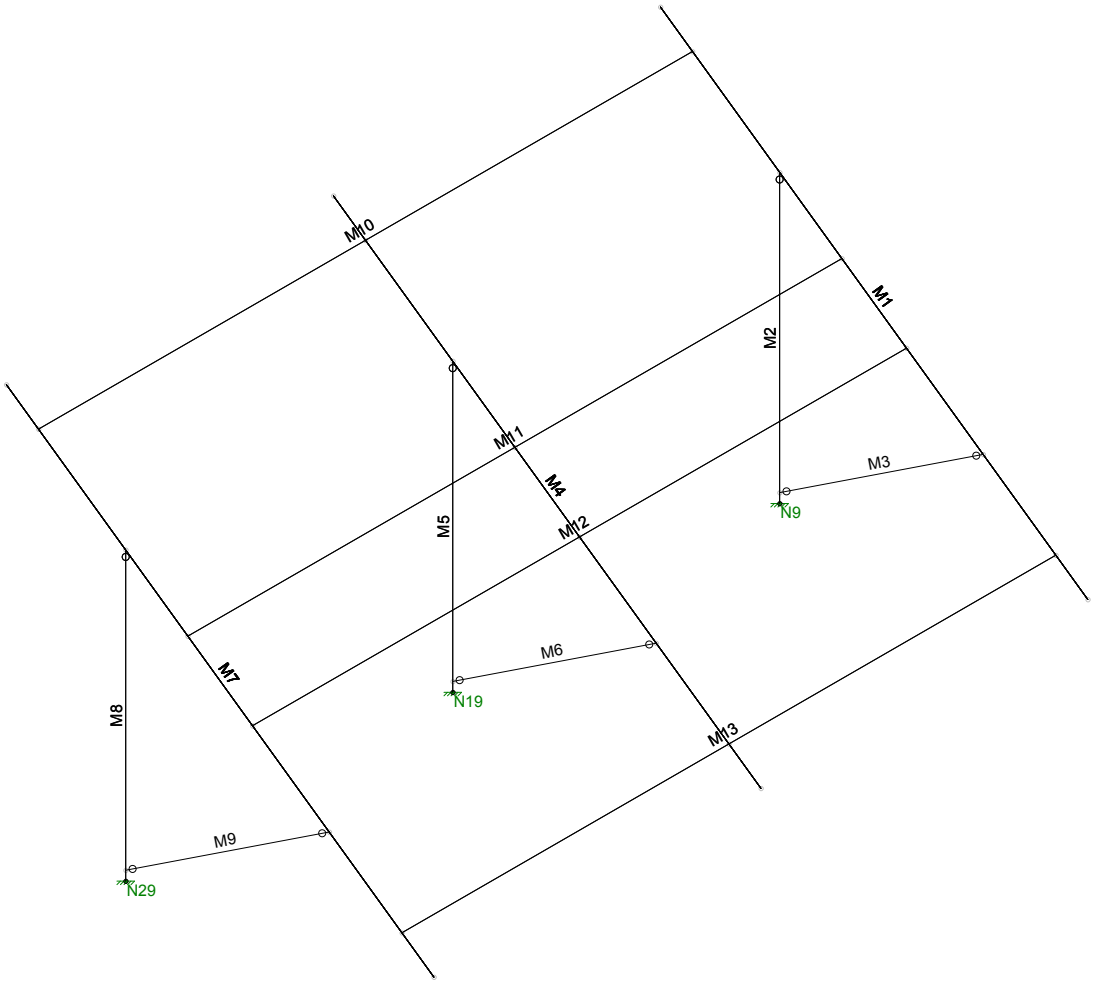



| | | |
|---|---|---|
| Schletter, Inc. | | 35° Tilt w/ Seismic Design |
| HCV | Standard FS Racking System | |
| | Representative Calculations - ASCE 7-10 | |

## 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.*

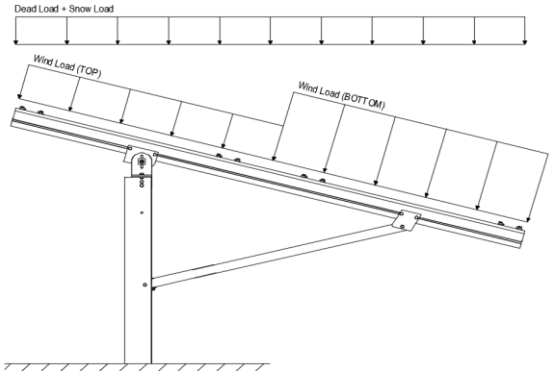
### 1.2 Construction

*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 = | 1700 mm | Height = | 1550 mm |
| Width = | 1050 mm | Width = | 970 mm |
| Dead Load = | 3.00 psf | Dead Load = | 1.75 psf |

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




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

### 1.3 Technical Codes

- ASCE 7-10 - 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, $P_s$ = | 14.43 psf | *(ASCE 7-10, Eq. 7.4-1)* |
| $I_s$ = | 1.00 | |
| $C_s$ = | 0.64 | |
| $C_e$ = | 0.90 | |
| $C_t$ = | 1.20 | |

### 2.3 Wind Loads

| | | | |
|---|---|---|---|
| Design Wind Speed, V = | 150 mph | | Exposure Category = C |
| Height < | 15 ft | | Importance Category = II |
| Peak Velocity Pressure, $q_z$ = | 35.33 psf | *Including the gust factor, G=0.85. (ASCE 7-10, Eq. 27.3-1)* | |

Pressure Coefficients

| | | | |
|---|---|---|---|
| $Cf+_{TOP}$ = | 1.2 | *(Pressure)* | *Provided pressure coefficients are the result of wind tunnel testing done by Ruscheweyh Consult. Coefficients are located in test report # 1127/0510-e. Negative forces are applied away from the surface.* |
| $Cf+_{BOTTOM}$ = | 2 | | |
| $Cf-_{TOP}$ = | -2.4 | *(Suction)* | |
| $Cf-_{BOTTOM}$ = | -1.2 | | |

### 2.4 Seismic Loads

| | | | | |
|---|---|---|---|---|
| $S_S$ = | 2.50 | R = | 1.25 | *ASCE 7, Section 12.8.1.3: A maximum $S_s$ of 1.5 may be used to calculate the base shear, $C_s$, of structures under five stories and with a period, T, of 0.5 or less. Therefore, a $S_{ds}$ of 1.0 was used to calculate $C_s$.* |
| $S_{DS}$ = | 1.67 | $C_S$ = | 0.8 | |
| $S_1$ = | 1.00 | ρ = | 1.3 | |
| $S_{D1}$ = | 1.00 | Ω = | 1.25 | |
| $T_a$ = | 0.08 | $C_d$ = | 1.25 | |

### 2.5 Combination of Loads

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

Strength Design, LRFD

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

1.2D + 1.6S + 0.5W
1.2D + 1.0W + 0.5S
0.9D + 1.0W [M]
1.54D + 1.3E + 0.2S [R]
0.56D + 1.3E [R]
1.54D + 1.25E + 0.2S [O]
0.56D + 1.25E [O]

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

Allowable Stress Design, ASD

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

1.0D + 1.0S
1.0D + 0.6W
1.0D + 0.75L + 0.45W + 0.75S
0.6D + 0.6W [M]
1.238D + 0.875E [O]
1.1785D + 0.65625E + 0.75S [O]
0.362D + 0.875E [O]

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

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

## 3. STRUCTURAL ANALYSIS

### 3.1 RISA Results

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

### 3.2 RISA Components

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

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

| **Posts** | Location |
|---|---|
| M2 | Outer |
| M5 | Inner |
| M8 | Outer |

| **Girders** | Location |
|---|---|
| M1 | Outer |
| M4 | Inner |
| M7 | Outer |

| **Reactions** | Location |
|---|---|
| N9 | Outer |
| N19 | Inner |
| N29 | Outer |

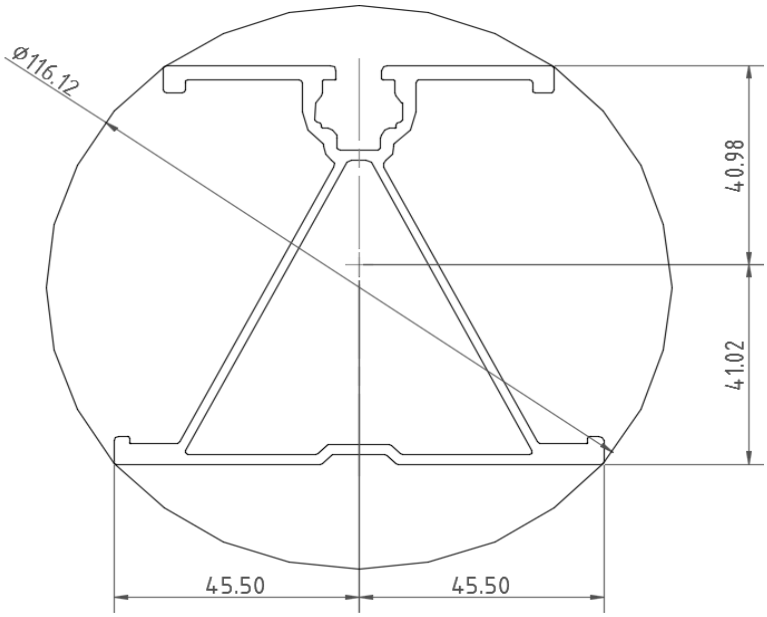
| **Struts** | Location |
|---|---|
| M3 | Outer |
| M6 | Inner |
| M9 | Outer |

## 4. MEMBER DESIGN CALCULATIONS

### 4.1 Purlin Design

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

| | | |
|---|---|---|
| Purlin Type = | **S1.5** | |
| Aluminum Type = | 6105-T5 | |
| $F_{ty}$ = | 35 | ksi |
| $L_b$ = | 84 | in |
| $\Phi F_{ty\ STRONG\text{-}AXIS}$ = | 25.07 | ksi |
| $\Phi F_{ty\ WEAK\text{-}AXIS}$ = | 23.08 | ksi |
| $S_y$ = | 1.33 | $in^3$ |
| $S_x$ = | 0.6 | $in^3$ |
| E = | 10100 | ksi |
| $I_y$ = | 2.16 | $in^4$ |
| $I_x$ = | 1.07 | $in^4$ |
| A = | 1.25 | $in^2$ |
| g = | 1.50 | lbs/ft |
| $M_y$ = | 1.222 | k-ft |
| $M_z$ = | 0.176 | k-ft |
| $M_{y\ allowable}$ = | 2.779 | k-ft |
| $M_{z\ allowable}$ = | 1.154 | k-ft |
| Utilization = | 59% | |

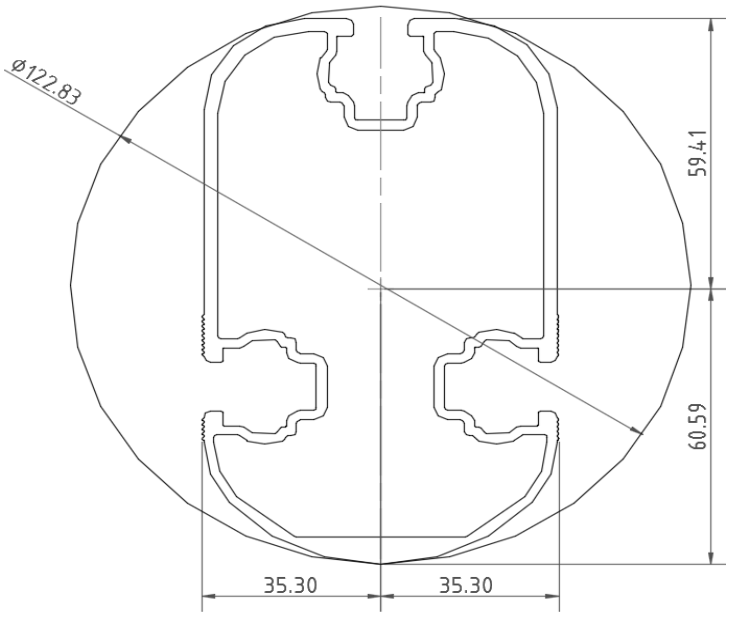


DETAIL VIEW

### 4.2 Girder Design

*Loads from purlins are transferred to the posts using an inclined girder, which is connected to the steel post. Loads on the girder result from the support reactions of the purlins. See Appendix A.2 for detailed member calculations. Section units are in (mm).*

| | | |
|---|---|---|
| Girder Type = | **T5** | |
| Aluminum Type = | 6105-T5 | |
| $F_{ty}$ = | 35 | ksi |
| $L_b$ = | 63.82 | in |
| $\Phi F_{ty\ AXIAL}$ = | 30.80 | ksi |
| $\Phi F_{ty\ STRONG\text{-}AXIS}$ = | 30.46 | ksi |
| $\Phi F_{ty\ WEAK\text{-}AXIS}$ = | 31.56 | ksi |
| $S_y$ = | 1.98 | $in^3$ |
| $S_x$ = | 1.32 | $in^3$ |
| E = | 10100 | ksi |
| $I_y$ = | 4.74 | $in^4$ |
| $I_x$ = | 1.83 | $in^4$ |
| A = | 1.93 | $in^2$ |
| g = | 2.32 | lbs/ft |
| $M_y$ = | 3.953 | k-ft |
| $M_z$ = | 0.000 | k-ft |
| $P_n$ = | 0.045 | k |
| $M_{y\ allowable}$ = | 5.026 | k-ft |
| $M_{z\ allowable}$ = | 3.472 | k-ft |
| $P_{n\ allowable}$ = | 59.439 | k |
| Utilization = | 79% | |

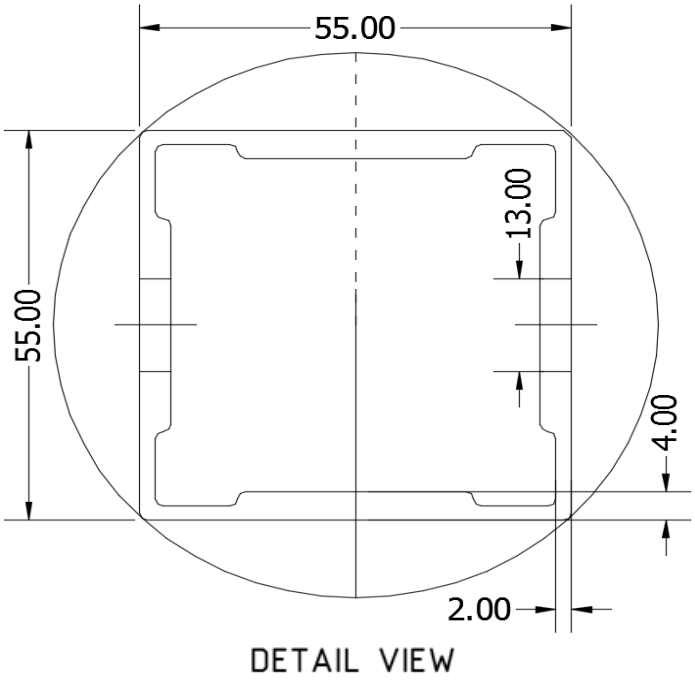


DETAIL VIEW

### 4.3 Strut Design

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

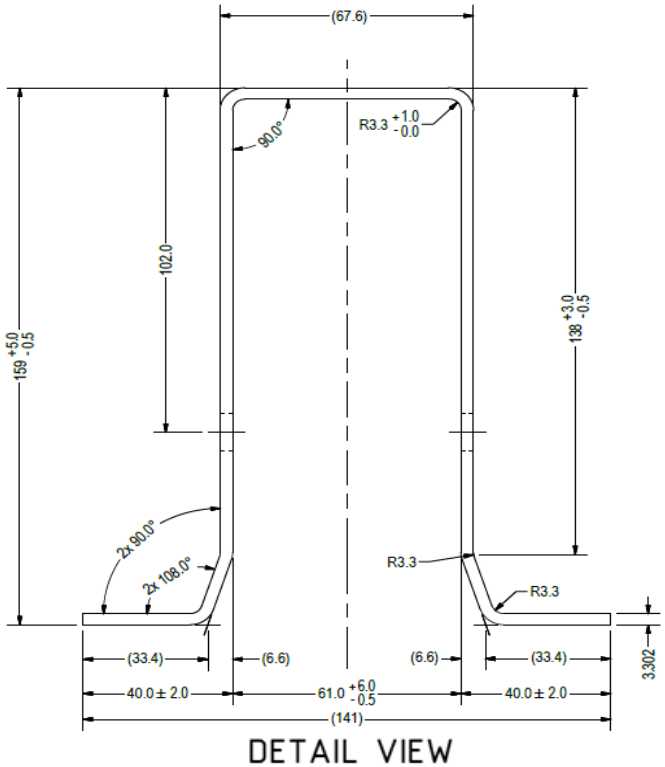
| | | |
|---|---|---|
| Strut Type = | **55x55** | |
| Aluminum Type = | 6105-T5 | |
| $F_{ty}$ = | 35 | ksi |
| $L_b$ = | 61.00 | in |
| $\Phi F_{ty\ AXIAL}$ = | 13.67 | ksi |
| $\Phi F_{ty\ BENDING}$ = | 28.22 | ksi |
| $S_y$ = | 0.60 | $in^3$ |
| $S_x$ = | 0.60 | $in^3$ |
| E = | 10100 | ksi |
| $I_y$ = | 0.67 | $in^4$ |
| $I_x$ = | 0.67 | $in^4$ |
| A = | 0.98 | $in^2$ |
| g = | 1.18 | lbs/ft |
| $M_y$ = | 0.004 | k-ft |
| $M_z$ = | 0.000 | k-ft |
| $P_n$ = | 3.795 | k |
| $M_{y\ allowable}$ = | 1.408 | k-ft |
| $M_{z\ allowable}$ = | 1.408 | k-ft |
| $P_{n\ allowable}$ = | 13.425 | k |
| Utilization = | 29% | |




### 4.4 Post Design

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

| | | |
|---|---|---|
| Post Type = | **FG8** | |
| Steel Type = | J2340 | |
| $F_{ty}$ = | 60 | ksi |
| $L_b$ = | 85.68 | in |
| $\Phi$ = | 0.90 | |
| $\Phi F_{ty}$ = | 54.00 | ksi |
| $S_y$ = | 3.46 | $in^3$ |
| $S_x$ = | 1.55 | $in^3$ |
| E = | 29000 | ksi |
| $I_y$ = | 10.94 | $in^4$ |
| $I_x$ = | 4.31 | $in^4$ |
| A = | 2.23 | $in^2$ |
| g = | 7.59 | lbs/ft |
| $M_y$ = | 15.460 | k-ft |
| $M_z$ = | 0.000 | k-ft |
| $P_r$ = | -4.753 | k |
| $M_{y\ allowable}$ = | 19.207 | k-ft |
| $M_{z\ allowable}$ = | 14.389 | k-ft |
| $P_c$ = | 28.060 | k |
| Utilization = | 93% | |



## 5. FOUNDATION DESIGN CALCULATIONS

### 5.1 Rammed Post Foundations

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

| | | |
|---|---|---|
| Maximum Tensile Load = | 6.14 | k |
| Maximum Lateral Load = | 4.00 | k |

### 5.2 Design of Drilled Shaft Foundations

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

### 5.3 Lateral Force Resistance

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

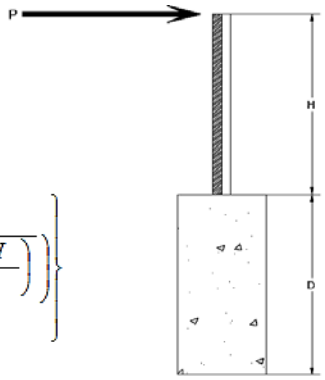
| | | |
|---|---|---|
| Lateral Force @ Top of Pole, P = | 0.97 | k |
| Height of Pole Above Grade, H = | 7.14 | ft |
| Diameter of Pole Footing, B = | 2.00 | ft |
| Lateral Soil Bearing Capacity, S = | 0.10 | ksf/ft |
| Isolated Pole Factor, F = | 2 | |
| First Trial Depth, D = | 3.25 | ft |

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

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

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

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




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

Non-Constrained

| | | |
|---|---|---|
| Lateral Force @ Top of Pole, P = | 0.97 | k |
| Height of Pole Above Grade, H = | 7.14 | ft |
| Diameter of Pole Footing, B = | 2.00 | ft |
| Lateral Soil Bearing Capacity, S = | 0.20 | ksf/ft |

| | | | |
|---|---|---|---|
| 1st Trial @ $D_1$ = | 3.25 | ft | |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.22 | ksf | |
| Lateral Soil Bearing @ D, $S_3$ = | 0.65 | ksf | |
| Constant 2.34P/($S_1$B), A = | 5.26 | | |
| Required Footing Depth, D = | 9.54 | ft | |
| 2nd Trial @ $D_2$ = | 6.40 | ft | |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.43 | ksf | |
| Lateral Soil Bearing @ D, $S_3$ = | 1.28 | ksf | |
| Constant 2.34P/($S_1$B), A = | 2.67 | | |
| Required Footing Depth, D = | 6.09 | ft | |
| 3rd Trial @ $D_3$ = | 6.24 | ft | |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.42 | ksf | |
| Lateral Soil Bearing @ D, $S_3$ = | 1.25 | ksf | |
| Constant 2.34P/($S_1$B), A = | 2.74 | | |
| Required Footing Depth, D = | 6.18 | ft | |
| 4th Trial @ $D_4$ = | 6.21 | ft | |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.41 | ksf | |
| Lateral Soil Bearing @ D, $S_3$ = | 1.24 | ksf | |
| Constant 2.34P/($S_1$B), A = | 2.75 | | |
| Required Footing Depth, D = | 6.20 | ft | |
| 5th Trial @ $D_5$ = | 6.21 | ft | |
| Lateral Soil Bearing @ D/3, $S_1$ = | 0.41 | ksf | |
| Lateral Soil Bearing @ D, $S_3$ = | 1.24 | ksf | |
| Constant 2.34P/($S_1$B), A = | 2.75 | | |
| Required Footing Depth, D = | 6.25 | ft | |

A 2ft diameter x 6.25ft deep footing unrestrained at ground level is required for the racking structure.

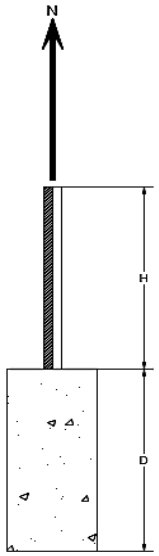
## 5.4 Uplifting Force Resistance

*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 = | 2.82 | 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 = | 1.82 | k |
| Required Concrete Volume, V = | 12.58 | $ft^3$ |
| Required Footing Depth, D = | 4.25 | ft |

| Iteration | z | dz | Qs | Side |
|---|---|---|---|---|
| 1 | 0.2 | 0.2 | 118.10 | 6.08 |
| 2 | 0.4 | 0.2 | 118.10 | 5.98 |
| 3 | 0.6 | 0.2 | 118.10 | 5.87 |
| 4 | 0.8 | 0.2 | 118.10 | 5.77 |
| 5 | 1 | 0.2 | 118.10 | 5.66 |
| 6 | 1.2 | 0.2 | 118.10 | 5.56 |
| 7 | 1.4 | 0.2 | 118.10 | 5.46 |
| 8 | 1.6 | 0.2 | 118.10 | 5.35 |
| 9 | 1.8 | 0.2 | 118.10 | 5.25 |
| 10 | 2 | 0.2 | 118.10 | 5.15 |
| 11 | 2.2 | 0.2 | 118.10 | 5.04 |
| 12 | 2.4 | 0.2 | 118.10 | 4.94 |
| 13 | 2.6 | 0.2 | 118.10 | 4.83 |
| 14 | 2.8 | 0.2 | 118.10 | 4.73 |
| 15 | 3 | 0.2 | 118.10 | 4.63 |
| 16 | 3.2 | 0.2 | 118.10 | 4.52 |
| 17 | 3.4 | 0.2 | 118.10 | 4.42 |
| 18 | 3.6 | 0.2 | 118.10 | 4.32 |
| 19 | 3.8 | 0.2 | 118.10 | 4.21 |
| 20 | 4 | 0.2 | 118.10 | 4.11 |
| 21 | 4.2 | 0.2 | 118.10 | 4.00 |
| 22 | 0 | 0.0 | 0.00 | 4.00 |
| 23 | 0 | 0.0 | 0.00 | 4.00 |
| 24 | 0 | 0.0 | 0.00 | 4.00 |
| 25 | 0 | 0.0 | 0.00 | 4.00 |
| 26 | 0 | 0.0 | 0.00 | 4.00 |
| 27 | 0 | 0.0 | 0.00 | 4.00 |
| 28 | 0 | 0.0 | 0.00 | 4.00 |
| 29 | 0 | 0.0 | 0.00 | 4.00 |
| 30 | 0 | 0.0 | 0.00 | 4.00 |
| 31 | 0 | 0.0 | 0.00 | 4.00 |
| 32 | 0 | 0.0 | 0.00 | 4.00 |
| 33 | 0 | 0.0 | 0.00 | 4.00 |
| 34 | 0 | 0.0 | 0.00 | 4.00 |
| Max | 4.2 | Sum | 0.99 | |

A 2ft diameter x 4.25ft deep footing unrestrained at ground level is required for the racking structure.




