

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



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	(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 =	140 mph	Exposure Category = C
Height <	15 ft	Importance Category = II
Peak Velocity Pressure, q_z =	30.77 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 - N/A

S_S =	0.00	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} =	0.00	C_s =	0	
S_1 =	0.00	ρ =	1.3	
S_{D1} =	0.00	Ω =	1.25	
T_a =	0.00	C_d =	1.25	

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:

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

Allowable Stress Design, ASD

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

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

^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 =	114 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 =	1.596 k-ft
M_z =	0.170 k-ft
$M_{y \text{ allowable}}$ =	2.779 k-ft
$M_{z \text{ allowable}}$ =	1.154 k-ft
Utilization =	72%

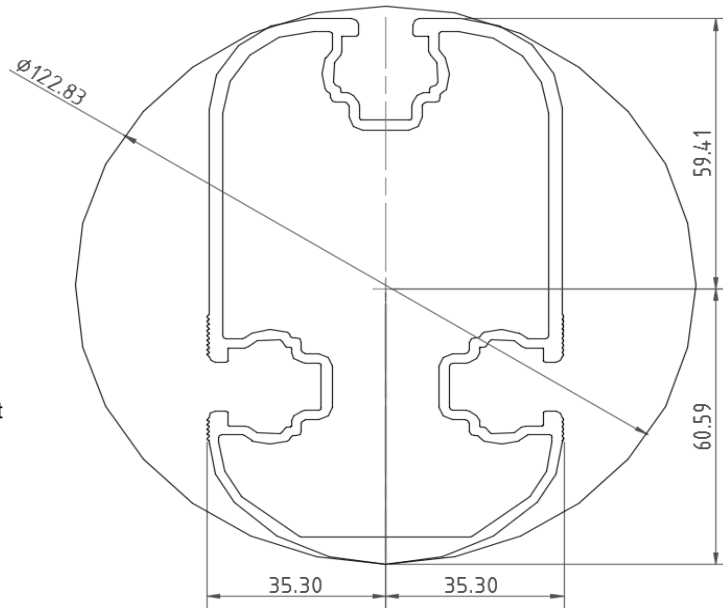


DETAIL VIEW

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 =	4.499 k-ft
M_z =	0.000 k-ft
P_n =	0.019 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

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 = 6.92 k
Maximum Lateral Load = 3.34 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 = 1.16 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

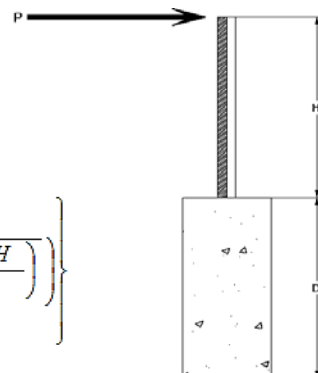
Lateral Bearing @ Bottom = S_3
Lateral Bearing @ D/3 = S_1
Required Depth = D

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

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

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

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



Non-Constrained

Lateral Force @ Top of Pole, P = 1.16 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 = 6.28
Required Footing Depth, D = 9.81 ft

2nd Trial @ D_2 = 6.53 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 = 3.13
Required Footing Depth, D = 6.00 ft

3rd Trial @ D_3 = 6.26 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 = 3.26
Required Footing Depth, D = 6.17 ft

4th Trial @ D_4 = 6.22 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 = 3.28
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 = 3.29
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 =	3.17 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 =	2.09 k
Required Concrete Volume, V =	14.40 ft ³
Required Footing Depth, D =	<u>4.75 ft</u>

A 2ft diameter x 4.75ft deep footing unrestrained at ground level is required for the racking structure.



Iteration	z	dz	Qs	Side
1	0.2	0.2	118.10	6.87
2	0.4	0.2	118.10	6.76
3	0.6	0.2	118.10	6.66
4	0.8	0.2	118.10	6.55
5	1	0.2	118.10	6.45
6	1.2	0.2	118.10	6.35
7	1.4	0.2	118.10	6.24
8	1.6	0.2	118.10	6.14
9	1.8	0.2	118.10	6.04
10	2	0.2	118.10	5.93
11	2.2	0.2	118.10	5.83
12	2.4	0.2	118.10	5.73
13	2.6	0.2	118.10	5.62
14	2.8	0.2	118.10	5.52
15	3	0.2	118.10	5.41
16	3.2	0.2	118.10	5.31
17	3.4	0.2	118.10	5.21
18	3.6	0.2	118.10	5.10
19	3.8	0.2	118.10	5.00
20	4	0.2	118.10	4.90
21	4.2	0.2	118.10	4.79
22	4.4	0.2	118.10	4.69
23	4.6	0.2	118.10	4.58
24	0	0.0	0.00	4.58
25	0	0.0	0.00	4.58
26	0	0.0	0.00	4.58
27	0	0.0	0.00	4.58
28	0	0.0	0.00	4.58
29	0	0.0	0.00	4.58
30	0	0.0	0.00	4.58
31	0	0.0	0.00	4.58
32	0	0.0	0.00	4.58
33	0	0.0	0.00	4.58
34	0	0.0	0.00	4.58
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 =	6.25 ft
Footing Diameter, B =	2.00 ft
Compressive Force, P =	4.24 k

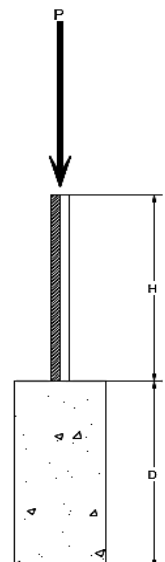
Footing Area =	3.14 ft ²
Circumference =	6.28 ft
Skin Friction Area =	20.42 ft ²
Concrete Weight =	0.145 kcf

<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	19.63 ft ³
Weight	2.85 k

<u>Skin Friction Resistance</u>	
Skin Friction =	0.15 ksf
Resistance =	3.06 k
1/3 Increase for Wind =	1.33
Total Resistance =	10.37 k
Applied Force =	7.08 k
Utilization =	<u>68%</u>

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 =	0.635 k
Allowable Uplift =	1.214 k
Utilization =	<u>52%</u>



Fastening of Purlins to Girders

Maximum Uplifting Force =	2.147 k
Allowable Uplift =	2.180 k
Utilization =	<u>99%</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 =	5.053 k
M10 Bolt Shear Capacity =	8.894 k
Utilization =	<u>57%</u>

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

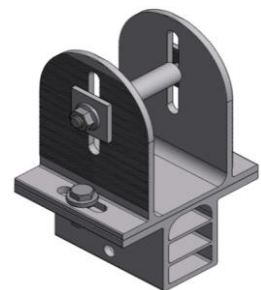


A strut under compression is shown to demonstrate the load transfer from the girder. Single M10 bolts are located at each end of the strut and are subjected to double shear.

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 =	4.555 k
Allowable Load =	5.649 k
Utilization =	<u>81%</u>



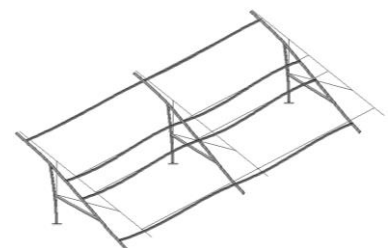
7. SEISMIC DESIGN

7.1 Seismic Drift - N/A

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

Mean Height, h_{sx} =	70.15 in
Allowable Story Drift for All Other Structures, Δ = {	0.020 h_{sx}
Max Drift, Δ_{MAX} =	1.403 in
	<u>N/A</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

$$L_b = 114 \text{ in}$$

$$J = 0.432$$

$$315.377$$

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

$$S1 = 0.51461$$

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

$$S2 = 1701.56$$

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

$$\phi F_L = 27.5 \text{ ksi}$$

Weak Axis:

3.4.14

$$L_b = 114$$

$$J = 0.432$$

$$200.561$$

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

$$S1 = 0.51461$$

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

$$S2 = 1701.56$$

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

$$\phi F_L = 28.8$$

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

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

$$J = \frac{0.942}{95.1963}$$

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

$$S1 = 0.51461$$

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

$$S2 = 1701.56$$

$$\phi F_L = \phi b [Bc - 1.6Dc \sqrt{((L_b S_c) / (C_b \sqrt{(I_y J) / 2}))}]$$

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

Weak Axis:

3.4.14

$$L_b = 61$$

$$J = \frac{0.942}{95.1963}$$

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

$$S1 = 0.51461$$

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

$$S2 = 1701.56$$

$$\phi F_L = \phi b [Bc - 1.6Dc \sqrt{((L_b S_c) / (C_b \sqrt{(I_y J) / 2}))}]$$

$$\phi F_L = 30.2$$

3.4.16

$$b/t = 24.5$$

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

$$S1 = 12.2$$

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

$$S2 = 46.7$$

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

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

3.4.16

$$b/t = 24.5$$

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

$$S1 = 12.2$$

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

$$S2 = 46.7$$

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

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

3.4.16.1 Not Used

$$Rb/t = 0.0$$

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

$$S1 = 1.1$$

$$S2 = C_t$$

$$S2 = 141.0$$

$$\phi F_L = 1.17 \phi_y F_{cy}$$

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

3.4.16.1

N/A for Weak Direction

3.4.18

$$h/t = 24.5$$

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

$$S1 = 36.9$$

$$m = 0.65$$

$$C_0 = 27.5$$

$$Cc = 27.5$$

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

$$S2 = 77.3$$

$$\phi F_L = 1.3 \phi_y F_{cy}$$

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

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

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

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

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

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

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

3.4.18

$$h/t = 24.5$$

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

$$S1 = 36.9$$

$$m = 0.65$$

$$C_0 = 27.5$$

$$Cc = 27.5$$

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

$$S2 = 77.3$$

$$\phi F_L = 1.3 \phi_y F_{cy}$$

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

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

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

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

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

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

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

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 = 6.29 k (LRFD Factored Load)
 Mr (Strong) = 10.46 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

$P_r/P_c = 0.1837 < 0.2$
 Utilization = $0.70 < 1.0$ OK

Bending (Weak Axis):

Yielding:
 $M_n = 14.65$ k-ft

Flange Local Buckling:

$M_n = 14.39$ k-ft

$P_r/P_c = 0.184 < 0.2$
 Utilization = $0.00 < 1.0$ OK

Combined Forces

Utilization = **70%**

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								

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	-94.402	-94.402	0	0
2	M11	y	-94.402	-94.402	0	0
3	M12	y	-145.893	-145.893	0	0
4	M13	y	-145.893	-145.893	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	188.803	188.803	0	0
2	M11	y	188.803	188.803	0	0
3	M12	y	85.82	85.82	0	0
4	M13	y	85.82	85.82	0	0

