Project Number: U2716-095-191

August 6, 2019

Sunmodo
14800 NE 65th Street
Vancouver, WA 98682

REFERENCE: Sunmodo Sunturf Ground Mount B2
Ground Mount PV Array Installation

To Whom It May Concern:

Per request of Sunmodo, we have been asked to prepare the structural design of a ground-mounted PV solar array system with several foundation options as shown in the attached calculations. The adopted building code in this jurisdiction is the 2009 International Building Code. Vector Structural Engineering requires that we review each site specific install, and we are not liable for installs at site specific locations we have not reviewed. The following design parameters are used in our analysis:

- Minimum Design Loads for Buildings and Other Structures (ASCE 7-05)
- Design wind speed for occupancy category I structures: 90 mph
- Importance Factor: 0.77
- Wind exposure: C
- Ground snow load: 30 psf
- The ground screws and helical piers must be tested to 1.5 times uplift and 2.0 times lateral reactions found in the table below. A minimum of one ground screw or helical pier must be tested.

Load (ASD)	Value (lbs)	Factor of Safety	Test Value (lbs)
UPLIFT	2480	1.5	3960
LATERAL	1620	2	3370

Foundation concrete shall have a minimum compressive strength of 2500 psi at 28 days. Cement for all concrete shall be Type I or II with a minimum of 6% entrained air with a water/cement ratio of 0.50. Maximum aggregate size shall be 3/4". No special inspection of concrete strength is required.

Footings are designed based on an allowable soil bearing pressure of 1500 psf an allowable skin friction of 250 psf, an allowable lateral bearing pressure of 150 pcf, and a coefficient of friction of 0.3. Vector Structural Engineering strongly recommends independent soils testing be performed by a licensed geotechnical engineer to verify the assumed soil parameters.

All ground mounts are to be installed per manufacturer's recommendations. The use of solar panel support span tables provided by the manufacturer is allowed only where the site conditions and solar panel configuration match the description of the span tables. Electrical engineering is beyond our scope. All work performed must be in accordance with accepted industry-wide methods and applicable safety standards. Vector Structural Engineering assumes no responsibility for improper installation of the solar panels.

Very truly yours,

VECTOR STRUCTURAL ENGINEERING, LLC

Clifton Palmer, P.E.
License: 51669 - Expires: 10/31/2021
Project Engineer

Enclosures

CMP/stb

VECTOR ENGINEERS
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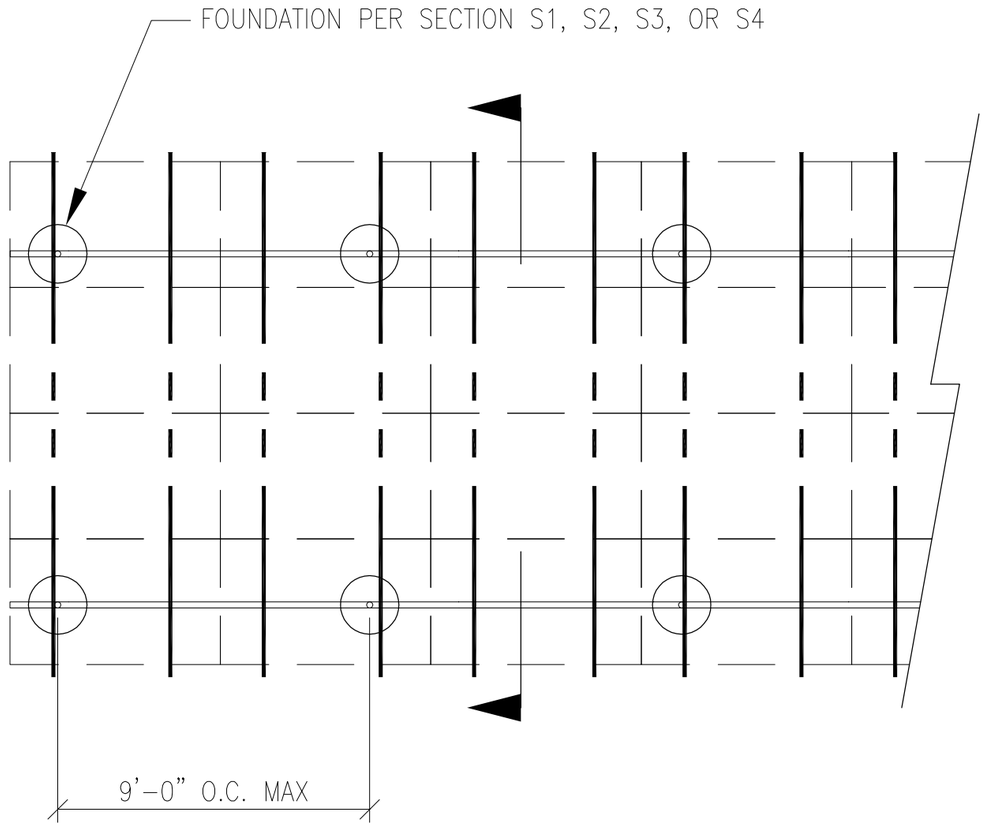
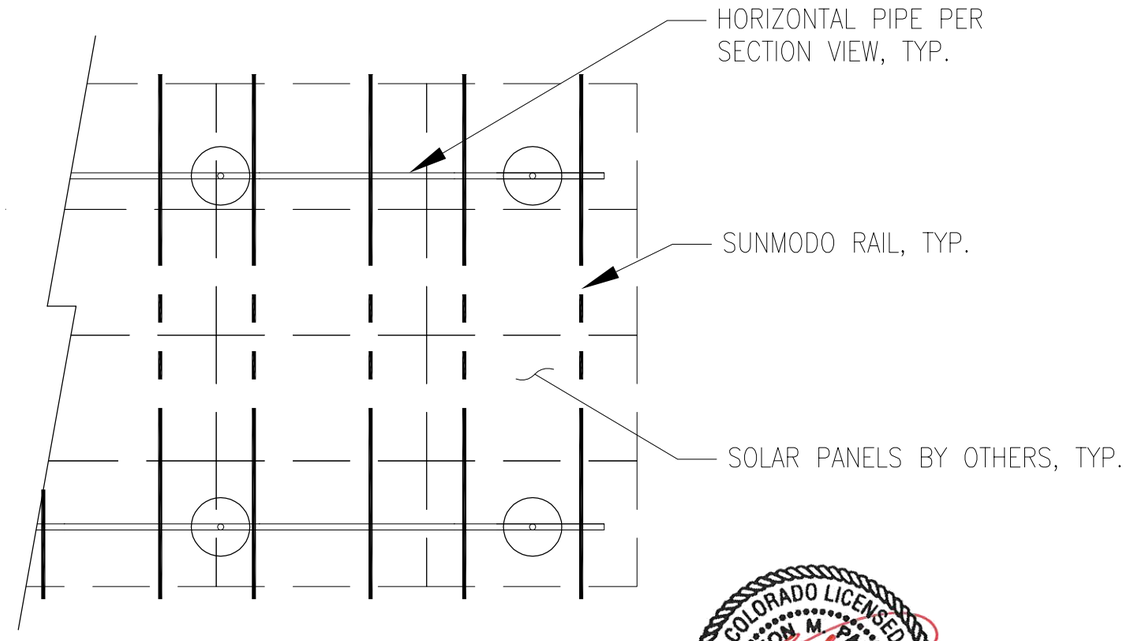
JOB NO. U2716-095-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS B2

SUBJECT ALL OPTIONS





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CLIFTON M. PALMER
0051669
03/26/2020
PROFESSIONAL ENGINEER

PV ARRAY PLAN

N.T.S.

P1

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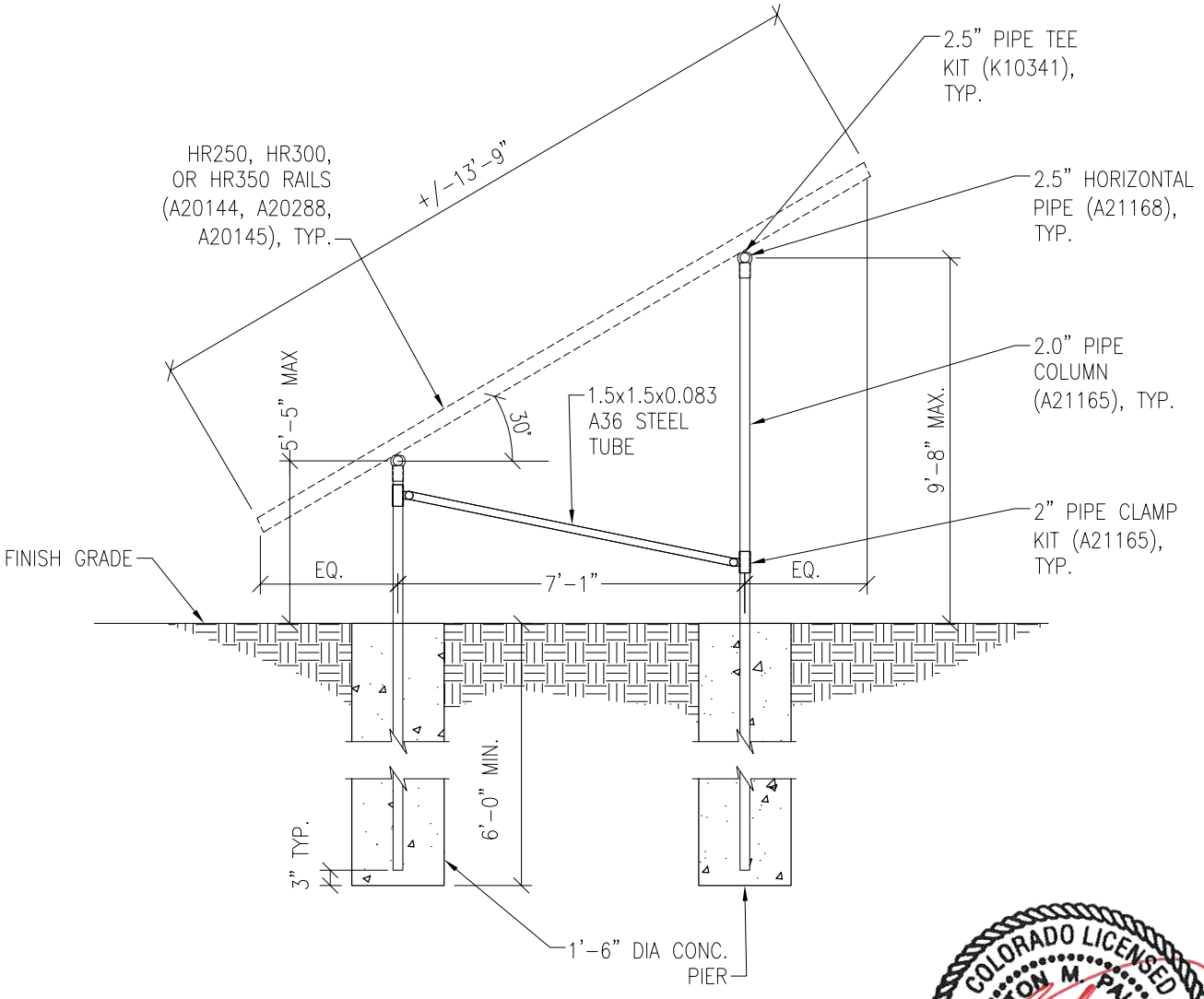
JOB NO. U2716-095-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS B2

SUBJECT DRILLED PIER OPTION



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03/26/2020
PROFESSIONAL ENGINEER

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PV ARRAY SECTION

N.T.S.

S1

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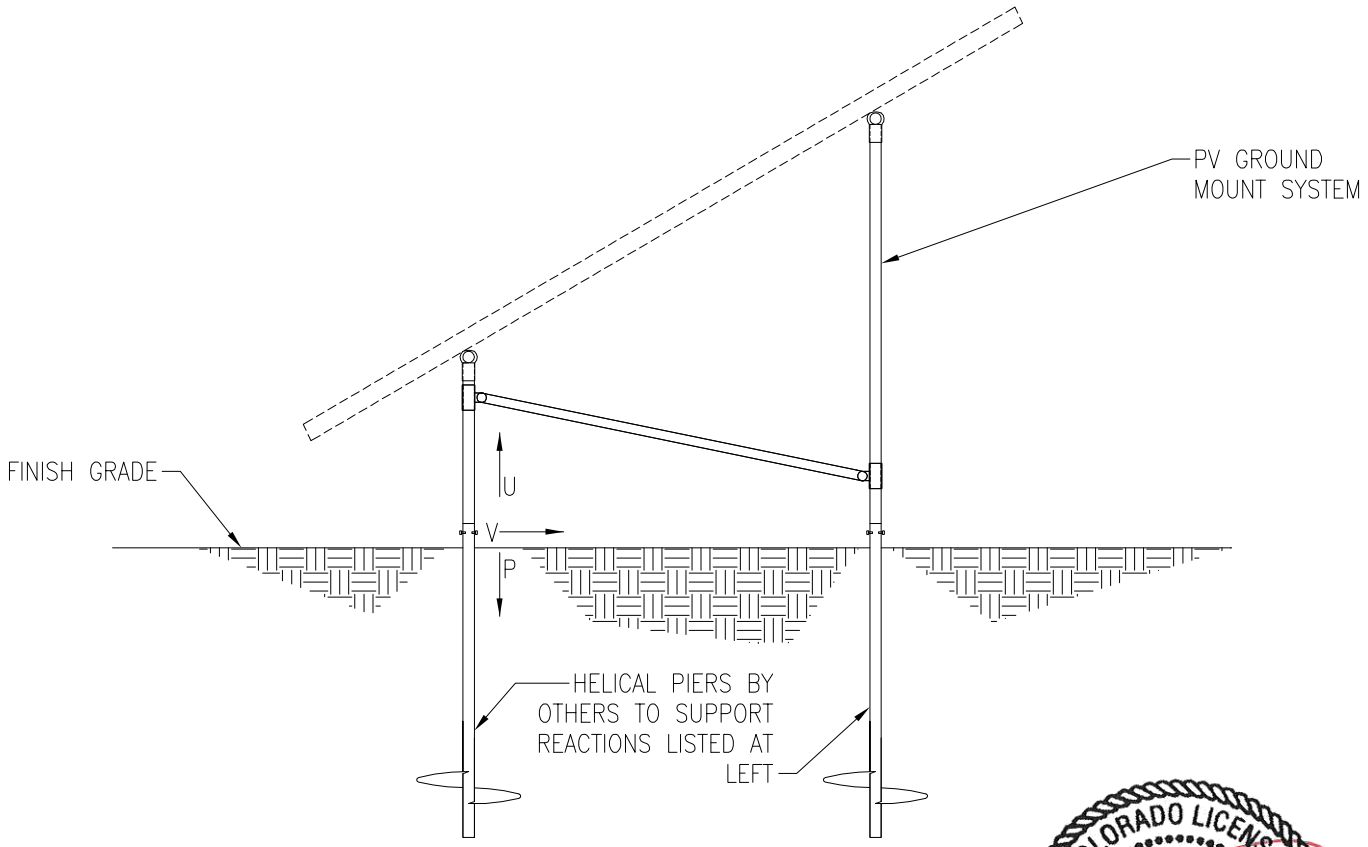
JOB NO. U2716-095-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS B2

SUBJECT HELICAL PIER OPTION

NOTES:

1. For ground mount components see Section S1.
2. A minimum of (1) helical pier must be load-tested as follows:
   - 2.1. Safety factor for uplift = 1.5,
   - 2.2. Safety factor for lateral loads = 2.0
   - 2.3. Upward deflection limit = 1/2"
   - 2.4. Lateral deflection limit = 1"
   - 2.5. The load tests must be performed by an approved contractor.



MAXIMUM REACTIONS:
U = 2,480 LBS
P = 3,100 LBS
V = 1,620 LBS

PV ARRAY SECTION

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S2

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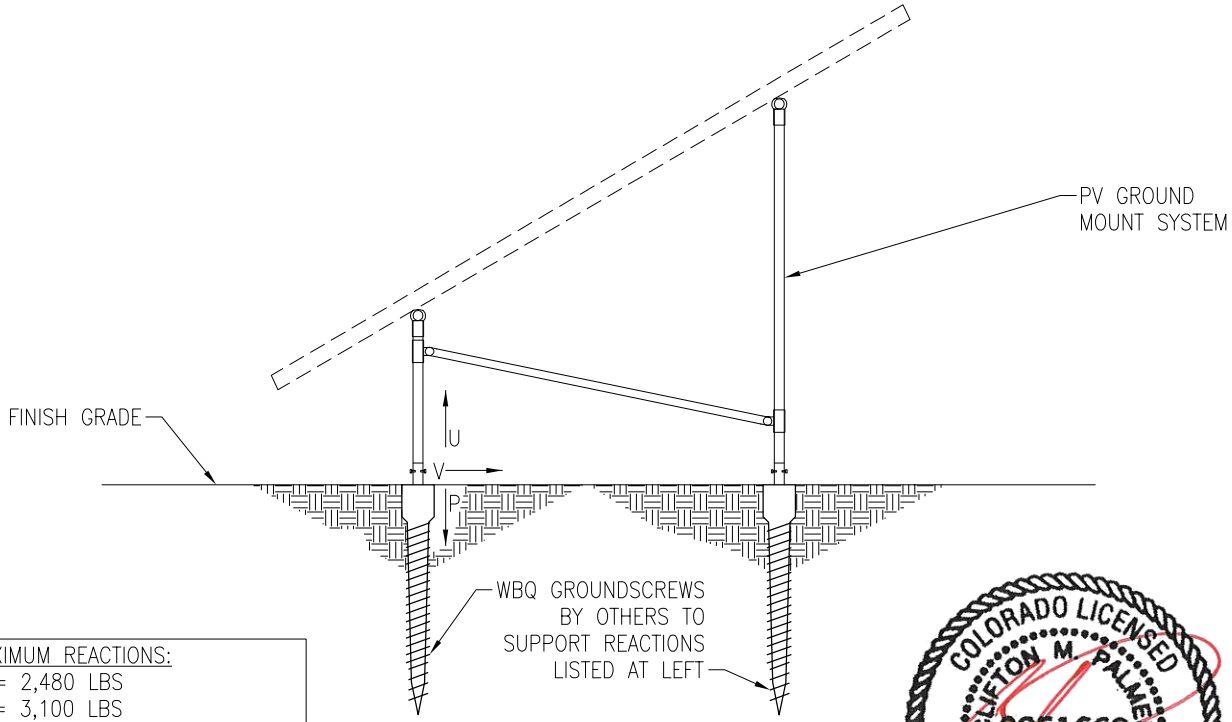
JOB NO. U2716-095-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS B2

SUBJECT GROUND SCREW OPTION

NOTES:

1. For ground mount components see Section S1.
2. A minimum of (1) ground screw must be load-tested as follows:
   - 2.1. Safety factor for uplift = 1.5,
   - 2.2. Safety factor for lateral loads = 2.0
   - 2.3. Upward deflection limit = 1/2"
   - 2.4. Lateral deflection limit = 1"
   - 2.5. The load tests must be performed by an approved contractor.



MAXIMUM REACTIONS:
U = 2,480 LBS
P = 3,100 LBS
V = 1,620 LBS

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03/26/2020
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PV ARRAY SECTION S3

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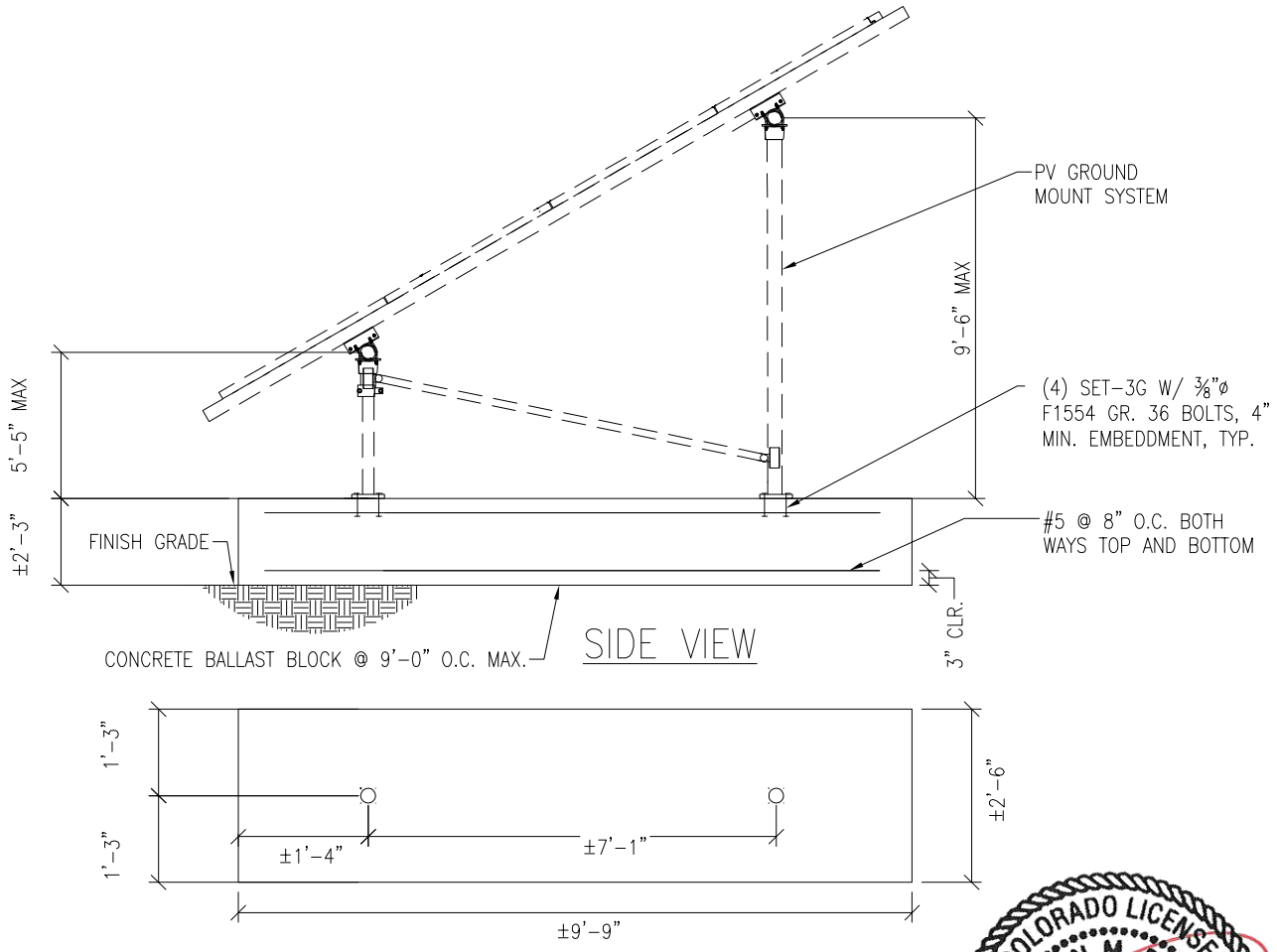
VECTOR ENGINEERS

JOB NO. U2716-095-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS B2

SUBJECT BALLASTED BLOCK OPTION

NOTES:
1. For ground mount components see Section S1.