## 5.5 Compressive Force Resistance

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

| | | |
|---|---|---|
| Depth Below Grade, D = | 6.25 | ft |
| Footing Diameter, B = | 2.00 | ft |
| Compressive Force, P = | 3.12 | k |
| Footing Area = | 3.14 | $ft^2$ |
| Circumference = | 6.28 | ft |
| Skin Friction Area = | 20.42 | $ft^2$ |
| Concrete Weight = | 0.145 | kcf |

Bearing Pressure

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

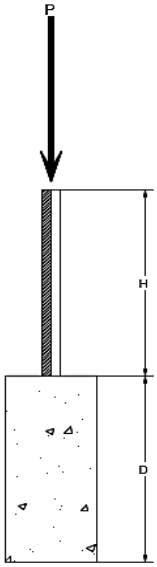
Weight of Concrete

| | | |
|---|---|---|
| Footing Volume | 19.63 | $ft^3$ |
| Weight | 2.85 | k |

Skin Friction Resistance

| | | |
|---|---|---|
| Skin Friction = | 0.15 | ksf |
| Resistance = | 3.06 | k |
| 1/3 Increase for Wind = | 1.33 | |
| Total Resistance = | 10.37 | k |
| Applied Force = | 5.96 | k |
| Utilization = | 58% | |

A 2ft diameter footing passes at a depth of 6.25ft.



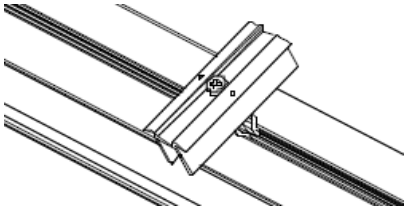
## 6. DESIGN OF JOINTS AND CONNECTIONS

### 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.*

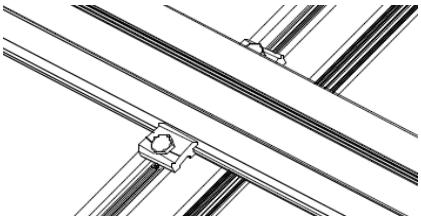
Fastening of Modules to Purlins

| | | |
|---|---|---|
| Maximum Uplifting Force | = | 0.799 k |
| Allowable Uplift | = | 1.214 k |
| Utilization | = | 66% |



Fastening of Purlins to Girders

| | | |
|---|---|---|
| Maximum Uplifting Force | = | 2.006 k |
| Allowable Uplift | = | 2.180 k |
| Utilization | = | 92% |

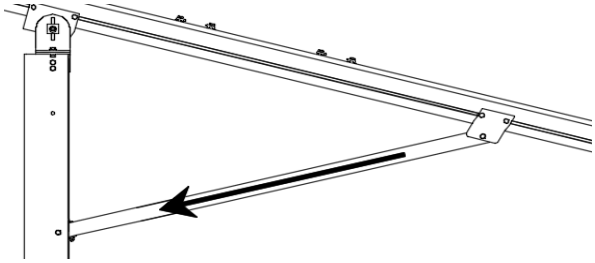


### 6.2 Strut Connections

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

| | | |
|---|---|---|
| Maximum Axial Load | = | 3.795 k |
| M10 Bolt Shear Capacity | = | 8.894 k |
| Utilization | = | 43% |

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

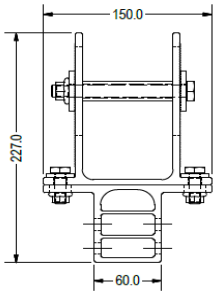


*A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.*

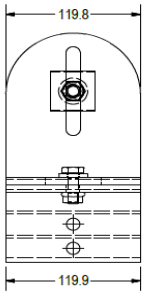
### 6.3 Girder to Post Connection

*In order to connect the girder to the post, custom extruded sections are assembled to create a post head piece. The reliability of calculations is uncertain due to limited standards, therefore the strength of the head piece has been evaluated by load testing.*

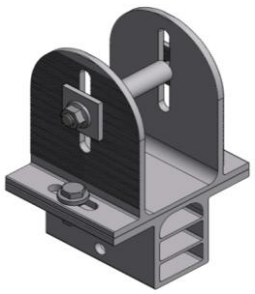
| | | |
|---|---|---|
| Maximum Tensile Load | = | 4.224 k |
| Allowable Load | = | 5.649 k |
| Utilization | = | 75% |



FRONT VIEW



SIDE VIEW



## 7. SEISMIC DESIGN

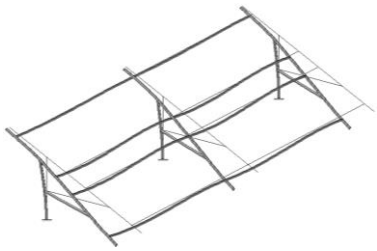
### 7.1 Seismic Drift

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

| | | |
|---|---|---|
| Mean Height, $h_{sx}$ | = | 77.78 in |
| Allowable Story Drift for All Other Structures, Δ | = { | $0.020h_{sx}$ |
| | | 1.556 in |
| Max Drift, $\Delta_{MAX}$ | = | 0.485 in |

*0.485 ≤ 1.556, OK.*

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



**APPENDIX A**

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

Purlin = **S1.5**

| Strong Axis: | | Weak Axis: | |
|---|---|---|---|
| **3.4.14** | | **3.4.14** | |
| $L_b$ = | 84 in | $L_b$ = | 84 |
| J = | 0.432 | J = | 0.432 |
| | 232.383 | | 147.782 |
| $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$ | | $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b}Fcy}{1.6Dc}\right)^2$ | |
| S1 = | 0.51461 | S1 = | 0.51461 |
| $S2 = \left(\frac{C_c}{1.6}\right)^2$ | | $S2 = \left(\frac{C_c}{1.6}\right)^2$ | |
| S2 = | 1701.56 | S2 = | 1701.56 |
| $\varphi F_L$= | φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))] | $\varphi F_L$= | φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))] |
| $\varphi F_L$= | 28.4 ksi | $\varphi F_L$= | 29.4 |
| **3.4.16** | | **3.4.16** | |
| b/t = | 32.195 | b/t = | 37.0588 |
| $S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$ | | $S1 = \frac{Bp - \frac{\theta_y}{\theta_b}Fcy}{1.6Dp}$ | |
| S1 = | 12.2 | S1 = | 12.2 |
| $S2 = \frac{k_1 Bp}{1.6Dp}$ | | $S2 = \frac{k_1 Bp}{1.6Dp}$ | |
| S2 = | 46.7 | S2 = | 46.7 |
| $\varphi F_L$= | φb[Bp-1.6Dp*b/t] | $\varphi F_L$= | φb[Bp-1.6Dp*b/t] |
| $\varphi F_L$= | 25.1 ksi | $\varphi F_L$= | 23.1 ksi |
| **3.4.16.1** | Not Used | **3.4.16.1** | |
| Rb/t = | | N/A for Weak Direction | |
| $S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b}Fcy}{1.6Dt}\right)^2$ | | | |
| S1 = | 1.1 | | |
| $S2 = C_t$ | | | |
| S2 = | 141.0 | | |
| $\varphi F_L$= | 1.17φyFcy | | |
| $\varphi F_L$= | 38.9 ksi | | |
| **3.4.18** | | **3.4.18** | |
| h/t = | 37.0588 | h/t = | 32.195 |
| $S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$ | | $S1 = \frac{Bbr - \frac{\theta_y}{\theta_b}1.3Fcy}{mDbr}$ | |
| S1 = | 36.9 | S1 = | 36.9 |
| m = | 0.65 | m = | 0.65 |
| $C_0$ = | 40.985 | $C_0$ = | 45.5 |
| Cc = | 41.015 | Cc = | 45.5 |
| $S2 = \frac{k_1 Bbr}{mDbr}$ | | $S2 = \frac{k_1 Bbr}{mDbr}$ | |
| S2 = | 77.2 | S2 = | 77.3 |
| $\varphi F_L$= | φb[Bbr-mDbr*h/t] | $\varphi F_L$= | 1.3φyFcy |
| $\varphi F_L$= | 43.2 ksi | $\varphi F_L$= | 43.2 ksi |
| $\varphi F_L$St= | 25.1 ksi | $\varphi F_L$Wk= | 23.1 ksi |
| Ix = | 897074 $mm^4$ | Iy = | 446476 $mm^4$ |
| | 2.155 $in^4$ | | 1.073 $in^4$ |
| y = | 41.015 mm | x = | 45.5 mm |
| Sx = | 1.335 $in^3$ | Sy = | 0.599 $in^3$ |
| $M_{max}$St = | 2.788 k-ft | $M_{max}$Wk = | 1.152 k-ft |

Compression

**3.4.9**

b/t = 32.195
S1 = 12.21 (See 3.4.16 above for formula)
S2 = 32.70 (See 3.4.16 above for formula)
$\varphi F_L$ = φc[Bp-1.6Dp*b/t]
$\varphi F_L$ = 25.1 ksi

b/t = 37.0588
S1 = 12.21
S2 = 32.70
$\varphi F_L$ = (φck2*√(BpE))/(1.6b/t)
$\varphi F_L$ = 21.9 ksi

**3.4.10**

Rb/t = 0.0

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

S1 = 6.87
S2 = 131.3
$\varphi F_L$ = φyFcy
$\varphi F_L$ = 33.25 ksi

$\varphi F_L$ = 21.94 ksi
A = 1215.13 $mm^2$
1.88 $in^2$
$P_{max}$ = 41.32 kips

**A.2 Design of Aluminum Girders - Aluminum Design Manual, 2005 Edition**

Girder = **T5**

Strong Axis:

**3.4.14**

$L_b$ = 63.8189 in
J = 1.98
82.1278

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

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56
$\varphi F_L$ = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
$\varphi F_L$ = 30.5 ksi

**3.4.16**

b/t = 4.5

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

S1 = 12.2

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

S2 = 46.7
$\varphi F_L$ = φyFcy
$\varphi F_L$ = 33.3 ksi

Weak Axis:

**3.4.14**

$L_b$ = 63.8189
J = 1.98
89.1294

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

S1 = 0.51461

$$S2 = \left(\frac{C_c}{1.6}\right)^2$$

S2 = 1701.56
$\varphi F_L$ = φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))]
$\varphi F_L$ = 30.3

**3.4.16**

b/t = 16.3333

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

S1 = 12.2

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

S2 = 46.7
$\varphi F_L$ = φb[Bp-1.6Dp*b/t]
$\varphi F_L$ = 31.6 ksi

**3.4.16.1** Used

Rb/t = 20.0

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

S1 = 1.1

$$S2 = C_t$$

S2 = 141.0

$\varphi F_L$= φb[Bt-Dt*√(Rb/t)]

$\varphi F_L$= 30.8 ksi

**3.4.16.1**

N/A for Weak Direction

**3.4.18**

h/t = 16.3333

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

S1 = 37.9

m = 0.63

$C_0$ = 61.046

Cc = 58.954

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

S2 = 79.4

$\varphi F_L$= 1.3φyFcy

$\varphi F_L$= 43.2 ksi

**3.4.18**

h/t = 4.5

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

S1 = 36.9

m = 0.65

$C_0$ = 35

Cc = 35

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

S2 = 77.3

$\varphi F_L$= 1.3φyFcy

$\varphi F_L$= 43.2 ksi

$\varphi F_L St$= 30.5 ksi

Ix = 1970917 $mm^4$

4.735 $in^4$

y = 61.046 mm

Sx = 1.970 $in^3$

$M_{max}St$ = 5.001 k-ft

$\varphi F_L Wk$= 31.6 ksi

Iy = 763048 $mm^4$

1.833 $in^4$

x = 35 mm

Sy = 1.330 $in^3$

$M_{max}Wk$ = 3.499 k-ft

Compression

**3.4.9**

b/t = 4.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

$\varphi F_L$= φyFcy

$\varphi F_L$= 33.3 ksi

b/t = 16.3333

S1 = 12.21

S2 = 32.70

$\varphi F_L$= φc[Bp-1.6Dp*b/t]

$\varphi F_L$= 31.6 ksi

**3.4.10**

Rb/t = 20.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L$= φc[Bt-Dt*√(Rb/t)]

$\varphi F_L$= 30.80 ksi

$\varphi F_L$= 30.80 ksi

A = 1215.13 $mm^2$

1.88 $in^2$

$P_{max}$ = 58.01 kips

**A.3 Design of Aluminum Struts - Aluminum Design Manual, 2005 Edition**

Strut = **55x55**

| Strong Axis: | Weak Axis: |
|---|---|
| **3.4.14** | **3.4.14** |
| $L_b$ = 61 in | $L_b$ = 61 |
| J = 0.942 | J = 0.942 |
| 95.1963 | 95.1963 |
| $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$ | $S1 = \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc}\right)^2$ |
| S1 = 0.51461 | S1 = 0.51461 |
| $S2 = \left(\frac{C_c}{1.6}\right)^2$ | $S2 = \left(\frac{C_c}{1.6}\right)^2$ |
| S2 = 1701.56 | S2 = 1701.56 |
| $\varphi F_L$= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))] | $\varphi F_L$= φb[Bc-1.6Dc*√((LbSc)/(Cb*√(IyJ)/2))] |
| $\varphi F_L$= 30.2 ksi | $\varphi F_L$= 30.2 |
| **3.4.16** | **3.4.16** |
| b/t = 24.5 | b/t = 24.5 |
| $S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$ | $S1 = \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp}$ |
| S1 = 12.2 | S1 = 12.2 |
| $S2 = \frac{k_1 Bp}{1.6Dp}$ | $S2 = \frac{k_1 Bp}{1.6Dp}$ |
| S2 = 46.7 | S2 = 46.7 |
| $\varphi F_L$= φb[Bp-1.6Dp*b/t] | $\varphi F_L$= φb[Bp-1.6Dp*b/t] |
| $\varphi F_L$= 28.2 ksi | $\varphi F_L$= 28.2 ksi |
| **3.4.16.1** Not Used | **3.4.16.1** |
| Rb/t = 0.0 | N/A for Weak Direction |
| $S1 = \left(\frac{Bt - 1.17\frac{\theta_y}{\theta_b} Fcy}{1.6Dt}\right)^2$ | |
| S1 = 1.1 | |
| $S2 = C_t$ | |
| S2 = 141.0 | |
| $\varphi F_L$= 1.17φyFcy | |
| $\varphi F_L$= 38.9 ksi | |
| **3.4.18** | **3.4.18** |
| h/t = 24.5 | h/t = 24.5 |
| $S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$ | $S1 = \frac{Bbr - \frac{\theta_y}{\theta_b} 1.3Fcy}{mDbr}$ |
| S1 = 36.9 | S1 = 36.9 |
| m = 0.65 | m = 0.65 |
| $C_0$ = 27.5 | $C_0$ = 27.5 |
| Cc = 27.5 | Cc = 27.5 |
| $S2 = \frac{k_1 Bbr}{mDbr}$ | $S2 = \frac{k_1 Bbr}{mDbr}$ |
| S2 = 77.3 | S2 = 77.3 |
| $\varphi F_L$= 1.3φyFcy | $\varphi F_L$= 1.3φyFcy |
| $\varphi F_L$= 43.2 ksi | $\varphi F_L$= 43.2 ksi |
| $\varphi F_L$St= 28.2 ksi | $\varphi F_L$Wk= 28.2 ksi |
| Ix = 279836 $mm^4$ | Iy = 279836 $mm^4$ |
| 0.672 $in^4$ | 0.672 $in^4$ |
| y = 27.5 mm | x = 27.5 mm |
| Sx = 0.621 $in^3$ | Sy = 0.621 $in^3$ |
| $M_{max}$St = 1.460 k-ft | $M_{max}$Wk = 1.460 k-ft |

Compression

**3.4.7**

λ = 1.41113

r = 0.81 in

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

$S1^*$ = 0.33515

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

$S2^*$ = 1.23671

φcc = 0.77756

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

$\varphi F_L$ = 13.6667 ksi

**3.4.9**

b/t = 24.5

S1 = 12.21 (See 3.4.16 above for formula)

S2 = 32.70 (See 3.4.16 above for formula)

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

$\varphi F_L$ = 28.2 ksi

b/t = 24.5

S1 = 12.21

S2 = 32.70

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

$\varphi F_L$ = 28.2 ksi

**3.4.10**

Rb/t = 0.0

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

S1 = 6.87

S2 = 131.3

$\varphi F_L = \varphi yFcy$

$\varphi F_L$ = 33.25 ksi

$\varphi F_L$ = 13.67 ksi

A = 663.99 $mm^2$

1.03 $in^2$

$P_{max}$ = 14.07 kips

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

Post Type = **FG8**

| | | | |
|---|---|---|---|
| Unbraced Length = | 85.68 | in | |
| Pr = | -4.75 | k | (LRFD Factored Load) |
| Mr (Strong) = | 15.46 | k-ft | (LRFD Factored Load) |
| Mr (Weak) = | 0.00 | k-ft | (LRFD Factored Load) |

Flexural Buckling:

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

Torsional/Flexural Torsional Buckling:

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

Bending (Strong Axis):

Yielding:

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

Flange Local Buckling:

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

| | | | | |
|---|---|---|---|---|
| Pr/Pc = | 0.129 | < | 0.2 | |
| Utilization = | 0.93 | < | 1.0 | OK |

Bending (Weak Axis):

Yielding:

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

Flange Local Buckling:

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

| | | | | |
|---|---|---|---|---|
| Pr/Pc = | 0.129 | < | 0.2 | |
| Utilization = | 0.00 | < | 1.0 | OK |

Combined Forces

Utilization = 93%

**APPENDIX B**

**B.1**

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

## Basic Load Cases

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

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

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

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

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

## Member Distributed Loads (BLC 3 : Snow Load)

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

## Member Distributed Loads (BLC 4 : Wind Load - Pressure)

| | Member Label | Direction | Start Magnitude[lb/ft,F] | End Magnitude[lb/ft,F] | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M10 | y | -118.221 | -118.221 | 0 | 0 |
| 2 | M11 | y | -118.221 | -118.221 | 0 | 0 |
| 3 | M12 | y | -197.035 | -197.035 | 0 | 0 |
| 4 | M13 | y | -197.035 | -197.035 | 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 | 236.442 | 236.442 | 0 | 0 |
| 2 | M11 | y | 236.442 | 236.442 | 0 | 0 |
| 3 | M12 | y | 118.221 | 118.221 | 0 | 0 |
| 4 | M13 | y | 118.221 | 118.221 | 0 | 0 |

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

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

## Load Combinations

| | Description | S... | P... | S... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | LRFD 1.2D + 1.6S + 0.5W | 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 | 994.003 | 2 | 1900.68 | 2 | 129.78 | 2 | .189 | 2 | .029 | 5 | 5.506 | 3 |
| 2 | | min | -1312.788 | 3 | -1463.845 | 3 | -266.34 | 5 | -1.172 | 5 | -.017 | 2 | -.082 | 10 |
| 3 | N19 | max | 3075.049 | 2 | 5300.299 | 2 | 0 | 1 | 0 | 3 | .03 | 4 | 9.157 | 3 |
| 4 | | min | -3070.361 | 3 | -4693.538 | 3 | -282.364 | 5 | -1.216 | 4 | 0 | 10 | -.393 | 10 |
| 5 | N29 | max | 994.003 | 2 | 1900.68 | 2 | 171.495 | 3 | .289 | 3 | .03 | 4 | 5.506 | 3 |
| 6 | | min | -1312.788 | 3 | -1463.845 | 3 | -282.565 | 4 | -1.206 | 4 | -.008 | 3 | -.248 | 5 |
| 7 | Totals: | max | 5063.056 | 2 | 9101.658 | 2 | 0 | 1 | | | | | | |
| 8 | | min | -5695.938 | 3 | -7621.229 | 3 | -821.36 | 4 | | | | | | |

