

Schletter, Inc.	Standard FS Racking System Representative Calculations - ASCE 7-10	25° Tilt w/ Seismic Design
HCV		

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.

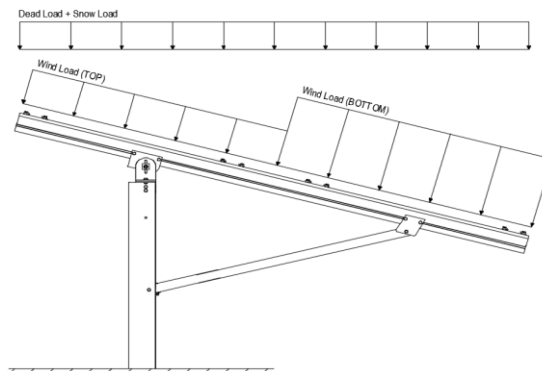
PV modules are required to meet the following specifications:

	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 = 25°
Maximum Height Above Grade = 3 ft

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



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

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	(ASCE 7-10, Eq. 7.4-1)
Sloped Roof Snow Load, P_s =	18.56 psf	
I_s =	1.00	
C_s =	0.82	
C_e =	0.90	
C_t =	1.20	

2.3 Wind Loads

Design Wind Speed, V =	130 mph	Exposure Category = C
Height <	15 ft	Importance Category = II
Peak Velocity Pressure, q_z =	26.53 psf	Including the gust factor, $G=0.85$. (ASCE 7-10, Eq. 27.3-1)

Pressure Coefficients

$C_{f+ TOP}$ =	1.1	(Pressure)
$C_{f+ BOTTOM}$ =	1.7	
$C_{f- TOP}$ =	-2.2	(Suction)
$C_{f- BOTTOM}$ =	-1	

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

2.4 Seismic Loads

S_S =	2.50	R =	1.25	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:

$$\begin{aligned}
 &1.2D + 1.6S + 0.5W \\
 &1.2D + 1.0W + 0.5S \\
 &0.9D + 1.0W^M \\
 &1.54D + 1.3E + 0.2S^R \quad (\text{ASCE 7, Eq 2.3.2-1 through 2.3.2-7}) \text{ \& (ASCE 7, Section 12.4.3.2)} \\
 &0.56D + 1.3E^R \\
 &1.54D + 1.25E + 0.2S^O \\
 &0.56D + 1.25E^O
 \end{aligned}$$

Allowable Stress Design, ASD

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

$$\begin{aligned}
 &1.0D + 1.0S \\
 &1.0D + 0.6W \\
 &1.0D + 0.75L + 0.45W + 0.75S \\
 &0.6D + 0.6W^M \quad (\text{ASCE 7, Eq 2.4.1-1 through 2.4.1-8}) \text{ \& (ASCE 7, Section 12.4.3.2)} \\
 &1.238D + 0.875E^O \\
 &1.1785D + 0.65625E + 0.75S^O \\
 &0.362D + 0.875E^O
 \end{aligned}$$

^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.

<u>Purlins</u>	<u>Location</u>	<u>Posts</u>	<u>Location</u>
M10	Top	M2	Outer
M11	Mid-Top	M5	Inner
M12	Mid-Bottom	M8	Outer
M13	Bottom		
<u>Girders</u>	<u>Location</u>	<u>Reactions</u>	<u>Location</u>
M1	Outer	N9	Outer
M4	Inner	N19	Inner
M7	Outer	N29	Outer
<u>Struts</u>	<u>Location</u>		
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 continuous 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 =	132 in
ΦF_{ty} STRONG-AXIS =	25.07 ksi
ΦF_{ty} WEAK-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 =	1.993 k-ft
M_z =	0.276 k-ft
$M_{y \text{ allowable}}$ =	2.779 k-ft
$M_{z \text{ allowable}}$ =	1.154 k-ft
Utilization =	96%



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
ΦF_{ty} AXIAL =	30.80 ksi
ΦF_{ty} STRONG-AXIS =	30.46 ksi
ΦF_{ty} WEAK-AXIS =	31.56 ksi
S_y =	1.98 in ³
S_x =	1.32 in ³
E =	10100 ksi
I_y =	4.74 in ⁴
I_x =	1.83 in ⁴
A =	1.93 in ²
g =	2.32 lbs/ft
M_y =	4.498 k-ft
M_z =	0.000 k-ft
P_n =	0.025 k
$M_{y \text{ allowable}}$ =	5.026 k-ft
$M_{z \text{ allowable}}$ =	3.472 k-ft
$P_{n \text{ allowable}}$ =	59.439 k
Utilization =	90%

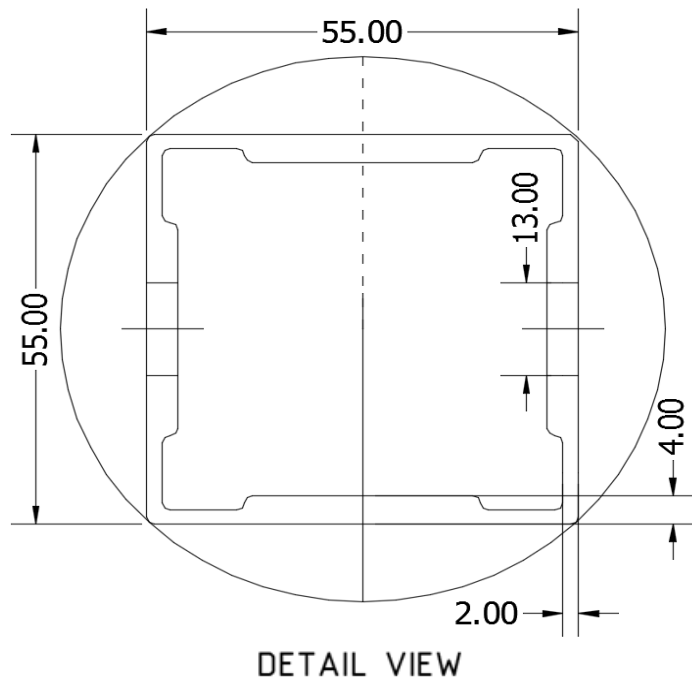


DETAIL VIEW

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).

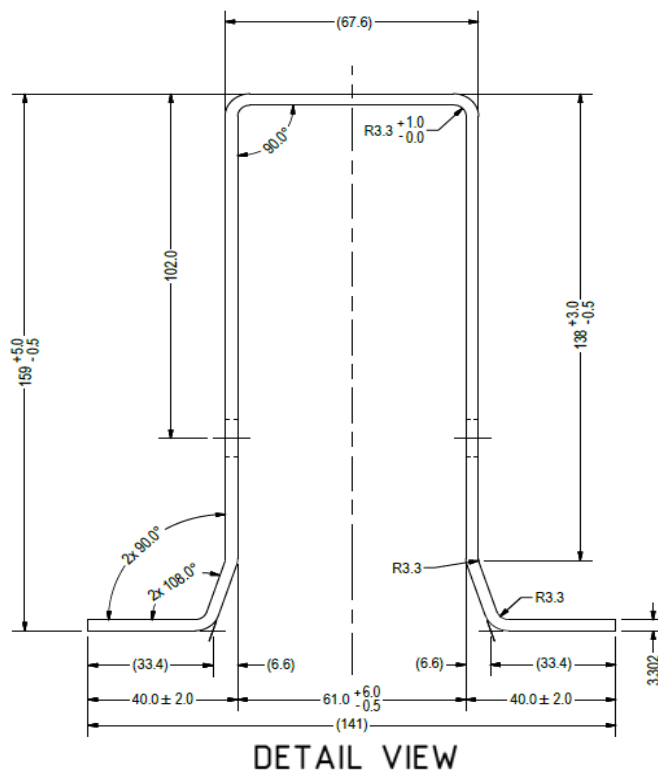
Strut Type =	55x55
Aluminum Type =	6105-T5
F_{ty} =	35 ksi
L_b =	61.00 in
$\Phi F_{ty \text{ AXIAL}}$ =	13.67 ksi
$\Phi F_{ty \text{ BENDING}}$ =	28.22 ksi
S_y =	0.60 in ³
S_x =	0.60 in ³
E =	10100 ksi
I_y =	0.67 in ⁴
I_x =	0.67 in ⁴
A =	0.98 in ²
g =	1.18 lbs/ft
M_y =	0.000 k-ft
M_z =	0.421 k-ft
P_n =	5.189 k
$M_{y \text{ allowable}}$ =	1.408 k-ft
$M_{z \text{ allowable}}$ =	1.408 k-ft
$P_{n \text{ allowable}}$ =	13.425 k
Utilization =	69%



4.4 Post Design

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

Post Type =	FG8
Steel Type =	J2340
F_{ty} =	60 ksi
L_b =	72.60 in
Φ =	0.90
ΦF_{ty} =	54.00 ksi
S_y =	3.46 in ³
S_x =	1.55 in ³
E =	29000 ksi
I_y =	10.94 in ⁴
I_x =	4.31 in ⁴
A =	2.23 in ²
g =	7.59 lbs/ft
M_y =	12.027 k-ft
M_z =	0.000 k-ft
P_r =	6.904 k
$M_{y \text{ allowable}}$ =	19.207 k-ft
$M_{z \text{ allowable}}$ =	14.389 k-ft
P_c =	38.073 k
Utilization =	82%



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 = 6.84 k
Maximum Lateral Load = 3.33 k

5.2 Design of Drilled Shaft Foundations

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

5.3 Lateral Force Resistance

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



Lateral Force @ Top of Pole, P = 1.33 k
Height of Pole Above Grade, H = 5.05 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

$$S_3 = \text{Min} (D, 12')$$

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

$$A = 2.34 \frac{P}{S_1 B}$$

$$D = \left\{ 0.5 A \left(1 + \sqrt{1 + \left(\frac{4.36 H}{A} \right)^2} \right) \right\}$$

Lateral Bearing @ Bottom = S_3

Lateral Bearing @ D/3 = S_1

Required Depth = D

Non-Constrained

Lateral Force @ Top of Pole, P = 1.33 k
Height of Pole Above Grade, H = 5.05 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 = 7.16

Required Footing Depth, D = 10.81 ft

2nd Trial @ D_2 = 7.03 ft

Lateral Soil Bearing @ D/3, S_1 = 0.47 ksf

Lateral Soil Bearing @ D, S_3 = 1.41 ksf

Constant $2.34P/(S_1 B)$, A = 3.31

Required Footing Depth, D = 6.23 ft

3rd Trial @ D_3 = 6.63 ft

Lateral Soil Bearing @ D/3, S_1 = 0.44 ksf

Lateral Soil Bearing @ D, S_3 = 1.33 ksf

Constant $2.34P/(S_1 B)$, A = 3.51

Required Footing Depth, D = 6.49 ft

4th Trial @ D_4 = 6.56 ft

Lateral Soil Bearing @ D/3, S_1 = 0.44 ksf

Lateral Soil Bearing @ D, S_3 = 1.31 ksf

Constant $2.34P/(S_1 B)$, A = 3.55

Required Footing Depth, D = 6.54 ft

5th Trial @ D_5 = 6.55 ft

Lateral Soil Bearing @ D/3, S_1 = 0.44 ksf

Lateral Soil Bearing @ D, S_3 = 1.31 ksf

Constant $2.34P/(S_1 B)$, A = 3.55

Required Footing Depth, D = 6.75 ft

A 2ft diameter x 6.75ft deep footing unrestrained at ground level is required for the racking structure.

5.4 Uplifting Force Resistance

Uplifting forces of the racking system are checked against the uplift resistance of the soil. Clay soils are assumed.

Weight of Concrete, g_{con} =	145 pcf
Uplifting Force, N =	3.14 k
Footing Diameter, B =	2.00 ft
Factor of Safety =	2.50
Cohesion =	208.85 psf
γ_s =	120.43 pcf
α =	0.45
Required Concrete Weight, g =	2.05 k
Required Concrete Volume, V =	14.13 ft ³
Required Footing Depth, D =	<u>4.50</u> ft

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



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.78
2	0.4	0.2	118.10	6.68
3	0.6	0.2	118.10	6.57
4	0.8	0.2	118.10	6.47
5	1	0.2	118.10	6.37
6	1.2	0.2	118.10	6.26
7	1.4	0.2	118.10	6.16
8	1.6	0.2	118.10	6.05
9	1.8	0.2	118.10	5.95
10	2	0.2	118.10	5.85
11	2.2	0.2	118.10	5.74
12	2.4	0.2	118.10	5.64
13	2.6	0.2	118.10	5.54
14	2.8	0.2	118.10	5.43
15	3	0.2	118.10	5.33
16	3.2	0.2	118.10	5.22
17	3.4	0.2	118.10	5.12
18	3.6	0.2	118.10	5.02
19	3.8	0.2	118.10	4.91
20	4	0.2	118.10	4.81
21	4.2	0.2	118.10	4.71
22	4.4	0.2	118.10	4.60
23	4.6	0.2	118.10	4.50
24	0	0.0	0.00	4.50
25	0	0.0	0.00	4.50
26	0	0.0	0.00	4.50
27	0	0.0	0.00	4.50
28	0	0.0	0.00	4.50
29	0	0.0	0.00	4.50
30	0	0.0	0.00	4.50
31	0	0.0	0.00	4.50
32	0	0.0	0.00	4.50
33	0	0.0	0.00	4.50
34	0	0.0	0.00	4.50
Max	4.6	Sum	1.09	

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 =	6.75 ft
Footing Diameter, B =	2.00 ft
Compressive Force, P =	4.55 k

Footing Area =	3.14 ft ²
Circumference =	6.28 ft
Skin Friction Area =	23.56 ft ²
Concrete Weight =	0.145 kcf

<u>Bearing Pressure</u>	
Bearing Area =	3.14 ft ²
Bearing Capacity =	1.5 ksf
Resistance =	4.71 k

<u>Weight of Concrete</u>	
Footing Volume	21.21 ft ³
Weight	3.07 k

<u>Skin Friction Resistance</u>	
Skin Friction =	0.15 ksf
Resistance =	3.53 k
1/3 Increase for Wind =	1.33
Total Resistance =	11.00 k
Applied Force =	7.63 k
Utilization =	<u>69%</u>

A 2ft diameter footing passes at a depth of 6.75ft.



