Project Number: U2716-115-191

August 6, 2019

Sunmodo
14800 NE 65th Street
Vancouver, WA 98682

REFERENCE: Sunmodo Sunturf Ground Mount A6
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 Connecticut State Building Code, 2018 Edition (2015 IBC). 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 7-10)
- Design wind speed for risk category I structures: 140 mph
- Wind exposure: C
- Ground snow load: 70 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.

Load (ASD)	Value (lbs)	Factor of Safety	Test Value (lbs)
UPLIFT	2950	1.5	4425
LATERAL	2080	2	4160

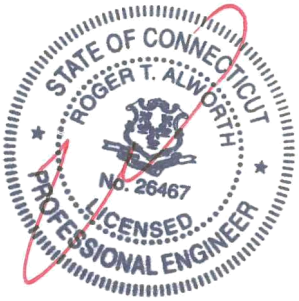
Foundation concrete shall have a minimum compressive strength of 2500 psi at 28 days. Cement for all concrete shall be Type I or II with a minimum of 6% entrained air with a water/cement ratio of 0.50. Maximum aggregate size shall be 3/4". No special inspection of concrete strength is required.

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
Firm License: PEC 0001229



08/06/2019

Roger Alworth, P.E.
License: PEN.0026467 - Expires: 01/31/2021
Principal

Enclosures

RTA/stb

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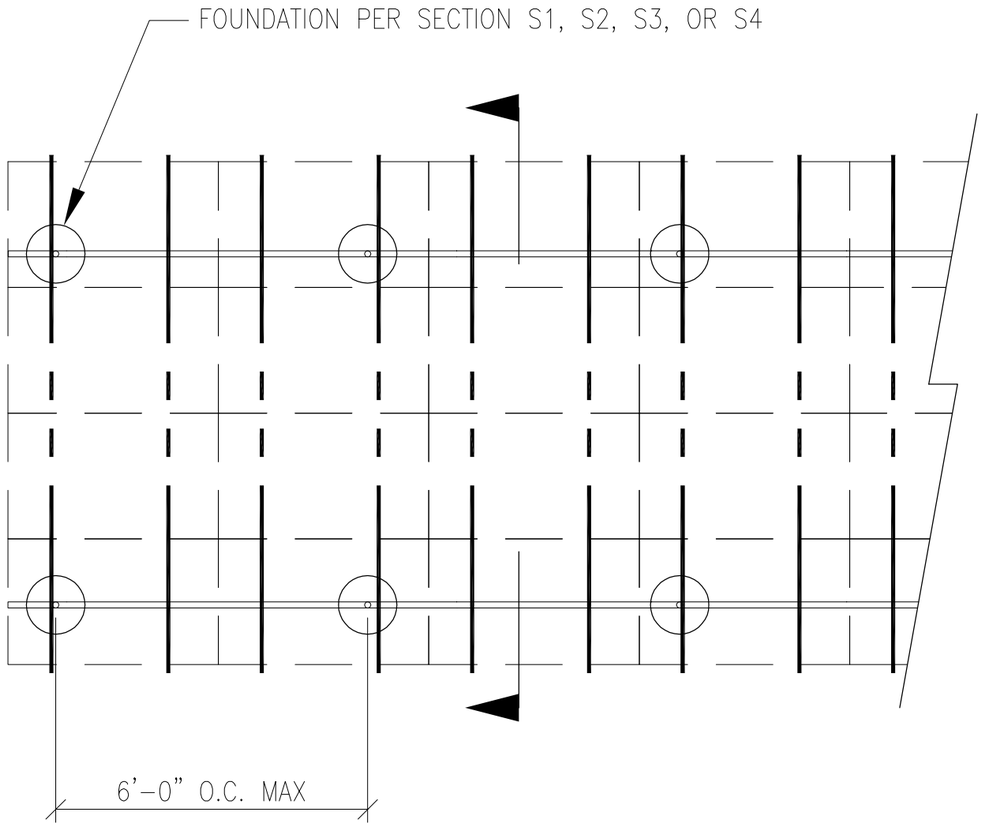
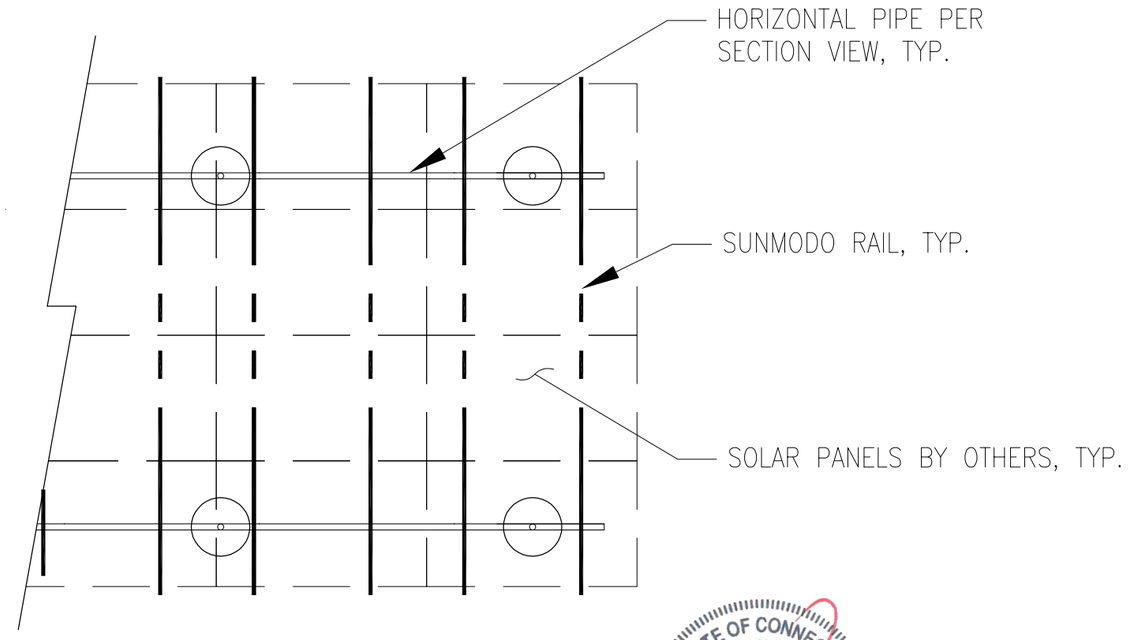
JOB NO. U2716-115-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS A6

SUBJECT ALL OPTIONS





STATE OF CONNECTICUT
ROGER T. ALWORTH
No. 26467
LICENSED
PROFESSIONAL ENGINEER

08/06/2019

PV ARRAY PLAN

N.T.S.

P1

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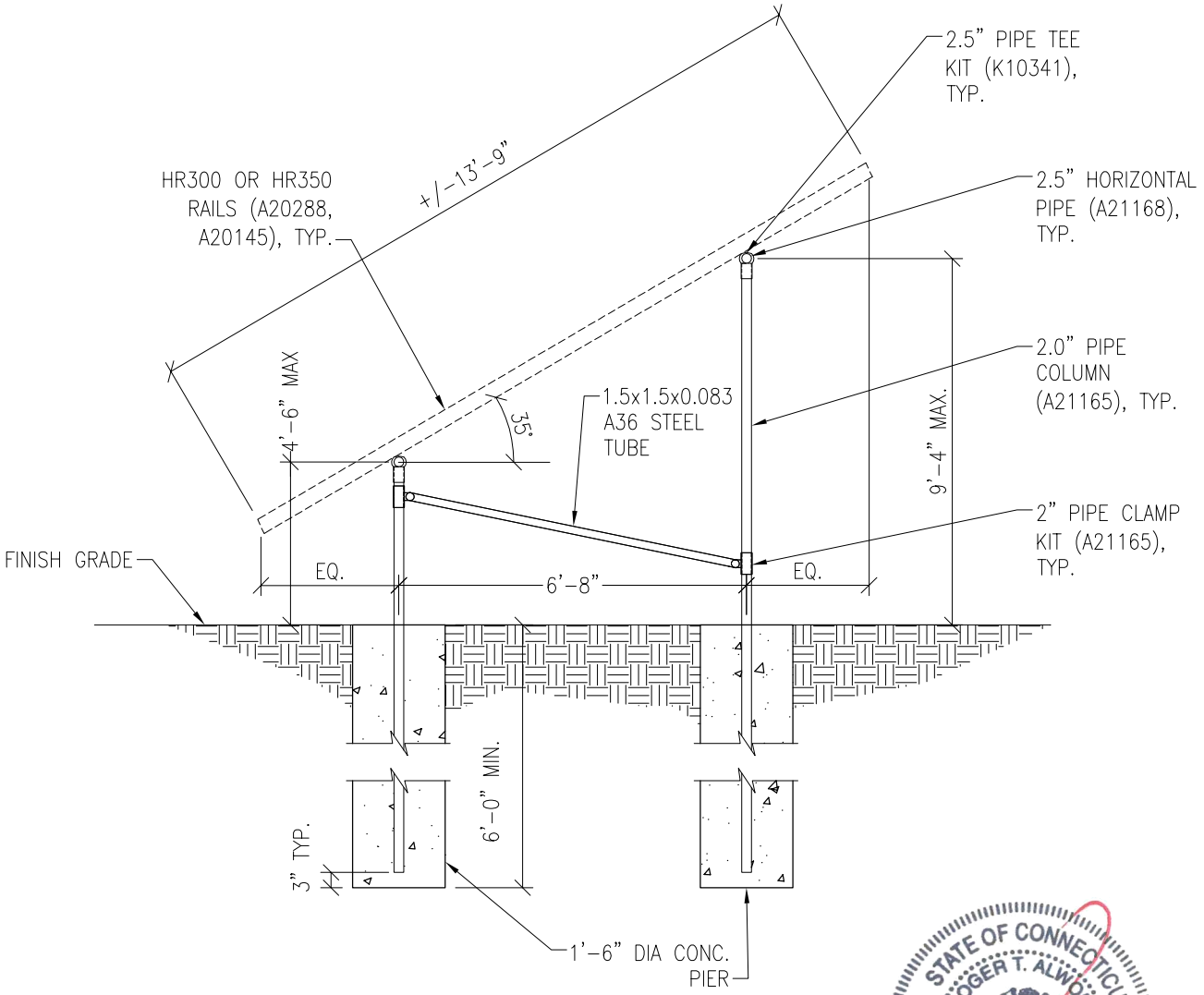
JOB NO. U2716-115-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS A6

SUBJECT DRILLED PIER OPTION



STATE OF CONNECTICUT
ROGER T. ALWORTH
No. 26467
LICENSED PROFESSIONAL ENGINEER

08/06/2019

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PV ARRAY SECTION

N.T.S.

S1

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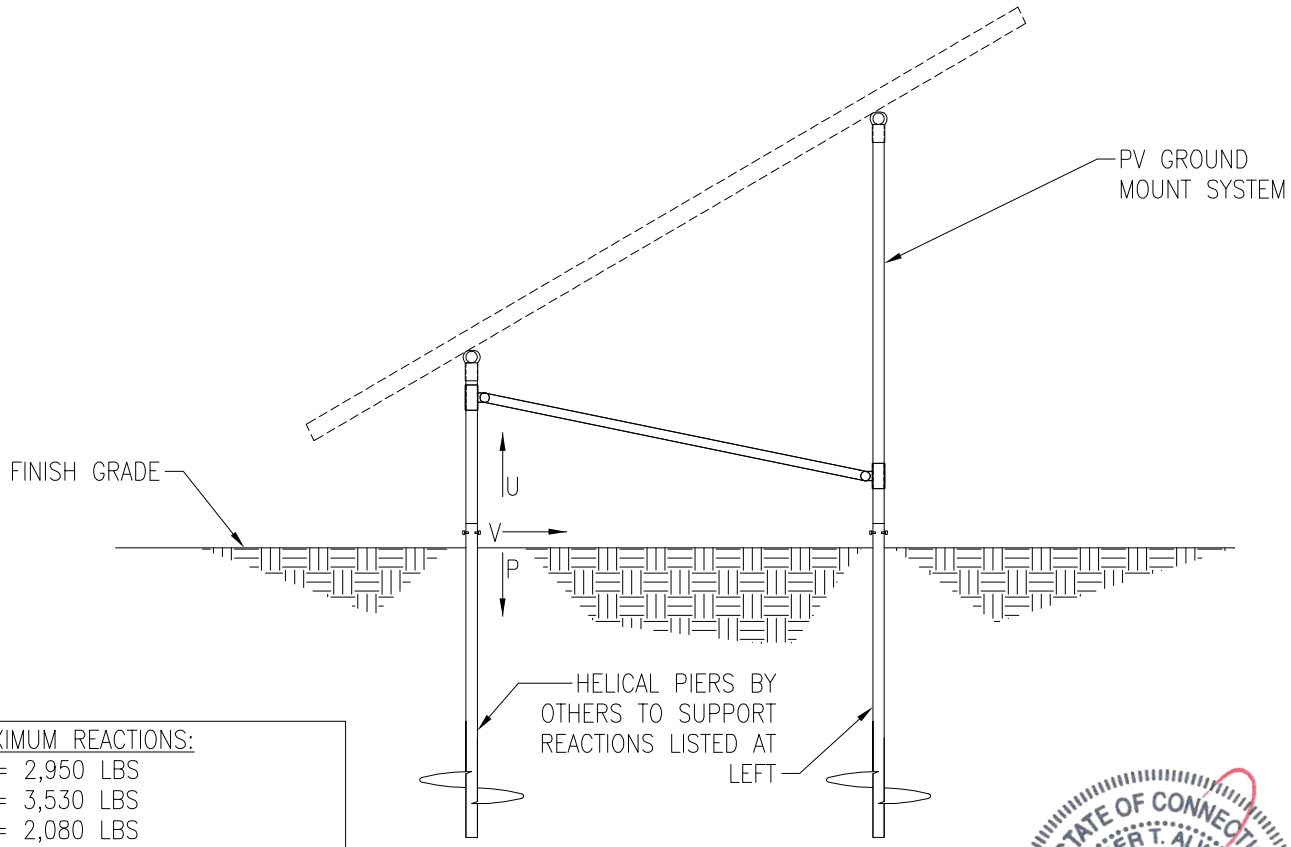
JOB NO. U2716-115-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS A6

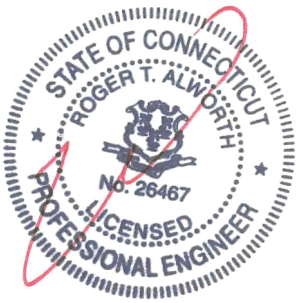
SUBJECT HELICAL PIER OPTION

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 = 2,950 LBS
P = 3,530 LBS
V = 2,080 LBS



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PV ARRAY SECTION S2

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VECTOR ENGINEERS

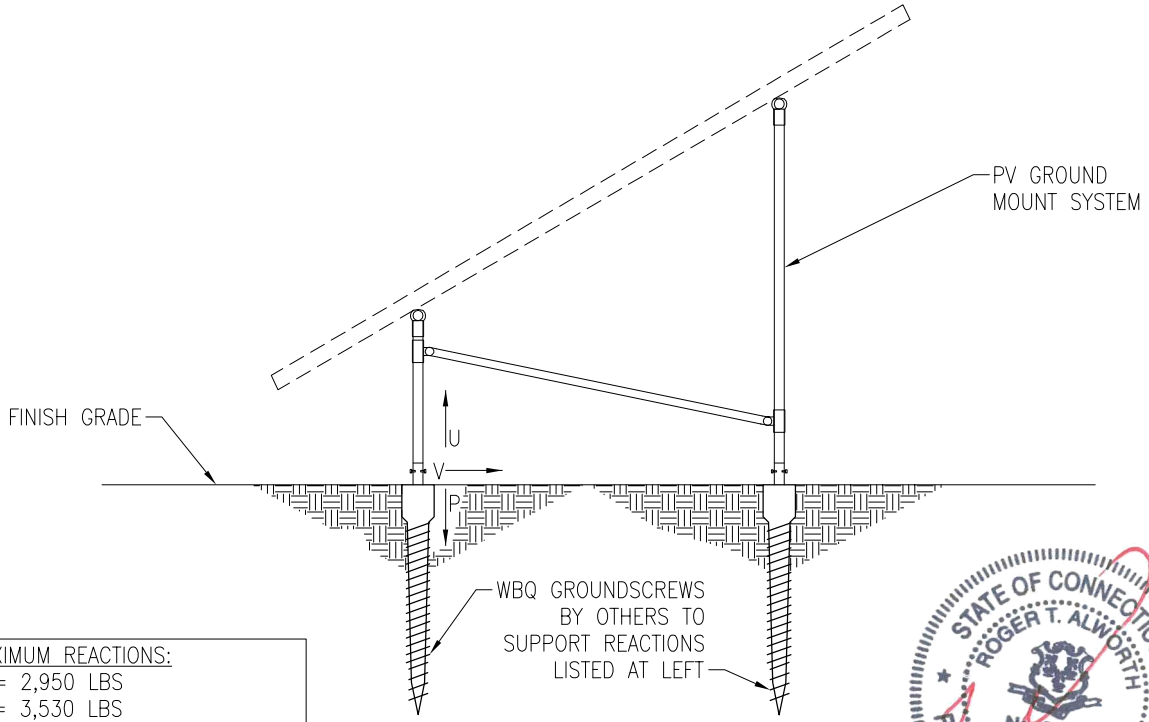
JOB NO. U2716-115-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS A6