## Envelope Member Section Forces

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | 1 | max | 0 | 1 | .006 | 2 | .001 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 2 | | | min | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 3 | | 2 | max | -.299 | 15 | -.428 | 15 | 0 | 10 | 0 | 1 | 0 | 10 | 0 | 6 |
| 4 | | | min | -1.274 | 6 | -1.817 | 6 | -1.499 | 5 | 0 | 1 | 0 | 5 | 0 | 15 |
| 5 | | 3 | max | -19.536 | 10 | 306.443 | 3 | -7.878 | 10 | .04 | 3 | .119 | 4 | .279 | 2 |
| 6 | | | min | -132.432 | 1 | -640.438 | 2 | -62.419 | 1 | -.151 | 2 | .011 | 10 | -.13 | 3 |
| 7 | | 4 | max | -20.363 | 10 | 305.38 | 3 | -7.878 | 10 | .04 | 3 | .08 | 4 | .677 | 2 |
| 8 | | | min | -133.424 | 1 | -641.856 | 2 | -63.5 | 4 | -.151 | 2 | .007 | 10 | -.32 | 3 |
| 9 | | 5 | max | -21.19 | 10 | 304.317 | 3 | -7.878 | 10 | .04 | 3 | .04 | 4 | 1.075 | 2 |
| 10 | | | min | -134.417 | 1 | -643.273 | 2 | -65 | 4 | -.151 | 2 | .002 | 10 | -.51 | 3 |
| 11 | | 6 | max | 137.573 | 3 | 543.172 | 2 | -19.701 | 12 | .032 | 2 | .048 | 2 | 1.039 | 2 |
| 12 | | | min | -529.924 | 2 | -170.285 | 3 | -91.624 | 1 | -.048 | 3 | -.026 | 5 | -.524 | 3 |
| 13 | | 7 | max | 136.829 | 3 | 541.755 | 2 | -19.701 | 12 | .032 | 2 | .007 | 10 | .703 | 2 |
| 14 | | | min | -530.917 | 2 | -171.348 | 3 | -91.624 | 1 | -.048 | 3 | -.054 | 4 | -.418 | 3 |
| 15 | | 8 | max | 136.085 | 3 | 540.337 | 2 | -19.701 | 12 | .032 | 2 | -.012 | 10 | .367 | 2 |
| 16 | | | min | -531.909 | 2 | -172.412 | 3 | -91.624 | 1 | -.048 | 3 | -.088 | 4 | -.312 | 3 |
| 17 | | 9 | max | 85.412 | 3 | 114.682 | 3 | -15.414 | 10 | .014 | 5 | .066 | 3 | .167 | 2 |
| 18 | | | min | -605.098 | 1 | -65.203 | 2 | -105.569 | 1 | -.091 | 2 | -.005 | 10 | -.264 | 3 |
| 19 | | 10 | max | 84.667 | 3 | 113.619 | 3 | -15.414 | 10 | .014 | 5 | .032 | 3 | .208 | 2 |
| 20 | | | min | -606.091 | 1 | -66.62 | 2 | -105.569 | 1 | -.091 | 2 | -.026 | 2 | -.335 | 3 |
| 21 | | 11 | max | 83.923 | 3 | 112.556 | 3 | -15.414 | 10 | .014 | 5 | -.002 | 12 | .25 | 2 |
| 22 | | | min | -607.083 | 1 | -68.038 | 2 | -105.569 | 1 | -.091 | 2 | -.089 | 4 | -.405 | 3 |
| 23 | | 12 | max | 28.789 | 3 | 787.42 | 3 | 94.886 | 2 | .202 | 3 | .072 | 1 | .444 | 2 |
| 24 | | | min | -744.258 | 1 | -451.549 | 2 | -255.86 | 3 | -.144 | 2 | -.039 | 5 | -.738 | 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 | 28.044 | 3 | 786.357 | 3 | 94.886 | 2 | .202 | 3 | .09 | 2 | .725 | 2 |
| 26 | | | min | -745.251 | 1 | -452.967 | 2 | -255.86 | 3 | -.144 | 2 | -.125 | 5 | -1.226 | 3 |
| 27 | | 14 | max | 135.041 | 1 | 434.713 | 2 | 51.14 | 5 | .16 | 2 | .107 | 3 | .994 | 2 |
| 28 | | | min | 4.399 | 15 | -733.342 | 3 | -103.814 | 3 | -.331 | 3 | -.104 | 4 | -1.693 | 3 |
| 29 | | 15 | max | 134.049 | 1 | 433.296 | 2 | 49.64 | 5 | .16 | 2 | .043 | 3 | .725 | 2 |
| 30 | | | min | 4.099 | 15 | -734.405 | 3 | -103.814 | 3 | -.331 | 3 | -.081 | 4 | -1.237 | 3 |
| 31 | | 16 | max | 133.056 | 1 | 431.878 | 2 | 48.14 | 5 | .16 | 2 | -.014 | 12 | .457 | 2 |
| 32 | | | min | 3.8 | 15 | -735.468 | 3 | -103.814 | 3 | -.331 | 3 | -.1 | 1 | -.781 | 3 |
| 33 | | 17 | max | 132.064 | 1 | 430.461 | 2 | 46.64 | 5 | .16 | 2 | -.004 | 15 | .189 | 2 |
| 34 | | | min | 3.5 | 15 | -736.531 | 3 | -103.814 | 3 | -.331 | 3 | -.125 | 1 | -.324 | 3 |
| 35 | | 18 | max | 1.274 | 6 | 1.819 | 6 | 1.5 | 4 | 0 | 1 | 0 | 10 | 0 | 6 |
| 36 | | | min | .299 | 15 | .428 | 15 | 0 | 10 | 0 | 1 | 0 | 4 | 0 | 15 |
| 37 | | 19 | max | 0 | 1 | .005 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 38 | | | min | 0 | 1 | -.009 | 3 | 0 | 15 | 0 | 1 | 0 | 1 | 0 | 1 |
| 39 | M4 | 1 | max | 0 | 1 | .014 | 2 | .001 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 40 | | | min | 0 | 1 | -.002 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 41 | | 2 | max | -.299 | 15 | -.428 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 6 |
| 42 | | | min | -1.274 | 4 | -1.817 | 6 | -1.499 | 5 | 0 | 1 | 0 | 5 | 0 | 15 |
| 43 | | 3 | max | 45.27 | 3 | 974.546 | 3 | 0 | 1 | .042 | 4 | .138 | 4 | .694 | 2 |
| 44 | | | min | -259.803 | 1 | -1808.027 | 2 | -71.547 | 5 | 0 | 1 | 0 | 1 | -.38 | 3 |
| 45 | | 4 | max | 44.525 | 3 | 973.483 | 3 | 0 | 1 | .042 | 4 | .094 | 4 | 1.817 | 2 |
| 46 | | | min | -260.796 | 1 | -1809.445 | 2 | -73.047 | 5 | 0 | 1 | 0 | 1 | -.985 | 3 |
| 47 | | 5 | max | 43.781 | 3 | 972.42 | 3 | 0 | 1 | .042 | 4 | .048 | 4 | 2.94 | 2 |
| 48 | | | min | -261.788 | 1 | -1810.862 | 2 | -74.547 | 5 | 0 | 1 | 0 | 1 | -1.588 | 3 |
| 49 | | 6 | max | 755.194 | 3 | 1710.585 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 2.772 | 2 |
| 50 | | | min | -1514.032 | 2 | -807.05 | 3 | -56.696 | 4 | -.035 | 4 | -.027 | 5 | -1.539 | 3 |
| 51 | | 7 | max | 754.45 | 3 | 1709.167 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1.711 | 2 |
| 52 | | | min | -1515.024 | 2 | -808.113 | 3 | -58.195 | 4 | -.035 | 4 | -.062 | 4 | -1.038 | 3 |
| 53 | | 8 | max | 753.705 | 3 | 1707.75 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | .65 | 2 |
| 54 | | | min | -1516.017 | 2 | -809.176 | 3 | -59.695 | 4 | -.035 | 4 | -.099 | 4 | -.536 | 3 |
| 55 | | 9 | max | 809.787 | 3 | 204.425 | 3 | 0 | 1 | .009 | 4 | .059 | 5 | .029 | 1 |
| 56 | | | min | -1627.461 | 2 | -175.715 | 2 | -136.186 | 4 | 0 | 1 | 0 | 1 | -.27 | 3 |
| 57 | | 10 | max | 809.042 | 3 | 203.362 | 3 | 0 | 1 | .009 | 4 | 0 | 1 | .123 | 2 |
| 58 | | | min | -1628.454 | 2 | -177.133 | 2 | -137.686 | 4 | 0 | 1 | -.026 | 4 | -.397 | 3 |
| 59 | | 11 | max | 808.298 | 3 | 202.299 | 3 | 0 | 1 | .009 | 4 | 0 | 1 | .233 | 2 |
| 60 | | | min | -1629.446 | 2 | -178.55 | 2 | -139.185 | 4 | 0 | 1 | -.112 | 4 | -.523 | 3 |
| 61 | | 12 | max | 873.302 | 3 | 2093.596 | 3 | 0 | 1 | .121 | 4 | 0 | 1 | .829 | 2 |
| 62 | | | min | -1747.579 | 2 | -1402.808 | 2 | -149.985 | 4 | 0 | 1 | -.032 | 4 | -1.408 | 3 |
| 63 | | 13 | max | 872.558 | 3 | 2092.533 | 3 | 0 | 1 | .121 | 4 | 0 | 1 | 1.7 | 2 |
| 64 | | | min | -1748.572 | 2 | -1404.225 | 2 | -151.485 | 4 | 0 | 1 | -.126 | 4 | -2.707 | 3 |
| 65 | | 14 | max | 263.517 | 1 | 1134.031 | 2 | 54.315 | 5 | 0 | 1 | 0 | 1 | 2.537 | 2 |
| 66 | | | min | -44.741 | 3 | -1766.202 | 3 | 0 | 1 | -.081 | 4 | -.077 | 5 | -3.953 | 3 |
| 67 | | 15 | max | 262.525 | 1 | 1132.613 | 2 | 52.816 | 5 | 0 | 1 | 0 | 1 | 1.834 | 2 |
| 68 | | | min | -45.486 | 3 | -1767.265 | 3 | 0 | 1 | -.081 | 4 | -.044 | 5 | -2.857 | 3 |
| 69 | | 16 | max | 261.532 | 1 | 1131.196 | 2 | 51.316 | 5 | 0 | 1 | 0 | 1 | 1.131 | 2 |
| 70 | | | min | -46.23 | 3 | -1768.328 | 3 | 0 | 1 | -.081 | 4 | -.011 | 5 | -1.759 | 3 |
| 71 | | 17 | max | 260.54 | 1 | 1129.778 | 2 | 49.816 | 5 | 0 | 1 | .02 | 4 | .429 | 2 |
| 72 | | | min | -46.975 | 3 | -1769.391 | 3 | 0 | 1 | -.081 | 4 | 0 | 1 | -.662 | 3 |
| 73 | | 18 | max | 1.274 | 6 | 1.82 | 6 | 1.5 | 5 | 0 | 1 | 0 | 1 | 0 | 6 |
| 74 | | | min | .299 | 15 | .428 | 15 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 15 |
| 75 | | 19 | max | 0 | 1 | .01 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 76 | | | min | 0 | 1 | -.017 | 3 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 77 | M7 | 1 | max | 0 | 1 | .006 | 2 | .002 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 78 | | | min | 0 | 1 | 0 | 3 | 0 | 10 | 0 | 1 | 0 | 1 | 0 | 1 |
| 79 | | 2 | max | -.299 | 15 | -.428 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 4 |
| 80 | | | min | -1.274 | 6 | -1.818 | 4 | -1.499 | 5 | 0 | 1 | 0 | 5 | 0 | 15 |
| 81 | | 3 | max | 13.215 | 5 | 306.443 | 3 | 62.419 | 1 | .151 | 2 | .067 | 5 | .279 | 2 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82 | | | min | -132.432 | 1 | -640.438 | 2 | -35.042 | 5 | -.04 | 3 | -.117 | 1 | -.13 | 3 |
| 83 | | 4 | max | 12.752 | 5 | 305.38 | 3 | 62.419 | 1 | .151 | 2 | .045 | 5 | .677 | 2 |
| 84 | | | min | -133.424 | 1 | -641.856 | 2 | -36.542 | 5 | -.04 | 3 | -.078 | 1 | -.32 | 3 |
| 85 | | 5 | max | 12.289 | 5 | 304.317 | 3 | 62.419 | 1 | .151 | 2 | .022 | 5 | 1.075 | 2 |
| 86 | | | min | -134.417 | 1 | -643.273 | 2 | -38.042 | 5 | -.04 | 3 | -.04 | 1 | -.51 | 3 |
| 87 | | 6 | max | 137.573 | 3 | 543.172 | 2 | 91.624 | 1 | .048 | 3 | .016 | 3 | 1.039 | 2 |
| 88 | | | min | -529.924 | 2 | -170.285 | 3 | -20.234 | 5 | -.032 | 2 | -.048 | 2 | -.524 | 3 |
| 89 | | 7 | max | 136.829 | 3 | 541.755 | 2 | 91.624 | 1 | .048 | 3 | .036 | 3 | .703 | 2 |
| 90 | | | min | -530.917 | 2 | -171.348 | 3 | -21.734 | 5 | -.032 | 2 | -.042 | 5 | -.418 | 3 |
| 91 | | 8 | max | 136.085 | 3 | 540.337 | 2 | 91.624 | 1 | .048 | 3 | .075 | 1 | .367 | 2 |
| 92 | | | min | -531.909 | 2 | -172.412 | 3 | -23.233 | 5 | -.032 | 2 | -.056 | 5 | -.312 | 3 |
| 93 | | 9 | max | 85.412 | 3 | 114.682 | 3 | 105.569 | 1 | .091 | 2 | .014 | 5 | .167 | 2 |
| 94 | | | min | -605.098 | 1 | -65.203 | 2 | -56.294 | 5 | .009 | 9 | -.066 | 3 | -.264 | 3 |
| 95 | | 10 | max | 84.667 | 3 | 113.619 | 3 | 105.569 | 1 | .091 | 2 | .026 | 2 | .208 | 2 |
| 96 | | | min | -606.091 | 1 | -66.62 | 2 | -57.794 | 5 | .009 | 9 | -.032 | 3 | -.335 | 3 |
| 97 | | 11 | max | 83.923 | 3 | 112.556 | 3 | 105.569 | 1 | .091 | 2 | .084 | 1 | .25 | 2 |
| 98 | | | min | -607.083 | 1 | -68.038 | 2 | -59.293 | 5 | .009 | 9 | -.058 | 5 | -.405 | 3 |
| 99 | | 12 | max | 28.789 | 3 | 787.42 | 3 | 255.86 | 3 | .144 | 2 | -.011 | 10 | .444 | 2 |
| 100 | | | min | -744.258 | 1 | -451.549 | 2 | -134.503 | 5 | -.202 | 3 | -.072 | 1 | -.738 | 3 |
| 101 | | 13 | max | 28.044 | 3 | 786.357 | 3 | 255.86 | 3 | .144 | 2 | .109 | 3 | .725 | 2 |
| 102 | | | min | -745.251 | 1 | -452.967 | 2 | -136.002 | 5 | -.202 | 3 | -.149 | 4 | -1.226 | 3 |
| 103 | | 14 | max | 135.041 | 1 | 434.713 | 2 | 103.814 | 3 | .331 | 3 | .065 | 2 | .994 | 2 |
| 104 | | | min | 13.199 | 15 | -733.342 | 3 | -9.867 | 10 | -.16 | 2 | -.107 | 3 | -1.693 | 3 |
| 105 | | 15 | max | 134.049 | 1 | 433.296 | 2 | 103.814 | 3 | .331 | 3 | .075 | 1 | .725 | 2 |
| 106 | | | min | 12.9 | 15 | -734.405 | 3 | -9.867 | 10 | -.16 | 2 | -.057 | 5 | -1.237 | 3 |
| 107 | | 16 | max | 133.056 | 1 | 431.878 | 2 | 103.814 | 3 | .331 | 3 | .1 | 1 | .457 | 2 |
| 108 | | | min | 12.6 | 15 | -735.468 | 3 | -9.867 | 10 | -.16 | 2 | -.021 | 5 | -.781 | 3 |
| 109 | | 17 | max | 132.064 | 1 | 430.461 | 2 | 103.814 | 3 | .331 | 3 | .125 | 1 | .189 | 2 |
| 110 | | | min | 12.301 | 15 | -736.531 | 3 | -9.867 | 10 | -.16 | 2 | .01 | 15 | -.324 | 3 |
| 111 | | 18 | max | 1.274 | 6 | 1.82 | 4 | 1.5 | 5 | 0 | 1 | 0 | 1 | 0 | 4 |
| 112 | | | min | .299 | 15 | .428 | 15 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 15 |
| 113 | | 19 | max | 0 | 1 | .005 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 1 |
| 114 | | | min | 0 | 1 | -.009 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 115 | M10 | 1 | max | 103.827 | 3 | 427.29 | 2 | -11.705 | 15 | .014 | 2 | .142 | 1 | .16 | 2 |
| 116 | | | min | -9.868 | 10 | -738.585 | 3 | -130.101 | 1 | -.027 | 3 | .014 | 10 | -.331 | 3 |
| 117 | | 2 | max | 103.827 | 3 | 317.291 | 2 | -10.111 | 15 | .014 | 2 | .093 | 3 | .173 | 3 |
| 118 | | | min | -9.868 | 10 | -558.1 | 3 | -101.283 | 1 | -.027 | 3 | .002 | 10 | -.129 | 2 |
| 119 | | 3 | max | 103.827 | 3 | 207.293 | 2 | -8.517 | 15 | .014 | 2 | .06 | 3 | .537 | 3 |
| 120 | | | min | -9.868 | 10 | -377.614 | 3 | -72.466 | 1 | -.027 | 3 | -.016 | 1 | -.333 | 2 |
| 121 | | 4 | max | 103.827 | 3 | 97.294 | 2 | -4.432 | 10 | .014 | 2 | .029 | 3 | .761 | 3 |
| 122 | | | min | -9.868 | 10 | -197.129 | 3 | -43.649 | 1 | -.027 | 3 | -.061 | 1 | -.452 | 2 |
| 123 | | 5 | max | 103.827 | 3 | 14.343 | 5 | -.029 | 10 | .014 | 2 | 0 | 3 | .844 | 3 |
| 124 | | | min | -9.868 | 10 | -17.284 | 1 | -36.421 | 3 | -.027 | 3 | -.084 | 1 | -.485 | 2 |
| 125 | | 6 | max | 103.827 | 3 | 163.841 | 3 | 13.986 | 1 | .014 | 2 | -.005 | 15 | .786 | 3 |
| 126 | | | min | -9.868 | 10 | -122.703 | 2 | -34.031 | 3 | -.027 | 3 | -.084 | 1 | -.432 | 2 |
| 127 | | 7 | max | 103.827 | 3 | 344.326 | 3 | 42.803 | 1 | .014 | 2 | -.007 | 10 | .589 | 3 |
| 128 | | | min | -9.868 | 10 | -232.702 | 2 | -31.64 | 3 | -.027 | 3 | -.062 | 1 | -.294 | 2 |
| 129 | | 8 | max | 103.827 | 3 | 524.812 | 3 | 71.621 | 1 | .014 | 2 | .002 | 10 | .251 | 3 |
| 130 | | | min | -9.868 | 10 | -342.701 | 2 | -29.249 | 3 | -.027 | 3 | -.077 | 3 | -.07 | 2 |
| 131 | | 9 | max | 103.827 | 3 | 705.297 | 3 | 100.438 | 1 | .014 | 2 | .049 | 1 | .239 | 2 |
| 132 | | | min | -10.618 | 5 | -452.699 | 2 | -26.859 | 3 | -.027 | 3 | -.099 | 3 | -.228 | 3 |
| 133 | | 10 | max | 103.827 | 3 | 562.698 | 2 | 129.255 | 1 | .008 | 10 | .139 | 1 | .634 | 2 |
| 134 | | | min | -9.868 | 10 | -885.782 | 3 | -74.972 | 14 | -.027 | 3 | -.118 | 3 | -.846 | 3 |
| 135 | | 11 | max | 103.827 | 3 | 452.699 | 2 | 26.859 | 3 | .027 | 3 | .049 | 1 | .239 | 2 |
| 136 | | | min | -9.868 | 10 | -705.297 | 3 | -100.438 | 1 | -.014 | 2 | -.099 | 3 | -.228 | 3 |
| 137 | | 12 | max | 103.827 | 3 | 342.701 | 2 | 29.249 | 3 | .027 | 3 | .008 | 5 | .251 | 3 |
| 138 | | | min | -9.868 | 10 | -524.812 | 3 | -71.621 | 1 | -.014 | 2 | -.077 | 3 | -.07 | 2 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 139 | | 13 | max | 103.827 | 3 | 232.702 | 2 | 31.64 | 3 | .027 | 3 | 0 | 15 | .589 | 3 |
| 140 | | | min | -9.868 | 10 | -344.326 | 3 | -42.803 | 1 | -.014 | 2 | -.062 | 1 | -.294 | 2 |
| 141 | | 14 | max | 103.827 | 3 | 122.703 | 2 | 34.031 | 3 | .027 | 3 | -.005 | 15 | .786 | 3 |
| 142 | | | min | -9.868 | 10 | -163.841 | 3 | -13.986 | 1 | -.014 | 2 | -.084 | 1 | -.432 | 2 |
| 143 | | 15 | max | 103.827 | 3 | 20.295 | 4 | 36.421 | 3 | .027 | 3 | 0 | 3 | .844 | 3 |
| 144 | | | min | -11.705 | 5 | 6.056 | 10 | -5.103 | 5 | -.014 | 2 | -.084 | 1 | -.485 | 2 |
| 145 | | 16 | max | 103.827 | 3 | 197.129 | 3 | 43.649 | 1 | .027 | 3 | .029 | 3 | .761 | 3 |
| 146 | | | min | -19.689 | 5 | -97.294 | 2 | -2.637 | 5 | -.014 | 2 | -.061 | 1 | -.452 | 2 |
| 147 | | 17 | max | 103.827 | 3 | 377.614 | 3 | 72.466 | 1 | .027 | 3 | .06 | 3 | .537 | 3 |
| 148 | | | min | -27.673 | 5 | -207.293 | 2 | -.286 | 15 | -.014 | 2 | -.019 | 4 | -.333 | 2 |
| 149 | | 18 | max | 103.827 | 3 | 558.1 | 3 | 101.283 | 1 | .027 | 3 | .093 | 3 | .173 | 3 |
| 150 | | | min | -35.657 | 5 | -317.291 | 2 | 1.308 | 15 | -.014 | 2 | -.015 | 5 | -.129 | 2 |
| 151 | | 19 | max | 103.827 | 3 | 738.585 | 3 | 130.101 | 1 | .027 | 3 | .142 | 1 | .16 | 2 |
| 152 | | | min | -43.641 | 5 | -427.29 | 2 | 2.902 | 15 | -.014 | 2 | -.013 | 5 | -.331 | 3 |
| 153 | M11 | 1 | max | 140.124 | 2 | 380.941 | 2 | 12.916 | 5 | 0 | 10 | .17 | 1 | .095 | 4 |
| 154 | | | min | -201.024 | 3 | -675.637 | 3 | -136.254 | 1 | -.005 | 3 | -.073 | 5 | -.289 | 3 |
| 155 | | 2 | max | 140.124 | 2 | 270.942 | 2 | 15.382 | 5 | 0 | 10 | .124 | 3 | .166 | 3 |
| 156 | | | min | -201.024 | 3 | -495.152 | 3 | -107.437 | 1 | -.005 | 3 | -.062 | 5 | -.2 | 2 |
| 157 | | 3 | max | 140.124 | 2 | 160.943 | 2 | 17.848 | 5 | 0 | 10 | .085 | 3 | .481 | 3 |
| 158 | | | min | -201.024 | 3 | -314.667 | 3 | -78.619 | 1 | -.005 | 3 | -.049 | 5 | -.368 | 2 |
| 159 | | 4 | max | 140.124 | 2 | 50.945 | 2 | 20.314 | 5 | 0 | 10 | .048 | 3 | .655 | 3 |
| 160 | | | min | -201.024 | 3 | -134.182 | 3 | -49.802 | 1 | -.005 | 3 | -.047 | 1 | -.451 | 2 |
| 161 | | 5 | max | 140.124 | 2 | 46.303 | 3 | 22.78 | 5 | 0 | 10 | .012 | 3 | .689 | 3 |
| 162 | | | min | -201.024 | 3 | -59.054 | 2 | -44.371 | 3 | -.005 | 3 | -.074 | 1 | -.448 | 2 |
| 163 | | 6 | max | 140.124 | 2 | 226.788 | 3 | 26.587 | 4 | 0 | 10 | 0 | 5 | .583 | 3 |
| 164 | | | min | -201.024 | 3 | -169.053 | 2 | -41.981 | 3 | -.005 | 3 | -.079 | 1 | -.359 | 2 |
| 165 | | 7 | max | 140.124 | 2 | 407.274 | 3 | 36.65 | 1 | 0 | 10 | .022 | 5 | .337 | 3 |
| 166 | | | min | -201.024 | 3 | -279.052 | 2 | -39.59 | 3 | -.005 | 3 | -.062 | 1 | -.185 | 2 |
| 167 | | 8 | max | 140.124 | 2 | 587.759 | 3 | 65.467 | 1 | 0 | 10 | .044 | 5 | .075 | 2 |
| 168 | | | min | -201.024 | 3 | -389.05 | 2 | -37.199 | 3 | -.005 | 3 | -.083 | 3 | -.05 | 3 |
| 169 | | 9 | max | 140.124 | 2 | 768.244 | 3 | 94.285 | 1 | 0 | 10 | .077 | 4 | .421 | 2 |
| 170 | | | min | -201.024 | 3 | -499.049 | 2 | -34.809 | 3 | -.005 | 3 | -.111 | 3 | -.578 | 3 |
| 171 | | 10 | max | 140.124 | 2 | 139.246 | 14 | 123.102 | 1 | 0 | 10 | .124 | 1 | .852 | 2 |
| 172 | | | min | -201.024 | 3 | -948.729 | 3 | -55.207 | 14 | -.005 | 3 | -.137 | 3 | -1.245 | 3 |
| 173 | | 11 | max | 140.124 | 2 | 499.049 | 2 | 34.809 | 3 | .005 | 3 | .04 | 1 | .421 | 2 |
| 174 | | | min | -201.024 | 3 | -768.244 | 3 | -94.285 | 1 | 0 | 5 | -.111 | 3 | -.578 | 3 |
| 175 | | 12 | max | 140.124 | 2 | 389.05 | 2 | 37.199 | 3 | .005 | 3 | .002 | 10 | .075 | 2 |
| 176 | | | min | -201.024 | 3 | -587.759 | 3 | -65.467 | 1 | 0 | 5 | -.083 | 3 | -.05 | 3 |
| 177 | | 13 | max | 140.124 | 2 | 279.052 | 2 | 39.59 | 3 | .005 | 3 | -.007 | 10 | .337 | 3 |
| 178 | | | min | -201.024 | 3 | -407.274 | 3 | -36.65 | 1 | 0 | 5 | -.062 | 1 | -.185 | 2 |
| 179 | | 14 | max | 140.124 | 2 | 169.053 | 2 | 41.981 | 3 | .005 | 3 | -.01 | 15 | .583 | 3 |
| 180 | | | min | -201.024 | 3 | -226.788 | 3 | -8.01 | 2 | 0 | 5 | -.079 | 1 | -.359 | 2 |
| 181 | | 15 | max | 140.124 | 2 | 59.054 | 2 | 44.371 | 3 | .005 | 3 | .012 | 3 | .689 | 3 |
| 182 | | | min | -201.024 | 3 | -46.303 | 3 | .135 | 10 | 0 | 5 | -.074 | 1 | -.448 | 2 |
| 183 | | 16 | max | 140.124 | 2 | 134.182 | 3 | 49.802 | 1 | .005 | 3 | .048 | 3 | .655 | 3 |
| 184 | | | min | -201.024 | 3 | -50.945 | 2 | 4.538 | 10 | 0 | 5 | -.047 | 1 | -.451 | 2 |
| 185 | | 17 | max | 140.124 | 2 | 314.667 | 3 | 78.619 | 1 | .005 | 3 | .085 | 3 | .481 | 3 |
| 186 | | | min | -201.024 | 3 | -160.943 | 2 | 8.942 | 10 | 0 | 5 | -.009 | 2 | -.368 | 2 |
| 187 | | 18 | max | 140.124 | 2 | 495.152 | 3 | 107.437 | 1 | .005 | 3 | .124 | 3 | .166 | 3 |
| 188 | | | min | -201.024 | 3 | -270.942 | 2 | 13.345 | 10 | 0 | 5 | .002 | 10 | -.2 | 2 |
| 189 | | 19 | max | 140.124 | 2 | 675.637 | 3 | 136.254 | 1 | .005 | 3 | .17 | 1 | .053 | 2 |
| 190 | | | min | -201.024 | 3 | -380.941 | 2 | 17.748 | 10 | 0 | 5 | .014 | 10 | -.289 | 3 |
| 191 | M12 | 1 | max | 31.522 | 5 | 603.112 | 2 | 18.612 | 5 | 0 | 10 | .181 | 1 | .123 | 2 |
| 192 | | | min | -23.285 | 3 | -288.149 | 3 | -138.702 | 1 | -.005 | 3 | -.093 | 5 | .012 | 9 |
| 193 | | 2 | max | 23.538 | 5 | 431.813 | 2 | 21.078 | 5 | 0 | 10 | .109 | 3 | .229 | 3 |
| 194 | | | min | -23.285 | 3 | -199.614 | 3 | -109.885 | 1 | -.005 | 3 | -.077 | 5 | -.28 | 2 |
| 195 | | 3 | max | 20.683 | 2 | 260.515 | 2 | 23.544 | 5 | 0 | 10 | .073 | 3 | .35 | 3 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 196 | | | min | -23.285 | 3 | -111.078 | 3 | -81.067 | 1 | -.005 | 3 | -.06 | 5 | -.549 | 2 |
| 197 | | 4 | max | 20.683 | 2 | 89.216 | 2 | 26.009 | 5 | 0 | 10 | .039 | 3 | .402 | 3 |
| 198 | | | min | -23.285 | 3 | -22.543 | 3 | -52.25 | 1 | -.005 | 3 | -.051 | 4 | -.685 | 2 |
| 199 | | 5 | max | 20.683 | 2 | 65.993 | 3 | 28.475 | 5 | 0 | 10 | .006 | 3 | .385 | 3 |
| 200 | | | min | -23.285 | 3 | -82.082 | 2 | -40.313 | 3 | -.005 | 3 | -.071 | 1 | -.688 | 2 |
| 201 | | 6 | max | 20.683 | 2 | 154.528 | 3 | 32.078 | 4 | 0 | 10 | .004 | 5 | .299 | 3 |
| 202 | | | min | -23.285 | 3 | -253.381 | 2 | -37.923 | 3 | -.005 | 3 | -.078 | 1 | -.557 | 2 |
| 203 | | 7 | max | 20.683 | 2 | 243.064 | 3 | 41.801 | 4 | 0 | 10 | .029 | 5 | .145 | 3 |
| 204 | | | min | -24.212 | 14 | -424.679 | 2 | -35.532 | 3 | -.005 | 3 | -.062 | 1 | -.293 | 2 |
| 205 | | 8 | max | 20.683 | 2 | 331.599 | 3 | 63.019 | 1 | 0 | 10 | .056 | 5 | .104 | 2 |
| 206 | | | min | -32.088 | 4 | -595.978 | 2 | -33.142 | 3 | -.005 | 3 | -.079 | 3 | -.079 | 3 |
| 207 | | 9 | max | 20.683 | 2 | 420.135 | 3 | 91.837 | 1 | 0 | 10 | .093 | 4 | .634 | 2 |
| 208 | | | min | -40.072 | 4 | -767.276 | 2 | -30.751 | 3 | -.005 | 3 | -.104 | 3 | -.371 | 3 |
| 209 | | 10 | max | 20.683 | 2 | 938.575 | 2 | 82.729 | 14 | 0 | 2 | .144 | 4 | 1.297 | 2 |
| 210 | | | min | -48.056 | 4 | -537.987 | 10 | -120.654 | 1 | -.005 | 3 | -.127 | 3 | -.732 | 3 |
| 211 | | 11 | max | 26.799 | 5 | 767.276 | 2 | 30.751 | 3 | .005 | 3 | .036 | 1 | .634 | 2 |
| 212 | | | min | -23.285 | 3 | -420.135 | 3 | -91.837 | 1 | 0 | 5 | -.104 | 3 | -.371 | 3 |
| 213 | | 12 | max | 20.683 | 2 | 595.978 | 2 | 33.142 | 3 | .005 | 3 | 0 | 10 | .104 | 2 |
| 214 | | | min | -23.285 | 3 | -331.599 | 3 | -63.019 | 1 | 0 | 5 | -.079 | 3 | -.079 | 3 |