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 =	0.546 k
Allowable Uplift =	1.214 k
Utilization =	<u>45%</u>



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.129 k
Allowable Uplift =	2.180 k
Utilization =	<u>98%</u>



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 =	5.189 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	<u>58%</u>

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

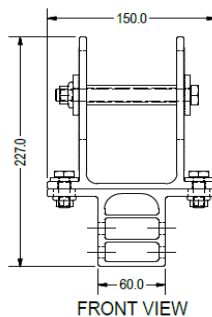


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

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 =	4.531 k
Allowable Load =	5.649 k
Utilization =	<u>80%</u>



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} =	58.15 in
Allowable Story Drift for All Other Structures, Δ =	$0.020h_{sx}$
Max Drift, Δ_{MAX} =	1.163 in
	<u>0.602 ≤ 1.163. OK.</u>

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:

3.4.14

$$L_b = 132 \text{ in}$$

$$J = 0.432$$

$$365.174$$

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

$$S1 = 0.51461$$

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

$$S2 = 1701.56$$

$$\phi F_L = \phi b [Bc - 1.6Dc \sqrt{((LbSc)/(Cb \sqrt{(lyJ)/2}))}]$$

$$\phi F_L = 27.1 \text{ ksi}$$

Weak Axis:

3.4.14

$$L_b = 132$$

$$J = 0.432$$

$$232.229$$

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

$$S1 = 0.51461$$

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

$$S2 = 1701.56$$

$$\phi F_L = \phi b [Bc - 1.6Dc \sqrt{((LbSc)/(Cb \sqrt{(lyJ)/2}))}]$$

$$\phi F_L = 28.4$$

3.4.16

$$b/t = 32.195$$

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

$$S1 = 12.2$$

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

$$S2 = 46.7$$

$$\phi F_L = \phi b [Bp - 1.6Dp \cdot b/t]$$

$$\phi F_L = 25.1 \text{ ksi}$$

3.4.16

$$b/t = 37.0588$$

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

$$S1 = 12.2$$

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

$$S2 = 46.7$$

$$\phi F_L = \phi b [Bp - 1.6Dp \cdot b/t]$$

$$\phi F_L = 23.1 \text{ ksi}$$

3.4.16.1 Not Used

$$Rb/t =$$

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

$$S1 = 1.1$$

$$S2 = C_t$$

$$S2 = 141.0$$

$$\phi F_L = 1.17 \phi y Fcy$$

$$\phi F_L = 38.9 \text{ ksi}$$

3.4.16.1

N/A for Weak Direction

3.4.18

$$h/t = 37.0588$$

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

$$S1 = 36.9$$

$$m = 0.65$$

$$C_0 = 40.985$$

$$Cc = 41.015$$

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

$$S2 = 77.2$$

$$\phi F_L = \phi b [Bbr - mDbr \cdot h/t]$$

$$\phi F_L = 43.2 \text{ ksi}$$

$$\phi F_L St = 25.1 \text{ ksi}$$

$$I_x = 897074 \text{ mm}^4$$

$$2.155 \text{ in}^4$$

$$y = 41.015 \text{ mm}$$

$$S_x = 1.335 \text{ in}^3$$

$$M_{\max} St = 2.788 \text{ k-ft}$$

3.4.18

$$h/t = 32.195$$

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

$$S1 = 36.9$$

$$m = 0.65$$

$$C_0 = 45.5$$

$$Cc = 45.5$$

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

$$S2 = 77.3$$

$$\phi F_L = 1.3 \phi y Fcy$$

$$\phi F_L = 43.2 \text{ ksi}$$

$$\phi F_L Wk = 23.1 \text{ ksi}$$

$$I_y = 446476 \text{ mm}^4$$

$$1.073 \text{ in}^4$$

$$x = 45.5 \text{ mm}$$

$$S_y = 0.599 \text{ in}^3$$

$$M_{\max} Wk = 1.152 \text{ k-ft}$$

Compression

3.4.9

$$\begin{aligned} b/t &= 32.195 \\ S1 &= 12.21 \text{ (See 3.4.16 above for formula)} \\ S2 &= 32.70 \text{ (See 3.4.16 above for formula)} \\ \phi F_L &= \phi c [Bp - 1.6Dp \cdot b/t] \\ \phi F_L &= 25.1 \text{ ksi} \end{aligned}$$

$$\begin{aligned} b/t &= 37.0588 \\ S1 &= 12.21 \\ S2 &= 32.70 \\ \phi F_L &= (\phi c k_2 \sqrt{(BpE)}) / (1.6b/t) \\ \phi F_L &= 21.9 \text{ ksi} \end{aligned}$$

3.4.10

$$\begin{aligned} Rb/t &= 0.0 \\ S1 &= \left(\frac{Bt - \frac{\theta_y}{\theta_b} Fcy}{Dt} \right)^2 \\ S1 &= 6.87 \\ S2 &= 131.3 \\ \phi F_L &= \phi_y Fcy \\ \phi F_L &= 33.25 \text{ ksi} \\ \phi F_L &= 21.94 \text{ ksi} \\ A &= 1215.13 \text{ mm}^2 \\ &= 1.88 \text{ in}^2 \\ P_{\max} &= 41.32 \text{ kips} \end{aligned}$$

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

Girder = **T5**

Strong Axis:

3.4.14

$$\begin{aligned} L_b &= 63.8189 \text{ in} \\ J &= 1.98 \\ &= 82.1278 \\ S1 &= \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc} \right)^2 \\ S1 &= 0.51461 \\ S2 &= \left(\frac{C_c}{1.6} \right)^2 \\ S2 &= 1701.56 \\ \phi F_L &= \phi b [Bc - 1.6Dc \sqrt{((LbSc)/(Cb \sqrt{(IyJ)/2}))}] \\ \phi F_L &= 30.5 \text{ ksi} \end{aligned}$$

Weak Axis:

3.4.14

$$\begin{aligned} L_b &= 63.8189 \\ J &= 1.98 \\ &= 89.1294 \\ S1 &= \left(\frac{Bc - \frac{\theta_y}{\theta_b} Fcy}{1.6Dc} \right)^2 \\ S1 &= 0.51461 \\ S2 &= \left(\frac{C_c}{1.6} \right)^2 \\ S2 &= 1701.56 \\ \phi F_L &= \phi b [Bc - 1.6Dc \sqrt{((LbSc)/(Cb \sqrt{(IyJ)/2}))}] \\ \phi F_L &= 30.3 \end{aligned}$$

3.4.16

$$\begin{aligned} b/t &= 4.5 \\ S1 &= \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp} \\ S1 &= 12.2 \\ S2 &= \frac{k_1 Bp}{1.6Dp} \\ S2 &= 46.7 \\ \phi F_L &= \phi_y Fcy \\ \phi F_L &= 33.3 \text{ ksi} \end{aligned}$$

3.4.16

$$\begin{aligned} b/t &= 16.3333 \\ S1 &= \frac{Bp - \frac{\theta_y}{\theta_b} Fcy}{1.6Dp} \\ S1 &= 12.2 \\ S2 &= \frac{k_1 Bp}{1.6Dp} \\ S2 &= 46.7 \\ \phi F_L &= \phi b [Bp - 1.6Dp \cdot b/t] \\ \phi F_L &= 31.6 \text{ ksi} \end{aligned}$$

3.4.16.1 Used

$$Rb/t = 20.0$$

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

$$S1 = 1.1$$

$$S2 = C_t$$

$$S2 = 141.0$$

$$\phi F_L = \phi b [Bt - Dt \sqrt{(Rb/t)}]$$

$$\phi F_L = 30.8 \text{ ksi}$$

3.4.18

$$h/t = 16.3333$$

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

$$S1 = 37.9$$

$$m = 0.63$$

$$C_0 = 61.046$$

$$Cc = 58.954$$

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

$$S2 = 79.4$$

$$\phi F_L = 1.3\phi y Fcy$$

$$\phi F_L = 43.2 \text{ ksi}$$

$$\phi F_L St = 30.5 \text{ ksi}$$

$$I_x = 1970917 \text{ mm}^4$$

$$4.735 \text{ in}^4$$

$$y = 61.046 \text{ mm}$$

$$S_x = 1.970 \text{ in}^3$$

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

3.4.16.1

N/A for Weak Direction

3.4.18

$$h/t = 4.5$$

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

$$S1 = 36.9$$

$$m = 0.65$$

$$C_0 = 35$$

$$Cc = 35$$

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

$$S2 = 77.3$$

$$\phi F_L = 1.3\phi y Fcy$$

$$\phi F_L = 43.2 \text{ ksi}$$

$$\phi F_L Wk = 31.6 \text{ ksi}$$

$$I_y = 763048 \text{ mm}^4$$

$$1.833 \text{ in}^4$$

$$x = 35 \text{ mm}$$

$$S_y = 1.330 \text{ in}^3$$

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

Compression

3.4.9

$$b/t = 4.5$$

$$S1 = 12.21 \text{ (See 3.4.16 above for formula)}$$

$$S2 = 32.70 \text{ (See 3.4.16 above for formula)}$$

$$\phi F_L = \phi y Fcy$$

$$\phi F_L = 33.3 \text{ ksi}$$

$$b/t = 16.3333$$

$$S1 = 12.21$$

$$S2 = 32.70$$

$$\phi F_L = \phi c [Bp - 1.6Dp \sqrt{b/t}]$$

$$\phi F_L = 31.6 \text{ ksi}$$

3.4.10

$$Rb/t = 20.0$$

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

$$S1 = 6.87$$

$$S2 = 131.3$$

$$\phi F_L = \phi c [Bt - Dt \sqrt{(Rb/t)}]$$

$$\phi F_L = 30.80 \text{ ksi}$$

$$\phi F_L = 30.80 \text{ ksi}$$

$$A = 1215.13 \text{ mm}^2$$

$$1.88 \text{ in}^2$$

$$P_{max} = 58.01 \text{ kips}$$

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

Strut = **55x55**

Strong Axis:

3.4.14

$$L_b = 61 \text{ in}$$

$$J = 0.942$$

$$95.1963$$

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

$$S1 = 0.51461$$

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

$$S2 = 1701.56$$

$$\phi F_L = \phi b [Bc - 1.6Dc \sqrt{((LbSc)/(Cb \sqrt{(IyJ)/2}))}]$$

$$\phi F_L = 30.2 \text{ ksi}$$

Weak Axis:

3.4.14

$$L_b = 61$$

$$J = 0.942$$

$$95.1963$$

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

$$S1 = 0.51461$$

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

$$S2 = 1701.56$$

$$\phi F_L = \phi b [Bc - 1.6Dc \sqrt{((LbSc)/(Cb \sqrt{(IyJ)/2}))}]$$

$$\phi F_L = 30.2$$

3.4.16

$$b/t = 24.5$$

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

$$S1 = 12.2$$

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

$$S2 = 46.7$$

$$\phi F_L = \phi b [Bp - 1.6Dp \cdot b/t]$$

$$\phi F_L = 28.2 \text{ ksi}$$

3.4.16

$$b/t = 24.5$$

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

$$S1 = 12.2$$

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

$$S2 = 46.7$$

$$\phi F_L = \phi b [Bp - 1.6Dp \cdot b/t]$$

$$\phi F_L = 28.2 \text{ ksi}$$

3.4.16.1 Not Used

$$Rb/t = 0.0$$

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

$$S1 = 1.1$$

$$S2 = C_t$$

$$S2 = 141.0$$

$$\phi F_L = 1.17 \phi_y Fcy$$

$$\phi F_L = 38.9 \text{ ksi}$$

3.4.16.1

N/A for Weak Direction

3.4.18

$$h/t = 24.5$$

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

$$S1 = 36.9$$

$$m = 0.65$$

$$C_0 = 27.5$$

$$Cc = 27.5$$

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

$$S2 = 77.3$$

$$\phi F_L = 1.3 \phi_y Fcy$$

$$\phi F_L = 43.2 \text{ ksi}$$

$$\phi F_L St = 28.2 \text{ ksi}$$

$$I_x = 279836 \text{ mm}^4$$

$$0.672 \text{ in}^4$$

$$y = 27.5 \text{ mm}$$

$$S_x = 0.621 \text{ in}^3$$

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

3.4.18

$$h/t = 24.5$$

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

$$S1 = 36.9$$

$$m = 0.65$$

$$C_0 = 27.5$$

$$Cc = 27.5$$

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

$$S2 = 77.3$$

$$\phi F_L = 1.3 \phi_y Fcy$$

$$\phi F_L = 43.2 \text{ ksi}$$

$$\phi F_L Wk = 28.2 \text{ ksi}$$

$$I_y = 279836 \text{ mm}^4$$

$$0.672 \text{ in}^4$$

$$x = 27.5 \text{ mm}$$

$$S_y = 0.621 \text{ in}^3$$

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

Compression

3.4.7

$$\lambda = 1.41113$$

$$r = 0.81 \text{ in}$$

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

$$S1^* = 0.33515$$

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

$$S2^* = 1.23671$$

$$\phi_{cc} = 0.77756$$

$$\phi F_L = (\phi_{cc} Fcy) / (\lambda^2)$$

$$\phi F_L = 13.6667 \text{ ksi}$$

3.4.9

$$b/t = 24.5$$

$$S1 = 12.21 \text{ (See 3.4.16 above for formula)}$$

$$S2 = 32.70 \text{ (See 3.4.16 above for formula)}$$

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

$$\phi F_L = 28.2 \text{ ksi}$$

$$b/t = 24.5$$

$$S1 = 12.21$$

$$S2 = 32.70$$

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

$$\phi F_L = 28.2 \text{ ksi}$$

3.4.10

$$Rb/t = 0.0$$

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

$$S1 = 6.87$$

$$S2 = 131.3$$

$$\phi F_L = \phi_y Fcy$$

$$\phi F_L = 33.25 \text{ ksi}$$

$$\phi F_L = 13.67 \text{ ksi}$$

$$A = 663.99 \text{ mm}^2$$

$$1.03 \text{ in}^2$$

$$P_{\max} = 14.07 \text{ kips}$$

A.4 Design of Galvanized Steel Posts

Post Type = **FG8**

Unbraced Length = 72.60 in
 Pr = 6.90 k (LRFD Factored Load)
 Mr (Strong) = 12.03 k-ft (LRFD Factored Load)
 Mr (Weak) = 0.00 k-ft (LRFD Factored Load)

Flexural Buckling:

$kL/r = 104.47$
 $4.71\sqrt{E/F_y} = 103.55 \Rightarrow kL/r > 4.71\sqrt{E/F_y}$
 $F_{cr} = 23.00$ ksi
 $F_e = 26.23$ ksi
 $P_n = 51.291$ k

Torsional/Flexural Torsional Buckling:

$F_{cr} = 17.0733$ ksi
 $F_{ey} = 66.8981$ ksi
 $F_{ez} = 21.7595$ ksi
 $P_n = 38.0734$ k

Bending (Strong Axis):

Yielding:
 $M_n = 21.95$ k-ft

Flange Local Buckling:

$M_n = 19.207$ k-ft

$P_r/P_c = 0.2015 \geq 0.2$
 Utilization = $0.82 < 1.0$ OK

Bending (Weak Axis):

Yielding:
 $M_n = 14.65$ k-ft

Flange Local Buckling:

$M_n = 14.39$ k-ft

$P_r/P_c = 0.201 \geq 0.2$
 Utilization = $0.00 < 1.0$ OK

Combined Forces

Utilization = **82%**

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.