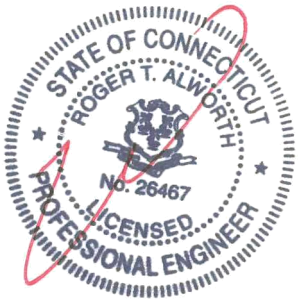
SUBJECT GROUND SCREW OPTION

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 = 2,950 LBS
P = 3,530 LBS
V = 2,080 LBS



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PV ARRAY SECTION

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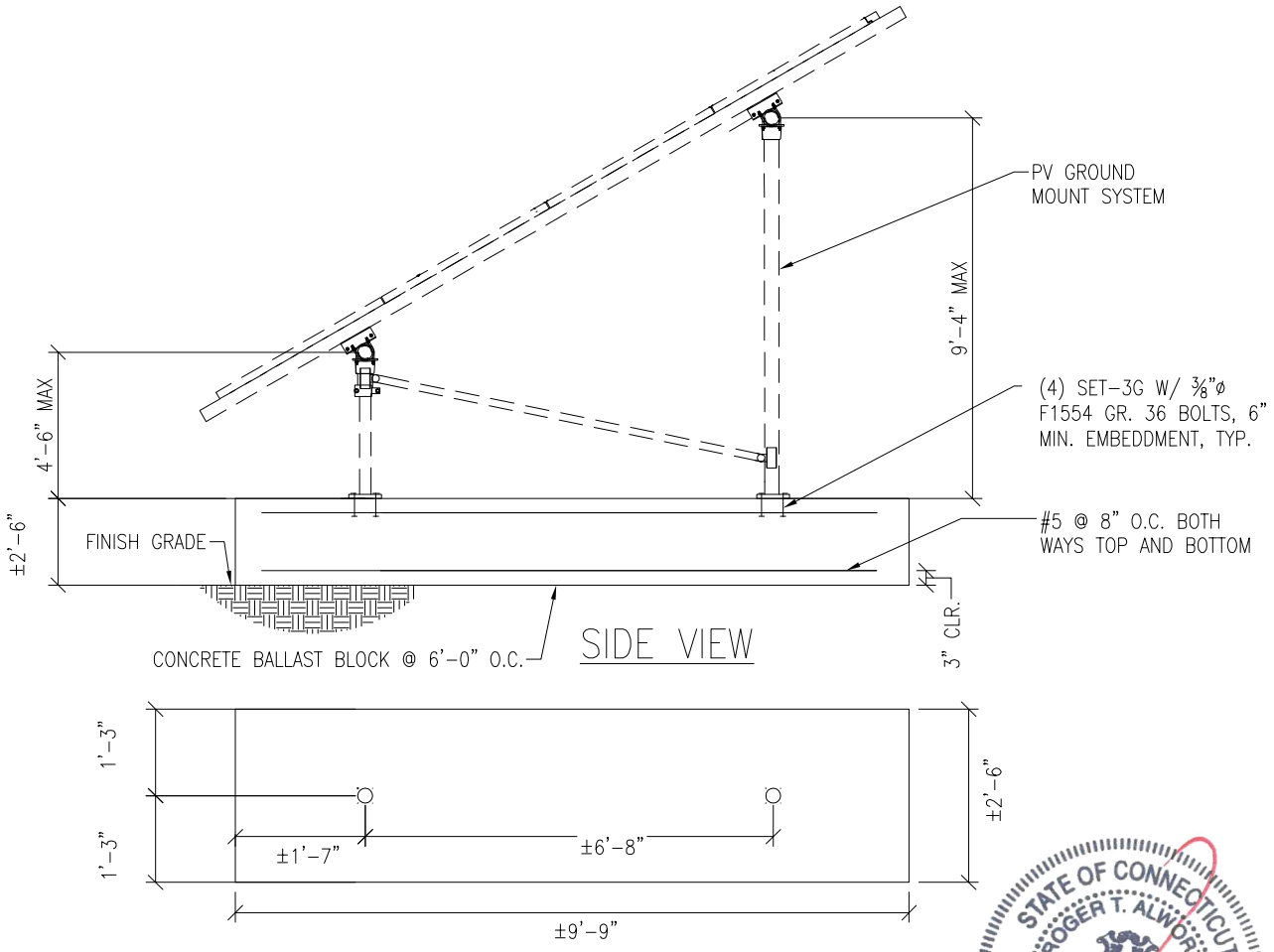
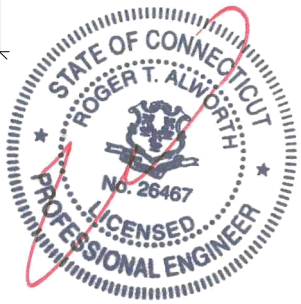
JOB NO. U2716-115-191

PROJECT SUNMODO SUNTURF GROUND MOUNTS A6

SUBJECT BALLASTED BLOCK OPTION

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





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PV ARRAY SECTION

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JOB NO.: U2716-115-191 **DESIGNED:** STB
DATE: 08/01/19

PROJECT: A6 – 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]:	6.7
Longitudinal Column Spacing (L3) [ft]:	6.0
# of Columns in Longitudinal Direction:	14
# of Columns in Transverse Direction:	2
Total Number of Columns:	28
Panel Slope from Horizontal (a) [°]:	35.0
Short Column Height (H1) [ft]:	4.6
Approximate Tall Column Height (H2) [ft]:	9.3
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]:	6.0
Tributary Area per Column [ft^2]:	41.2
Rail Weight [plf]:	1.0
Transverse Rail Weight per Column [lb]:	13.7
Longitudinal Rail Weight per Column [lb]:	21.9
Tall Column Weight [lb]:	33.9
Panel Weight per Column [lb]:	89.7
Rail Weight per Column [lb]:	13.7
Cross Pipe Weight per Column [lb]:	21.9
Brace Weight per Column [lb]:	16.4
Total Weight per Column (1.0 D) [lb]:	**175.7**

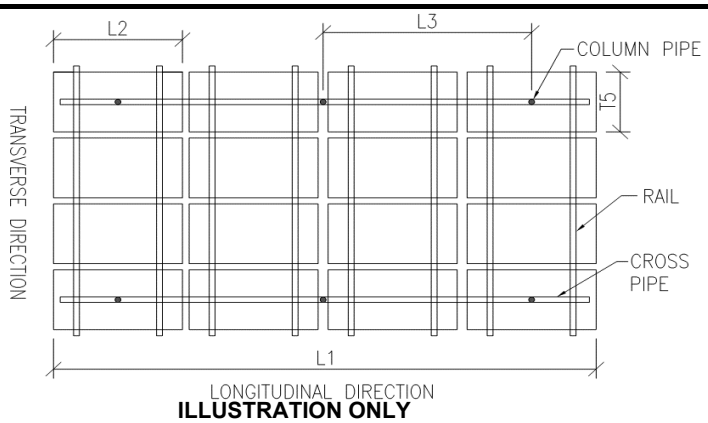


ILLUSTRATION ONLY

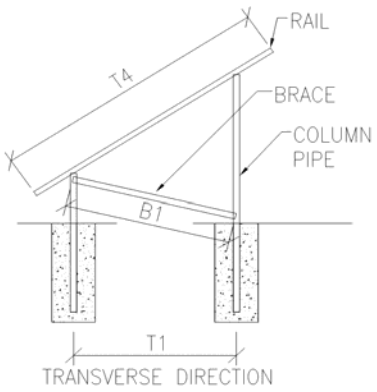


ILLUSTRATION ONLY

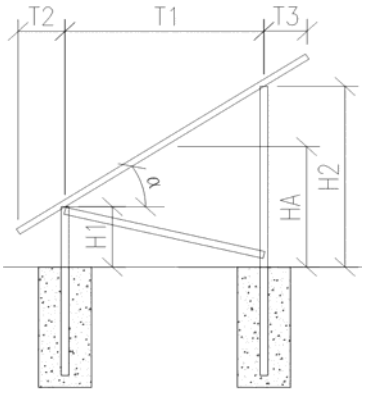


ILLUSTRATION ONLY

Assumptions:
- T2 = T3

JOB NO.: U2716-115-191 **DESIGNED:** STB
DATE: 08/01/19

PROJECT: A6 – Sunmodo Sunturf GM **SUBJECT:** Snow Load

SNOW LOAD (S):

ASCE 7 Standard:	10	
Panel Slope from Horizontal [°]:	35.0	
Snow Ground Load, p_g [psf]:	70.0	(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)
Risk Category:	I	(Table 1.5-1)
Importance Factor, I_S:	0.8	(Table 1.5-2)
Flat Roof Snow Load, p_f [psf]:	42	(Equation 7.3-1)
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:	0.636	(Figure 7-2)
Sloped Roof Snow Load, p_s [psf]:	27	(Equation 7.4-1)
Design Snow Load, S [psf]:	27	
Tributary Transverse Length [ft]:	5.6	
Tributary Longitudinal Length [ft]:	6	
Tributary Area per Column [ft^2]:	33.7	
Snow Load per Column (1.0 S) [lb]:	**909.2**	

JOB NO.: U2716-115-191 **DESIGNED:** STB
DATE: 08/01/19

PROJECT: A6 – Sunmodo Sunturf GM **SUBJECT:** Wind Pressure

Design Wind Load:

ASCE 7 Standard:	10	
Basic Wind Speed, V [mph]:	140	
Risk Category:	I	
Exposure Category	C	(Section 26.7.3)
Velocity Pressure Exposure Coefficient, K_h:	0.85	(Table 27.3-1)
Topographic Factor, K_{ht}:	1.0	(Section 26.8.2)
Wind Directionality Factor, K_d:	0.85	(Table 26.6-1)
Internal Pressure Coefficient, GC_{pi} :	0.00	(Table 26.11-1)
Velocity Pressure, q_h [psf]:	36.3	(Equation 27.3-1)
Gust Effect Factor, G:	0.85	(Section 26.9.1)
Panel Slope [degrees]:	35.0	

Net Pressure Coefficients (C_N) per: (Figure 27.4-4)

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)	-2.43	-0.57
Case 3 (γ = 180°, Load Case A)	2.10	2.17
Case 4 (γ = 180°, Load Case B)	2.67	1.07

Design Wind Pressures (p) [psf] per: (Equation 27.4-3)

Clear Wind Flow	q_hGC_{NW}	q_hGC_{NL}
Case 1 (γ = 0°, Load Case A)	-55.5	-55.5
Case 2 (γ = 0°, Load Case B)	-75.0	-17.5
Case 3 (γ = 180°, Load Case A)	64.7	66.8
Case 4 (γ = 180°, Load Case B)	82.2	32.9

Wind Pressure on Each Side of Panels [psf]

Clear Wind Flow	Short Col. Pressure	Long Col. Pressure
Case 1 (γ = 0°, Load Case A)	-55.5	-55.5
Case 2 (γ = 0°, Load Case B)	-17.5	-75.0
Case 3 (γ = 180°, Load Case A)	64.7	66.8
Case 4 (γ = 180°, Load Case B)	82.2	32.9

JOB NO.: U2716-115-191

PROJECT: A6 – Sunmodo Sunturf GM **SUBJECT:** Open Building Wind Loads

Design Wind Load Per ASCE 7-10

$p = q_h G C_n$

Velocity Pressure Exposure Coefficient, K_h:	0.85	(Table 27.3-1)
Topographic Factor, K_{ht}:	1.0	(Section 26.8.2)
Wind Directionality Factor, K_d:	0.85	(Table 26.6-1)
Ultimate Wind Speed, V [mph]:	140	
Velocity Pressure, q_h [psf]:	36.3	(Equation 27.3-1)
Gust Effect Factor, G:	0.85	(Section 26.9.1)

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

Force Coefficient, C_N:

Horizontal Distance from Winward Edge	Roof angle	Load Case	Obstructed Wind Flow CN
<= h	35	A	-0.8
		B	0.8
> h, <= 2h	35	A	-0.6
		B	0.5
> 2h	35	A	-0.3
		B	0.3

Design Wind Pressure, p [psf]:

	Roof angle	Load Case	Obstructed Wind Flow
<= h	35	A	-24.7
		B	24.7
> h, <= 2h	35	A	-18.5
		B	15.4
> 2h	35	A	-9.2
		B	9.2

JOB NO.: U2716-115-191 **DESIGNED:** STB

Foundation Option 1: Drilled Concrete Pier

JOB NO.: U2716-115-191 **DESIGNED:** STB
DATE: 08/01/19

PROJECT: A6 – Sunmodo Sunturf GM

Drilled Pier Design

Design Loads:

Max. Shear, V [k]:	2.1	Max. Down, P_d [k]:	3.5
Max. Moment, M [k-ft]:	0.0	Max. Uplift, P_u [k]:	3.0

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]:	2,080	
Point of Application, h [ft]:	0.0	
S_{1_max} [psf]:		
S_1 [psf]:	600	
$A = 2.34*P/(S_1 b)$:	5.41	
Required Pier Depth, d_{reqd} [ft]:	5.4	**Lateral bearing capacity OK.**

JOB NO.: U2716-115-191 **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	2950	1.5	4425
LATERAL	2080	2	4160

JOB NO.: U2716-115-191 **DESIGNED:** STB

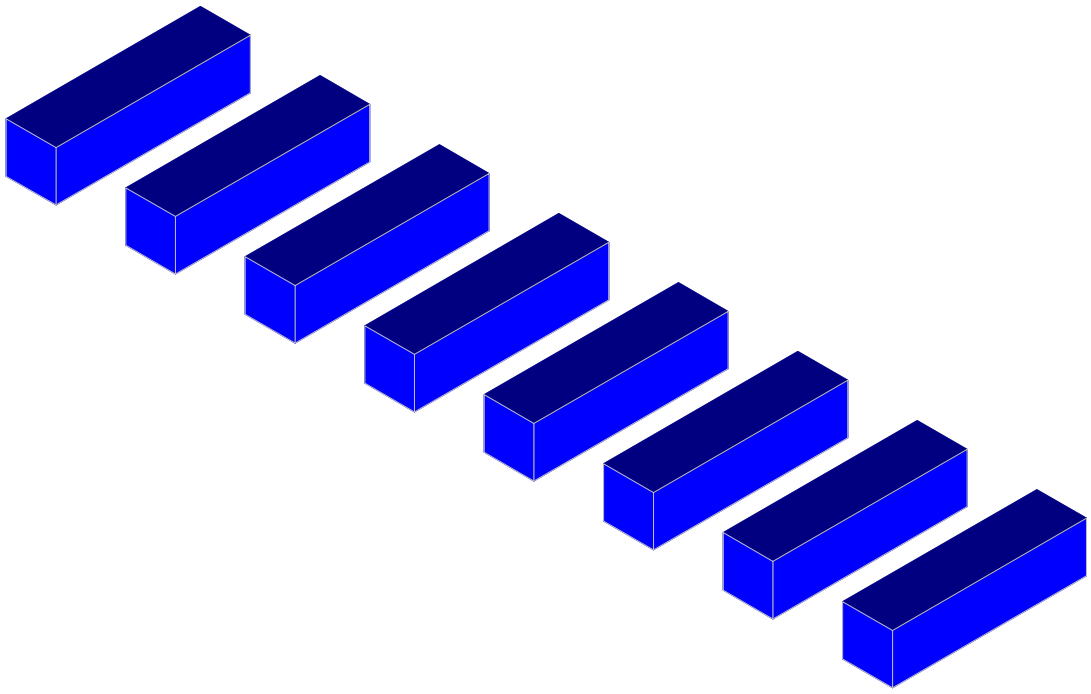
Foundation Option 3: Ground Screw

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	2950	1.5	4425
LATERAL	2080	2	4160