| 215 | | 13 | max | 20.683 | 2 | 424.679 | 2 | 35.532 | 3 | .005 | 3 | -.007 | 10 | .145 | 3 |
| 216 | | | min | -23.285 | 3 | -243.064 | 3 | -34.202 | 1 | 0 | 5 | -.062 | 1 | -.293 | 2 |
| 217 | | 14 | max | 20.683 | 2 | 253.381 | 2 | 37.923 | 3 | .005 | 3 | -.011 | 10 | .299 | 3 |
| 218 | | | min | -23.285 | 3 | -154.528 | 3 | -5.385 | 1 | 0 | 5 | -.078 | 1 | -.557 | 2 |
| 219 | | 15 | max | 20.683 | 2 | 82.082 | 2 | 40.313 | 3 | .005 | 3 | .007 | 5 | .385 | 3 |
| 220 | | | min | -23.285 | 3 | -65.993 | 3 | 2.028 | 10 | 0 | 5 | -.071 | 1 | -.688 | 2 |
| 221 | | 16 | max | 20.683 | 2 | 22.543 | 3 | 52.25 | 1 | .005 | 3 | .039 | 3 | .402 | 3 |
| 222 | | | min | -23.285 | 3 | -89.216 | 2 | 6.431 | 10 | 0 | 5 | -.041 | 1 | -.685 | 2 |
| 223 | | 17 | max | 20.683 | 2 | 111.078 | 3 | 81.067 | 1 | .005 | 3 | .073 | 3 | .35 | 3 |
| 224 | | | min | -28.899 | 4 | -260.515 | 2 | 10.834 | 10 | 0 | 5 | 0 | 10 | -.549 | 2 |
| 225 | | 18 | max | 20.683 | 2 | 199.614 | 3 | 109.885 | 1 | .005 | 3 | .114 | 4 | .229 | 3 |
| 226 | | | min | -36.883 | 4 | -431.813 | 2 | 15.237 | 10 | 0 | 5 | .009 | 10 | -.28 | 2 |
| 227 | | 19 | max | 20.683 | 2 | 288.149 | 3 | 138.702 | 1 | .005 | 3 | .181 | 1 | .123 | 2 |
| 228 | | | min | -44.867 | 4 | -603.112 | 2 | 19.64 | 10 | 0 | 5 | .023 | 10 | -.043 | 5 |
| 229 | M13 | 1 | max | 32.011 | 5 | 637.956 | 2 | 14.143 | 5 | .007 | 3 | .142 | 1 | .151 | 2 |
| 230 | | | min | -62.379 | 1 | -308.537 | 3 | -130.411 | 1 | -.019 | 2 | -.082 | 5 | -.04 | 3 |
| 231 | | 2 | max | 24.027 | 5 | 466.657 | 2 | 16.609 | 5 | .007 | 3 | .089 | 3 | .165 | 3 |
| 232 | | | min | -62.379 | 1 | -220.001 | 3 | -101.594 | 1 | -.019 | 2 | -.07 | 5 | -.278 | 2 |
| 233 | | 3 | max | 16.043 | 5 | 295.359 | 2 | 19.075 | 5 | .007 | 3 | .057 | 3 | .302 | 3 |
| 234 | | | min | -62.379 | 1 | -131.466 | 3 | -72.776 | 1 | -.019 | 2 | -.059 | 4 | -.574 | 2 |
| 235 | | 4 | max | 8.059 | 5 | 124.06 | 2 | 21.541 | 5 | .007 | 3 | .027 | 3 | .37 | 3 |
| 236 | | | min | -62.379 | 1 | -42.93 | 3 | -43.959 | 1 | -.019 | 2 | -.061 | 1 | -.738 | 2 |
| 237 | | 5 | max | .215 | 15 | 45.605 | 3 | 24.006 | 5 | .007 | 3 | -.001 | 12 | .369 | 3 |
| 238 | | | min | -62.379 | 1 | -47.238 | 2 | -35.218 | 3 | -.019 | 2 | -.084 | 1 | -.767 | 2 |
| 239 | | 6 | max | -5.159 | 15 | 134.141 | 3 | 29.512 | 4 | .007 | 3 | -.002 | 15 | .299 | 3 |
| 240 | | | min | -62.379 | 1 | -218.537 | 2 | -32.827 | 3 | -.019 | 2 | -.085 | 1 | -.664 | 2 |
| 241 | | 7 | max | -7.876 | 10 | 222.676 | 3 | 42.493 | 1 | .007 | 3 | .019 | 5 | .16 | 3 |
| 242 | | | min | -62.379 | 1 | -389.835 | 2 | -30.436 | 3 | -.019 | 2 | -.063 | 1 | -.428 | 2 |
| 243 | | 8 | max | -7.876 | 10 | 311.212 | 3 | 71.31 | 1 | .007 | 3 | .042 | 5 | -.007 | 15 |
| 244 | | | min | -62.379 | 1 | -561.134 | 2 | -28.046 | 3 | -.019 | 2 | -.075 | 3 | -.06 | 1 |
| 245 | | 9 | max | -7.876 | 10 | 399.747 | 3 | 100.127 | 1 | .007 | 3 | .079 | 4 | .445 | 2 |
| 246 | | | min | -62.379 | 1 | -732.432 | 2 | -25.655 | 3 | -.019 | 2 | -.096 | 3 | -.324 | 3 |
| 247 | | 10 | max | -7.876 | 10 | 903.731 | 2 | 84.472 | 14 | 0 | 15 | .137 | 1 | 1.082 | 2 |
| 248 | | | min | -62.379 | 1 | -114.193 | 14 | -128.945 | 1 | -.019 | 2 | -.115 | 3 | -.669 | 3 |
| 249 | | 11 | max | 20.773 | 5 | 732.432 | 2 | 25.655 | 3 | .019 | 2 | .048 | 1 | .445 | 2 |
| 250 | | | min | -62.379 | 1 | -399.747 | 3 | -100.127 | 1 | -.007 | 3 | -.096 | 3 | -.324 | 3 |
| 251 | | 12 | max | 12.789 | 5 | 561.134 | 2 | 28.046 | 3 | .019 | 2 | .001 | 10 | .004 | 5 |
| 252 | | | min | -62.379 | 1 | -311.212 | 3 | -71.31 | 1 | -.007 | 3 | -.075 | 3 | -.06 | 1 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 253 | | 13 | max | 4.805 | 5 | 389.835 | 2 | 30.436 | 3 | .019 | 2 | -.007 | 10 | .16 | 3 |
| 254 | | | min | -62.379 | 1 | -222.676 | 3 | -42.493 | 1 | -.007 | 3 | -.063 | 1 | -.428 | 2 |
| 255 | | 14 | max | -1.97 | 15 | 218.537 | 2 | 32.827 | 3 | .019 | 2 | -.008 | 15 | .299 | 3 |
| 256 | | | min | -62.379 | 1 | -134.141 | 3 | -13.675 | 1 | -.007 | 3 | -.085 | 1 | -.664 | 2 |
| 257 | | 15 | max | -7.344 | 15 | 47.238 | 2 | 35.218 | 3 | .019 | 2 | .008 | 5 | .369 | 3 |
| 258 | | | min | -62.379 | 1 | -45.605 | 3 | .269 | 10 | -.007 | 3 | -.084 | 1 | -.767 | 2 |
| 259 | | 16 | max | -7.876 | 10 | 42.93 | 3 | 43.959 | 1 | .019 | 2 | .03 | 5 | .37 | 3 |
| 260 | | | min | -62.379 | 1 | -124.06 | 2 | 4.672 | 10 | -.007 | 3 | -.061 | 1 | -.738 | 2 |
| 261 | | 17 | max | -7.876 | 10 | 131.466 | 3 | 72.776 | 1 | .019 | 2 | .057 | 3 | .302 | 3 |
| 262 | | | min | -62.379 | 1 | -295.359 | 2 | 9.075 | 10 | -.007 | 3 | -.016 | 1 | -.574 | 2 |
| 263 | | 18 | max | -7.876 | 10 | 220.001 | 3 | 101.594 | 1 | .019 | 2 | .094 | 4 | .165 | 3 |
| 264 | | | min | -62.379 | 1 | -466.657 | 2 | 13.479 | 10 | -.007 | 3 | .002 | 10 | -.278 | 2 |
| 265 | | 19 | max | -7.876 | 10 | 308.537 | 3 | 130.411 | 1 | .019 | 2 | .145 | 4 | .151 | 2 |
| 266 | | | min | -62.379 | 1 | -637.956 | 2 | 17.882 | 10 | -.007 | 3 | .015 | 10 | -.04 | 3 |
| 267 | M2 | 1 | max | 1900.68 | 2 | 1312.348 | 3 | 129.829 | 2 | .029 | 5 | 1.172 | 5 | 5.506 | 3 |
| 268 | | | min | -1463.845 | 3 | -994.053 | 2 | -266.356 | 5 | -.017 | 2 | -.189 | 2 | -.082 | 10 |
| 269 | | 2 | max | 1187.477 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | 1.06 | 5 | 5.118 | 3 |
| 270 | | | min | -1191.263 | 3 | 6.866 | 10 | -239.639 | 5 | 0 | 3 | -.144 | 2 | .04 | 10 |
| 271 | | 3 | max | 1184.371 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .978 | 5 | 4.817 | 3 |
| 272 | | | min | -1193.593 | 3 | 6.866 | 10 | -236.947 | 5 | 0 | 3 | -.114 | 2 | .037 | 10 |
| 273 | | 4 | max | 1181.265 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .898 | 5 | 4.516 | 3 |
| 274 | | | min | -1195.922 | 3 | 6.866 | 10 | -234.255 | 5 | 0 | 3 | -.083 | 2 | .035 | 10 |
| 275 | | 5 | max | 1178.159 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .819 | 5 | 4.215 | 3 |
| 276 | | | min | -1198.252 | 3 | 6.866 | 10 | -231.563 | 5 | 0 | 3 | -.053 | 2 | .033 | 10 |
| 277 | | 6 | max | 1175.053 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .74 | 4 | 3.914 | 3 |
| 278 | | | min | -1200.581 | 3 | 6.866 | 10 | -228.872 | 5 | 0 | 3 | -.025 | 1 | .03 | 10 |
| 279 | | 7 | max | 1171.947 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .664 | 4 | 3.613 | 3 |
| 280 | | | min | -1202.911 | 3 | 6.866 | 10 | -226.18 | 5 | 0 | 3 | -.028 | 3 | .028 | 10 |
| 281 | | 8 | max | 1168.841 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .589 | 4 | 3.312 | 3 |
| 282 | | | min | -1205.24 | 3 | 6.866 | 10 | -223.488 | 5 | 0 | 3 | -.08 | 3 | .026 | 10 |
| 283 | | 9 | max | 1165.735 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .516 | 4 | 3.011 | 3 |
| 284 | | | min | -1207.57 | 3 | 6.866 | 10 | -220.796 | 5 | 0 | 3 | -.132 | 3 | .023 | 10 |
| 285 | | 10 | max | 1162.629 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .443 | 4 | 2.71 | 3 |
| 286 | | | min | -1209.9 | 3 | 6.866 | 10 | -218.104 | 5 | 0 | 3 | -.184 | 3 | .021 | 10 |
| 287 | | 11 | max | 1159.523 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .37 | 4 | 2.408 | 3 |
| 288 | | | min | -1212.229 | 3 | 6.866 | 10 | -215.412 | 5 | 0 | 3 | -.235 | 3 | .019 | 10 |
| 289 | | 12 | max | 1156.417 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .299 | 4 | 2.107 | 3 |
| 290 | | | min | -1214.559 | 3 | 6.866 | 10 | -212.72 | 5 | 0 | 3 | -.287 | 3 | .016 | 10 |
| 291 | | 13 | max | 1153.31 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .229 | 4 | 1.806 | 3 |
| 292 | | | min | -1216.888 | 3 | 6.866 | 10 | -210.028 | 5 | 0 | 3 | -.339 | 3 | .014 | 10 |
| 293 | | 14 | max | 1150.204 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .219 | 2 | 1.505 | 3 |
| 294 | | | min | -1219.218 | 3 | 6.866 | 10 | -207.336 | 5 | 0 | 3 | -.391 | 3 | .012 | 10 |
| 295 | | 15 | max | 1147.098 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .25 | 2 | 1.204 | 3 |
| 296 | | | min | -1221.547 | 3 | 6.866 | 10 | -204.644 | 5 | 0 | 3 | -.443 | 3 | .009 | 10 |
| 297 | | 16 | max | 1143.992 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .28 | 2 | .903 | 3 |
| 298 | | | min | -1223.877 | 3 | 6.866 | 10 | -201.952 | 5 | 0 | 3 | -.495 | 3 | .007 | 10 |
| 299 | | 17 | max | 1140.886 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .31 | 2 | .602 | 3 |
| 300 | | | min | -1226.207 | 3 | 6.866 | 10 | -199.26 | 5 | 0 | 3 | -.547 | 3 | .005 | 10 |
| 301 | | 18 | max | 1137.78 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .34 | 2 | .301 | 3 |
| 302 | | | min | -1228.536 | 3 | 6.866 | 10 | -196.568 | 5 | 0 | 3 | -.599 | 3 | .002 | 10 |
| 303 | | 19 | max | 1134.674 | 2 | 882.588 | 3 | 88.745 | 2 | 0 | 2 | .371 | 2 | 0 | 1 |
| 304 | | | min | -1230.866 | 3 | 6.866 | 10 | -193.876 | 5 | 0 | 3 | -.651 | 3 | 0 | 1 |
| 305 | M5 | 1 | max | 5300.299 | 2 | 3067.859 | 3 | 0 | 1 | .03 | 4 | 1.216 | 4 | 9.157 | 3 |
| 306 | | | min | -4693.538 | 3 | -3075.684 | 2 | -282.396 | 5 | 0 | 1 | 0 | 1 | -.393 | 10 |
| 307 | | 2 | max | 3203.783 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | 1.099 | 4 | 8.338 | 3 |
| 308 | | | min | -3656.536 | 3 | -4.376 | 10 | -254.864 | 4 | 0 | 4 | 0 | 1 | -.025 | 10 |
| 309 | | 3 | max | 3200.677 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | 1.012 | 4 | 7.847 | 3 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 310 | | | min | -3658.866 | 3 | -4.376 | 10 | -252.172 | 4 | 0 | 4 | 0 | 1 | -.024 | 10 |
| 311 | | 4 | max | 3197.571 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .927 | 4 | 7.357 | 3 |
| 312 | | | min | -3661.195 | 3 | -4.376 | 10 | -249.48 | 4 | 0 | 4 | 0 | 1 | -.022 | 10 |
| 313 | | 5 | max | 3194.465 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .842 | 4 | 6.866 | 3 |
| 314 | | | min | -3663.525 | 3 | -4.376 | 10 | -246.788 | 4 | 0 | 4 | 0 | 1 | -.021 | 10 |
| 315 | | 6 | max | 3191.359 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .758 | 4 | 6.376 | 3 |
| 316 | | | min | -3665.854 | 3 | -4.376 | 10 | -244.096 | 4 | 0 | 4 | 0 | 1 | -.019 | 10 |
| 317 | | 7 | max | 3188.253 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .676 | 4 | 5.885 | 3 |
| 318 | | | min | -3668.184 | 3 | -4.376 | 10 | -241.404 | 4 | 0 | 4 | 0 | 1 | -.018 | 10 |
| 319 | | 8 | max | 3185.147 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .594 | 4 | 5.395 | 3 |
| 320 | | | min | -3670.514 | 3 | -4.376 | 10 | -238.712 | 4 | 0 | 4 | 0 | 1 | -.016 | 10 |
| 321 | | 9 | max | 3182.041 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .513 | 4 | 4.904 | 3 |
| 322 | | | min | -3672.843 | 3 | -4.376 | 10 | -236.02 | 4 | 0 | 4 | 0 | 1 | -.015 | 10 |
| 323 | | 10 | max | 3178.935 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .433 | 4 | 4.414 | 3 |
| 324 | | | min | -3675.173 | 3 | -4.376 | 10 | -233.328 | 4 | 0 | 4 | 0 | 1 | -.013 | 10 |
| 325 | | 11 | max | 3175.828 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .354 | 4 | 3.924 | 3 |
| 326 | | | min | -3677.502 | 3 | -4.376 | 10 | -230.636 | 4 | 0 | 4 | 0 | 1 | -.012 | 10 |
| 327 | | 12 | max | 3172.722 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .275 | 4 | 3.433 | 3 |
| 328 | | | min | -3679.832 | 3 | -4.376 | 10 | -227.945 | 4 | 0 | 4 | 0 | 1 | -.01 | 10 |
| 329 | | 13 | max | 3169.616 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .198 | 4 | 2.943 | 3 |
| 330 | | | min | -3682.161 | 3 | -4.376 | 10 | -225.253 | 4 | 0 | 4 | 0 | 1 | -.009 | 10 |
| 331 | | 14 | max | 3166.51 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .122 | 4 | 2.452 | 3 |
| 332 | | | min | -3684.491 | 3 | -4.376 | 10 | -222.561 | 4 | 0 | 4 | 0 | 1 | -.007 | 10 |
| 333 | | 15 | max | 3163.404 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | .046 | 4 | 1.962 | 3 |
| 334 | | | min | -3686.82 | 3 | -4.376 | 10 | -219.869 | 4 | 0 | 4 | 0 | 1 | -.006 | 10 |
| 335 | | 16 | max | 3160.298 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 1.471 | 3 |
| 336 | | | min | -3689.15 | 3 | -4.376 | 10 | -217.177 | 4 | 0 | 4 | -.028 | 5 | -.004 | 10 |
| 337 | | 17 | max | 3157.192 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | .981 | 3 |
| 338 | | | min | -3691.48 | 3 | -4.376 | 10 | -214.485 | 4 | 0 | 4 | -.102 | 4 | -.003 | 10 |
| 339 | | 18 | max | 3154.086 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | .49 | 3 |
| 340 | | | min | -3693.809 | 3 | -4.376 | 10 | -211.793 | 4 | 0 | 4 | -.175 | 4 | -.001 | 10 |
| 341 | | 19 | max | 3150.98 | 2 | 1437.782 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 342 | | | min | -3696.139 | 3 | -4.376 | 10 | -209.101 | 4 | 0 | 4 | -.246 | 4 | 0 | 1 |
| 343 | M8 | 1 | max | 1900.68 | 2 | 1312.348 | 3 | 171.438 | 3 | .03 | 4 | 1.206 | 4 | 5.506 | 3 |
| 344 | | | min | -1463.845 | 3 | -994.053 | 2 | -282.623 | 4 | -.008 | 3 | -.289 | 3 | -.248 | 5 |
| 345 | | 2 | max | 1187.477 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | 1.088 | 4 | 5.118 | 3 |
| 346 | | | min | -1191.263 | 3 | -38.933 | 5 | -252.059 | 4 | 0 | 2 | -.232 | 3 | -.226 | 5 |
| 347 | | 3 | max | 1184.371 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | 1.002 | 4 | 4.817 | 3 |
| 348 | | | min | -1193.593 | 3 | -38.933 | 5 | -249.367 | 4 | 0 | 2 | -.18 | 3 | -.212 | 5 |
| 349 | | 4 | max | 1181.265 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .918 | 4 | 4.516 | 3 |
| 350 | | | min | -1195.922 | 3 | -38.933 | 5 | -246.675 | 4 | 0 | 2 | -.128 | 3 | -.199 | 5 |
| 351 | | 5 | max | 1178.159 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .834 | 4 | 4.215 | 3 |
| 352 | | | min | -1198.252 | 3 | -38.933 | 5 | -243.983 | 4 | 0 | 2 | -.076 | 3 | -.186 | 5 |
| 353 | | 6 | max | 1175.053 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .751 | 4 | 3.914 | 3 |
| 354 | | | min | -1200.581 | 3 | -38.933 | 5 | -241.291 | 4 | 0 | 2 | -.024 | 3 | -.173 | 5 |
| 355 | | 7 | max | 1171.947 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .67 | 4 | 3.613 | 3 |
| 356 | | | min | -1202.911 | 3 | -38.933 | 5 | -238.599 | 4 | 0 | 2 | -.007 | 2 | -.159 | 5 |
| 357 | | 8 | max | 1168.841 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .589 | 4 | 3.312 | 3 |
| 358 | | | min | -1205.24 | 3 | -38.933 | 5 | -235.907 | 4 | 0 | 2 | -.038 | 2 | -.146 | 5 |
| 359 | | 9 | max | 1165.735 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .509 | 4 | 3.011 | 3 |
| 360 | | | min | -1207.57 | 3 | -38.933 | 5 | -233.215 | 4 | 0 | 2 | -.068 | 2 | -.133 | 5 |
| 361 | | 10 | max | 1162.629 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .432 | 5 | 2.71 | 3 |
| 362 | | | min | -1209.9 | 3 | -38.933 | 5 | -230.523 | 4 | 0 | 2 | -.098 | 2 | -.12 | 5 |
| 363 | | 11 | max | 1159.523 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .356 | 5 | 2.408 | 3 |
| 364 | | | min | -1212.229 | 3 | -38.933 | 5 | -227.831 | 4 | 0 | 2 | -.129 | 2 | -.106 | 5 |
| 365 | | 12 | max | 1156.417 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .287 | 3 | 2.107 | 3 |
| 366 | | | min | -1214.559 | 3 | -38.933 | 5 | -225.14 | 4 | 0 | 2 | -.159 | 2 | -.093 | 5 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 367 | | 13 | max | 1153.31 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .339 | 3 | 1.806 | 3 |
| 368 | | | min | -1216.888 | 3 | -38.933 | 5 | -222.448 | 4 | 0 | 2 | -.189 | 2 | -.08 | 5 |
| 369 | | 14 | max | 1150.204 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .391 | 3 | 1.505 | 3 |
| 370 | | | min | -1219.218 | 3 | -38.933 | 5 | -219.756 | 4 | 0 | 2 | -.219 | 2 | -.066 | 5 |
| 371 | | 15 | max | 1147.098 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .443 | 3 | 1.204 | 3 |
| 372 | | | min | -1221.547 | 3 | -38.933 | 5 | -217.064 | 4 | 0 | 2 | -.25 | 2 | -.053 | 5 |
| 373 | | 16 | max | 1143.992 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .495 | 3 | .903 | 3 |
| 374 | | | min | -1223.877 | 3 | -38.933 | 5 | -214.372 | 4 | 0 | 2 | -.28 | 2 | -.04 | 5 |
| 375 | | 17 | max | 1140.886 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .547 | 3 | .602 | 3 |
| 376 | | | min | -1226.207 | 3 | -38.933 | 5 | -211.68 | 4 | 0 | 2 | -.31 | 2 | -.027 | 5 |
| 377 | | 18 | max | 1137.78 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .599 | 3 | .301 | 3 |
| 378 | | | min | -1228.536 | 3 | -38.933 | 5 | -208.988 | 4 | 0 | 2 | -.34 | 2 | -.013 | 5 |
| 379 | | 19 | max | 1134.674 | 2 | 882.588 | 3 | 152.142 | 3 | 0 | 3 | .651 | 3 | 0 | 1 |
| 380 | | | min | -1230.866 | 3 | -38.933 | 5 | -206.296 | 4 | 0 | 2 | -.371 | 2 | 0 | 1 |
| 381 | M3 | 1 | max | 1281.303 | 2 | 4.147 | 6 | 40.92 | 2 | .003 | 3 | .038 | 5 | 0 | 1 |
| 382 | | | min | -505.184 | 3 | .975 | 15 | -24.295 | 5 | -.005 | 4 | -.018 | 2 | 0 | 1 |
| 383 | | 2 | max | 1281.065 | 2 | 3.686 | 6 | 40.92 | 2 | .003 | 3 | .031 | 5 | 0 | 15 |
| 384 | | | min | -505.363 | 3 | .866 | 15 | -23.922 | 5 | -.005 | 4 | -.006 | 2 | -.001 | 6 |
| 385 | | 3 | max | 1280.827 | 2 | 3.225 | 6 | 40.92 | 2 | .003 | 3 | .025 | 4 | 0 | 15 |
| 386 | | | min | -505.541 | 3 | .758 | 15 | -23.548 | 5 | -.005 | 4 | -.003 | 3 | -.002 | 6 |
| 387 | | 4 | max | 1280.589 | 2 | 2.765 | 6 | 40.92 | 2 | .003 | 3 | .019 | 4 | 0 | 15 |
| 388 | | | min | -505.72 | 3 | .65 | 15 | -23.175 | 5 | -.005 | 4 | -.008 | 3 | -.003 | 6 |
| 389 | | 5 | max | 1280.351 | 2 | 2.304 | 6 | 40.92 | 2 | .003 | 3 | .029 | 2 | 0 | 15 |
| 390 | | | min | -505.898 | 3 | .542 | 15 | -22.802 | 5 | -.005 | 4 | -.014 | 3 | -.004 | 6 |
| 391 | | 6 | max | 1280.113 | 2 | 1.843 | 6 | 40.92 | 2 | .003 | 3 | .041 | 2 | -.001 | 15 |
| 392 | | | min | -506.077 | 3 | .433 | 15 | -22.428 | 5 | -.005 | 4 | -.02 | 3 | -.004 | 6 |
| 393 | | 7 | max | 1279.875 | 2 | 1.382 | 6 | 40.92 | 2 | .003 | 3 | .053 | 2 | -.001 | 15 |
| 394 | | | min | -506.255 | 3 | .325 | 15 | -22.055 | 5 | -.005 | 4 | -.025 | 3 | -.005 | 6 |
| 395 | | 8 | max | 1279.637 | 2 | .922 | 6 | 40.92 | 2 | .003 | 3 | .065 | 2 | -.001 | 15 |
| 396 | | | min | -506.434 | 3 | .217 | 15 | -21.682 | 5 | -.005 | 4 | -.031 | 3 | -.005 | 6 |
| 397 | | 9 | max | 1279.399 | 2 | .461 | 6 | 40.92 | 2 | .003 | 3 | .077 | 2 | -.001 | 15 |
| 398 | | | min | -506.612 | 3 | .108 | 15 | -21.308 | 5 | -.005 | 4 | -.037 | 3 | -.005 | 6 |
| 399 | | 10 | max | 1279.161 | 2 | 0 | 1 | 40.92 | 2 | .003 | 3 | .089 | 2 | -.001 | 15 |
| 400 | | | min | -506.791 | 3 | 0 | 1 | -20.935 | 5 | -.005 | 4 | -.042 | 3 | -.005 | 6 |
| 401 | | 11 | max | 1278.923 | 2 | -.108 | 15 | 40.92 | 2 | .003 | 3 | .101 | 2 | -.001 | 15 |
| 402 | | | min | -506.969 | 3 | -.461 | 4 | -20.562 | 5 | -.005 | 4 | -.048 | 3 | -.005 | 6 |
| 403 | | 12 | max | 1278.685 | 2 | -.217 | 15 | 40.92 | 2 | .003 | 3 | .112 | 2 | -.001 | 15 |
| 404 | | | min | -507.148 | 3 | -.922 | 4 | -20.188 | 5 | -.005 | 4 | -.054 | 3 | -.005 | 6 |
| 405 | | 13 | max | 1278.447 | 2 | -.325 | 15 | 40.92 | 2 | .003 | 3 | .124 | 2 | -.001 | 15 |
| 406 | | | min | -507.326 | 3 | -1.382 | 4 | -19.815 | 5 | -.005 | 4 | -.059 | 3 | -.005 | 6 |
| 407 | | 14 | max | 1278.209 | 2 | -.433 | 15 | 40.92 | 2 | .003 | 3 | .136 | 2 | -.001 | 15 |
| 408 | | | min | -507.505 | 3 | -1.843 | 4 | -19.451 | 3 | -.005 | 4 | -.065 | 3 | -.004 | 6 |
| 409 | | 15 | max | 1277.971 | 2 | -.542 | 15 | 40.92 | 2 | .003 | 3 | .148 | 2 | 0 | 15 |
| 410 | | | min | -507.683 | 3 | -2.304 | 4 | -19.451 | 3 | -.005 | 4 | -.071 | 3 | -.004 | 6 |
| 411 | | 16 | max | 1277.733 | 2 | -.65 | 15 | 40.92 | 2 | .003 | 3 | .16 | 2 | 0 | 15 |
| 412 | | | min | -507.862 | 3 | -2.765 | 4 | -19.451 | 3 | -.005 | 4 | -.076 | 3 | -.003 | 6 |
| 413 | | 17 | max | 1277.495 | 2 | -.758 | 15 | 40.92 | 2 | .003 | 3 | .172 | 2 | 0 | 15 |
| 414 | | | min | -508.04 | 3 | -3.225 | 4 | -19.451 | 3 | -.005 | 4 | -.082 | 3 | -.002 | 6 |
| 415 | | 18 | max | 1277.257 | 2 | -.866 | 15 | 40.92 | 2 | .003 | 3 | .184 | 2 | 0 | 15 |
| 416 | | | min | -508.219 | 3 | -3.686 | 4 | -19.451 | 3 | -.005 | 4 | -.088 | 3 | -.001 | 6 |
| 417 | | 19 | max | 1277.019 | 2 | -.975 | 15 | 40.92 | 2 | .003 | 3 | .196 | 2 | 0 | 1 |
| 418 | | | min | -508.397 | 3 | -4.147 | 4 | -19.451 | 3 | -.005 | 4 | -.093 | 3 | 0 | 1 |
| 419 | M6 | 1 | max | 3788.115 | 2 | 4.147 | 6 | 0 | 1 | 0 | 1 | .039 | 4 | 0 | 1 |
| 420 | | | min | -1908.854 | 3 | .975 | 15 | -27.036 | 4 | -.004 | 4 | 0 | 1 | 0 | 1 |
| 421 | | 2 | max | 3787.877 | 2 | 3.686 | 6 | 0 | 1 | 0 | 1 | .032 | 4 | 0 | 15 |
| 422 | | | min | -1909.032 | 3 | .866 | 15 | -26.663 | 4 | -.004 | 4 | 0 | 1 | -.001 | 6 |
| 423 | | 3 | max | 3787.639 | 2 | 3.225 | 6 | 0 | 1 | 0 | 1 | .024 | 4 | 0 | 15 |