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PV ARRAY SECTION

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S4

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JOB NO.: U2716-095-191 **DESIGNED:** STB
DATE: 07/29/19

PROJECT: B2 – Sunmodo Sunturf GM **SUBJECT:** Dead Load

Design Weight:

Individual Panel Weight [lb]:	50.7
Panel Transverse Length (T5) [in]:	41.2
Panel Transverse Length (T5) [ft]:	3.4
Panel Longitudinal Length (L2) [in]:	81.4
Panel Longitudinal Length (L2) [ft]:	6.8
Individual Panel Area [ft^2]:	23.3
Individual Panel Weight [psf]:	2.2
# of Panels in Transverse Direction:	4
Approximate Transverse Length (T4) [ft]:	13.7
# of Panels in Longitudinal Direction:	12
Approximate Longitudinal Length (L1) [ft]:	81.4
Transverse Column Spacing (T1) [ft]:	7.1
Longitudinal Column Spacing (L3) [ft]:	9.0
# of Columns in Longitudinal Direction:	10
# of Columns in Transverse Direction:	2
Total Number of Columns:	20
Panel Slope from Horizontal (a) [°]:	30.0
Short Column Height (H1) [ft]:	5.4
Approximate Tall Column Height (H2) [ft]:	9.5
Transverse Brace between Columns :	Yes
Approximate Brace Length (B1) [ft]:	9.0
Weight of Columns [plf]:	3.7
Weight of Cross Pipe [plf]:	3.7
Weight of Brace [plf]:	3.7
Tributary Transverse Length per Column [ft]:	6.9
Tributary Longitudinal Length per Column [ft]:	9.0
Tributary Area per Column [ft^2]:	61.8
Rail Weight [plf]:	1.0
Transverse Rail Weight per Column [lb]:	27.5
Longitudinal Rail Weight per Column [lb]:	32.9
Tall Column Weight [lb]:	34.7
Panel Weight per Column [lb]:	134.5
Rail Weight per Column [lb]:	27.5
Cross Pipe Weight per Column [lb]:	32.9
Brace Weight per Column [lb]:	16.4
Total Weight per Column (1.0 D) [lb]:	**246.0**

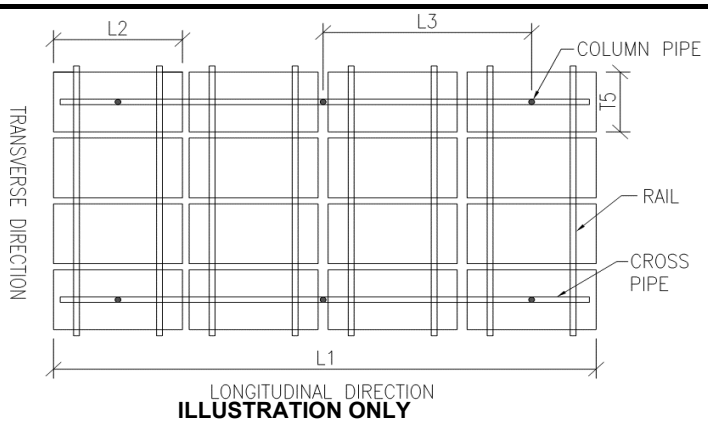
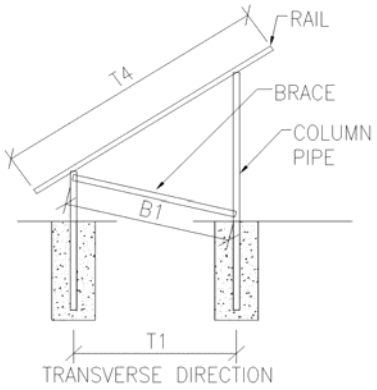


ILLUSTRATION ONLY



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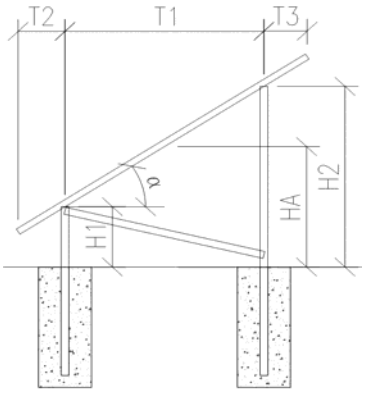

ILLUSTRATION ONLY

Assumptions:
- T2 = T3

JOB NO.: U2716-095-191 **DESIGNED:** STB
DATE: 07/26/19

PROJECT: B2 – Sunmodo Sunturf GM **SUBJECT:** Snow Load

SNOW LOAD (S):

ASCE 7 Standard:	05	
Panel Slope from Horizontal [°]:	30.0	
Snow Ground Load, p_g [psf]:	30.0	(Section 7.2)
Terrain Category:	C	(Table 7-2)
Exposure of Roof:	Fully Exposed	(Table 7-2)
Exposure Factor, C_e:	0.9	(Table 7-2)
Thermal Factor, C_t:	1.2	(Table 7-3)
Occupancy Category:	I	(Table 1-1)
Importance Factor, I_S:	0.8	(Table 7-4)
Flat Roof Snow Load, p_f [psf]:	18	(Equation 7-1)
Minimum Roof Snow Load, p_m [psf]:	0	(Section 7.3.4)
Unobstructed Slippery Surface?	Yes	(Section 7.4)
Slope Factor Figure:	Figure 7-2c	(Section 7.4)
Roof Slope Factor, C_s:	0.727	(Figure 7-2)
Sloped Roof Snow Load, p_s [psf]:	13	(Equation 7-2)
Design Snow Load, S [psf]:	13	
Tributary Transverse Length [ft]:	5.9	
Tributary Longitudinal Length [ft]:	9	
Tributary Area per Column [ft^2]:	53.5	
Snow Load per Column (1.0 S) [lb]:	**706.2**	

JOB NO.: U2716-095-191 **DESIGNED:** STB
DATE: 07/26/19

PROJECT: B2 – Sunmodo Sunturf GM **SUBJECT:** Wind Pressure

Design Wind Load:

ASCE 7 Standard:	05	
Basic Wind Speed, V [mph]:	90	
Occupancy Category:	I	
Importance, Iw:	0.87	
Exposure Category	C	(Section 6.5.6.3)
Velocity Pressure Exposure Coefficient, K_h:	0.85	(Table 6-3)
Topographic Factor, K_{ht}:	1.0	(Section 6.5.7.2)
Wind Directionality Factor, K_d:	0.85	(Table 6-4)
Internal Pressure Coefficient, GC_{pi} :	0.00	(Figure 6-5)
Velocity Pressure, q_h [psf]:	13.0	(Equation 6-15)
Gust Effect Factor, G:	0.85	(Section 6.5.8)
Panel Slope [degrees]:	30.0	

Net Pressure Coefficients (C_N) per: (Figure 6-18A)

Clear Wind Flow	C_{NW}	C_{NL}
Case 1 (γ = 0°, Load Case A)	-1.80	-1.80
Case 2 (γ = 0°, Load Case B)	-2.50	-0.50
Case 3 (γ = 180°, Load Case A)	2.10	2.10
Case 4 (γ = 180°, Load Case B)	2.60	1.00

Design Wind Pressures (p) [psf] per: (Equation 6-25)

Clear Wind Flow	q_hGC_{NW}	q_hGC_{NL}
Case 1 (γ = 0°, Load Case A)	-19.9	-19.9
Case 2 (γ = 0°, Load Case B)	-27.7	-5.5
Case 3 (γ = 180°, Load Case A)	23.3	23.3
Case 4 (γ = 180°, Load Case B)	28.8	11.1

Wind Pressure on Each Side of Panels [psf]

Clear Wind Flow	Short Col. Pressure	Long Col. Pressure
Case 1 (γ = 0°, Load Case A)	-19.9	-19.9
Case 2 (γ = 0°, Load Case B)	-5.5	-27.7
Case 3 (γ = 180°, Load Case A)	23.3	23.3
Case 4 (γ = 180°, Load Case B)	28.8	11.1

JOB NO.: U2716-095-191

PROJECT: B2 – Sunmodo Sunturf GM **SUBJECT:** Open Building Wind Loads

Design Wind Load Per ASCE 7-05

$p = q_h G C_n$

Velocity Pressure Exposure Coefficient, K_h:	0.85	(Table 6-3)
Topographic Factor, K_{ht}:	1.0	(Section 6.5.7.2)
Wind Directionality Factor, K_d:	0.85	(Table 6-4)
Ultimate Wind Speed, V [mph]:	90	
Velocity Pressure, q_h [psf]:	13.0	(Equation 6-15)
Gust Effect Factor, G:	0.85	(Section 6.5.8)

$\gamma = 90^o$ or 270^o

Force Coefficient, C_N:

Horizontal Distance from Winward Edge	Roof angle	Load Case	Obstructed Wind Flow CN
<= h	30	A	-0.8
		B	0.8
> h, <= 2h	30	A	-0.6
		B	0.5
> 2h	30	A	-0.3
		B	0.3

Design Wind Pressure, p [psf]:

	Roof angle	Load Case	Obstructed Wind Flow
<= h	30	A	-8.9
		B	8.9
> h, <= 2h	30	A	-6.6
		B	5.5
> 2h	30	A	-3.3
		B	3.3

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JOB NO.: U2716-095-191 **DESIGNED:** STB

Foundation Option 1: Drilled Concrete Pier

JOB NO.: U2716-095-191 **DESIGNED:** STB
DATE: 07/29/19

PROJECT: B2 – Sunmodo Sunturf GM

Drilled Pier Design

Design Loads:

Max. Shear, V [k]:	1.6	Max. Down, P_d [k]:	3.1
Max. Moment, M [k-ft]:	0.0	Max. Uplift, P_u [k]:	2.5

Pier Properties:

Pier Diameter, b [ft]:	1.5	Volume of Concrete [ft^3]:	11
Min. Pier Diameter, b_{min} (opt'l) [ft]:		Volume of Concrete [yd^3]:	0.4
Top of Pier Elevation [ft]:	0.00	Weight of Concrete [k]:	1.6
Pier Depth, d [ft]:	6.0		
Min. Pier Depth, d_{min} (opt'l) [ft]:			
Max. Pier Depth, d_{max} (opt'l) [ft]:			

Soil Properties:

Allow. Bearing Pressure [psf]:	1,500	Optional Parameters for Uplift:		
1/3 increase for short term loads?	No			
		Skin Friction [psf]:	250	(IBC 1810.3.3.1.4)
Lateral Bearing, S [pcf]:	150	Top Length to Ignore [ft]:	0.0	
Max. Lateral Bearing (opt'l) [psf]:		1/3 increase for short term loads?	No	
Top Depth to Ignore [ft]:	0.0	Combine w/ Bearing:	No	
1/3 increase for short term loads?	No			
1/2" deflection at t/o pier allowed:	Yes			

Check Bearing:

Bearing Capacity [k]:	7.1	**Bearing capacity OK.**

Check Uplift:

Uplift Capacity [k]:	8.5	**Uplift capacity OK.**

Check Lateral Bearing:

Applied Lateral Force, P [lb]:	1,620	
Point of Application, h [ft]:	0.0	
S_{1_max} [psf]:		
S_1 [psf]:	600	
$A = 2.34*P/(S_1 b)$:	4.21	
Required Pier Depth, d_{reqd} [ft]:	4.2	**Lateral bearing capacity OK.**

JOB NO.: U2716-095-191 **DESIGNED:** STB

Foundation Option 2: Helical Pier

The ground screws and helical piers must be tested to 1.5 times uplift and 2.0 times lateral reactions found in the table below.

Load (ASD)	Value (lbs)	Factor of Safety	Test Value (lbs)
UPLIFT	2480	1.5	3960
LATERAL	1620	2	3370

JOB NO.: U2716-095-191 **DESIGNED:** STB

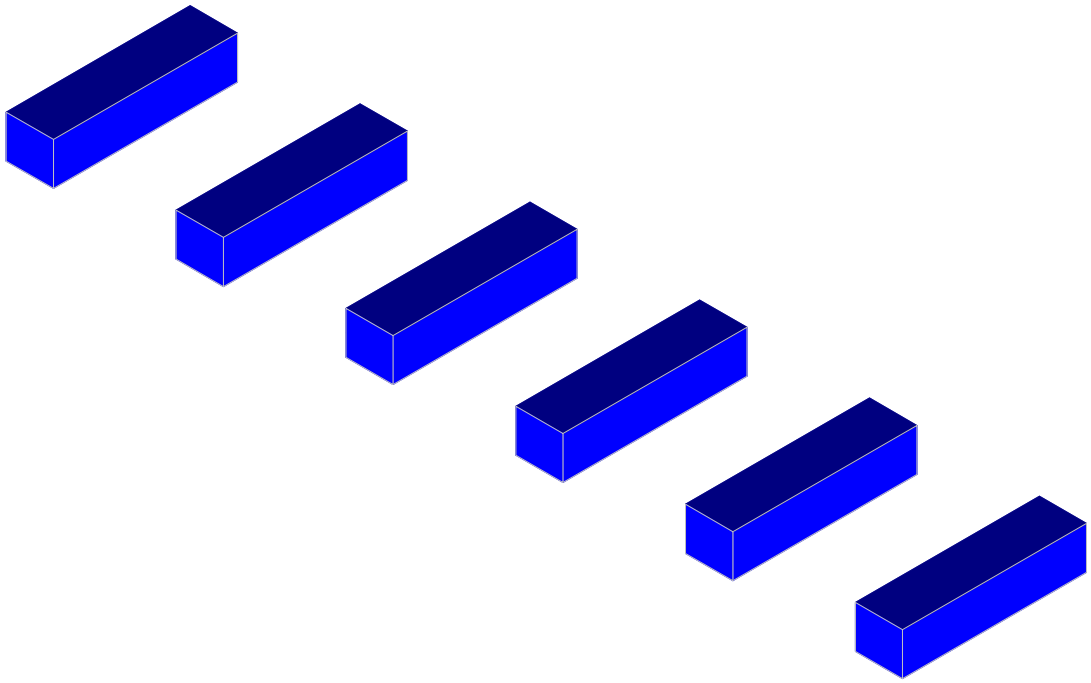
Foundation Option 3: Ground Screw

The ground screws and helical piers must be tested to 1.5 times uplift and 2.0 times lateral reactions found in the table below.

Load (ASD)	Value (lbs)	Factor of Safety	Test Value (lbs)
UPLIFT	2480	1.5	3960
LATERAL	1620	2	3370

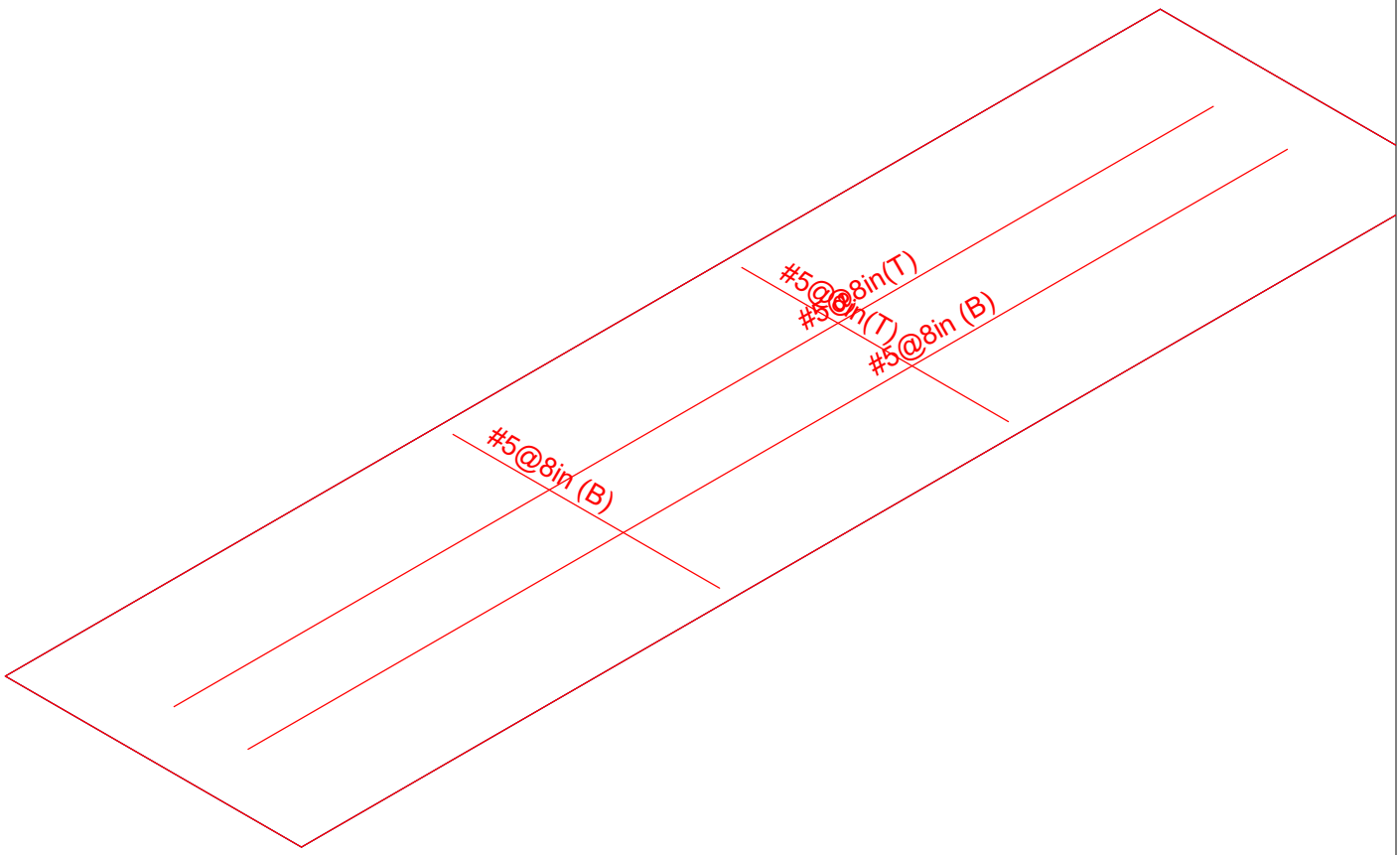
JOB NO.: U2716-095-191 **DESIGNED:** STB

Foundation Option 4: Ballasted Block



Results for LC 1, 1.0 D

Vector Structural Engineeri...		SK - 1
STB	Ground Mount	July 26, 2019 at 4:25 PM
U2716.095.191		USA B2 GM v4.r3d



Results for LC 1, 1.0 D

Vector Structural Engineeri...	Ground Mount	SK - 15
STB		May 7, 2019 at 1:06 PM
U2716.095.191		USA B2 GM - 81 in panels.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	100
Mesh Size (in)	12
Max Iterations	10
Merge Tolerance (in)	.12
Solver	Sparse Accelerated
Coefficient of Friction	.3
No. of Shear Regions	4
Shear Region Spacing Increment (in)	4
Min 1 Bar Dia Spacing for Beams?	No
Optimize footings for OTM / Sliding?	Yes
Parme Beta Factor	.65
Pile Safety Factor	3
Concrete Stress Block	Rectangular
Concrete Rebar Set	ASTM A615
Concrete Code	ACI 318-08
HR Steel Pile Code	AISC 14th(360-10): ASD
Wood Pile Code	AWC NDS-15: ASD

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[lb/ft^3]	f'c[psi]	Lambda	Flex Stee..	Shear St...
1	Conc3000NW	3156	1372	.15	.6	145	3000	1	60000	60000
2	Conc3500NW	3409	1482	.15	.6	145	3500	1	60000	60000
3	Conc4000NW	3644	1584	.15	.6	145	4000	1	60000	60000
4	Conc3000LW	2085	907	.15	.6	109.999	3000	.75	60000	60000
5	Conc3500LW	2252	979	.15	.6	109.999	3500	.75	60000	60000
6	Conc4000LW	2408	1047	.15	.6	109.999	4000	.75	60000	60000
7	Conc2500NW	3156	1372	.15	.6	145	2500	1	60000	60000

General Design Parameters

	Label	Max Bending Chk	Max Shear Chk	Top Cover[in]	Bottom Cover[in]
1	Typical	1	1	3	3

Slab Rebar Parameters

	Label	Top Bar	Bottom Bar	Max Top Bar Sp..	Min Top Bar Sp...	Max Bot Bar Sp...	Min Bot Bar Sp...	Spacing Incr..	Rebar Options
1	Typical	#5	#5	8	8	8	8	1	Optimize

Soil Definitions

	Label	Subgrade Modulus[lb/ft^3]	Allowable Bearing[psf]	Depth Properties	Default?
1	Default	1e+5	1500	None	Yes

Point Loads and Moments (Cat 1 : DL)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-16.057
2	R3D_N1	Y	225.456
3	R3D_N2	X	-6.511
4	R3D_N2	Y	205.758
5	R3D_N132	Y	249.973
6	R3D_N133	X	-1.806
7	R3D_N133	Y	273.894
8	R3D_N109	Y	249.808
9	R3D_N110A	Y	275.351

Point Loads and Moments (Cat 1 : DL) (Continued)

	Label	Direction	Magnitude[lb,lb-ft]
10	R3D_N121	Y	257.609
11	R3D_N122	Y	262.078
12	R3D_N133B	Y	257.742
13	R3D_N134B	Y	263.011
14	R3D_N137C_1	X	15.56
15	R3D_N137C_1	Y	226.992
16	R3D_N138B_1	X	6.875
17	R3D_N138B_1	Y	208.156