Load Combinations

	Description	S...	P...	S...	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								



RISA-3D Version 13.0.0 [T:\...\FS 60 Cell 2V 25° 140mph 30psf 9.5ft 7-10 NS.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
33	17	max	188.224	1	492.386	2	-4.684	15	.233	2	-.008	12	.209	2
34		min	7.843	15	-741.164	3	-121.699	1	-.43	3	-.271	1	-.322	3
35	18	max	.939	4	2.013	4	0	1	0	1	0	15	0	4
36		min	.221	15	.473	15	0	5	0	1	0	1	0	15
37	19	max	0	1	.002	2	0	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	.016	2	0	1	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	4
42		min	-.939	4	-2.009	4	0	1	0	1	0	1	0	15
43	3	max	-10.781	12	928.096	3	0	1	0	1	0	1	.757	2
44		min	-325.505	1	-1981.024	2	0	1	0	1	0	1	-.358	3
45	4	max	-11.147	12	926.92	3	0	1	0	1	0	1	1.987	2
46		min	-326.236	1	-1982.593	2	0	1	0	1	0	1	-.934	3
47	5	max	-11.513	12	925.743	3	0	1	0	1	0	1	3.218	2
48		min	-326.967	1	-1984.161	2	0	1	0	1	0	1	-1.509	3
49	6	max	1418.214	3	1817.567	2	0	1	0	1	0	1	3.055	2
50		min	-3486.661	2	-703.141	3	0	1	0	1	0	1	-1.486	3
51	7	max	1417.666	3	1815.998	2	0	1	0	1	0	1	1.927	2
52		min	-3487.392	2	-704.317	3	0	1	0	1	0	1	-1.049	3
53	8	max	1417.117	3	1814.43	2	0	1	0	1	0	1	.8	2
54		min	-3488.123	2	-705.494	3	0	1	0	1	0	1	-.611	3
55	9	max	1402.586	3	273.902	3	0	1	0	1	0	1	.144	1
56		min	-3587.927	2	-236.578	1	0	1	0	1	0	1	-.393	3
57	10	max	1402.037	3	272.725	3	0	1	0	1	0	1	.291	1
58		min	-3588.658	2	-238.146	1	0	1	0	1	0	1	-.563	3
59	11	max	1401.489	3	271.549	3	0	1	0	1	0	1	.44	1
60		min	-3589.389	2	-239.715	1	0	1	0	1	0	1	-.731	3
61	12	max	1394.352	3	2298.372	3	0	1	0	1	0	1	1.153	1
62		min	-3791.67	1	-1713.201	2	0	1	0	1	0	1	-1.707	3
63	13	max	1393.804	3	2297.195	3	0	1	0	1	0	1	2.208	1
64		min	-3792.401	1	-1714.769	2	0	1	0	1	0	1	-3.133	3
65	14	max	327.793	1	1432.083	2	0	1	0	1	0	1	3.222	2
66		min	12.916	12	-2002.89	3	0	1	0	1	0	1	-4.499	3
67	15	max	327.061	1	1430.514	2	0	1	0	1	0	1	2.333	2
68		min	12.55	12	-2004.067	3	0	1	0	1	0	1	-3.256	3
69	16	max	326.33	1	1428.946	2	0	1	0	1	0	1	1.446	2
70		min	12.185	12	-2005.243	3	0	1	0	1	0	1	-2.012	3
71	17	max	325.599	1	1427.378	2	0	1	0	1	0	1	.56	1
72		min	11.819	12	-2006.419	3	0	1	0	1	0	1	-.767	3
73	18	max	.939	4	2.014	4	0	1	0	1	0	1	0	4
74		min	.221	15	.473	15	0	1	0	1	0	1	0	15
75	19	max	0	1	.006	2	0	1	0	1	0	1	0	1
76		min	0	1	-.012	3	0	1	0	1	0	1	0	1
77	M7	1	max	0	.006	2	.001	1	0	1	0	1	0	1
78		min	0	1	-.001	3	0	5	0	1	0	1	0	1
79	2	max	-.221	15	-.473	15	.001	1	0	1	0	1	0	4
80		min	-.939	4	-2.011	4	0	5	0	1	0	15	0	15
81	3	max	-7.827	15	301.456	3	157.2	1	.237	2	-.009	15	.307	2
82		min	-188.27	1	-701.411	2	1.567	12	-.066	3	-.252	1	-.13	3
83	4	max	-8.048	15	300.279	3	157.2	1	.237	2	-.006	15	.743	2
84		min	-189.002	1	-702.979	2	1.567	12	-.066	3	-.154	1	-.317	3
85	5	max	-8.268	15	299.103	3	157.2	1	.237	2	.004	10	1.18	2
86		min	-189.733	1	-704.548	2	1.567	12	-.066	3	-.057	1	-.503	3
87	6	max	398.141	3	614.49	2	211.756	1	.056	3	.043	3	1.133	2
88		min	-1259.127	2	-177.074	3	-25.556	3	-.038	2	-.11	2	-.514	3
89	7	max	397.593	3	612.922	2	211.756	1	.056	3	.027	3	.752	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
90			min	-1259.858	2	-178.251	3	-25.556	3	-.038	2	-.01	10	-.403	3
91		8	max	397.044	3	611.353	2	211.756	1	.056	3	.156	1	.372	2
92			min	-1260.59	2	-179.427	3	-25.556	3	-.038	2	.006	15	-.292	3
93		9	max	381.973	3	95.146	3	221.196	1	.189	2	-.004	15	.154	1
94			min	-1386.318	1	-64.629	2	-24.225	3	.002	15	-.088	1	-.243	3
95		10	max	381.424	3	93.97	3	221.196	1	.189	2	.052	2	.192	1
96			min	-1387.05	1	-66.198	2	-24.225	3	.002	15	-.053	3	-.301	3
97		11	max	380.876	3	92.794	3	221.196	1	.189	2	.186	1	.233	2
98			min	-1387.781	1	-67.766	2	-24.225	3	.002	15	-.068	3	-.359	3
99		12	max	362.107	3	819.764	3	275.194	3	.334	2	-.005	15	.469	2
100			min	-1580.747	1	-542.704	2	-117.827	2	-.365	3	-.142	1	-.703	3
101		13	max	361.558	3	818.588	3	275.194	3	.334	2	.151	3	.806	2
102			min	-1581.479	1	-544.272	2	-117.827	2	-.365	3	-.176	1	-1.212	3
103		14	max	190.417	1	497.091	2	121.699	1	.43	3	.044	1	1.13	2
104			min	8.505	15	-737.636	3	4.684	15	-.233	2	-.052	3	-1.698	3
105		15	max	189.686	1	495.523	2	121.699	1	.43	3	.12	1	.822	2
106			min	8.285	15	-738.812	3	4.684	15	-.233	2	-.03	3	-1.24	3
107		16	max	188.955	1	493.955	2	121.699	1	.43	3	.195	1	.515	2
108			min	8.064	15	-739.988	3	4.684	15	-.233	2	-.009	3	-.781	3
109		17	max	188.224	1	492.386	2	121.699	1	.43	3	.271	1	.209	2
110			min	7.843	15	-741.164	3	4.684	15	-.233	2	.008	12	-.322	3
111		18	max	.939	4	2.013	4	0	5	0	1	0	1	0	4
112			min	.221	15	.473	15	0	1	0	1	0	15	0	15
113		19	max	0	1	.002	2	0	5	0	1	0	1	0	1
114			min	0	1	-.005	3	0	1	0	1	0	1	0	1
115	M10	1	max	121.696	1	489.052	2	-7.403	15	.009	2	.32	1	.233	2
116			min	4.684	15	-743.485	3	-187.038	1	-.022	3	.012	15	-.43	3
117		2	max	121.696	1	355.641	2	-5.809	15	.009	2	.143	1	.253	3
118			min	4.684	15	-549.319	3	-148.279	1	-.022	3	.005	15	-.214	1
119		3	max	121.696	1	222.23	2	-4.215	15	.009	2	.029	2	.73	3
120			min	4.684	15	-355.154	3	-109.52	1	-.022	3	-.007	9	-.518	2
121		4	max	121.696	1	88.819	2	-2.621	15	.009	2	0	10	1.002	3
122			min	4.684	15	-160.988	3	-70.761	1	-.022	3	-.088	1	-.682	2
123		5	max	121.696	1	33.178	3	-1.027	15	.009	2	-.006	15	1.07	3
124			min	4.684	15	-45.767	1	-32.003	1	-.022	3	-.142	1	-.705	2
125		6	max	121.696	1	227.343	3	8.931	9	.009	2	-.006	15	.932	3
126			min	4.684	15	-178.708	1	-7.971	2	-.022	3	-.156	1	-.588	2
127		7	max	121.696	1	421.509	3	45.515	1	.009	2	-.005	15	.59	3
128			min	4.684	15	-311.65	1	-1.99	10	-.022	3	-.128	1	-.329	2
129		8	max	121.696	1	615.674	3	84.274	1	.009	2	-.002	15	.075	1
130			min	4.684	15	-444.825	2	2.35	12	-.022	3	-.06	1	.002	15
131		9	max	121.696	1	809.84	3	123.033	1	.009	2	.05	9	.615	1
132			min	4.684	15	-578.236	2	3.944	12	-.022	3	-.022	10	-.71	3
133		10	max	121.696	1	711.647	2	-5.538	12	.009	2	.2	1	1.295	1
134			min	4.684	15	-1004.005	3	-161.791	1	-.022	3	-.012	10	-1.667	3
135		11	max	121.696	1	578.236	2	-3.944	12	.022	3	.05	9	.615	1
136			min	4.684	15	-809.84	3	-123.033	1	-.009	2	-.022	10	-.71	3
137		12	max	121.696	1	444.825	2	-2.35	12	.022	3	-.002	15	.075	1
138			min	4.684	15	-615.674	3	-84.274	1	-.009	2	-.06	1	.002	15
139		13	max	121.696	1	311.65	1	1.99	10	.022	3	-.005	15	.59	3
140			min	4.684	15	-421.509	3	-45.515	1	-.009	2	-.128	1	-.329	2
141		14	max	121.696	1	178.708	1	7.971	2	.022	3	-.006	15	.932	3
142			min	4.684	15	-227.343	3	-8.931	9	-.009	2	-.156	1	-.588	2
143		15	max	121.696	1	45.767	1	32.003	1	.022	3	-.006	15	1.07	3
144			min	4.684	15	-33.178	3	1.027	15	-.009	2	-.142	1	-.705	2
145		16	max	121.696	1	160.988	3	70.761	1	.022	3	0	10	1.002	3
146			min	4.684	15	-88.819	2	2.621	15	-.009	2	-.088	1	-.682	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
147	17	max	121.696	1	355.154	3	109.52	1	.022	3	.029	2	.73	3
148		min	4.684	15	-222.23	2	4.215	15	-.009	2	-.007	9	-.518	2
149	18	max	121.696	1	549.319	3	148.279	1	.022	3	.143	1	.253	3
150		min	4.684	15	-355.641	2	5.809	15	-.009	2	.005	15	-.214	1
151	19	max	121.696	1	743.485	3	187.038	1	.022	3	.32	1	.233	2
152		min	4.684	15	-489.052	2	7.403	15	-.009	2	.012	15	-.43	3
153	M11	1	max	275.208	1	474.175	1	-7.651	15	0	.357	1	.175	1
154		min	-299.31	3	-729.241	3	-192.866	1	-.006	1	.013	15	-.481	3
155	2	max	275.208	1	341.233	1	-6.057	15	0	15	.174	1	.186	3
156		min	-299.31	3	-535.076	3	-154.107	1	-.006	1	.006	15	-.283	2
157	3	max	275.208	1	208.291	1	-4.463	15	0	15	.037	2	.648	3
158		min	-299.31	3	-340.91	3	-115.348	1	-.006	1	0	15	-.568	2
159	4	max	275.208	1	75.35	1	-2.869	15	0	15	.01	3	.906	3
160		min	-299.31	3	-146.744	3	-76.589	1	-.006	1	-.07	1	-.714	2
161	5	max	275.208	1	47.421	3	-1.275	15	0	15	0	3	.958	3
162		min	-299.31	3	-62.607	2	-37.83	1	-.006	1	-.13	1	-.718	2
163	6	max	275.208	1	241.587	3	4.973	9	0	15	-.005	12	.805	3
164		min	-299.31	3	-196.018	2	-9.934	2	-.006	1	-.15	1	-.581	2
165	7	max	275.208	1	435.752	3	39.687	1	0	15	-.005	15	.448	3
166		min	-299.31	3	-329.429	2	-3.737	3	-.006	1	-.128	1	-.304	2
167	8	max	275.208	1	629.918	3	78.446	1	0	15	-.002	15	.114	2
168		min	-299.31	3	-462.84	2	-1.347	3	-.006	1	-.066	1	-.114	3
169	9	max	275.208	1	824.083	3	117.205	1	0	15	.042	9	.673	2
170		min	-299.31	3	-596.251	2	1.044	3	-.006	1	-.026	2	-.882	3
171	10	max	275.208	1	729.662	2	-2.694	12	.006	1	.181	1	1.373	2
172		min	-299.31	3	-1018.249	3	-155.963	1	0	15	-.014	10	-1.854	3
173	11	max	275.208	1	596.251	2	-1.044	3	.006	1	.042	9	.673	2
174		min	-299.31	3	-824.083	3	-117.205	1	0	15	-.026	2	-.882	3
175	12	max	275.208	1	462.84	2	1.347	3	.006	1	-.002	15	.114	2
176		min	-299.31	3	-629.918	3	-78.446	1	0	15	-.066	1	-.114	3
177	13	max	275.208	1	329.429	2	3.737	3	.006	1	-.005	15	.448	3
178		min	-299.31	3	-435.752	3	-39.687	1	0	15	-.128	1	-.304	2
179	14	max	275.208	1	196.018	2	9.934	2	.006	1	-.005	12	.805	3
180		min	-299.31	3	-241.587	3	-4.973	9	0	15	-.15	1	-.581	2
181	15	max	275.208	1	62.607	2	37.83	1	.006	1	0	3	.958	3
182		min	-299.31	3	-47.421	3	1.275	15	0	15	-.13	1	-.718	2
183	16	max	275.208	1	146.744	3	76.589	1	.006	1	.01	3	.906	3
184		min	-299.31	3	-75.35	1	2.869	15	0	15	-.07	1	-.714	2
185	17	max	275.208	1	340.91	3	115.348	1	.006	1	.037	2	.648	3
186		min	-299.31	3	-208.291	1	4.463	15	0	15	0	15	-.568	2
187	18	max	275.208	1	535.076	3	154.107	1	.006	1	.174	1	.186	3
188		min	-299.31	3	-341.233	1	6.057	15	0	15	.006	15	-.283	2
189	19	max	275.208	1	729.241	3	192.866	1	.006	1	.357	1	.175	1
190		min	-299.31	3	-474.175	1	7.651	15	0	15	.013	15	-.481	3
191	M12	1	max	33.638	2	672.349	2	-7.735	15	0	.378	1	.227	2
192		min	-20.89	9	-276.397	3	-196.27	1	-.007	1	.014	15	.003	15
193	2	max	33.638	2	484.587	2	-6.141	15	0	3	.191	1	.307	3
194		min	-20.89	9	-190.936	3	-157.511	1	-.007	1	.007	15	-.383	2
195	3	max	33.638	2	296.824	2	-4.547	15	0	3	.052	2	.463	3
196		min	-20.89	9	-105.475	3	-118.753	1	-.007	1	0	15	-.796	2
197	4	max	33.638	2	109.062	2	-2.953	15	0	3	.007	10	.529	3
198		min	-20.89	9	-20.013	3	-79.994	1	-.007	1	-.059	1	-1.01	2
199	5	max	33.638	2	65.448	3	-1.359	15	0	3	-.005	12	.505	3
200		min	-20.89	9	-78.701	2	-41.235	1	-.007	1	-.123	1	-1.026	2
201	6	max	33.638	2	150.909	3	3.648	9	0	3	-.006	15	.391	3
202		min	-20.89	9	-266.464	2	-13.515	2	-.007	1	-.146	1	-.844	2
203	7	max	33.638	2	236.371	3	36.283	1	0	3	-.005	15	.187	3