## *Envelope Member Section Forces (Continued)*

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 424 | | | min | -1909.211 | 3 | .758 | 15 | -26.29 | 4 | -.004 | 4 | 0 | 1 | -.002 | 6 |
| 425 | | 4 | max | 3787.401 | 2 | 2.765 | 6 | 0 | 1 | 0 | 1 | .016 | 4 | 0 | 15 |
| 426 | | | min | -1909.389 | 3 | .65 | 15 | -25.916 | 4 | -.004 | 4 | 0 | 1 | -.003 | 6 |
| 427 | | 5 | max | 3787.163 | 2 | 2.304 | 6 | 0 | 1 | 0 | 1 | .009 | 4 | 0 | 15 |
| 428 | | | min | -1909.568 | 3 | .542 | 15 | -25.543 | 4 | -.004 | 4 | 0 | 1 | -.004 | 6 |
| 429 | | 6 | max | 3786.925 | 2 | 1.843 | 6 | 0 | 1 | 0 | 1 | .001 | 4 | -.001 | 15 |
| 430 | | | min | -1909.746 | 3 | .433 | 15 | -25.17 | 4 | -.004 | 4 | 0 | 1 | -.004 | 6 |
| 431 | | 7 | max | 3786.687 | 2 | 1.382 | 6 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 432 | | | min | -1909.925 | 3 | .325 | 15 | -24.796 | 4 | -.004 | 4 | -.006 | 4 | -.005 | 6 |
| 433 | | 8 | max | 3786.449 | 2 | .922 | 6 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 434 | | | min | -1910.103 | 3 | .217 | 15 | -24.423 | 4 | -.004 | 4 | -.013 | 4 | -.005 | 6 |
| 435 | | 9 | max | 3786.211 | 2 | .461 | 6 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 436 | | | min | -1910.282 | 3 | .108 | 15 | -24.05 | 4 | -.004 | 4 | -.02 | 4 | -.005 | 6 |
| 437 | | 10 | max | 3785.973 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 438 | | | min | -1910.46 | 3 | 0 | 1 | -23.676 | 4 | -.004 | 4 | -.027 | 4 | -.005 | 6 |
| 439 | | 11 | max | 3785.735 | 2 | -.108 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 440 | | | min | -1910.639 | 3 | -.461 | 4 | -23.303 | 4 | -.004 | 4 | -.034 | 4 | -.005 | 6 |
| 441 | | 12 | max | 3785.497 | 2 | -.217 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 442 | | | min | -1910.817 | 3 | -.922 | 4 | -22.93 | 4 | -.004 | 4 | -.04 | 4 | -.005 | 6 |
| 443 | | 13 | max | 3785.259 | 2 | -.325 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 444 | | | min | -1910.996 | 3 | -1.382 | 4 | -22.556 | 4 | -.004 | 4 | -.047 | 4 | -.005 | 6 |
| 445 | | 14 | max | 3785.021 | 2 | -.433 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | -.001 | 15 |
| 446 | | | min | -1911.174 | 3 | -1.843 | 4 | -22.183 | 4 | -.004 | 4 | -.054 | 4 | -.004 | 6 |
| 447 | | 15 | max | 3784.783 | 2 | -.542 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 448 | | | min | -1911.353 | 3 | -2.304 | 4 | -21.81 | 4 | -.004 | 4 | -.06 | 4 | -.004 | 6 |
| 449 | | 16 | max | 3784.545 | 2 | -.65 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 450 | | | min | -1911.531 | 3 | -2.765 | 4 | -21.436 | 4 | -.004 | 4 | -.066 | 4 | -.003 | 6 |
| 451 | | 17 | max | 3784.307 | 2 | -.758 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 452 | | | min | -1911.71 | 3 | -3.225 | 4 | -21.063 | 4 | -.004 | 4 | -.072 | 4 | -.002 | 6 |
| 453 | | 18 | max | 3784.069 | 2 | -.866 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 15 |
| 454 | | | min | -1911.888 | 3 | -3.686 | 4 | -20.69 | 4 | -.004 | 4 | -.078 | 4 | -.001 | 6 |
| 455 | | 19 | max | 3783.831 | 2 | -.975 | 15 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 456 | | | min | -1912.067 | 3 | -4.147 | 4 | -20.317 | 4 | -.004 | 4 | -.084 | 4 | 0 | 1 |
| 457 | M9 | 1 | max | 1281.303 | 2 | 4.147 | 6 | 19.451 | 3 | .005 | 2 | .04 | 4 | 0 | 1 |
| 458 | | | min | -505.184 | 3 | .975 | 15 | -40.92 | 2 | -.005 | 5 | -.008 | 3 | 0 | 1 |
| 459 | | 2 | max | 1281.065 | 2 | 3.686 | 6 | 19.451 | 3 | .005 | 2 | .032 | 4 | 0 | 15 |
| 460 | | | min | -505.363 | 3 | .866 | 15 | -40.92 | 2 | -.005 | 5 | -.003 | 3 | -.001 | 6 |
| 461 | | 3 | max | 1280.827 | 2 | 3.225 | 6 | 19.451 | 3 | .005 | 2 | .024 | 5 | 0 | 15 |
| 462 | | | min | -505.541 | 3 | .758 | 15 | -40.92 | 2 | -.005 | 5 | -.005 | 2 | -.002 | 6 |
| 463 | | 4 | max | 1280.589 | 2 | 2.765 | 6 | 19.451 | 3 | .005 | 2 | .017 | 5 | 0 | 15 |
| 464 | | | min | -505.72 | 3 | .65 | 15 | -40.92 | 2 | -.005 | 5 | -.017 | 2 | -.003 | 6 |
| 465 | | 5 | max | 1280.351 | 2 | 2.304 | 6 | 19.451 | 3 | .005 | 2 | .014 | 3 | 0 | 15 |
| 466 | | | min | -505.898 | 3 | .542 | 15 | -40.92 | 2 | -.005 | 5 | -.029 | 2 | -.004 | 6 |
| 467 | | 6 | max | 1280.113 | 2 | 1.843 | 6 | 19.451 | 3 | .005 | 2 | .02 | 3 | -.001 | 15 |
| 468 | | | min | -506.077 | 3 | .433 | 15 | -40.92 | 2 | -.005 | 5 | -.041 | 2 | -.004 | 6 |
| 469 | | 7 | max | 1279.875 | 2 | 1.382 | 6 | 19.451 | 3 | .005 | 2 | .025 | 3 | -.001 | 15 |
| 470 | | | min | -506.255 | 3 | .325 | 15 | -40.92 | 2 | -.005 | 5 | -.053 | 2 | -.005 | 6 |
| 471 | | 8 | max | 1279.637 | 2 | .922 | 6 | 19.451 | 3 | .005 | 2 | .031 | 3 | -.001 | 15 |
| 472 | | | min | -506.434 | 3 | .217 | 15 | -40.92 | 2 | -.005 | 5 | -.065 | 2 | -.005 | 6 |
| 473 | | 9 | max | 1279.399 | 2 | .461 | 6 | 19.451 | 3 | .005 | 2 | .037 | 3 | -.001 | 15 |
| 474 | | | min | -506.612 | 3 | .108 | 15 | -40.92 | 2 | -.005 | 5 | -.077 | 2 | -.005 | 6 |
| 475 | | 10 | max | 1279.161 | 2 | 0 | 1 | 19.451 | 3 | .005 | 2 | .042 | 3 | -.001 | 15 |
| 476 | | | min | -506.791 | 3 | 0 | 1 | -40.92 | 2 | -.005 | 5 | -.089 | 2 | -.005 | 6 |
| 477 | | 11 | max | 1278.923 | 2 | -.108 | 15 | 19.451 | 3 | .005 | 2 | .048 | 3 | -.001 | 15 |
| 478 | | | min | -506.969 | 3 | -.461 | 4 | -40.92 | 2 | -.005 | 5 | -.101 | 2 | -.005 | 6 |
| 479 | | 12 | max | 1278.685 | 2 | -.217 | 15 | 19.451 | 3 | .005 | 2 | .054 | 3 | -.001 | 15 |
| 480 | | | min | -507.148 | 3 | -.922 | 4 | -40.92 | 2 | -.005 | 5 | -.112 | 2 | -.005 | 6 |

## Envelope Member Section Forces (Continued)

| | Member | Sec | | Axial[lb] | LC | y Shear[lb] | LC | z Shear[lb] | LC | Torque[k-ft] | LC | y-y Mome... | LC | z-z Mome... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 481 | | 13 | max | 1278.447 | 2 | -.325 | 15 | 19.451 | 3 | .005 | 2 | .059 | 3 | -.001 | 15 |
| 482 | | | min | -507.326 | 3 | -1.382 | 4 | -40.92 | 2 | -.005 | 5 | -.124 | 2 | -.005 | 6 |
| 483 | | 14 | max | 1278.209 | 2 | -.433 | 15 | 19.451 | 3 | .005 | 2 | .065 | 3 | -.001 | 15 |
| 484 | | | min | -507.505 | 3 | -1.843 | 4 | -40.92 | 2 | -.005 | 5 | -.136 | 2 | -.004 | 6 |
| 485 | | 15 | max | 1277.971 | 2 | -.542 | 15 | 19.451 | 3 | .005 | 2 | .071 | 3 | 0 | 15 |
| 486 | | | min | -507.683 | 3 | -2.304 | 4 | -40.92 | 2 | -.005 | 5 | -.148 | 2 | -.004 | 6 |
| 487 | | 16 | max | 1277.733 | 2 | -.65 | 15 | 19.451 | 3 | .005 | 2 | .076 | 3 | 0 | 15 |
| 488 | | | min | -507.862 | 3 | -2.765 | 4 | -40.92 | 2 | -.005 | 5 | -.16 | 2 | -.003 | 6 |
| 489 | | 17 | max | 1277.495 | 2 | -.758 | 15 | 19.451 | 3 | .005 | 2 | .082 | 3 | 0 | 15 |
| 490 | | | min | -508.04 | 3 | -3.225 | 4 | -40.92 | 2 | -.005 | 5 | -.172 | 2 | -.002 | 6 |
| 491 | | 18 | max | 1277.257 | 2 | -.866 | 15 | 19.451 | 3 | .005 | 2 | .088 | 3 | 0 | 15 |
| 492 | | | min | -508.219 | 3 | -3.686 | 4 | -40.92 | 2 | -.005 | 5 | -.184 | 2 | -.001 | 6 |
| 493 | | 19 | max | 1277.019 | 2 | -.975 | 15 | 19.451 | 3 | .005 | 2 | .093 | 3 | 0 | 1 |
| 494 | | | min | -508.397 | 3 | -4.147 | 4 | -40.92 | 2 | -.005 | 5 | -.196 | 2 | 0 | 1 |