Point Loads and Moments (Cat 6 : RLL)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-46.465
2	R3D_N1	Y	549.744
3	R3D_N2	X	-19.805
4	R3D_N2	Y	551.975
5	R3D_N132	Y	641.548
6	R3D_N133	X	-5.891
7	R3D_N133	Y	759.01
8	R3D_N109	Y	640.562
9	R3D_N110A	X	1.868
10	R3D_N110A	Y	763.567
11	R3D_N121	Y	667.063
12	R3D_N122	Y	721.759
13	R3D_N133B	X	1.231
14	R3D_N133B	Y	667.431
15	R3D_N134B	X	3.288
16	R3D_N134B	Y	724.843
17	R3D_N137C_1	X	44.845
18	R3D_N137C_1	Y	550.247
19	R3D_N138B_1	X	21.355
20	R3D_N138B_1	Y	554.933

Point Loads and Moments (Cat 16 : OL1)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	80.454
2	R3D_N1	Y	-1811.462
3	R3D_N1	Z	946.417
4	R3D_N2	X	33.617
5	R3D_N2	Y	121.896
6	R3D_N2	Z	-44.035
7	R3D_N132	Y	-2377.195
8	R3D_N132	Z	1369.974
9	R3D_N133	X	5.38
10	R3D_N133	Y	242.588
11	R3D_N133	Z	-53.461
12	R3D_N109	X	1.787
13	R3D_N109	Y	-2392.606
14	R3D_N109	Z	1379.995
15	R3D_N110A	X	-5.594
16	R3D_N110A	Y	248.319
17	R3D_N110A	Z	-53.704
18	R3D_N121	X	-1.511
19	R3D_N121	Y	-2314.666
20	R3D_N121	Z	1271.676
21	R3D_N122	Y	186.557
22	R3D_N122	Z	-53.667

Point Loads and Moments (Cat 16 : OL1) (Continued)

	Label	Direction	Magnitude[lb,lb-ft]
23	R3D_N133B	X	-3.434
24	R3D_N133B	Y	-2311.081
25	R3D_N133B	Z	1265.096
26	R3D_N134B	X	-1.419
27	R3D_N134B	Y	179.265
28	R3D_N134B	Z	-53.428
29	R3D_N137C_1	X	-76.743
30	R3D_N137C_1	Y	-1829.741
31	R3D_N137C_1	Z	957.116
32	R3D_N138B_1	X	-32.221
33	R3D_N138B_1	Y	129.309
34	R3D_N138B_1	Z	-44.348

Point Loads and Moments (Cat 17 : OL2)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	104.545
2	R3D_N1	Y	-2023.906
3	R3D_N1	Z	780.55
4	R3D_N2	X	11.717
5	R3D_N2	Y	591.635
6	R3D_N2	Z	-36.327
7	R3D_N132	Y	-2625.77
8	R3D_N132	Z	1131.156
9	R3D_N133	X	-2.211
10	R3D_N133	Y	905.693
11	R3D_N133	Z	-44.1
12	R3D_N109	X	2.467
13	R3D_N109	Y	-2637.938
14	R3D_N109	Z	1138.8
15	R3D_N110A	X	-2.821
16	R3D_N110A	Y	914.518
17	R3D_N110A	Z	-44.317
18	R3D_N121	X	-1.915
19	R3D_N121	Y	-2584.886
20	R3D_N121	Z	1050.238
21	R3D_N122	Y	821.308
22	R3D_N122	Z	-44.307
23	R3D_N133B	X	-4.447
24	R3D_N133B	Y	-2580.441
25	R3D_N133B	Z	1041.982
26	R3D_N134B	X	3.198
27	R3D_N134B	Y	816.828
28	R3D_N134B	Z	-44.021
29	R3D_N137C_1	X	-99.969
30	R3D_N137C_1	Y	-2039.87
31	R3D_N137C_1	Z	789.584
32	R3D_N138B_1	X	-8.941
33	R3D_N138B_1	Y	600.905
34	R3D_N138B_1	Z	-36.624

Point Loads and Moments (Cat 18 : OL3)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-94.2
2	R3D_N1	Y	2120.958
3	R3D_N1	Z	-1108.117
4	R3D_N2	X	-39.361

Point Loads and Moments (Cat 18 : OL3) (Continued)

	Label	Direction	Magnitude[lb,lb-ft]
5	R3D_N2	Y	-142.723
6	R3D_N2	Z	51.559
7	R3D_N132	Y	2783.349
8	R3D_N132	Z	-1604.04
9	R3D_N133	X	-6.299
10	R3D_N133	Y	-284.035
11	R3D_N133	Z	62.595
12	R3D_N109	X	-2.092
13	R3D_N109	Y	2801.393
14	R3D_N109	Z	-1615.773
15	R3D_N110A	X	6.55
16	R3D_N110A	Y	-290.745
17	R3D_N110A	Z	62.88
18	R3D_N121	X	1.769
19	R3D_N121	Y	2710.137
20	R3D_N121	Z	-1488.947
21	R3D_N122	Y	-218.431
22	R3D_N122	Z	62.837
23	R3D_N133B	X	4.021
24	R3D_N133B	Y	2705.94
25	R3D_N133B	Z	-1481.243
26	R3D_N134B	X	1.661
27	R3D_N134B	Y	-209.893
28	R3D_N134B	Z	62.557
29	R3D_N137C_1	X	89.855
30	R3D_N137C_1	Y	2142.36
31	R3D_N137C_1	Z	-1120.644
32	R3D_N138B_1	X	37.727
33	R3D_N138B_1	Y	-151.402
34	R3D_N138B_1	Z	51.925

Point Loads and Moments (Cat 19 : OL4)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-50.811
2	R3D_N1	Y	1407.13
3	R3D_N1	Z	-955.91
4	R3D_N2	X	-46.718
5	R3D_N2	Y	268.436
6	R3D_N2	Z	44.47
7	R3D_N132	Y	1870.679
8	R3D_N132	Z	-1382.694
9	R3D_N133	X	-10.734
10	R3D_N133	Y	317.568
11	R3D_N133	Z	53.991
12	R3D_N109	X	-1.013
13	R3D_N109	Y	1886.676
14	R3D_N109	Z	-1393.311
15	R3D_N110A	X	7.08
16	R3D_N110A	Y	315.048
17	R3D_N110A	Z	54.223
18	R3D_N121	Y	1799.002
19	R3D_N121	Z	-1283.289
20	R3D_N122	X	-1.148
21	R3D_N122	Y	343.725
22	R3D_N122	Z	54.17
23	R3D_N133B	X	2.181

Point Loads and Moments (Cat 19 : OL4) (Continued)

	Label	Direction	Magnitude[lb,lb-ft]
24	R3D_N133B	Y	1796.569
25	R3D_N133B	Z	-1278.898
26	R3D_N134B	X	4.916
27	R3D_N134B	Y	352.314
28	R3D_N134B	Z	53.999
29	R3D_N137C_1	X	48.271
30	R3D_N137C_1	Y	1424.884
31	R3D_N137C_1	Z	-966.549
32	R3D_N138B_1	X	46.604
33	R3D_N138B_1	Y	263.465
34	R3D_N138B_1	Z	44.755

Point Loads and Moments (Cat 20 : OL5)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-24.484
2	R3D_N1	Y	793.463
3	R3D_N1	Z	-421.16
4	R3D_N2	X	-11.035
5	R3D_N2	Y	-57.251
6	R3D_N2	Z	17.547
7	R3D_N132	X	1.831
8	R3D_N132	Y	387.266
9	R3D_N132	Z	-227.835
10	R3D_N133	Y	-40.053
11	R3D_N133	Z	8.977
12	R3D_N109	Y	800.939
13	R3D_N109	Z	-460.338
14	R3D_N110A	X	3.089
15	R3D_N110A	Y	-78.694
16	R3D_N110A	Z	16.994
17	R3D_N121	X	2.345
18	R3D_N121	Y	400.877
19	R3D_N121	Z	-221.196
20	R3D_N122	X	1.976
21	R3D_N122	Y	-33.981
22	R3D_N122	Z	11.165
23	R3D_N133B	X	1.657
24	R3D_N133B	Y	378.007
25	R3D_N133B	Z	-206.258
26	R3D_N134B	Y	-27.508
27	R3D_N134B	Z	9.298
28	R3D_N137C_1	X	17.857
29	R3D_N137C_1	Y	309.688
30	R3D_N137C_1	Z	-158.866
31	R3D_N138B_1	X	5.686
32	R3D_N138B_1	Y	-19.648
33	R3D_N138B_1	Z	7.39

Point Loads and Moments (Cat 21 : OL6)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	24.484
2	R3D_N1	Y	-793.463
3	R3D_N1	Z	421.16
4	R3D_N2	X	11.035
5	R3D_N2	Y	57.251
6	R3D_N2	Z	-17.547

Point Loads and Moments (Cat 21 : OL6) (Continued)

	Label	Direction	Magnitude[lb,lb-ft]
7	R3D_N132	X	-1.831
8	R3D_N132	Y	-387.266
9	R3D_N132	Z	227.835
10	R3D_N133	Y	40.053
11	R3D_N133	Z	-8.977
12	R3D_N109	Y	-800.939
13	R3D_N109	Z	460.338
14	R3D_N110A	X	-3.089
15	R3D_N110A	Y	78.694
16	R3D_N110A	Z	-16.994
17	R3D_N121	X	-2.345
18	R3D_N121	Y	-400.877
19	R3D_N121	Z	221.196
20	R3D_N122	X	-1.976
21	R3D_N122	Y	33.981
22	R3D_N122	Z	-11.165
23	R3D_N133B	X	-1.657
24	R3D_N133B	Y	-378.007
25	R3D_N133B	Z	206.258
26	R3D_N134B	Y	27.508
27	R3D_N134B	Z	-9.298
28	R3D_N137C_1	X	-17.857
29	R3D_N137C_1	Y	-309.688
30	R3D_N137C_1	Z	158.866
31	R3D_N138B_1	X	-5.686
32	R3D_N138B_1	Y	19.648
33	R3D_N138B_1	Z	-7.39

Slabs

	Label	Thickness [in]	Material	Local Axis Angle [deg]	Analysis Offset [in]
1	S1	27	Conc2500NW	0	0
2	S2	27	Conc2500NW	0	0
3	S3	27	Conc2500NW	0	0
4	S4	27	Conc2500NW	0	0
5	S5	27	Conc2500NW	0	0
6	S6	27	Conc2500NW	0	0

Load Combinations

	Label	Solve	Service	A..	SF	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	C...	F...	C...	F...
1	1.0 D	Yes	Yes		1.5	DL	1																		
2	1.0 D + 1....	Yes	Yes		1.5	DL	1	RLL	1																
3	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL1	1														
4	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL2	1														
5	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL3	1														
6	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL4	1														
7	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL5	1														
8	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL6	1														
9	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL1	.75														
10	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL2	.75														
11	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL3	.75														
12	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL4	.75														
13	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL5	.75														
14	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL6	.75														
15	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL1	1														
16	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL2	1														
17	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL3	1														

Load Combinations (Continued)

	Label	Solve	Service	A..	SF	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	Cat..	Fa...	C...	F...	C...	F...
18	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL4	1														
19	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL5	1														
20	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL6	1														
21																									
22	1.4D	Yes				DL	1.4																		
23	1.2D+1.6SL	Yes				DL	1.2	RLL	1.6																
24	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL1	.8														
25	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL2	.8														
26	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL3	.8														
27	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL4	.8														
28	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL5	.8														
29	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL6	.8														
30	1.2D+1.6...	Yes				DL	1.2	RLL	.5	OL1	1.6														
31	1.2D-1.6...	Yes				DL	1.2	RLL	.5	OL2	1.6														
32	1.2D+1.6...	Yes				DL	1.2	RLL	.5	OL3	1.6														
33	1.2D-1.6...	Yes				DL	1.2	RLL	.5	OL4	1.6														
34	1.2D+1.6...	Yes				DL	1.2	RLL	.5	OL5	1.6														
35	1.2D-1.6...	Yes				DL	1.2	RLL	.5	OL6	1.6														
36	.9D+1.6Wx	Yes				DL	.9			OL1	1.6														
37	.9D-1.6Wx	Yes				DL	.9			OL2	1.6														
38	.9D+1.6Wz	Yes				DL	.9			OL3	1.6														
39	.9D-1.6Wz	Yes				DL	.9			OL4	1.6														
40	.9D+1.6W...	Yes				DL	.9			OL5	1.6														
41	.9D-1.6W90	Yes				DL	.9			OL6	1.6														

Design Strips

	Label	Rebar Angle from Pl...	No. of Design Cuts	Design Rule
1	DS1	0	50	Typical
2	DS2	90	50	Typical

Load Categories

	Category	Point Loads	Line Loads	Area Loads
1	DL	17		
2	RLL	20		
3	OL1	34		
4	OL2	34		
5	OL3	34		
6	OL4	34		
7	OL5	33		
8	OL6	33		

Strip Reinforcing

	Label	UC Top	LC	Top Bars	Governing ...	UC Bot	LC	Bot B...	Gover...	UC Shear	LC	Governing ...
1	DS1	.015	26	#5@8in	DS1-X26	.026	37	#5@8in	DS1-...	.04	37	DS1-X15
2	DS2	.001	36	#5@8in	DS2-X26	.002	32	#5@8in	DS2-...	.005	32	DS2-X25

Slab Overturning Safety Factors

	LC	Slab	Angle[deg]	Mo-xx[lb-ft]	Ms-xx[lb-ft]	Mo-zz[lb-ft]	Ms-zz[lb-ft]	Ms-xx/Mo-xx	Ms-zz/Mo-zz
1	1	S1	0	0	40890.866	0	10602.11	9.999+	9.999+
2	1	S2	0	0	41526.769	0	10684.422	9.999+	9.999+
3	1	S3	0	0	41425.193	0	10676.67	9.999+	9.999+
4	1	S4	0	0	41433.411	0	10678.181	9.999+	9.999+
5	1	S5	0	0	41514.518	0	10686.654	9.999+	9.999+
6	1	S6	0	0	40913.881	0	10506.428	9.999+	9.999+
7	2	S1	0	0	46499.075	0	12311.986	9.999+	9.999+

Slab Overturning Safety Factors (Continued)

	LC	Slab	Angle[deg]	Mo-xx[lb-ft]	Ms-xx[lb-ft]	Mo-zz[lb-ft]	Ms-zz[lb-ft]	Ms-xx/Mo-xx	Ms-zz/Mo-zz
8	2	S2	0	0	49094.936	0	12669.402	9.999+	9.999+
9	2	S3	0	0	48676.47	0	12644.169	9.999+	9.999+
10	2	S4	0	0	48711.741	0	12640.404	9.999+	9.999+
11	2	S5	0	0	49045.134	0	12684.032	9.999+	9.999+
12	2	S6	0	0	46548.276	0	11923.151	9.999+	9.999+
13	3	S1	0	16681.79	40849.09	2650.212	10602.11	2.449	4
14	3	S2	0	22234.108	41129.16	3029.174	10684.422	1.85	3.527
15	3	S3	0	21426.021	41177.382	3011.422	10676.67	1.922	3.545
16	3	S4	0	21390.987	41179.56	3009.155	10678.181	1.925	3.549
17	3	S5	0	22092.941	41128.804	3036.132	10686.654	1.862	3.52
18	3	S6	0	16845.788	40864.437	2163.775	10506.428	2.426	4.856
19	4	S1	0	17512.86	40849.09	2290.64	10602.11	2.333	4.628
20	4	S2	0	22938.847	41129.16	2440.716	10684.422	1.793	4.378
21	4	S3	0	22415.093	41177.382	2494.093	10676.67	1.837	4.281
22	4	S4	0	22366.079	41179.56	2495.641	10678.181	1.841	4.279
23	4	S5	0	22833.056	41128.804	2431.8	10686.654	1.801	4.395
24	4	S6	0	17652.07	40864.437	1803.925	10462.335	2.315	5.8
25	5	S1	0	244.118	40890.866	0	13705.122	9.999+	9.999+
26	5	S2	0	1554.042	41526.769	0	14231.144	9.999+	9.999+
27	5	S3	0	792.578	41425.193	0	14202.607	9.999+	9.999+
28	5	S4	0	709.23	41433.411	0	14201.463	9.999+	9.999+
29	5	S5	0	1499.261	41514.518	0	14241.521	9.999+	9.999+
30	5	S6	0	312.091	40913.881	0	13039.893	9.999+	9.999+
31	6	S1	0	0	43372.146	0	13195.268	9.999+	9.999+
32	6	S2	0	0	44205.207	0	13789.88	9.999+	9.999+
33	6	S3	0	0	44458.39	0	13714.784	9.999+	9.999+
34	6	S4	0	0	44545.974	0	13706.464	9.999+	9.999+
35	6	S5	0	0	44212.627	0	13810.823	9.999+	9.999+
36	6	S6	0	0	43357.308	0	12684.786	9.999+	9.999+
37	7	S1	0	143.221	40890.866	0	11724.995	9.999+	9.999+
38	7	S2	0	404.829	41526.769	0	11700.652	9.999+	9.999+
39	7	S3	0	129.517	41425.193	0	11186.72	9.999+	9.999+
40	7	S4	0	80.763	41433.411	0	11170.992	9.999+	9.999+
41	7	S5	0	223.047	41514.518	0	11174.42	9.999+	9.999+
42	7	S6	0	19.128	40913.881	0	10864.347	9.999+	9.999+
43	8	S1	0	7321.301	40849.09	1122.885	10602.11	5.579	9.442
44	8	S2	0	7446.729	41129.16	1016.229	10684.422	5.523	9.999+
45	8	S3	0	3706.768	41177.382	510.05	10676.67	9.999+	9.999+
46	8	S4	0	3498.127	41179.56	492.812	10678.181	9.999+	9.999+
47	8	S5	0	3608.386	41128.804	487.767	10686.654	9.999+	9.999+
48	8	S6	0	2847.02	40864.437	367.18	10462.335	9.999+	9.999+
49	9	S1	0	12511.343	44699.266	1987.659	11884.517	3.573	5.979
50	9	S2	0	16675.581	45720.744	2271.881	12173.157	2.742	5.358
51	9	S3	0	16069.516	45894.705	2258.567	12152.294	2.856	5.381
52	9	S4	0	16043.24	45901.837	2256.866	12149.848	2.861	5.384
53	9	S5	0	16569.706	45722.443	2277.099	12184.688	2.759	5.351
54	9	S6	0	12634.341	44720.286	1622.831	11568.97	3.54	7.129
55	10	S1	0	13134.645	44699.266	1717.98	11884.517	3.403	6.918
56	10	S2	0	17204.135	45720.744	1830.537	12173.157	2.658	6.65
57	10	S3	0	16811.32	45894.705	1870.57	12152.294	2.73	6.497
58	10	S4	0	16774.559	45901.837	1871.731	12149.848	2.736	6.491
59	10	S5	0	17124.792	45722.443	1823.85	12184.688	2.67	6.681
60	10	S6	0	13239.052	44720.286	1352.944	11472.007	3.378	8.479
61	11	S1	0	183.089	45097.023	0	14211.776	9.999+	9.999+
62	11	S2	0	1165.532	47202.894	0	14833.198	9.999+	9.999+
63	11	S3	0	594.433	46863.651	0	14796.746	9.999+	9.999+
64	11	S4	0	531.923	46892.159	0	14792.31	9.999+	9.999+

Slab Overturning Safety Factors (Continued)

	LC	Slab	Angle[deg]	Mo-xx[lb-ft]	Ms-xx[lb-ft]	Mo-zz[lb-ft]	Ms-zz[lb-ft]	Ms-xx/Mo-xx	Ms-zz/Mo-zz
65	11	S5	0	1124.446	47162.48	0	14850.839	9.999+	9.999+
66	11	S6	0	234.068	45139.677	0	13469.069	9.999+	9.999+
67	12	S1	0	0	46957.983	0	13829.386	9.999+	9.999+
68	12	S2	0	0	49211.723	0	14502.25	9.999+	9.999+
69	12	S3	0	0	49138.549	0	14430.879	9.999+	9.999+
70	12	S4	0	0	49226.581	0	14421.06	9.999+	9.999+
71	12	S5	0	0	49186.062	0	14527.815	9.999+	9.999+
72	12	S6	0	0	46972.248	0	13202.739	9.999+	9.999+
73	13	S1	0	107.416	45097.023	0	12726.681	9.999+	9.999+
74	13	S2	0	303.622	47202.894	0	12935.329	9.999+	9.999+
75	13	S3	0	97.138	46863.651	0	12534.831	9.999+	9.999+
76	13	S4	0	60.573	46892.159	0	12519.457	9.999+	9.999+
77	13	S5	0	167.285	47162.48	0	12550.513	9.999+	9.999+
78	13	S6	0	14.346	45139.677	0	11837.409	9.999+	9.999+
79	14	S1	0	5490.975	44699.266	842.164	11884.517	8.14	9.999+
80	14	S2	0	5585.047	45720.744	762.172	12173.157	8.186	9.999+
81	14	S3	0	2780.076	45894.705	382.537	12152.294	9.999+	9.999+
82	14	S4	0	2623.596	45901.837	369.609	12149.848	9.999+	9.999+
83	14	S5	0	2706.289	45722.443	365.825	12184.688	9.999+	9.999+
84	14	S6	0	2135.265	44720.286	275.385	11472.007	9.999+	9.999+
85	15	S1	0	16681.79	24509.454	2650.212	6361.266	1.469	2.4
86	15	S2	0	22234.108	24677.496	3029.174	6410.653	1.11	2.116
87	15	S3	0	21426.021	24706.429	3011.422	6406.002	1.153	2.127
88	15	S4	0	21390.987	24707.736	3009.155	6406.908	1.155	2.129
89	15	S5	0	22092.941	24677.283	3036.132	6411.992	1.117	2.112
90	15	S6	0	16845.788	24518.662	2163.775	6303.857	1.455	2.913
91	16	S1	0	17512.86	24509.454	2290.64	6361.266	1.4	2.777
92	16	S2	0	22938.847	24677.496	2440.716	6410.653	1.076	2.627
93	16	S3	0	22415.093	24706.429	2494.093	6406.002	1.102	2.568
94	16	S4	0	22366.079	24707.736	2495.641	6406.908	1.105	2.567
95	16	S5	0	22833.056	24677.283	2431.8	6411.992	1.081	2.637
96	16	S6	0	17652.07	24518.662	1803.925	6277.401	1.389	3.48
97	17	S1	0	244.118	24534.52	0	9464.278	9.999+	9.999+
98	17	S2	0	1554.042	24916.061	0	9957.375	9.999+	9.999+
99	17	S3	0	792.578	24855.116	0	9931.938	9.999+	9.999+
100	17	S4	0	709.23	24860.047	0	9930.19	9.999+	9.999+
101	17	S5	0	1499.261	24908.711	0	9966.86	9.999+	9.999+
102	17	S6	0	312.091	24548.328	0	8837.322	9.999+	9.999+
103	18	S1	0	0	27015.799	0	8954.424	9.999+	9.999+
104	18	S2	0	0	27594.5	0	9516.111	9.999+	9.999+
105	18	S3	0	0	27888.313	0	9444.116	9.999+	9.999+
106	18	S4	0	0	27972.609	0	9435.191	9.999+	9.999+
107	18	S5	0	0	27606.82	0	9536.162	9.999+	9.999+
108	18	S6	0	0	26991.756	0	8482.215	9.999+	9.999+
109	19	S1	0	143.221	24534.52	0	7484.151	9.999+	9.999+
110	19	S2	0	404.829	24916.061	0	7426.883	9.999+	9.999+
111	19	S3	0	129.517	24855.116	0	6916.052	9.999+	9.999+
112	19	S4	0	80.763	24860.047	0	6899.72	9.999+	9.999+
113	19	S5	0	223.047	24908.711	0	6899.759	9.999+	9.999+
114	19	S6	0	19.128	24548.328	0	6661.776	9.999+	9.999+
115	20	S1	0	7321.301	24509.454	1122.885	6361.266	3.348	5.665
116	20	S2	0	7446.729	24677.496	1016.229	6410.653	3.314	6.308
117	20	S3	0	3706.768	24706.429	510.05	6406.002	6.665	9.999+
118	20	S4	0	3498.127	24707.736	492.812	6406.908	7.063	9.999+
119	20	S5	0	3608.386	24677.283	487.767	6411.992	6.839	9.999+
120	20	S6	0	2847.02	24518.662	367.18	6277.401	8.612	9.999+