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
204			min	-20.89	9	-454.226	2	-4.241	10	-.007	1	-.129	1	-.464	2
205		8	max	33.638	2	321.832	3	75.041	1	0	3	-.002	15	.115	2
206			min	-20.89	9	-641.989	2	.162	10	-.007	1	-.07	1	-.108	3
207		9	max	33.638	2	407.293	3	113.8	1	0	3	.039	9	.892	2
208			min	-20.89	9	-829.751	2	3.227	12	-.007	1	-.033	2	-.493	3
209		10	max	33.638	2	1017.514	2	104.948	9	.007	1	.17	1	1.867	2
210			min	-20.89	9	-610.203	11	-152.559	1	0	3	-.02	10	-.968	3
211		11	max	33.638	2	829.751	2	-3.227	12	.007	1	.039	9	.892	2
212			min	-20.89	9	-407.293	3	-113.8	1	0	3	-.033	2	-.493	3
213		12	max	33.638	2	641.989	2	-.162	10	.007	1	-.002	15	.115	2
214			min	-20.89	9	-321.832	3	-75.041	1	0	3	-.07	1	-.108	3
215		13	max	33.638	2	454.226	2	4.241	10	.007	1	-.005	15	.187	3
216			min	-20.89	9	-236.371	3	-36.283	1	0	3	-.129	1	-.464	2
217		14	max	33.638	2	266.464	2	13.515	2	.007	1	-.006	15	.391	3
218			min	-20.89	9	-150.909	3	-3.648	9	0	3	-.146	1	-.844	2
219		15	max	33.638	2	78.701	2	41.235	1	.007	1	-.005	12	.505	3
220			min	-20.89	9	-65.448	3	1.359	15	0	3	-.123	1	-1.026	2
221		16	max	33.638	2	20.013	3	79.994	1	.007	1	.007	10	.529	3
222			min	-20.89	9	-109.062	2	2.953	15	0	3	-.059	1	-1.01	2
223		17	max	33.638	2	105.475	3	118.753	1	.007	1	.052	2	.463	3
224			min	-20.89	9	-296.824	2	4.547	15	0	3	0	15	-.796	2
225		18	max	33.638	2	190.936	3	157.511	1	.007	1	.191	1	.307	3
226			min	-20.89	9	-484.587	2	6.141	15	0	3	.007	15	-.383	2
227		19	max	33.638	2	276.397	3	196.27	1	.007	1	.378	1	.227	2
228			min	-20.89	9	-672.349	2	7.735	15	0	3	.014	15	.003	15
229	M13	1	max	-1.567	12	698.756	2	-7.386	15	.008	3	.315	1	.237	2
230			min	-157.078	1	-303.853	3	-186.441	1	-.023	2	.012	15	-.066	3
231		2	max	-1.567	12	510.994	2	-5.792	15	.008	3	.139	1	.209	3
232			min	-157.078	1	-218.392	3	-147.683	1	-.023	2	.005	15	-.402	2
233		3	max	-1.567	12	323.231	2	-4.198	15	.008	3	.026	2	.395	3
234			min	-157.078	1	-132.931	3	-108.924	1	-.023	2	-.008	9	-.842	2
235		4	max	-1.567	12	135.468	2	-2.604	15	.008	3	-.001	10	.49	3
236			min	-157.078	1	-47.469	3	-70.165	1	-.023	2	-.091	1	-1.084	2
237		5	max	-1.567	12	37.992	3	-1.01	15	.008	3	-.005	12	.495	3
238			min	-157.078	1	-52.294	2	-31.406	1	-.023	2	-.144	1	-1.128	2
239		6	max	-1.567	12	123.453	3	9.198	9	.008	3	-.006	15	.41	3
240			min	-157.078	1	-240.057	2	-7.424	2	-.023	2	-.157	1	-.974	2
241		7	max	-1.567	12	208.915	3	46.111	1	.008	3	-.005	15	.234	3
242			min	-157.078	1	-427.82	2	-1.712	10	-.023	2	-.129	1	-.621	2
243		8	max	-1.567	12	294.376	3	84.87	1	.008	3	-.002	15	-.003	15
244			min	-157.078	1	-615.582	2	1.838	12	-.023	2	-.06	1	-.084	1
245		9	max	-1.567	12	379.837	3	123.629	1	.008	3	.05	9	.679	2
246			min	-157.078	1	-803.345	2	3.432	12	-.023	2	-.022	10	-.387	3
247		10	max	-1.567	12	991.107	2	110.498	9	.02	1	.201	1	1.626	2
248			min	-157.078	1	-591.451	11	-162.388	1	-.023	2	-.012	10	-.833	3
249		11	max	-1.567	12	803.345	2	-3.432	12	.023	2	.05	9	.679	2
250			min	-157.078	1	-379.837	3	-123.629	1	-.008	3	-.022	10	-.387	3
251		12	max	-1.567	12	615.582	2	-1.838	12	.023	2	-.002	15	-.003	15
252			min	-157.078	1	-294.376	3	-84.87	1	-.008	3	-.06	1	-.084	1
253		13	max	-1.567	12	427.82	2	1.712	10	.023	2	-.005	15	.234	3
254			min	-157.078	1	-208.915	3	-46.111	1	-.008	3	-.129	1	-.621	2
255		14	max	-1.567	12	240.057	2	7.424	2	.023	2	-.006	15	.41	3
256			min	-157.078	1	-123.453	3	-9.198	9	-.008	3	-.157	1	-.974	2
257		15	max	-1.567	12	52.294	2	31.406	1	.023	2	-.005	12	.495	3
258			min	-157.078	1	-37.992	3	1.01	15	-.008	3	-.144	1	-1.128	2
259		16	max	-1.567	12	47.469	3	70.165	1	.023	2	-.001	10	.49	3
260			min	-157.078	1	-135.468	2	2.604	15	-.008	3	-.091	1	-1.084	2



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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
261		17	max	-1.567	12	132.931	3	108.924	1	.023	2	.026	2	.395	3
262			min	-157.078	1	-323.231	2	4.198	15	-.008	3	-.008	9	-.842	2
263		18	max	-1.567	12	218.392	3	147.683	1	.023	2	.139	1	.209	3
264			min	-157.078	1	-510.994	2	5.792	15	-.008	3	.005	15	-.402	2
265		19	max	-1.567	12	303.853	3	186.441	1	.023	2	.315	1	.237	2
266			min	-157.078	1	-698.756	2	7.386	15	-.008	3	.012	15	-.066	3
267	M2	1	max	2347.565	2	921.625	3	240.948	2	.004	3	.34	3	4.982	1
268			min	-1771.164	3	-663.981	2	-267.657	3	-.01	2	-.293	1	.184	15
269		2	max	2345.01	2	921.625	3	240.948	2	.004	3	.265	3	5.04	1
270			min	-1773.08	3	-663.981	2	-267.657	3	-.01	2	-.228	1	.182	15
271		3	max	2342.455	2	921.625	3	240.948	2	.004	3	.19	3	5.099	1
272			min	-1774.996	3	-663.981	2	-267.657	3	-.01	2	-.163	1	.181	15
273		4	max	1732.324	1	1174.532	1	178.637	2	.002	2	.138	3	4.943	1
274			min	-1527.527	3	41.223	15	-241.097	3	-.001	3	-.141	1	.173	15
275		5	max	1729.769	1	1174.532	1	178.637	2	.002	2	.07	3	4.614	1
276			min	-1529.443	3	41.223	15	-241.097	3	-.001	3	-.092	1	.162	15
277		6	max	1727.215	1	1174.532	1	178.637	2	.002	2	.003	3	4.284	1
278			min	-1531.359	3	41.223	15	-241.097	3	-.001	3	-.042	1	.15	15
279		7	max	1724.66	1	1174.532	1	178.637	2	.002	2	.023	2	3.955	1
280			min	-1533.275	3	41.223	15	-241.097	3	-.001	3	-.065	3	.139	15
281		8	max	1722.105	1	1174.532	1	178.637	2	.002	2	.073	2	3.625	1
282			min	-1535.192	3	41.223	15	-241.097	3	-.001	3	-.133	3	.127	15
283		9	max	1719.55	1	1174.532	1	178.637	2	.002	2	.123	2	3.295	1
284			min	-1537.108	3	41.223	15	-241.097	3	-.001	3	-.2	3	.116	15
285		10	max	1716.995	1	1174.532	1	178.637	2	.002	2	.174	2	2.966	1
286			min	-1539.024	3	41.223	15	-241.097	3	-.001	3	-.268	3	.104	15
287		11	max	1714.44	1	1174.532	1	178.637	2	.002	2	.224	2	2.636	1
288			min	-1540.94	3	41.223	15	-241.097	3	-.001	3	-.336	3	.093	15
289		12	max	1711.885	1	1174.532	1	178.637	2	.002	2	.274	2	2.307	1
290			min	-1542.856	3	41.223	15	-241.097	3	-.001	3	-.403	3	.081	15
291		13	max	1709.33	1	1174.532	1	178.637	2	.002	2	.324	2	1.977	1
292			min	-1544.772	3	41.223	15	-241.097	3	-.001	3	-.471	3	.069	15
293		14	max	1706.775	1	1174.532	1	178.637	2	.002	2	.374	2	1.648	1
294			min	-1546.689	3	41.223	15	-241.097	3	-.001	3	-.539	3	.058	15
295		15	max	1704.221	1	1174.532	1	178.637	2	.002	2	.424	2	1.318	1
296			min	-1548.605	3	41.223	15	-241.097	3	-.001	3	-.606	3	.046	15
297		16	max	1701.666	1	1174.532	1	178.637	2	.002	2	.474	2	.989	1
298			min	-1550.521	3	41.223	15	-241.097	3	-.001	3	-.674	3	.035	15
299		17	max	1699.111	1	1174.532	1	178.637	2	.002	2	.524	2	.659	1
300			min	-1552.437	3	41.223	15	-241.097	3	-.001	3	-.741	3	.023	15
301		18	max	1696.556	1	1174.532	1	178.637	2	.002	2	.574	2	.33	1
302			min	-1554.353	3	41.223	15	-241.097	3	-.001	3	-.809	3	.012	15
303		19	max	1694.001	1	1174.532	1	178.637	2	.002	2	.625	2	0	1
304			min	-1556.269	3	41.223	15	-241.097	3	-.001	3	-.877	3	0	1
305	M5	1	max	6517.747	2	2562.304	3	0	1	0	1	0	1	9.657	1
306			min	-5317.217	3	-2520.631	2	0	1	0	1	0	1	.32	15
307		2	max	6515.192	2	2562.304	3	0	1	0	1	0	1	10.077	1
308			min	-5319.133	3	-2520.631	2	0	1	0	1	0	1	.323	15
309		3	max	6512.637	2	2562.304	3	0	1	0	1	0	1	10.498	1
310			min	-5321.049	3	-2520.631	2	0	1	0	1	0	1	.327	15
311		4	max	4639.635	1	2449.021	1	0	1	0	1	0	1	10.307	1
312			min	-4457.931	3	75.213	15	0	1	0	1	0	1	.317	15
313		5	max	4637.08	1	2449.021	1	0	1	0	1	0	1	9.62	1
314			min	-4459.847	3	75.213	15	0	1	0	1	0	1	.295	15
315		6	max	4634.525	1	2449.021	1	0	1	0	1	0	1	8.933	1
316			min	-4461.763	3	75.213	15	0	1	0	1	0	1	.274	15
317		7	max	4631.97	1	2449.021	1	0	1	0	1	0	1	8.246	1