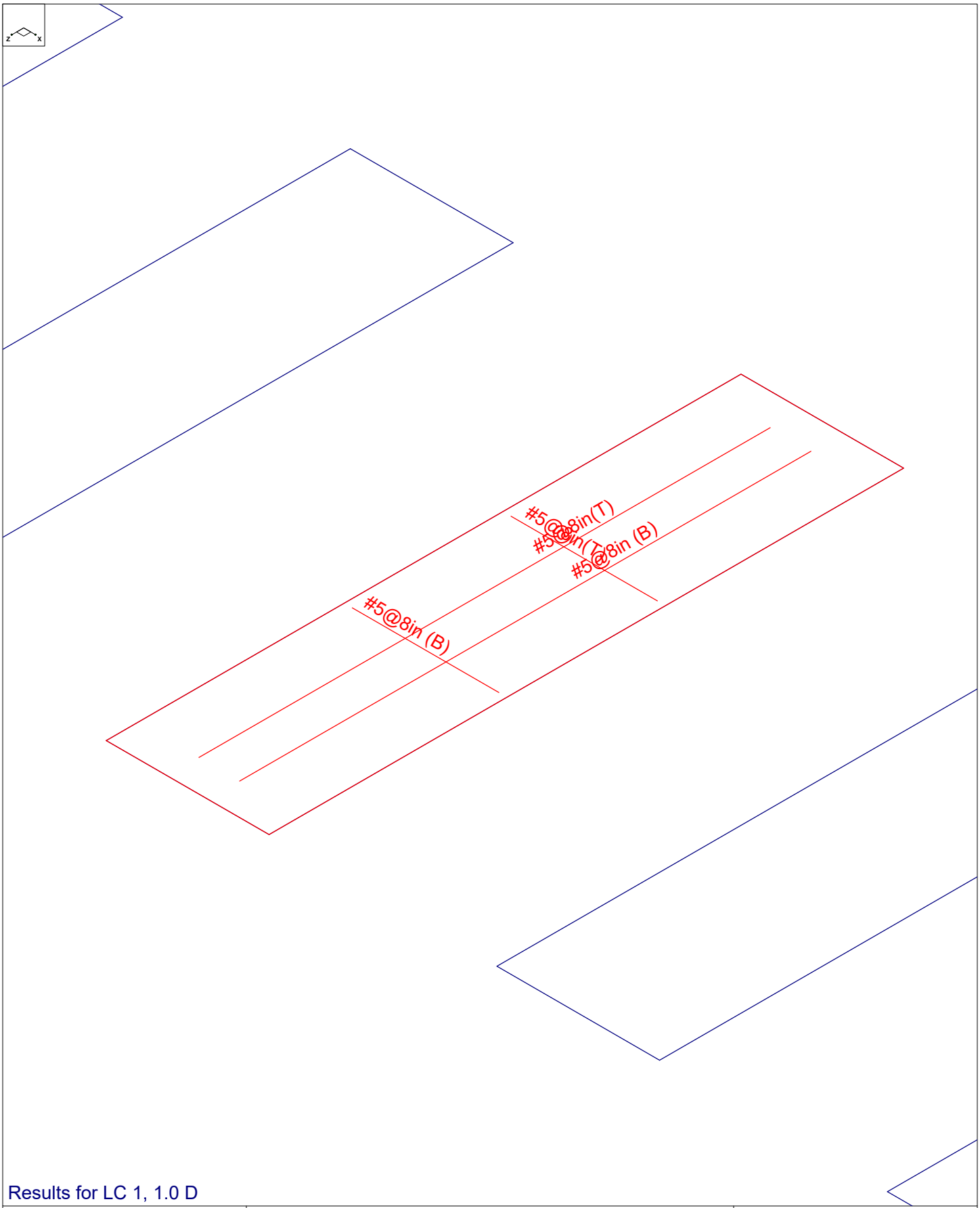
JOB NO.: U2716-115-191 **DESIGNED:** STB

Foundation Option 4: Ballasted Block



Results for LC 1, 1.0 D

Vector Structural Engineeri...		SK - 2
STB	Ground Mount	Aug 1, 2019 at 1:12 PM
U2716.115.191		New England A6.r3d



Results for LC 1, 1.0 D

Vector Structural Engineeri...	Ground Mount	SK - 1
STB		Aug 1, 2019 at 1:11 PM
U2716.115.191		New England A6.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 318-14
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	-8.238
2	R3D_N1	Y	178.46
3	R3D_N2_1	Y	149.189
4	R3D_N132	Y	185.088
5	R3D_N133	Y	177.875
6	R3D_N109	Y	178.531
7	R3D_N110A	X	1.449
8	R3D_N110A	Y	184.509
9	R3D_N121	Y	186.229

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

	Label	Direction	Magnitude[lb,lb-ft]
10	R3D_N122	Y	176.902
11	R3D_N133B_1	Y	185.034
12	R3D_N134B	Y	177.882
13	R3D_N151	Y	186.036
14	R3D_N152	Y	177.04
15	R3D_N143A_1	Y	179.575
16	R3D_N144A_1	X	-1.457
17	R3D_N144A_1	Y	184.062
18	R3D_N149A	X	8.333
19	R3D_N149A	Y	178.923
20	R3D_N150A	Y	148.355

Point Loads and Moments (Cat 6 : RLL)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-46.365
2	R3D_N1	Y	812.547
3	R3D_N2_1	X	-4.221
4	R3D_N2_1	Y	760.112
5	R3D_N132	Y	893.223
6	R3D_N133	Y	932.422
7	R3D_N109	X	1.043
8	R3D_N109	Y	843.82
9	R3D_N110A	X	9.576
10	R3D_N110A	Y	976.145
11	R3D_N121	Y	902.245
12	R3D_N122	X	1.26
13	R3D_N122	Y	926.235
14	R3D_N133B_1	Y	892.816
15	R3D_N134B	Y	932.465
16	R3D_N151	Y	900.773
17	R3D_N152	X	-1.308
18	R3D_N152	Y	927.17
19	R3D_N143A_1	X	-1.441
20	R3D_N143A_1	Y	851.681
21	R3D_N144A_1	X	-9.662
22	R3D_N144A_1	Y	973.146
23	R3D_N149A	X	47.075
24	R3D_N149A	Y	815.051
25	R3D_N150A	X	4.157
26	R3D_N150A	Y	752.98

Point Loads and Moments (Cat 16 : OL1)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	121.1
2	R3D_N1	Y	-3935.159
3	R3D_N1	Z	2247.534
4	R3D_N2_1	X	22.823
5	R3D_N2_1	Y	659.155
6	R3D_N2_1	Z	-117.108
7	R3D_N132	X	-1.452
8	R3D_N132	Y	-4560.42
9	R3D_N132	Z	2754.549
10	R3D_N133	X	6.982
11	R3D_N133	Y	805.432
12	R3D_N133	Z	-132.292
13	R3D_N109	X	-2.856

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

	Label	Direction	Magnitude[lb,lb-ft]
14	R3D_N109	Y	-4617.075
15	R3D_N109	Z	2913.788
16	R3D_N110A	X	-13.024
17	R3D_N110A	Y	926.418
18	R3D_N110A	Z	-131.275
19	R3D_N121	Y	-4580.244
20	R3D_N121	Z	2738.8
21	R3D_N122	X	-12.127
22	R3D_N122	Y	817.684
23	R3D_N122	Z	-132.252
24	R3D_N133B_1	X	1.384
25	R3D_N133B_1	Y	-4560.357
26	R3D_N133B_1	Z	2754.708
27	R3D_N134B	X	-6.22
28	R3D_N134B	Y	804.954
29	R3D_N134B	Z	-132.272
30	R3D_N151	Y	-4585.026
31	R3D_N151	Z	2741.252
32	R3D_N152	X	12.038
33	R3D_N152	Y	821.102
34	R3D_N152	Z	-132.301
35	R3D_N143A_1	X	3.482
36	R3D_N143A_1	Y	-4606.76
37	R3D_N143A_1	Z	2908.59
38	R3D_N144A_1	X	11.868
39	R3D_N144A_1	Y	923.329
40	R3D_N144A_1	Z	-131.2
41	R3D_N149A	X	-122.051
42	R3D_N149A	Y	-3942.202
43	R3D_N149A	Z	2250.932
44	R3D_N150A	X	-22.338
45	R3D_N150A	Y	660.503
46	R3D_N150A	Z	-117.15

Point Loads and Moments (Cat 17 : OL2)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	155.159
2	R3D_N1	Y	-4383.725
3	R3D_N1	Z	1900.542
4	R3D_N2_1	X	14.847
5	R3D_N2_1	Y	1513.488
6	R3D_N2_1	Z	-98.902
7	R3D_N132	X	-1.8
8	R3D_N132	Y	-5064.132
9	R3D_N132	Z	2320.952
10	R3D_N133	X	8.173
11	R3D_N133	Y	1897.595
12	R3D_N133	Z	-111.475
13	R3D_N109	X	-3.583
14	R3D_N109	Y	-5084.179
15	R3D_N109	Z	2454.766
16	R3D_N110A	X	2.949
17	R3D_N110A	Y	2090.94
18	R3D_N110A	Z	-110.762
19	R3D_N121	X	1.038
20	R3D_N121	Y	-5095.53

Point Loads and Moments (Cat 17 : OL2) (Continued)

	Label	Direction	Magnitude[lb,lb-ft]
21	R3D_N121	Z	2312.939
22	R3D_N122	X	-13.607
23	R3D_N122	Y	1905.159
24	R3D_N122	Z	-111.618
25	R3D_N133B_1	X	1.709
26	R3D_N133B_1	Y	-5063.996
27	R3D_N133B_1	Z	2321.06
28	R3D_N134B	X	-6.806
29	R3D_N134B	Y	1896.917
30	R3D_N134B	Z	-111.449
31	R3D_N151	Y	-5101.322
32	R3D_N151	Z	2315.659
33	R3D_N152	X	13.509
34	R3D_N152	Y	1910.073
35	R3D_N152	Z	-111.681
36	R3D_N143A_1	X	4.358
37	R3D_N143A_1	Y	-5072.539
38	R3D_N143A_1	Z	2449.933
39	R3D_N144A_1	X	-4.376
40	R3D_N144A_1	Y	2086.155
41	R3D_N144A_1	Z	-110.693
42	R3D_N149A	X	-156.329
43	R3D_N149A	Y	-4391.75
44	R3D_N149A	Z	1903.407
45	R3D_N150A	X	-14.691
46	R3D_N150A	Y	1516.064
47	R3D_N150A	Z	-98.925

Point Loads and Moments (Cat 18 : OL3)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-145.447
2	R3D_N1	Y	4702.258
3	R3D_N1	Z	-2663.627
4	R3D_N2_1	X	-26.886
5	R3D_N2_1	Y	-816.105
6	R3D_N2_1	Z	138.784
7	R3D_N132	X	1.741
8	R3D_N132	Y	5448.815
9	R3D_N132	Z	-3264.204
10	R3D_N133	X	-8.357
11	R3D_N133	Y	-998.974
12	R3D_N133	Z	156.769
13	R3D_N109	X	3.427
14	R3D_N109	Y	5514.942
15	R3D_N109	Z	-3452.892
16	R3D_N110A	X	14.926
17	R3D_N110A	Y	-1145.683
18	R3D_N110A	Z	155.57
19	R3D_N121	Y	5472.843
20	R3D_N121	Z	-3245.732
21	R3D_N122	X	14.494
22	R3D_N122	Y	-1013.392
23	R3D_N122	Z	156.729
24	R3D_N133B_1	X	-1.66
25	R3D_N133B_1	Y	5448.737
26	R3D_N133B_1	Z	-3264.39

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

	Label	Direction	Magnitude[lb,lb-ft]
27	R3D_N134B	X	7.428
28	R3D_N134B	Y	-998.396
29	R3D_N134B	Z	156.746
30	R3D_N151	Y	5478.575
31	R3D_N151	Z	-3248.662
32	R3D_N152	X	-14.388
33	R3D_N152	Y	-1017.516
34	R3D_N152	Z	156.787
35	R3D_N143A_1	X	-4.179
36	R3D_N143A_1	Y	5502.61
37	R3D_N143A_1	Z	-3446.716
38	R3D_N144A_1	X	-13.538
39	R3D_N144A_1	Y	-1141.942
40	R3D_N144A_1	Z	155.48
41	R3D_N149A	X	146.587
42	R3D_N149A	Y	4710.681
43	R3D_N149A	Z	-2667.653
44	R3D_N150A	X	26.32
45	R3D_N150A	Y	-817.754
46	R3D_N150A	Z	138.834

Point Loads and Moments (Cat 19 : OL4)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-79.067
2	R3D_N1	Y	3133.586
3	R3D_N1	Z	-2306.89
4	R3D_N2_1	X	-27.243
5	R3D_N2_1	Y	143.188
6	R3D_N2_1	Z	120.309
7	R3D_N132	Y	3645.312
8	R3D_N132	Z	-2834.435
9	R3D_N133	X	-5.22
10	R3D_N133	Y	216.323
11	R3D_N133	Z	136.122
12	R3D_N109	X	1.929
13	R3D_N109	Y	3727.352
14	R3D_N109	Z	-2998.6
15	R3D_N110A	X	25.34
16	R3D_N110A	Y	170.197
17	R3D_N110A	Z	134.953
18	R3D_N121	Y	3653.112
19	R3D_N121	Z	-2813.722
20	R3D_N122	X	9.573
21	R3D_N122	Y	201.35
22	R3D_N122	Z	135.93
23	R3D_N133B_1	Y	3645.318
24	R3D_N133B_1	Z	-2834.62
25	R3D_N134B	X	5.058
26	R3D_N134B	Y	216.58
27	R3D_N134B	Z	136.11
28	R3D_N151	Y	3656.521
29	R3D_N151	Z	-2815.684
30	R3D_N152	X	-9.501
31	R3D_N152	Y	199.577
32	R3D_N152	Z	135.961
33	R3D_N143A_1	X	-2.363

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

	Label	Direction	Magnitude[lb,lb-ft]
34	R3D_N143A_1	Y	3719.266
35	R3D_N143A_1	Z	-2993.64
36	R3D_N144A_1	X	-24.537
37	R3D_N144A_1	Y	171.505
38	R3D_N144A_1	Z	134.88
39	R3D_N149A	X	79.729
40	R3D_N149A	Y	3139.042
41	R3D_N149A	Z	-2310.384
42	R3D_N150A	X	26.528
43	R3D_N150A	Y	143.036
44	R3D_N150A	Z	120.363

Point Loads and Moments (Cat 20 : OL5)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	-37.717
2	R3D_N1	Y	1692.364
3	R3D_N1	Z	-985.845
4	R3D_N2_1	X	-8.617
5	R3D_N2_1	Y	-286.407
6	R3D_N2_1	Z	48.042
7	R3D_N132	X	1.273
8	R3D_N132	Y	748.157
9	R3D_N132	Z	-452.154
10	R3D_N133	X	-1.644
11	R3D_N133	Y	-128.386
12	R3D_N133	Z	23.324
13	R3D_N109	X	2.87
14	R3D_N109	Y	1847.223
15	R3D_N109	Z	-1146.415
16	R3D_N110A	X	5.945
17	R3D_N110A	Y	-361.245
18	R3D_N110A	Z	48.258
19	R3D_N121	X	1.716
20	R3D_N121	Y	1303.283
21	R3D_N121	Z	-782.125
22	R3D_N122	X	4.802
23	R3D_N122	Y	-222.915
24	R3D_N122	Z	37.885
25	R3D_N133B_1	Y	791.324
26	R3D_N133B_1	Z	-485.279
27	R3D_N134B	X	1.039
28	R3D_N134B	Y	-146.271
29	R3D_N134B	Z	27.397
30	R3D_N151	X	1.049
31	R3D_N151	Y	763.684
32	R3D_N151	Z	-455.429
33	R3D_N152	X	-2.418
34	R3D_N152	Y	-136.335
35	R3D_N152	Z	22.305
36	R3D_N143A_1	Y	745.832
37	R3D_N143A_1	Z	-481.738
38	R3D_N144A_1	X	-2.251
39	R3D_N144A_1	Y	-153.132
40	R3D_N144A_1	Z	21.844
41	R3D_N149A	X	28.953
42	R3D_N149A	Y	670.453

Point Loads and Moments (Cat 20 : OL5) (Continued)

	Label	Direction	Magnitude[lb,lb-ft]
43	R3D_N149A	Z	-373.524
44	R3D_N150A	X	3.146
45	R3D_N150A	Y	-109.794
46	R3D_N150A	Z	19.464