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

Sept 14, 2015

Checked By: _____

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	-46.9	-46.9	0	0
2	M11	Y	-46.9	-46.9	0	0
3	M12	Y	-46.9	-46.9	0	0
4	M13	Y	-46.9	-46.9	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	-81.397	-81.397	0	0
2	M11	y	-81.397	-81.397	0	0
3	M12	y	-125.796	-125.796	0	0
4	M13	y	-125.796	-125.796	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	162.794	162.794	0	0
2	M11	y	162.794	162.794	0	0
3	M12	y	73.997	73.997	0	0
4	M13	y	73.997	73.997	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



RISA-3D Version 13.0.0 [T:\... \130mph\FS 60 Cell 2V 25° 130mph 30psf 11ft 7-10.r3d] Page 15



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

Sept 14, 2015

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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	358.063	3	818.679	3	170.548	2	.47	3	.238	1	.876	1
26		min	-1719.618	1	-605.276	1	-336.05	3	-.452	2	-.189	3	-1.189	3
27	14	max	213.591	1	544.434	1	79.2	5	.318	1	.062	3	1.236	1
28		min	11.057	12	-728.879	3	-149.178	1	-.511	3	-.228	4	-1.676	3
29	15	max	212.86	1	542.866	1	77.7	5	.318	1	.038	3	.899	1
30		min	10.691	12	-730.055	3	-149.178	1	-.511	3	-.199	4	-1.223	3
31	16	max	212.128	1	541.298	1	76.2	5	.318	1	.013	3	.563	1
32		min	10.325	12	-731.231	3	-149.178	1	-.511	3	-.246	1	-.77	3
33	17	max	211.397	1	539.73	1	74.701	5	.318	1	-.008	12	.227	1
34		min	9.96	12	-732.407	3	-149.178	1	-.511	3	-.339	1	-.316	3
35	18	max	.939	6	2.013	6	1.5	4	0	1	0	12	0	6
36		min	.221	15	.473	15	0	12	0	1	0	4	0	15
37	19	max	0	1	.002	2	.001	1	0	1	0	1	0	1
38		min	0	1	-.005	3	0	5	0	1	0	1	0	1
39	M4	1	max	0	.017	2	.002	4	0	1	0	1	0	1
40		min	0	1	-.004	3	0	1	0	1	0	1	0	1
41	2	max	-.221	15	-.473	15	0	1	0	1	0	1	0	6
42		min	-.939	6	-2.009	6	-1.499	5	0	1	0	5	0	15
43	3	max	-14.336	12	921.141	3	0	1	.032	4	.237	4	.788	2
44		min	-389.446	1	-2051.428	2	-114.502	5	0	1	0	1	-.357	3
45	4	max	-14.702	12	919.965	3	0	1	.032	4	.166	4	2.062	2
46		min	-390.177	1	-2052.997	2	-116.002	5	0	1	0	1	-.929	3
47	5	max	-15.067	12	918.789	3	0	1	.032	4	.094	4	3.337	2
48		min	-390.908	1	-2054.565	2	-117.501	5	0	1	0	1	-1.499	3
49	6	max	1388.99	3	1864.819	2	0	1	0	1	0	1	3.174	2
50		min	-3625.542	2	-682.775	3	-108.333	4	-.027	4	-.02	5	-1.482	3
51	7	max	1388.442	3	1863.25	2	0	1	0	1	0	1	2.017	2
52		min	-3626.274	2	-683.952	3	-109.833	4	-.027	4	-.086	4	-1.058	3
53	8	max	1387.893	3	1861.682	2	0	1	0	1	0	1	.861	2
54		min	-3627.005	2	-685.128	3	-111.333	4	-.027	4	-.155	4	-.633	3
55	9	max	1367.699	3	277.782	3	0	1	.016	4	.112	4	.193	1
56		min	-3852.345	1	-251.985	1	-230.93	4	0	1	0	1	-.424	3
57	10	max	1367.151	3	276.606	3	0	1	.016	4	0	1	.35	1
58		min	-3853.076	1	-253.553	1	-232.43	4	0	1	-.032	4	-.596	3
59	11	max	1366.602	3	275.43	3	0	1	.016	4	0	1	.508	1
60		min	-3853.807	1	-255.121	1	-233.929	4	0	1	-.176	4	-.767	3
61	12	max	1353.336	3	2275.189	3	0	1	.148	4	.002	5	1.283	1
62		min	-4233.51	1	-1843.874	1	-255.972	5	0	1	0	1	-1.734	3
63	13	max	1352.788	3	2274.013	3	0	1	.148	4	0	1	2.428	1
64		min	-4234.241	1	-1845.442	1	-257.472	5	0	1	-.158	4	-3.146	3
65	14	max	391.602	1	1565.76	1	71.207	5	0	1	0	1	3.527	1
66		min	16.587	12	-2000.211	3	0	1	-.106	4	-.197	5	-4.498	3
67	15	max	390.871	1	1564.192	1	69.707	5	0	1	0	1	2.556	1
68		min	16.222	12	-2001.387	3	0	1	-.106	4	-.153	5	-3.256	3
69	16	max	390.139	1	1562.623	1	68.207	5	0	1	0	1	1.585	1
70		min	15.856	12	-2002.564	3	0	1	-.106	4	-.11	5	-2.014	3
71	17	max	389.408	1	1561.055	1	66.708	5	0	1	0	1	.616	1
72		min	15.49	12	-2003.74	3	0	1	-.106	4	-.069	4	-.771	3
73	18	max	.939	6	2.014	6	1.5	5	0	1	0	1	0	6
74		min	.221	15	.473	15	0	1	0	1	0	5	0	15
75	19	max	0	1	.006	2	0	1	0	1	0	1	0	1
76		min	0	1	-.012	3	0	4	0	1	0	1	0	1
77	M7	1	max	0	.007	1	.003	4	0	1	0	1	0	1
78		min	0	1	-.001	3	0	12	0	1	0	1	0	1
79	2	max	-.221	15	-.473	15	.001	1	0	1	0	1	0	4
80		min	-.939	6	-2.011	4	-1.499	5	0	1	0	5	0	15
81	3	max	13.153	5	296.301	3	197.277	1	.28	2	.11	5	.31	2



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

Sept 14, 2015

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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	-211.378	1	-711.298	2	-49.027	5	-.076	3	-.312	1	-.127	3
83		4	max	12.812	5	295.125	3	197.277	1	.28	2	.079	5	.752	2
84			min	-212.11	1	-712.866	2	-50.526	5	-.076	3	-.19	1	-.31	3
85		5	max	12.471	5	293.948	3	197.277	1	.28	2	.047	5	1.194	2
86			min	-212.841	1	-714.434	2	-52.026	5	-.076	3	-.067	1	-.493	3
87		6	max	395.545	3	630.299	2	269.951	1	.082	3	.055	3	1.144	2
88			min	-1288.292	2	-180.062	3	-39.844	5	-.07	2	-.141	1	-.502	3
89		7	max	394.996	3	628.731	2	269.951	1	.082	3	.033	3	.754	2
90			min	-1289.023	2	-181.238	3	-41.344	5	-.07	2	-.054	5	-.39	3
91		8	max	394.448	3	627.162	2	269.951	1	.082	3	.194	1	.364	2
92			min	-1289.755	2	-182.414	3	-42.844	5	-.07	2	-.08	5	-.277	3
93		9	max	378.81	3	91.802	3	270.229	1	.238	2	.038	5	.151	1
94			min	-1502.272	1	-71.251	2	-96.03	5	.019	15	-.099	1	-.225	3
95		10	max	378.262	3	90.625	3	270.229	1	.238	2	.068	1	.195	1
96			min	-1503.003	1	-72.82	2	-97.529	5	.019	15	-.066	3	-.282	3
97		11	max	377.713	3	89.449	3	270.229	1	.238	2	.236	1	.239	1
98			min	-1503.734	1	-74.388	2	-99.029	5	.019	15	-.085	3	-.337	3
99		12	max	358.612	3	819.855	3	336.05	3	.452	2	-.012	12	.501	1
100			min	-1718.887	1	-603.708	1	-224.021	4	-.47	3	-.177	1	-.681	3
101		13	max	358.063	3	818.679	3	336.05	3	.452	2	.189	3	.876	1
102			min	-1719.618	1	-605.276	1	-225.521	4	-.47	3	-.238	1	-1.189	3
103		14	max	213.591	1	544.434	1	149.178	1	.511	3	.061	1	1.236	1
104			min	7.029	15	-728.879	3	20.598	10	-.318	1	-.213	5	-1.676	3
105		15	max	212.86	1	542.866	1	149.178	1	.511	3	.154	1	.899	1
106			min	6.809	15	-730.055	3	20.598	10	-.318	1	-.153	5	-1.223	3
107		16	max	212.128	1	541.298	1	149.178	1	.511	3	.246	1	.563	1
108			min	6.588	15	-731.231	3	20.598	10	-.318	1	-.094	5	-.77	3
109		17	max	211.397	1	539.73	1	149.178	1	.511	3	.339	1	.227	1
110			min	6.368	15	-732.407	3	20.598	10	-.318	1	-.035	5	-.316	3
111		18	max	.939	6	2.013	4	1.5	5	0	1	0	1	0	4
112			min	.221	15	.473	15	-.001	1	0	1	0	5	0	15
113		19	max	0	1	.002	2	0	15	0	1	0	1	0	1
114			min	0	1	-.005	3	-.001	1	0	1	0	1	0	1
115	M10	1	max	149.164	1	536.271	1	-5.93	15	.008	1	.399	1	.318	1
116			min	20.593	10	-734.73	3	-210.286	1	-.02	3	.001	15	-.511	3
117		2	max	149.164	1	390.286	1	-4.085	15	.008	1	.17	1	.269	3
118			min	20.593	10	-541.695	3	-165.408	1	-.02	3	-.007	5	-.249	1
119		3	max	149.164	1	244.301	1	-2.239	15	.008	1	.021	2	.814	3
120			min	20.593	10	-348.661	3	-120.529	1	-.02	3	-.017	4	-.637	1
121		4	max	149.164	1	98.316	1	-.393	15	.008	1	-.005	10	1.122	3
122			min	20.593	10	-155.626	3	-75.651	1	-.02	3	-.125	1	-.846	1
123		5	max	149.164	1	37.408	3	2.096	5	.008	1	-.009	12	1.194	3
124			min	20.593	10	-47.669	1	-30.772	1	-.02	3	-.19	1	-.877	1
125		6	max	149.164	1	230.443	3	14.106	1	.008	1	-.007	15	1.03	3
126			min	18.309	15	-193.654	1	-3.605	10	-.02	3	-.2	1	-.729	1
127		7	max	149.164	1	423.477	3	58.985	1	.008	1	-.001	15	.631	3
128			min	9.864	15	-339.639	1	1.494	10	-.02	3	-.156	1	-.403	1
129		8	max	149.164	1	616.512	3	103.864	1	.008	1	.009	5	.101	1
130			min	1.42	15	-485.624	1	3.682	12	-.02	3	-.056	1	-.018	5
131		9	max	149.164	1	809.546	3	148.742	1	.008	1	.098	1	.784	1
132			min	-10.009	5	-631.609	1	5.527	12	-.02	3	-.012	10	-.876	3
133		10	max	149.164	1	1002.581	3	193.621	1	0	15	.307	1	1.645	1
134			min	20.593	10	-777.594	1	-105.138	14	-.02	3	.006	10	-1.984	3
135		11	max	149.164	1	631.609	1	-3.822	15	.02	3	.098	1	.784	1
136			min	19.03	15	-809.546	3	-148.742	1	-.008	1	-.012	10	-.876	3
137		12	max	149.164	1	485.624	1	-1.977	15	.02	3	-.006	12	.101	1
138			min	10.586	15	-616.512	3	-103.864	1	-.008	1	-.056	1	-.005	3



Company : Schletter, Inc.
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Job Number :
Model Name : Standard FS Racking System

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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	149.164	1	339.639	1	-131	15	.02	3	-.009	12	.631	3
140		min	2.141	15	-423.477	3	-58.985	1	-.008	1	-.156	1	-.403	1
141	14	max	149.164	1	193.654	1	3.605	10	.02	3	-.01	15	1.03	3
142		min	-8.994	5	-230.443	3	-14.106	1	-.008	1	-.2	1	-.729	1
143	15	max	149.164	1	47.669	1	30.772	1	.02	3	-.006	15	1.194	3
144		min	-21.541	5	-37.408	3	1.854	12	-.008	1	-.19	1	-.877	1
145	16	max	149.164	1	155.626	3	75.651	1	.02	3	0	15	1.122	3
146		min	-34.087	5	-98.316	1	3.699	12	-.008	1	-.125	1	-.846	1
147	17	max	149.164	1	348.661	3	120.529	1	.02	3	.021	2	.814	3
148		min	-46.634	5	-244.301	1	5.545	12	-.008	1	-.013	9	-.637	1
149	18	max	149.164	1	541.695	3	165.408	1	.02	3	.17	1	.269	3
150		min	-59.18	5	-390.286	1	7.39	12	-.008	1	.008	12	-.249	1
151	19	max	149.164	1	734.73	3	210.286	1	.02	3	.399	1	.318	1
152		min	-71.726	5	-536.271	1	9.235	12	-.008	1	.018	12	-.511	3
153	M11	1	max	366.845	1	527.522	1	16.994	5	0	.436	1	.268	1
154		min	-366.75	3	-732.65	3	-215.293	1	-.006	1	-.143	5	-.606	3
155	2	max	366.845	1	381.537	1	19.85	5	0	15	.2	1	.172	3
156		min	-366.75	3	-539.615	3	-170.415	1	-.006	1	-.121	5	-.307	2
157	3	max	366.845	1	235.552	1	22.705	5	0	15	.026	2	.713	3
158		min	-366.75	3	-346.581	3	-125.536	1	-.006	1	-.095	5	-.665	1
159	4	max	366.845	1	89.567	1	25.56	5	0	15	.008	3	1.019	3
160		min	-366.75	3	-153.546	3	-80.658	1	-.006	1	-.107	1	-.864	1
161	5	max	366.845	1	39.488	3	28.415	5	0	15	-.002	12	1.088	3
162		min	-366.75	3	-58.976	2	-35.779	1	-.006	1	-.178	1	-.884	1
163	6	max	366.845	1	232.523	3	34.383	4	0	15	.004	5	.922	3
164		min	-366.75	3	-202.403	1	-4.547	3	-.006	1	-.194	1	-.726	1
165	7	max	366.845	1	425.557	3	53.978	1	0	15	.044	5	.52	3
166		min	-366.75	3	-348.388	1	-1.779	3	-.006	1	-.156	1	-.389	1
167	8	max	366.845	1	618.592	3	98.857	1	0	15	.088	5	.126	1
168		min	-366.75	3	-494.373	1	.989	3	-.006	1	-.062	1	-.118	3
169	9	max	366.845	1	811.626	3	143.735	1	0	15	.159	4	.819	1
170		min	-366.75	3	-640.358	1	2.838	12	-.006	1	-.012	10	-.992	3
171	10	max	366.845	1	1004.661	3	188.614	1	0	15	.289	1	1.691	1
172		min	-366.75	3	-786.343	1	-88.629	14	-.006	1	-.005	3	-2.102	3
173	11	max	366.845	1	640.358	1	20.949	5	.006	1	.086	1	.819	1
174		min	-366.75	3	-811.626	3	-143.735	1	0	5	-.121	5	-.992	3
175	12	max	366.845	1	494.373	1	23.804	5	.006	1	-.009	12	.126	1
176		min	-366.75	3	-618.592	3	-98.857	1	0	5	-.104	4	-.118	3
177	13	max	366.845	1	348.388	1	26.659	5	.006	1	-.009	12	.52	3
178		min	-366.75	3	-425.557	3	-53.978	1	0	5	-.156	1	-.389	1
179	14	max	366.845	1	202.403	1	29.514	5	.006	1	-.007	12	.922	3
180		min	-366.75	3	-232.523	3	-9.099	1	0	5	-.194	1	-.726	1
181	15	max	366.845	1	58.976	2	39.316	4	.006	1	.009	5	1.088	3
182		min	-366.75	3	-39.488	3	4.543	12	0	5	-.178	1	-.884	1
183	16	max	366.845	1	153.546	3	80.658	1	.006	1	.051	5	1.019	3
184		min	-366.75	3	-89.567	1	6.388	12	0	5	-.107	1	-.864	1
185	17	max	366.845	1	346.581	3	125.536	1	.006	1	.097	4	.713	3
186		min	-366.75	3	-235.552	1	8.234	12	0	5	.004	9	-.665	1
187	18	max	366.845	1	539.615	3	170.415	1	.006	1	.2	1	.172	3
188		min	-366.75	3	-381.537	1	10.079	12	0	5	.024	12	-.307	2
189	19	max	366.845	1	732.65	3	215.293	1	.006	1	.436	1	.268	1
190		min	-366.75	3	-527.522	1	11.924	12	0	5	.038	12	-.606	3
191	M12	1	max	51.578	5	694.817	2	19.6	5	0	.461	1	.308	2
192		min	-20.138	9	-276.001	3	-218.77	1	-.007	1	-.157	5	.033	12
193	2	max	50.646	2	501.971	2	22.455	5	0	3	.221	1	.34	3
194		min	-20.138	9	-191.496	3	-173.892	1	-.007	1	-.131	5	-.423	2
195	3	max	50.646	2	309.125	2	25.31	5	0	3	.043	2	.522	3