## Envelope Member Section Deflections

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | 1 | max | -.003 | 10 | -.027 | 15 | .011 | 1 | 5.097e-3 | 3 | NC | 3 | NC | 1 |
| 2 | | | min | -.305 | 3 | -.287 | 1 | -.378 | 5 | -1.309e-2 | 2 | 531.179 | 1 | 675.139 | 5 |
| 3 | | 2 | max | -.003 | 10 | -.023 | 15 | .003 | 1 | 5.097e-3 | 3 | NC | 2 | NC | 1 |
| 4 | | | min | -.305 | 3 | -.229 | 1 | -.365 | 4 | -1.309e-2 | 2 | 687.974 | 1 | 725.806 | 5 |
| 5 | | 3 | max | -.003 | 10 | -.019 | 15 | 0 | 10 | 4.782e-3 | 3 | NC | 3 | NC | 1 |
| 6 | | | min | -.305 | 3 | -.172 | 1 | -.352 | 4 | -1.19e-2 | 2 | 871.144 | 14 | 788.314 | 5 |
| 7 | | 4 | max | -.003 | 10 | -.016 | 15 | -.001 | 10 | 4.299e-3 | 3 | NC | 3 | NC | 2 |
| 8 | | | min | -.305 | 3 | -.127 | 3 | -.335 | 4 | -1.008e-2 | 2 | 1000.144 | 14 | 879.166 | 5 |
| 9 | | 5 | max | -.003 | 10 | -.012 | 15 | -.002 | 10 | 3.815e-3 | 3 | NC | 3 | NC | 1 |
| 10 | | | min | -.305 | 3 | -.121 | 3 | -.315 | 4 | -8.256e-3 | 2 | 787.606 | 2 | 1009.472 | 5 |
| 11 | | 6 | max | -.003 | 10 | .004 | 10 | 0 | 12 | 3.958e-3 | 3 | NC | 1 | NC | 1 |
| 12 | | | min | -.305 | 3 | -.107 | 3 | -.294 | 4 | -7.74e-3 | 2 | 650.978 | 2 | 1194.08 | 5 |
| 13 | | 7 | max | -.003 | 10 | .021 | 2 | 0 | 3 | 4.534e-3 | 3 | NC | 5 | NC | 1 |
| 14 | | | min | -.305 | 3 | -.086 | 3 | -.274 | 4 | -8.128e-3 | 2 | 590.823 | 2 | 1447.87 | 5 |
| 15 | | 8 | max | -.003 | 10 | .032 | 2 | 0 | 3 | 5.11e-3 | 3 | NC | 5 | NC | 1 |
| 16 | | | min | -.305 | 3 | -.059 | 3 | -.255 | 4 | -8.516e-3 | 2 | 562.932 | 2 | 1796.894 | 5 |
| 17 | | 9 | max | -.003 | 10 | .038 | 2 | 0 | 10 | 5.858e-3 | 3 | NC | 5 | NC | 1 |
| 18 | | | min | -.305 | 3 | -.028 | 3 | -.239 | 4 | -8.369e-3 | 2 | 548.319 | 2 | 2279.881 | 5 |
| 19 | | 10 | max | -.003 | 10 | .05 | 1 | 0 | 2 | 6.908e-3 | 3 | NC | 5 | NC | 1 |
| 20 | | | min | -.305 | 3 | .005 | 12 | -.224 | 4 | -7.277e-3 | 2 | 539.055 | 2 | 3113.969 | 5 |
| 21 | | 11 | max | -.003 | 10 | .063 | 1 | 0 | 3 | 7.959e-3 | 3 | NC | 5 | NC | 1 |
| 22 | | | min | -.305 | 3 | .009 | 15 | -.209 | 4 | -6.186e-3 | 2 | 536.204 | 2 | 4768.59 | 5 |
| 23 | | 12 | max | -.003 | 10 | .091 | 3 | .003 | 3 | 6.784e-3 | 3 | NC | 5 | NC | 1 |
| 24 | | | min | -.305 | 3 | .012 | 15 | -.196 | 4 | -4.685e-3 | 2 | 540.589 | 2 | 8966.935 | 5 |
| 25 | | 13 | max | -.003 | 10 | .146 | 3 | .007 | 3 | 4.349e-3 | 3 | NC | 5 | NC | 1 |
| 26 | | | min | -.305 | 3 | .012 | 10 | -.184 | 4 | -3.334e-3 | 4 | 486.644 | 3 | NC | 1 |
| 27 | | 14 | max | -.002 | 10 | .217 | 3 | .007 | 3 | 2.056e-3 | 3 | NC | 5 | NC | 1 |
| 28 | | | min | -.305 | 3 | 0 | 10 | -.176 | 4 | -4.356e-3 | 4 | 386.095 | 3 | NC | 1 |
| 29 | | 15 | max | -.002 | 10 | .312 | 3 | .005 | 1 | 6.042e-3 | 3 | NC | 5 | NC | 1 |
| 30 | | | min | -.305 | 3 | -.019 | 10 | -.174 | 5 | -3.706e-3 | 4 | 303.399 | 3 | NC | 1 |
| 31 | | 16 | max | -.002 | 10 | .424 | 3 | .006 | 1 | 1.003e-2 | 3 | NC | 5 | NC | 1 |
| 32 | | | min | -.305 | 3 | -.058 | 2 | -.174 | 5 | -5.159e-3 | 2 | 242.147 | 3 | NC | 1 |
| 33 | | 17 | max | -.002 | 10 | .546 | 3 | .004 | 1 | 1.401e-2 | 3 | NC | 4 | NC | 1 |
| 34 | | | min | -.306 | 3 | -.105 | 2 | -.176 | 4 | -7.088e-3 | 2 | 198.252 | 3 | NC | 1 |
| 35 | | 18 | max | -.002 | 10 | .673 | 3 | 0 | 10 | 1.661e-2 | 3 | NC | 4 | NC | 1 |
| 36 | | | min | -.306 | 3 | -.156 | 2 | -.179 | 4 | -8.346e-3 | 2 | 166.94 | 3 | NC | 1 |
| 37 | | 19 | max | -.002 | 10 | .8 | 3 | -.001 | 10 | 1.661e-2 | 3 | NC | 1 | NC | 1 |
| 38 | | | min | -.306 | 3 | -.206 | 2 | -.183 | 4 | -8.346e-3 | 2 | 144.189 | 3 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | M4 | 1 | max | -.001 | 10 | -.02 | 15 | 0 | 1 | 1.991e-4 | 4 | NC | 3 | NC | 1 |
| 40 | | | min | -.494 | 3 | -.639 | 2 | -.375 | 4 | 0 | 1 | 373.427 | 1 | 676.442 | 4 |
| 41 | | 2 | max | -.001 | 10 | -.016 | 15 | 0 | 1 | 1.991e-4 | 4 | NC | 2 | NC | 1 |
| 42 | | | min | -.494 | 3 | -.488 | 2 | -.365 | 4 | 0 | 1 | 565.839 | 1 | 715.658 | 4 |
| 43 | | 3 | max | -.001 | 10 | -.013 | 15 | 0 | 1 | 0 | 1 | 9163.075 | 11 | NC | 1 |
| 44 | | | min | -.494 | 3 | -.336 | 2 | -.353 | 4 | -1.321e-4 | 4 | 817.756 | 9 | 765.068 | 4 |
| 45 | | 4 | max | -.001 | 10 | -.009 | 15 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 46 | | | min | -.494 | 3 | -.213 | 1 | -.336 | 4 | -6.4e-4 | 4 | 452.512 | 2 | 845.699 | 4 |
| 47 | | 5 | max | -.001 | 10 | -.006 | 15 | 0 | 1 | 0 | 1 | NC | 15 | NC | 1 |
| 48 | | | min | -.494 | 3 | -.181 | 3 | -.316 | 4 | -1.148e-3 | 4 | 323.963 | 2 | 968.22 | 4 |
| 49 | | 6 | max | -.001 | 10 | .006 | 10 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 50 | | | min | -.495 | 3 | -.172 | 3 | -.294 | 4 | -1.108e-3 | 4 | 273.816 | 2 | 1146.815 | 4 |
| 51 | | 7 | max | 0 | 10 | .036 | 2 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 52 | | | min | -.495 | 3 | -.14 | 3 | -.273 | 4 | -6.88e-4 | 4 | 254.909 | 2 | 1393.781 | 4 |
| 53 | | 8 | max | 0 | 10 | .049 | 2 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 54 | | | min | -.495 | 3 | -.095 | 3 | -.255 | 4 | -2.684e-4 | 4 | 248.927 | 2 | 1725.285 | 4 |
| 55 | | 9 | max | 0 | 10 | .053 | 2 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 56 | | | min | -.495 | 3 | -.042 | 3 | -.24 | 4 | -4.137e-5 | 4 | 246.999 | 2 | 2153.445 | 4 |
| 57 | | 10 | max | 0 | 10 | .072 | 1 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 58 | | | min | -.496 | 3 | .003 | 15 | -.224 | 4 | -1.548e-4 | 4 | 244.951 | 2 | 2897.88 | 4 |
| 59 | | 11 | max | 0 | 10 | .092 | 1 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 60 | | | min | -.496 | 3 | .005 | 15 | -.208 | 4 | -2.682e-4 | 4 | 243.689 | 2 | 4296.501 | 4 |
| 61 | | 12 | max | 0 | 10 | .144 | 3 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 62 | | | min | -.496 | 3 | .006 | 15 | -.196 | 4 | -1.239e-3 | 4 | 243.712 | 2 | 7087.964 | 4 |
| 63 | | 13 | max | .001 | 10 | .232 | 3 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 64 | | | min | -.497 | 3 | .007 | 15 | -.185 | 4 | -2.695e-3 | 4 | 248.758 | 2 | NC | 1 |
| 65 | | 14 | max | .001 | 10 | .357 | 3 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 66 | | | min | -.497 | 3 | -.004 | 10 | -.179 | 4 | -4.097e-3 | 4 | 265.898 | 2 | NC | 1 |
| 67 | | 15 | max | .001 | 10 | .535 | 3 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 68 | | | min | -.497 | 3 | -.054 | 2 | -.178 | 4 | -3.118e-3 | 4 | 218.637 | 3 | NC | 1 |
| 69 | | 16 | max | .001 | 10 | .753 | 3 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 70 | | | min | -.497 | 3 | -.149 | 2 | -.178 | 4 | -2.139e-3 | 4 | 161.325 | 3 | NC | 1 |
| 71 | | 17 | max | .001 | 10 | .995 | 3 | 0 | 1 | 0 | 1 | NC | 5 | NC | 1 |
| 72 | | | min | -.497 | 3 | -.259 | 2 | -.178 | 4 | -1.16e-3 | 4 | 124.921 | 3 | NC | 1 |
| 73 | | 18 | max | .001 | 10 | 1.246 | 3 | 0 | 1 | 0 | 1 | NC | 4 | NC | 1 |
| 74 | | | min | -.497 | 3 | -.374 | 2 | -.178 | 4 | -5.212e-4 | 4 | 101.252 | 3 | NC | 1 |
| 75 | | 19 | max | .001 | 10 | 1.496 | 3 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 76 | | | min | -.497 | 3 | -.489 | 2 | -.177 | 4 | -5.212e-4 | 4 | 85.158 | 3 | NC | 1 |
| 77 | M7 | 1 | max | .014 | 5 | .003 | 5 | -.002 | 10 | 1.309e-2 | 2 | NC | 3 | NC | 1 |
| 78 | | | min | -.305 | 3 | -.287 | 1 | -.384 | 4 | -5.097e-3 | 3 | 531.179 | 1 | 643.552 | 4 |
| 79 | | 2 | max | .014 | 5 | .004 | 5 | 0 | 10 | 1.309e-2 | 2 | NC | 2 | NC | 1 |
| 80 | | | min | -.305 | 3 | -.229 | 1 | -.367 | 4 | -5.097e-3 | 3 | 687.974 | 1 | 701.56 | 4 |
| 81 | | 3 | max | .014 | 5 | .004 | 5 | .004 | 1 | 1.19e-2 | 2 | NC | 3 | NC | 1 |
| 82 | | | min | -.305 | 3 | -.172 | 1 | -.349 | 4 | -4.782e-3 | 3 | 932.643 | 9 | 772.463 | 4 |
| 83 | | 4 | max | .014 | 5 | .005 | 5 | .007 | 1 | 1.008e-2 | 2 | NC | 3 | NC | 2 |
| 84 | | | min | -.305 | 3 | -.127 | 3 | -.331 | 5 | -4.299e-3 | 3 | 1096.502 | 9 | 865.977 | 4 |
| 85 | | 5 | max | .013 | 5 | .005 | 5 | .007 | 1 | 8.256e-3 | 2 | NC | 3 | NC | 1 |
| 86 | | | min | -.305 | 3 | -.121 | 3 | -.311 | 5 | -3.815e-3 | 3 | 787.606 | 2 | 991.475 | 4 |
| 87 | | 6 | max | .013 | 5 | .005 | 5 | .005 | 1 | 7.74e-3 | 2 | NC | 1 | NC | 1 |
| 88 | | | min | -.305 | 3 | -.107 | 3 | -.291 | 4 | -3.958e-3 | 3 | 650.978 | 2 | 1160.955 | 4 |
| 89 | | 7 | max | .014 | 5 | .021 | 2 | .003 | 2 | 8.128e-3 | 2 | NC | 4 | NC | 1 |
| 90 | | | min | -.305 | 3 | -.086 | 3 | -.273 | 4 | -4.534e-3 | 3 | 590.823 | 2 | 1384.118 | 4 |
| 91 | | 8 | max | .014 | 5 | .032 | 2 | 0 | 2 | 8.516e-3 | 2 | NC | 4 | NC | 1 |
| 92 | | | min | -.305 | 3 | -.059 | 3 | -.255 | 4 | -5.11e-3 | 3 | 562.932 | 2 | 1685.748 | 4 |
| 93 | | 9 | max | .014 | 5 | .038 | 2 | 0 | 3 | 8.369e-3 | 2 | NC | 5 | NC | 1 |
| 94 | | | min | -.305 | 3 | -.028 | 3 | -.239 | 4 | -5.858e-3 | 3 | 548.319 | 2 | 2112.762 | 4 |
| 95 | | 10 | max | .014 | 5 | .05 | 1 | 0 | 3 | 7.277e-3 | 2 | NC | 5 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 96 | | | min | -.305 | 3 | -.001 | 5 | -.224 | 4 | -6.908e-3 | 3 | 539.055 | 2 | 2807.93 | 4 |
| 97 | | 11 | max | .013 | 5 | .063 | 1 | 0 | 2 | 6.186e-3 | 2 | NC | 5 | NC | 1 |
| 98 | | | min | -.305 | 3 | -.003 | 5 | -.209 | 4 | -7.959e-3 | 3 | 536.204 | 2 | 4095.228 | 4 |
| 99 | | 12 | max | .013 | 5 | .091 | 3 | .002 | 2 | 4.685e-3 | 2 | NC | 5 | NC | 1 |
| 100 | | | min | -.305 | 3 | -.005 | 5 | -.195 | 4 | -6.784e-3 | 3 | 540.589 | 2 | 7068.396 | 4 |
| 101 | | 13 | max | .013 | 5 | .146 | 3 | .003 | 2 | 2.952e-3 | 2 | NC | 5 | NC | 1 |
| 102 | | | min | -.305 | 3 | -.007 | 5 | -.184 | 4 | -4.349e-3 | 3 | 486.644 | 3 | NC | 1 |
| 103 | | 14 | max | .013 | 5 | .217 | 3 | .001 | 2 | 1.3e-3 | 2 | NC | 5 | NC | 1 |
| 104 | | | min | -.305 | 3 | -.01 | 5 | -.178 | 4 | -4.122e-3 | 5 | 386.095 | 3 | NC | 1 |
| 105 | | 15 | max | .013 | 5 | .312 | 3 | 0 | 10 | 3.229e-3 | 2 | NC | 9 | NC | 1 |
| 106 | | | min | -.305 | 3 | -.019 | 10 | -.177 | 4 | -6.042e-3 | 3 | 303.399 | 3 | NC | 1 |
| 107 | | 16 | max | .013 | 5 | .424 | 3 | -.001 | 10 | 5.159e-3 | 2 | NC | 9 | NC | 1 |
| 108 | | | min | -.305 | 3 | -.058 | 2 | -.178 | 4 | -1.003e-2 | 3 | 242.147 | 3 | NC | 1 |
| 109 | | 17 | max | .013 | 5 | .546 | 3 | 0 | 10 | 7.088e-3 | 2 | NC | 4 | NC | 1 |
| 110 | | | min | -.306 | 3 | -.105 | 2 | -.178 | 4 | -1.401e-2 | 3 | 198.252 | 3 | NC | 1 |
| 111 | | 18 | max | .013 | 5 | .673 | 3 | .003 | 1 | 8.346e-3 | 2 | NC | 4 | NC | 1 |
| 112 | | | min | -.306 | 3 | -.156 | 2 | -.177 | 4 | -1.661e-2 | 3 | 166.94 | 3 | NC | 1 |
| 113 | | 19 | max | .013 | 5 | .8 | 3 | .011 | 1 | 8.346e-3 | 2 | NC | 1 | NC | 1 |
| 114 | | | min | -.306 | 3 | -.206 | 2 | -.178 | 5 | -1.661e-2 | 3 | 144.189 | 3 | NC | 1 |
| 115 | M10 | 1 | max | 0 | 3 | .629 | 3 | .306 | 3 | 1.701e-2 | 3 | NC | 1 | NC | 1 |
| 116 | | | min | -.178 | 4 | -.138 | 2 | -.013 | 5 | -6.757e-3 | 2 | NC | 1 | NC | 1 |
| 117 | | 2 | max | 0 | 3 | .788 | 3 | .318 | 3 | 1.886e-2 | 3 | NC | 4 | NC | 1 |
| 118 | | | min | -.178 | 4 | -.217 | 2 | -.012 | 5 | -7.725e-3 | 2 | 1059.707 | 3 | NC | 1 |
| 119 | | 3 | max | 0 | 3 | .938 | 3 | .339 | 3 | 2.07e-2 | 3 | NC | 4 | NC | 2 |
| 120 | | | min | -.178 | 4 | -.291 | 2 | -.009 | 5 | -8.694e-3 | 2 | 543.133 | 3 | 4798.88 | 1 |
| 121 | | 4 | max | 0 | 3 | 1.064 | 3 | .367 | 3 | 2.254e-2 | 3 | NC | 4 | NC | 4 |
| 122 | | | min | -.178 | 4 | -.348 | 2 | -.004 | 5 | -9.663e-3 | 2 | 386.315 | 3 | 2750.236 | 3 |
| 123 | | 5 | max | 0 | 3 | 1.154 | 3 | .397 | 3 | 2.438e-2 | 3 | NC | 4 | NC | 5 |
| 124 | | | min | -.178 | 4 | -.385 | 2 | 0 | 15 | -1.063e-2 | 2 | 320.311 | 3 | 1842.835 | 3 |
| 125 | | 6 | max | 0 | 3 | 1.203 | 3 | .427 | 3 | 2.623e-2 | 3 | NC | 4 | NC | 5 |
| 126 | | | min | -.178 | 4 | -.398 | 2 | .004 | 15 | -1.16e-2 | 2 | 292.601 | 3 | 1385.597 | 3 |
| 127 | | 7 | max | 0 | 3 | 1.216 | 3 | .454 | 3 | 2.807e-2 | 3 | NC | 4 | NC | 5 |
| 128 | | | min | -.178 | 4 | -.391 | 2 | .005 | 10 | -1.257e-2 | 2 | 286.378 | 3 | 1129.842 | 3 |
| 129 | | 8 | max | 0 | 3 | 1.201 | 3 | .477 | 3 | 2.991e-2 | 3 | NC | 4 | NC | 2 |
| 130 | | | min | -.178 | 4 | -.37 | 2 | .002 | 10 | -1.354e-2 | 2 | 294.01 | 3 | 982.235 | 3 |
| 131 | | 9 | max | 0 | 3 | 1.174 | 3 | .492 | 3 | 3.175e-2 | 3 | NC | 13 | NC | 2 |
| 132 | | | min | -.178 | 4 | -.346 | 2 | 0 | 10 | -1.451e-2 | 2 | 308.427 | 3 | 903.231 | 3 |
| 133 | | 10 | max | 0 | 1 | 1.159 | 3 | .497 | 3 | 3.36e-2 | 3 | NC | 9 | NC | 2 |
| 134 | | | min | -.178 | 4 | -.334 | 2 | -.001 | 10 | -1.547e-2 | 2 | 317.296 | 3 | 877.423 | 3 |
| 135 | | 11 | max | 0 | 10 | 1.174 | 3 | .492 | 3 | 3.175e-2 | 3 | NC | 14 | NC | 2 |
| 136 | | | min | -.178 | 4 | -.346 | 2 | 0 | 10 | -1.451e-2 | 2 | 308.427 | 3 | 903.231 | 3 |
| 137 | | 12 | max | 0 | 10 | 1.201 | 3 | .477 | 3 | 2.991e-2 | 3 | NC | 14 | NC | 2 |
| 138 | | | min | -.178 | 4 | -.37 | 2 | .002 | 10 | -1.354e-2 | 2 | 294.01 | 3 | 982.235 | 3 |
| 139 | | 13 | max | 0 | 10 | 1.216 | 3 | .454 | 3 | 2.807e-2 | 3 | NC | 14 | NC | 5 |
| 140 | | | min | -.178 | 4 | -.391 | 2 | .005 | 10 | -1.257e-2 | 2 | 286.378 | 3 | 1129.842 | 3 |
| 141 | | 14 | max | 0 | 10 | 1.203 | 3 | .427 | 3 | 2.623e-2 | 3 | NC | 14 | NC | 5 |
| 142 | | | min | -.178 | 4 | -.398 | 2 | .007 | 10 | -1.16e-2 | 2 | 292.601 | 3 | 1385.597 | 3 |
| 143 | | 15 | max | 0 | 10 | 1.154 | 3 | .397 | 3 | 2.438e-2 | 3 | NC | 14 | NC | 5 |
| 144 | | | min | -.178 | 4 | -.385 | 2 | .008 | 10 | -1.063e-2 | 2 | 320.311 | 3 | 1842.835 | 3 |
| 145 | | 16 | max | 0 | 10 | 1.064 | 3 | .367 | 3 | 2.254e-2 | 3 | NC | 14 | NC | 5 |
| 146 | | | min | -.178 | 4 | -.348 | 2 | .008 | 10 | -9.663e-3 | 2 | 386.315 | 3 | 2750.236 | 3 |
| 147 | | 17 | max | 0 | 10 | .938 | 3 | .339 | 3 | 2.07e-2 | 3 | NC | 14 | NC | 2 |
| 148 | | | min | -.178 | 4 | -.291 | 2 | .006 | 10 | -8.694e-3 | 2 | 543.133 | 3 | 4798.88 | 1 |
| 149 | | 18 | max | 0 | 10 | .788 | 3 | .318 | 3 | 1.886e-2 | 3 | NC | 9 | NC | 1 |
| 150 | | | min | -.178 | 4 | -.217 | 2 | .004 | 10 | -7.725e-3 | 2 | 1059.707 | 3 | NC | 1 |
| 151 | | 19 | max | 0 | 10 | .629 | 3 | .306 | 3 | 1.701e-2 | 3 | NC | 1 | NC | 1 |
| 152 | | | min | -.178 | 4 | -.138 | 2 | .002 | 10 | -6.757e-3 | 2 | 2380.389 | 4 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 153 | M11 | 1 | max | 0 | 2 | .068 | 1 | .305 | 3 | 5.931e-3 | 3 | NC | 1 | NC | 1 |
| 154 | | | min | -.203 | 4 | -.003 | 5 | -.013 | 5 | -3.335e-4 | 10 | NC | 1 | NC | 1 |
| 155 | | 2 | max | 0 | 2 | .142 | 3 | .311 | 3 | 6.286e-3 | 3 | NC | 4 | NC | 1 |
| 156 | | | min | -.204 | 4 | -.01 | 10 | 0 | 15 | -3.313e-4 | 10 | 2084.785 | 3 | NC | 1 |
| 157 | | 3 | max | 0 | 2 | .216 | 3 | .329 | 3 | 6.64e-3 | 3 | NC | 4 | NC | 2 |
| 158 | | | min | -.204 | 4 | -.053 | 2 | .004 | 15 | -3.292e-4 | 10 | 1092.543 | 3 | 6052.426 | 1 |
| 159 | | 4 | max | 0 | 2 | .266 | 3 | .355 | 3 | 6.995e-3 | 3 | NC | 4 | NC | 5 |