Point Loads and Moments (Cat 21 : OL6)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1	X	38.21
2	R3D_N1	Y	-1697.671
3	R3D_N1	Z	987.17
4	R3D_N2_1	X	9.229
5	R3D_N2_1	Y	286.656
6	R3D_N2_1	Z	-46.612
7	R3D_N132	X	-1.294
8	R3D_N132	Y	-750.035
9	R3D_N132	Z	453.879
10	R3D_N133	X	1.611
11	R3D_N133	Y	131.175
12	R3D_N133	Z	-22.987
13	R3D_N109	X	-3.371
14	R3D_N109	Y	-1669.664
15	R3D_N109	Z	1043.334
16	R3D_N110A	X	-7.663
17	R3D_N110A	Y	324.399
18	R3D_N110A	Z	-44.557
19	R3D_N121	X	-1.297
20	R3D_N121	Y	-1092.985
21	R3D_N121	Z	658.166
22	R3D_N122	X	-2.959
23	R3D_N122	Y	191.714
24	R3D_N122	Z	-33.868
25	R3D_N133B_1	X	-1.056
26	R3D_N133B_1	Y	-789.772
27	R3D_N133B_1	Z	481.013
28	R3D_N134B	X	-1.459
29	R3D_N134B	Y	140.154
30	R3D_N134B	Z	-26.001
31	R3D_N151	X	-1.079
32	R3D_N151	Y	-763.563
33	R3D_N151	Z	455.047
34	R3D_N152	X	2.312
35	R3D_N152	Y	135.94
36	R3D_N152	Z	-22.212
37	R3D_N143A_1	Y	-745.347
38	R3D_N143A_1	Z	481.742
39	R3D_N144A_1	X	2.147
40	R3D_N144A_1	Y	153.224
41	R3D_N144A_1	Z	-21.819
42	R3D_N149A	X	-29.206
43	R3D_N149A	Y	-670.947
44	R3D_N149A	Z	373.518
45	R3D_N150A	X	-3.219
46	R3D_N150A	Y	109.698
47	R3D_N150A	Z	-19.456

Slabs

	Label	Thickness [in]	Material	Local Axis Angle [deg]	Analysis Offset [in]
1	S1	30	Conc2500NW	0	0
2	S2	30	Conc2500NW	0	0
3	S3	30	Conc2500NW	0	0
4	S4	30	Conc2500NW	0	0
5	S5	30	Conc2500NW	0	0
6	S6	30	Conc2500NW	0	0
7	S7	30	Conc2500NW	0	0
8	S8	30	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	.6														
4	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL2	.6														
5	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL3	.6														
6	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL4	.6														
7	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL5	.6														
8	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL6	.6														
9	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL1	.45														
10	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL2	.45														
11	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL3	.45														
12	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL4	.45														
13	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL5	.45														
14	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL6	.45														
15	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL1	.6														
16	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL2	.6														
17	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL3	.6														
18	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL4	.6														
19	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL5	.6														
20	0.6 D + 0....	Yes	Yes			DL	.6	RLL		OL6	.6														
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	.5														
25	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL2	.5														
26	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL3	.5														
27	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL4	.5														
28	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL5	.5														
29	1.2D+1.6S...	Yes				DL	1.2	RLL	1.6	OL6	.5														
30	1.2D+1.0...	Yes				DL	1.2			OL1	1														
31	1.2D-1.0Wx	Yes				DL	1.2			OL2	1														
32	1.2D+1.0...	Yes				DL	1.2			OL3	1														
33	1.2D-1.0Wz	Yes				DL	1.2			OL4	1														
34	1.2D+1.0...	Yes				DL	1.2			OL5	1														
35	1.2D-1.0...	Yes				DL	1.2			OL6	1														
36	.9D+1.0Wx	Yes				DL	.9			OL1	1														
37	.9D-1.0Wx	Yes				DL	.9			OL2	1														
38	.9D+1.0Wz	Yes				DL	.9			OL3	1														
39	.9D-1.0Wz	Yes				DL	.9			OL4	1														
40	.9D+1.0W...	Yes				DL	.9			OL5	1														
41	.9D-1.0W90	Yes				DL	.9			OL6	1														

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	20		
2	RLL	26		
3	OL1	46		
4	OL2	47		
5	OL3	46		
6	OL4	44		
7	OL5	46		
8	OL6	47		

Strip Reinforcing

	Label	UC Top	LC	Top Bars	Governing ...	UC Bot	LC	Bot B...	Gover...	UC Shear	LC	Governing ...
1	DS1	.017	26	#5@8in	DS1-X26	.048	37	#5@8in	DS1-...	.049	37	DS1-X45
2	DS2	.002	36	#5@8in	DS2-X26	.003	26	#5@8in	DS2-...	.006	26	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	44588.714	0	11475.096	9.999+	9.999+
2	1	S2	0	0	44880.216	0	11495.117	9.999+	9.999+
3	1	S3	0	0	44829.644	0	11498.854	9.999+	9.999+
4	1	S4	0	0	44835.836	0	11498.585	9.999+	9.999+
5	1	S5	0	0	44835.866	0	11498.644	9.999+	9.999+
6	1	S6	0	0	44830.479	0	11498.785	9.999+	9.999+
7	1	S7	0	0	44878.179	0	11503.13	9.999+	9.999+
8	1	S8	0	0	44582.562	0	11433.205	9.999+	9.999+
9	2	S1	0	0	52146.163	0	13567.384	9.999+	9.999+
10	2	S2	0	0	54269.45	0	13743.527	9.999+	9.999+
11	2	S3	0	0	53899.633	0	13781.305	9.999+	9.999+
12	2	S4	0	0	53942.289	0	13780.187	9.999+	9.999+
13	2	S5	0	0	53942.61	0	13780.701	9.999+	9.999+
14	2	S6	0	0	53905.849	0	13786.985	9.999+	9.999+
15	2	S7	0	0	54255.118	0	13811.919	9.999+	9.999+
16	2	S8	0	0	52085.135	0	13265.162	9.999+	9.999+
17	3	S1	0	21884.718	44756.554	2672.888	11475.096	2.045	4.293
18	3	S2	0	25963.708	44810.113	2791.812	11502.364	1.726	4.12
19	3	S3	0	25617.147	44861.572	2840.11	11498.854	1.751	4.049
20	3	S4	0	25554.989	44853.282	2823.807	11498.585	1.755	4.072
21	3	S5	0	25554.6	44853.713	2824.536	11498.644	1.755	4.071
22	3	S6	0	25641.108	44860.2	2840.999	11498.785	1.75	4.047
23	3	S7	0	25908.26	44817.975	2785.599	11503.13	1.73	4.13
24	3	S8	0	21923.05	44759.084	2677.858	11474.87	2.042	4.285
25	4	S1	0	22820.609	44756.554	2407.687	11475.096	1.961	4.766
26	4	S2	0	26546.675	44810.113	2245.88	11502.364	1.688	5.122
27	4	S3	0	26555.475	44861.572	2411.632	11498.854	1.689	4.768
28	4	S4	0	26420.812	44853.282	2382.955	11498.585	1.698	4.825
29	4	S5	0	26420.666	44853.713	2384.463	11498.644	1.698	4.822
30	4	S6	0	26583.418	44860.2	2413.7	11498.785	1.688	4.764
31	4	S7	0	26486.798	44817.975	2239.814	11495.845	1.692	5.132
32	4	S8	0	22861.874	44759.084	2413.294	11474.87	1.958	4.755
33	5	S1	0	3359.848	44588.714	0	14648.21	9.999+	9.999+
34	5	S2	0	5377.931	44880.216	0	14744.533	8.345	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
35	5	S3	0	4450.606	44829.644	0	14821.701	9.999+	9.999+
36	5	S4	0	4427.24	44835.836	0	14827.688	9.999+	9.999+
37	5	S5	0	4429.709	44835.866	0	14845.949	9.999+	9.999+
38	5	S6	0	4469.884	44830.479	0	14866.161	9.999+	9.999+
39	5	S7	0	5361.999	44878.179	0	14800.207	8.37	9.999+
40	5	S8	0	3365.977	44582.562	0	14093.539	9.999+	9.999+
41	6	S1	0	0	44994.522	0	14092.142	9.999+	9.999+
42	6	S2	0	0	44968.197	0	14377.375	9.999+	9.999+
43	6	S3	0	0	45280.082	0	14375.341	9.999+	9.999+
44	6	S4	0	0	45323.186	0	14387.421	9.999+	9.999+
45	6	S5	0	0	45322.234	0	14402.701	9.999+	9.999+
46	6	S6	0	0	45272.487	0	14405.11	9.999+	9.999+
47	6	S7	0	0	44972.284	0	14461.558	9.999+	9.999+
48	6	S8	0	0	44987.638	0	13735.378	9.999+	9.999+
49	7	S1	0	1216.678	44588.714	0	12599.066	9.999+	9.999+
50	7	S2	0	1680.541	44880.216	0	12596.379	9.999+	9.999+
51	7	S3	0	981.672	44829.644	0	12299.355	9.999+	9.999+
52	7	S4	0	659.111	44835.836	0	11980.815	9.999+	9.999+
53	7	S5	0	568.005	44835.866	0	11964.03	9.999+	9.999+
54	7	S6	0	599.045	44830.479	0	11971.35	9.999+	9.999+
55	7	S7	0	739.304	44878.179	0	11951.032	9.999+	9.999+
56	7	S8	0	437.641	44582.562	0	11805.55	9.999+	9.999+
57	8	S1	0	9471.454	44756.554	1129.42	11475.096	4.725	9.999+
58	8	S2	0	9387.576	44810.113	1025.501	11502.364	4.773	9.999+
59	8	S3	0	6119.542	44861.572	682.338	11498.854	7.331	9.999+
60	8	S4	0	4426.27	44853.282	490.987	11498.585	9.999+	9.999+
61	8	S5	0	4203.459	44853.713	464.62	11498.644	9.999+	9.999+
62	8	S6	0	4268.37	44860.2	472.567	11498.785	9.999+	9.999+
63	8	S7	0	4204.192	44817.975	447.313	11503.13	9.999+	9.999+
64	8	S8	0	3720.014	44759.084	469.574	11474.87	9.999+	9.999+
65	9	S1	0	16413.539	50588.555	2004.666	13044.312	3.082	6.507
66	9	S2	0	19472.781	51076.702	2093.859	13228.49	2.623	6.318
67	9	S3	0	19212.86	51429.866	2130.082	13215.417	2.677	6.204
68	9	S4	0	19166.242	51370.834	2117.855	13209.786	2.68	6.237
69	9	S5	0	19165.95	51373.707	2118.402	13210.187	2.68	6.236
70	9	S6	0	19230.831	51420.532	2130.749	13214.935	2.674	6.202
71	9	S7	0	19431.195	51129.335	2089.199	13234.722	2.631	6.335
72	9	S8	0	16442.287	50598.399	2008.394	13040.96	3.077	6.493
73	10	S1	0	17115.457	50588.555	1805.765	13044.312	2.956	7.224
74	10	S2	0	19910.006	51076.702	1682.984	13181.424	2.565	7.832
75	10	S3	0	19916.606	51429.866	1808.724	13215.417	2.582	7.306
76	10	S4	0	19815.609	51370.834	1787.216	13209.786	2.592	7.391
77	10	S5	0	19815.5	51373.707	1788.347	13210.187	2.593	7.387
78	10	S6	0	19937.564	51420.532	1810.275	13214.935	2.579	7.3
79	10	S7	0	19865.098	51129.335	1679.861	13185.802	2.574	7.849
80	10	S8	0	17146.405	50598.399	1809.971	13040.96	2.951	7.205
81	11	S1	0	2519.886	50256.801	0	15424.147	9.999+	9.999+
82	11	S2	0	4033.448	51922.141	0	15618.486	9.999+	9.999+
83	11	S3	0	3337.954	51632.136	0	15702.827	9.999+	9.999+
84	11	S4	0	3320.43	51665.676	0	15706.613	9.999+	9.999+
85	11	S5	0	3322.281	51665.924	0	15720.665	9.999+	9.999+
86	11	S6	0	3352.413	51637.007	0	15740.467	9.999+	9.999+
87	11	S7	0	4021.5	51910.883	0	15707.529	9.999+	9.999+
88	11	S8	0	2524.483	50209.492	0	14802.423	9.999+	9.999+
89	12	S1	0	0	50561.157	0	15007.096	9.999+	9.999+
90	12	S2	0	0	51988.127	0	15343.118	9.999+	9.999+
91	12	S3	0	0	51969.965	0	15368.057	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
92	12	S4	0	0	52031.188	0	15376.413	9.999+	9.999+
93	12	S5	0	0	52030.701	0	15388.229	9.999+	9.999+
94	12	S6	0	0	51968.512	0	15394.678	9.999+	9.999+
95	12	S7	0	0	51981.462	0	15453.543	9.999+	9.999+
96	12	S8	0	0	50513.299	0	14533.803	9.999+	9.999+
97	13	S1	0	912.508	50256.801	0	13887.289	9.999+	9.999+
98	13	S2	0	1260.406	51922.141	0	14007.371	9.999+	9.999+
99	13	S3	0	736.254	51632.136	0	13811.067	9.999+	9.999+
100	13	S4	0	494.333	51665.676	0	13571.459	9.999+	9.999+
101	13	S5	0	426.004	51665.924	0	13559.226	9.999+	9.999+
102	13	S6	0	449.284	51637.007	0	13569.358	9.999+	9.999+
103	13	S7	0	554.478	51910.883	0	13570.648	9.999+	9.999+
104	13	S8	0	328.23	50209.492	0	13086.432	9.999+	9.999+
105	14	S1	0	7103.591	50588.555	847.065	13044.312	7.122	9.999+
106	14	S2	0	7040.682	51076.702	769.126	13228.49	7.255	9.999+
107	14	S3	0	4589.656	51429.866	511.754	13215.417	9.999+	9.999+
108	14	S4	0	3319.702	51370.834	368.24	13209.786	9.999+	9.999+
109	14	S5	0	3152.594	51373.707	348.465	13210.187	9.999+	9.999+
110	14	S6	0	3201.278	51420.532	354.425	13214.935	9.999+	9.999+
111	14	S7	0	3153.144	51129.335	335.485	13234.722	9.999+	9.999+
112	14	S8	0	2790.011	50598.399	352.181	13040.96	9.999+	9.999+
113	15	S1	0	21884.718	26853.932	2672.888	6885.058	1.227	2.576
114	15	S2	0	25963.708	26886.068	2791.812	6901.418	1.036	2.472
115	15	S3	0	25617.147	26916.943	2840.11	6899.313	1.051	2.429
116	15	S4	0	25554.989	26911.969	2823.807	6899.151	1.053	2.443
117	15	S5	0	25554.6	26912.228	2824.536	6899.187	1.053	2.443
118	15	S6	0	25641.108	26916.12	2840.999	6899.271	1.05	2.428
119	15	S7	0	25908.26	26890.785	2785.599	6901.878	1.038	2.478
120	15	S8	0	21923.05	26855.45	2677.858	6884.922	1.225	2.571
121	16	S1	0	22820.609	26853.932	2407.687	6885.058	1.177	2.86
122	16	S2	0	26546.675	26886.068	2245.88	6901.418	1.013	3.073
123	16	S3	0	26555.475	26916.943	2411.632	6899.313	1.014	2.861
124	16	S4	0	26420.812	26911.969	2382.955	6899.151	1.019	2.895
125	16	S5	0	26420.666	26912.228	2384.463	6899.187	1.019	2.893
126	16	S6	0	26583.418	26916.12	2413.7	6899.271	1.013	2.858
127	16	S7	0	26486.798	26890.785	2239.814	6897.507	1.015	3.079
128	16	S8	0	22861.874	26855.45	2413.294	6884.922	1.175	2.853
129	17	S1	0	3359.848	26753.228	0	10058.171	7.963	9.999+
130	17	S2	0	5377.931	26928.13	0	10146.486	5.007	9.999+
131	17	S3	0	4450.606	26897.786	0	10222.16	6.044	9.999+
132	17	S4	0	4427.24	26901.501	0	10228.254	6.076	9.999+
133	17	S5	0	4429.709	26901.52	0	10246.491	6.073	9.999+
134	17	S6	0	4469.884	26898.288	0	10266.647	6.018	9.999+
135	17	S7	0	5361.999	26926.907	0	10198.955	5.022	9.999+
136	17	S8	0	3365.977	26749.537	0	9520.257	7.947	9.999+
137	18	S1	0	0	27159.036	0	9502.103	9.999+	9.999+
138	18	S2	0	0	27016.11	0	9779.328	9.999+	9.999+
139	18	S3	0	0	27348.225	0	9775.799	9.999+	9.999+
140	18	S4	0	0	27388.851	0	9787.987	9.999+	9.999+
141	18	S5	0	0	27387.888	0	9803.243	9.999+	9.999+
142	18	S6	0	0	27340.295	0	9805.596	9.999+	9.999+
143	18	S7	0	0	27021.012	0	9860.306	9.999+	9.999+
144	18	S8	0	0	27154.614	0	9162.096	9.999+	9.999+
145	19	S1	0	1216.678	26753.228	0	8009.027	9.999+	9.999+
146	19	S2	0	1680.541	26928.13	0	7998.332	9.999+	9.999+
147	19	S3	0	981.672	26897.786	0	7699.813	9.999+	9.999+
148	19	S4	0	659.111	26901.501	0	7381.381	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
149	19	S5	0	568.005	26901.52	0	7364.572	9.999+	9.999+
150	19	S6	0	599.045	26898.288	0	7371.836	9.999+	9.999+
151	19	S7	0	739.304	26926.907	0	7349.78	9.999+	9.999+
152	19	S8	0	437.641	26749.537	0	7232.268	9.999+	9.999+
153	20	S1	0	9471.454	26853.932	1129.42	6885.058	2.835	6.096
154	20	S2	0	9387.576	26886.068	1025.501	6901.418	2.864	6.73
155	20	S3	0	6119.542	26916.943	682.338	6899.313	4.399	9.999+
156	20	S4	0	4426.27	26911.969	490.987	6899.151	6.08	9.999+
157	20	S5	0	4203.459	26912.228	464.62	6899.187	6.402	9.999+
158	20	S6	0	4268.37	26916.12	472.567	6899.271	6.306	9.999+
159	20	S7	0	4204.192	26890.785	447.313	6901.878	6.396	9.999+
160	20	S8	0	3720.014	26855.45	469.574	6884.922	7.219	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	8.238	2749.08	0	2749.08	9.999+	9.999+
2	1	S2	0	1.449	2759.698	0	2759.698	9.999+	9.999+
3	1	S3	0	0	2759.725	0	2759.725	9.999+	9.999+
4	1	S4	0	0	2759.66	0	2759.66	9.999+	9.999+
5	1	S5	0	0	2759.675	0	2759.675	9.999+	9.999+
6	1	S6	0	0	2759.709	0	2759.709	9.999+	9.999+
7	1	S7	0	1.457	2759.877	0	2759.877	9.999+	9.999+
8	1	S8	0	8.333	2748.969	0	2748.969	9.999+	9.999+
9	2	S1	0	58.823	3220.878	0	3220.878	9.999+	9.999+
10	2	S2	0	12.068	3305.687	0	3305.687	9.999+	9.999+
11	2	S3	0	1.26	3308.269	0	3308.269	9.999+	9.999+
12	2	S4	0	0	3307.245	0	3307.245	9.999+	9.999+
13	2	S5	0	0	3307.368	0	3307.368	9.999+	9.999+
14	2	S6	0	1.308	3308.092	0	3308.092	9.999+	9.999+
15	2	S7	0	12.56	3307.325	0	3307.325	9.999+	9.999+
16	2	S8	0	59.565	3219.378	0	3219.378	9.999+	9.999+
17	3	S1	0	78.116	2159.4	1278.255	2159.4	9.999+	1.689
18	3	S2	0	8.079	2095.379	1669.508	2095.379	9.999+	1.255
19	3	S3	0	7.276	2082.464	1563.929	2082.464	9.999+	1.332
20	3	S4	0	2.902	2083.688	1573.461	2083.688	9.999+	1.324
21	3	S5	0	3.318	2083.777	1573.354	2083.777	9.999+	1.324
22	3	S6	0	7.223	2082.202	1565.371	2082.202	9.999+	1.33
23	3	S7	0	7.753	2096.859	1666.434	2096.859	9.999+	1.258
24	3	S8	0	78.301	2158.263	1280.269	2158.263	9.999+	1.686
25	4	S1	0	93.766	2232.438	1080.984	2232.438	9.999+	2.065
26	4	S2	0	1.069	2220.915	1406.403	2220.915	9.999+	1.579
27	4	S3	0	7.541	2185.458	1320.793	2185.458	9.999+	1.655
28	4	S4	0	3.058	2189.586	1325.766	2189.586	9.999+	1.652
29	4	S5	0	3.824	2189.698	1325.686	2189.698	9.999+	1.652
30	4	S6	0	8.106	2185.284	1322.387	2185.284	9.999+	1.653
31	4	S7	0	1.468	2222.328	1403.544	2222.328	9.999+	1.583
32	4	S8	0	94.279	2231.346	1082.689	2231.346	9.999+	2.061
33	5	S1	0	111.637	3448.588	1514.906	3448.588	9.999+	2.276
34	5	S2	0	12.461	3546.164	1978.394	3546.164	9.999+	1.792
35	5	S3	0	8.697	3562.426	1853.402	3562.426	9.999+	1.922
36	5	S4	0	3.461	3560.722	1864.587	3560.722	9.999+	1.91
37	5	S5	0	3.969	3560.646	1864.46	3560.646	9.999+	1.91
38	5	S6	0	8.633	3562.699	1855.125	3562.699	9.999+	1.92
39	5	S7	0	12.087	3544.797	1974.742	3544.797	9.999+	1.795
40	5	S8	0	112.077	3449.696	1517.292	3449.696	9.999+	2.274
41	6	S1	0	72.024	3338.9	1311.948	3338.9	9.999+	2.545