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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	-20.138	9	-106.991	3	-129.013	1	-.007	1	-.102	5	-.919	2
197		4	max	50.646	2	116.278	2	28.165	5	0	3	0	10	.601	3
198			min	-20.138	9	-22.486	3	-84.134	1	-.007	1	-.094	1	-1.179	2
199		5	max	50.646	2	62.019	3	31.02	5	0	3	-.007	12	.577	3
200			min	-20.138	9	-76.568	2	-39.256	1	-.007	1	-.17	1	-1.203	2
201		6	max	50.646	2	146.524	3	36.546	4	0	3	.007	5	.449	3
202			min	-21.157	14	-269.414	2	-6.674	2	-.007	1	-.19	1	-.992	2
203		7	max	50.646	2	231.028	3	50.501	1	0	3	.05	5	.219	3
204			min	-30.446	4	-462.261	2	-.244	10	-.007	1	-.156	1	-.545	2
205		8	max	50.646	2	315.533	3	95.38	1	0	3	.097	5	.138	2
206			min	-42.992	4	-655.107	2	2.964	12	-.007	1	-.067	1	-.115	3
207		9	max	50.646	2	400.038	3	140.258	1	0	3	.17	4	1.057	2
208			min	-55.538	4	-847.954	2	4.81	12	-.007	1	-.016	10	-.553	3
209		10	max	50.646	2	484.543	3	185.137	1	0	3	.276	1	2.211	2
210			min	-68.085	4	-1040.8	2	6.655	12	-.007	1	0	10	-1.093	3
211		11	max	50.646	2	847.954	2	23.838	5	.007	1	.077	1	1.057	2
212			min	-20.138	9	-400.038	3	-140.258	1	0	5	-.134	5	-.553	3
213		12	max	50.646	2	655.107	2	26.693	5	.007	1	-.006	12	.138	2
214			min	-20.138	9	-315.533	3	-95.38	1	0	5	-.114	4	-.115	3
215		13	max	50.646	2	462.261	2	29.548	5	.007	1	-.009	12	.219	3
216			min	-20.138	9	-231.028	3	-50.501	1	0	5	-.156	1	-.545	2
217		14	max	50.646	2	269.414	2	32.403	5	.007	1	-.009	12	.449	3
218			min	-20.138	9	-146.524	3	-7.481	9	0	5	-.19	1	-.992	2
219		15	max	50.646	2	76.568	2	42.723	4	.007	1	.011	5	.577	3
220			min	-20.138	9	-62.019	3	2.572	12	0	5	-.17	1	-1.203	2
221		16	max	50.646	2	22.486	3	84.134	1	.007	1	.056	5	.601	3
222			min	-25.19	4	-116.278	2	4.417	12	0	5	-.094	1	-1.179	2
223		17	max	50.646	2	106.991	3	129.013	1	.007	1	.108	4	.522	3
224			min	-37.736	4	-309.125	2	6.262	12	0	5	.004	12	-.919	2
225		18	max	50.646	2	191.496	3	173.892	1	.007	1	.221	1	.34	3
226			min	-50.282	4	-501.971	2	8.108	12	0	5	.012	12	-.423	2
227		19	max	50.646	2	276.001	3	218.77	1	.007	1	.461	1	.308	2
228			min	-62.829	4	-694.817	2	9.953	12	0	5	.024	12	-.035	5
229	M13	1	max	45.962	5	708.667	2	13.839	5	.007	3	.392	1	.28	2
230			min	-197.101	1	-298.7	3	-209.439	1	-.021	2	-.13	5	-.076	3
231		2	max	33.415	5	515.82	2	16.694	5	.007	3	.164	1	.237	3
232			min	-197.101	1	-214.195	3	-164.561	1	-.021	2	-.112	5	-.469	2
233		3	max	20.869	5	322.974	2	19.549	5	.007	3	.016	2	.447	3
234			min	-197.101	1	-129.691	3	-119.682	1	-.021	2	-.095	4	-.981	2
235		4	max	8.323	5	130.128	2	22.404	5	.007	3	-.003	12	.554	3
236			min	-197.101	1	-45.186	3	-74.804	1	-.021	2	-.129	1	-1.258	2
237		5	max	1.114	3	39.319	3	25.259	5	.007	3	-.007	12	.558	3
238			min	-197.101	1	-62.719	2	-29.925	1	-.021	2	-.193	1	-1.299	2
239		6	max	1.114	3	123.824	3	32.526	4	.007	3	-.001	15	.458	3
240			min	-197.101	1	-255.565	2	-3.213	10	-.021	2	-.202	1	-1.105	2
241		7	max	1.114	3	208.329	3	59.832	1	.007	3	.034	5	.255	3
242			min	-197.101	1	-448.412	2	1.266	12	-.021	2	-.156	1	-.675	2
243		8	max	1.114	3	292.834	3	104.711	1	.007	3	.073	5	0	10
244			min	-197.101	1	-641.258	2	3.112	12	-.021	2	-.056	1	-.051	3
245		9	max	1.114	3	377.339	3	149.589	1	.007	3	.143	4	.893	2
246			min	-197.101	1	-834.104	2	4.957	12	-.021	2	-.011	10	-.461	3
247		10	max	1.114	3	461.843	3	194.468	1	0	15	.31	1	2.03	2
248			min	-197.101	1	-1026.951	2	6.802	12	-.021	2	.006	12	-.973	3
249		11	max	32.129	5	834.104	2	17.022	5	.021	2	.099	1	.893	2
250			min	-197.101	1	-377.339	3	-149.589	1	-.007	3	-.101	5	-.461	3
251		12	max	19.583	5	641.258	2	19.877	5	.021	2	-.006	12	.003	5
252			min	-197.101	1	-292.834	3	-104.711	1	-.007	3	-.087	4	-.051	3



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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	7.036	5	448.412	2	22.732	5	.021	2	-.009	12	.255	3
254			min	-197.101	1	-208.329	3	-59.832	1	-.007	3	-.156	1	-.675	2
255		14	max	1.114	3	255.565	2	25.587	5	.021	2	-.009	12	.458	3
256			min	-197.101	1	-123.824	3	-14.954	1	-.007	3	-.202	1	-1.105	2
257		15	max	1.114	3	62.719	2	34.001	4	.021	2	.01	5	.558	3
258			min	-197.101	1	-39.319	3	2.424	12	-.007	3	-.193	1	-1.299	2
259		16	max	1.114	3	45.186	3	74.804	1	.021	2	.047	5	.554	3
260			min	-197.101	1	-130.128	2	4.269	12	-.007	3	-.129	1	-1.258	2
261		17	max	1.114	3	129.691	3	119.682	1	.021	2	.087	5	.447	3
262			min	-197.101	1	-322.974	2	6.115	12	-.007	3	-.015	9	-.981	2
263		18	max	1.114	3	214.195	3	164.561	1	.021	2	.164	1	.237	3
264			min	-197.101	1	-515.82	2	7.96	12	-.007	3	.012	12	-.469	2
265		19	max	1.114	3	298.7	3	209.439	1	.021	2	.392	1	.28	2
266			min	-197.101	1	-708.667	2	9.805	12	-.007	3	.023	12	-.076	3
267	M2	1	max	2552.821	1	918.923	3	320.172	1	.012	5	1.447	5	5.416	1
268			min	-1760.371	3	-675.085	2	-354.914	5	-.012	2	-.401	1	.515	15
269		2	max	2550.267	1	918.923	3	320.172	1	.012	5	1.348	5	5.474	1
270			min	-1762.287	3	-675.085	2	-352.7	5	-.012	2	-.312	1	.494	15
271		3	max	2547.712	1	918.923	3	320.172	1	.012	5	1.249	5	5.533	1
272			min	-1764.203	3	-675.085	2	-350.485	5	-.012	2	-.222	1	.473	15
273		4	max	1904.476	1	1273.911	1	245.898	1	.002	2	1.151	5	5.361	1
274			min	-1517.911	3	106.262	15	-333.614	5	-.001	3	-.189	1	.447	15
275		5	max	1901.921	1	1273.911	1	245.898	1	.002	2	1.057	5	5.004	1
276			min	-1519.827	3	106.262	15	-331.4	5	-.001	3	-.12	1	.417	15
277		6	max	1899.366	1	1273.911	1	245.898	1	.002	2	.965	4	4.647	1
278			min	-1521.743	3	106.262	15	-329.186	5	-.001	3	-.051	1	.388	15
279		7	max	1896.811	1	1273.911	1	245.898	1	.002	2	.882	4	4.289	1
280			min	-1523.659	3	106.262	15	-326.972	5	-.001	3	-.083	3	.358	15
281		8	max	1894.256	1	1273.911	1	245.898	1	.002	2	.8	4	3.932	1
282			min	-1525.575	3	106.262	15	-324.757	5	-.001	3	-.166	3	.328	15
283		9	max	1891.701	1	1273.911	1	245.898	1	.002	2	.718	4	3.574	1
284			min	-1527.492	3	106.262	15	-322.543	5	-.001	3	-.249	3	.298	15
285		10	max	1889.146	1	1273.911	1	245.898	1	.002	2	.636	4	3.217	1
286			min	-1529.408	3	106.262	15	-320.329	5	-.001	3	-.332	3	.268	15
287		11	max	1886.591	1	1273.911	1	245.898	1	.002	2	.556	4	2.859	1
288			min	-1531.324	3	106.262	15	-318.115	5	-.001	3	-.416	3	.239	15
289		12	max	1884.037	1	1273.911	1	245.898	1	.002	2	.476	4	2.502	1
290			min	-1533.24	3	106.262	15	-315.9	5	-.001	3	-.499	3	.209	15
291		13	max	1881.482	1	1273.911	1	245.898	1	.002	2	.436	2	2.145	1
292			min	-1535.156	3	106.262	15	-313.686	5	-.001	3	-.582	3	.179	15
293		14	max	1878.927	1	1273.911	1	245.898	1	.002	2	.502	2	1.787	1
294			min	-1537.072	3	106.262	15	-311.472	5	-.001	3	-.666	3	.149	15
295		15	max	1876.372	1	1273.911	1	245.898	1	.002	2	.57	1	1.43	1
296			min	-1538.989	3	106.262	15	-309.258	5	-.001	3	-.749	3	.119	15
297		16	max	1873.817	1	1273.911	1	245.898	1	.002	2	.639	1	1.072	1
298			min	-1540.905	3	106.262	15	-307.043	5	-.001	3	-.832	3	.089	15
299		17	max	1871.262	1	1273.911	1	245.898	1	.002	2	.708	1	.715	1
300			min	-1542.821	3	106.262	15	-304.829	5	-.001	3	-.915	3	.06	15
301		18	max	1868.707	1	1273.911	1	245.898	1	.002	2	.777	1	.357	1
302			min	-1544.737	3	106.262	15	-302.615	5	-.001	3	-.999	3	.03	15
303		19	max	1866.152	1	1273.911	1	245.898	1	.002	2	.846	1	0	1
304			min	-1546.653	3	106.262	15	-300.401	5	-.001	3	-1.082	3	0	1
305	M5	1	max	6926.171	1	2560.517	3	0	1	.013	4	1.523	4	11.183	1
306			min	-5259.209	3	-2490.91	2	-389.08	5	0	1	0	1	.376	15
307		2	max	6923.616	1	2560.517	3	0	1	.013	4	1.415	4	11.603	1
308			min	-5261.125	3	-2490.91	2	-386.866	5	0	1	0	1	.379	15
309		3	max	6921.061	1	2560.517	3	0	1	.013	4	1.307	4	12.022	1



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

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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	-5263.042	3	-2490.91	2	-384.651	5	0	1	0	1	.383	15
311		4	max	5113.928	1	2798.295	1	0	1	0	1	1.203	4	11.777	1
312			min	-4414.667	3	88.172	15	-368.882	4	0	4	0	1	.371	15
313		5	max	5111.373	1	2798.295	1	0	1	0	1	1.099	4	10.992	1
314			min	-4416.583	3	88.172	15	-366.668	4	0	4	0	1	.346	15
315		6	max	5108.818	1	2798.295	1	0	1	0	1	.997	4	10.207	1
316			min	-4418.499	3	88.172	15	-364.454	4	0	4	0	1	.322	15
317		7	max	5106.263	1	2798.295	1	0	1	0	1	.895	4	9.422	1
318			min	-4420.416	3	88.172	15	-362.24	4	0	4	0	1	.297	15
319		8	max	5103.709	1	2798.295	1	0	1	0	1	.794	4	8.637	1
320			min	-4422.332	3	88.172	15	-360.025	4	0	4	0	1	.272	15
321		9	max	5101.154	1	2798.295	1	0	1	0	1	.693	4	7.851	1
322			min	-4424.248	3	88.172	15	-357.811	4	0	4	0	1	.247	15
323		10	max	5098.599	1	2798.295	1	0	1	0	1	.593	4	7.066	1
324			min	-4426.164	3	88.172	15	-355.597	4	0	4	0	1	.223	15
325		11	max	5096.044	1	2798.295	1	0	1	0	1	.493	4	6.281	1
326			min	-4428.08	3	88.172	15	-353.383	4	0	4	0	1	.198	15
327		12	max	5093.489	1	2798.295	1	0	1	0	1	.394	4	5.496	1
328			min	-4429.996	3	88.172	15	-351.169	4	0	4	0	1	.173	15
329		13	max	5090.934	1	2798.295	1	0	1	0	1	.296	4	4.711	1
330			min	-4431.913	3	88.172	15	-348.954	4	0	4	0	1	.148	15
331		14	max	5088.379	1	2798.295	1	0	1	0	1	.199	4	3.926	1
332			min	-4433.829	3	88.172	15	-346.74	4	0	4	0	1	.124	15
333		15	max	5085.824	1	2798.295	1	0	1	0	1	.102	4	3.141	1
334			min	-4435.745	3	88.172	15	-344.526	4	0	4	0	1	.099	15
335		16	max	5083.269	1	2798.295	1	0	1	0	1	.005	4	2.355	1
336			min	-4437.661	3	88.172	15	-342.312	4	0	4	0	1	.074	15
337		17	max	5080.715	1	2798.295	1	0	1	0	1	0	1	1.57	1
338			min	-4439.577	3	88.172	15	-340.097	4	0	4	-.09	4	.049	15
339		18	max	5078.16	1	2798.295	1	0	1	0	1	0	1	.785	1
340			min	-4441.493	3	88.172	15	-337.883	4	0	4	-.186	4	.025	15
341		19	max	5075.605	1	2798.295	1	0	1	0	1	0	1	0	1
342			min	-4443.41	3	88.172	15	-335.669	4	0	4	-.28	4	0	1
343	M8	1	max	2552.821	1	918.923	3	331.041	3	.014	4	1.556	4	5.416	1
344			min	-1760.371	3	-675.085	2	-426.458	4	-.006	3	-.416	3	-.146	5
345		2	max	2550.267	1	918.923	3	331.041	3	.014	4	1.437	4	5.474	1
346			min	-1762.287	3	-675.085	2	-424.244	4	-.006	3	-.323	3	-.121	5
347		3	max	2547.712	1	918.923	3	331.041	3	.014	4	1.318	4	5.533	1
348			min	-1764.203	3	-675.085	2	-422.03	4	-.006	3	-.23	3	-.095	5
349		4	max	1904.476	1	1273.911	1	296.743	3	.001	3	1.21	4	5.361	1
350			min	-1517.911	3	-19.234	5	-392.501	4	-.002	2	-.167	3	-.081	5
351		5	max	1901.921	1	1273.911	1	296.743	3	.001	3	1.1	4	5.004	1
352			min	-1519.827	3	-19.234	5	-390.287	4	-.002	2	-.084	3	-.076	5
353		6	max	1899.366	1	1273.911	1	296.743	3	.001	3	.991	4	4.647	1
354			min	-1521.743	3	-19.234	5	-388.072	4	-.002	2	0	3	-.07	5
355		7	max	1896.811	1	1273.911	1	296.743	3	.001	3	.882	4	4.289	1
356			min	-1523.659	3	-19.234	5	-385.858	4	-.002	2	-.037	2	-.065	5
357		8	max	1894.256	1	1273.911	1	296.743	3	.001	3	.775	5	3.932	1
358			min	-1525.575	3	-19.234	5	-383.644	4	-.002	2	-.103	2	-.059	5
359		9	max	1891.701	1	1273.911	1	296.743	3	.001	3	.679	5	3.574	1
360			min	-1527.492	3	-19.234	5	-381.43	4	-.002	2	-.17	2	-.054	5
361		10	max	1889.146	1	1273.911	1	296.743	3	.001	3	.583	5	3.217	1
362			min	-1529.408	3	-19.234	5	-379.216	4	-.002	2	-.236	2	-.049	5
363		11	max	1886.591	1	1273.911	1	296.743	3	.001	3	.488	5	2.859	1
364			min	-1531.324	3	-19.234	5	-377.001	4	-.002	2	-.303	2	-.043	5
365		12	max	1884.037	1	1273.911	1	296.743	3	.001	3	.499	3	2.502	1
366			min	-1533.24	3	-19.234	5	-374.787	4	-.002	2	-.369	2	-.038	5