Slab Sliding Safety Factors

	LC	Slab	Angle[deg]	Va-xx[lb]	Vr-xx[lb]	Va-zz[lb]	Vr-zz[lb]	SR-xx	SR-zz
1	1	S1	0	22.568	2515.071	0	2515.071	9.999+	9.999+
2	1	S2	0	0	2543.255	0	2543.255	9.999+	9.999+
3	1	S3	0	0	2541.613	0	2541.613	9.999+	9.999+
4	1	S4	0	0	2541.933	0	2541.933	9.999+	9.999+
5	1	S5	0	1.806	2542.867	0	2542.867	9.999+	9.999+
6	1	S6	0	22.435	2516.252	0	2516.252	9.999+	9.999+
7	2	S1	0	88.838	2845.587	0	2845.587	9.999+	9.999+
8	2	S2	0	1.868	2964.494	0	2964.494	9.999+	9.999+
9	2	S3	0	0	2958.26	0	2958.26	9.999+	9.999+
10	2	S4	0	4.518	2959.616	0	2959.616	9.999+	9.999+
11	2	S5	0	7.697	2963.035	0	2963.035	9.999+	9.999+
12	2	S6	0	88.635	2847.806	0	2847.806	9.999+	9.999+
13	3	S1	0	91.503	2008.202	902.382	2008.202	9.999+	2.225
14	3	S2	0	3.807	1899.969	1326.291	1899.969	9.999+	1.433
15	3	S3	0	1.511	1903.181	1218.009	1903.181	9.999+	1.563
16	3	S4	0	4.853	1902.388	1211.668	1902.388	9.999+	1.57
17	3	S5	0	3.574	1902.485	1316.513	1902.485	9.999+	1.445
18	3	S6	0	86.53	2006.122	912.768	2006.122	9.999+	2.198
19	4	S1	0	93.694	2085.39	744.224	2085.39	9.999+	2.802
20	4	S2	0	.354	2026.229	1094.483	2026.229	9.999+	1.851
21	4	S3	0	1.915	2012.54	1005.931	2012.54	9.999+	2.001
22	4	S4	0	1.249	2012.849	997.96	2012.849	9.999+	2.017
23	4	S5	0	4.017	2026.844	1087.057	2026.844	9.999+	1.865
24	4	S6	0	86.475	2084.562	752.96	2084.562	9.999+	2.768
25	5	S1	0	156.129	3108.542	1056.558	3108.542	9.999+	2.942
26	5	S2	0	4.458	3296.449	1552.893	3296.449	9.999+	2.123
27	5	S3	0	1.769	3289.125	1426.111	3289.125	9.999+	2.306
28	5	S4	0	5.682	3290.747	1418.686	3290.747	9.999+	2.32
29	5	S5	0	8.105	3292.661	1541.445	3292.661	9.999+	2.136
30	5	S6	0	150.016	3113.539	1068.718	3113.539	9.999+	2.913
31	6	S1	0	120.097	3017.741	911.44	3017.741	9.999+	3.311
32	6	S2	0	6.067	3203.772	1339.088	3203.772	9.999+	2.393
33	6	S3	0	1.148	3184.431	1229.119	3184.431	9.999+	2.591
34	6	S4	0	7.097	3186.598	1224.9	3186.598	9.999+	2.602
35	6	S5	0	12.54	3199.341	1328.703	3199.341	9.999+	2.408
36	6	S6	0	117.31	3022.756	921.794	3022.756	9.999+	3.279
37	7	S1	0	58.087	2735.935	403.613	2735.935	9.999+	6.779
38	7	S2	0	3.089	2759.928	443.344	2759.928	9.999+	6.225
39	7	S3	0	4.32	2651.682	210.032	2651.682	9.999+	9.999+
40	7	S4	0	1.657	2647.083	196.96	2647.083	9.999+	9.999+
41	7	S5	0	.025	2647.031	218.858	2647.031	9.999+	9.999+
42	7	S6	0	45.977	2603.264	151.475	2603.264	9.999+	9.999+
43	8	S1	0	12.951	2294.208	403.613	2294.208	9.999+	5.684
44	8	S2	0	3.089	2326.581	443.344	2326.581	9.999+	5.248
45	8	S3	0	4.32	2431.544	210.032	2431.544	9.999+	9.999+
46	8	S4	0	1.657	2436.784	196.96	2436.784	9.999+	9.999+
47	8	S5	0	3.636	2438.703	218.858	2438.703	9.999+	9.999+
48	8	S6	0	1.108	2429.24	151.475	2429.24	9.999+	9.999+
49	9	S1	0	13.283	2382.806	676.787	2382.806	9.999+	3.521
50	9	S2	0	1.454	2376.719	994.718	2376.719	9.999+	2.389
51	9	S3	0	1.133	2375.274	913.507	2375.274	9.999+	2.6
52	9	S4	0	.251	2375.536	908.751	2375.536	9.999+	2.614
53	9	S5	0	2.189	2377.706	987.385	2377.706	9.999+	2.408
54	9	S6	0	9.639	2382.32	684.576	2382.32	9.999+	3.48
55	10	S1	0	14.926	2440.697	558.168	2440.697	9.999+	4.373
56	10	S2	0	1.136	2471.414	820.862	2471.414	9.999+	3.011
57	10	S3	0	1.437	2457.293	754.448	2457.293	9.999+	3.257

Slab Sliding Safety Factors (Continued)

	LC	Slab	Angle[deg]	Va-xx[lb]	Vr-xx[lb]	Va-zz[lb]	Vr-zz[lb]	SR-xx	SR-zz
58	10	S4	0	2.452	2458.382	748.47	2458.382	9.999+	3.285
59	10	S5	0	7.882	2470.975	815.292	2470.975	9.999+	3.031
60	10	S6	0	9.598	2441.15	564.72	2441.15	9.999+	4.323
61	11	S1	0	172.441	3208.061	792.419	3208.061	9.999+	4.048
62	11	S2	0	4.744	3424.08	1164.67	3424.08	9.999+	2.94
63	11	S3	0	1.327	3414.732	1069.583	3414.732	9.999+	3.193
64	11	S4	0	7.65	3416.806	1064.015	3416.806	9.999+	3.211
65	11	S5	0	10.948	3420.338	1156.084	3420.338	9.999+	2.959
66	11	S6	0	167.771	3212.883	801.539	3212.883	9.999+	4.008
67	12	S1	0	145.417	3139.96	683.58	3139.96	9.999+	4.593
68	12	S2	0	5.951	3354.572	1004.316	3354.572	9.999+	3.34
69	12	S3	0	.861	3336.212	921.839	3336.212	9.999+	3.619
70	12	S4	0	8.711	3338.694	918.675	3338.694	9.999+	3.634
71	12	S5	0	14.275	3350.348	996.527	3350.348	9.999+	3.362
72	12	S6	0	143.241	3144.796	691.346	3144.796	9.999+	4.549
73	13	S1	0	98.91	2928.606	302.71	2928.606	9.999+	9.675
74	13	S2	0	3.718	3021.689	332.508	3021.689	9.999+	9.088
75	13	S3	0	3.24	2936.65	157.524	2936.65	9.999+	9.999+
76	13	S4	0	4.631	2934.057	147.72	2934.057	9.999+	9.999+
77	13	S5	0	4.851	2936.116	164.144	2936.116	9.999+	9.999+
78	13	S6	0	89.742	2830.176	113.607	2830.176	9.999+	9.999+
79	14	S1	0	45.631	2597.31	302.71	2597.31	9.999+	8.58
80	14	S2	0	.916	2696.679	332.508	2696.679	9.999+	8.11
81	14	S3	0	3.24	2771.547	157.524	2771.547	9.999+	9.999+
82	14	S4	0	2.146	2776.333	147.72	2776.333	9.999+	9.999+
83	14	S5	0	7.597	2779.87	164.144	2779.87	9.999+	9.999+
84	14	S6	0	54.428	2699.658	113.607	2699.658	9.999+	9.999+
85	15	S1	0	100.531	1002.173	902.382	1002.173	9.969	1.111
86	15	S2	0	3.807	882.667	1326.291	882.667	9.999+	.666
87	15	S3	0	1.511	886.535	1218.009	886.535	9.999+	.728
88	15	S4	0	4.853	885.615	1211.668	885.615	9.999+	.731
89	15	S5	0	4.296	885.338	1316.513	885.338	9.999+	.672
90	15	S6	0	95.504	999.621	912.768	999.621	9.999+	1.095
91	16	S1	0	102.721	1079.361	744.224	1079.361	9.999+	1.45
92	16	S2	0	.354	1008.927	1094.483	1008.927	9.999+	.922
93	16	S3	0	1.915	995.894	1005.931	995.894	9.999+	.99
94	16	S4	0	1.249	996.076	997.96	996.076	9.999+	.998
95	16	S5	0	3.295	1009.697	1087.057	1009.697	9.999+	.929
96	16	S6	0	95.449	1078.062	752.96	1078.062	9.999+	1.432
97	17	S1	0	147.101	2102.513	1056.558	2102.513	9.999+	1.99
98	17	S2	0	4.458	2279.147	1552.893	2279.147	9.999+	1.468
99	17	S3	0	1.769	2272.48	1426.111	2272.48	9.999+	1.593
100	17	S4	0	5.682	2273.974	1418.686	2273.974	9.999+	1.603
101	17	S5	0	7.382	2275.514	1541.445	2275.514	9.999+	1.476
102	17	S6	0	141.042	2107.038	1068.718	2107.038	9.999+	1.972
103	18	S1	0	111.07	2011.712	911.44	2011.712	9.999+	2.207
104	18	S2	0	6.067	2186.47	1339.088	2186.47	9.999+	1.633
105	18	S3	0	1.148	2167.786	1229.119	2167.786	9.999+	1.764
106	18	S4	0	7.097	2169.825	1224.9	2169.825	9.999+	1.771
107	18	S5	0	11.818	2182.194	1328.703	2182.194	9.999+	1.642
108	18	S6	0	108.336	2016.256	921.794	2016.256	9.999+	2.187
109	19	S1	0	49.06	1729.906	403.613	1729.906	9.999+	4.286
110	19	S2	0	3.089	1742.626	443.344	1742.626	9.999+	3.931
111	19	S3	0	4.32	1635.037	210.032	1635.037	9.999+	7.785
112	19	S4	0	1.657	1630.309	196.96	1630.309	9.999+	8.277
113	19	S5	0	.747	1629.884	218.858	1629.884	9.999+	7.447
114	19	S6	0	37.003	1596.763	151.475	1596.763	9.999+	9.999+

Slab Sliding Safety Factors (Continued)

	LC	Slab	Angle[deg]	Va-xx[lb]	Vr-xx[lb]	Va-zz[lb]	Vr-zz[lb]	SR-xx	SR-zz
115	20	S1	0	21.978	1288.179	403.613	1288.179	9.999+	3.192
116	20	S2	0	3.089	1309.28	443.344	1309.28	9.999+	2.953
117	20	S3	0	4.32	1414.899	210.032	1414.899	9.999+	6.737
118	20	S4	0	1.657	1420.01	196.96	1420.01	9.999+	7.21
119	20	S5	0	2.914	1421.556	218.858	1421.556	9.999+	6.495
120	20	S6	0	10.081	1422.739	151.475	1422.739	9.999+	9.393

Envelope Slab Soil Pressures

	Label	UC	LC	Soil Pressure[psf]	Allowable Bearing[psf]	Point
1	S1	.425	5	637.306	1500	N1
2	S2	.49	5	734.585	1500	N18
3	S3	.481	5	721.1	1500	N22
4	S4	.48	5	720.182	1500	N26
5	S5	.488	5	731.988	1500	N30
6	S6	.427	5	640.619	1500	N34

Company:		Date:	5/14/2018
Engineer:		Page:	1/6
Project:			
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-08
Units: Imperial units

Anchor Information:
Anchor type: Bonded anchor
Material: F1554 Grade 36
Diameter (inch): 0.375
Effective Embedment depth, h_{ef} (inch): 4.000
Code report: ICC-ES ESR-4057
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 5.25
c_{ac} (inch): 7.12
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 24.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Hole condition: Dry concrete
Inspection: Periodic
Temperature range, Short/Long: 150/110°F
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 4.75 x 4.75 x 0.31

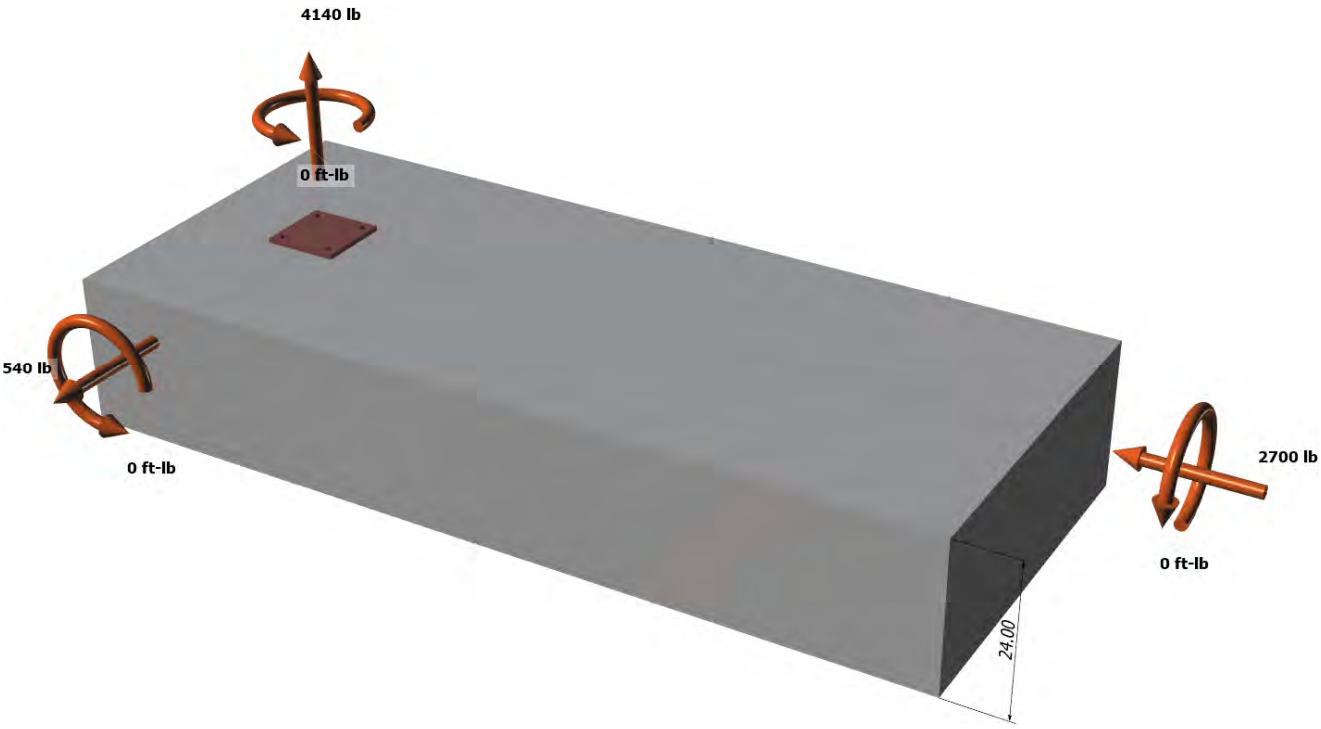
Recommended Anchor
Anchor Name: SET-3G - SET-3G w/ 3/8"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-4057

Load and Geometry
Load factor source: ACI 318 Section 9.2
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: No
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]: 4140
V_{uax} [lb]: 540
V_{uay} [lb]: -2700
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

<Figure 1>



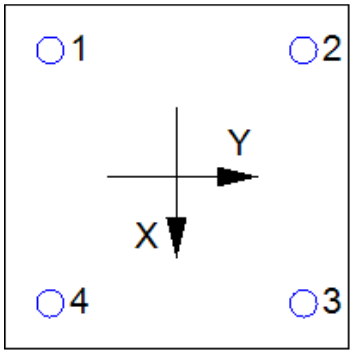
<Figure 2>

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	1035.0	135.0	-675.0	688.4
2	1035.0	135.0	-675.0	688.4
3	1035.0	135.0	-675.0	688.4
4	1035.0	135.0	-675.0	688.4
Sum	4140.0	540.0	-2700.0	2753.5

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 4140
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



4. Steel Strength of Anchor in Tension (Sec. D.5.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
4525	0.75	3394

5. Concrete Breakout Strength of Anchor in Tension (Sec. D.5.2)

$N_b = k_c \lambda \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. D-7)

k_c	λ	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	4.000	6800

$\phi N_{cbg} = \phi (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. D.4.1 & Eq. D-5)

A_{Nc} (in^2)	A_{Nco} (in^2)	$c_{a,min}$ (in)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cbg} (lb)
240.25	144.00	7.25	1.000	1.000	1.00	1.000	6800	0.65	7374

6. Adhesive Strength of Anchor in Tension (AC308 Sec. 3.3)

$\tau_{k,cr} = \tau_{k,cr} f_{short\text{-}term} K_{sat} (f'_c / 2{,}500)^n$

$\tau_{k,cr}$ (psi)	$f_{short\text{-}term}$	K_{sat}	f'_c (psi)	n	$\tau_{k,cr}$ (psi)
1346	1.00	1.00	2500	0.24	1346

$N_{a0} = \tau_{k,cr} \pi d_a h_{ef}$ (Eq. D-16f)

$\tau_{k,cr}$ (psi)	d_a (in)	h_{ef} (in)	N_{a0} (lb)
1346	0.38	4.000	6343

$\phi N_{ag} = \phi (A_{Na} / A_{Na0}) \Psi_{ed,Na} \Psi_{g,Na} \Psi_{ec,Na} \Psi_{p,Na} N_{a0}$ (Sec. D.4.1 & Eq. D-16b)

A_{Na} (in^2)	A_{Na0} (in^2)	$\Psi_{ed,Na}$	$\Psi_{g,Na}$	$\Psi_{ec,Na}$	$\Psi_{p,Na}$	N_{a0}(lb)	ϕ	ϕN_{ag} (lb)
161.83	85.03	1.000	1.038	1.000	1.000	6343	0.55	6892

8. Steel Strength of Anchor in Shear (Sec. D.6.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
2715	1.0	0.65	1765

9. Concrete Breakout Strength of Anchor in Shear (Sec. D.6.2)

Shear perpendicular to edge in x-direction:

$V_{bx} = 7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda\sqrt{f'_c}c_{a1}^{1.5}$ (Eq. D-24)

l_e (in)	d_a (in)	λ	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
3.00	0.375	1.00	2500	13.75	16564

$\phi V_{cbgx} = \phi\,(A_{Vc} / A_{Vco})\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{bx}$ (Sec. D.4.1 & Eq. D-22)

A_{Vc} (in²)	A_{Vco} (in²)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbgx} (lb)
647.11	850.78	1.000	0.805	1.000	1.000	16564	0.70	7103

Shear perpendicular to edge in y-direction:

$V_{by} = 7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda\sqrt{f'_c}c_{a1}^{1.5}$ (Eq. D-24)

l_e (in)	d_a (in)	λ	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
3.00	0.375	1.00	2500	10.75	11450

$\phi V_{cbgy} = \phi\,(A_{Vc} / A_{Vco})\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{by}$ (Sec. D.4.1 & Eq. D-22)

A_{Vc} (in²)	A_{Vco} (in²)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbgy} (lb)
387.00	520.03	1.000	0.891	1.000	1.000	11450	0.70	5313

Shear parallel to edge in x-direction:

$V_{by} = 7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda\sqrt{f'_c}c_{a1}^{1.5}$ (Eq. D-24)

l_e (in)	d_a (in)	λ	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
3.00	0.375	1.00	2500	7.25	6342

$\phi V_{cbgx} = \phi\,(2)(A_{Vc} / A_{Vco})\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{by}$ (Sec. D.4.1, D.6.2.1(c) & Eq. D-22)

A_{Vc} (in²)	A_{Vco} (in²)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbgx} (lb)
261.00	236.53	1.000	1.000	1.000	1.000	6342	0.70	9797

Shear parallel to edge in y-direction:

$V_{bx} = 7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda\sqrt{f'_c}c_{a1}^{1.5}$ (Eq. D-24)

l_e (in)	d_a (in)	λ	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
3.00	0.375	1.00	2500	10.25	10661

$\phi V_{cbgy} = \phi\,(2)(A_{Vc} / A_{Vco})\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{bx}$ (Sec. D.4.1, D.6.2.1(c) & Eq. D-22)

A_{Vc} (in²)	A_{Vco} (in²)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbgy} (lb)
401.67	472.78	1.000	1.000	1.000	1.000	10661	0.70	12680

10. Concrete Pryout Strength of Anchor in Shear (Sec. D.6.3)

$\phi V_{cpg} = \phi \min|k_{cp}N_{ag}\,;\, k_{cp}N_{cbg}| = \phi \min|k_{cp}(A_{Na} / A_{Na0})\Psi_{ed,Na}\Psi_{g,Na}\Psi_{ec,Na}\Psi_{p,Na}N_{a0}\,;\, k_{cp}(A_{Nc} / A_{Nco})\Psi_{ec,N}\Psi_{ed,N}\Psi_{c,N}\Psi_{cp,N}N_b|$ (Eq. D-30b)

k_{cp}	A_{Na} (in²)	A_{Na0} (in²)	$\Psi_{ed,Na}$	$\Psi_{g,Na}$	$\Psi_{ec,Na}$	$\Psi_{p,Na}$	N_{a0} (lb)	N_a (lb)
2.0	161.83	85.03	1.000	1.038	1.000	1.000	6343	12531

A_{Nc} (in²)	A_{Nco} (in²)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	N_{cb} (lb)	ϕ
240.25	144.00	1.000	1.000	1.000	1.000	6800	11345	0.70

ϕV_{cpg} (lb)
15883

11. Results

Interaction of Tensile and Shear Forces (Sec. RD.7)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	1035	3394	0.30	Pass
Concrete breakout	4140	7374	0.56	Pass
Adhesive	**4140**	**6892**	**0.60**	**Pass (Governs)**

Shear	Factored Load, V_{ua} (lb)	Design Strength, ϕV_n (lb)	Ratio	Status
Steel	688	1765	0.39	Pass
T Concrete breakout x+	540	7103	0.08	Pass
T Concrete breakout y-	2700	5313	0.51	Pass
|| Concrete breakout y-	270	9797	0.03	Pass
|| Concrete breakout x-	1350	12680	0.11	Pass
Concrete breakout, combined	**-**	**-**	**0.51**	**Pass (Governs)**
Pryout	2753	15883	0.17	Pass

Interaction check	$(N_{ua}/\phi N_{ua})^{5/3}$	$(V_{ua}/\phi V_{ua})^{5/3}$	Combined Ratio	Permissible	Status
Sec. RD.7	0.43	0.33	75.7%	1.0	Pass

SET-3G w/ 3/8"Ø F1554 Gr. 36 with hef = 4.000 inch meets the selected design criteria.