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
42	6	S2	0	17.811	3461.257	1718.188	3461.257	9.999+	2.014
43	6	S3	0	5.744	3453.528	1606.675	3453.528	9.999+	2.149
44	6	S4	0	3.035	3454.802	1619.106	3454.802	9.999+	2.134
45	6	S5	0	3.132	3454.769	1618.988	3454.769	9.999+	2.134
46	6	S6	0	5.7	3453.806	1607.834	3453.806	9.999+	2.148
47	6	S7	0	17.597	3460.216	1715.256	3460.216	9.999+	2.017
48	6	S8	0	72.087	3339.743	1314.013	3339.743	9.999+	2.542
49	7	S1	0	36.038	3002.153	562.682	3002.153	9.999+	5.335
50	7	S2	0	6.738	3027.174	658.894	3027.174	9.999+	4.594
51	7	S3	0	3.91	2954.191	446.544	2954.191	9.999+	6.616
52	7	S4	0	.624	2875.77	274.729	2875.77	9.999+	9.999+
53	7	S5	0	.223	2871.234	257.298	2871.234	9.999+	9.999+
54	7	S6	0	.821	2872.631	259.875	2872.631	9.999+	9.999+
55	7	S7	0	2.808	2866.563	275.936	2866.563	9.999+	9.999+
56	7	S8	0	27.593	2849.888	212.436	2849.888	9.999+	9.999+
57	8	S1	0	20.226	2495.098	564.335	2495.098	9.999+	4.421
58	8	S2	0	5.171	2517.55	599.266	2517.55	9.999+	4.201
59	8	S3	0	2.554	2597.496	374.579	2597.496	9.999+	6.934
60	8	S4	0	1.509	2642.729	273.007	2642.729	9.999+	9.68
61	8	S5	0	.19	2648.28	258.535	2648.28	9.999+	9.999+
62	8	S6	0	.74	2646.736	259.7	2646.736	9.999+	9.999+
63	8	S7	0	.169	2653.295	275.954	2653.295	9.999+	9.615
64	8	S8	0	11.122	2647.944	212.437	2647.944	9.999+	9.999+
65	9	S1	0	18.589	2660.668	958.692	2660.668	9.999+	2.775
66	9	S2	0	2.267	2670.951	1252.131	2670.951	9.999+	2.133
67	9	S3	0	4.512	2663.188	1172.947	2663.188	9.999+	2.271
68	9	S4	0	2.176	2663.369	1180.096	2663.369	9.999+	2.257
69	9	S5	0	2.489	2663.521	1180.016	2663.521	9.999+	2.257
70	9	S6	0	4.436	2662.866	1174.028	2662.866	9.999+	2.268
71	9	S7	0	2.876	2673.2	1249.826	2673.2	9.999+	2.139
72	9	S8	0	18.218	2658.747	960.202	2658.747	9.999+	2.769
73	10	S1	0	30.326	2715.447	810.738	2715.447	9.999+	3.349
74	10	S2	0	9.128	2765.103	1054.802	2765.103	9.999+	2.621
75	10	S3	0	4.711	2740.433	990.594	2740.433	9.999+	2.766
76	10	S4	0	2.294	2742.793	994.325	2742.793	9.999+	2.758
77	10	S5	0	2.868	2742.962	994.265	2742.962	9.999+	2.759
78	10	S6	0	5.098	2740.177	991.79	2740.177	9.999+	2.763
79	10	S7	0	9.792	2767.301	1052.658	2767.301	9.999+	2.629
80	10	S8	0	30.202	2713.558	812.017	2713.558	9.999+	3.342
81	11	S1	0	123.727	3627.559	1136.179	3627.559	9.999+	3.193
82	11	S2	0	17.672	3759.04	1483.795	3759.04	9.999+	2.533
83	11	S3	0	7.468	3773.159	1390.052	3773.159	9.999+	2.714
84	11	S4	0	2.596	3771.145	1398.44	3771.145	9.999+	2.697
85	11	S5	0	2.977	3771.173	1398.345	3771.173	9.999+	2.697
86	11	S6	0	7.456	3773.239	1391.344	3773.239	9.999+	2.712
87	11	S7	0	17.757	3759.153	1481.056	3759.153	9.999+	2.538
88	11	S8	0	124.566	3627.321	1137.969	3627.321	9.999+	3.188
89	12	S1	0	94.016	3545.293	983.961	3545.293	9.999+	3.603
90	12	S2	0	21.684	3695.359	1288.641	3695.359	9.999+	2.868
91	12	S3	0	5.253	3691.485	1205.006	3691.485	9.999+	3.063
92	12	S4	0	2.276	3691.705	1214.329	3691.705	9.999+	3.04
93	12	S5	0	2.349	3691.766	1214.241	3691.766	9.999+	3.04
94	12	S6	0	5.256	3691.569	1205.875	3691.569	9.999+	3.061
95	12	S7	0	21.889	3695.717	1286.442	3695.717	9.999+	2.873
96	12	S8	0	94.573	3544.856	985.51	3544.856	9.999+	3.597
97	13	S1	0	67.027	3292.733	422.011	3292.733	9.999+	7.802
98	13	S2	0	13.38	3369.797	494.171	3369.797	9.999+	6.819

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
99	13	S3	0	3.878	3316.983	334.908	3316.983	9.999+	9.904
100	13	S4	0	.468	3257.431	206.047	3257.431	9.999+	9.999+
101	13	S5	0	.167	3254.114	192.973	3254.114	9.999+	9.999+
102	13	S6	0	1.597	3255.688	194.906	3255.688	9.999+	9.999+
103	13	S7	0	10.797	3250.477	206.952	3250.477	9.999+	9.999+
104	13	S8	0	61.202	3177.465	159.327	3177.465	9.999+	9.999+
105	14	S1	0	24.829	2912.442	423.251	2912.442	9.999+	6.881
106	14	S2	0	4.448	2987.579	449.449	2987.579	9.999+	6.647
107	14	S3	0	.97	3049.461	280.934	3049.461	9.999+	9.999+
108	14	S4	0	1.132	3082.65	204.755	3082.65	9.999+	9.999+
109	14	S5	0	.142	3086.899	193.901	3086.899	9.999+	9.999+
110	14	S6	0	.426	3086.267	194.775	3086.267	9.999+	9.999+
111	14	S7	0	8.818	3090.526	206.966	3090.526	9.999+	9.999+
112	14	S8	0	32.166	3026.007	159.328	3026.007	9.999+	9.999+
113	15	S1	0	81.411	1059.768	1278.255	1059.768	9.999+	.829
114	15	S2	0	8.658	991.5	1669.508	991.5	9.999+	.594
115	15	S3	0	7.276	978.574	1563.929	978.574	9.999+	.626
116	15	S4	0	2.902	979.824	1573.461	979.824	9.999+	.623
117	15	S5	0	3.318	979.907	1573.354	979.907	9.999+	.623
118	15	S6	0	7.223	978.319	1565.371	978.319	9.999+	.625
119	15	S7	0	8.336	992.909	1666.434	992.909	9.999+	.596
120	15	S8	0	81.634	1058.676	1280.269	1058.676	9.999+	.827
121	16	S1	0	97.061	1132.806	1080.984	1132.806	9.999+	1.048
122	16	S2	0	.49	1117.036	1406.403	1117.036	9.999+	.794
123	16	S3	0	7.541	1081.568	1320.793	1081.568	9.999+	.819
124	16	S4	0	3.058	1085.722	1325.766	1085.722	9.999+	.819
125	16	S5	0	3.824	1085.828	1325.686	1085.828	9.999+	.819
126	16	S6	0	8.106	1081.4	1322.387	1081.4	9.999+	.818
127	16	S7	0	.885	1118.377	1403.544	1118.377	9.999+	.797
128	16	S8	0	97.612	1131.758	1082.689	1131.758	9.999+	1.045
129	17	S1	0	108.342	2348.956	1514.906	2348.956	9.999+	1.551
130	17	S2	0	11.881	2442.285	1978.394	2442.285	9.999+	1.234
131	17	S3	0	8.697	2458.536	1853.402	2458.536	9.999+	1.326
132	17	S4	0	3.461	2456.858	1864.587	2456.858	9.999+	1.318
133	17	S5	0	3.969	2456.776	1864.46	2456.776	9.999+	1.318
134	17	S6	0	8.633	2458.816	1855.125	2458.816	9.999+	1.325
135	17	S7	0	11.505	2440.846	1974.742	2440.846	9.999+	1.236
136	17	S8	0	108.744	2350.108	1517.292	2350.108	9.999+	1.549
137	18	S1	0	68.728	2239.268	1311.948	2239.268	9.999+	1.707
138	18	S2	0	17.231	2357.377	1718.188	2357.377	9.999+	1.372
139	18	S3	0	5.744	2349.638	1606.675	2349.638	9.999+	1.462
140	18	S4	0	3.035	2350.938	1619.106	2350.938	9.999+	1.452
141	18	S5	0	3.132	2350.899	1618.988	2350.899	9.999+	1.452
142	18	S6	0	5.7	2349.923	1607.834	2349.923	9.999+	1.462
143	18	S7	0	17.014	2356.265	1715.256	2356.265	9.999+	1.374
144	18	S8	0	68.754	2240.155	1314.013	2240.155	9.999+	1.705
145	19	S1	0	32.743	1902.52	562.682	1902.52	9.999+	3.381
146	19	S2	0	6.158	1923.295	658.894	1923.295	9.999+	2.919
147	19	S3	0	3.91	1850.301	446.544	1850.301	9.999+	4.144
148	19	S4	0	.624	1771.906	274.729	1771.906	9.999+	6.45
149	19	S5	0	.223	1767.364	257.298	1767.364	9.999+	6.869
150	19	S6	0	.821	1768.748	259.875	1768.748	9.999+	6.806
151	19	S7	0	2.225	1762.612	275.936	1762.612	9.999+	6.388
152	19	S8	0	24.259	1750.3	212.436	1750.3	9.999+	8.239
153	20	S1	0	23.521	1395.466	564.335	1395.466	9.999+	2.473
154	20	S2	0	5.751	1413.671	599.266	1413.671	9.999+	2.359
155	20	S3	0	2.554	1493.606	374.579	1493.606	9.999+	3.987

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
156	20	S4	0	1.509	1538.865	273.007	1538.865	9.999+	5.637
157	20	S5	0	.19	1544.41	258.535	1544.41	9.999+	5.974
158	20	S6	0	.74	1542.853	259.7	1542.853	9.999+	5.941
159	20	S7	0	.414	1549.344	275.954	1549.344	9.999+	5.614
160	20	S8	0	14.455	1548.357	212.437	1548.357	9.999+	7.289

Envelope Slab Soil Pressures

	Label	UC	LC	Soil Pressure[psf]	Allowable Bearing[psf]	Point
1	S1	.496	5	744.723	1500	N226
2	S2	.598	16	896.283	1500	N24
3	S3	.588	16	881.33	1500	N25
4	S4	.573	16	859.848	1500	N29
5	S5	.573	16	859.965	1500	N33
6	S6	.591	16	885.894	1500	N40
7	S7	.591	16	887.103	1500	N41
8	S8	.497	5	745.477	1500	N275

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 318-14
Units: Imperial units

Anchor Information:
Anchor type: Bonded anchor
Material: F1554 Grade 36
Diameter (inch): 0.375
Effective Embedment depth, h_{ef} (inch): 6.000
Code report: ICC-ES ESR-4057
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 7.25
c_{ac} (inch): 10.99
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 30.00
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