Company : Schletter, Inc.
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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	1881.482	1	1273.911	1	296.743	3	.001	3	.582	3	2.145	1
368			min	-1535.156	3	-19.234	5	-372.573	4	-.002	2	-.436	2	-.032	5
369		14	max	1878.927	1	1273.911	1	296.743	3	.001	3	.666	3	1.787	1
370			min	-1537.072	3	-19.234	5	-370.359	4	-.002	2	-.502	2	-.027	5
371		15	max	1876.372	1	1273.911	1	296.743	3	.001	3	.749	3	1.43	1
372			min	-1538.989	3	-19.234	5	-368.144	4	-.002	2	-.57	1	-.022	5
373		16	max	1873.817	1	1273.911	1	296.743	3	.001	3	.832	3	1.072	1
374			min	-1540.905	3	-19.234	5	-365.93	4	-.002	2	-.639	1	-.016	5
375		17	max	1871.262	1	1273.911	1	296.743	3	.001	3	.915	3	.715	1
376			min	-1542.821	3	-19.234	5	-363.716	4	-.002	2	-.708	1	-.011	5
377		18	max	1868.707	1	1273.911	1	296.743	3	.001	3	.999	3	.357	1
378			min	-1544.737	3	-19.234	5	-361.502	4	-.002	2	-.777	1	-.005	5
379		19	max	1866.152	1	1273.911	1	296.743	3	.001	3	1.082	3	0	1
380			min	-1546.653	3	-19.234	5	-359.287	4	-.002	2	-.846	1	0	1
381	M3	1	max	1796.146	2	4.588	4	78.355	2	.025	3	.014	4	0	1
382			min	-625.701	3	1.079	15	-35.037	3	-.052	2	-.004	3	0	1
383		2	max	1795.971	2	4.078	4	78.355	2	.025	3	.03	2	0	15
384			min	-625.832	3	.959	15	-35.037	3	-.052	2	-.014	3	-.001	4
385		3	max	1795.797	2	3.569	4	78.355	2	.025	3	.053	2	0	15
386			min	-625.962	3	.839	15	-35.037	3	-.052	2	-.024	3	-.002	4
387		4	max	1795.623	2	3.059	4	78.355	2	.025	3	.075	2	0	15
388			min	-626.093	3	.719	15	-35.037	3	-.052	2	-.034	3	-.003	4
389		5	max	1795.448	2	2.549	4	78.355	2	.025	3	.098	2	0	15
390			min	-626.224	3	.599	15	-35.037	3	-.052	2	-.045	3	-.004	4
391		6	max	1795.274	2	2.039	4	78.355	2	.025	3	.121	2	-.001	15
392			min	-626.355	3	.479	15	-35.037	3	-.052	2	-.055	3	-.005	4
393		7	max	1795.099	2	1.529	4	78.355	2	.025	3	.144	2	-.001	15
394			min	-626.486	3	.36	15	-35.037	3	-.052	2	-.065	3	-.005	4
395		8	max	1794.925	2	1.02	4	78.355	2	.025	3	.167	2	-.001	15
396			min	-626.616	3	.24	15	-35.037	3	-.052	2	-.075	3	-.006	4
397		9	max	1794.751	2	.51	4	78.355	2	.025	3	.19	2	-.001	15
398			min	-626.747	3	.12	15	-35.037	3	-.052	2	-.086	3	-.006	4
399		10	max	1794.576	2	0	1	78.355	2	.025	3	.213	2	-.001	15
400			min	-626.878	3	0	1	-35.037	3	-.052	2	-.096	3	-.006	4
401		11	max	1794.402	2	-.12	15	78.355	2	.025	3	.236	2	-.001	15
402			min	-627.009	3	-.51	6	-35.037	3	-.052	2	-.106	3	-.006	4
403		12	max	1794.227	2	-.24	15	78.355	2	.025	3	.259	2	-.001	15
404			min	-627.14	3	-1.02	6	-35.037	3	-.052	2	-.116	3	-.006	4
405		13	max	1794.053	2	-.36	15	78.355	2	.025	3	.282	2	-.001	15
406			min	-627.27	3	-1.529	6	-35.037	3	-.052	2	-.127	3	-.005	4
407		14	max	1793.879	2	-.479	15	78.355	2	.025	3	.305	2	-.001	15
408			min	-627.401	3	-2.039	6	-35.037	3	-.052	2	-.137	3	-.005	4
409		15	max	1793.704	2	-.599	15	78.355	2	.025	3	.328	2	0	15
410			min	-627.532	3	-2.549	6	-35.037	3	-.052	2	-.147	3	-.004	4
411		16	max	1793.53	2	-.719	15	78.355	2	.025	3	.35	2	0	15
412			min	-627.663	3	-3.059	6	-35.037	3	-.052	2	-.157	3	-.003	4
413		17	max	1793.356	2	-.839	15	78.355	2	.025	3	.373	2	0	15
414			min	-627.793	3	-3.569	6	-35.037	3	-.052	2	-.167	3	-.002	4
415		18	max	1793.181	2	-.959	15	78.355	2	.025	3	.396	2	0	15
416			min	-627.924	3	-4.078	6	-35.037	3	-.052	2	-.178	3	-.001	4
417		19	max	1793.007	2	-1.079	15	78.355	2	.025	3	.419	2	0	1
418			min	-628.055	3	-4.588	6	-35.037	3	-.052	2	-.188	3	0	1
419	M6	1	max	5208.589	2	4.588	4	0	1	.006	5	.012	4	0	1
420			min	-2133.656	3	1.079	15	-19.469	4	0	1	0	1	0	1
421		2	max	5208.415	2	4.078	4	0	1	.006	5	.006	4	0	15
422			min	-2133.786	3	.959	15	-19.093	4	0	1	0	1	-.001	4
423		3	max	5208.24	2	3.569	4	0	1	.006	5	0	4	0	15



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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	-2133.917	3	.839	15	-18.717	4	0	1	0	1	-.002	4
425		4	max	5208.066	2	3.059	4	0	1	.006	5	0	1	0	15
426			min	-2134.048	3	.719	15	-18.341	4	0	1	-.004	4	-.003	4
427		5	max	5207.892	2	2.549	4	0	1	.006	5	0	1	0	15
428			min	-2134.179	3	.599	15	-17.965	4	0	1	-.01	4	-.004	4
429		6	max	5207.717	2	2.039	4	0	1	.006	5	0	1	-.001	15
430			min	-2134.31	3	.479	15	-17.589	4	0	1	-.015	4	-.005	4
431		7	max	5207.543	2	1.529	4	0	1	.006	5	0	1	-.001	15
432			min	-2134.44	3	.36	15	-17.213	4	0	1	-.02	4	-.005	4
433		8	max	5207.369	2	1.02	4	0	1	.006	5	0	1	-.001	15
434			min	-2134.571	3	.24	15	-16.837	4	0	1	-.025	4	-.006	4
435		9	max	5207.194	2	.51	4	0	1	.006	5	0	1	-.001	15
436			min	-2134.702	3	.12	15	-16.461	4	0	1	-.03	4	-.006	4
437		10	max	5207.02	2	0	1	0	1	.006	5	0	1	-.001	15
438			min	-2134.833	3	0	1	-16.085	4	0	1	-.035	4	-.006	4
439		11	max	5206.845	2	-.12	15	0	1	.006	5	0	1	-.001	15
440			min	-2134.963	3	-.51	6	-15.709	4	0	1	-.039	4	-.006	4
441		12	max	5206.671	2	-.24	15	0	1	.006	5	0	1	-.001	15
442			min	-2135.094	3	-1.02	6	-15.333	4	0	1	-.044	4	-.006	4
443		13	max	5206.497	2	-.36	15	0	1	.006	5	0	1	-.001	15
444			min	-2135.225	3	-1.529	6	-14.957	4	0	1	-.048	4	-.005	4
445		14	max	5206.322	2	-.479	15	0	1	.006	5	0	1	-.001	15
446			min	-2135.356	3	-2.039	6	-14.581	4	0	1	-.053	4	-.005	4
447		15	max	5206.148	2	-.599	15	0	1	.006	5	0	1	0	15
448			min	-2135.487	3	-2.549	6	-14.205	4	0	1	-.057	4	-.004	4
449		16	max	5205.973	2	-.719	15	0	1	.006	5	0	1	0	15
450			min	-2135.617	3	-3.059	6	-13.829	4	0	1	-.061	4	-.003	4
451		17	max	5205.799	2	-.839	15	0	1	.006	5	0	1	0	15
452			min	-2135.748	3	-3.569	6	-13.453	4	0	1	-.065	4	-.002	4
453		18	max	5205.625	2	-.959	15	0	1	.006	5	0	1	0	15
454			min	-2135.879	3	-4.078	6	-13.077	4	0	1	-.069	4	-.001	4
455		19	max	5205.45	2	-1.079	15	0	1	.006	5	0	1	0	1
456			min	-2136.01	3	-4.588	6	-12.701	4	0	1	-.073	4	0	1
457	M9	1	max	1796.146	2	4.588	4	35.037	3	.052	2	.012	5	0	1
458			min	-625.701	3	1.079	15	-78.355	2	-.025	3	-.007	2	0	1
459		2	max	1795.971	2	4.078	4	35.037	3	.052	2	.014	3	0	15
460			min	-625.832	3	.959	15	-78.355	2	-.025	3	-.03	2	-.001	4
461		3	max	1795.797	2	3.569	4	35.037	3	.052	2	.024	3	0	15
462			min	-625.962	3	.839	15	-78.355	2	-.025	3	-.053	2	-.002	4
463		4	max	1795.623	2	3.059	4	35.037	3	.052	2	.034	3	0	15
464			min	-626.093	3	.719	15	-78.355	2	-.025	3	-.075	2	-.003	4
465		5	max	1795.448	2	2.549	4	35.037	3	.052	2	.045	3	0	15
466			min	-626.224	3	.599	15	-78.355	2	-.025	3	-.098	2	-.004	4
467		6	max	1795.274	2	2.039	4	35.037	3	.052	2	.055	3	-.001	15
468			min	-626.355	3	.479	15	-78.355	2	-.025	3	-.121	2	-.005	4
469		7	max	1795.099	2	1.529	4	35.037	3	.052	2	.065	3	-.001	15
470			min	-626.486	3	.36	15	-78.355	2	-.025	3	-.144	2	-.005	4
471		8	max	1794.925	2	1.02	4	35.037	3	.052	2	.075	3	-.001	15
472			min	-626.616	3	.24	15	-78.355	2	-.025	3	-.167	2	-.006	4
473		9	max	1794.751	2	.51	4	35.037	3	.052	2	.086	3	-.001	15
474			min	-626.747	3	.12	15	-78.355	2	-.025	3	-.19	2	-.006	4
475		10	max	1794.576	2	0	1	35.037	3	.052	2	.096	3	-.001	15
476			min	-626.878	3	0	1	-78.355	2	-.025	3	-.213	2	-.006	4
477		11	max	1794.402	2	-.12	15	35.037	3	.052	2	.106	3	-.001	15
478			min	-627.009	3	-.51	6	-78.355	2	-.025	3	-.236	2	-.006	4
479		12	max	1794.227	2	-.24	15	35.037	3	.052	2	.116	3	-.001	15
480			min	-627.14	3	-1.02	6	-78.355	2	-.025	3	-.259	2	-.006	4



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

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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	1794.053	2	-.36	15	35.037	3	.052	2	.127	3	-.001	15
482		min	-627.27	3	-1.529	6	-78.355	2	-.025	3	-.282	2	-.005	4
483	14	max	1793.879	2	-.479	15	35.037	3	.052	2	.137	3	-.001	15
484		min	-627.401	3	-2.039	6	-78.355	2	-.025	3	-.305	2	-.005	4
485	15	max	1793.704	2	-.599	15	35.037	3	.052	2	.147	3	0	15
486		min	-627.532	3	-2.549	6	-78.355	2	-.025	3	-.328	2	-.004	4
487	16	max	1793.53	2	-.719	15	35.037	3	.052	2	.157	3	0	15
488		min	-627.663	3	-3.059	6	-78.355	2	-.025	3	-.35	2	-.003	4
489	17	max	1793.356	2	-.839	15	35.037	3	.052	2	.167	3	0	15
490		min	-627.793	3	-3.569	6	-78.355	2	-.025	3	-.373	2	-.002	4
491	18	max	1793.181	2	-.959	15	35.037	3	.052	2	.178	3	0	15
492		min	-627.924	3	-4.078	6	-78.355	2	-.025	3	-.396	2	-.001	4
493	19	max	1793.007	2	-1.079	15	35.037	3	.052	2	.188	3	0	1
494		min	-628.055	3	-4.588	6	-78.355	2	-.025	3	-.419	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	-.023	15	.04	3	.03	1	1.254e-2	3	NC	3	NC	3
2			min	-.27	1	-.666	1	-.613	5	-3.171e-2	2	187.346	1	268.203	5
3		2	max	-.023	15	.015	3	.009	1	1.254e-2	3	9290.018	12	NC	3
4			min	-.27	1	-.564	1	-.584	4	-3.171e-2	2	218.502	1	285.334	5
5		3	max	-.023	15	-.008	12	0	12	1.194e-2	3	4639.051	12	NC	2
6			min	-.27	1	-.462	1	-.556	4	-2.952e-2	2	262.141	1	305.712	5
7		4	max	-.023	15	-.021	12	0	12	1.102e-2	3	3163.36	12	NC	1
8			min	-.27	1	-.363	1	-.522	4	-2.615e-2	2	324.644	1	333.256	5
9		5	max	-.023	15	-.021	15	0	3	1.011e-2	3	3016.391	15	NC	1
10			min	-.27	1	-.274	1	-.482	4	-2.278e-2	2	413.917	1	369.993	5
11		6	max	-.023	15	-.017	15	.002	3	1.031e-2	3	3331.883	15	NC	1
12			min	-.269	1	-.2	1	-.439	4	-2.19e-2	2	536.003	1	418.264	5
13		7	max	-.023	15	-.013	15	.002	3	1.13e-2	3	4991.901	10	NC	2
14			min	-.269	1	-.141	1	-.396	4	-2.274e-2	2	701.611	1	480.127	5
15		8	max	-.023	15	-.01	15	0	3	1.228e-2	3	NC	10	NC	2
16			min	-.268	1	-.092	1	-.355	4	-2.358e-2	2	946.634	1	558.473	5
17		9	max	-.023	15	-.006	15	0	9	1.35e-2	3	NC	2	NC	2
18			min	-.268	1	-.063	3	-.319	4	-2.308e-2	2	1305.345	3	657.018	5
19		10	max	-.023	15	.004	2	0	1	1.513e-2	3	7977.593	11	NC	2
20			min	-.267	1	-.055	3	-.283	4	-2.021e-2	2	1407.602	3	799.259	5
21		11	max	-.023	15	.036	1	.002	3	1.676e-2	3	NC	11	NC	2
22			min	-.267	1	-.044	3	-.248	4	-1.734e-2	2	1598.168	3	1012.488	5
23		12	max	-.023	15	.073	1	.008	3	1.374e-2	3	NC	9	NC	2
24			min	-.266	1	-.028	3	-.216	4	-1.291e-2	1	1697.07	2	1346.574	5
25		13	max	-.023	15	.104	1	.015	3	8.073e-3	3	NC	9	NC	2
26			min	-.265	1	-.003	3	-.184	4	-7.494e-3	1	1344.195	2	1967.14	5
27		14	max	-.023	15	.122	1	.014	3	2.67e-3	3	NC	3	NC	2
28			min	-.265	1	.011	15	-.157	4	-5.59e-3	4	1231.082	2	3146.419	5
29		15	max	-.023	15	.123	1	.009	3	8.818e-3	3	NC	4	NC	2
30			min	-.265	1	.013	15	-.138	5	-6.101e-3	1	1312.282	2	4001.81	1
31		16	max	-.023	15	.184	3	.012	1	1.496e-2	3	NC	4	NC	3
32			min	-.265	1	.016	15	-.127	5	-9.924e-3	1	932.374	3	3513.333	1
33		17	max	-.023	15	.275	3	.008	1	2.111e-2	3	NC	4	NC	3
34			min	-.265	1	.012	10	-.121	5	-1.375e-2	1	569.143	3	3944.915	1
35		18	max	-.023	15	.371	3	-.001	12	2.512e-2	3	NC	4	NC	2
36			min	-.265	1	-.004	10	-.12	4	-1.624e-2	1	404.467	3	7251.703	1
37		19	max	-.023	15	.467	3	-.004	12	2.512e-2	3	NC	1	NC	1
38			min	-.265	1	-.02	10	-.12	4	-1.624e-2	1	313.805	3	NC	1