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

Sept 14, 2015

Checked By: _____

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[lb]	LC	y Shear[lb]	LC	z Shear[lb]	LC	Torque[k-ft]	LC	y-y Mome...	LC	z-z Mome...	LC
318			min	-4463.68	3	75.213	15	0	1	0	1	0	1	.253	15
319		8	max	4629.415	1	2449.021	1	0	1	0	1	0	1	7.559	1
320			min	-4465.596	3	75.213	15	0	1	0	1	0	1	.232	15
321		9	max	4626.86	1	2449.021	1	0	1	0	1	0	1	6.871	1
322			min	-4467.512	3	75.213	15	0	1	0	1	0	1	.211	15
323		10	max	4624.306	1	2449.021	1	0	1	0	1	0	1	6.184	1
324			min	-4469.428	3	75.213	15	0	1	0	1	0	1	.19	15
325		11	max	4621.751	1	2449.021	1	0	1	0	1	0	1	5.497	1
326			min	-4471.344	3	75.213	15	0	1	0	1	0	1	.169	15
327		12	max	4619.196	1	2449.021	1	0	1	0	1	0	1	4.81	1
328			min	-4473.26	3	75.213	15	0	1	0	1	0	1	.148	15
329		13	max	4616.641	1	2449.021	1	0	1	0	1	0	1	4.123	1
330			min	-4475.177	3	75.213	15	0	1	0	1	0	1	.127	15
331		14	max	4614.086	1	2449.021	1	0	1	0	1	0	1	3.436	1
332			min	-4477.093	3	75.213	15	0	1	0	1	0	1	.106	15
333		15	max	4611.531	1	2449.021	1	0	1	0	1	0	1	2.749	1
334			min	-4479.009	3	75.213	15	0	1	0	1	0	1	.084	15
335		16	max	4608.976	1	2449.021	1	0	1	0	1	0	1	2.061	1
336			min	-4480.925	3	75.213	15	0	1	0	1	0	1	.063	15
337		17	max	4606.421	1	2449.021	1	0	1	0	1	0	1	1.374	1
338			min	-4482.841	3	75.213	15	0	1	0	1	0	1	.042	15
339		18	max	4603.866	1	2449.021	1	0	1	0	1	0	1	.687	1
340			min	-4484.757	3	75.213	15	0	1	0	1	0	1	.021	15
341		19	max	4601.312	1	2449.021	1	0	1	0	1	0	1	0	1
342			min	-4486.674	3	75.213	15	0	1	0	1	0	1	0	1
343	M8	1	max	2347.565	2	921.625	3	267.657	3	.01	2	.293	1	4.982	1
344			min	-1771.164	3	-663.981	2	-240.948	2	-.004	3	-.34	3	.184	15
345		2	max	2345.01	2	921.625	3	267.657	3	.01	2	.228	1	5.04	1
346			min	-1773.08	3	-663.981	2	-240.948	2	-.004	3	-.265	3	.182	15
347		3	max	2342.455	2	921.625	3	267.657	3	.01	2	.163	1	5.099	1
348			min	-1774.996	3	-663.981	2	-240.948	2	-.004	3	-.19	3	.181	15
349		4	max	1732.324	1	1174.532	1	241.097	3	.001	3	.141	1	4.943	1
350			min	-1527.527	3	41.223	15	-178.637	2	-.002	2	-.138	3	.173	15
351		5	max	1729.769	1	1174.532	1	241.097	3	.001	3	.092	1	4.614	1
352			min	-1529.443	3	41.223	15	-178.637	2	-.002	2	-.07	3	.162	15
353		6	max	1727.215	1	1174.532	1	241.097	3	.001	3	.042	1	4.284	1
354			min	-1531.359	3	41.223	15	-178.637	2	-.002	2	-.003	3	.15	15
355		7	max	1724.66	1	1174.532	1	241.097	3	.001	3	.065	3	3.955	1
356			min	-1533.275	3	41.223	15	-178.637	2	-.002	2	-.023	2	.139	15
357		8	max	1722.105	1	1174.532	1	241.097	3	.001	3	.133	3	3.625	1
358			min	-1535.192	3	41.223	15	-178.637	2	-.002	2	-.073	2	.127	15
359		9	max	1719.55	1	1174.532	1	241.097	3	.001	3	.2	3	3.295	1
360			min	-1537.108	3	41.223	15	-178.637	2	-.002	2	-.123	2	.116	15
361		10	max	1716.995	1	1174.532	1	241.097	3	.001	3	.268	3	2.966	1
362			min	-1539.024	3	41.223	15	-178.637	2	-.002	2	-.174	2	.104	15
363		11	max	1714.44	1	1174.532	1	241.097	3	.001	3	.336	3	2.636	1
364			min	-1540.94	3	41.223	15	-178.637	2	-.002	2	-.224	2	.093	15
365		12	max	1711.885	1	1174.532	1	241.097	3	.001	3	.403	3	2.307	1
366			min	-1542.856	3	41.223	15	-178.637	2	-.002	2	-.274	2	.081	15
367		13	max	1709.33	1	1174.532	1	241.097	3	.001	3	.471	3	1.977	1
368			min	-1544.772	3	41.223	15	-178.637	2	-.002	2	-.324	2	.069	15
369		14	max	1706.775	1	1174.532	1	241.097	3	.001	3	.539	3	1.648	1
370			min	-1546.689	3	41.223	15	-178.637	2	-.002	2	-.374	2	.058	15
371		15	max	1704.221	1	1174.532	1	241.097	3	.001	3	.606	3	1.318	1
372			min	-1548.605	3	41.223	15	-178.637	2	-.002	2	-.424	2	.046	15
373		16	max	1701.666	1	1174.532	1	241.097	3	.001	3	.674	3	.989	1
374			min	-1550.521	3	41.223	15	-178.637	2	-.002	2	-.474	2	.035	15



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
375		17	max	1699.111	1	1174.532	1	241.097	3	.001	3	.741	3	.659	1
376			min	-1552.437	3	41.223	15	-178.637	2	-.002	2	-.524	2	.023	15
377		18	max	1696.556	1	1174.532	1	241.097	3	.001	3	.809	3	.33	1
378			min	-1554.353	3	41.223	15	-178.637	2	-.002	2	-.574	2	.012	15
379		19	max	1694.001	1	1174.532	1	241.097	3	.001	3	.877	3	0	1
380			min	-1556.269	3	41.223	15	-178.637	2	-.002	2	-.625	2	0	1
381	M3	1	max	1761.91	2	4.588	4	61.634	2	.02	3	.005	2	0	1
382			min	-628.639	3	1.079	15	-27.153	3	-.041	2	-.003	3	0	1
383		2	max	1761.736	2	4.078	4	61.634	2	.02	3	.023	2	0	15
384			min	-628.77	3	.959	15	-27.153	3	-.041	2	-.011	3	-.001	4
385		3	max	1761.562	2	3.569	4	61.634	2	.02	3	.041	2	0	15
386			min	-628.9	3	.839	15	-27.153	3	-.041	2	-.019	3	-.002	4
387		4	max	1761.387	2	3.059	4	61.634	2	.02	3	.059	2	0	15
388			min	-629.031	3	.719	15	-27.153	3	-.041	2	-.027	3	-.003	4
389		5	max	1761.213	2	2.549	4	61.634	2	.02	3	.077	2	0	15
390			min	-629.162	3	.599	15	-27.153	3	-.041	2	-.035	3	-.004	4
391		6	max	1761.038	2	2.039	4	61.634	2	.02	3	.095	2	-.001	15
392			min	-629.293	3	.479	15	-27.153	3	-.041	2	-.043	3	-.005	4
393		7	max	1760.864	2	1.529	4	61.634	2	.02	3	.113	2	-.001	15
394			min	-629.424	3	.36	15	-27.153	3	-.041	2	-.05	3	-.005	4
395		8	max	1760.69	2	1.02	4	61.634	2	.02	3	.131	2	-.001	15
396			min	-629.554	3	.24	15	-27.153	3	-.041	2	-.058	3	-.006	4
397		9	max	1760.515	2	.51	4	61.634	2	.02	3	.149	2	-.001	15
398			min	-629.685	3	.12	15	-27.153	3	-.041	2	-.066	3	-.006	4
399		10	max	1760.341	2	0	1	61.634	2	.02	3	.167	2	-.001	15
400			min	-629.816	3	0	1	-27.153	3	-.041	2	-.074	3	-.006	4
401		11	max	1760.166	2	-.12	15	61.634	2	.02	3	.185	2	-.001	15
402			min	-629.947	3	-.51	4	-27.153	3	-.041	2	-.082	3	-.006	4
403		12	max	1759.992	2	-.24	15	61.634	2	.02	3	.204	2	-.001	15
404			min	-630.078	3	-1.02	4	-27.153	3	-.041	2	-.09	3	-.006	4
405		13	max	1759.818	2	-.36	15	61.634	2	.02	3	.222	2	-.001	15
406			min	-630.208	3	-1.529	4	-27.153	3	-.041	2	-.098	3	-.005	4
407		14	max	1759.643	2	-.479	15	61.634	2	.02	3	.24	2	-.001	15
408			min	-630.339	3	-2.039	4	-27.153	3	-.041	2	-.106	3	-.005	4
409		15	max	1759.469	2	-.599	15	61.634	2	.02	3	.258	2	0	15
410			min	-630.47	3	-2.549	4	-27.153	3	-.041	2	-.114	3	-.004	4
411		16	max	1759.295	2	-.719	15	61.634	2	.02	3	.276	2	0	15
412			min	-630.601	3	-3.059	4	-27.153	3	-.041	2	-.122	3	-.003	4
413		17	max	1759.12	2	-.839	15	61.634	2	.02	3	.294	2	0	15
414			min	-630.732	3	-3.569	4	-27.153	3	-.041	2	-.13	3	-.002	4
415		18	max	1758.946	2	-.959	15	61.634	2	.02	3	.312	2	0	15
416			min	-630.862	3	-4.078	4	-27.153	3	-.041	2	-.138	3	-.001	4
417		19	max	1758.771	2	-1.079	15	61.634	2	.02	3	.33	2	0	1
418			min	-630.993	3	-4.588	4	-27.153	3	-.041	2	-.146	3	0	1
419	M6	1	max	5053.172	2	4.588	4	0	1	0	1	0	1	0	1
420			min	-2169.86	3	1.079	15	0	1	0	1	0	1	0	1
421		2	max	5052.998	2	4.078	4	0	1	0	1	0	1	0	15
422			min	-2169.991	3	.959	15	0	1	0	1	0	1	-.001	4
423		3	max	5052.824	2	3.569	4	0	1	0	1	0	1	0	15
424			min	-2170.122	3	.839	15	0	1	0	1	0	1	-.002	4
425		4	max	5052.649	2	3.059	4	0	1	0	1	0	1	0	15
426			min	-2170.253	3	.719	15	0	1	0	1	0	1	-.003	4
427		5	max	5052.475	2	2.549	4	0	1	0	1	0	1	0	15
428			min	-2170.384	3	.599	15	0	1	0	1	0	1	-.004	4
429		6	max	5052.301	2	2.039	4	0	1	0	1	0	1	-.001	15
430			min	-2170.514	3	.479	15	0	1	0	1	0	1	-.005	4
431		7	max	5052.126	2	1.529	4	0	1	0	1	0	1	-.001	15