12. Warnings

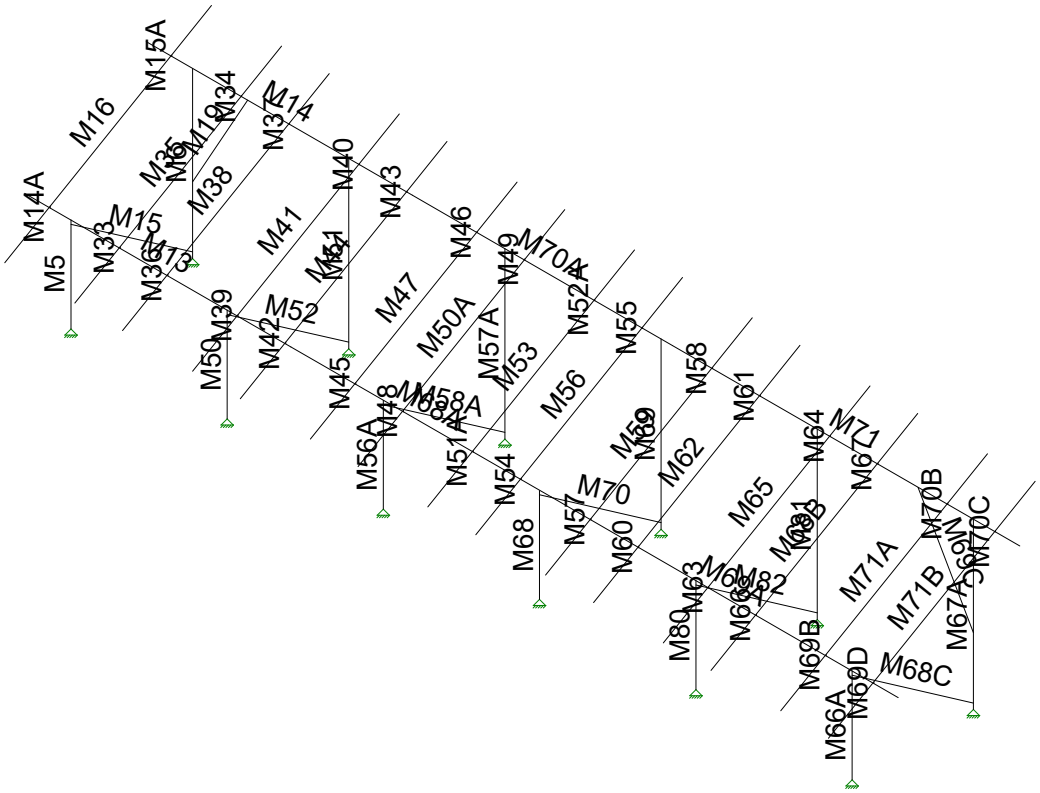
- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

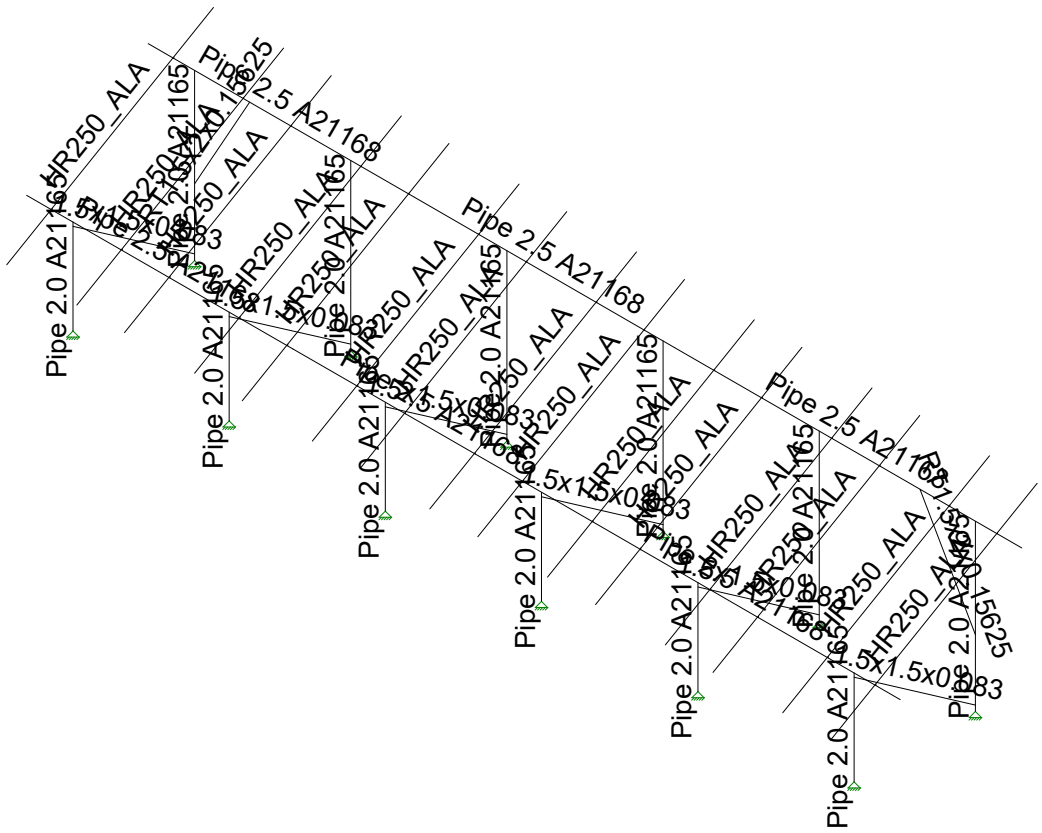
VECTOR ENGINEERS

JOB NO.: U2716-095-191 **DESIGNED:** STB

Framing Analysis



Vector Structural Engineeri...		SK - 3
STB	Ground Mount	July 29, 2019 at 2:46 PM
U2716.095.191		USA B2 GM v4.r3d



Vector Structural Engineeri...		SK - 4
STB	Ground Mount	July 29, 2019 at 2:46 PM
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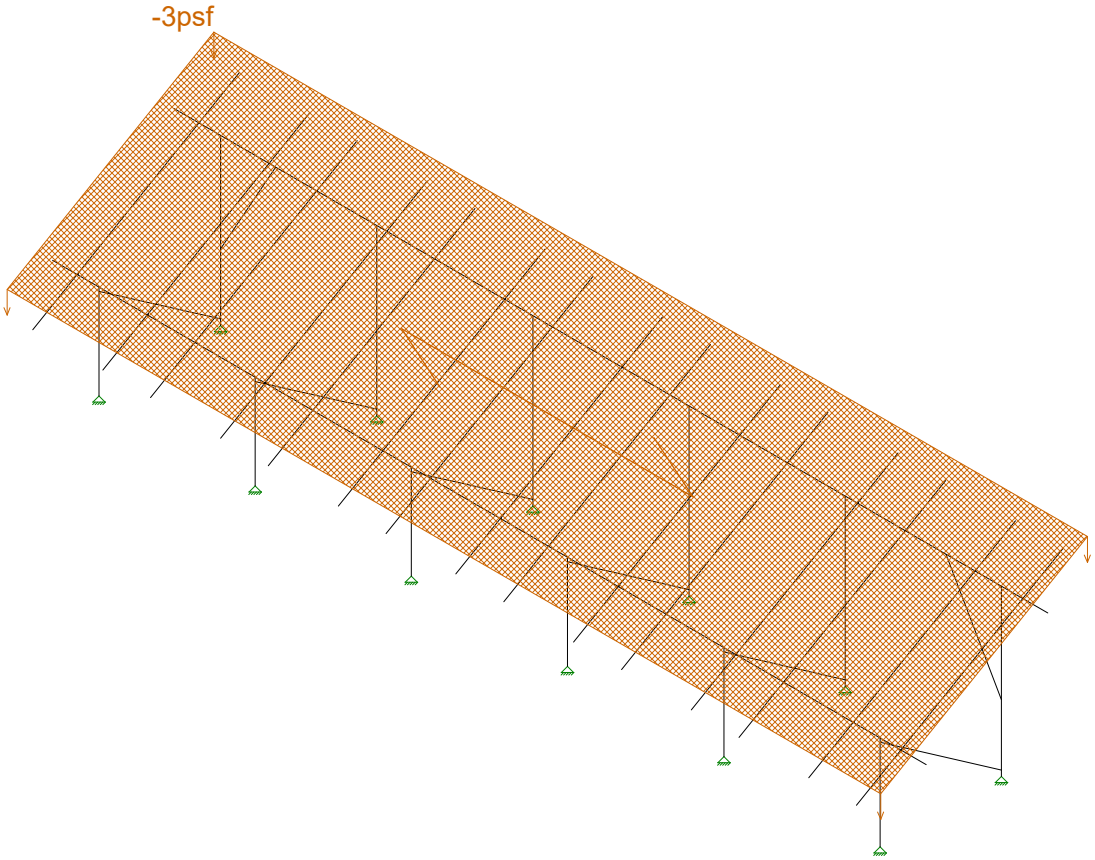
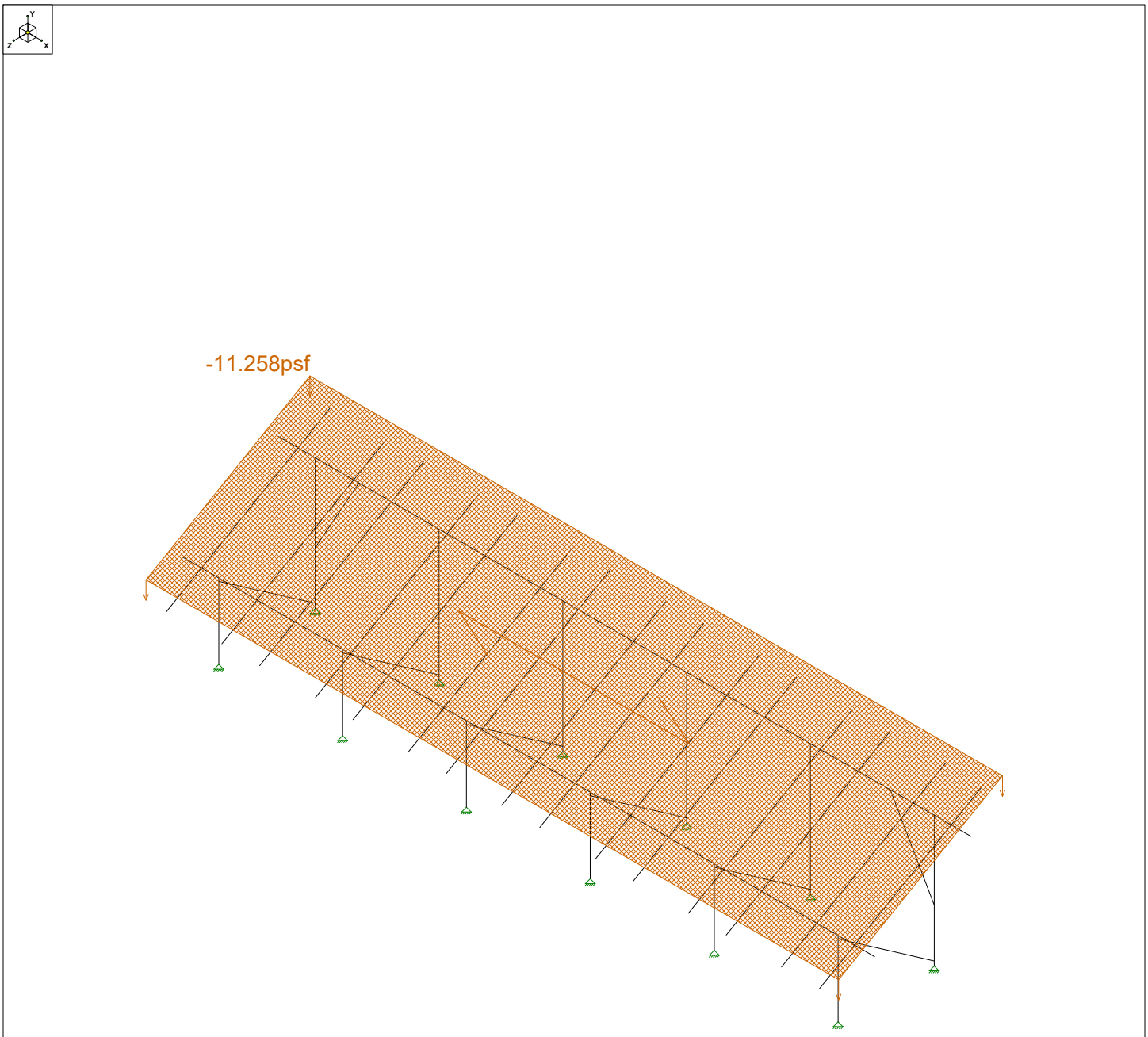


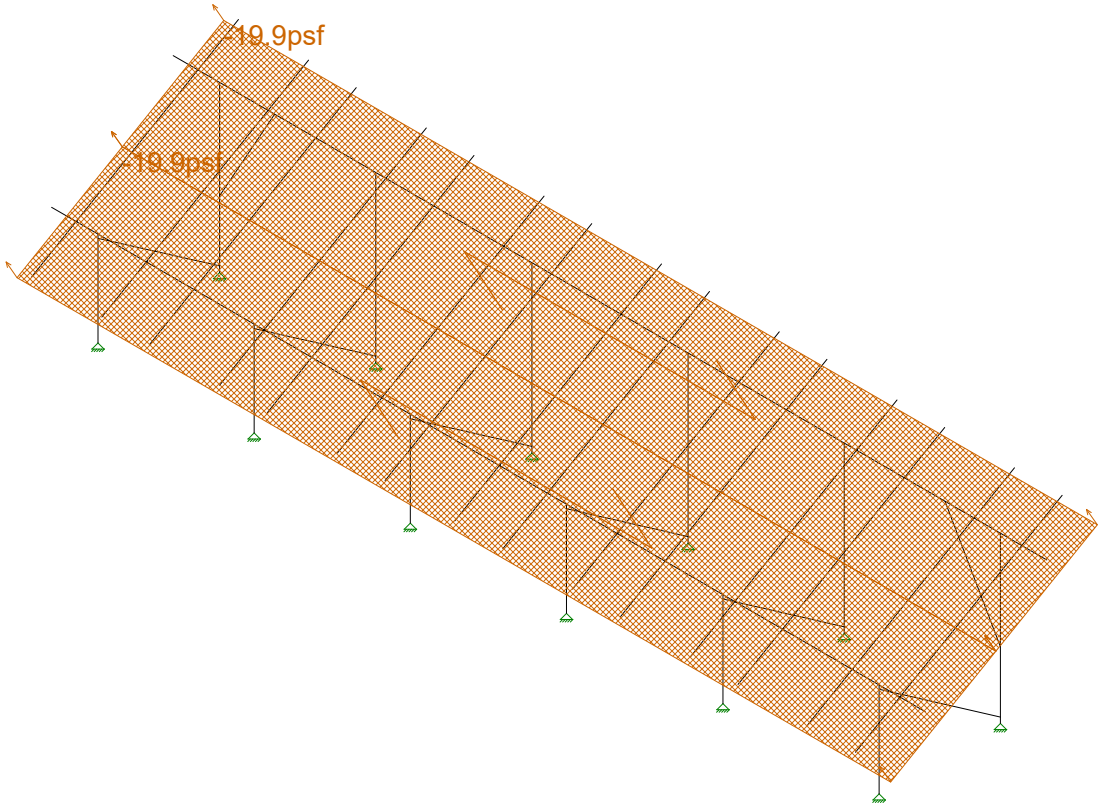
Loads: BLC 2, Solar Panel Weight

Vector Structural Engineeri...		SK - 6
STB	Ground Mount	July 29, 2019 at 2:46 PM
U2716.095.191		USA B2 GM v4.r3d



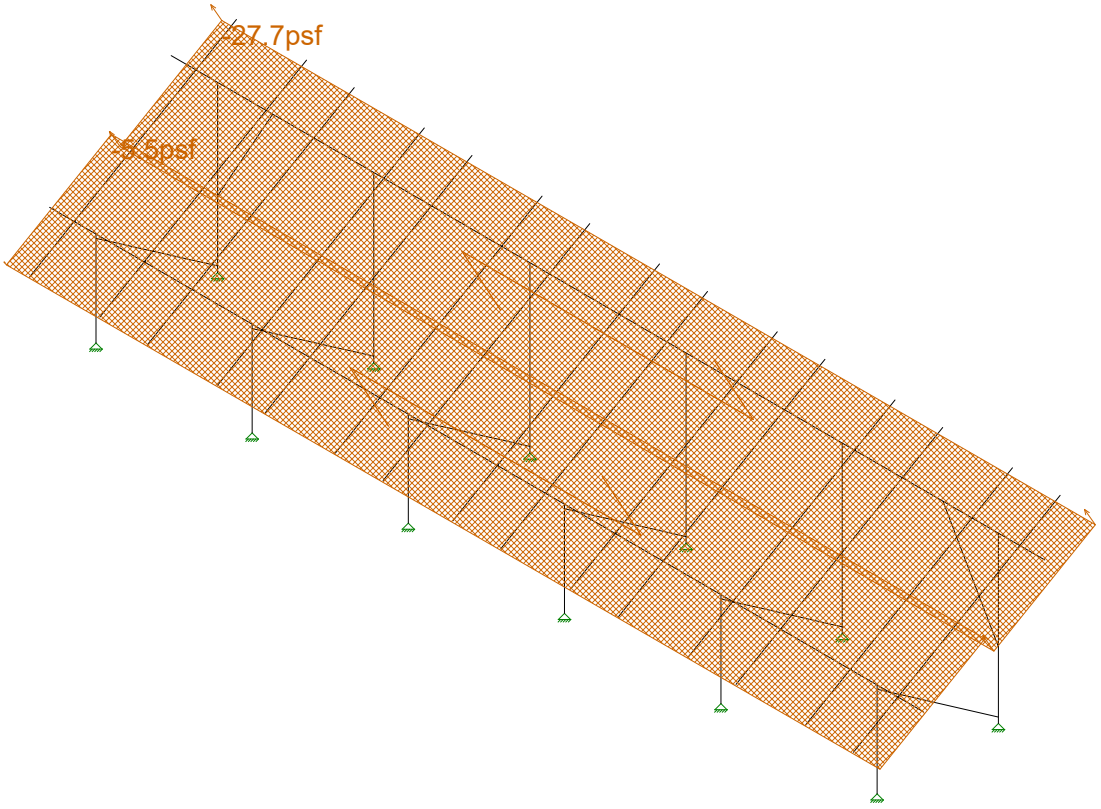
Loads: BLC 3, Roof Live/Snow

Vector Structural Engineeri...		SK - 7
STB	Ground Mount	July 29, 2019 at 2:46 PM
U2716.095.191		USA B2 GM v4.r3d