Company : Schletter, Inc.
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Job Number :
Model Name : Standard FS Racking System

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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	-.019	15	.22	3	0	1	1.773e-4	4	NC	3	NC	1
40			min	-.589	1	-1.568	1	-.609	4	0	1	87.43	1	270.269	4
41		2	max	-.019	15	.141	3	0	1	1.773e-4	4	3379.142	15	NC	1
42			min	-.589	1	-1.319	1	-.584	4	0	1	104.381	1	284.431	4
43		3	max	-.019	15	.063	3	0	1	0	1	4072.224	15	NC	1
44			min	-.589	1	-1.07	1	-.557	4	-7.146e-5	4	129.561	1	301.582	4
45		4	max	-.019	15	-.01	12	0	1	0	1	5080.921	15	NC	1
46			min	-.589	1	-.829	1	-.523	4	-4.53e-4	4	168.78	1	327.133	4
47		5	max	-.019	15	-.019	15	0	1	0	1	6556.596	15	NC	1
48			min	-.589	1	-.614	1	-.482	4	-8.346e-4	4	231.455	1	363.176	4
49		6	max	-.019	15	-.014	15	0	1	0	1	8647.351	15	NC	1
50			min	-.588	1	-.441	1	-.438	4	-7.991e-4	4	329.993	1	412.033	4
51		7	max	-.019	15	-.01	15	0	1	0	1	NC	15	NC	1
52			min	-.586	1	-.309	1	-.395	4	-4.75e-4	4	382.088	3	475.156	4
53		8	max	-.019	15	-.007	15	0	1	0	1	NC	5	NC	1
54			min	-.585	1	-.201	1	-.355	4	-1.51e-4	4	377.538	3	553.918	4
55		9	max	-.019	15	-.003	15	0	1	0	1	NC	5	NC	1
56			min	-.584	1	-.131	3	-.32	4	-1.41e-5	4	382.103	3	648.891	4
57		10	max	-.019	15	.004	10	0	1	0	1	NC	4	NC	1
58			min	-.582	1	-.121	3	-.283	4	-2.08e-4	4	393.127	3	789.282	4
59		11	max	-.018	15	.081	1	0	1	0	1	NC	4	NC	1
60			min	-.581	1	-.103	3	-.247	4	-4.019e-4	4	415.138	3	998.63	4
61		12	max	-.018	15	.164	1	0	1	0	1	NC	5	NC	1
62			min	-.579	1	-.075	3	-.216	4	-1.613e-3	4	454.782	3	1307.262	4
63		13	max	-.018	15	.231	1	0	1	0	1	NC	5	NC	1
64			min	-.578	1	-.024	3	-.185	4	-3.399e-3	4	423.786	2	1872.668	4
65		14	max	-.018	15	.263	1	0	1	0	1	NC	5	NC	1
66			min	-.576	1	.008	15	-.159	4	-5.118e-3	4	398.533	2	2895.16	4
67		15	max	-.018	15	.248	1	0	1	0	1	NC	3	NC	1
68			min	-.576	1	.008	15	-.142	4	-3.844e-3	4	430.586	2	4582.306	4
69		16	max	-.018	15	.428	3	0	1	0	1	NC	5	NC	1
70			min	-.576	1	.007	15	-.131	4	-2.57e-3	4	530.304	2	7576.538	4
71		17	max	-.018	15	.657	3	0	1	0	1	NC	5	NC	1
72			min	-.576	1	.005	15	-.123	4	-1.296e-3	4	306.218	3	NC	1
73		18	max	-.018	15	.896	3	0	1	0	1	NC	4	NC	1
74			min	-.577	1	-.034	2	-.118	4	-4.652e-4	4	198.082	3	NC	1
75		19	max	-.018	15	1.135	3	0	1	0	1	NC	1	NC	1
76			min	-.577	1	-.121	2	-.113	4	-4.652e-4	4	146.492	3	NC	1
77	M7	1	max	.004	5	.04	3	-.001	12	3.171e-2	2	NC	3	NC	3
78			min	-.27	1	-.666	1	-.626	4	-1.254e-2	3	187.346	1	257.638	4
79		2	max	.004	5	.015	3	0	12	3.171e-2	2	NC	5	NC	3
80			min	-.27	1	-.564	1	-.589	4	-1.254e-2	3	218.502	1	277.277	4
81		3	max	.004	5	0	15	.009	1	2.952e-2	2	NC	5	NC	2
82			min	-.27	1	-.462	1	-.552	4	-1.194e-2	3	262.141	1	300.402	4
83		4	max	.004	5	.001	15	.016	1	2.615e-2	2	NC	5	NC	1
84			min	-.27	1	-.363	1	-.513	5	-1.102e-2	3	324.644	1	328.955	4
85		5	max	.004	5	.003	5	.017	1	2.278e-2	2	NC	5	NC	1
86			min	-.27	1	-.274	1	-.473	5	-1.011e-2	3	413.917	1	364.855	4
87		6	max	.004	5	.003	5	.014	1	2.19e-2	2	NC	5	NC	1
88			min	-.269	1	-.2	1	-.432	4	-1.031e-2	3	536.003	1	410.293	4
89		7	max	.004	5	.004	5	.007	1	2.274e-2	2	NC	5	NC	2
90			min	-.269	1	-.141	1	-.393	4	-1.13e-2	3	701.611	1	466.219	4
91		8	max	.004	5	.003	5	.002	2	2.358e-2	2	NC	4	NC	2
92			min	-.268	1	-.092	1	-.355	4	-1.228e-2	3	946.634	1	536.367	4
93		9	max	.004	5	.003	5	0	3	2.308e-2	2	NC	2	NC	2
94			min	-.268	1	-.063	3	-.319	4	-1.35e-2	3	1305.345	3	627.451	4
95		10	max	.004	5	.004	2	0	3	2.021e-2	2	NC	4	NC	2



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

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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	-.267	1	-.055	3	-.283	4	-1.513e-2	3	1407.602	3	755.929	4
97	11	max	.004	5	.036	1	.001	2	1.734e-2	2	NC	5	NC	2
98		min	-.267	1	-.044	3	-.247	4	-1.676e-2	3	1598.168	3	947.531	4
99	12	max	.004	5	.073	1	.008	1	1.291e-2	1	NC	5	NC	2
100		min	-.266	1	-.028	3	-.212	4	-1.374e-2	3	1697.07	2	1256.06	4
101	13	max	.005	5	.104	1	.01	2	7.494e-3	1	NC	5	NC	2
102		min	-.265	1	-.003	3	-.181	4	-8.073e-3	3	1344.195	2	1783.991	4
103	14	max	.005	5	.122	1	.007	2	2.279e-3	1	NC	3	NC	2
104		min	-.265	1	-.002	5	-.157	4	-5.017e-3	5	1231.082	2	2595.36	4
105	15	max	.004	5	.123	1	0	10	6.101e-3	1	NC	5	NC	2
106		min	-.265	1	-.005	5	-.143	4	-8.818e-3	3	1312.282	2	3594.471	4
107	16	max	.004	5	.184	3	-.001	10	9.924e-3	1	NC	5	NC	3
108		min	-.265	1	-.009	5	-.133	4	-1.496e-2	3	932.374	3	3513.333	1
109	17	max	.004	5	.275	3	-.001	10	1.375e-2	1	NC	5	NC	3
110		min	-.265	1	-.014	5	-.125	4	-2.111e-2	3	569.143	3	3944.915	1
111	18	max	.004	5	.371	3	.008	1	1.624e-2	1	NC	4	NC	2
112		min	-.265	1	-.019	5	-.116	5	-2.512e-2	3	404.467	3	7251.703	1
113	19	max	.004	5	.467	3	.026	1	1.624e-2	1	NC	1	NC	1
114		min	-.265	1	-.023	5	-.11	5	-2.512e-2	3	313.805	3	NC	1
115	M10	1	max	.002	.338	3	.265	1	1.286e-2	3	NC	1	NC	1
116		min	-.119	4	-.017	5	-.004	5	-3.857e-3	2	NC	1	NC	1
117	2	max	.001	1	.72	3	.339	1	1.499e-2	3	NC	5	NC	3
118		min	-.119	4	-.213	2	.004	15	-4.719e-3	2	691.644	3	3553.04	1
119	3	max	.001	1	1.072	3	.455	1	1.711e-2	3	NC	5	NC	3
120		min	-.119	4	-.422	2	.011	15	-5.581e-3	2	359.775	3	1388.974	1
121	4	max	.001	1	1.33	3	.571	1	1.924e-2	3	NC	5	NC	5
122		min	-.119	4	-.56	2	.016	15	-6.444e-3	2	266.189	3	863.659	1
123	5	max	0	1	1.457	3	.658	1	2.137e-2	3	NC	5	NC	5
124		min	-.119	4	-.606	2	.018	15	-7.306e-3	2	235.899	3	672.491	1
125	6	max	0	1	1.445	3	.7	1	2.349e-2	3	NC	5	NC	5
126		min	-.119	4	-.554	2	.018	15	-8.168e-3	2	238.425	3	606.535	1
127	7	max	0	1	1.314	3	.696	1	2.562e-2	3	NC	5	NC	5
128		min	-.119	4	-.421	2	.017	15	-9.03e-3	2	270.6	3	612.078	1
129	8	max	0	1	1.109	3	.657	1	2.775e-2	3	NC	5	NC	5
130		min	-.119	4	-.244	2	.015	15	-9.893e-3	2	342.179	3	674.528	1
131	9	max	0	1	.908	3	.604	1	2.988e-2	3	NC	4	NC	5
132		min	-.119	4	-.08	2	.015	15	-1.075e-2	2	462.87	3	778.383	1
133	10	max	0	1	.813	3	.577	1	3.2e-2	3	NC	1	NC	5
134		min	-.12	4	-.018	10	.018	15	-1.162e-2	2	555.319	3	847.712	1
135	11	max	0	10	.908	3	.604	1	2.988e-2	3	NC	4	NC	5
136		min	-.12	4	-.08	2	.024	15	-1.075e-2	2	462.87	3	778.383	1
137	12	max	0	10	1.109	3	.657	1	2.775e-2	3	NC	5	NC	5
138		min	-.12	4	-.244	2	.029	15	-9.893e-3	2	342.179	3	674.528	1
139	13	max	0	10	1.314	3	.696	1	2.562e-2	3	NC	5	NC	15
140		min	-.12	4	-.421	2	.032	15	-9.03e-3	2	270.6	3	612.078	1
141	14	max	0	10	1.445	3	.7	1	2.349e-2	3	NC	15	NC	5
142		min	-.12	4	-.554	2	.032	15	-8.168e-3	2	238.425	3	606.535	1
143	15	max	0	10	1.457	3	.658	1	2.137e-2	3	8484.599	15	NC	5
144		min	-.12	4	-.606	2	.03	15	-7.306e-3	2	235.899	3	672.491	1
145	16	max	0	10	1.33	3	.571	1	1.924e-2	3	8215.391	15	NC	5
146		min	-.12	4	-.56	2	.026	15	-6.444e-3	2	266.189	3	863.659	1
147	17	max	0	10	1.072	3	.455	1	1.711e-2	3	9587.002	15	NC	3
148		min	-.12	4	-.422	2	.023	15	-5.581e-3	2	359.775	3	1388.974	1
149	18	max	0	10	.72	3	.339	1	1.499e-2	3	NC	5	NC	3
150		min	-.12	4	-.213	2	.021	15	-4.719e-3	2	691.644	3	3553.04	1
151	19	max	0	10	.338	3	.265	1	1.286e-2	3	NC	1	NC	1
152		min	-.12	4	.002	10	.023	15	-3.857e-3	2	NC	1	NC	1