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
432			min	-2170.645	3	.36	15	0	1	0	1	0	1	-.005	4
433		8	max	5051.952	2	1.02	4	0	1	0	1	0	1	-.001	15
434			min	-2170.776	3	.24	15	0	1	0	1	0	1	-.006	4
435		9	max	5051.777	2	.51	4	0	1	0	1	0	1	-.001	15
436			min	-2170.907	3	.12	15	0	1	0	1	0	1	-.006	4
437		10	max	5051.603	2	0	1	0	1	0	1	0	1	-.001	15
438			min	-2171.037	3	0	1	0	1	0	1	0	1	-.006	4
439		11	max	5051.429	2	-.12	15	0	1	0	1	0	1	-.001	15
440			min	-2171.168	3	-.51	4	0	1	0	1	0	1	-.006	4
441		12	max	5051.254	2	-.24	15	0	1	0	1	0	1	-.001	15
442			min	-2171.299	3	-1.02	4	0	1	0	1	0	1	-.006	4
443		13	max	5051.08	2	-.36	15	0	1	0	1	0	1	-.001	15
444			min	-2171.43	3	-1.529	4	0	1	0	1	0	1	-.005	4
445		14	max	5050.905	2	-.479	15	0	1	0	1	0	1	-.001	15
446			min	-2171.561	3	-2.039	4	0	1	0	1	0	1	-.005	4
447		15	max	5050.731	2	-.599	15	0	1	0	1	0	1	0	15
448			min	-2171.691	3	-2.549	4	0	1	0	1	0	1	-.004	4
449		16	max	5050.557	2	-.719	15	0	1	0	1	0	1	0	15
450			min	-2171.822	3	-3.059	4	0	1	0	1	0	1	-.003	4
451		17	max	5050.382	2	-.839	15	0	1	0	1	0	1	0	15
452			min	-2171.953	3	-3.569	4	0	1	0	1	0	1	-.002	4
453		18	max	5050.208	2	-.959	15	0	1	0	1	0	1	0	15
454			min	-2172.084	3	-4.078	4	0	1	0	1	0	1	-.001	4
455		19	max	5050.034	2	-1.079	15	0	1	0	1	0	1	0	1
456			min	-2172.215	3	-4.588	4	0	1	0	1	0	1	0	1
457	M9	1	max	1761.91	2	4.588	4	27.153	3	.041	2	.003	3	0	1
458			min	-628.639	3	1.079	15	-61.634	2	-.02	3	-.005	2	0	1
459		2	max	1761.736	2	4.078	4	27.153	3	.041	2	.011	3	0	15
460			min	-628.77	3	.959	15	-61.634	2	-.02	3	-.023	2	-.001	4
461		3	max	1761.562	2	3.569	4	27.153	3	.041	2	.019	3	0	15
462			min	-628.9	3	.839	15	-61.634	2	-.02	3	-.041	2	-.002	4
463		4	max	1761.387	2	3.059	4	27.153	3	.041	2	.027	3	0	15
464			min	-629.031	3	.719	15	-61.634	2	-.02	3	-.059	2	-.003	4
465		5	max	1761.213	2	2.549	4	27.153	3	.041	2	.035	3	0	15
466			min	-629.162	3	.599	15	-61.634	2	-.02	3	-.077	2	-.004	4
467		6	max	1761.038	2	2.039	4	27.153	3	.041	2	.043	3	-.001	15
468			min	-629.293	3	.479	15	-61.634	2	-.02	3	-.095	2	-.005	4
469		7	max	1760.864	2	1.529	4	27.153	3	.041	2	.05	3	-.001	15
470			min	-629.424	3	.36	15	-61.634	2	-.02	3	-.113	2	-.005	4
471		8	max	1760.69	2	1.02	4	27.153	3	.041	2	.058	3	-.001	15
472			min	-629.554	3	.24	15	-61.634	2	-.02	3	-.131	2	-.006	4
473		9	max	1760.515	2	.51	4	27.153	3	.041	2	.066	3	-.001	15
474			min	-629.685	3	.12	15	-61.634	2	-.02	3	-.149	2	-.006	4
475		10	max	1760.341	2	0	1	27.153	3	.041	2	.074	3	-.001	15
476			min	-629.816	3	0	1	-61.634	2	-.02	3	-.167	2	-.006	4
477		11	max	1760.166	2	-.12	15	27.153	3	.041	2	.082	3	-.001	15
478			min	-629.947	3	-.51	4	-61.634	2	-.02	3	-.185	2	-.006	4
479		12	max	1759.992	2	-.24	15	27.153	3	.041	2	.09	3	-.001	15
480			min	-630.078	3	-1.02	4	-61.634	2	-.02	3	-.204	2	-.006	4
481		13	max	1759.818	2	-.36	15	27.153	3	.041	2	.098	3	-.001	15
482			min	-630.208	3	-1.529	4	-61.634	2	-.02	3	-.222	2	-.005	4
483		14	max	1759.643	2	-.479	15	27.153	3	.041	2	.106	3	-.001	15
484			min	-630.339	3	-2.039	4	-61.634	2	-.02	3	-.24	2	-.005	4
485		15	max	1759.469	2	-.599	15	27.153	3	.041	2	.114	3	0	15
486			min	-630.47	3	-2.549	4	-61.634	2	-.02	3	-.258	2	-.004	4
487		16	max	1759.295	2	-.719	15	27.153	3	.041	2	.122	3	0	15
488			min	-630.601	3	-3.059	4	-61.634	2	-.02	3	-.276	2	-.003	4



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Designer : HCV
Job Number :
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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
489	17	max	1759.12	2	-.839	15	27.153	3	.041	2	.13	3	0	15
490		min	-630.732	3	-3.569	4	-61.634	2	-.02	3	-.294	2	-.002	4
491	18	max	1758.946	2	-.959	15	27.153	3	.041	2	.138	3	0	15
492		min	-630.862	3	-4.078	4	-61.634	2	-.02	3	-.312	2	-.001	4
493	19	max	1758.771	2	-1.079	15	27.153	3	.041	2	.146	3	0	1
494		min	-630.993	3	-4.588	4	-61.634	2	-.02	3	-.33	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	15	-.009	3	.024	1	9.999e-3	3	NC	3	NC	3
2		min	1	1	-.249	1	0	15	-2.554e-2	2	201.26	1	2949.914	1
3		2	max	15	-.009	3	.007	1	9.999e-3	3	8831.667	12	NC	3
4		min	1	1	-.249	1	0	15	-2.554e-2	2	234.959	1	4681.941	1
5		3	max	15	-.009	12	0	15	9.478e-3	3	7791.806	15	NC	2
6		min	1	1	-.249	1	-.007	1	-2.368e-2	2	282.269	1	9460.288	1
7		4	max	15	-.009	15	0	15	8.68e-3	3	9225.878	15	NC	1
8		min	1	1	-.249	1	-.013	1	-2.083e-2	2	350.228	1	NC	1
9		5	max	15	-.009	15	0	3	7.882e-3	3	NC	15	NC	1
10		min	1	1	-.249	1	-.014	1	-1.797e-2	2	447.669	1	NC	1
11		6	max	15	-.009	15	.001	3	7.955e-3	3	NC	15	NC	1
12		min	1	1	-.248	1	-.011	1	-1.708e-2	2	581.545	1	NC	1
13		7	max	15	-.009	15	.002	3	8.631e-3	3	NC	5	NC	2
14		min	1	1	-.248	1	-.005	1	-1.753e-2	2	764.001	1	8410.657	1
15		8	max	15	-.009	15	0	3	9.307e-3	3	NC	5	NC	2
16		min	1	1	-.247	1	-.001	2	-1.798e-2	2	1035.088	1	6411.844	1
17		9	max	15	-.009	15	0	15	1.024e-2	3	NC	2	NC	2
18		min	1	3	-.247	3	0	3	-1.745e-2	2	1218.477	3	6336.971	1
19		10	max	15	-.009	2	0	2	1.164e-2	3	NC	5	NC	2
20		min	1	3	-.246	3	0	3	-1.517e-2	2	1305.488	3	6150.554	1
21		11	max	15	-.009	2	.001	3	1.304e-2	3	NC	1	NC	2
22		min	1	3	-.246	3	0	2	-1.289e-2	2	1470.135	3	6483.777	1
23		12	max	15	-.009	1	.006	3	1.074e-2	3	NC	4	NC	2
24		min	1	3	-.245	3	-.006	1	-9.497e-3	2	1749.287	2	8611.346	1
25		13	max	15	-.009	1	.011	3	6.337e-3	3	NC	4	NC	2
26		min	1	3	-.245	3	-.007	2	-5.479e-3	2	1388.993	2	9131.683	1
27		14	max	15	-.009	1	.011	3	2.15e-3	3	NC	3	NC	2
28		min	1	15	-.244	15	-.004	2	-1.625e-3	1	1274.198	2	6665.548	1
29		15	max	15	-.009	1	.007	3	7.323e-3	3	NC	4	NC	2
30		min	1	15	-.244	15	0	10	-4.418e-3	2	1359.188	2	4815.735	1
31		16	max	15	-.009	3	.01	1	1.25e-2	3	NC	4	NC	3
32		min	1	15	-.244	15	0	15	-7.224e-3	2	945.85	3	4288.406	1
33		17	max	15	-.009	3	.006	1	1.767e-2	3	NC	4	NC	3
34		min	1	15	-.244	15	0	15	-1.003e-2	2	569.827	3	4844.124	1
35		18	max	15	-.009	3	0	15	2.104e-2	3	NC	4	NC	2
36		min	1	10	-.244	10	-.006	1	-1.186e-2	2	402.571	3	8915.738	1
37		19	max	15	-.009	3	0	15	2.104e-2	3	NC	1	NC	1
38		min	1	10	-.244	10	-.021	1	-1.186e-2	2	311.319	3	NC	1
39	M4	1	max	15	-.016	3	0	1	0	1	NC	3	NC	1
40		min	1	1	-.515	1	0	1	0	1	100.072	1	NC	1
41		2	max	15	-.016	3	0	1	0	1	3992.221	15	NC	1
42		min	1	1	-.515	1	0	1	0	1	120.064	1	NC	1
43		3	max	15	-.016	3	0	1	0	1	4817.124	15	NC	1
44		min	1	1	-.515	1	0	1	0	1	150.131	1	NC	1
45		4	max	15	-.016	3	0	1	0	1	6021.337	15	NC	1
46		min	1	1	-.515	1	0	1	0	1	197.816	1	NC	1



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

Sept 14, 2015

Checked By: _____

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
47		5	max	-.016	15	-.016	15	0	1	0	1	7790.07	15	NC	1
48			min	-.514	1	-.54	1	0	1	0	1	276.047	1	NC	1
49		6	max	-.016	15	-.012	15	0	1	0	1	NC	15	NC	1
50			min	-.514	1	-.387	1	0	1	0	1	402.672	3	NC	1
51		7	max	-.016	15	-.009	15	0	1	0	1	NC	15	NC	1
52			min	-.512	1	-.27	1	0	1	0	1	381.109	3	NC	1
53		8	max	-.016	15	-.006	15	0	1	0	1	NC	2	NC	1
54			min	-.511	1	-.176	1	0	1	0	1	376.481	3	NC	1
55		9	max	-.016	15	-.003	15	0	1	0	1	NC	5	NC	1
56			min	-.51	1	-.126	3	0	1	0	1	380.59	3	NC	1
57		10	max	-.016	15	.003	10	0	1	0	1	NC	4	NC	1
58			min	-.509	1	-.117	3	0	1	0	1	390.584	3	NC	1
59		11	max	-.016	15	.071	1	0	1	0	1	NC	4	NC	1
60			min	-.507	1	-.1	3	0	1	0	1	410.684	3	NC	1
61		12	max	-.016	15	.144	1	0	1	0	1	NC	5	NC	1
62			min	-.506	1	-.074	3	0	1	0	1	446.777	3	NC	1
63		13	max	-.016	15	.202	1	0	1	0	1	NC	5	NC	1
64			min	-.504	1	-.024	3	0	1	0	1	423.557	2	NC	1
65		14	max	-.016	15	.23	1	0	1	0	1	NC	5	NC	1
66			min	-.503	1	.007	15	0	1	0	1	401.483	2	NC	1
67		15	max	-.016	15	.222	3	0	1	0	1	NC	3	NC	1
68			min	-.503	1	.007	15	0	1	0	1	435.498	2	NC	1
69		16	max	-.016	15	.421	3	0	1	0	1	NC	5	NC	1
70			min	-.503	1	.006	15	0	1	0	1	537.432	2	NC	1
71		17	max	-.016	15	.647	3	0	1	0	1	NC	5	NC	1
72			min	-.503	1	.005	15	0	1	0	1	318.459	3	NC	1
73		18	max	-.016	15	.884	3	0	1	0	1	NC	4	NC	1
74			min	-.504	1	-.05	2	0	1	0	1	203.88	3	NC	1
75		19	max	-.016	15	1.12	3	0	1	0	1	NC	1	NC	1
76			min	-.504	1	-.136	2	0	1	0	1	150.047	3	NC	1
77	M7	1	max	-.009	15	.045	3	0	15	2.554e-2	2	NC	3	NC	3
78			min	-.249	1	-.62	1	-.024	1	-9.999e-3	3	201.26	1	2949.914	1
79		2	max	-.009	15	.019	3	0	15	2.554e-2	2	8831.667	12	NC	3
80			min	-.249	1	-.524	1	-.007	1	-9.999e-3	3	234.959	1	4681.941	1
81		3	max	-.009	15	-.006	12	.007	1	2.368e-2	2	7791.806	15	NC	2
82			min	-.249	1	-.429	1	0	15	-9.478e-3	3	282.269	1	9460.288	1
83		4	max	-.009	15	-.011	15	.013	1	2.083e-2	2	9225.878	15	NC	1
84			min	-.249	1	-.336	1	0	15	-8.68e-3	3	350.228	1	NC	1
85		5	max	-.009	15	-.009	15	.014	1	1.797e-2	2	NC	15	NC	1
86			min	-.249	1	-.253	1	0	3	-7.882e-3	3	447.669	1	NC	1
87		6	max	-.009	15	-.007	15	.011	1	1.708e-2	2	NC	15	NC	1
88			min	-.248	1	-.184	1	-.001	3	-7.955e-3	3	581.545	1	NC	1
89		7	max	-.009	15	-.005	15	.005	1	1.753e-2	2	NC	5	NC	2
90			min	-.248	1	-.129	1	-.002	3	-8.631e-3	3	764.001	1	8410.657	1
91		8	max	-.009	15	-.003	15	.001	2	1.798e-2	2	NC	5	NC	2
92			min	-.247	1	-.083	1	0	3	-9.307e-3	3	1035.088	1	6411.844	1
93		9	max	-.009	15	-.002	15	0	3	1.745e-2	2	NC	2	NC	2
94			min	-.247	1	-.065	3	0	15	-1.024e-2	3	1218.477	3	6336.971	1
95		10	max	-.009	15	.005	2	0	3	1.517e-2	2	NC	5	NC	2
96			min	-.246	1	-.058	3	0	2	-1.164e-2	3	1305.488	3	6150.554	1
97		11	max	-.009	15	.035	2	0	2	1.289e-2	2	NC	1	NC	2
98			min	-.246	1	-.046	3	-.001	3	-1.304e-2	3	1470.135	3	6483.777	1
99		12	max	-.009	15	.068	1	.006	1	9.497e-3	2	NC	4	NC	2
100			min	-.245	1	-.03	3	-.006	3	-1.074e-2	3	1749.287	2	8611.346	1
101		13	max	-.009	15	.096	1	.007	2	5.479e-3	2	NC	4	NC	2
102			min	-.245	1	-.004	3	-.011	3	-6.337e-3	3	1388.993	2	9131.683	1
103		14	max	-.009	15	.112	1	.004	2	1.625e-3	1	NC	3	NC	2