| 160 | | | min | -.204 | 4 | -.079 | 2 | .006 | 15 | -3.271e-4 | 10 | 821.76 | 3 | 3365.119 | 3 |
| 161 | | 5 | max | 0 | 2 | .286 | 3 | .386 | 3 | 7.35e-3 | 3 | NC | 4 | NC | 5 |
| 162 | | | min | -.204 | 4 | -.084 | 2 | .005 | 15 | -3.25e-4 | 10 | 749.287 | 3 | 2081.851 | 3 |
| 163 | | 6 | max | 0 | 2 | .273 | 3 | .418 | 3 | 7.705e-3 | 3 | NC | 4 | NC | 5 |
| 164 | | | min | -.204 | 4 | -.068 | 2 | .003 | 15 | -3.228e-4 | 10 | 794.509 | 3 | 1490.815 | 3 |
| 165 | | 7 | max | 0 | 2 | .233 | 3 | .448 | 3 | 8.06e-3 | 3 | NC | 4 | NC | 5 |
| 166 | | | min | -.204 | 4 | -.035 | 2 | .002 | 15 | -3.207e-4 | 10 | 981.015 | 3 | 1177.603 | 3 |
| 167 | | 8 | max | 0 | 2 | .177 | 3 | .473 | 3 | 8.415e-3 | 3 | NC | 1 | NC | 2 |
| 168 | | | min | -.204 | 4 | -.003 | 10 | .002 | 15 | -3.186e-4 | 10 | 1455.17 | 3 | 1002.653 | 3 |
| 169 | | 9 | max | 0 | 2 | .124 | 3 | .49 | 3 | 8.77e-3 | 3 | NC | 2 | NC | 2 |
| 170 | | | min | -.204 | 4 | .004 | 15 | 0 | 10 | -3.165e-4 | 10 | 2682.654 | 3 | 910.629 | 3 |
| 171 | | 10 | max | 0 | 1 | .1 | 3 | .496 | 3 | 9.125e-3 | 3 | NC | 4 | NC | 2 |
| 172 | | | min | -.204 | 4 | .005 | 15 | 0 | 10 | -3.143e-4 | 10 | 4410.82 | 3 | 880.692 | 3 |
| 173 | | 11 | max | 0 | 3 | .124 | 3 | .49 | 3 | 8.77e-3 | 3 | NC | 2 | NC | 2 |
| 174 | | | min | -.204 | 4 | .006 | 15 | 0 | 10 | -3.165e-4 | 10 | 2682.654 | 3 | 910.629 | 3 |
| 175 | | 12 | max | 0 | 3 | .177 | 3 | .473 | 3 | 8.415e-3 | 3 | NC | 1 | NC | 2 |
| 176 | | | min | -.204 | 4 | -.003 | 10 | .003 | 10 | -3.186e-4 | 10 | 1455.17 | 3 | 1002.653 | 3 |
| 177 | | 13 | max | 0 | 3 | .233 | 3 | .448 | 3 | 8.06e-3 | 3 | NC | 4 | NC | 5 |
| 178 | | | min | -.204 | 4 | -.035 | 2 | .006 | 10 | -3.207e-4 | 10 | 981.015 | 3 | 1177.603 | 3 |
| 179 | | 14 | max | 0 | 3 | .273 | 3 | .418 | 3 | 7.705e-3 | 3 | NC | 4 | NC | 5 |
| 180 | | | min | -.204 | 4 | -.068 | 2 | .008 | 10 | -3.228e-4 | 10 | 794.509 | 3 | 1490.815 | 3 |
| 181 | | 15 | max | 0 | 3 | .286 | 3 | .386 | 3 | 7.35e-3 | 3 | NC | 5 | NC | 4 |
| 182 | | | min | -.204 | 4 | -.084 | 2 | .009 | 10 | -3.25e-4 | 10 | 749.287 | 3 | 2081.851 | 3 |
| 183 | | 16 | max | 0 | 3 | .266 | 3 | .355 | 3 | 6.995e-3 | 3 | NC | 5 | NC | 4 |
| 184 | | | min | -.204 | 4 | -.079 | 2 | .008 | 10 | -3.271e-4 | 10 | 821.76 | 3 | 3365.119 | 3 |
| 185 | | 17 | max | .001 | 3 | .216 | 3 | .329 | 3 | 6.64e-3 | 3 | NC | 5 | NC | 2 |
| 186 | | | min | -.204 | 4 | -.053 | 2 | .007 | 10 | -3.292e-4 | 10 | 1092.543 | 3 | 6052.426 | 1 |
| 187 | | 18 | max | .001 | 3 | .142 | 3 | .311 | 3 | 6.286e-3 | 3 | NC | 4 | NC | 1 |
| 188 | | | min | -.204 | 4 | -.01 | 10 | .005 | 10 | -3.313e-4 | 10 | 2084.785 | 3 | NC | 1 |
| 189 | | 19 | max | .001 | 3 | .068 | 1 | .305 | 3 | 5.931e-3 | 3 | NC | 1 | NC | 1 |
| 190 | | | min | -.204 | 4 | .01 | 15 | .003 | 10 | -3.335e-4 | 10 | NC | 1 | NC | 1 |
| 191 | M12 | 1 | max | 0 | 2 | .036 | 2 | .305 | 3 | 4.237e-3 | 3 | NC | 1 | NC | 1 |
| 192 | | | min | -.245 | 4 | -.039 | 3 | -.014 | 5 | -2.096e-4 | 5 | NC | 1 | NC | 1 |
| 193 | | 2 | max | 0 | 2 | .009 | 3 | .314 | 3 | 4.557e-3 | 3 | NC | 4 | NC | 1 |
| 194 | | | min | -.245 | 4 | -.045 | 2 | 0 | 15 | -1.506e-4 | 5 | 2075.875 | 2 | NC | 1 |
| 195 | | 3 | max | 0 | 2 | .047 | 3 | .334 | 3 | 4.877e-3 | 3 | NC | 4 | NC | 2 |
| 196 | | | min | -.245 | 4 | -.113 | 2 | .005 | 10 | -9.161e-5 | 5 | 1127.718 | 2 | 5899.752 | 3 |
| 197 | | 4 | max | 0 | 2 | .068 | 3 | .36 | 3 | 5.197e-3 | 3 | NC | 4 | NC | 2 |
| 198 | | | min | -.245 | 4 | -.155 | 2 | .006 | 10 | -3.263e-5 | 5 | 878.633 | 2 | 3054.441 | 3 |
| 199 | | 5 | max | 0 | 2 | .07 | 3 | .391 | 3 | 5.518e-3 | 3 | NC | 4 | NC | 5 |
| 200 | | | min | -.245 | 4 | -.165 | 2 | .005 | 15 | 1.048e-5 | 15 | 835.41 | 2 | 1970.233 | 3 |
| 201 | | 6 | max | 0 | 2 | .053 | 3 | .421 | 3 | 5.838e-3 | 3 | NC | 4 | NC | 5 |
| 202 | | | min | -.245 | 4 | -.142 | 2 | .003 | 15 | 4.99e-5 | 15 | 941.077 | 2 | 1446.238 | 3 |
| 203 | | 7 | max | 0 | 2 | .023 | 3 | .45 | 3 | 6.158e-3 | 3 | NC | 4 | NC | 4 |
| 204 | | | min | -.245 | 4 | -.094 | 2 | 0 | 15 | 8.933e-5 | 15 | 1295.014 | 2 | 1160.621 | 3 |
| 205 | | 8 | max | 0 | 2 | .002 | 4 | .474 | 3 | 6.478e-3 | 3 | NC | 4 | NC | 2 |
| 206 | | | min | -.245 | 4 | -.031 | 2 | 0 | 15 | 8.342e-5 | 10 | 2493.112 | 2 | 998.373 | 3 |
| 207 | | 9 | max | 0 | 2 | .026 | 2 | .489 | 3 | 6.799e-3 | 3 | NC | 1 | NC | 2 |
| 208 | | | min | -.245 | 4 | -.047 | 3 | .001 | 10 | 5.779e-5 | 10 | NC | 1 | 912.258 | 3 |
| 209 | | 10 | max | 0 | 1 | .052 | 2 | .495 | 3 | 7.119e-3 | 3 | NC | 1 | NC | 2 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 210 | | | min | -.245 | 4 | -.061 | 3 | 0 | 10 | 3.216e-5 | 10 | 7645.488 | 3 | 884.177 | 3 |
| 211 | | 11 | max | 0 | 3 | .026 | 2 | .489 | 3 | 6.799e-3 | 3 | NC | 1 | NC | 2 |
| 212 | | | min | -.245 | 4 | -.047 | 3 | .001 | 10 | 5.779e-5 | 10 | NC | 1 | 912.258 | 3 |
| 213 | | 12 | max | 0 | 3 | 0 | 9 | .474 | 3 | 6.478e-3 | 3 | NC | 4 | NC | 2 |
| 214 | | | min | -.245 | 4 | -.031 | 2 | .003 | 10 | 8.342e-5 | 10 | 2493.112 | 2 | 998.373 | 3 |
| 215 | | 13 | max | 0 | 3 | .023 | 3 | .45 | 3 | 6.158e-3 | 3 | NC | 4 | NC | 5 |
| 216 | | | min | -.245 | 4 | -.094 | 2 | .005 | 10 | 1.09e-4 | 10 | 1295.014 | 2 | 1160.621 | 3 |
| 217 | | 14 | max | 0 | 3 | .053 | 3 | .421 | 3 | 5.838e-3 | 3 | NC | 5 | NC | 5 |
| 218 | | | min | -.245 | 4 | -.142 | 2 | .007 | 10 | 1.347e-4 | 10 | 941.077 | 2 | 1446.238 | 3 |
| 219 | | 15 | max | 0 | 3 | .07 | 3 | .391 | 3 | 5.518e-3 | 3 | NC | 5 | NC | 4 |
| 220 | | | min | -.245 | 4 | -.165 | 2 | .007 | 10 | 1.603e-4 | 10 | 835.41 | 2 | 1970.233 | 3 |
| 221 | | 16 | max | 0 | 3 | .068 | 3 | .36 | 3 | 5.197e-3 | 3 | NC | 5 | NC | 2 |
| 222 | | | min | -.245 | 4 | -.155 | 2 | .006 | 10 | 1.859e-4 | 10 | 878.633 | 2 | 3054.441 | 3 |
| 223 | | 17 | max | 0 | 3 | .047 | 3 | .334 | 3 | 4.877e-3 | 3 | NC | 5 | NC | 2 |
| 224 | | | min | -.245 | 4 | -.113 | 2 | .005 | 10 | 2.115e-4 | 10 | 1127.718 | 2 | 5899.752 | 3 |
| 225 | | 18 | max | 0 | 3 | .009 | 3 | .314 | 3 | 4.557e-3 | 3 | NC | 4 | NC | 1 |
| 226 | | | min | -.245 | 4 | -.045 | 2 | .004 | 10 | 2.372e-4 | 10 | 2075.875 | 2 | NC | 1 |
| 227 | | 19 | max | 0 | 3 | .036 | 2 | .305 | 3 | 4.237e-3 | 3 | NC | 1 | NC | 1 |
| 228 | | | min | -.245 | 4 | -.039 | 3 | .003 | 10 | 2.628e-4 | 10 | NC | 1 | NC | 1 |
| 229 | M13 | 1 | max | 0 | 10 | .004 | 5 | .305 | 3 | 8.577e-3 | 2 | NC | 1 | NC | 1 |
| 230 | | | min | -.361 | 4 | -.209 | 1 | -.014 | 5 | 4.355e-5 | 15 | NC | 1 | NC | 1 |
| 231 | | 2 | max | 0 | 10 | .002 | 5 | .318 | 3 | 9.88e-3 | 2 | NC | 4 | NC | 1 |
| 232 | | | min | -.361 | 4 | -.311 | 2 | 0 | 15 | -4.208e-4 | 3 | 1378.803 | 2 | NC | 1 |
| 233 | | 3 | max | 0 | 10 | 0 | 15 | .34 | 3 | 1.118e-2 | 2 | NC | 5 | NC | 2 |
| 234 | | | min | -.361 | 4 | -.42 | 2 | .006 | 15 | -8.952e-4 | 3 | 727.681 | 2 | 4704.769 | 1 |
| 235 | | 4 | max | 0 | 10 | -.003 | 15 | .367 | 3 | 1.249e-2 | 2 | NC | 5 | NC | 10 |
| 236 | | | min | -.361 | 4 | -.502 | 2 | .009 | 15 | -1.37e-3 | 3 | 536.997 | 2 | 2735.211 | 3 |
| 237 | | 5 | max | 0 | 10 | -.005 | 15 | .396 | 3 | 1.379e-2 | 2 | NC | 5 | NC | 5 |
| 238 | | | min | -.361 | 4 | -.549 | 2 | .008 | 15 | -1.844e-3 | 3 | 466.724 | 2 | 1844.873 | 3 |
| 239 | | 6 | max | 0 | 10 | -.008 | 15 | .426 | 3 | 1.509e-2 | 2 | NC | 5 | NC | 5 |
| 240 | | | min | -.361 | 4 | -.56 | 2 | .006 | 15 | -2.319e-3 | 3 | 453.133 | 2 | 1393.188 | 3 |
| 241 | | 7 | max | 0 | 10 | -.01 | 15 | .453 | 3 | 1.639e-2 | 2 | NC | 5 | NC | 5 |
| 242 | | | min | -.361 | 4 | -.539 | 2 | .004 | 15 | -2.793e-3 | 3 | 479.724 | 2 | 1139.449 | 3 |
| 243 | | 8 | max | 0 | 10 | -.012 | 15 | .474 | 3 | 1.77e-2 | 2 | NC | 5 | NC | 2 |
| 244 | | | min | -.361 | 4 | -.499 | 2 | .003 | 15 | -3.268e-3 | 3 | 542.531 | 2 | 992.622 | 3 |
| 245 | | 9 | max | 0 | 10 | -.014 | 15 | .489 | 3 | 1.9e-2 | 2 | NC | 5 | NC | 2 |
| 246 | | | min | -.361 | 4 | -.456 | 2 | .003 | 10 | -3.742e-3 | 3 | 629.493 | 2 | 913.937 | 3 |
| 247 | | 10 | max | 0 | 1 | -.015 | 15 | .494 | 3 | 2.03e-2 | 2 | NC | 3 | NC | 2 |
| 248 | | | min | -.361 | 4 | -.435 | 2 | .001 | 10 | -4.216e-3 | 3 | 682.885 | 2 | 888.232 | 3 |
| 249 | | 11 | max | 0 | 1 | -.017 | 15 | .489 | 3 | 1.9e-2 | 2 | NC | 5 | NC | 2 |
| 250 | | | min | -.361 | 4 | -.456 | 2 | .003 | 10 | -3.742e-3 | 3 | 629.493 | 2 | 913.937 | 3 |
| 251 | | 12 | max | 0 | 1 | -.019 | 15 | .474 | 3 | 1.77e-2 | 2 | NC | 5 | NC | 2 |
| 252 | | | min | -.361 | 4 | -.499 | 2 | .005 | 10 | -3.268e-3 | 3 | 542.531 | 2 | 992.622 | 3 |
| 253 | | 13 | max | 0 | 1 | -.022 | 15 | .453 | 3 | 1.639e-2 | 2 | NC | 5 | NC | 5 |
| 254 | | | min | -.361 | 4 | -.539 | 2 | .007 | 10 | -2.793e-3 | 3 | 479.724 | 2 | 1139.449 | 3 |
| 255 | | 14 | max | 0 | 1 | -.017 | 12 | .426 | 3 | 1.509e-2 | 2 | NC | 5 | NC | 5 |
| 256 | | | min | -.361 | 4 | -.56 | 2 | .009 | 10 | -2.319e-3 | 3 | 453.133 | 2 | 1393.188 | 3 |
| 257 | | 15 | max | 0 | 1 | -.01 | 12 | .396 | 3 | 1.379e-2 | 2 | NC | 5 | NC | 4 |
| 258 | | | min | -.361 | 4 | -.549 | 2 | .01 | 10 | -1.844e-3 | 3 | 466.724 | 2 | 1844.873 | 3 |
| 259 | | 16 | max | 0 | 1 | -.014 | 12 | .367 | 3 | 1.249e-2 | 2 | NC | 5 | NC | 4 |
| 260 | | | min | -.361 | 4 | -.502 | 2 | .009 | 10 | -1.37e-3 | 3 | 536.997 | 2 | 2735.211 | 3 |
| 261 | | 17 | max | 0 | 1 | -.026 | 15 | .34 | 3 | 1.118e-2 | 2 | NC | 5 | NC | 2 |
| 262 | | | min | -.361 | 4 | -.42 | 2 | .008 | 10 | -8.952e-4 | 3 | 727.681 | 2 | 4704.769 | 1 |
| 263 | | 18 | max | 0 | 1 | -.025 | 15 | .318 | 3 | 9.88e-3 | 2 | NC | 4 | NC | 1 |
| 264 | | | min | -.361 | 4 | -.311 | 2 | .005 | 10 | -4.208e-4 | 3 | 1378.803 | 2 | NC | 1 |
| 265 | | 19 | max | 0 | 1 | -.022 | 15 | .305 | 3 | 8.577e-3 | 2 | NC | 1 | NC | 1 |
| 266 | | | min | -.361 | 4 | -.209 | 1 | .003 | 10 | 5.368e-5 | 3 | NC | 1 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 267 | M2 | 1 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 268 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 269 | | 2 | max | 0 | 3 | 0 | 10 | 0 | 5 | 3.292e-3 | 2 | NC | 1 | NC | 1 |
| 270 | | | min | 0 | 2 | -.002 | 3 | 0 | 2 | -5.644e-3 | 5 | NC | 1 | NC | 1 |
| 271 | | 3 | max | 0 | 3 | 0 | 10 | .004 | 5 | 3.028e-3 | 2 | NC | 1 | NC | 1 |
| 272 | | | min | 0 | 2 | -.007 | 3 | 0 | 2 | -5.479e-3 | 5 | NC | 1 | NC | 1 |
| 273 | | 4 | max | 0 | 3 | 0 | 10 | .008 | 5 | 2.764e-3 | 2 | NC | 1 | NC | 1 |
| 274 | | | min | 0 | 2 | -.015 | 3 | -.001 | 2 | -5.314e-3 | 5 | 4869.061 | 3 | 9373.96 | 5 |
| 275 | | 5 | max | 0 | 3 | 0 | 10 | .014 | 5 | 2.499e-3 | 2 | NC | 2 | NC | 1 |
| 276 | | | min | 0 | 2 | -.026 | 3 | -.002 | 2 | -5.149e-3 | 5 | 2819.113 | 3 | 5441.911 | 5 |
| 277 | | 6 | max | 0 | 3 | 0 | 10 | .021 | 5 | 2.235e-3 | 2 | NC | 2 | NC | 1 |
| 278 | | | min | 0 | 2 | -.04 | 3 | -.003 | 2 | -4.984e-3 | 5 | 1850.883 | 3 | 3588.2 | 5 |
| 279 | | 7 | max | 0 | 3 | 0 | 10 | .029 | 5 | 1.97e-3 | 2 | NC | 2 | NC | 1 |
| 280 | | | min | 0 | 2 | -.056 | 3 | -.003 | 2 | -4.819e-3 | 5 | 1316.689 | 3 | 2565.639 | 5 |
| 281 | | 8 | max | 0 | 3 | 0 | 10 | .038 | 5 | 1.706e-3 | 2 | NC | 2 | NC | 1 |
| 282 | | | min | 0 | 2 | -.074 | 3 | -.004 | 2 | -4.654e-3 | 5 | 990.22 | 3 | 1940.394 | 5 |
| 283 | | 9 | max | 0 | 3 | 0 | 10 | .048 | 5 | 1.441e-3 | 2 | NC | 10 | NC | 1 |
| 284 | | | min | 0 | 2 | -.095 | 3 | -.005 | 2 | -4.489e-3 | 5 | 775.941 | 3 | 1529.666 | 5 |
| 285 | | 10 | max | 0 | 3 | 0 | 10 | .059 | 5 | 1.177e-3 | 2 | NC | 10 | NC | 1 |
| 286 | | | min | 0 | 2 | -.117 | 3 | -.006 | 2 | -4.323e-3 | 5 | 627.55 | 3 | 1244.971 | 5 |
| 287 | | 11 | max | 0 | 3 | 0 | 10 | .071 | 5 | 9.122e-4 | 2 | NC | 10 | NC | 1 |
| 288 | | | min | 0 | 2 | -.142 | 3 | -.006 | 2 | -4.169e-3 | 4 | 520.421 | 3 | 1039.27 | 5 |
| 289 | | 12 | max | 0 | 3 | 0 | 10 | .083 | 5 | 6.477e-4 | 2 | NC | 10 | NC | 1 |
| 290 | | | min | 0 | 2 | -.167 | 3 | -.006 | 2 | -4.024e-3 | 4 | 440.482 | 3 | 885.682 | 5 |
| 291 | | 13 | max | 0 | 3 | -.001 | 10 | .096 | 5 | 4.534e-4 | 3 | NC | 10 | NC | 1 |
| 292 | | | min | 0 | 2 | -.194 | 3 | -.006 | 2 | -3.88e-3 | 4 | 379.207 | 3 | 767.917 | 5 |
| 293 | | 14 | max | .001 | 3 | -.001 | 10 | .109 | 5 | 6.409e-4 | 3 | NC | 10 | NC | 1 |
| 294 | | | min | 0 | 2 | -.222 | 3 | -.006 | 2 | -3.736e-3 | 4 | 331.178 | 3 | 675.624 | 5 |
| 295 | | 15 | max | .001 | 3 | -.002 | 10 | .122 | 5 | 8.285e-4 | 3 | NC | 10 | NC | 1 |
| 296 | | | min | -.001 | 2 | -.252 | 3 | -.006 | 2 | -3.592e-3 | 4 | 292.834 | 3 | 601.99 | 5 |
| 297 | | 16 | max | .001 | 3 | -.002 | 10 | .136 | 5 | 1.016e-3 | 3 | NC | 10 | NC | 1 |
| 298 | | | min | -.001 | 2 | -.282 | 3 | -.005 | 1 | -3.448e-3 | 4 | 261.737 | 3 | 542.35 | 5 |
| 299 | | 17 | max | .001 | 3 | -.002 | 10 | .149 | 4 | 1.204e-3 | 3 | NC | 10 | NC | 1 |
| 300 | | | min | -.001 | 2 | -.312 | 3 | -.004 | 1 | -3.304e-3 | 4 | 236.177 | 3 | 493.079 | 4 |
| 301 | | 18 | max | .001 | 3 | -.002 | 10 | .163 | 4 | 1.391e-3 | 3 | NC | 10 | NC | 1 |
| 302 | | | min | -.001 | 2 | -.343 | 3 | -.003 | 1 | -3.16e-3 | 4 | 214.926 | 3 | 452.15 | 4 |
| 303 | | 19 | max | .001 | 3 | -.002 | 10 | .176 | 4 | 1.579e-3 | 3 | NC | 10 | NC | 1 |
| 304 | | | min | -.001 | 2 | -.374 | 3 | -.007 | 3 | -3.016e-3 | 4 | 197.082 | 3 | 417.906 | 4 |
| 305 | M5 | 1 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 306 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 307 | | 2 | max | 0 | 3 | 0 | 10 | 0 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 308 | | | min | 0 | 2 | -.003 | 3 | 0 | 1 | -5.918e-3 | 4 | NC | 1 | NC | 1 |
| 309 | | 3 | max | 0 | 3 | 0 | 10 | .004 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 310 | | | min | 0 | 2 | -.012 | 3 | 0 | 1 | -5.728e-3 | 4 | 6386.555 | 3 | NC | 1 |
| 311 | | 4 | max | 0 | 3 | 0 | 10 | .008 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 312 | | | min | 0 | 2 | -.025 | 3 | 0 | 1 | -5.537e-3 | 4 | 2966.154 | 3 | 9039.225 | 4 |
| 313 | | 5 | max | 0 | 3 | 0 | 10 | .014 | 4 | 0 | 1 | NC | 2 | NC | 1 |
| 314 | | | min | 0 | 2 | -.043 | 3 | 0 | 1 | -5.346e-3 | 4 | 1721.463 | 3 | 5251.276 | 4 |
| 315 | | 6 | max | .001 | 3 | 0 | 10 | .021 | 4 | 0 | 1 | NC | 2 | NC | 1 |
| 316 | | | min | -.001 | 2 | -.065 | 3 | 0 | 1 | -5.155e-3 | 4 | 1131.648 | 3 | 3465.053 | 4 |
| 317 | | 7 | max | .001 | 3 | 0 | 10 | .03 | 4 | 0 | 1 | NC | 2 | NC | 1 |
| 318 | | | min | -.001 | 2 | -.091 | 3 | 0 | 1 | -4.965e-3 | 4 | 805.653 | 3 | 2479.512 | 4 |
| 319 | | 8 | max | .002 | 3 | .001 | 10 | .039 | 4 | 0 | 1 | NC | 2 | NC | 1 |
| 320 | | | min | -.001 | 2 | -.122 | 3 | 0 | 1 | -4.774e-3 | 4 | 606.203 | 3 | 1876.806 | 4 |
| 321 | | 9 | max | .002 | 3 | .001 | 10 | .05 | 4 | 0 | 1 | NC | 5 | NC | 1 |
| 322 | | | min | -.002 | 2 | -.155 | 3 | 0 | 1 | -4.583e-3 | 4 | 475.194 | 3 | 1480.837 | 4 |
| 323 | | 10 | max | .002 | 3 | .001 | 10 | .061 | 4 | 0 | 1 | NC | 5 | NC | 1 |