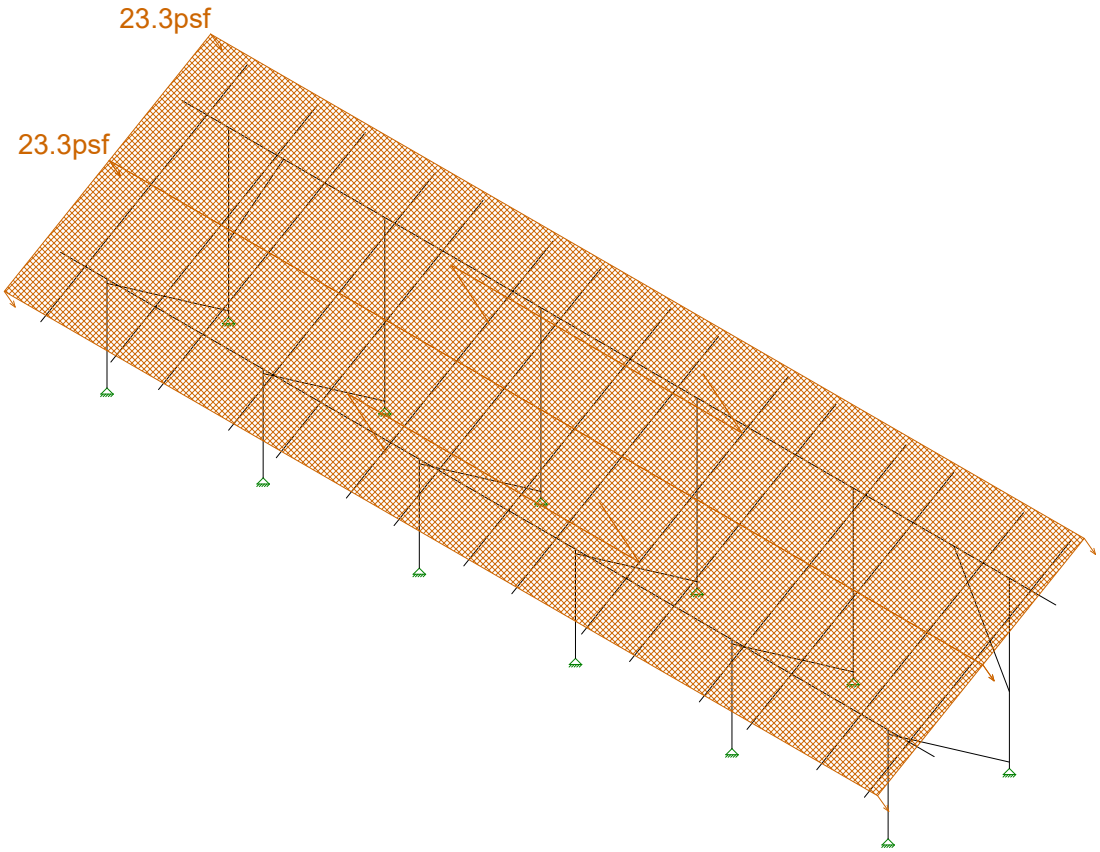
Loads: BLC 4, Wind A 0 deg

Vector Structural Engineeri...	Ground Mount	SK - 8
STB		July 29, 2019 at 2:46 PM
U2716.095.191		USA B2 GM v4.r3d



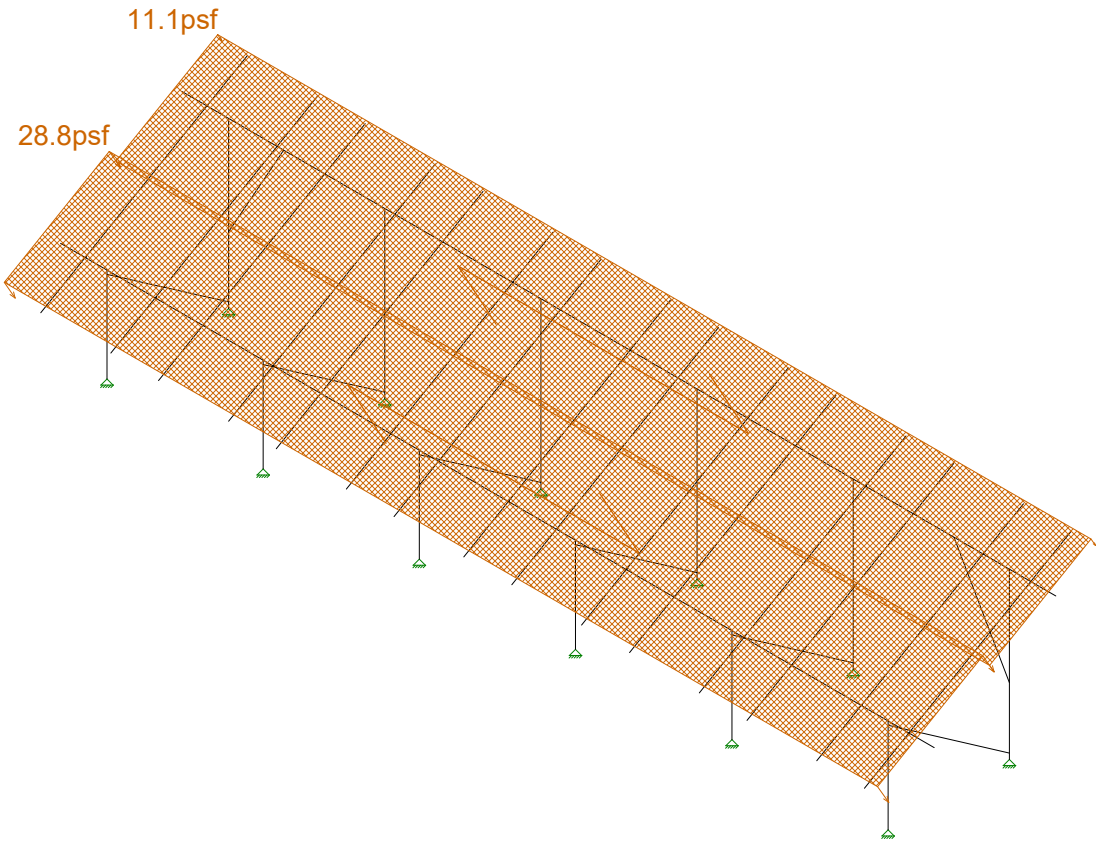
Loads: BLC 5, Wind B 0 deg

Vector Structural Engineeri...	Ground Mount	SK - 9
STB		July 29, 2019 at 2:46 PM
U2716.095.191		USA B2 GM v4.r3d



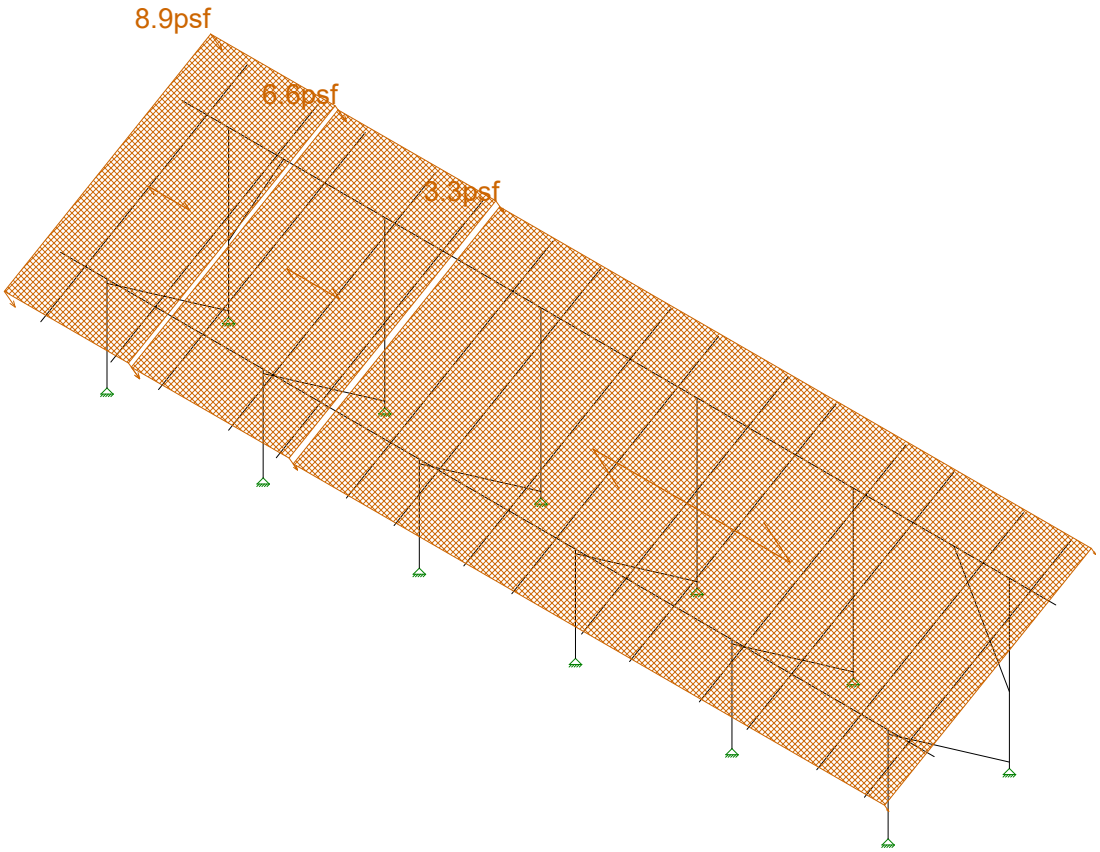
Loads: BLC 6, Wind A 180 deg

Vector Structural Engineeri...		SK - 10
STB	Ground Mount	July 29, 2019 at 2:47 PM
U2716.095.191		USA B2 GM v4.r3d



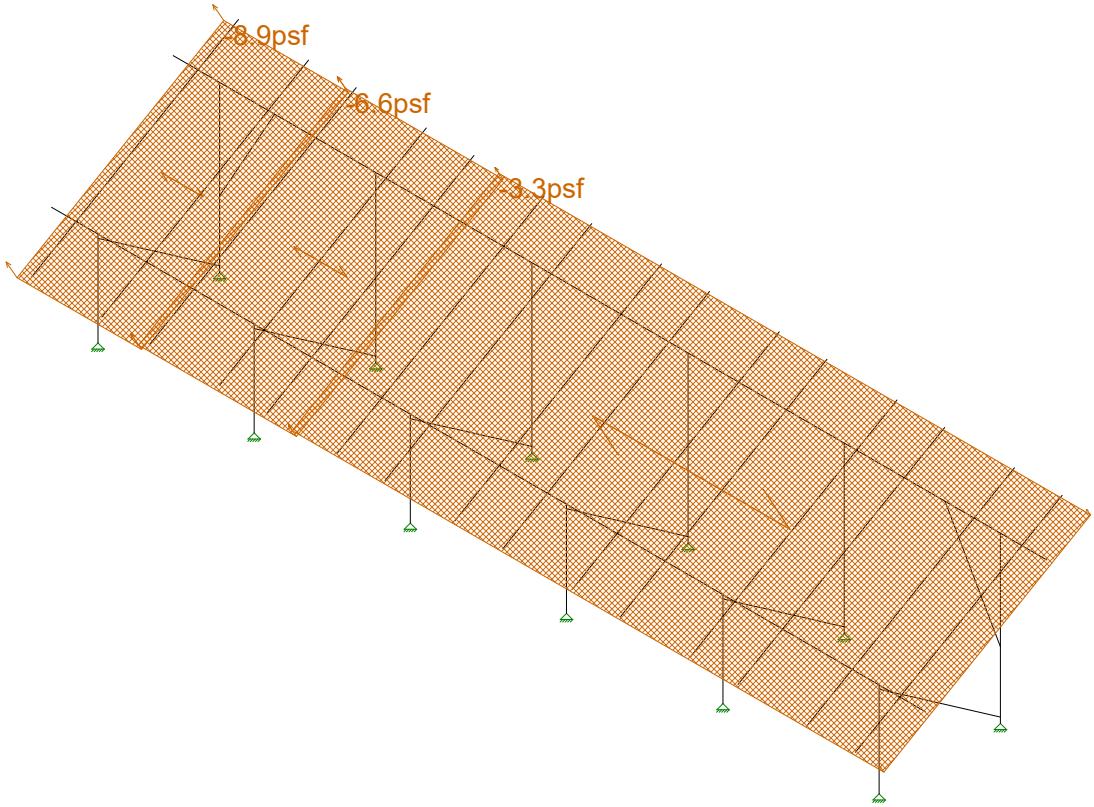
Loads: BLC 7, Wind B 180 deg

Vector Structural Engineeri...		SK - 12
STB	Ground Mount	July 29, 2019 at 2:47 PM
U2716.095.191		USA B2 GM v4.r3d



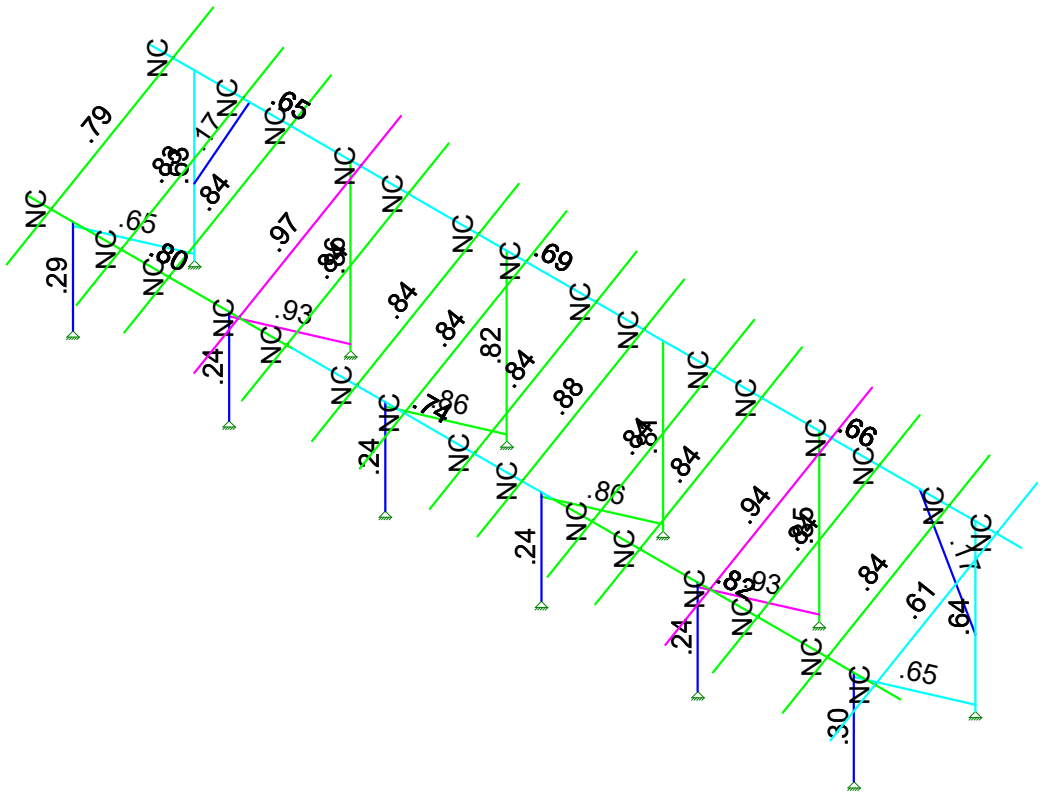
Loads: BLC 8, Wind A 90

Vector Structural Engineeri...		SK - 13
STB	Ground Mount	July 29, 2019 at 2:47 PM
U2716.095.191		USA B2 GM v4.r3d



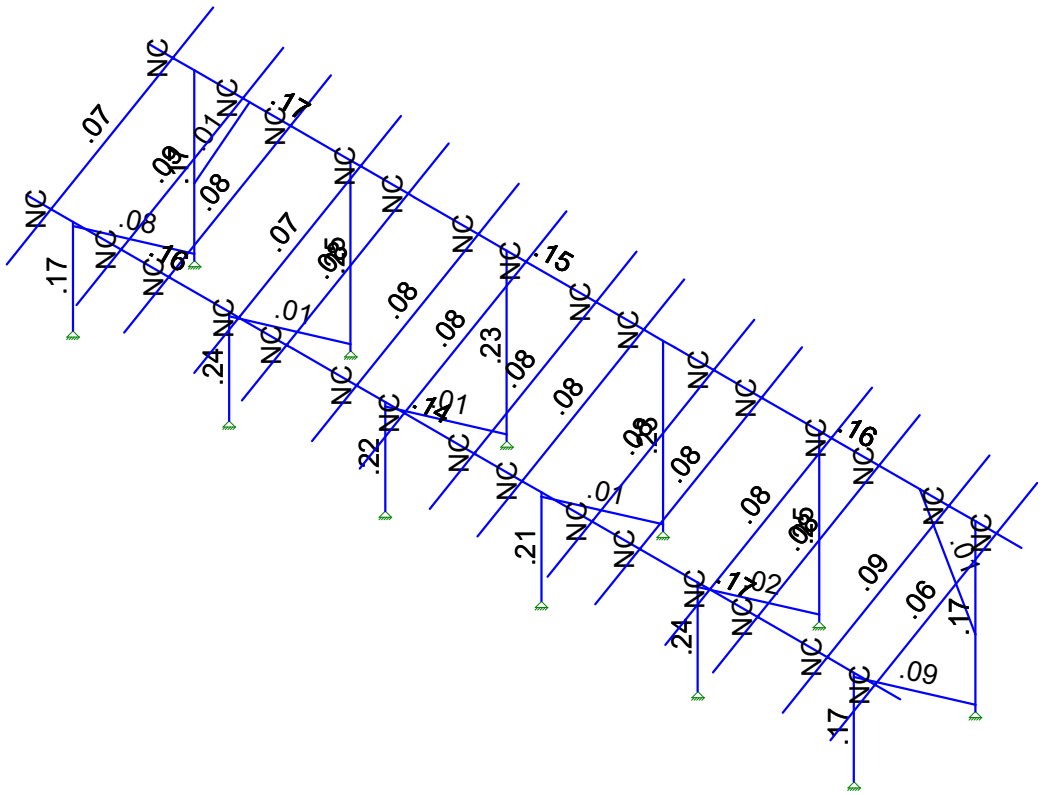
Loads: BLC 9, Wind B 90

Vector Structural Engineeri...		SK - 14
STB	Ground Mount	July 29, 2019 at 2:47 PM
U2716.095.191		USA B2 GM v4.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Vector Structural Engineeri...		SK - 1
STB	Ground Mount	July 29, 2019 at 2:45 PM
U2716.095.191		USA B2 GM v4.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Vector Structural Engineeri...	Ground Mount	SK - 2
STB		July 29, 2019 at 2:45 PM
U2716.095.191		USA B2 GM v4.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 13th(360-05): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 13th(360-05): ASD
Cold Formed Steel Code	AISI S100-07: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-08
Masonry Code	ACI 530-08: ASD
Aluminum Code	AA ADM1-05: ASD - Building
	AISC 14th(360-10): ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	15600
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/ft^3]	Yield[psi]	Ry	Fu[psi]	Rt
1	A992	29000	11154	.3	.65	490	50000	1.1	65000	1.1
2	A36 Gr.36	29000	11154	.3	.65	490	36000	1.5	58000	1.2
3	A572 Gr.50	29000	11154	.3	.65	490	50000	1.1	65000	1.1
4	A500 Gr.B R...	29000	11154	.3	.65	527	42000	1.4	58000	1.3
5	A500 Gr.B Re...	29000	11154	.3	.65	527	46000	1.4	58000	1.3
6	A53 Gr.B	29000	11154	.3	.65	490	35000	1.6	60000	1.2
7	A1085	29000	11154	.3	.65	490	50000	1.4	65000	1.3

Aluminum Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (...	Density[...	Table 3.3	kt	Ftu[psi]	Fty[psi]	Fcy[psi]	Fsu[psi]	Ct
1	3003-H14	10100	3787.5	.33	1.3	172.8	Table 3.3-3	1	19000	16000	13000	12000	141
2	6061-T6	10100	3787.5	.33	1.3	172.8	Table 3.3-4	1	38000	35000	35000	24000	141
3	6063-T5	10100	3787.5	.33	1.3	172.8	Table 3.3-4	1	22000	16000	16000	13000	141
4	6063-T6	10100	3787.5	.33	1.3	172.8	Table 3.3-4	1	30000	25000	25000	19000	141
5	5052-H34	10200	3787.5	.33	1.3	172.8	Table 3.3-3	1	34000	26000	24000	20000	141
6	6061-T6 W	10100	3787.5	.33	1.3	172.8	Table 3.3-3	1	24000	15000	15000	15000	141
7	6005-T5	10100	3787.5	.33	1.3	172.8	Table 3.3-3	1	38000	35000	35000	24000	141

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Post	Pipe 2.0 A21165	Column	Pipe	A572 Gr.50	Typical	.776	.499	.499	.998
2	Cross Beam	Pipe 2.5 A21168	Beam	Wide Flange	A572 Gr.50	Typical	.947	.907	.907	1.814
3	Diagonal Brace	1.5x1.5x0.083	HBrace	SquareTube	A36 Gr.36	Typical	.47	.158	.158	.236

Aluminum Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	AL Posts	2.375ODX0.188	Column	Pipe	6005-T5	Typical	1.29	.778	.778	1.54
2	AL Brace	RT1.5x2x0.15625	VBrace	Rectangular Tubes	6005-T5	Typical	.996	.327	.524	.602
3	AL Rails	HR250 ALA	Beam	Rectangular Tubes	6005-T5	Typical	.723	.095	.486	.261
4	AL Cross Beam	Cross Rail	Beam	Rectangular Tubes	6005-T5	Typical	1.909	1.97	4.366	4.017

Member Area Loads (BLC 2 : Solar Panel Weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N200	N199	N196	Y	A-B	-3

Member Area Loads (BLC 3 : Roof Live/Snow)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N200	N199	N196	PY	A-B	-13

Member Area Loads (BLC 4 : Wind A 0 deg)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N200	N201	N198	Perp	A-B	-19.9
2	N198	N201	N199	N196	Perp	A-B	-19.9

Member Area Loads (BLC 5 : Wind B 0 deg)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N200	N201	N198	Perp	A-B	-27.7
2	N198	N201	N199	N196	Perp	A-B	-5.5

Member Area Loads (BLC 6 : Wind A 180 deg)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N200	N201	N198	Perp	A-B	23.3
2	N198	N201	N199	N196	Perp	A-B	23.3

Member Area Loads (BLC 7 : Wind B 180 deg)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N200	N201	N198	Perp	A-B	11.1
2	N198	N201	N199	N196	Perp	A-B	28.8

Member Area Loads (BLC 8 : Wind A 90)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N203	N202	N196	Perp	A-B	8.9
2	N203	N209	N208	N202	Perp	A-B	6.6
3	N209	N200	N199	N208	Perp	A-B	3.3

Member Area Loads (BLC 9 : Wind B 90)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N203	N202	N196	Perp	A-B	-8.9
2	N203	N209	N208	N202	Perp	A-B	-6.6
3	N209	N200	N199	N208	Perp	A-B	-3.3

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(M...	Surface...
1	Self Weight	DL		-1.05						
2	Solar Panel Weight	DL							1	