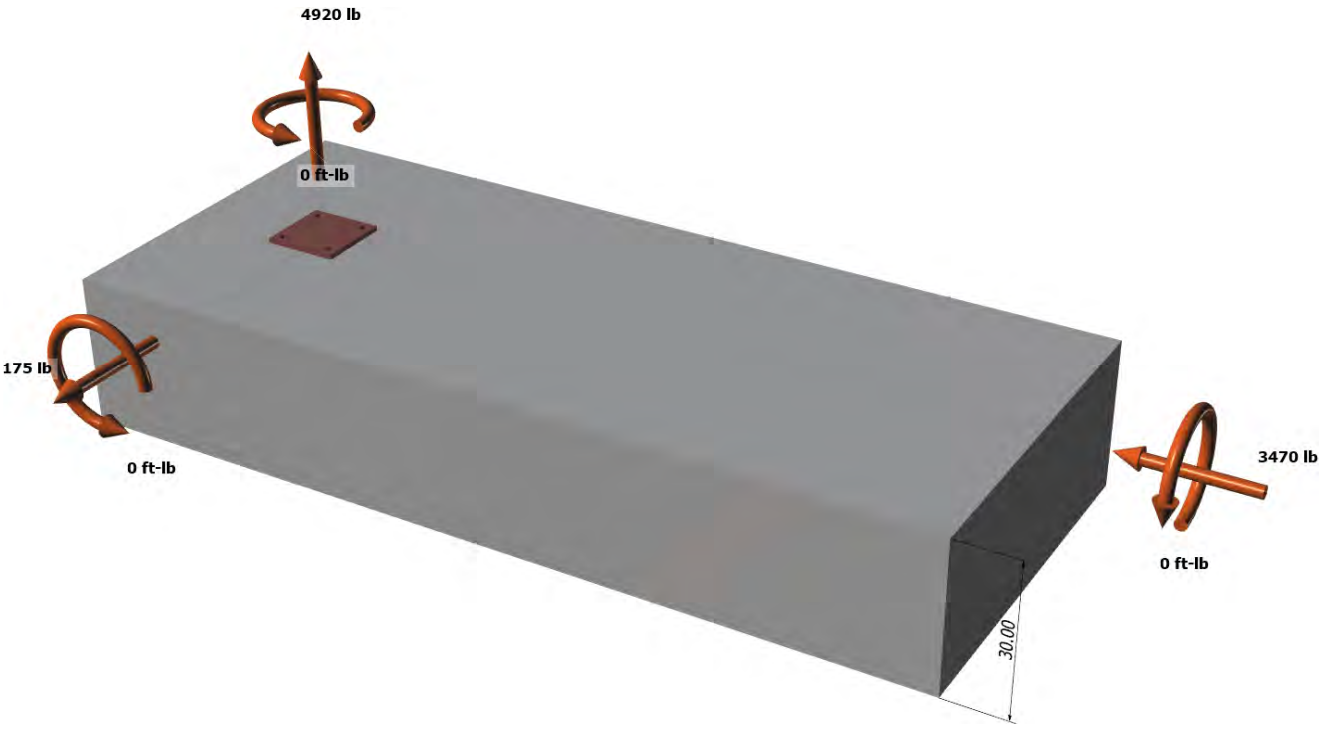
Recommended Anchor
Anchor Name: SET-3G - SET-3G w/ 3/8"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-4057

Load and Geometry
Load factor source: ACI 318 Section 5.3
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]: 4920
V_{uax} [lb]: 175
V_{uay} [lb]: -3470
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

<Figure 1>



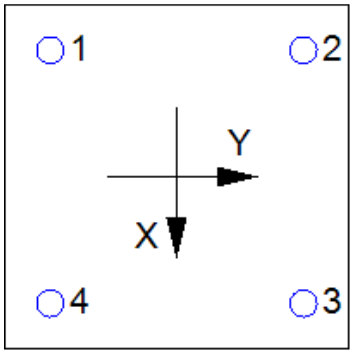
<Figure 2>

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	1230.0	43.8	-867.5	868.6
2	1230.0	43.8	-867.5	868.6
3	1230.0	43.8	-867.5	868.6
4	1230.0	43.8	-867.5	868.6
Sum	4920.0	175.0	-3470.0	3474.4

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 4920
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. 17.4.1)

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

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. 17.4.2.2a)

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	6.000	12492

$\phi N_{cbg} = \phi (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1b)

A_{Nc} (in²)	A_{Nco} (in²)	$c_{a,min}$ (in)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cbg} (lb)
424.63	324.00	7.25	1.000	0.942	1.00	1.000	12492	0.65	10021

6. Adhesive Strength of Anchor in Tension (Sec. 17.4.5)

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

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

$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef}$ (Eq. 17.4.5.2)

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	1346	0.38	6.000	9514

$\phi N_{ag} = \phi (A_{Na} / A_{Na0}) \Psi_{ec,Na} \Psi_{ed,Na} \Psi_{cp,Na} N_{ba}$ (Sec. 17.3.1 & Eq. 17.4.5.1b)

A_{Na} (in²)	A_{Na0} (in²)	c_{Na} (in)	$c_{a,min}$ (in)	$\Psi_{ec,Na}$	$\Psi_{ed,Na}$	$\Psi_{cp,Na}$	N_{ba}(lb)	ϕ	ϕN_{ag} (lb)
198.45	112.09	5.29	7.25	1.000	1.000	1.000	9514	0.55	9265

8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

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. 17.5.2)

Shear perpendicular to edge in x-direction:

$V_{bx} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	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. 17.3.1 & Eq. 17.5.2.1b)

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:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	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. 17.3.1 & Eq. 17.5.2.1b)

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:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	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. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1b)

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:

$V_{bx} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	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. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1b)

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. 17.5.3)

$\phi V_{cpg} = \phi \min|k_{cp}N_{ag};\ k_{cp}N_{cbg}| = \phi \min|k_{cp}(A_{Na} / A_{Na0})\,\Psi_{ec,Na}\Psi_{ed,Na}\Psi_{cp,Na}N_{ba};\ k_{cp}(A_{Nc} / A_{Nco})\,\Psi_{ec,N}\Psi_{ed,N}\Psi_{c,N}\Psi_{cp,N}N_b|$ (Sec. 17.3.1 & Eq. 17.5.3.1b)

k_{cp}	A_{Na} (in²)	A_{Na0} (in²)	$\Psi_{ed,Na}$	$\Psi_{ec,Na}$	$\Psi_{cp,Na}$	N_{ba} (lb)	N_a (lb)
2.0	198.45	112.09	1.000	1.000	1.000	9514	16845

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
424.63	324.00	1.000	0.942	1.000	1.000	12492	15417	0.70

ϕV_{cpg} (lb)
21584

11. Results

Interaction of Tensile and Shear Forces (Sec. R17.6)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	1230	3394	0.36	Pass
Concrete breakout	4920	10021	0.49	Pass
Adhesive	**4920**	**9265**	**0.53**	**Pass (Governs)**

Shear	Factored Load, V_{ua} (lb)	Design Strength, ϕV_n (lb)	Ratio	Status
Steel	869	1765	0.49	Pass
T Concrete breakout x+	175	7103	0.02	Pass
T Concrete breakout y-	3470	5313	0.65	Pass
|| Concrete breakout y-	87	9797	0.01	Pass
|| Concrete breakout x-	1735	12680	0.14	Pass
Concrete breakout, combined	**-**	**-**	**0.65**	**Pass (Governs)**
Pryout	3474	21584	0.16	Pass

Interaction check	$(N_{ua}/\phi N_{ua})^{5/3}$	$(V_{ua}/\phi V_{ua})^{5/3}$	Combined Ratio	Permissible	Status
Sec. R17.6	0.35	0.49	84.1%	1.0	Pass

SET-3G w/ 3/8"Ø F1554 Gr. 36 with hef = 6.000 inch meets the selected design criteria.

12. Warnings

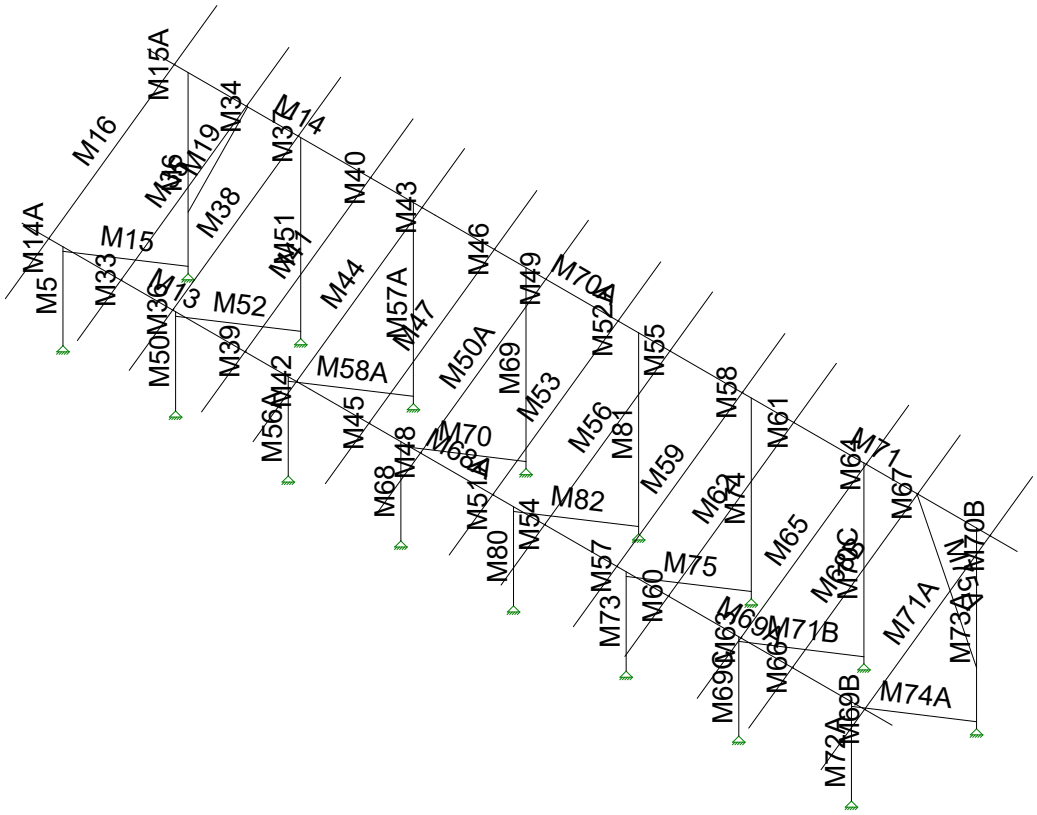
- Designer must exercise own judgement to determine if this design is suitable.

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

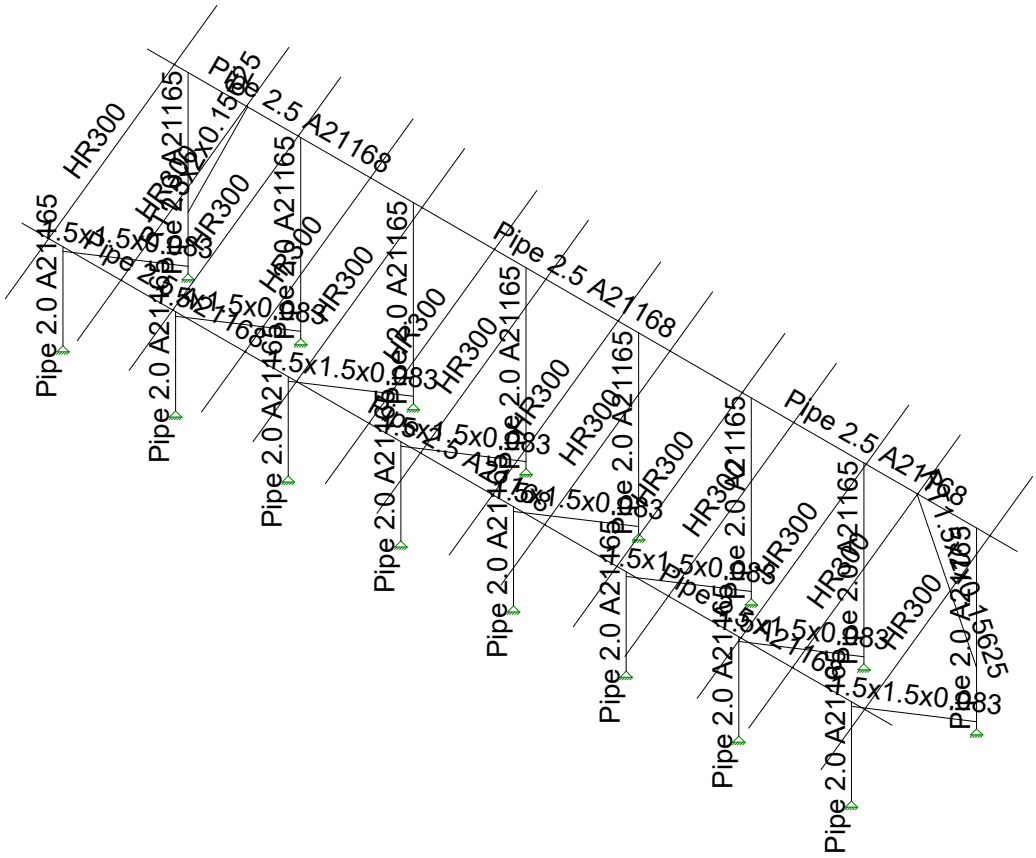
JOB NO.: U2716-070-181 **DESIGNED:** STB

PROJECT: Ground Mount Package for Ontario Canada

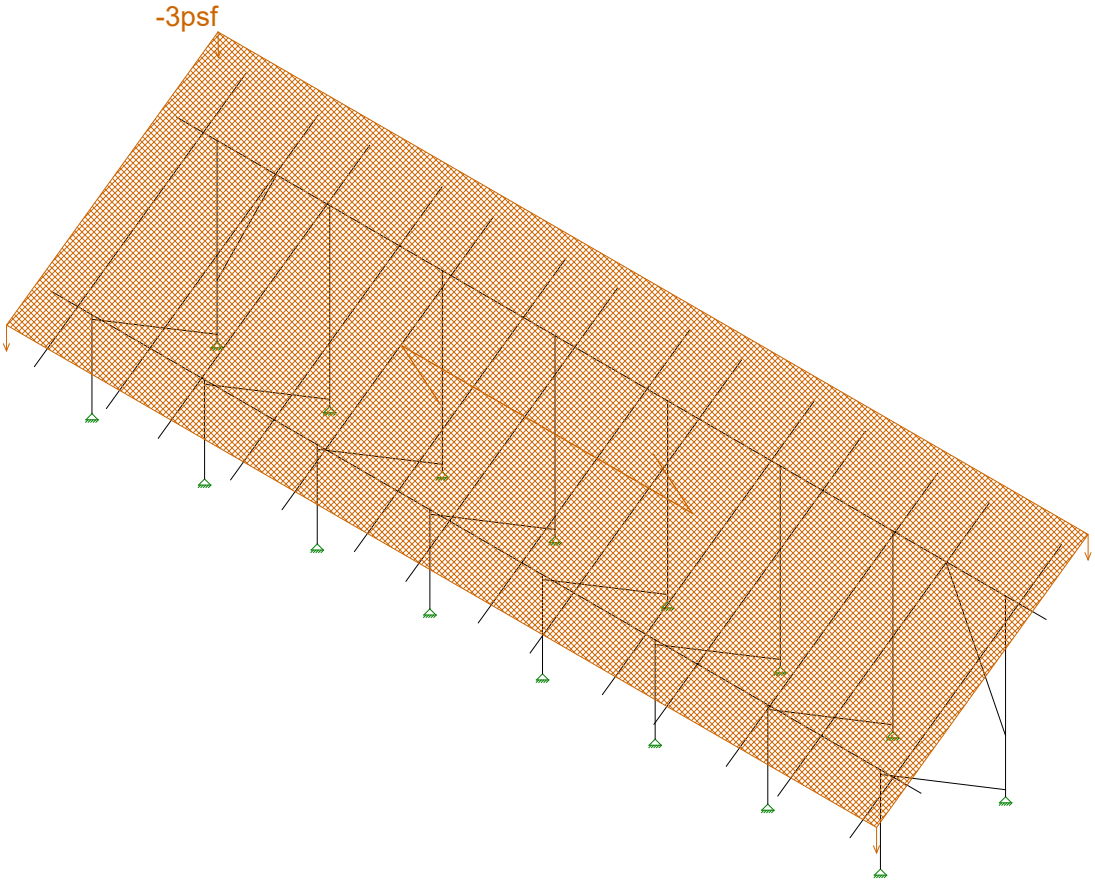
Framing Analysis



Vector Structural Engineeri...		SK - 5
STB	Ground Mount	Aug 1, 2019 at 1:17 PM
U2716.115.191		New England A6.r3d