## Envelope Member Section Deflections (Continued)

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 324 | | | min | -.002 | 2 | -.192 | 3 | 0 | 1 | -4.393e-3 | 4 | 384.42 | 3 | 1206.355 | 4 |
| 325 | | 11 | max | .002 | 3 | .002 | 10 | .073 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 326 | | | min | -.002 | 2 | -.231 | 3 | 0 | 1 | -4.202e-3 | 4 | 318.861 | 3 | 1008.037 | 4 |
| 327 | | 12 | max | .003 | 3 | .002 | 10 | .086 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 328 | | | min | -.002 | 2 | -.273 | 3 | 0 | 1 | -4.011e-3 | 4 | 269.926 | 3 | 859.976 | 4 |
| 329 | | 13 | max | .003 | 3 | .002 | 10 | .099 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 330 | | | min | -.002 | 2 | -.317 | 3 | 0 | 1 | -3.82e-3 | 4 | 232.407 | 3 | 746.474 | 4 |
| 331 | | 14 | max | .003 | 3 | .002 | 10 | .112 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 332 | | | min | -.003 | 2 | -.363 | 3 | 0 | 1 | -3.63e-3 | 4 | 202.992 | 3 | 657.556 | 4 |
| 333 | | 15 | max | .003 | 3 | .002 | 10 | .126 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 334 | | | min | -.003 | 2 | -.41 | 3 | 0 | 1 | -3.439e-3 | 4 | 179.505 | 3 | 586.654 | 4 |
| 335 | | 16 | max | .004 | 3 | .003 | 10 | .139 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 336 | | | min | -.003 | 2 | -.459 | 3 | 0 | 1 | -3.248e-3 | 4 | 160.455 | 3 | 529.272 | 4 |
| 337 | | 17 | max | .004 | 3 | .003 | 10 | .153 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 338 | | | min | -.003 | 2 | -.509 | 3 | 0 | 1 | -3.057e-3 | 4 | 144.794 | 3 | 482.259 | 4 |
| 339 | | 18 | max | .004 | 3 | .003 | 10 | .166 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 340 | | | min | -.003 | 2 | -.559 | 3 | 0 | 1 | -2.867e-3 | 4 | 131.772 | 3 | 443.352 | 4 |
| 341 | | 19 | max | .004 | 3 | .003 | 10 | .179 | 4 | 0 | 1 | NC | 10 | NC | 1 |
| 342 | | | min | -.004 | 2 | -.61 | 3 | 0 | 1 | -2.676e-3 | 4 | 120.838 | 3 | 410.895 | 4 |
| 343 | M8 | 1 | max | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 344 | | | min | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | NC | 1 | NC | 1 |
| 345 | | 2 | max | 0 | 3 | 0 | 5 | 0 | 4 | 1.61e-3 | 3 | NC | 1 | NC | 1 |
| 346 | | | min | 0 | 2 | -.002 | 3 | 0 | 3 | -6.014e-3 | 4 | NC | 1 | NC | 1 |
| 347 | | 3 | max | 0 | 3 | 0 | 5 | .004 | 4 | 1.423e-3 | 3 | NC | 1 | NC | 1 |
| 348 | | | min | 0 | 2 | -.007 | 3 | 0 | 3 | -5.811e-3 | 4 | NC | 1 | NC | 1 |
| 349 | | 4 | max | 0 | 3 | 0 | 5 | .008 | 4 | 1.235e-3 | 3 | NC | 1 | NC | 1 |
| 350 | | | min | 0 | 2 | -.015 | 3 | -.002 | 3 | -5.609e-3 | 4 | 4869.061 | 3 | 9123.522 | 4 |
| 351 | | 5 | max | 0 | 3 | .001 | 5 | .014 | 4 | 1.047e-3 | 3 | NC | 2 | NC | 1 |
| 352 | | | min | 0 | 2 | -.026 | 3 | -.003 | 3 | -5.406e-3 | 4 | 2819.113 | 3 | 5300.777 | 4 |
| 353 | | 6 | max | 0 | 3 | .002 | 5 | .021 | 4 | 8.598e-4 | 3 | NC | 2 | NC | 1 |
| 354 | | | min | 0 | 2 | -.04 | 3 | -.004 | 3 | -5.204e-3 | 4 | 1850.883 | 3 | 3497.869 | 4 |
| 355 | | 7 | max | 0 | 3 | .002 | 5 | .029 | 4 | 6.722e-4 | 3 | NC | 2 | NC | 1 |
| 356 | | | min | 0 | 2 | -.056 | 3 | -.005 | 3 | -5.001e-3 | 4 | 1316.689 | 3 | 2503.027 | 4 |
| 357 | | 8 | max | 0 | 3 | .003 | 5 | .039 | 4 | 4.846e-4 | 3 | NC | 2 | NC | 1 |
| 358 | | | min | 0 | 2 | -.074 | 3 | -.007 | 3 | -4.799e-3 | 4 | 990.22 | 3 | 1894.593 | 4 |
| 359 | | 9 | max | 0 | 3 | .004 | 5 | .049 | 4 | 2.97e-4 | 3 | NC | 4 | NC | 1 |
| 360 | | | min | 0 | 2 | -.095 | 3 | -.008 | 3 | -4.596e-3 | 4 | 775.941 | 3 | 1494.841 | 4 |
| 361 | | 10 | max | 0 | 3 | .005 | 5 | .061 | 4 | 1.094e-4 | 3 | NC | 5 | NC | 1 |
| 362 | | | min | 0 | 2 | -.117 | 3 | -.009 | 3 | -4.394e-3 | 4 | 627.55 | 3 | 1217.725 | 4 |
| 363 | | 11 | max | 0 | 3 | .006 | 5 | .072 | 4 | -2.198e-5 | 9 | NC | 5 | NC | 1 |
| 364 | | | min | 0 | 2 | -.142 | 3 | -.009 | 3 | -4.191e-3 | 4 | 520.421 | 3 | 1017.495 | 4 |
| 365 | | 12 | max | 0 | 3 | .007 | 5 | .085 | 4 | 3.546e-5 | 9 | NC | 7 | NC | 1 |
| 366 | | | min | 0 | 2 | -.167 | 3 | -.009 | 3 | -3.989e-3 | 4 | 440.482 | 3 | 868.001 | 4 |
| 367 | | 13 | max | 0 | 3 | .009 | 5 | .098 | 4 | 9.29e-5 | 9 | NC | 10 | NC | 1 |
| 368 | | | min | 0 | 2 | -.194 | 3 | -.009 | 3 | -3.804e-3 | 5 | 379.207 | 3 | 753.397 | 4 |
| 369 | | 14 | max | .001 | 3 | .01 | 5 | .111 | 4 | 1.503e-4 | 9 | NC | 10 | NC | 1 |
| 370 | | | min | 0 | 2 | -.222 | 3 | -.008 | 3 | -3.624e-3 | 5 | 331.178 | 3 | 663.61 | 4 |
| 371 | | 15 | max | .001 | 3 | .011 | 5 | .124 | 4 | 3.176e-4 | 1 | NC | 10 | NC | 1 |
| 372 | | | min | -.001 | 2 | -.252 | 3 | -.007 | 3 | -3.444e-3 | 5 | 292.834 | 3 | 592.01 | 4 |
| 373 | | 16 | max | .001 | 3 | .012 | 5 | .138 | 4 | 5.175e-4 | 1 | NC | 10 | NC | 1 |
| 374 | | | min | -.001 | 2 | -.282 | 3 | -.005 | 3 | -3.264e-3 | 5 | 261.737 | 3 | 534.058 | 4 |
| 375 | | 17 | max | .001 | 3 | .014 | 5 | .151 | 4 | 7.174e-4 | 1 | NC | 10 | NC | 1 |
| 376 | | | min | -.001 | 2 | -.312 | 3 | -.002 | 3 | -3.084e-3 | 5 | 236.177 | 3 | 486.574 | 4 |
| 377 | | 18 | max | .001 | 3 | .015 | 5 | .165 | 4 | 9.392e-4 | 2 | NC | 10 | NC | 1 |
| 378 | | | min | -.001 | 2 | -.343 | 3 | 0 | 10 | -2.904e-3 | 5 | 214.926 | 3 | 447.272 | 4 |
| 379 | | 19 | max | .001 | 3 | .017 | 5 | .178 | 4 | 1.204e-3 | 2 | NC | 10 | NC | 1 |
| 380 | | | min | -.001 | 2 | -.374 | 3 | -.002 | 2 | -2.724e-3 | 5 | 197.082 | 3 | 414.48 | 4 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 381 | M3 | 1 | max | 0 | 3 | 0 | 10 | 0 | 5 | 1.845e-3 | 2 | NC | 1 | NC | 1 |
| 382 | | | min | 0 | 2 | 0 | 3 | 0 | 2 | -2.934e-3 | 5 | NC | 1 | NC | 1 |
| 383 | | 2 | max | 0 | 3 | 0 | 10 | .018 | 5 | 1.898e-3 | 2 | NC | 1 | NC | 3 |
| 384 | | | min | 0 | 2 | -.019 | 3 | -.01 | 2 | -2.877e-3 | 5 | NC | 1 | 6036.735 | 2 |
| 385 | | 3 | max | 0 | 3 | -.001 | 10 | .036 | 5 | 1.951e-3 | 2 | NC | 1 | NC | 4 |
| 386 | | | min | 0 | 2 | -.037 | 3 | -.02 | 2 | -2.82e-3 | 5 | NC | 1 | 2998.452 | 2 |
| 387 | | 4 | max | .001 | 3 | -.002 | 10 | .055 | 5 | 2.003e-3 | 2 | NC | 1 | NC | 4 |
| 388 | | | min | -.001 | 2 | -.056 | 3 | -.031 | 2 | -2.763e-3 | 5 | NC | 1 | 2002.033 | 2 |
| 389 | | 5 | max | .001 | 3 | -.003 | 10 | .074 | 5 | 2.056e-3 | 2 | NC | 1 | NC | 4 |
| 390 | | | min | -.002 | 2 | -.074 | 3 | -.04 | 2 | -2.706e-3 | 5 | NC | 1 | 1516.194 | 2 |
| 391 | | 6 | max | .001 | 3 | -.003 | 10 | .093 | 5 | 2.109e-3 | 2 | NC | 1 | NC | 4 |
| 392 | | | min | -.002 | 2 | -.093 | 3 | -.05 | 2 | -2.649e-3 | 5 | NC | 1 | 1235.177 | 2 |
| 393 | | 7 | max | .002 | 3 | -.004 | 10 | .112 | 5 | 2.162e-3 | 2 | NC | 1 | NC | 13 |
| 394 | | | min | -.003 | 2 | -.111 | 3 | -.058 | 2 | -2.592e-3 | 5 | NC | 1 | 1057.542 | 2 |
| 395 | | 8 | max | .002 | 3 | -.005 | 10 | .132 | 5 | 2.215e-3 | 2 | NC | 1 | 9434.375 | 13 |
| 396 | | | min | -.003 | 2 | -.129 | 3 | -.065 | 2 | -2.535e-3 | 5 | NC | 1 | 940.341 | 2 |
| 397 | | 9 | max | .002 | 3 | -.005 | 10 | .151 | 5 | 2.267e-3 | 2 | NC | 1 | 7866.42 | 13 |
| 398 | | | min | -.004 | 2 | -.148 | 3 | -.071 | 2 | -2.478e-3 | 5 | NC | 1 | 862.739 | 2 |
| 399 | | 10 | max | .002 | 3 | -.005 | 10 | .17 | 5 | 2.32e-3 | 2 | NC | 1 | 6860.915 | 13 |
| 400 | | | min | -.004 | 2 | -.166 | 3 | -.075 | 2 | -2.42e-3 | 5 | NC | 1 | 814.008 | 2 |
| 401 | | 11 | max | .002 | 3 | -.006 | 10 | .188 | 5 | 2.373e-3 | 2 | NC | 1 | 6225.939 | 13 |
| 402 | | | min | -.004 | 2 | -.184 | 3 | -.077 | 2 | -2.363e-3 | 5 | NC | 1 | 731.821 | 14 |
| 403 | | 12 | max | .003 | 3 | -.006 | 10 | .206 | 5 | 2.426e-3 | 2 | NC | 1 | 5865.977 | 13 |
| 404 | | | min | -.005 | 2 | -.202 | 3 | -.077 | 2 | -2.306e-3 | 5 | NC | 1 | 661.169 | 14 |
| 405 | | 13 | max | .003 | 3 | -.006 | 10 | .223 | 5 | 2.479e-3 | 2 | NC | 1 | 5743.717 | 13 |
| 406 | | | min | -.005 | 2 | -.22 | 3 | -.075 | 2 | -2.249e-3 | 5 | NC | 1 | 603.052 | 14 |
| 407 | | 14 | max | .003 | 3 | -.006 | 10 | .239 | 5 | 2.531e-3 | 2 | NC | 1 | 5871.619 | 13 |
| 408 | | | min | -.006 | 2 | -.238 | 3 | -.07 | 2 | -2.192e-3 | 5 | NC | 1 | 554.538 | 14 |
| 409 | | 15 | max | .003 | 3 | -.006 | 10 | .255 | 5 | 2.584e-3 | 2 | NC | 1 | 6331.985 | 13 |
| 410 | | | min | -.006 | 2 | -.255 | 3 | -.062 | 2 | -2.135e-3 | 5 | NC | 1 | 513.538 | 14 |
| 411 | | 16 | max | .003 | 3 | -.006 | 10 | .269 | 5 | 2.637e-3 | 2 | NC | 1 | 7363.102 | 13 |
| 412 | | | min | -.007 | 2 | -.273 | 3 | -.051 | 2 | -2.078e-3 | 5 | NC | 1 | 478.525 | 14 |
| 413 | | 17 | max | .003 | 3 | -.006 | 10 | .282 | 5 | 2.69e-3 | 2 | NC | 1 | 9723.471 | 13 |
| 414 | | | min | -.007 | 2 | -.291 | 3 | -.036 | 2 | -2.021e-3 | 5 | NC | 1 | 448.355 | 14 |
| 415 | | 18 | max | .004 | 3 | -.006 | 10 | .295 | 4 | 2.743e-3 | 2 | NC | 1 | NC | 4 |
| 416 | | | min | -.007 | 2 | -.309 | 3 | -.018 | 2 | -1.964e-3 | 5 | NC | 1 | 422.16 | 14 |
| 417 | | 19 | max | .004 | 3 | -.005 | 10 | .306 | 4 | 2.795e-3 | 2 | NC | 1 | NC | 1 |
| 418 | | | min | -.008 | 2 | -.326 | 3 | .002 | 12 | -1.907e-3 | 5 | NC | 1 | 399.263 | 14 |
| 419 | M6 | 1 | max | .001 | 3 | 0 | 10 | 0 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 420 | | | min | 0 | 2 | 0 | 3 | 0 | 1 | -3.083e-3 | 4 | NC | 1 | NC | 1 |
| 421 | | 2 | max | .002 | 3 | 0 | 10 | .019 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 422 | | | min | -.002 | 2 | -.03 | 3 | 0 | 1 | -3.035e-3 | 4 | NC | 1 | NC | 1 |
| 423 | | 3 | max | .002 | 3 | -.002 | 10 | .038 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 424 | | | min | -.003 | 2 | -.06 | 3 | 0 | 1 | -2.987e-3 | 4 | NC | 1 | NC | 1 |
| 425 | | 4 | max | .003 | 3 | -.002 | 10 | .057 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 426 | | | min | -.004 | 2 | -.089 | 3 | 0 | 1 | -2.938e-3 | 4 | NC | 1 | NC | 1 |
| 427 | | 5 | max | .004 | 3 | -.003 | 10 | .077 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 428 | | | min | -.005 | 2 | -.119 | 3 | 0 | 1 | -2.89e-3 | 4 | NC | 1 | 7191.044 | 4 |
| 429 | | 6 | max | .004 | 3 | -.004 | 10 | .097 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 430 | | | min | -.007 | 2 | -.148 | 3 | 0 | 1 | -2.842e-3 | 4 | NC | 1 | 5324.626 | 4 |
| 431 | | 7 | max | .005 | 3 | -.004 | 10 | .117 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 432 | | | min | -.008 | 2 | -.178 | 3 | 0 | 1 | -2.793e-3 | 4 | NC | 1 | 4218.564 | 4 |
| 433 | | 8 | max | .006 | 3 | -.005 | 10 | .137 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 434 | | | min | -.009 | 2 | -.207 | 3 | 0 | 1 | -2.745e-3 | 4 | NC | 1 | 3517.392 | 4 |
| 435 | | 9 | max | .006 | 3 | -.006 | 10 | .157 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 436 | | | min | -.011 | 2 | -.236 | 3 | 0 | 1 | -2.697e-3 | 4 | NC | 1 | 3056.954 | 4 |
| 437 | | 10 | max | .007 | 3 | -.006 | 10 | .176 | 4 | 0 | 1 | NC | 1 | NC | 1 |

## *Envelope Member Section Deflections (Continued)*

| | Member | Sec | | x [in] | LC | y [in] | LC | z [in] | LC | x Rotate [r... | LC | (n) L/y Ratio | LC | (n) L/z Ratio | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 438 | | | min | -.012 | 2 | -.266 | 3 | 0 | 1 | -2.648e-3 | 4 | NC | 1 | 2754.038 | 4 |
| 439 | | 11 | max | .008 | 3 | -.006 | 10 | .195 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 440 | | | min | -.013 | 2 | -.295 | 3 | 0 | 1 | -2.6e-3 | 4 | NC | 1 | 2564.954 | 4 |
| 441 | | 12 | max | .008 | 3 | -.007 | 10 | .213 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 442 | | | min | -.014 | 2 | -.324 | 3 | 0 | 1 | -2.552e-3 | 4 | NC | 1 | 2468.584 | 4 |
| 443 | | 13 | max | .009 | 3 | -.007 | 10 | .23 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 444 | | | min | -.016 | 2 | -.353 | 3 | 0 | 1 | -2.503e-3 | 4 | NC | 1 | 2460.232 | 4 |
| 445 | | 14 | max | .009 | 3 | -.007 | 10 | .246 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 446 | | | min | -.017 | 2 | -.382 | 3 | 0 | 1 | -2.455e-3 | 4 | NC | 1 | 2552.739 | 4 |
| 447 | | 15 | max | .01 | 3 | -.007 | 10 | .261 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 448 | | | min | -.018 | 2 | -.411 | 3 | 0 | 1 | -2.407e-3 | 4 | NC | 1 | 2788.015 | 4 |
| 449 | | 16 | max | .011 | 3 | -.007 | 10 | .275 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 450 | | | min | -.019 | 2 | -.44 | 3 | 0 | 1 | -2.358e-3 | 4 | NC | 1 | 3277.549 | 4 |
| 451 | | 17 | max | .011 | 3 | -.007 | 10 | .287 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 452 | | | min | -.021 | 2 | -.469 | 3 | 0 | 1 | -2.31e-3 | 4 | NC | 1 | 4369.28 | 4 |
| 453 | | 18 | max | .012 | 3 | -.007 | 10 | .298 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 454 | | | min | -.022 | 2 | -.497 | 3 | 0 | 1 | -2.262e-3 | 4 | NC | 1 | 7821.038 | 4 |
| 455 | | 19 | max | .013 | 3 | -.007 | 10 | .307 | 4 | 0 | 1 | NC | 1 | NC | 1 |
| 456 | | | min | -.023 | 2 | -.526 | 3 | 0 | 1 | -2.214e-3 | 4 | NC | 1 | NC | 1 |
| 457 | M9 | 1 | max | 0 | 3 | 0 | 5 | 0 | 4 | 8.794e-4 | 3 | NC | 1 | NC | 1 |
| 458 | | | min | 0 | 2 | 0 | 3 | 0 | 3 | -3.14e-3 | 4 | NC | 1 | NC | 1 |
| 459 | | 2 | max | 0 | 3 | 0 | 5 | .019 | 4 | 9.197e-4 | 3 | NC | 1 | NC | 3 |
| 460 | | | min | 0 | 2 | -.019 | 3 | -.005 | 3 | -3.084e-3 | 4 | NC | 1 | 6036.735 | 2 |
| 461 | | 3 | max | 0 | 3 | .001 | 5 | .038 | 4 | 9.601e-4 | 3 | NC | 1 | NC | 4 |
| 462 | | | min | 0 | 2 | -.037 | 3 | -.01 | 3 | -3.028e-3 | 4 | NC | 1 | 2998.452 | 2 |
| 463 | | 4 | max | .001 | 3 | .002 | 5 | .058 | 4 | 1.e-3 | 3 | NC | 1 | NC | 5 |
| 464 | | | min | -.001 | 2 | -.056 | 3 | -.015 | 3 | -2.972e-3 | 4 | NC | 1 | 2002.033 | 2 |
| 465 | | 5 | max | .001 | 3 | .002 | 5 | .078 | 4 | 1.041e-3 | 3 | NC | 1 | NC | 15 |
| 466 | | | min | -.002 | 2 | -.074 | 3 | -.02 | 3 | -2.916e-3 | 4 | NC | 1 | 1516.194 | 2 |
| 467 | | 6 | max | .001 | 3 | .003 | 5 | .099 | 4 | 1.081e-3 | 3 | NC | 1 | 8664.911 | 15 |
| 468 | | | min | -.002 | 2 | -.093 | 3 | -.025 | 3 | -2.86e-3 | 4 | NC | 1 | 1235.177 | 2 |
| 469 | | 7 | max | .002 | 3 | .004 | 5 | .119 | 4 | 1.122e-3 | 3 | NC | 1 | 6817.797 | 15 |
| 470 | | | min | -.003 | 2 | -.111 | 3 | -.029 | 3 | -2.804e-3 | 4 | NC | 1 | 1057.542 | 2 |
| 471 | | 8 | max | .002 | 3 | .004 | 5 | .139 | 4 | 1.162e-3 | 3 | NC | 1 | 5654.602 | 15 |
| 472 | | | min | -.003 | 2 | -.129 | 3 | -.033 | 3 | -2.748e-3 | 4 | NC | 1 | 940.341 | 2 |
| 473 | | 9 | max | .002 | 3 | .005 | 5 | .159 | 4 | 1.202e-3 | 3 | NC | 1 | 4893.904 | 15 |
| 474 | | | min | -.004 | 2 | -.148 | 3 | -.036 | 3 | -2.691e-3 | 4 | NC | 1 | 862.739 | 2 |
| 475 | | 10 | max | .002 | 3 | .006 | 5 | .178 | 4 | 1.243e-3 | 3 | NC | 1 | 4475.474 | 9 |
| 476 | | | min | -.004 | 2 | -.166 | 3 | -.038 | 3 | -2.635e-3 | 4 | NC | 1 | 814.008 | 2 |
| 477 | | 11 | max | .002 | 3 | .007 | 5 | .197 | 4 | 1.283e-3 | 3 | NC | 1 | 4336.5 | 9 |
| 478 | | | min | -.004 | 2 | -.184 | 3 | -.039 | 3 | -2.579e-3 | 4 | 9554.37 | 5 | 788.927 | 2 |
| 479 | | 12 | max | .003 | 3 | .007 | 5 | .215 | 4 | 1.323e-3 | 3 | NC | 1 | 4319.646 | 9 |
| 480 | | | min | -.005 | 2 | -.202 | 3 | -.04 | 3 | -2.523e-3 | 4 | 8447.789 | 5 | 786.039 | 2 |
| 481 | | 13 | max | .003 | 3 | .008 | 5 | .232 | 4 | 1.364e-3 | 3 | NC | 1 | 4436.651 | 9 |
| 482 | | | min | -.005 | 2 | -.22 | 3 | -.039 | 3 | -2.479e-3 | 2 | 7534.439 | 5 | 807.499 | 2 |
| 483 | | 14 | max | .003 | 3 | .009 | 5 | .247 | 4 | 1.404e-3 | 3 | NC | 1 | 4727.213 | 9 |
| 484 | | | min | -.006 | 2 | -.238 | 3 | -.037 | 3 | -2.531e-3 | 2 | 6771.779 | 5 | 860.55 | 2 |
| 485 | | 15 | max | .003 | 3 | .01 | 5 | .262 | 4 | 1.444e-3 | 3 | NC | 1 | 5285.572 | 9 |
| 486 | | | min | -.006 | 2 | -.255 | 3 | -.033 | 3 | -2.584e-3 | 2 | 6128.981 | 5 | 962.367 | 2 |
| 487 | | 16 | max | .003 | 3 | .011 | 5 | .274 | 4 | 1.485e-3 | 3 | NC | 1 | 6344.748 | 9 |
| 488 | | | min | -.007 | 2 | -.273 | 3 | -.028 | 3 | -2.637e-3 | 2 | 5583.108 | 5 | 1155.408 | 2 |
| 489 | | 17 | max | .003 | 3 | .012 | 5 | .286 | 4 | 1.525e-3 | 3 | NC | 1 | 8617.244 | 9 |
| 490 | | | min | -.007 | 2 | -.291 | 3 | -.021 | 3 | -2.69e-3 | 2 | 5116.727 | 5 | 1569.484 | 2 |
| 491 | | 18 | max | .004 | 3 | .013 | 5 | .295 | 4 | 1.565e-3 | 3 | NC | 1 | NC | 9 |
| 492 | | | min | -.007 | 2 | -.309 | 3 | -.013 | 3 | -2.743e-3 | 2 | 4716.354 | 5 | 2857.066 | 2 |
| 493 | | 19 | max | .004 | 3 | .014 | 5 | .303 | 4 | 1.606e-3 | 3 | NC | 1 | NC | 1 |
| 494 | | | min | -.008 | 2 | -.326 | 3 | -.006 | 1 | -2.795e-3 | 2 | 4371.411 | 5 | NC | 1 |