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(M...	Surface...
3	Roof Live/Snow	RLL							1	
4	Wind A 0 deg	OL1							2	
5	Wind B 0 deg	OL2							2	
6	Wind A 180 deg	OL3							2	
7	Wind B 180 deg	OL4							2	
8	Wind A 90	OL5							3	
9	Wind B 90	OL6							3	
10	BLC 2 Transient Area ...	None						35		
11	BLC 3 Transient Area ...	None						35		
12	BLC 4 Transient Area ...	None						124		
13	BLC 5 Transient Area ...	None						124		
14	BLC 6 Transient Area ...	None						124		
15	BLC 7 Transient Area ...	None						124		
16	BLC 8 Transient Area ...	None						102		
17	BLC 9 Transient Area ...	None						102		

Load Combinations

	Description	S...	PD...	SRSS	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.0 D	Yes	Y		DL	1																		
2	1.0 D + 1.0 S	Yes	Y		DL	1	RLL	1																
3	1.0 D + 0.6 W1	Yes	Y		DL	1	RLL		OL1	1														
4	1.0 D + 0.6 W2	Yes	Y		DL	1	RLL		OL2	1														
5	1.0 D + 0.6 W3	Yes	Y		DL	1	RLL		OL3	1														
6	1.0 D + 0.6 W4	Yes	Y		DL	1	RLL		OL4	1														
7	1.0 D + 0.6 W5	Yes	Y		DL	1	RLL		OL5	1														
8	1.0 D + 0.6 W6	Yes	Y		DL	1	RLL		OL6	1														
9	1.0 D + 0.45 W1 + 0....	Yes	Y		DL	1	RLL	.75	OL1	.75														
10	1.0 D + 0.45 W2 + 0....	Yes	Y		DL	1	RLL	.75	OL2	.75														
11	1.0 D + 0.45 W3 + 0....	Yes	Y		DL	1	RLL	.75	OL3	.75														
12	1.0 D + 0.45 W4 + 0....	Yes	Y		DL	1	RLL	.75	OL4	.75														
13	1.0 D + 0.45 W5 + 0....	Yes	Y		DL	1	RLL	.75	OL5	.75														
14	1.0 D + 0.45 W6 + 0....	Yes	Y		DL	1	RLL	.75	OL6	.75														
15	0.6 D + 0.6 W1	Yes	Y		DL	.6	RLL		OL1	1														
16	0.6 D + 0.6 W2	Yes	Y		DL	.6	RLL		OL2	1														
17	0.6 D + 0.6 W3	Yes	Y		DL	.6	RLL		OL3	1														
18	0.6 D + 0.6 W4	Yes	Y		DL	.6	RLL		OL4	1														
19	0.6 D + 0.6 W5	Yes	Y		DL	.6	RLL		OL5	1														
20	0.6 D + 0.6 W6	Yes	Y		DL	.6	RLL		OL6	1														

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N2	max	56.325	12	1061.945	10	44.243	3	0	1	0	1	0	1
2		min	-29.873	15	-31.816	17	-52.348	5	0	1	0	1	0	1
3	N1	max	108.116	11	2338.875	5	1109.6...	5	0	1	0	1	0	1
4		min	-100.821	16	-1893.286	16	-946.381	3	0	1	0	1	0	1
5	N132	max	3.009	5	3054.238	5	1604.5...	5	0	1	0	1	0	1
6		min	-1.553	19	-2462.662	16	-1370....	3	0	1	0	1	0	1
7	N133	max	13.666	12	1522.366	10	54.195	3	0	1	0	1	0	1
8		min	-4.808	15	-128.509	17	-63.595	5	0	1	0	1	0	1
9	N109	max	4.574	11	3081.559	5	1616.2...	5	0	1	0	1	0	1
10		min	-1.671	16	-2473.087	16	-1380.96	3	0	1	0	1	0	1
11	N110A	max	4.463	15	1534.411	10	54.462	3	0	1	0	1	0	1
12		min	-9.847	5	-133.221	17	-63.859	5	0	1	0	1	0	1
13	N121	max	3.173	16	2972.869	5	1489.8...	5	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
14		min	-2.099	19	-2428.307	16	-1272....	3	0	1	0	1	0	1
15	N122	max	2.305	14	1419.091	10	54.185	3	0	1	0	1	0	1
16		min	-2.066	19	-69.579	17	-63.959	5	0	1	0	1	0	1
17	N133B	max	5.28	16	2972.003	5	1482.26	5	0	1	0	1	0	1
18		min	-1.705	13	-2423.124	16	-1265....	3	0	1	0	1	0	1
19	N134B	max	.252	15	1419.31	10	53.93	3	0	1	0	1	0	1
20		min	-7.911	12	-61.343	17	-63.717	5	0	1	0	1	0	1
21	N137C	max	97.359	16	2370.732	5	1122.0...	5	0	1	0	1	0	1
22		min	-105.771	11	-1907.154	16	-957.175	3	0	1	0	1	0	1
23	N138B	max	27.371	15	1075.058	10	44.588	3	0	1	0	1	0	1
24		min	-58.775	12	-34.804	17	-52.683	5	0	1	0	1	0	1
25	Totals:	max	.137	11	19275.533	11	8064.4...	5						
26		min	-.056	20	-10155.318	15	-6887....	15						

Envelope AISC 13th(360-05): ASD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	Pnc/om [...	Pnt/om [lb]	Mnyy/om...	Mnzz/om...	Cb	Eqn
1	M5	Pipe 2.0 A2...	.292	63.195	12	.172	63.195		5	14323.286	23232.186	1397.505	1397.505	1....	H1-1b
2	M6	Pipe 2.0 A2...	.630	3.561	5	.171	0		5	5778.24	23232.186	1397.505	1397.505	1....	H1-1a
3	M13	Pipe 2.5 A2...	.803	139....	12	.159	141....		6	11641.036	28358.413	2081.747	2081.747	1....	H1-1b
4	M14	Pipe 2.5 A2...	.647	139....	11	.166	141....		5	11641.036	28358.413	2081.747	2081.747	1....	H1-1b
5	M15	1.5x1.5x0.083	.647	53.339	5	.081	0	y	11	2263.956	10141.308	449.583	449.583	1....	H1-1a
6	M80	Pipe 2.0 A2...	.241	62.516	17	.235	63.195		5	14323.286	23232.186	1397.505	1397.505	1....	H1-1b
7	M81	Pipe 2.0 A2...	.854	3.561	5	.247	0		5	5778.24	23232.186	1397.505	1397.505	2....	H1-1a
8	M82	1.5x1.5x0.083	.925	53.339	5	.017	102....	y	4	2263.956	10141.308	449.583	449.583	1....	H1-1a
9	M50	Pipe 2.0 A2...	.244	62.516	17	.237	63.195		5	14323.286	23232.186	1397.505	1397.505	1....	H1-1b
10	M51	Pipe 2.0 A2...	.861	3.561	5	.249	0		5	5778.24	23232.186	1397.505	1397.505	1....	H1-1a
11	M52	1.5x1.5x0.083	.932	53.339	5	.014	102....	y	5	2263.956	10141.308	449.583	449.583	1....	H1-1a
12	M56A	Pipe 2.0 A2...	.240	62.516	17	.217	63.195		5	14323.286	23232.186	1397.505	1397.505	1....	H1-1b
13	M57A	Pipe 2.0 A2...	.816	3.561	5	.229	0		5	5778.24	23232.186	1397.505	1397.505	1....	H1-1a
14	M58A	1.5x1.5x0.083	.860	53.339	5	.011	0	y	11	2263.956	10141.308	449.583	449.583	1....	H1-1a
15	M68	Pipe 2.0 A2...	.239	62.516	17	.215	63.195		5	14323.286	23232.186	1397.505	1397.505	1....	H1-1b
16	M69	Pipe 2.0 A2...	.814	3.561	5	.228	0		5	5778.24	23232.186	1397.505	1397.505	1....	H1-1a
17	M70	1.5x1.5x0.083	.856	53.339	5	.008	102....	y	13	2263.956	10141.308	449.583	449.583	1....	H1-1a
18	M68A	Pipe 2.5 A2...	.743	172.5	12	.144	170....		6	11641.036	28358.413	2081.747	2081.747	3	H1-1b
19	M69A	Pipe 2.5 A2...	.819	100	12	.174	100		6	11641.036	28358.413	2081.747	2081.747	2....	H1-1b
20	M70A	Pipe 2.5 A2...	.688	172.5	11	.151	170....		11	11641.036	28358.413	2081.747	2081.747	3	H1-1b
21	M71	Pipe 2.5 A2...	.664	100	11	.158	100		5	11641.036	28358.413	2081.747	2081.747	2....	H1-1b
22	M66A	Pipe 2.0 A2...	.305	63.195	12	.175	63.195		5	14323.286	23232.186	1397.505	1397.505	1....	H1-1b
23	M67A	Pipe 2.0 A2...	.638	3.561	5	.173	0		5	5778.24	23232.186	1397.505	1397.505	1....	H1-1a
24	M68C	1.5x1.5x0.083	.654	53.339	5	.093	0	y	11	2263.956	10141.308	449.583	449.583	1....	H1-1a

Envelope AA ADM1-05: ASD - Building Aluminum Code Checks

	Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	Fc [psi]	Ft [psi]	Fb y-y ...	Fb z-z ...	Fs y-y ...	Fs z-z ...	Cb	Cmy	Cmz	Eqn
1	M19	RT1.5x2..	.168	49.431	11	.008	77.793	y	5	2773.1...	19487...	21212...	21154...	12246...	12246...	1....	.6	.6	4.1.1-1
2	M16	HR250_...	.795	36.1	12	.075	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-3
3	M35	HR250_...	.828	85.953	11	.088	37.819	y	12	3058.2...	19487...	19487...	19487...	12246...	12246...	1	.6	.6	4.1.2-1
4	M38	HR250_...	.838	36.1	12	.081	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-3
5	M41	HR250_...	.974	89.391	16	.073	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-1
6	M44	HR250_...	.838	36.1	12	.076	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-3
7	M47	HR250_...	.838	36.1	12	.076	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-3
8	M50A	HR250_...	.839	36.1	12	.077	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-3
9	M53	HR250_...	.838	36.1	12	.075	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-3
10	M56	HR250_...	.882	89.391	16	.077	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-1
11	M59	HR250_...	.839	36.1	12	.077	37.819	y	12	3058.2...	19487...	19551...	17939...	12246...	12246...	1	.6	.6	4.1.1-3

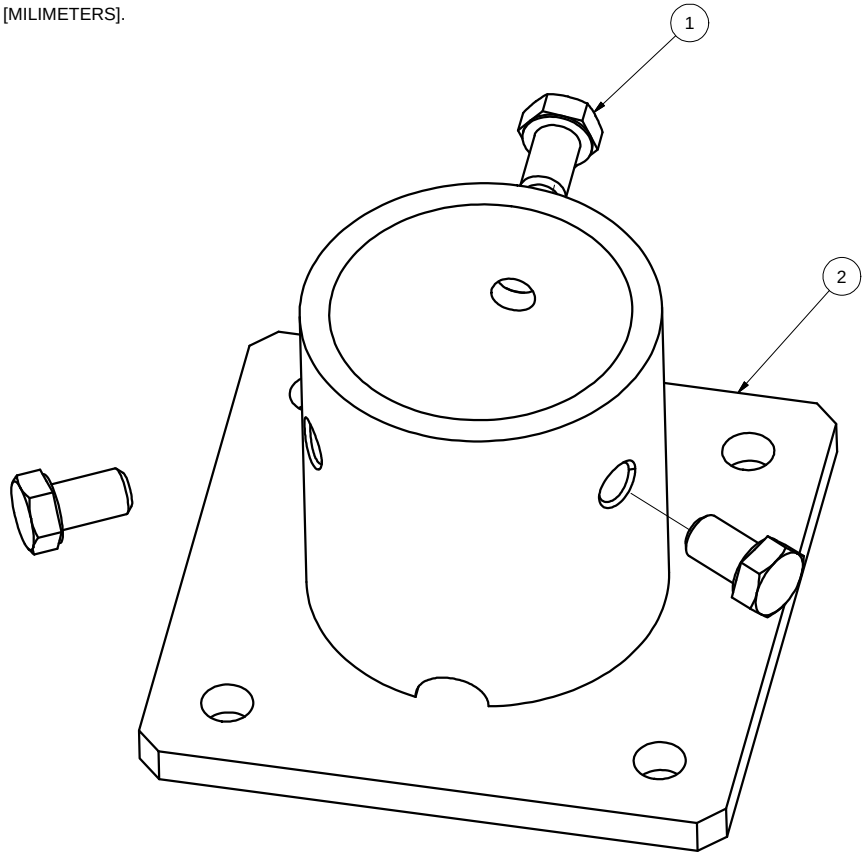
Envelope AA ADM1-05: ASD - Building Aluminum Code Checks (Continued)

	Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	Fc [psi]	Ft [psi]	Fb y-y ...	Fb z-z ...	Fs y-y ...	Fs z-z ...	Cb	Cmy	Cmz	Eqn
12	M62	HR250_...	.838	36.1	12	.077	37.819	y	12	3058.2...	19487....	19551....	17939....	12246....	12246....	1	.6	.6	4.1.1-3
13	M65	HR250_...	.943	89.391	16	.080	37.819	y	12	3058.2...	19487....	19551....	17939....	12246....	12246....	1	.6	.6	4.1.1-1
14	M68B	HR250_...	.836	36.1	12	.080	37.819	y	12	3058.2...	19487....	19551....	17939....	12246....	12246....	1	.6	.6	4.1.1-3
15	M71A	HR250_...	.840	85.953	11	.090	37.819	y	12	3058.2...	19487....	19487....	19487....	12246....	12246....	1	.6	.6	4.1.2-1
16	M69C	RT1.5x2...	.166	49.509	11	.011	77.916	y	5	2764.3...	19487....	21212....	21150....	12246....	12246....	1....	.6	.6	4.1.1-1
17	M71B	HR250_...	.611	36.1	12	.061	37.819	y	12	3058.2...	19487....	19551....	17939....	12246....	12246....	1	.6	.6	4.1.1-3

REVISIONS			
REV	DESCRIPTION	BY	DATE
A	INITIAL RELEASE	LWF	10/20/2016

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].



ITEM	PART NUMBER	DESCRIPTION	QTY
2	A21120-001	2" PIPE BASE	1
1	B15018-011	HEX CAP SCREW 3/8-16 X 5/8	3

MATERIAL: SEE NOTES

Third Angle Projection:

GENERAL SPECIFICATIONS
All Dimensions in inches [millimeters]
Tolerances
X.XXX ±0.01 [0.25mm]
X.XX ±0.02 [0.50mm]
X.X ±0.039 [1.0mm]
Unless otherwise spec'd
Break all sharp edges .010-.020 unless otherwise specified.

DRAWN BY: LWF
DATE: 10/20/2016
CHECKED BY:
APPROVALS:

Sunmodo Corp.

1905 E 5TH STREET, STE A, VANCOUVER, WA 98661

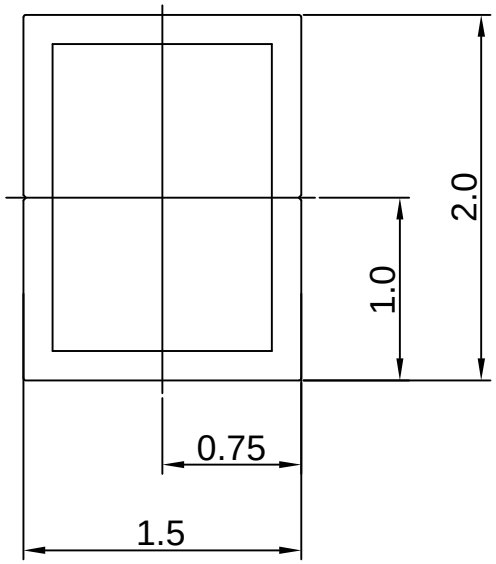
TITLE: 2" PIPE BASE KIT

B
DRAWING NUMBER: K10268-001

SCALE: NONE
SHEET 1 of 1

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
2. MATERAIL: ALUMINUM 6005-T5.
   FINISH: CLEAR ANODIZED 10 ųm THICK.
3. THE UNSPECIFIED DIMENSIONS ARE SPECIFIED BY 2D CAD FILE.



Section properties:

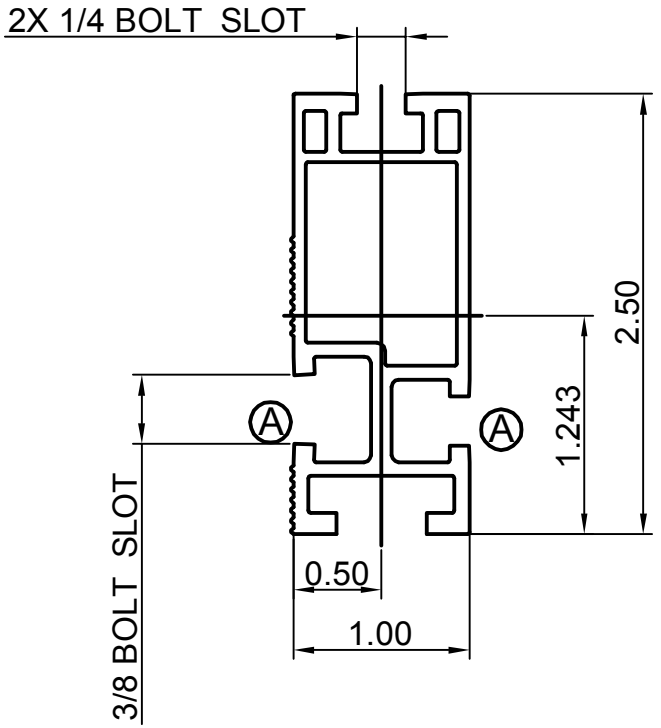
Weight: 1.156 lbs/ft
Area: 0.992 in^2
Perimeter: 12.601 in
Bounding Box: X: -1.000,1.000
Y: -0.750, 0.750
Centroid:(0.000,0.000)
Moments of Inertia(in^4): Ix=0.506,Iy=0.322
Section modulus in bending(in^3): Wx=0.675,Wy=0.322
Radii of Gyration: X: 0.714, Y: 0.570

MATERIAL: SEE NOTES		**Sunmodo Corp.**
Third Angle Projection:		1905 E 5TH STREET, SUITE A, VANCOUVER, WA 98661
GENERAL SPECIFICATIONS: All Dimensions in inches [millimeters] Tolerances: X.XXX ± 0.01 [0.25mm] X.XX ± 0.02 [0.50mm] X.X ± 0.039 [1.0mm] Unless otherwise spec'd	Break all sharp edges .010-.020 unless otherwise specified.	TITLE: 1.5X2 AL TUBE BRACE EXTRUSION
DRAWN BY: zcg	DATE: 03/12/2014	B — DRAWING NUMBER: A20164
CHECKED BY		
APPROVALS		SCALE: NONE — SHEET 1 of 1

REVISIONS			
REV	DESCRIPTON	BY	DATE
A	ADDED BOTTOM CHANNEL & CHANGED ONE 3/8 CHANNEL TO 1/4	zcg	02/21/2013

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
2. MATERAIL: ALUMINUM 6005-T5.
   FINISH: CLEAR ANODIZED 15 µm THICK.
3. THE UNSPECIFIED DIMENSIONS ARE SPECIFIED BY 2D CAD FILE.



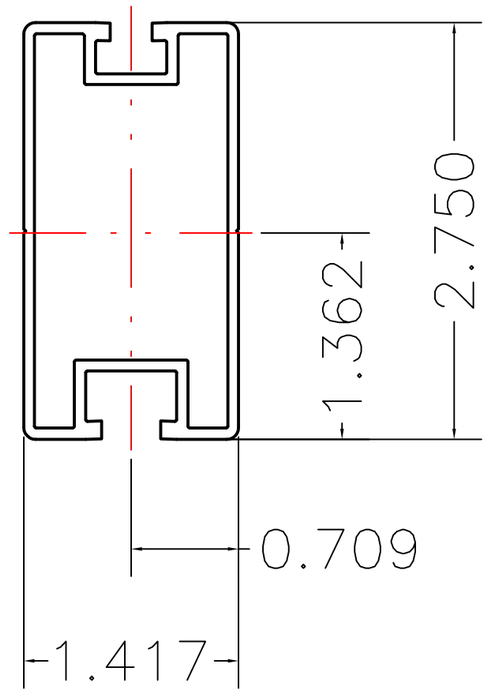
Section properties:

Weight: 0.850 lbs/ft
Area: 0.723 in^2
Perimeter: 17.325 in
Bounding Box: X: -0.500,0.500
Y: -1.243,1.257
Centroid:(0.000,0.000)
Moments of Incertia(in^4): Ix=0.486,Iy=0.095
Section modulus in bending(in^3): Wx=0.387,Wy=0.190
Radii of Gyration: X: 0.820, Y: 0.363

MATERIAL: SEE NOTES		**Sunmodo Corp.**	
Third Angle Projection:		1905 E 5TH STREET, SUITE A, VANCOUVER, WA 98661	
GENERAL SPECIFICATIONS All Dimensions in inches [millimeters] Tolerances X.XXX ± 0.01 [0.25mm] X.XX ± 0.02 [0.50mm] X.X ± 0.039 [1.0mm] Unless otherwise spec'd	Break all sharp edges .010-.020 unless otherwise specified.	TITLE: HELIO STANDARD RAIL	
DRAWN BY: zcg	DATE: 02/21/2013	B	DRAWING NUMBER: A20144
CHECKED BY			
APPROVALS		SCALE: NONE	SHEET 1 of 1

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
2. MATERIAL: 6005-T5.
   FINISH: CLEAR ANODIZED 10um THICK.
3. THE UNSPECIFIED RADII ARE .02" MAX.
4. THE UNSPECIFIED DIMENSIONS ARE SPECIFIED BY 2D CAD FILE.