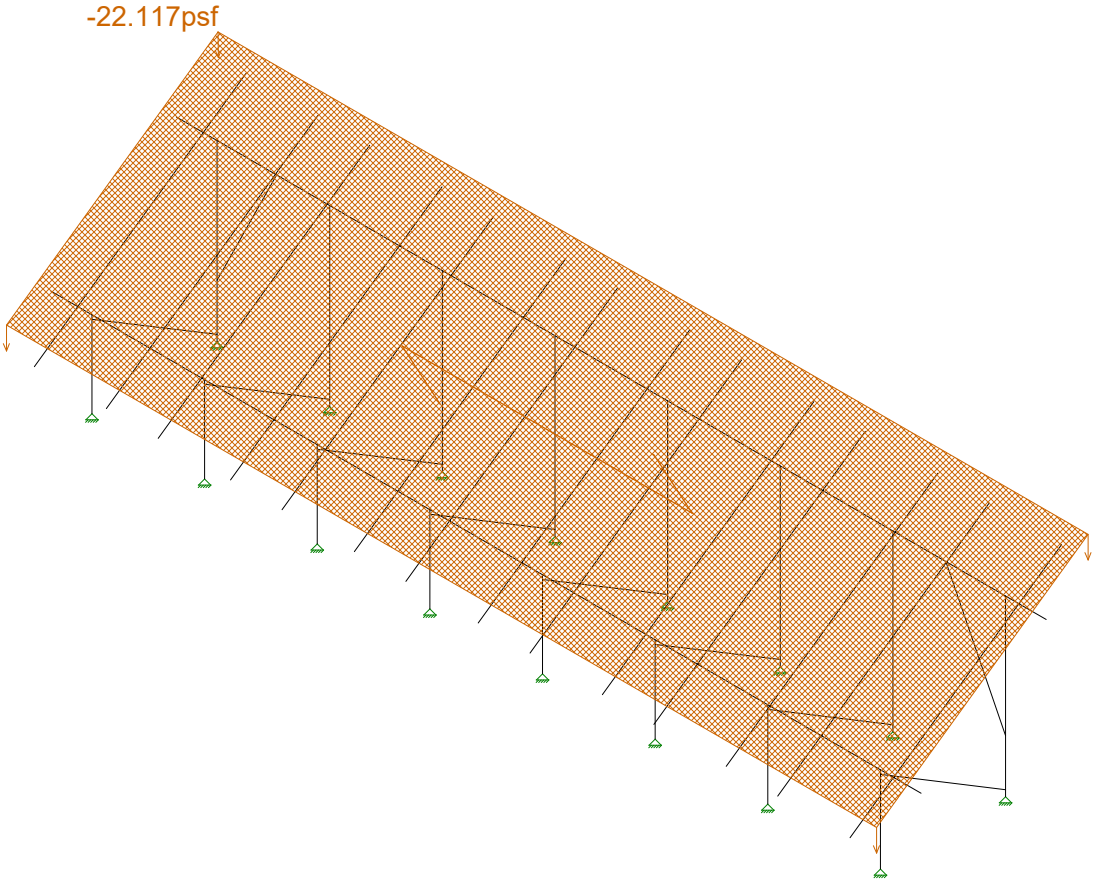


Vector Structural Engineeri...		SK - 6
STB	Ground Mount	Aug 1, 2019 at 1:17 PM
U2716.115.191		New England A6.r3d



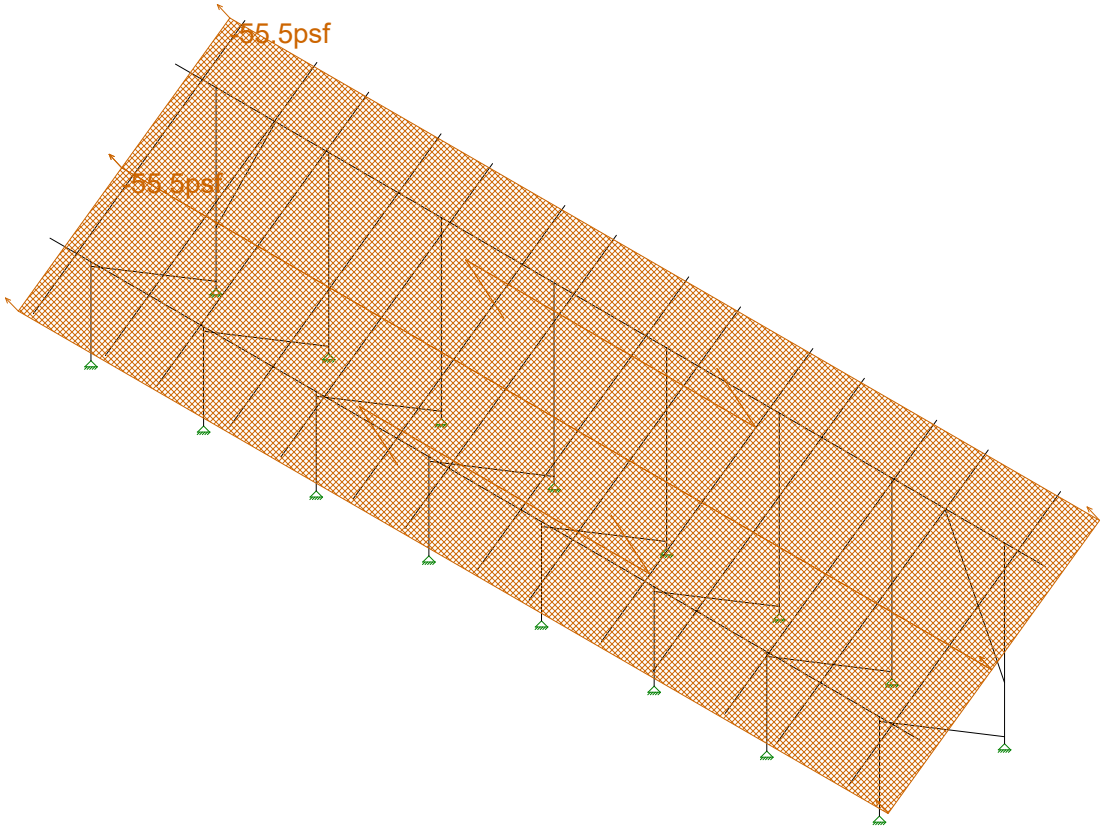
Loads: BLC 2, Solar Panel Weight

Vector Structural Engineeri...		SK - 7
STB	Ground Mount	Aug 1, 2019 at 1:17 PM
U2716.115.191		New England A6.r3d



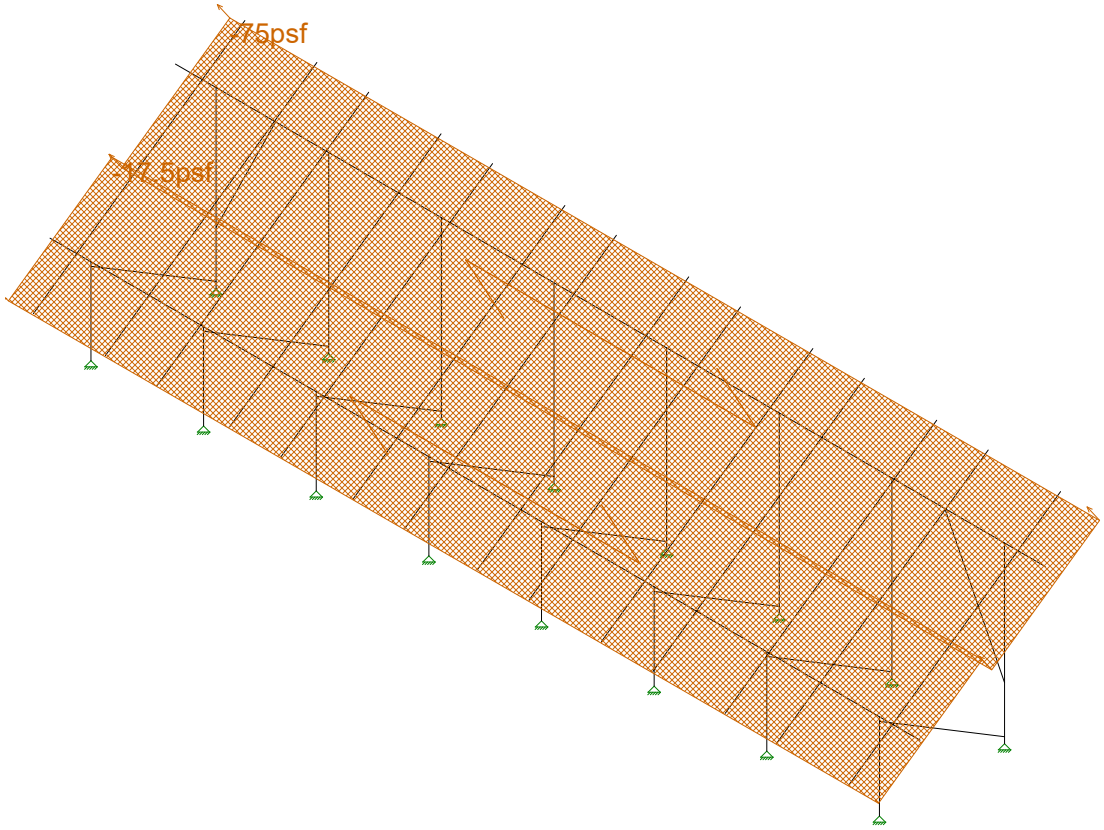
Loads: BLC 3, Roof Live/Snow

Vector Structural Engineeri...		SK - 8
STB	Ground Mount	Aug 1, 2019 at 1:17 PM
U2716.115.191		New England A6.r3d



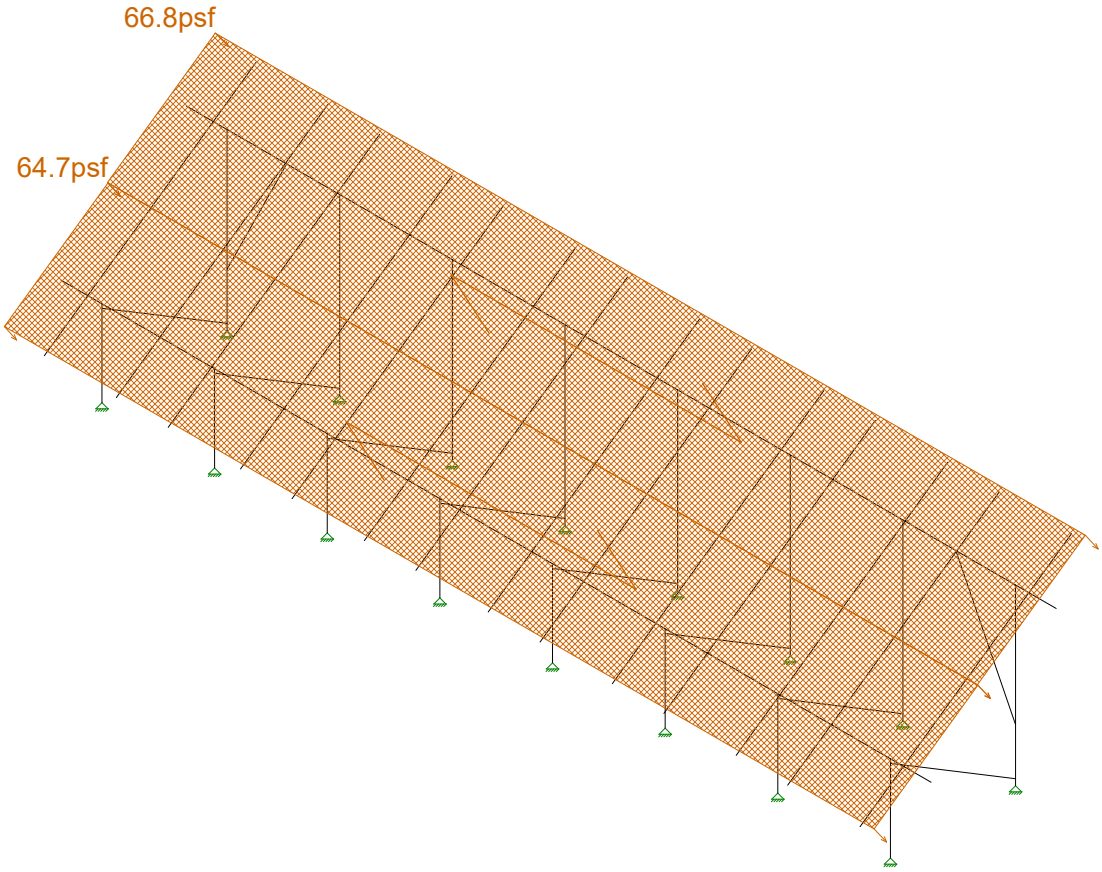
Loads: BLC 4, Wind A 0 deg

Vector Structural Engineeri...	Ground Mount	SK - 9
STB		Aug 1, 2019 at 1:17 PM
U2716.115.191		New England A6.r3d



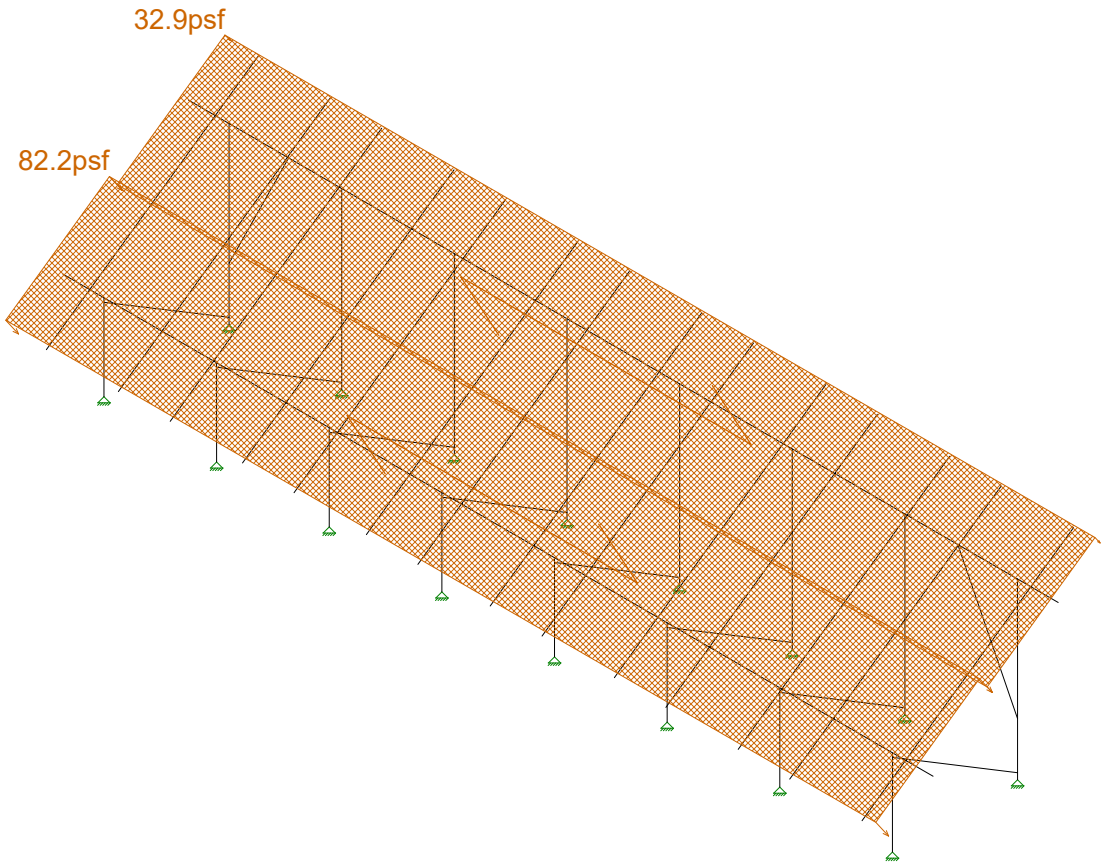
Loads: BLC 5, Wind B 0 deg

Vector Structural Engineeri...	Ground Mount	SK - 10
STB		Aug 1, 2019 at 1:18 PM
U2716.115.191		New England A6.r3d