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
104			min	-.244	1	.004	15	-.011	3	-2.15e-3	3	1274.198	2	6665.548	1
105		15	max	-.009	15	.113	1	0	10	4.418e-3	2	NC	4	NC	2
106			min	-.244	1	.004	15	-.007	3	-7.323e-3	3	1359.188	2	4815.735	1
107		16	max	-.009	15	.187	3	0	15	7.224e-3	2	NC	4	NC	3
108			min	-.244	1	.004	15	-.01	1	-1.25e-2	3	945.85	3	4288.406	1
109		17	max	-.009	15	.28	3	0	15	1.003e-2	2	NC	4	NC	3
110			min	-.244	1	.004	15	-.006	1	-1.767e-2	3	569.827	3	4844.124	1
111		18	max	-.009	15	.378	3	.006	1	1.186e-2	2	NC	4	NC	2
112			min	-.244	1	-.003	10	0	15	-2.104e-2	3	402.571	3	8915.738	1
113		19	max	-.009	15	.476	3	.021	1	1.186e-2	2	NC	1	NC	1
114			min	-.244	1	-.018	10	0	15	-2.104e-2	3	311.319	3	NC	1
115	M10	1	max	.001	1	.344	3	.244	1	1.311e-2	3	NC	1	NC	1
116			min	0	15	.003	10	.009	15	-3.724e-3	2	NC	1	NC	1
117		2	max	0	1	.618	3	.293	1	1.517e-2	3	NC	5	NC	3
118			min	0	15	-.131	2	.01	15	-4.583e-3	2	830.942	3	4701.065	1
119		3	max	0	1	.872	3	.367	1	1.723e-2	3	NC	5	NC	3
120			min	0	15	-.267	2	.013	15	-5.442e-3	2	431.857	3	1853.106	1
121		4	max	0	1	1.062	3	.444	1	1.93e-2	3	NC	5	NC	5
122			min	0	15	-.357	2	.016	15	-6.3e-3	2	317.333	3	1143.207	1
123		5	max	0	1	1.166	3	.505	1	2.136e-2	3	NC	5	NC	5
124			min	0	15	-.389	2	.018	15	-7.159e-3	2	277.403	3	874.225	1
125		6	max	0	1	1.176	3	.542	1	2.342e-2	3	NC	5	NC	5
126			min	0	15	-.359	2	.019	15	-8.018e-3	2	273.956	3	766.408	1
127		7	max	0	1	1.106	3	.551	1	2.549e-2	3	NC	5	NC	5
128			min	0	15	-.278	2	.019	15	-8.877e-3	2	299.342	3	742.334	1
129		8	max	0	1	.984	3	.539	1	2.755e-2	3	NC	5	NC	5
130			min	0	15	-.169	2	.018	15	-9.736e-3	2	356.001	3	773.808	1
131		9	max	0	1	.861	3	.517	1	2.961e-2	3	NC	4	NC	5
132			min	0	15	-.067	2	.016	15	-1.06e-2	2	441.023	3	837.67	1
133		10	max	0	1	.802	3	.504	1	3.168e-2	3	NC	4	NC	5
134			min	0	1	-.024	10	.016	15	-1.145e-2	2	498.045	3	879.673	1
135		11	max	0	15	.861	3	.517	1	2.961e-2	3	NC	4	NC	5
136			min	0	1	-.067	2	.016	15	-1.06e-2	2	441.023	3	837.67	1
137		12	max	0	15	.984	3	.539	1	2.755e-2	3	NC	5	NC	5
138			min	0	1	-.169	2	.018	15	-9.736e-3	2	356.001	3	773.808	1
139		13	max	0	15	1.106	3	.551	1	2.549e-2	3	NC	5	NC	5
140			min	0	1	-.278	2	.019	15	-8.877e-3	2	299.342	3	742.334	1
141		14	max	0	15	1.176	3	.542	1	2.342e-2	3	NC	5	NC	5
142			min	0	1	-.359	2	.019	15	-8.018e-3	2	273.956	3	766.408	1
143		15	max	0	15	1.166	3	.505	1	2.136e-2	3	NC	5	NC	5
144			min	0	1	-.389	2	.018	15	-7.159e-3	2	277.403	3	874.225	1
145		16	max	0	15	1.062	3	.444	1	1.93e-2	3	NC	5	NC	5
146			min	0	1	-.357	2	.016	15	-6.3e-3	2	317.333	3	1143.207	1
147		17	max	0	15	.872	3	.367	1	1.723e-2	3	NC	5	NC	3
148			min	0	1	-.267	2	.013	15	-5.442e-3	2	431.857	3	1853.106	1
149		18	max	0	15	.618	3	.293	1	1.517e-2	3	NC	5	NC	3
150			min	0	1	-.131	2	.01	15	-4.583e-3	2	830.942	3	4701.065	1
151		19	max	0	15	.344	3	.244	1	1.311e-2	3	NC	1	NC	1
152			min	-.001	1	.003	10	.009	15	-3.724e-3	2	NC	1	NC	1
153	M11	1	max	.002	1	.047	1	.246	1	4.576e-3	1	NC	1	NC	1
154			min	-.003	3	-.041	3	.009	15	1.656e-4	15	NC	1	NC	1
155		2	max	.002	1	.141	3	.283	1	5.169e-3	1	NC	5	NC	3
156			min	-.002	3	-.107	2	.01	15	1.814e-4	15	1253.619	3	6120.699	1
157		3	max	.002	1	.308	3	.352	1	5.763e-3	1	NC	5	NC	3
158			min	-.002	3	-.236	2	.012	15	1.973e-4	15	653.622	3	2151.816	1
159		4	max	.002	1	.419	3	.427	1	6.356e-3	1	NC	5	NC	3
160			min	-.002	3	-.314	2	.015	15	2.131e-4	15	495.675	3	1260.686	1



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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
161		5	max	.001	1	.452	3	.49	1	6.949e-3	1	NC	5	NC	3
162			min	-.001	3	-.331	2	.017	15	2.289e-4	15	462.872	3	934.639	1
163		6	max	.001	1	.401	3	.53	1	7.543e-3	1	NC	5	NC	5
164			min	-.001	3	-.286	2	.018	15	2.448e-4	15	515.855	3	801.405	1
165		7	max	0	1	.281	3	.545	1	8.136e-3	1	NC	5	NC	5
166			min	0	3	-.19	2	.018	15	2.606e-4	15	708.759	3	762.385	1
167		8	max	0	1	.122	3	.537	1	8.729e-3	1	NC	4	NC	5
168			min	0	3	-.068	2	.017	15	2.764e-4	15	1396.221	3	782.332	1
169		9	max	0	1	.049	1	.518	1	9.323e-3	1	NC	1	NC	5
170			min	0	3	-.024	3	.016	15	2.923e-4	15	NC	1	836.081	1
171		10	max	0	1	.098	1	.507	1	9.916e-3	1	NC	4	NC	5
172			min	0	1	-.092	3	.016	15	3.081e-4	15	4466.966	1	872.892	1
173		11	max	0	3	.049	1	.518	1	9.323e-3	1	NC	1	NC	5
174			min	0	1	-.024	3	.016	15	2.923e-4	15	NC	1	836.081	1
175		12	max	0	3	.122	3	.537	1	8.729e-3	1	NC	4	NC	5
176			min	0	1	-.068	2	.017	15	2.764e-4	15	1396.221	3	782.332	1
177		13	max	0	3	.281	3	.545	1	8.136e-3	1	NC	5	NC	5
178			min	0	1	-.19	2	.018	15	2.606e-4	15	708.759	3	762.385	1
179		14	max	.001	3	.401	3	.53	1	7.543e-3	1	NC	5	NC	5
180			min	-.001	1	-.286	2	.018	15	2.448e-4	15	515.855	3	801.405	1
181		15	max	.001	3	.452	3	.49	1	6.949e-3	1	NC	5	NC	3
182			min	-.001	1	-.331	2	.017	15	2.289e-4	15	462.872	3	934.639	1
183		16	max	.002	3	.419	3	.427	1	6.356e-3	1	NC	5	NC	3
184			min	-.002	1	-.314	2	.015	15	2.131e-4	15	495.675	3	1260.686	1
185		17	max	.002	3	.308	3	.352	1	5.763e-3	1	NC	5	NC	3
186			min	-.002	1	-.236	2	.012	15	1.973e-4	15	653.622	3	2151.816	1
187		18	max	.002	3	.141	3	.283	1	5.169e-3	1	NC	5	NC	3
188			min	-.002	1	-.107	2	.01	15	1.814e-4	15	1253.619	3	6120.699	1
189		19	max	.003	3	.047	1	.246	1	4.576e-3	1	NC	1	NC	1
190			min	-.002	1	-.041	3	.009	15	1.656e-4	15	NC	1	NC	1
191	M12	1	max	0	2	-.002	15	.247	1	5.548e-3	1	NC	1	NC	1
192			min	0	9	-.067	3	.009	15	1.946e-4	15	NC	1	NC	1
193		2	max	0	2	.05	3	.278	1	6.197e-3	1	NC	5	NC	2
194			min	0	9	-.27	2	.01	15	2.125e-4	15	985.65	2	7381.555	1
195		3	max	0	2	.14	3	.343	1	6.846e-3	1	NC	5	NC	3
196			min	0	9	-.469	2	.012	15	2.303e-4	15	529.99	2	2365.833	1
197		4	max	0	2	.189	3	.418	1	7.496e-3	1	NC	5	NC	3
198			min	0	9	-.599	2	.015	15	2.481e-4	15	407.021	2	1336.86	1
199		5	max	0	2	.193	3	.482	1	8.145e-3	1	NC	5	NC	5
200			min	0	9	-.641	2	.017	15	2.659e-4	15	378.555	2	971.108	1
201		6	max	0	2	.152	3	.525	1	8.794e-3	1	NC	5	NC	5
202			min	0	9	-.594	2	.018	15	2.838e-4	15	410.699	2	821.005	1
203		7	max	0	2	.078	3	.542	1	9.443e-3	1	NC	5	NC	5
204			min	0	9	-.473	2	.018	15	3.016e-4	15	524.313	2	772.29	1
205		8	max	0	2	-.008	15	.538	1	1.009e-2	1	NC	5	NC	5
206			min	0	9	-.314	2	.017	15	3.194e-4	15	828.994	2	784.84	1
207		9	max	0	2	-.005	15	.521	1	1.074e-2	1	NC	4	NC	5
208			min	0	9	-.18	1	.016	15	3.372e-4	15	1797.568	2	832.165	1
209		10	max	0	1	-.004	15	.51	1	1.139e-2	1	NC	4	NC	5
210			min	0	1	-.128	3	.016	15	3.551e-4	15	3487.228	1	865.702	1
211		11	max	0	9	-.005	15	.521	1	1.074e-2	1	NC	4	NC	5
212			min	0	2	-.18	1	.016	15	3.372e-4	15	1797.568	2	832.165	1
213		12	max	0	9	-.008	15	.538	1	1.009e-2	1	NC	5	NC	5
214			min	0	2	-.314	2	.017	15	3.194e-4	15	828.994	2	784.84	1
215		13	max	0	9	.078	3	.542	1	9.443e-3	1	NC	5	NC	5
216			min	0	2	-.473	2	.018	15	3.016e-4	15	524.313	2	772.29	1
217		14	max	0	9	.152	3	.525	1	8.794e-3	1	NC	5	NC	5



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

Sept 14, 2015

Checked By: _____

Envelope Member Section Deflections (Continued)

Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
218		min	0	2	-.594	2	.018	15	2.838e-4	15	410.699	2	821.005	1
219	15	max	0	9	-.193	3	.482	1	8.145e-3	1	NC	5	NC	5
220		min	0	2	-.641	2	.017	15	2.659e-4	15	378.555	2	971.108	1
221	16	max	0	9	.189	3	.418	1	7.496e-3	1	NC	5	NC	3
222		min	0	2	-.599	2	.015	15	2.481e-4	15	407.021	2	1336.86	1
223	17	max	0	9	.14	3	.343	1	6.846e-3	1	NC	5	NC	3
224		min	0	2	-.469	2	.012	15	2.303e-4	15	529.99	2	2365.833	1
225	18	max	0	9	.05	3	.278	1	6.197e-3	1	NC	5	NC	2
226		min	0	2	-.27	2	.01	15	2.125e-4	15	985.65	2	7381.555	1
227	19	max	0	9	-.002	15	.247	1	5.548e-3	1	NC	1	NC	1
228		min	0	2	-.067	3	.009	15	1.946e-4	15	NC	1	NC	1
229	M13	1	max	0	.01	3	.249	1	1.292e-2	2	NC	1	NC	1
230		min	-.001	1	-.491	1	.009	15	-3.475e-3	3	NC	1	NC	1
231	2	max	0	12	.135	3	.3	1	1.501e-2	2	NC	5	NC	3
232		min	-.001	1	-.777	1	.011	15	-4.262e-3	3	704.923	2	4460.332	1
233	3	max	0	12	.242	3	.376	1	1.71e-2	2	NC	5	NC	3
234		min	-.001	1	-1.064	2	.013	15	-5.049e-3	3	372.04	2	1787.604	1
235	4	max	0	12	.315	3	.454	1	1.92e-2	2	NC	15	NC	3
236		min	0	1	-1.28	2	.016	15	-5.835e-3	3	274.942	2	1110.987	1
237	5	max	0	12	.345	3	.516	1	2.129e-2	2	NC	15	NC	5
238		min	0	1	-1.402	2	.018	15	-6.622e-3	3	239.668	2	852.787	1
239	6	max	0	12	.332	3	.553	1	2.338e-2	2	NC	15	NC	5
240		min	0	1	-1.426	2	.019	15	-7.409e-3	3	233.819	2	748.943	1
241	7	max	0	12	.284	3	.563	1	2.547e-2	2	NC	15	NC	5
242		min	0	1	-1.365	2	.019	15	-8.195e-3	3	249.373	2	725.703	1
243	8	max	0	12	.216	3	.55	1	2.756e-2	2	NC	15	NC	5
244		min	0	1	-1.251	2	.018	15	-8.982e-3	3	284.991	2	755.921	1
245	9	max	0	12	.15	3	.528	1	2.966e-2	2	NC	15	NC	5
246		min	0	1	-1.141	1	.017	15	-9.768e-3	3	334.801	2	817.108	1
247	10	max	0	1	.12	3	.515	1	3.175e-2	2	NC	15	NC	5
248		min	0	1	-1.093	1	.016	15	-1.055e-2	3	365.718	2	857.24	1
249	11	max	0	1	.15	3	.528	1	2.966e-2	2	NC	15	NC	5
250		min	0	12	-1.141	1	.017	15	-9.768e-3	3	334.801	2	817.108	1
251	12	max	0	1	.216	3	.55	1	2.756e-2	2	NC	15	NC	5
252		min	0	12	-1.251	2	.018	15	-8.982e-3	3	284.991	2	755.921	1
253	13	max	0	1	.284	3	.563	1	2.547e-2	2	NC	15	NC	5
254		min	0	12	-1.365	2	.019	15	-8.195e-3	3	249.373	2	725.703	1
255	14	max	0	1	.332	3	.553	1	2.338e-2	2	NC	15	NC	5
256		min	0	12	-1.426	2	.019	15	-7.409e-3	3	233.819	2	748.943	1
257	15	max	0	1	.345	3	.516	1	2.129e-2	2	NC	15	NC	5
258		min	0	12	-1.402	2	.018	15	-6.622e-3	3	239.668	2	852.787	1
259	16	max	0	1	.315	3	.454	1	1.92e-2	2	NC	15	NC	3
260		min	0	12	-1.28	2	.016	15	-5.835e-3	3	274.942	2	1110.987	1
261	17	max	.001	1	.242	3	.376	1	1.71e-2	2	NC	5	NC	3
262		min	0	12	-1.064	2	.013	15	-5.049e-3	3	372.04	2	1787.604	1
263	18	max	.001	1	.135	3	.3	1	1.501e-2	2	NC	5	NC	3
264		min	0	12	-.777	1	.011	15	-4.262e-3	3	704.923	2	4460.332	1
265	19	max	.001	1	.01	3	.249	1	1.292e-2	2	NC	1	NC	1
266		min	0	12	-.491	1	.009	15	-3.475e-3	3	NC	1	NC	1
267	M2	1	max	0	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	3	2.717e-3	2	NC	1	NC	1
270		min	0	2	-.001	1	0	1	-1.206e-3	3	NC	1	NC	1
271	3	max	0	3	0	15	0	3	5.435e-3	2	NC	1	NC	1
272		min	0	2	-.004	1	0	1	-2.413e-3	3	NC	1	NC	1
273	4	max	0	3	0	15	.001	3	6.364e-3	2	NC	3	NC	1
274		min	0	1	-.01	1	-.001	1	-2.797e-3	3	6219.587	1	NC	1



Company : Schletter, Inc.
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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
275	5	max	0	3	0	15	.002	3	5.842e-3	2	NC	4	NC	1
276		min	0	1	-.017	1	-.002	1	-2.513e-3	3	3476.868	1	NC	1
277	6	max	0	3	0	15	.003	3	5.319e-3	2	NC	5	NC	1
278		min	0	1	-.027	1	-.003	1	-2.23e-3	3	2235.968	1	9584.325	3
279	7	max	0	3	-.001	15	.004	3	4.797e-3	2	NC	5	NC	1
280		min	0	1	-.039	1	-.004	1	-1.946e-3	3	1569.581	1	7690.522	3
281	8	max	0	3	-.002	15	.005	3	4.275e-3	2	NC	5	NC	1
282		min	0	1	-.052	1	-.005	1	-1.662e-3	3	1169.685	1	6470.116	3
283	9	max	0	3	-.002	15	.006	3	3.752e-3	2	NC	5	NC	4
284		min	0	1	-.067	1	-.005	1	-1.379e-3	3	910.443	1	5659.079	3
285	10	max	0	3	-.003	15	.006	3	3.23e-3	2	NC	5	NC	4
286		min	0	1	-.083	1	-.006	1	-1.095e-3	3	732.52	1	5121.376	3
287	11	max	0	3	-.004	15	.006	3	2.708e-3	2	NC	5	NC	4
288		min	0	1	-.1	1	-.007	1	-8.113e-4	3	604.973	1	4784.963	3
289	12	max	0	3	-.004	15	.006	3	2.185e-3	2	NC	15	NC	4
290		min	-.001	1	-.119	1	-.007	1	-5.277e-4	3	510.36	1	4614.77	3
291	13	max	0	3	-.005	15	.006	3	1.663e-3	2	NC	15	NC	4
292		min	-.001	1	-.138	1	-.007	1	-2.44e-4	3	438.186	1	4604.624	3
293	14	max	.001	3	-.006	15	.005	3	1.141e-3	2	NC	15	NC	4
294		min	-.001	1	-.159	1	-.007	1	5.904e-6	15	381.847	1	4779.865	3
295	15	max	.001	3	-.006	15	.003	3	6.184e-4	2	9498.117	15	NC	4
296		min	-.001	1	-.18	1	-.006	1	-8.963e-5	9	337.011	1	5220.526	3
297	16	max	.001	3	-.007	15	0	3	6.069e-4	3	8480.293	15	NC	4
298		min	-.001	1	-.202	1	-.005	1	-2.854e-4	1	300.752	1	6135.003	3
299	17	max	.001	3	-.008	15	0	15	8.905e-4	3	7645.15	15	NC	1
300		min	-.002	1	-.224	1	-.003	1	-7.71e-4	1	271.024	1	8172.427	3
301	18	max	.001	3	-.009	15	.001	2	1.174e-3	3	6951.839	15	NC	1
302		min	-.002	1	-.246	1	-.007	3	-1.257e-3	1	246.361	1	NC	1
303	19	max	.001	3	-.01	15	.004	2	1.458e-3	3	6370.49	15	NC	1
304		min	-.002	1	-.269	1	-.011	3	-1.742e-3	1	225.693	1	NC	1
305	M5	1	max	0	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	1	0	1	NC	1	NC	1
308		min	0	2	-.002	1	0	1	0	1	NC	1	NC	1
309	3	max	0	3	0	15	0	1	0	1	NC	3	NC	1
310		min	0	2	-.008	1	0	1	0	1	7467.193	1	NC	1
311	4	max	0	3	0	15	0	1	0	1	NC	4	NC	1
312		min	0	2	-.019	1	0	1	0	1	3168.508	1	NC	1
313	5	max	.001	3	-.001	15	0	1	0	1	NC	5	NC	1
314		min	-.001	2	-.035	1	0	1	0	1	1742.962	1	NC	1
315	6	max	.001	3	-.002	15	0	1	0	1	NC	5	NC	1
316		min	-.001	2	-.055	1	0	1	0	1	1110.831	1	NC	1
317	7	max	.002	3	-.002	15	0	1	0	1	NC	5	NC	1
318		min	-.002	2	-.078	1	0	1	0	1	775.305	1	NC	1
319	8	max	.002	3	-.003	15	0	1	0	1	NC	5	NC	1
320		min	-.002	1	-.105	1	0	1	0	1	575.487	1	NC	1
321	9	max	.002	3	-.004	15	0	1	0	1	NC	15	NC	1
322		min	-.002	1	-.136	1	0	1	0	1	446.644	1	NC	1
323	10	max	.002	3	-.005	15	0	1	0	1	NC	15	NC	1
324		min	-.002	1	-.169	1	0	1	0	1	358.57	1	NC	1
325	11	max	.002	3	-.006	15	0	1	0	1	9443.006	15	NC	1
326		min	-.003	1	-.205	1	0	1	0	1	295.626	1	NC	1
327	12	max	.003	3	-.008	15	0	1	0	1	7966.451	15	NC	1
328		min	-.003	1	-.243	1	0	1	0	1	249.049	1	NC	1
329	13	max	.003	3	-.009	15	0	1	0	1	6840.035	15	NC	1
330		min	-.003	1	-.284	1	0	1	0	1	213.589	1	NC	1
331	14	max	.003	3	-.01	15	0	1	0	1	5960.727	15	NC	1