Section properties:

Weight: 0.862 lbs/ft
Area: 0.736 in^2
Perimeter: 19.824 in
Bounding Box: X: -0.709,0.709
Y: -1.362,1.388
Centroid:(0.000,0.000)
Moments of Incertia(in^4): Ix=0.727,Iy=0.214
Section modulus in bending(in^3): Wx=0.524,Wy=0.302
Radii of Gyration: X: 994, Y: 0.539

MATERIAL	SEE NOTES
Third Angle Projection:	
GENERAL SPECIFICATIONS	All Dimensions in Inches [millimeters]
Tolerances	X.XXX ±0.01 [0.25mm] X.XX ±0.02 [0.50mm] X.X ±0.039 [1.0mm] Unless otherwise spec'd
	Break all sharp edges .010-.020 unless otherwise specified.
DRAWN BY	KYY
DATE	01/18/2018
CHECKED BY	
APPROVALS	

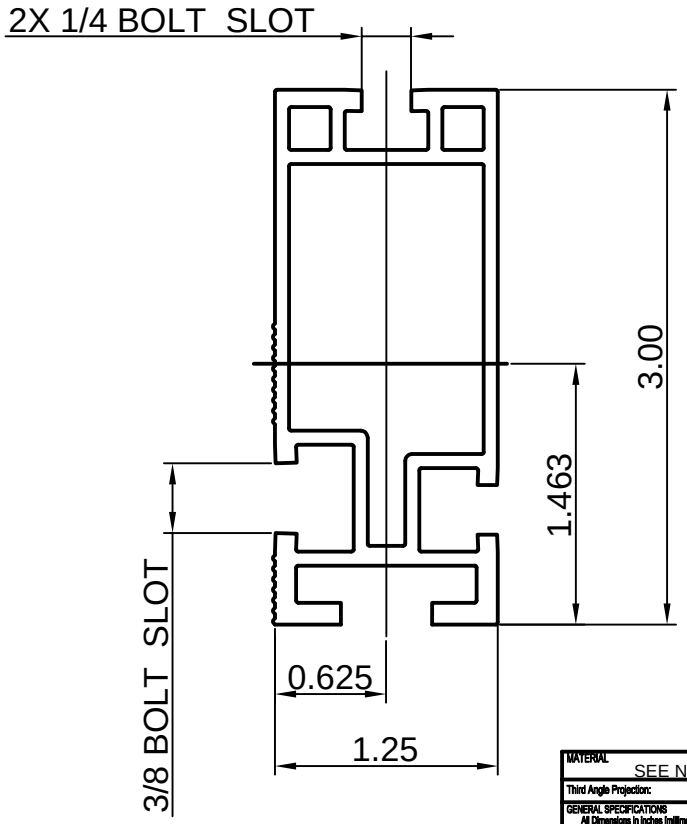
SunModo Corp.
14800 NE 65TH STREET, VANCOUVER WA 98682

TITLE	RAIL, HR300 (SUNRAY), EXTRUSION
B	DRAWING NUMBER A20288
SCALE:	NONE
SHEET	1 of 1

REV	DESCRIPTON	BY	DATE
A	0.44 WAS 0.41, 0.44 WAS 0.33	LWF	11/30/2015

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].
2. MATERAIL: ALUMINUM 6005-T5.
   FINISH: CLEAR ANODIZED 15 ųm THICK.
3. THE UNSPECIFIED DIMENSIONS ARE SPECIFIED BY 2D CAD FILE.



Section properties:

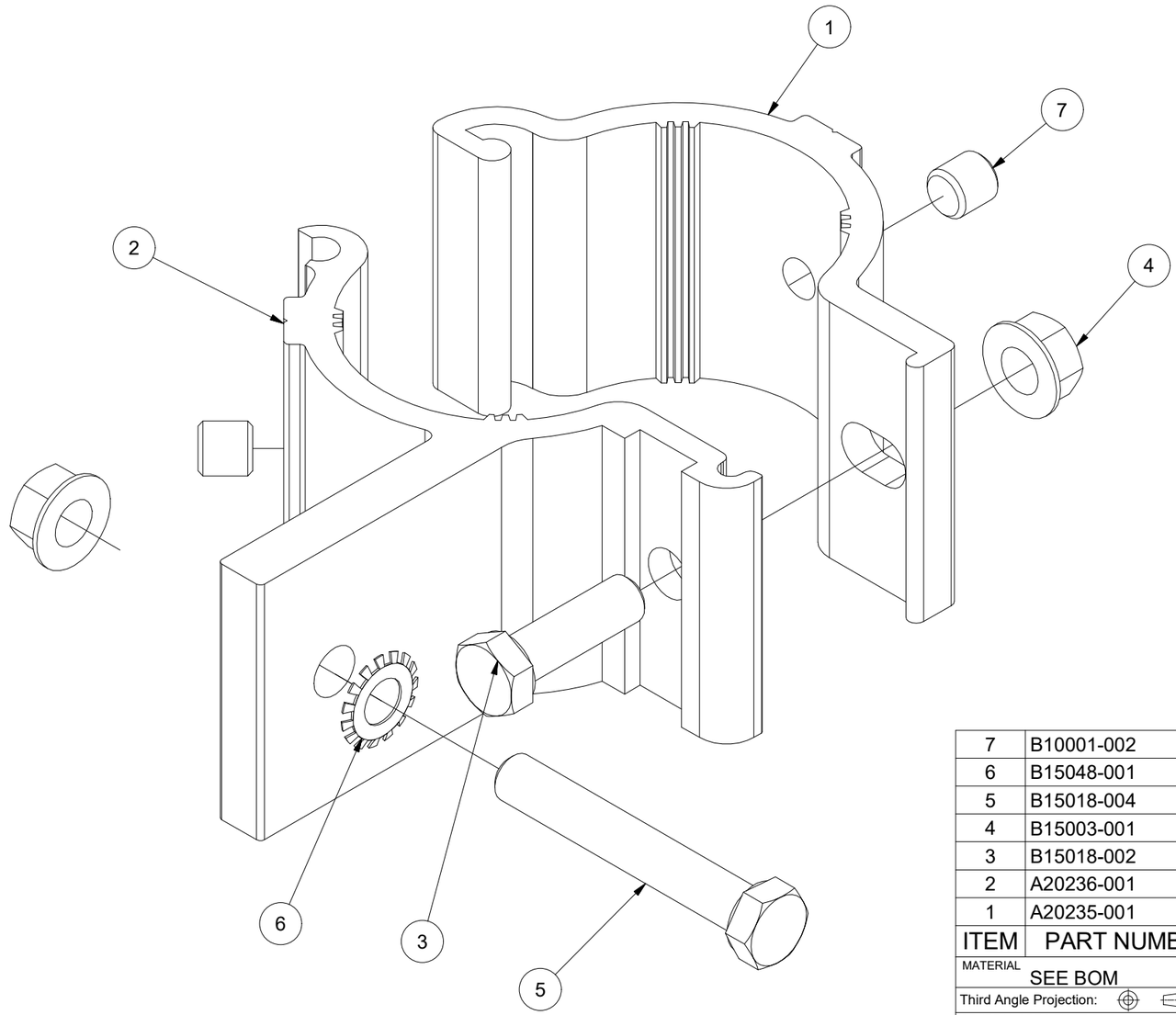
Weight: 1.151 lbs/ft
Area: 0.980 in^2
Perimeter: 22.104 in
Bounding Box: X: -0.625,0.625
Y: -1.463,1.537
Centroid:(0.000,0.000)
Moments of Inertia(in^4): Ix=1.047,Iy=0.207
Section modulus in bending(in^3): Wx=0.681,Wy=0.331
Radii of Gyration: X: 1.034, Y: 0.460

MATERIAL	SEE NOTES
Third Angle Projection:	
GENERAL SPECIFICATIONS All Dimensions in Inches [millimeters] Tolerances X.XXX ±0.01 [0.25mm] X.XX ±0.02 [0.50mm] X.X ±0.039 [1.0mm] Unless otherwise specfd	Break all sharp edges .010-.020 unless otherwise specified.
DRAWN BY: zcg	DATE: 02/21/2013
CHECKED BY	
APPROVALS	

Sunmodo Corp.

1905 E 5TH STREET, SUITE A, VANCOUVER, WA 98661

TITLE	HELIO HEAVY RAIL
B	DRAWING NUMBER A20145
SCALE: NONE	SHEET 1 of 1



ITEM	PART NUMBER	DESCRIPTION	QTY
7	B10001-002	SET SCREW M10X10	2
6	B15048-001	STAR WASHER FOR 3/8 BOLT	1
5	B15018-004	HEX CAP SCREW 3/8-16 X2.5	1
4	B15003-001	FLANGE NUT 3/8-16	2
3	B15018-002	HEX CAP SCREW 3/8-16 X 1.25	1
2	A20236-001	2 AL PIPE CLAMP, FEMALE	1
1	A20235-001	2 AL PIPE CLAMP, MALE	1

MATERIAL: SEE BOM

Third Angle Projection:

GENERAL SPECIFICATIONS
All Dimensions in inches [millimeters]
Tolerances
X.XXX ±0.01 [0.25mm]
X.XX ±0.02 [0.50mm]
X.X ±0.039 [1.0mm]
Unless otherwise spec'd

Break all sharp edges .010-.020 unless otherwise specified.

DRAWN BY: zcg
DATE: 08/12/2015
CHECKED BY:
APPROVALS:

Sunmodo Corp.

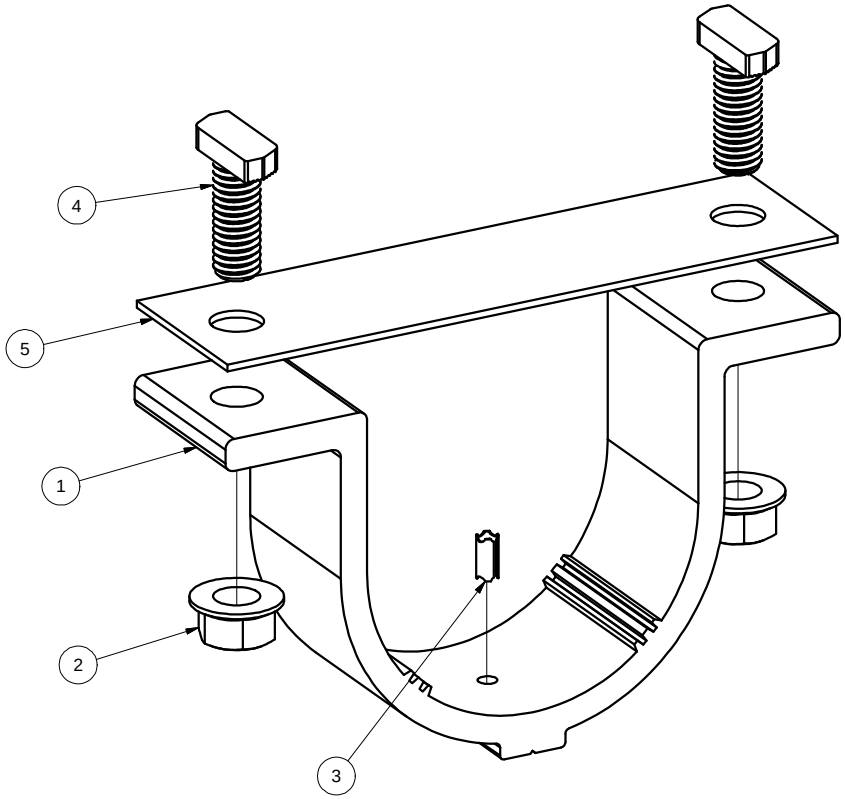
1905 E 5TH STREET, STE A, VANCOUVER, WA 98661

TITLE: 2 AL PIPE CLAMP KIT

B | DRAWING NUMBER: K10219-001

SCALE: NONE | SHEET 1 of 1

REVISIONS			
REV	DESCRIPTION	BY	DATE
A	INITIAL RELEASE	LWF	06/12/2018
B	ADD C10005-006	LWF	06/27/2018



ITEM	PART NUMBER	DESCRIPTION	QTY
5	C10005-006	PVC GASKTE T=1.5mm	1
4	B50033-001	T-BOLT, RAIL BOTTOM SLOT, 3/8-16 X 1"	2
3	B20018-002	GROUNDING PIN	1
2	B15003-001	FLANGE NUT 3/8-16	2
1	A20329-001	2.5" AL PIPE U-BOLT	1

MATERIAL: SEE NOTES

Third Angle Projection:

GENERAL SPECIFICATIONS
All Dimensions in inches [millimeters]
Tolerances
X.XXX ±0.01 [0.25mm]
X.XX ±0.02 [0.50mm]
X.X ±0.039 [1.0mm]
Unless otherwise spec'd
Break all sharp edges .010-.020 unless otherwise specified.

DRAWN BY: KYY
DATE: 06/12/2018
CHECKED BY:
APPROVALS:

SunModo Corp.

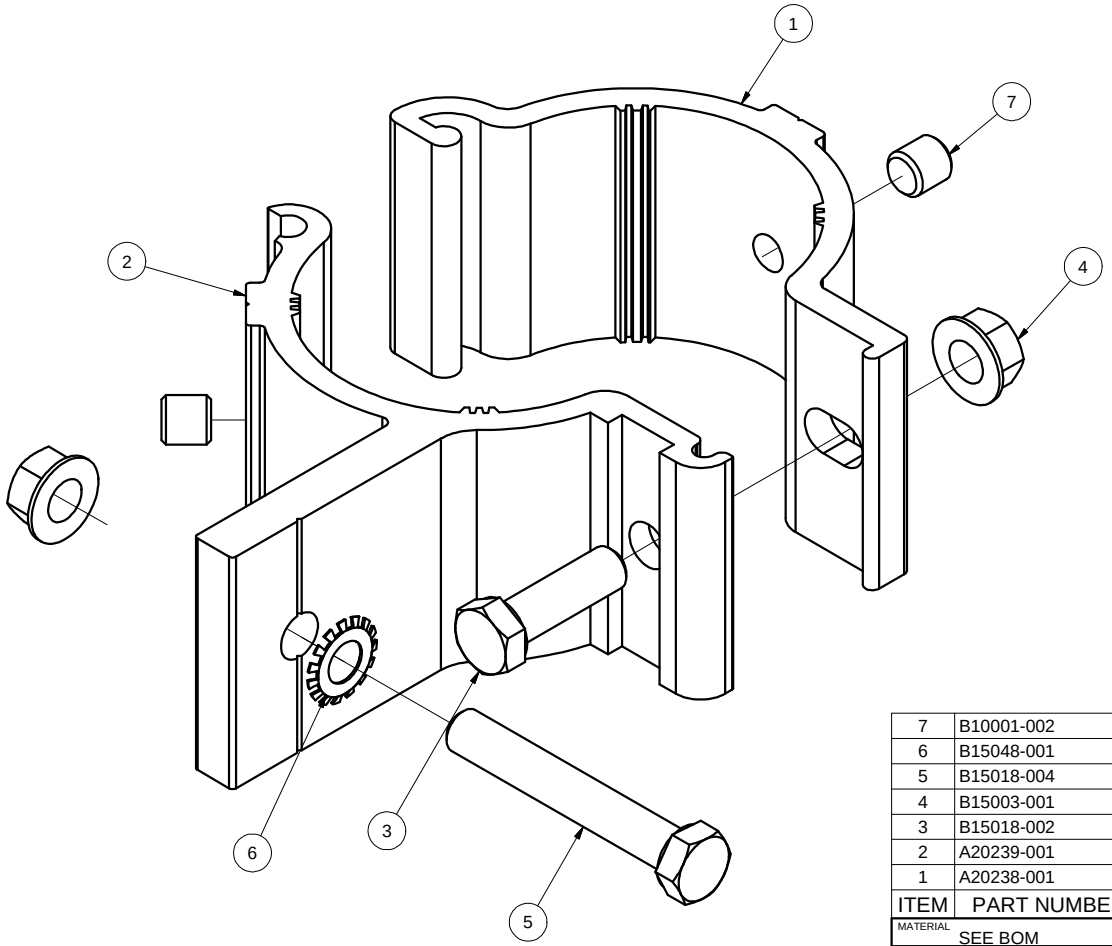
14800 NE 65TH STREET, VANCOUVER WA 98682

TITLE: 2.5" AL PIPE U-CLAMP KIT

B | DRAWING NUMBER: K10343-001

SCALE: NONE | SHEET 1 of 1

REVISIONS			
REV	DESCRIPTION	BY	DATE
A	INITIAL RELEASE	zcg	09/25/2015



ITEM	PART NUMBER	DESCRIPTION	QTY
7	B10001-002	SET SCREW M10X10	2
6	B15048-001	STAR WASHER FOR 3/8 BOLT	1
5	B15018-004	HEX CAP SCREW 3/8-16 X2.5	1
4	B15003-001	FLANGE NUT 3/8-16	2
3	B15018-002	HEX CAP SCREW 3/8-16 X 1.25	1
2	A20239-001	2.5 AL PIPE CLAMP, FEMALE	1
1	A20238-001	2.5 AL PIPE CLAMP, MALE	1

MATERIAL: SEE BOM

Third Angle Projection:

GENERAL SPECIFICATIONS
All Dimensions in inches [millimeters]
Tolerances
X.XXX ±0.01 [0.25mm]
X.XX ±0.02 [0.50mm]
X.X ±0.039 [1.0mm]
Unless otherwise spec'd
Break all sharp edges .010-.020 unless otherwise specified.

DRAWN BY: LWF
DATE: 08/21/2015
CHECKED BY:
APPROVALS:

Sunmodo Corp.

1905 E 5TH STREET, STE A, VANCOUVER, WA 98661

TITLE: 2.5 AL PIPE CLAMP KIT

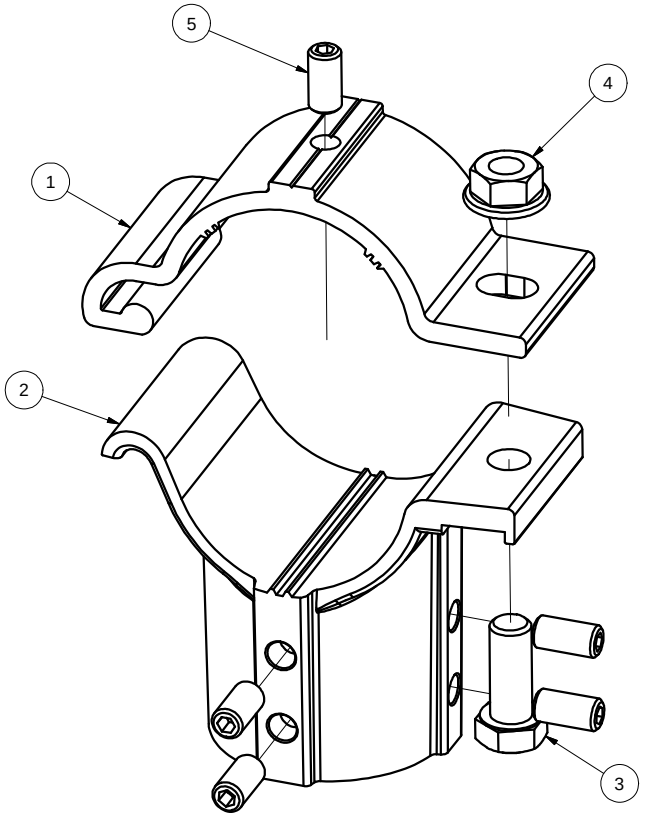
B

DRAWING NUMBER: K10222-001

SCALE: NONE

SHEET 1 of 1

REVISIONS			
REV	DESCRIPTION	BY	DATE
A	INITIAL RELEASE	LWF	06/12/2018



ITEM	PART NUMBER	DESCRIPTION	QTY
5	B10001-001	SET SCREW M10X20	5
4	B15020-001	FLANGE NUT 1/2-13	1
3	B15014-005	HEX CAP SCREW 1/2-13 X 1.25", 304 SS	1
2	A20327-001	2.5" AL PIPE TEE, FEMALE	1
1	A20326-001	2.5" AL PIPE TEE, MALE	1

MATERIAL: SEE NOTES

Third Angle Projection:

GENERAL SPECIFICATIONS
All Dimensions in inches [millimeters]
Tolerances
X.XXX ±0.01 [0.25mm]
X.XX ±0.02 [0.50mm]
X.X ±0.039 [1.0mm]
Unless otherwise spec'd
Break all sharp edges .010-.020 unless otherwise specified.

DRAWN BY: LWF
DATE: 06/12/2018
CHECKED BY:
APPROVALS:

SunModo Corp.

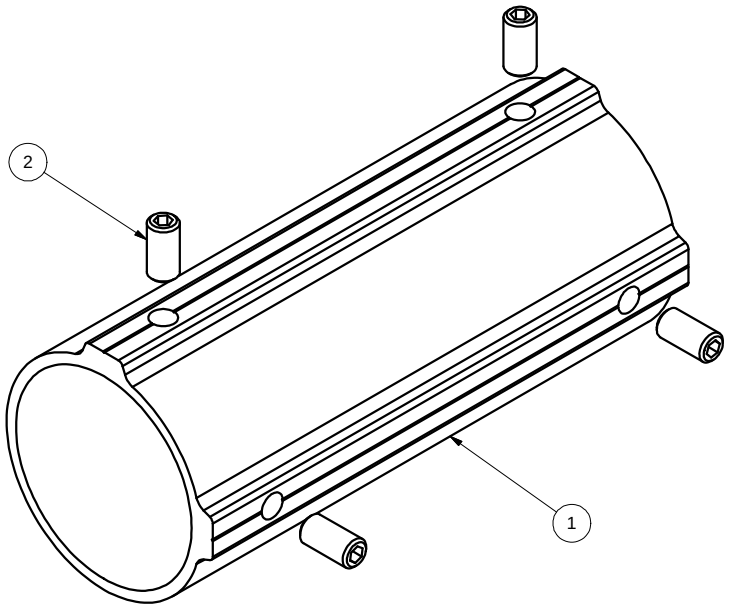
14800 NE 65TH STREET, VANCOUVER WA 98682

TITLE: 2.5" PIPE TEE KIT

B | DRAWING NUMBER: K10341-001

SCALE: NONE | SHEET 1 of 1

REVISIONS			
REV	DESCRIPTION	BY	DATE
A	INITIAL RELEASE	LWF	06/12/2018



ITEM	PART NUMBER	DESCRIPTION	QTY
2	B10001-001	SET SCREW M10X20	4
1	A20328-001	2.5" PIPE SPLICE	1

MATERIAL: SEE NOTES

Third Angle Projection:

GENERAL SPECIFICATIONS
All Dimensions in inches [millimeters]
Tolerances
X.XXX ±0.01 [0.25mm]
X.XX ±0.02 [0.50mm]
X.X ±0.039 [1.0mm]
Unless otherwise spec'd
Break all sharp edges .010-.020 unless otherwise specified.

DRAWN BY: LWF
DATE: 06/12/2018
CHECKED BY:
APPROVALS:

SunModo Corp.

14800 NE 65TH STREET, VANCOUVER WA 98682

TITLE: 2.5" PIPE SPLICE KIT

B | DRAWING NUMBER: K10342-001

SCALE: NONE | SHEET 1 of 1