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

Sept 14, 2015

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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	.004	1	.05	1	.267	1	5.018e-3	1	NC	1	NC	1
154			min	-.234	4	-.039	3	-.004	5	-1.078e-4	5	NC	1	NC	1
155		2	max	.003	1	.235	3	.326	1	5.714e-3	1	NC	5	NC	3
156			min	-.235	4	-.196	2	.029	15	-3.41e-5	5	965.309	3	4458.339	1
157		3	max	.003	1	.49	3	.434	1	6.409e-3	1	NC	5	NC	3
158			min	-.235	4	-.405	1	.043	15	1.751e-5	15	499.084	3	1579.62	1
159		4	max	.003	1	.663	3	.547	1	7.104e-3	1	NC	5	NC	3
160			min	-.235	4	-.539	1	.041	15	6.627e-5	15	375.936	3	940.629	1
161		5	max	.002	1	.718	3	.636	1	7.799e-3	1	NC	5	NC	3
162			min	-.235	4	-.573	1	.029	15	1.15e-4	15	348.704	3	713.892	1
163		6	max	.002	1	.646	3	.684	1	8.495e-3	1	NC	5	NC	5
164			min	-.235	4	-.504	1	.012	15	1.638e-4	15	385.27	3	632.179	1
165		7	max	.001	1	.468	3	.687	1	9.19e-3	1	NC	5	NC	5
166			min	-.235	4	-.35	1	-.005	5	2.125e-4	15	521.34	3	628.307	1
167		8	max	0	1	.229	3	.653	1	9.885e-3	1	NC	5	NC	13
168			min	-.235	4	-.153	2	-.019	5	2.613e-4	15	984.262	3	682.689	1
169		9	max	0	1	.029	1	.606	1	1.058e-2	1	NC	1	NC	5
170			min	-.236	4	-.001	5	-.011	5	3.101e-4	15	5692.509	3	777.754	1
171	10	max	0	1	.112	1	.58	1	1.128e-2	1	NC	4	NC	5	
172		min	-.236	4	-.094	3	.018	15	3.588e-4	15	4262.004	1	841.606	1	
173	11	max	0	3	.029	1	.606	1	1.058e-2	1	NC	1	7238.136	15	
174		min	-.236	4	.003	15	.048	15	3.689e-4	15	5692.509	3	777.754	1	
175	12	max	0	3	.229	3	.653	1	9.885e-3	1	NC	5	7549.921	12	
176		min	-.236	4	-.153	2	.057	15	3.789e-4	15	984.262	3	682.689	1	
177	13	max	.001	3	.468	3	.687	1	9.19e-3	1	NC	5	8528.773	12	
178		min	-.236	4	-.35	1	.052	15	3.89e-4	15	521.34	3	628.307	1	
179	14	max	.002	3	.646	3	.684	1	8.495e-3	1	NC	15	NC	12	
180		min	-.236	4	-.504	1	.037	15	3.99e-4	15	385.27	3	632.179	1	
181	15	max	.002	3	.718	3	.636	1	7.799e-3	1	8826.968	15	NC	3	
182		min	-.236	4	-.573	1	.017	15	4.091e-4	15	348.704	3	713.892	1	
183	16	max	.003	3	.663	3	.547	1	7.104e-3	1	8286.35	15	NC	3	
184		min	-.236	4	-.539	1	-.001	15	4.192e-4	15	375.936	3	940.629	1	
185	17	max	.003	3	.49	3	.434	1	6.409e-3	1	9452.799	15	NC	3	
186		min	-.236	4	-.405	1	-.015	5	4.292e-4	15	499.084	3	1579.62	1	
187	18	max	.003	3	.235	3	.326	1	5.714e-3	1	NC	5	NC	3	
188		min	-.236	4	-.196	2	-.008	5	4.393e-4	15	965.309	3	4458.339	1	
189	19	max	.004	3	.05	1	.267	1	5.018e-3	1	NC	1	NC	1	
190		min	-.236	4	-.039	3	.023	15	4.493e-4	15	NC	1	NC	1	
191	M12	1	max	0	2	.003	5	.268	1	6.004e-3	1	NC	1	NC	1
192			min	-.332	4	-.065	3	-.004	5	-5.745e-5	5	NC	1	NC	1
193		2	max	0	2	.115	3	.317	1	6.787e-3	1	NC	5	NC	2
194			min	-.332	4	-.397	2	.031	15	4.143e-6	15	741.988	2	4417.318	4
195		3	max	0	2	.255	3	.42	1	7.569e-3	1	NC	5	NC	3
196			min	-.332	4	-.705	2	.045	15	5.572e-5	15	397.744	2	1742.071	1
197		4	max	0	2	.335	3	.532	1	8.352e-3	1	NC	5	NC	12
198			min	-.332	4	-.906	2	.042	15	1.073e-4	15	305.177	2	1000.842	1
199		5	max	0	2	.344	3	.623	1	9.135e-3	1	NC	5	NC	12
200			min	-.332	4	-.97	2	.029	15	1.589e-4	15	284.187	2	744.507	1
201		6	max	0	2	.286	3	.674	1	9.917e-3	1	NC	5	NC	5
202			min	-.332	4	-.893	2	.01	15	2.104e-4	15	309.659	2	650.18	1
203		7	max	0	2	.176	3	.681	1	1.07e-2	1	NC	5	NC	5
204			min	-.332	4	-.702	2	-.01	5	2.62e-4	15	399.463	2	638.894	1
205		8	max	0	2	.041	3	.652	1	1.148e-2	1	NC	5	NC	13
206			min	-.332	4	-.448	1	-.024	5	3.136e-4	15	648.673	2	686.99	1
207		9	max	0	2	-.006	15	.609	1	1.227e-2	1	NC	3	NC	4
208			min	-.332	4	-.236	1	-.015	5	3.652e-4	15	1525.492	1	775.355	1
209		10	max	0	1	-.005	15	.584	1	1.305e-2	1	NC	4	NC	5



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

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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	-.332	4	-.139	1	.019	15	4.167e-4	15	3471.214	1	835.112	1
211	11	max	0	9	-.008	15	.609	1	1.227e-2	1	NC	3	7118.613	12
212		min	-.332	4	-.236	1	.051	15	4.236e-4	15	1525.492	1	775.355	1
213	12	max	0	9	.041	3	.652	1	1.148e-2	1	NC	5	7120.568	12
214		min	-.332	4	-.448	1	.061	15	4.305e-4	15	648.673	2	686.99	1
215	13	max	0	9	.176	3	.681	1	1.07e-2	1	NC	15	7417.901	12
216		min	-.332	4	-.702	2	.055	15	4.374e-4	15	399.463	2	638.894	1
217	14	max	0	9	.286	3	.674	1	9.917e-3	1	NC	15	NC	15
218		min	-.332	4	-.893	2	.038	15	4.354e-4	12	309.659	2	650.18	1
219	15	max	0	9	.344	3	.623	1	9.135e-3	1	8918.703	15	NC	5
220		min	-.332	4	-.97	2	.017	15	4.311e-4	12	284.187	2	744.507	1
221	16	max	0	9	.335	3	.532	1	8.352e-3	1	9114.332	15	NC	4
222		min	-.332	4	-.906	2	-.003	5	4.268e-4	12	305.177	2	1000.842	1
223	17	max	0	9	.255	3	.42	1	7.569e-3	1	NC	15	NC	3
224		min	-.332	4	-.705	2	-.02	5	4.225e-4	12	397.744	2	1742.071	1
225	18	max	0	9	.115	3	.317	1	6.787e-3	1	NC	5	NC	2
226		min	-.332	4	-.397	2	-.011	5	4.182e-4	12	741.988	2	5396.469	1
227	19	max	0	9	-.007	15	.268	1	6.004e-3	1	NC	1	NC	1
228		min	-.332	4	-.065	3	.023	15	4.139e-4	12	NC	1	NC	1
229	M13	max	0	3	.007	3	.27	1	1.37e-2	1	NC	1	NC	1
230		min	-.576	4	-.528	1	-.004	5	-3.314e-3	3	NC	1	NC	1
231	2	max	0	3	.188	3	.348	1	1.589e-2	1	NC	5	NC	3
232		min	-.576	4	-.959	1	.029	15	-4.115e-3	3	567.414	2	3361.629	1
233	3	max	0	3	.342	3	.467	1	1.808e-2	1	NC	5	NC	3
234		min	-.576	4	-1.342	1	.044	15	-4.916e-3	3	300.916	2	1339.365	1
235	4	max	0	3	.445	3	.584	1	2.028e-2	1	NC	15	NC	12
236		min	-.576	4	-1.633	2	.045	15	-5.717e-3	3	224.606	2	839.827	1
237	5	max	0	3	.482	3	.672	1	2.247e-2	1	NC	15	9937.105	12
238		min	-.576	4	-1.784	2	.036	15	-6.518e-3	3	198.996	2	656.798	1
239	6	max	0	3	.455	3	.715	1	2.466e-2	1	NC	15	NC	5
240		min	-.576	4	-1.784	2	.021	15	-7.319e-3	3	199.06	2	593.707	1
241	7	max	0	3	.374	3	.71	1	2.685e-2	1	NC	15	NC	5
242		min	-.576	4	-1.676	1	.005	15	-8.12e-3	3	220.518	2	599.577	1
243	8	max	0	3	.264	3	.67	1	2.905e-2	1	NC	15	NC	5
244		min	-.576	4	-1.498	1	-.005	5	-8.921e-3	3	266.533	2	660.367	1
245	9	max	0	3	.161	3	.617	1	3.127e-2	2	NC	15	NC	5
246		min	-.576	4	-1.318	1	-.002	15	-9.721e-3	3	334.14	1	760.772	1
247	10	max	0	1	.114	3	.589	1	3.354e-2	2	NC	15	NC	5
248		min	-.576	4	-1.233	1	.019	15	-1.052e-2	3	374.679	1	827.481	1
249	11	max	0	1	.161	3	.617	1	3.127e-2	2	NC	15	8541.635	15
250		min	-.576	4	-1.318	1	.042	15	-9.721e-3	3	334.14	1	760.772	1
251	12	max	0	1	.264	3	.67	1	2.905e-2	1	NC	15	7215.061	12
252		min	-.576	4	-1.498	1	.049	15	-8.921e-3	3	266.533	2	660.367	1
253	13	max	0	1	.374	3	.71	1	2.685e-2	1	8303.414	15	8835.095	15
254		min	-.576	4	-1.676	1	.044	15	-8.12e-3	3	220.518	2	599.577	1
255	14	max	0	1	.455	3	.715	1	2.466e-2	1	7389.087	15	NC	5
256		min	-.575	4	-1.784	2	.03	15	-7.319e-3	3	199.06	2	593.707	1
257	15	max	.001	1	.482	3	.672	1	2.247e-2	1	7224.422	15	NC	5
258		min	-.575	4	-1.784	2	.013	15	-6.518e-3	3	198.996	2	656.798	1
259	16	max	.001	1	.445	3	.584	1	2.028e-2	1	7909.628	15	NC	12
260		min	-.575	4	-1.633	2	-.002	15	-5.717e-3	3	224.606	2	839.827	1
261	17	max	.002	1	.342	3	.467	1	1.808e-2	1	NC	15	NC	3
262		min	-.575	4	-1.342	1	-.014	5	-4.916e-3	3	300.916	2	1339.365	1
263	18	max	.002	1	.188	3	.348	1	1.589e-2	1	NC	5	NC	3
264		min	-.575	4	-.959	1	-.005	5	-4.115e-3	3	567.414	2	3361.629	1
265	19	max	.002	1	.007	3	.27	1	1.37e-2	1	NC	1	NC	1
266		min	-.575	4	-.528	1	.023	15	-3.314e-3	3	NC	1	NC	1



Company : Schletter, Inc.
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Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
267	M2	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
268			min	0	1	0	1	0	1	0	1	NC	1	NC	1
269		2	max	0	3	0	15	0	5	3.461e-3	2	NC	1	NC	1
270			min	0	1	-.001	1	0	1	-3.291e-3	5	NC	1	NC	1
271		3	max	0	3	0	15	.003	5	6.922e-3	2	NC	1	NC	1
272			min	0	1	-.005	1	0	1	-6.582e-3	5	NC	1	NC	1
273		4	max	0	3	0	15	.007	5	8.105e-3	2	NC	3	NC	1
274			min	0	1	-.011	1	-.002	1	-7.94e-3	5	5722.95	1	8985.294	5
275		5	max	0	3	-.002	15	.012	5	7.438e-3	2	NC	5	NC	1
276			min	0	1	-.019	1	-.003	1	-7.728e-3	5	3200.904	1	5209.527	5
277		6	max	0	3	-.003	15	.018	5	6.771e-3	2	NC	5	NC	1
278			min	0	1	-.029	1	-.004	1	-7.517e-3	5	2059.104	1	3428.326	5
279		7	max	0	3	-.004	15	.025	5	6.104e-3	2	NC	5	NC	9
280			min	0	1	-.042	1	-.005	1	-7.305e-3	5	1445.702	1	2446.718	5
281		8	max	0	3	-.005	15	.033	5	5.437e-3	2	NC	15	NC	9
282			min	0	1	-.056	1	-.006	1	-7.094e-3	5	1077.509	1	1847.131	5
283		9	max	0	3	-.006	15	.042	5	4.77e-3	2	9627.407	15	NC	9
284			min	0	1	-.072	1	-.007	1	-6.882e-3	5	838.777	1	1453.361	5
285		10	max	0	3	-.008	15	.051	5	4.103e-3	2	7778.366	15	NC	9
286			min	0	1	-.09	1	-.008	1	-6.67e-3	5	674.91	1	1180.421	5
287		11	max	0	3	-.009	15	.062	5	3.436e-3	2	6445.118	15	NC	9
288			min	-.001	1	-.109	1	-.009	1	-6.459e-3	5	557.426	1	983.234	5
289		12	max	0	3	-.011	15	.072	5	2.769e-3	2	5451.512	15	NC	9
290			min	-.001	1	-.129	1	-.009	1	-6.247e-3	5	470.27	1	836.05	5
291		13	max	0	3	-.013	15	.084	5	2.102e-3	2	4690.672	15	NC	9
292			min	-.001	1	-.15	1	-.009	1	-6.036e-3	5	403.781	1	723.217	5
293		14	max	.001	3	-.015	15	.095	5	1.435e-3	2	4094.88	15	NC	9
294			min	-.001	1	-.172	1	-.009	1	-5.824e-3	5	351.876	1	634.798	5
295		15	max	.001	3	-.017	15	.107	5	7.685e-4	2	3619.466	15	NC	9
296			min	-.001	1	-.195	1	-.008	1	-5.686e-3	4	310.568	1	564.231	5
297		16	max	.001	3	-.019	15	.12	4	7.407e-4	3	3234.11	15	NC	9
298			min	-.002	1	-.219	1	-.006	1	-5.56e-3	4	277.16	1	506.755	4
299		17	max	.001	3	-.021	15	.132	4	1.104e-3	3	2917.529	15	NC	9
300			min	-.002	1	-.243	1	-.004	1	-5.434e-3	4	249.768	1	458.403	4
301		18	max	.001	3	-.023	15	.145	4	1.466e-3	3	2654.427	15	NC	1
302			min	-.002	1	-.267	1	-.008	3	-5.308e-3	4	227.043	1	418.208	4
303		19	max	.001	3	-.025	15	.158	4	1.829e-3	3	2433.601	15	NC	1
304			min	-.002	1	-.291	1	-.014	3	-5.182e-3	4	207.998	1	384.471	4
305	M5	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
306			min	0	1	0	1	0	1	0	1	NC	1	NC	1
307		2	max	0	3	0	15	0	4	0	1	NC	1	NC	1
308			min	0	1	-.002	1	0	1	-3.522e-3	4	NC	1	NC	1
309		3	max	0	3	0	15	.003	4	0	1	NC	3	NC	1
310			min	0	1	-.009	1	0	1	-7.045e-3	4	6429.614	1	NC	1
311		4	max	0	3	0	15	.007	4	0	1	NC	4	NC	1
312			min	-.001	1	-.022	1	0	1	-8.483e-3	4	2742.467	1	8553.523	4
313		5	max	.001	3	-.001	15	.012	4	0	1	NC	5	NC	1
314			min	-.001	1	-.04	1	0	1	-8.229e-3	4	1513.148	1	4963.573	4
315		6	max	.001	3	-.002	15	.019	4	0	1	NC	5	NC	1
316			min	-.002	1	-.063	1	0	1	-7.975e-3	4	965.975	1	3269.574	4
317		7	max	.001	3	-.003	15	.026	4	0	1	NC	5	NC	1
318			min	-.002	1	-.09	1	0	1	-7.721e-3	4	674.915	1	2335.907	4
319		8	max	.002	3	-.004	15	.034	4	0	1	NC	5	NC	1
320			min	-.002	1	-.121	1	0	1	-7.467e-3	4	501.334	1	1765.562	4
321		9	max	.002	3	-.005	15	.044	4	0	1	NC	15	NC	1
322			min	-.002	1	-.156	1	0	1	-7.213e-3	4	389.299	1	1390.981	4
323		10	max	.002	3	-.006	15	.054	4	0	1	9745.332	15	NC	1



Company : Schletter, Inc.
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Envelope Member Section Deflections (Continued)

Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
324		min	-.003	1	-.194	1	0	1	-6.959e-3	4	312.658	1	1131.35	4
325	11	max	.002	3	-.008	15	.064	4	0	1	8049.323	15	NC	1
326		min	-.003	1	-.235	1	0	1	-6.705e-3	4	257.854	1	943.798	4
327	12	max	.003	3	-.009	15	.075	4	0	1	6791.045	15	NC	1
328		min	-.003	1	-.279	1	0	1	-6.451e-3	4	217.282	1	803.833	4
329	13	max	.003	3	-.01	15	.087	4	0	1	5831.073	15	NC	1
330		min	-.003	1	-.325	1	0	1	-6.197e-3	4	186.384	1	696.572	4
331	14	max	.003	3	-.012	15	.099	4	0	1	5081.648	15	NC	1
332		min	-.004	1	-.373	1	0	1	-5.943e-3	4	162.297	1	612.565	4
333	15	max	.003	3	-.014	15	.111	4	0	1	4485.187	15	NC	1
334		min	-.004	1	-.423	1	0	1	-5.689e-3	4	143.15	1	545.572	4
335	16	max	.004	3	-.015	15	.123	4	0	1	4002.789	15	NC	1
336		min	-.004	1	-.475	1	0	1	-5.435e-3	4	127.681	1	491.347	4
337	17	max	.004	3	-.017	15	.136	4	0	1	3607.25	15	NC	1
338		min	-.004	1	-.527	1	0	1	-5.181e-3	4	115.008	1	446.909	4
339	18	max	.004	3	-.018	15	.148	4	0	1	3279.087	15	NC	1
340		min	-.005	1	-.58	1	0	1	-4.927e-3	4	104.503	1	410.114	4
341	19	max	.004	3	-.02	15	.16	4	0	1	3004.069	15	NC	1
342		min	-.005	1	-.633	1	0	1	-4.673e-3	4	95.705	1	379.394	4
343	M8	1	max	0	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	1.558e-3	3	NC	1	NC	1
346		min	0	1	-.001	1	0	3	-3.938e-3	4	NC	1	NC	1
347	3	max	0	3	0	5	.003	4	3.115e-3	3	NC	1	NC	1
348		min	0	1	-.005	1	0	3	-7.875e-3	4	NC	1	NC	1
349	4	max	0	3	0	5	.007	4	3.613e-3	3	NC	3	NC	1
350		min	0	1	-.011	1	-.002	3	-9.446e-3	4	5722.95	1	8407.434	4
351	5	max	0	3	0	5	.012	4	3.25e-3	3	NC	4	NC	1
352		min	0	1	-.019	1	-.003	3	-9.096e-3	4	3200.904	1	4888.937	4
353	6	max	0	3	0	5	.019	4	2.887e-3	3	NC	4	NC	1
354		min	0	1	-.029	1	-.004	3	-8.745e-3	4	2059.104	1	3226	4
355	7	max	0	3	0	5	.026	4	2.524e-3	3	NC	5	NC	9
356		min	0	1	-.042	1	-.005	3	-8.394e-3	4	1445.702	1	2308.52	4
357	8	max	0	3	.001	5	.035	4	2.162e-3	3	NC	5	NC	9
358		min	0	1	-.056	1	-.006	3	-8.044e-3	4	1077.509	1	1747.666	4
359	9	max	0	3	.001	5	.044	4	1.799e-3	3	NC	5	NC	9
360		min	0	1	-.072	1	-.007	3	-7.693e-3	4	838.777	1	1379.134	4
361	10	max	0	3	.002	5	.054	4	1.436e-3	3	NC	5	NC	9
362		min	0	1	-.09	1	-.007	3	-7.342e-3	4	674.91	1	1123.612	4
363	11	max	0	3	.002	5	.065	4	1.073e-3	3	NC	5	NC	9
364		min	-.001	1	-.109	1	-.008	3	-6.992e-3	4	557.426	1	939.001	4
365	12	max	0	3	.002	5	.076	4	7.105e-4	3	NC	5	NC	9
366		min	-.001	1	-.129	1	-.007	3	-6.641e-3	4	470.27	1	801.234	4
367	13	max	0	3	.003	5	.087	4	3.477e-4	3	NC	5	NC	9
368		min	-.001	1	-.15	1	-.007	3	-6.29e-3	4	403.781	1	695.681	4
369	14	max	.001	3	.003	5	.099	4	-1.024e-5	12	NC	5	NC	9
370		min	-.001	1	-.172	1	-.005	3	-5.94e-3	4	351.876	1	613.051	4
371	15	max	.001	3	.003	5	.111	4	1.123e-4	9	NC	5	NC	9
372		min	-.001	1	-.195	1	-.003	3	-5.591e-3	5	310.568	1	547.212	4
373	16	max	.001	3	.004	5	.123	4	4.023e-4	1	NC	5	NC	9
374		min	-.002	1	-.219	1	0	3	-5.329e-3	5	277.16	1	493.986	4
375	17	max	.001	3	.004	5	.135	4	1.053e-3	1	NC	5	NC	9
376		min	-.002	1	-.243	1	0	10	-5.067e-3	5	249.768	1	450.441	4
377	18	max	.001	3	.005	5	.146	4	1.703e-3	1	NC	5	NC	1
378		min	-.002	1	-.267	1	-.003	2	-4.805e-3	5	227.043	1	414.471	4
379	19	max	.001	3	.005	5	.158	4	2.353e-3	1	NC	5	NC	1
380		min	-.002	1	-.291	1	-.007	2	-4.543e-3	5	207.998	1	384.538	4



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

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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	.006	1	0	15	.005	5	3.22e-3	2	NC	1	NC	1
382			min	0	15	-.003	1	-.001	1	-2.278e-3	5	NC	1	NC	1
383		2	max	.006	1	-.002	15	.032	5	3.834e-3	2	NC	1	NC	5
384			min	0	15	-.024	1	-.028	2	-2.304e-3	5	NC	1	2247.27	2
385		3	max	.005	1	-.004	15	.06	5	4.449e-3	2	NC	1	NC	5
386			min	0	15	-.044	1	-.055	2	-2.33e-3	5	NC	1	1136.695	2
387		4	max	.005	1	-.006	15	.088	5	5.063e-3	2	NC	1	NC	13
388			min	0	15	-.065	1	-.081	2	-2.356e-3	5	NC	1	771.38	2
389		5	max	.004	1	-.008	15	.115	5	5.678e-3	2	NC	1	NC	13
390			min	0	15	-.085	1	-.105	2	-2.501e-3	3	NC	1	592.772	2
391		6	max	.004	3	-.009	15	.143	5	6.292e-3	2	NC	1	NC	13
392			min	0	10	-.105	1	-.127	2	-2.798e-3	3	NC	1	489.313	2
393		7	max	.004	3	-.011	15	.17	5	6.907e-3	2	NC	1	NC	13
394			min	0	10	-.126	1	-.146	2	-3.095e-3	3	NC	1	419.946	4
395		8	max	.004	3	-.013	15	.198	5	7.522e-3	2	NC	1	NC	13
396			min	0	10	-.146	1	-.162	2	-3.392e-3	3	NC	1	358.865	4
397		9	max	.004	3	-.015	15	.225	5	8.136e-3	2	NC	1	NC	13
398			min	0	10	-.166	1	-.174	2	-3.688e-3	3	NC	1	313.167	4
399		10	max	.005	3	-.016	15	.251	5	8.751e-3	2	NC	1	NC	13
400			min	-.001	2	-.186	1	-.183	2	-3.985e-3	3	NC	1	277.717	4
401		11	max	.005	3	-.018	15	.277	5	9.365e-3	2	NC	1	NC	13
402			min	-.002	2	-.206	1	-.186	2	-4.282e-3	3	NC	1	249.433	4
403		12	max	.005	3	-.019	15	.302	5	9.98e-3	2	NC	1	NC	13
404			min	-.002	2	-.226	1	-.185	2	-4.579e-3	3	NC	1	226.355	4
405		13	max	.005	3	-.021	15	.327	5	1.059e-2	2	NC	1	NC	13
406			min	-.003	2	-.245	1	-.178	2	-4.876e-3	3	NC	1	207.176	4
407		14	max	.005	3	-.023	15	.351	5	1.121e-2	2	NC	1	NC	13
408			min	-.004	2	-.265	1	-.165	2	-5.172e-3	3	NC	1	190.991	4
409		15	max	.006	3	-.024	15	.374	5	1.182e-2	2	NC	1	NC	13
410			min	-.004	2	-.285	1	-.145	2	-5.469e-3	3	NC	1	177.154	4
411		16	max	.006	3	-.026	15	.397	5	1.244e-2	2	NC	1	NC	13
412			min	-.005	2	-.304	1	-.118	2	-5.766e-3	3	NC	1	165.191	4
413		17	max	.006	3	-.027	15	.418	5	1.305e-2	2	NC	1	NC	13
414			min	-.005	2	-.323	1	-.083	2	-6.063e-3	3	NC	1	154.748	4
415		18	max	.006	3	-.029	15	.439	5	1.367e-2	2	NC	1	NC	5
416			min	-.006	2	-.343	1	-.04	2	-6.36e-3	3	NC	1	145.552	4
417		19	max	.006	3	-.03	15	.464	4	1.428e-2	2	NC	1	NC	1
418			min	-.007	2	-.362	1	0	3	-6.657e-3	3	NC	1	137.392	4
419	M6	1	max	.013	1	0	15	.005	4	0	1	NC	1	NC	1
420			min	0	15	-.007	1	0	1	-2.459e-3	4	NC	1	NC	1
421		2	max	.011	1	-.002	15	.034	4	0	1	NC	1	NC	1
422			min	0	15	-.051	1	0	1	-2.531e-3	4	NC	1	NC	1
423		3	max	.01	1	-.003	15	.064	4	0	1	NC	1	NC	1
424			min	0	15	-.096	1	0	1	-2.604e-3	4	NC	1	8046.427	4
425		4	max	.008	1	-.005	15	.093	4	0	1	NC	1	NC	1
426			min	0	15	-.14	1	0	1	-2.677e-3	4	NC	1	5323.345	4
427		5	max	.008	3	-.006	15	.123	4	0	1	NC	1	NC	1
428			min	0	15	-.184	1	0	1	-2.749e-3	4	NC	1	4001.959	4
429		6	max	.009	3	-.008	15	.152	4	0	1	NC	1	NC	1
430			min	0	10	-.229	1	0	1	-2.822e-3	4	NC	1	3241.216	4
431		7	max	.01	3	-.009	15	.181	4	0	1	NC	1	NC	1
432			min	-.001	10	-.273	1	0	1	-2.895e-3	4	NC	1	2762.388	4
433		8	max	.011	3	-.011	15	.209	4	0	1	NC	1	NC	1
434			min	-.003	2	-.317	1	0	1	-2.968e-3	4	NC	1	2447.611	4
435		9	max	.011	3	-.012	15	.237	4	0	1	NC	1	NC	1
436			min	-.005	2	-.361	1	0	1	-3.04e-3	4	NC	1	2239.751	4
437		10	max	.012	3	-.014	15	.265	4	0	1	NC	1	NC	1



Company : Schletter, Inc.
Designer : HCV
Job Number :
Model Name : Standard FS Racking System

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Envelope Member Section Deflections (Continued)

Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
438		min	-.006	2	-.405	1	0	1	-3.113e-3	4	NC	1	2109.363	4
439	11	max	.013	3	-.015	15	.291	4	0	1	NC	1	NC	1
440		min	-.008	2	-.449	1	0	1	-3.186e-3	4	NC	1	2041.995	4
441	12	max	.013	3	-.016	15	.317	4	0	1	NC	1	NC	1
442		min	-.01	2	-.493	1	0	1	-3.258e-3	4	NC	1	2033.36	4
443	13	max	.014	3	-.018	15	.341	4	0	1	NC	1	NC	1
444		min	-.012	2	-.536	1	0	1	-3.331e-3	4	NC	1	2088.769	4
445	14	max	.015	3	-.019	15	.365	4	0	1	NC	1	NC	1
446		min	-.013	2	-.58	1	0	1	-3.404e-3	4	NC	1	2226.908	4
447	15	max	.016	3	-.02	15	.388	4	0	1	NC	1	NC	1
448		min	-.015	2	-.623	1	0	1	-3.477e-3	4	NC	1	2492.434	4
449	16	max	.016	3	-.021	15	.409	4	0	1	NC	1	NC	1
450		min	-.017	2	-.667	1	0	1	-3.549e-3	4	NC	1	2995.953	4
451	17	max	.017	3	-.023	15	.429	4	0	1	NC	1	NC	1
452		min	-.019	2	-.71	1	0	1	-3.622e-3	4	NC	1	4075.842	4
453	18	max	.018	3	-.024	15	.447	4	0	1	NC	1	NC	1
454		min	-.02	2	-.754	1	0	1	-3.695e-3	4	NC	1	7433.142	4
455	19	max	.018	3	-.025	15	.464	4	0	1	NC	1	NC	1
456		min	-.022	2	-.797	1	0	1	-3.767e-3	4	NC	1	NC	1
457	M9	1	max	.006	1	0	.005	4	1.314e-3	3	NC	1	NC	1
458		min	0	5	-.003	1	-.001	3	-3.22e-3	2	NC	1	NC	1
459	2	max	.006	1	0	15	.038	4	1.611e-3	3	NC	1	NC	5
460		min	0	5	-.024	1	-.014	3	-3.834e-3	2	NC	1	2247.27	2
461	3	max	.005	1	0	15	.07	4	1.907e-3	3	NC	1	NC	15
462		min	0	5	-.044	1	-.026	3	-4.449e-3	2	NC	1	1136.695	2
463	4	max	.005	1	0	15	.103	4	2.204e-3	3	NC	1	7293.187	15
464		min	0	5	-.065	1	-.038	3	-5.063e-3	2	NC	1	771.38	2
465	5	max	.004	1	0	15	.135	4	2.501e-3	3	NC	1	5488.727	15
466		min	0	5	-.085	1	-.049	3	-5.678e-3	2	NC	1	592.772	2
467	6	max	.004	3	0	15	.167	4	2.798e-3	3	NC	1	4449.335	15
468		min	0	5	-.105	1	-.059	3	-6.292e-3	2	NC	1	489.313	2
469	7	max	.004	3	0	15	.198	4	3.095e-3	3	NC	1	3794.862	15
470		min	0	5	-.126	1	-.068	3	-6.907e-3	2	NC	1	423.989	2
471	8	max	.004	3	0	15	.228	4	3.392e-3	3	NC	1	3364.529	15
472		min	0	5	-.146	1	-.075	3	-7.522e-3	2	NC	1	381.141	2
473	9	max	.004	3	0	15	.258	4	3.688e-3	3	NC	1	3080.4	15
474		min	0	10	-.166	1	-.081	3	-8.136e-3	2	NC	1	353.202	2
475	10	max	.005	3	.001	5	.286	4	3.985e-3	3	NC	1	2902.323	15
476		min	-.001	2	-.186	1	-.085	3	-8.751e-3	2	NC	1	336.331	2
477	11	max	.005	3	.001	5	.312	4	4.282e-3	3	NC	1	2810.628	15
478		min	-.002	2	-.206	1	-.086	3	-9.365e-3	2	NC	1	328.746	2
479	12	max	.005	3	.002	5	.338	4	4.579e-3	3	NC	1	2799.551	15
480		min	-.002	2	-.226	1	-.086	3	-9.98e-3	2	NC	1	330.124	2
481	13	max	.005	3	.002	5	.361	4	4.876e-3	3	NC	1	2876.503	15
482		min	-.003	2	-.245	1	-.083	3	-1.059e-2	2	NC	1	341.618	2
483	14	max	.005	3	.003	5	.382	4	5.172e-3	3	NC	1	3067.293	15
484		min	-.004	2	-.265	1	-.077	3	-1.121e-2	2	NC	1	366.54	2
485	15	max	.006	3	.003	5	.402	4	5.469e-3	3	NC	1	3433.486	15
486		min	-.004	2	-.285	1	-.068	3	-1.182e-2	2	NC	1	412.51	2
487	16	max	.006	3	.004	5	.419	4	5.766e-3	3	NC	1	4127.509	15
488		min	-.005	2	-.304	1	-.056	3	-1.244e-2	2	NC	1	498.195	2
489	17	max	.006	3	.004	5	.434	4	6.063e-3	3	NC	1	5615.596	15
490		min	-.005	2	-.323	1	-.041	3	-1.305e-2	2	NC	1	680.504	2
491	18	max	.006	3	.005	5	.447	4	6.36e-3	3	NC	1	NC	15
492		min	-.006	2	-.343	1	-.022	3	-1.367e-2	2	NC	1	1245.252	2
493	19	max	.006	3	.005	5	.456	5	6.657e-3	3	NC	1	NC	1
494		min	-.007	2	-.362	1	-.017	1	-1.428e-2	2	NC	1	NC	1