Company : Schletter, Inc.
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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
332		min	-.003	1	-.326	1	0	1	0	1	185.955	1	NC	1
333	15	max	.003	3	-.012	15	0	1	0	1	5260.929	15	NC	1
334		min	-.004	1	-.37	1	0	1	0	1	163.994	1	NC	1
335	16	max	.004	3	-.013	15	0	1	0	1	4694.982	15	NC	1
336		min	-.004	1	-.414	1	0	1	0	1	146.255	1	NC	1
337	17	max	.004	3	-.014	15	0	1	0	1	4230.955	15	NC	1
338		min	-.004	1	-.46	1	0	1	0	1	131.726	1	NC	1
339	18	max	.004	3	-.016	15	0	1	0	1	3845.984	15	NC	1
340		min	-.004	1	-.506	1	0	1	0	1	119.684	1	NC	1
341	19	max	.004	3	-.017	15	0	1	0	1	3523.367	15	NC	1
342		min	-.005	1	-.553	1	0	1	0	1	109.6	1	NC	1
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	15	0	1	1.206e-3	3	NC	1	NC	1
346		min	0	2	-.001	1	0	3	-2.717e-3	2	NC	1	NC	1
347	3	max	0	3	0	15	0	1	2.413e-3	3	NC	1	NC	1
348		min	0	2	-.004	1	0	3	-5.435e-3	2	NC	1	NC	1
349	4	max	0	3	0	15	.001	1	2.797e-3	3	NC	3	NC	1
350		min	0	1	-.01	1	-.001	3	-6.364e-3	2	6219.587	1	NC	1
351	5	max	0	3	0	15	.002	1	2.513e-3	3	NC	4	NC	1
352		min	0	1	-.017	1	-.002	3	-5.842e-3	2	3476.868	1	NC	1
353	6	max	0	3	0	15	.003	1	2.23e-3	3	NC	5	NC	1
354		min	0	1	-.027	1	-.003	3	-5.319e-3	2	2235.968	1	9584.325	3
355	7	max	0	3	-.001	15	.004	1	1.946e-3	3	NC	5	NC	1
356		min	0	1	-.039	1	-.004	3	-4.797e-3	2	1569.581	1	7690.522	3
357	8	max	0	3	-.002	15	.005	1	1.662e-3	3	NC	5	NC	1
358		min	0	1	-.052	1	-.005	3	-4.275e-3	2	1169.685	1	6470.116	3
359	9	max	0	3	-.002	15	.005	1	1.379e-3	3	NC	5	NC	4
360		min	0	1	-.067	1	-.006	3	-3.752e-3	2	910.443	1	5659.079	3
361	10	max	0	3	-.003	15	.006	1	1.095e-3	3	NC	5	NC	4
362		min	0	1	-.083	1	-.006	3	-3.23e-3	2	732.52	1	5121.376	3
363	11	max	0	3	-.004	15	.007	1	8.113e-4	3	NC	5	NC	4
364		min	0	1	-.1	1	-.006	3	-2.708e-3	2	604.973	1	4784.963	3
365	12	max	0	3	-.004	15	.007	1	5.277e-4	3	NC	15	NC	4
366		min	-.001	1	-.119	1	-.006	3	-2.185e-3	2	510.36	1	4614.77	3
367	13	max	0	3	-.005	15	.007	1	2.44e-4	3	NC	15	NC	4
368		min	-.001	1	-.138	1	-.006	3	-1.663e-3	2	438.186	1	4604.624	3
369	14	max	.001	3	-.006	15	.007	1	-5.904e-6	15	NC	15	NC	4
370		min	-.001	1	-.159	1	-.005	3	-1.141e-3	2	381.847	1	4779.865	3
371	15	max	.001	3	-.006	15	.006	1	8.963e-5	9	9498.117	15	NC	4
372		min	-.001	1	-.18	1	-.003	3	-6.184e-4	2	337.011	1	5220.526	3
373	16	max	.001	3	-.007	15	.005	1	2.854e-4	1	8480.293	15	NC	4
374		min	-.001	1	-.202	1	0	3	-6.069e-4	3	300.752	1	6135.003	3
375	17	max	.001	3	-.008	15	.003	1	7.71e-4	1	7645.15	15	NC	1
376		min	-.002	1	-.224	1	0	15	-8.905e-4	3	271.024	1	8172.427	3
377	18	max	.001	3	-.009	15	.007	3	1.257e-3	1	6951.839	15	NC	1
378		min	-.002	1	-.246	1	-.001	2	-1.174e-3	3	246.361	1	NC	1
379	19	max	.001	3	-.01	15	.011	3	1.742e-3	1	6370.49	15	NC	1
380		min	-.002	1	-.269	1	-.004	2	-1.458e-3	3	225.693	1	NC	1
381	M3	1	max	.006	1	0	15	0	2.53e-3	2	NC	1	NC	1
382		min	0	15	-.003	1	0	1	-1.007e-3	3	NC	1	NC	1
383	2	max	.005	1	0	15	.011	3	3.011e-3	2	NC	1	NC	4
384		min	0	15	-.022	1	-.022	2	-1.239e-3	3	NC	1	2858.678	2
385	3	max	.005	1	-.002	15	.02	3	3.492e-3	2	NC	1	NC	4
386		min	0	15	-.041	1	-.043	2	-1.47e-3	3	NC	1	1445.911	2
387	4	max	.004	1	-.003	15	.029	3	3.973e-3	2	NC	1	NC	5
388		min	0	15	-.06	1	-.063	2	-1.702e-3	3	NC	1	981.193	2



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Job Number :
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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
389	5	max	.004	1	-.003	15	.038	3	4.453e-3	2	NC	1	NC	5
390		min	0	15	-.079	1	-.082	2	-1.934e-3	3	NC	1	753.986	2
391	6	max	.004	3	-.004	15	.046	3	4.934e-3	2	NC	1	NC	5
392		min	0	15	-.097	1	-.099	2	-2.165e-3	3	NC	1	622.377	2
393	7	max	.004	3	-.005	15	.052	3	5.415e-3	2	NC	1	NC	5
394		min	0	10	-.116	1	-.115	2	-2.397e-3	3	NC	1	539.277	2
395	8	max	.004	3	-.006	15	.058	3	5.896e-3	2	NC	1	NC	5
396		min	0	10	-.135	1	-.127	2	-2.628e-3	3	NC	1	484.769	2
397	9	max	.004	3	-.006	15	.063	3	6.376e-3	2	NC	1	NC	5
398		min	0	10	-.153	1	-.137	2	-2.86e-3	3	NC	1	449.227	2
399	10	max	.005	3	-.007	15	.066	3	6.857e-3	2	NC	1	NC	5
400		min	-.001	2	-.172	1	-.143	2	-3.091e-3	3	NC	1	427.762	2
401	11	max	.005	3	-.008	15	.067	3	7.338e-3	2	NC	1	NC	5
402		min	-.002	2	-.19	1	-.146	2	-3.323e-3	3	NC	1	418.108	2
403	12	max	.005	3	-.008	15	.067	3	7.818e-3	2	NC	1	NC	5
404		min	-.002	2	-.208	1	-.145	2	-3.554e-3	3	NC	1	419.856	2
405	13	max	.005	3	-.009	15	.064	3	8.299e-3	2	NC	1	NC	5
406		min	-.003	2	-.227	1	-.139	2	-3.786e-3	3	NC	1	434.468	2
407	14	max	.005	3	-.009	15	.06	3	8.78e-3	2	NC	1	NC	5
408		min	-.003	2	-.245	1	-.129	2	-4.017e-3	3	NC	1	466.157	2
409	15	max	.006	3	-.01	15	.053	3	9.261e-3	2	NC	1	NC	5
410		min	-.004	2	-.263	1	-.113	2	-4.249e-3	3	NC	1	524.615	2
411	16	max	.006	3	-.01	15	.044	3	9.741e-3	2	NC	1	NC	5
412		min	-.005	2	-.28	1	-.092	2	-4.48e-3	3	NC	1	633.581	2
413	17	max	.006	3	-.011	15	.032	3	1.022e-2	2	NC	1	NC	5
414		min	-.005	2	-.298	1	-.065	2	-4.712e-3	3	NC	1	865.423	2
415	18	max	.006	3	-.011	15	.017	3	1.07e-2	2	NC	1	NC	4
416		min	-.006	2	-.316	1	-.031	2	-4.943e-3	3	NC	1	1583.619	2
417	19	max	.006	3	-.012	15	.013	1	1.118e-2	2	NC	1	NC	1
418		min	-.006	2	-.334	1	0	3	-5.175e-3	3	NC	1	NC	1
419	M6	1	max	.011	1	0	15	0	0	1	NC	1	NC	1
420		min	0	15	-.006	1	0	1	0	1	NC	1	NC	1
421	2	max	.01	1	-.002	15	0	1	0	1	NC	1	NC	1
422		min	0	15	-.045	1	0	1	0	1	NC	1	NC	1
423	3	max	.008	1	-.003	15	0	1	0	1	NC	1	NC	1
424		min	0	15	-.084	1	0	1	0	1	NC	1	NC	1
425	4	max	.008	3	-.004	15	0	1	0	1	NC	1	NC	1
426		min	0	15	-.123	1	0	1	0	1	NC	1	NC	1
427	5	max	.008	3	-.006	15	0	1	0	1	NC	1	NC	1
428		min	0	15	-.162	1	0	1	0	1	NC	1	NC	1
429	6	max	.009	3	-.007	15	0	1	0	1	NC	1	NC	1
430		min	0	10	-.201	1	0	1	0	1	NC	1	NC	1
431	7	max	.01	3	-.008	15	0	1	0	1	NC	1	NC	1
432		min	-.002	2	-.239	1	0	1	0	1	NC	1	NC	1
433	8	max	.01	3	-.009	15	0	1	0	1	NC	1	NC	1
434		min	-.003	2	-.278	1	0	1	0	1	NC	1	NC	1
435	9	max	.011	3	-.011	15	0	1	0	1	NC	1	NC	1
436		min	-.005	2	-.317	1	0	1	0	1	NC	1	NC	1
437	10	max	.012	3	-.012	15	0	1	0	1	NC	1	NC	1
438		min	-.007	2	-.355	1	0	1	0	1	NC	1	NC	1
439	11	max	.013	3	-.013	15	0	1	0	1	NC	1	NC	1
440		min	-.008	2	-.394	1	0	1	0	1	NC	1	NC	1
441	12	max	.013	3	-.014	15	0	1	0	1	NC	1	NC	1
442		min	-.01	2	-.432	1	0	1	0	1	NC	1	NC	1
443	13	max	.014	3	-.015	15	0	1	0	1	NC	1	NC	1
444		min	-.012	2	-.47	1	0	1	0	1	NC	1	NC	1
445	14	max	.015	3	-.016	15	0	1	0	1	NC	1	NC	1



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

Sept 14, 2015

Checked By: _____

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
446			min	-.014	2	-.508	1	0	1	0	1	NC	1	NC	1
447		15	max	.016	3	-.017	15	0	1	0	1	NC	1	NC	1
448			min	-.015	2	-.546	1	0	1	0	1	NC	1	NC	1
449		16	max	.016	3	-.018	15	0	1	0	1	NC	1	NC	1
450			min	-.017	2	-.584	1	0	1	0	1	NC	1	NC	1
451		17	max	.017	3	-.019	15	0	1	0	1	NC	1	NC	1
452			min	-.019	2	-.622	1	0	1	0	1	NC	1	NC	1
453		18	max	.018	3	-.02	15	0	1	0	1	NC	1	NC	1
454			min	-.02	2	-.66	1	0	1	0	1	NC	1	NC	1
455		19	max	.019	3	-.021	15	0	1	0	1	NC	1	NC	1
456			min	-.022	2	-.698	1	0	1	0	1	NC	1	NC	1
457	M9	1	max	.006	1	0	15	0	1	1.007e-3	3	NC	1	NC	1
458			min	0	15	-.003	1	0	3	-2.53e-3	2	NC	1	NC	1
459		2	max	.005	1	0	15	.022	2	1.239e-3	3	NC	1	NC	4
460			min	0	15	-.022	1	-.011	3	-3.011e-3	2	NC	1	2858.678	2
461		3	max	.005	1	-.002	15	.043	2	1.47e-3	3	NC	1	NC	4
462			min	0	15	-.041	1	-.02	3	-3.492e-3	2	NC	1	1445.911	2
463		4	max	.004	1	-.003	15	.063	2	1.702e-3	3	NC	1	NC	5
464			min	0	15	-.06	1	-.029	3	-3.973e-3	2	NC	1	981.193	2
465		5	max	.004	1	-.003	15	.082	2	1.934e-3	3	NC	1	NC	5
466			min	0	15	-.079	1	-.038	3	-4.453e-3	2	NC	1	753.986	2
467		6	max	.004	3	-.004	15	.099	2	2.165e-3	3	NC	1	NC	5
468			min	0	15	-.097	1	-.046	3	-4.934e-3	2	NC	1	622.377	2
469		7	max	.004	3	-.005	15	.115	2	2.397e-3	3	NC	1	NC	5
470			min	0	10	-.116	1	-.052	3	-5.415e-3	2	NC	1	539.277	2
471		8	max	.004	3	-.006	15	.127	2	2.628e-3	3	NC	1	NC	5
472			min	0	10	-.135	1	-.058	3	-5.896e-3	2	NC	1	484.769	2
473		9	max	.004	3	-.006	15	.137	2	2.86e-3	3	NC	1	NC	5
474			min	0	10	-.153	1	-.063	3	-6.376e-3	2	NC	1	449.227	2
475		10	max	.005	3	-.007	15	.143	2	3.091e-3	3	NC	1	NC	5
476			min	-.001	2	-.172	1	-.066	3	-6.857e-3	2	NC	1	427.762	2
477		11	max	.005	3	-.008	15	.146	2	3.323e-3	3	NC	1	NC	5
478			min	-.002	2	-.19	1	-.067	3	-7.338e-3	2	NC	1	418.108	2
479		12	max	.005	3	-.008	15	.145	2	3.554e-3	3	NC	1	NC	5
480			min	-.002	2	-.208	1	-.067	3	-7.818e-3	2	NC	1	419.856	2
481		13	max	.005	3	-.009	15	.139	2	3.786e-3	3	NC	1	NC	5
482			min	-.003	2	-.227	1	-.064	3	-8.299e-3	2	NC	1	434.468	2
483		14	max	.005	3	-.009	15	.129	2	4.017e-3	3	NC	1	NC	5
484			min	-.003	2	-.245	1	-.06	3	-8.78e-3	2	NC	1	466.157	2
485		15	max	.006	3	-.01	15	.113	2	4.249e-3	3	NC	1	NC	5
486			min	-.004	2	-.263	1	-.053	3	-9.261e-3	2	NC	1	524.615	2
487		16	max	.006	3	-.01	15	.092	2	4.48e-3	3	NC	1	NC	5
488			min	-.005	2	-.28	1	-.044	3	-9.741e-3	2	NC	1	633.581	2
489		17	max	.006	3	-.011	15	.065	2	4.712e-3	3	NC	1	NC	5
490			min	-.005	2	-.298	1	-.032	3	-1.022e-2	2	NC	1	865.423	2
491		18	max	.006	3	-.011	15	.031	2	4.943e-3	3	NC	1	NC	4
492			min	-.006	2	-.316	1	-.017	3	-1.07e-2	2	NC	1	1583.619	2
493		19	max	.006	3	-.012	15	0	3	5.175e-3	3	NC	1	NC	1
494			min	-.006	2	-.334	1	-.013	1	-1.118e-2	2	NC	1	NC	1