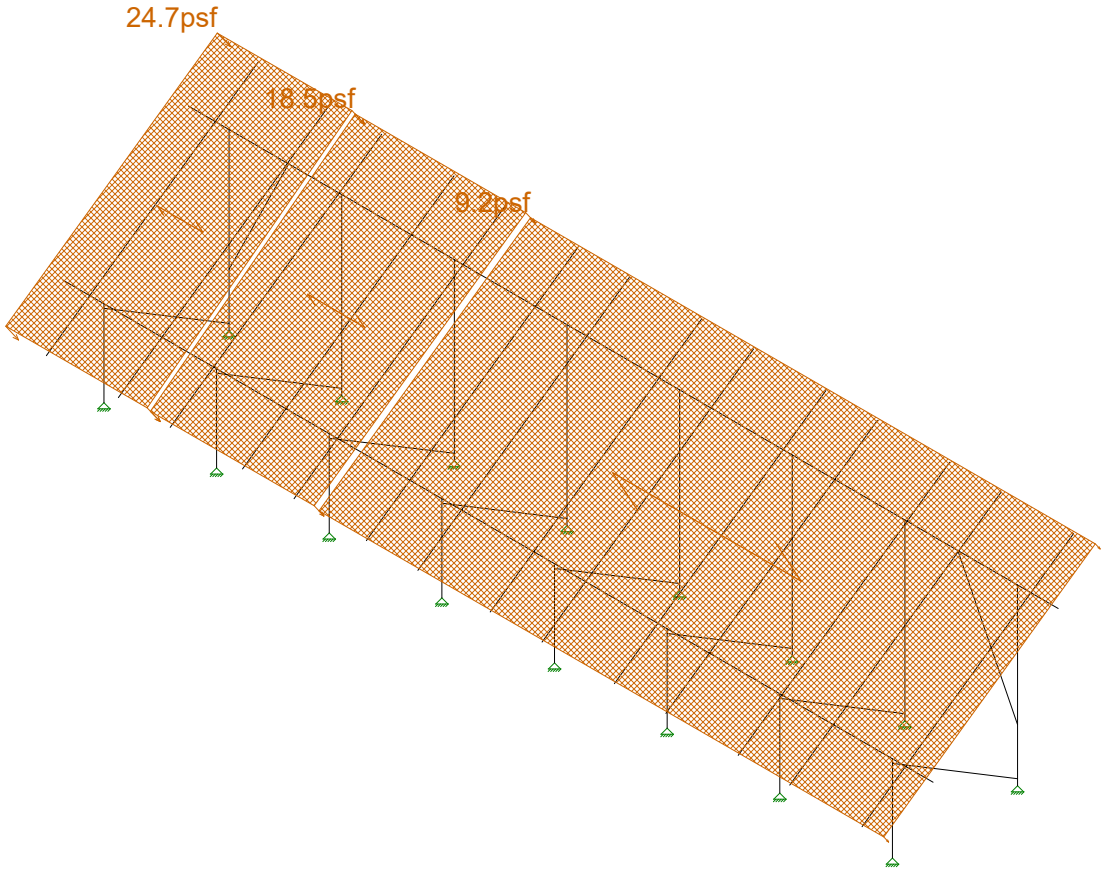
Loads: BLC 6, Wind A 180 deg

Vector Structural Engineeri...		SK - 11
STB	Ground Mount	Aug 1, 2019 at 1:18 PM
U2716.115.191		New England A6.r3d



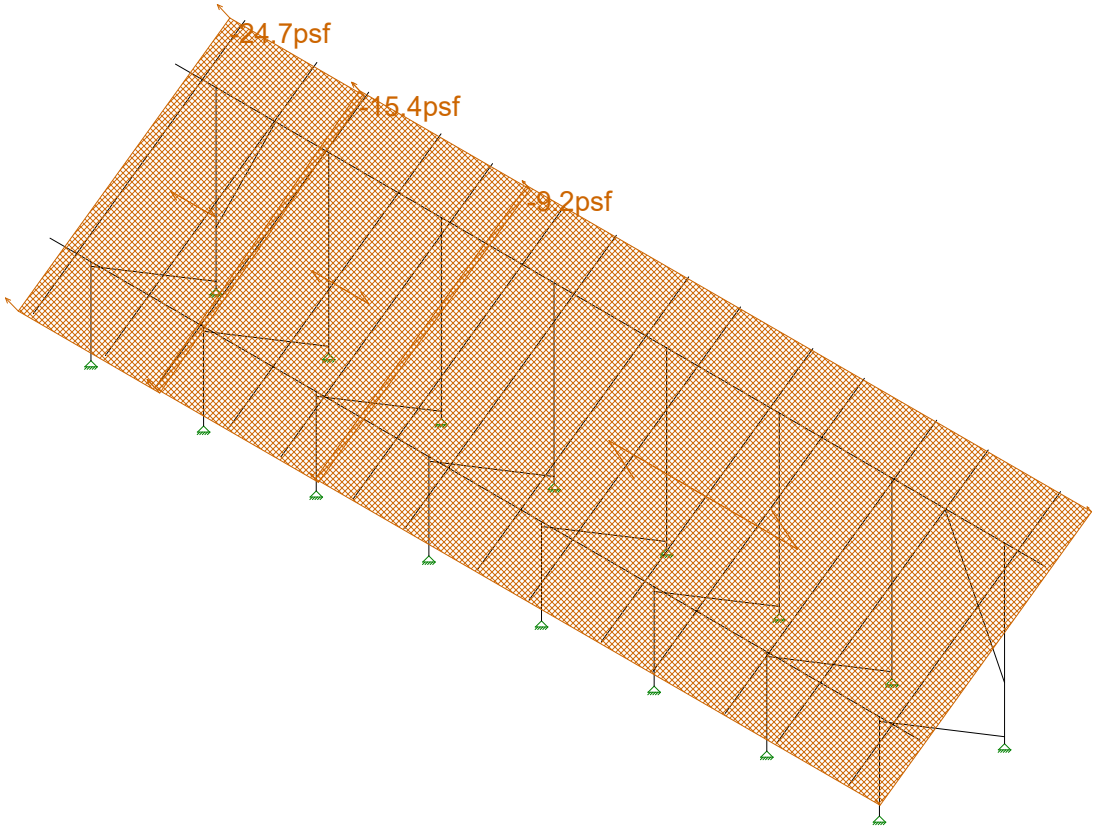
Loads: BLC 7, Wind B 180 deg

Vector Structural Engineeri...	Ground Mount	SK - 12
STB		Aug 1, 2019 at 1:18 PM
U2716.115.191		New England A6.r3d



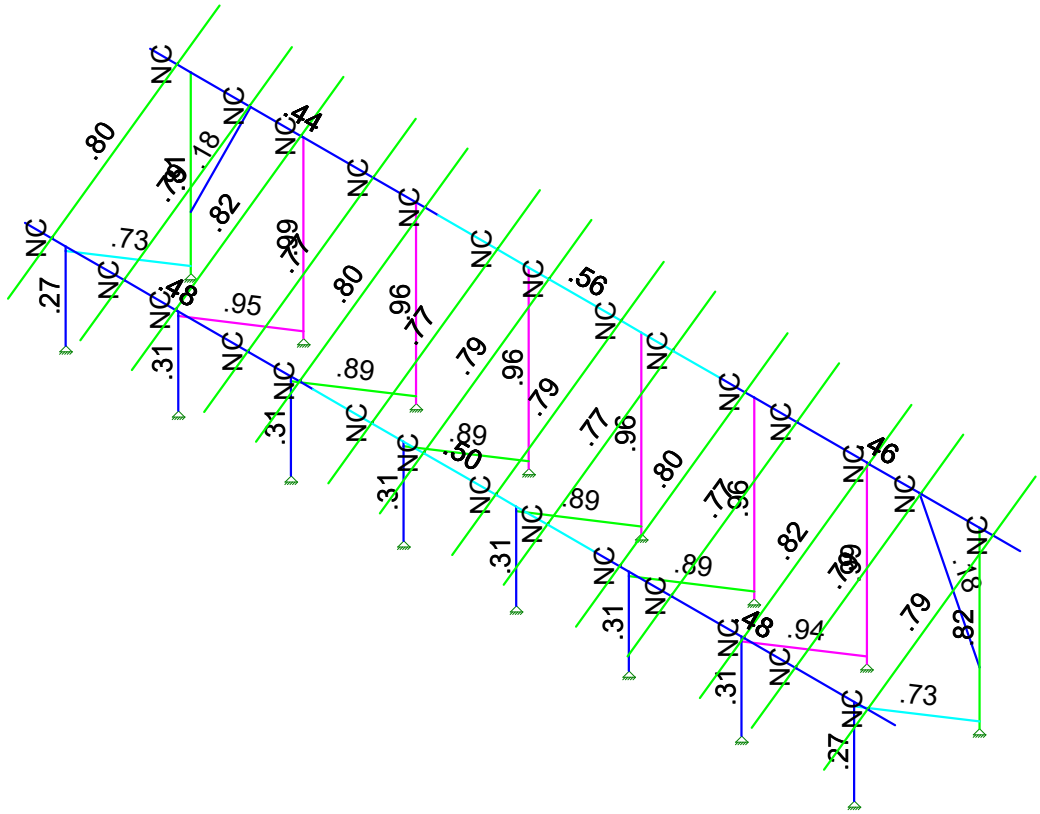
Loads: BLC 8, Wind A 90

Vector Structural Engineeri...	Ground Mount	SK - 13
STB		Aug 1, 2019 at 1:18 PM
U2716.115.191		New England A6.r3d



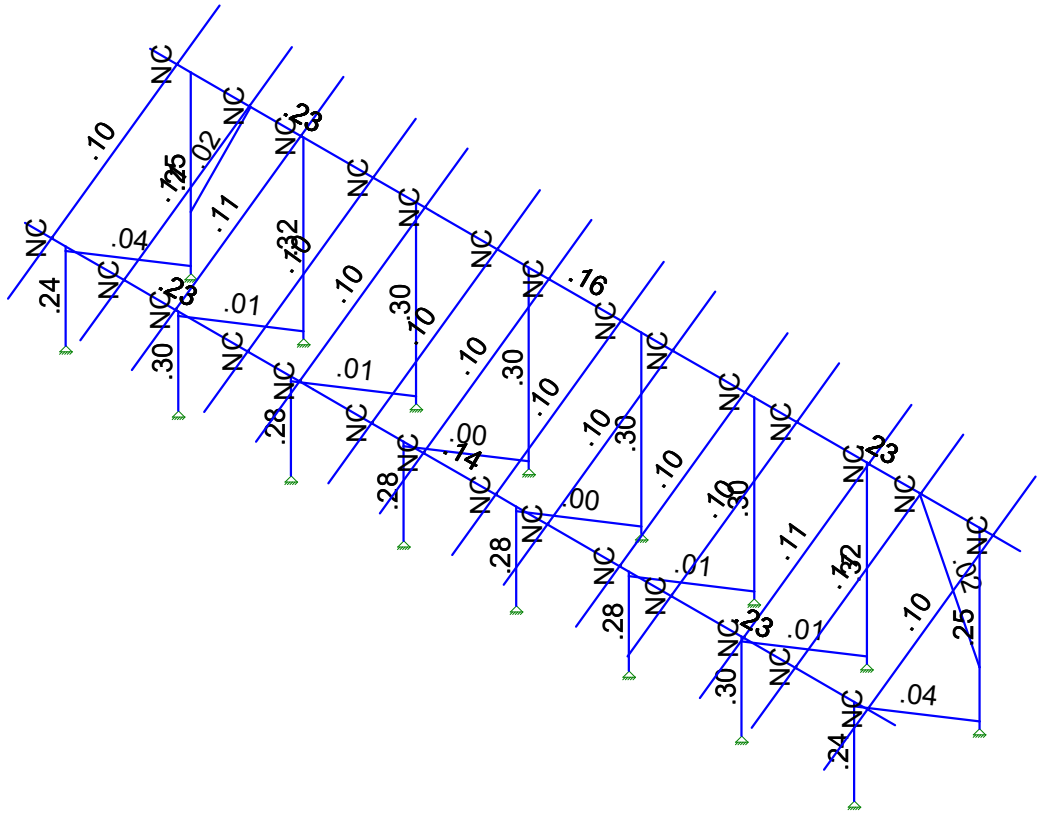
Loads: BLC 9, Wind B 90

Vector Structural Engineeri...		SK - 14
STB	Ground Mount	Aug 1, 2019 at 1:18 PM
U2716.115.191		New England A6.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Vector Structural Engineeri...		SK - 3
STB	Ground Mount	Aug 1, 2019 at 1:17 PM
U2716.115.191		New England A6.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Vector Structural Engineeri...	Ground Mount	SK - 4
STB		Aug 1, 2019 at 1:17 PM
U2716.115.191		New England A6.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 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-16: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-15: 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 B.4	kt	Ftu[psi]	Fty[psi]	Fcy[psi]	Fsu[psi]	Ct
1	3003-H14	10100	3787.5	.33	1.3	172.8	Table B.4-1	1	19000	16000	13000	12000	141
2	6061-T6	10100	3787.5	.33	1.3	172.8	Table B.4-2	1	38000	35000	35000	24000	141
3	6063-T5	10100	3787.5	.33	1.3	172.8	Table B.4-2	1	22000	16000	16000	13000	141
4	6063-T6	10100	3787.5	.33	1.3	172.8	Table B.4-2	1	30000	25000	25000	19000	141
5	5052-H34	10200	3787.5	.33	1.3	172.8	Table B.4-1	1	34000	26000	24000	20000	141
6	6061-T6 W	10100	3787.5	.33	1.3	172.8	Table B.4-1	1	24000	15000	15000	15000	141
7	6005-T5	10100	3787.5	.33	1.3	172.8	Table B.4-1	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	A572 Gr.50	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	HR300	Beam	Rectangular Tubes	6005-T5	Typical	.736	.214	.727	.614
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	-27

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	-55.5
2	N198	N201	N199	N196	Perp	A-B	-55.5

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	-75
2	N198	N201	N199	N196	Perp	A-B	-17.5

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	66.8
2	N198	N201	N199	N196	Perp	A-B	64.7

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	32.9
2	N198	N201	N199	N196	Perp	A-B	82.2

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	24.7
2	N203	N209	N208	N202	Perp	A-B	18.5
3	N209	N200	N199	N208	Perp	A-B	9.2

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	-24.7
2	N203	N209	N208	N202	Perp	A-B	-15.4
3	N209	N200	N199	N208	Perp	A-B	-9.2

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						34		
11	BLC 3 Transient Area ...	None						34		
12	BLC 4 Transient Area ...	None						120		
13	BLC 5 Transient Area ...	None						120		
14	BLC 6 Transient Area ...	None						120		
15	BLC 7 Transient Area ...	None						120		
16	BLC 8 Transient Area ...	None						98		
17	BLC 9 Transient Area ...	None						98		

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	.6														
4	1.0 D + 0.6 W2	Yes	Y		DL	1	RLL		OL2	.6														
5	1.0 D + 0.6 W3	Yes	Y		DL	1	RLL		OL3	.6														
6	1.0 D + 0.6 W4	Yes	Y		DL	1	RLL		OL4	.6														
7	1.0 D + 0.6 W5	Yes	Y		DL	1	RLL		OL5	.6														
8	1.0 D + 0.6 W6	Yes	Y		DL	1	RLL		OL6	.6														
9	1.0 D + 0.45 W1 + 0....	Yes	Y		DL	1	RLL	.75	OL1	.45														
10	1.0 D + 0.45 W2 + 0....	Yes	Y		DL	1	RLL	.75	OL2	.45														
11	1.0 D + 0.45 W3 + 0....	Yes	Y		DL	1	RLL	.75	OL3	.45														
12	1.0 D + 0.45 W4 + 0....	Yes	Y		DL	1	RLL	.75	OL4	.45														
13	1.0 D + 0.45 W5 + 0....	Yes	Y		DL	1	RLL	.75	OL5	.45														
14	1.0 D + 0.45 W6 + 0....	Yes	Y		DL	1	RLL	.75	OL6	.45														
15	0.6 D + 0.6 W1	Yes	Y		DL	.6	RLL		OL1	.6														
16	0.6 D + 0.6 W2	Yes	Y		DL	.6	RLL		OL2	.6														
17	0.6 D + 0.6 W3	Yes	Y		DL	.6	RLL		OL3	.6														
18	0.6 D + 0.6 W4	Yes	Y		DL	.6	RLL		OL4	.6														
19	0.6 D + 0.6 W5	Yes	Y		DL	.6	RLL		OL5	.6														
20	0.6 D + 0.6 W6	Yes	Y		DL	.6	RLL		OL6	.6														

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	17.504	5	1399.269	10	71.373	3	0	1	0	1	0	1
2		min	-12.955	15	-414.829	17	-82.238	5	0	1	0	1	0	1
3	N1	max	95.555	11	2995.874	5	1596.7...	5	0	1	0	1	0	1
4		min	-95.485	16	-2530.384	16	-1349....	3	0	1	0	1	0	1
5	N132	max	1.039	4	3469.069	5	1957.9...	5	0	1	0	1	0	1
6		min	-1.109	17	-2920.24	16	-1654....	3	0	1	0	1	0	1
7	N133	max	5.153	5	1730.851	10	80.941	3	0	1	0	1	0	1
8		min	-4.791	16	-506.05	17	-93.384	5	0	1	0	1	0	1
9	N109	max	2.076	20	3523.396	5	2073.1...	5	0	1	0	1	0	1
10		min	-3.098	11	-2921.682	16	-1749....	3	0	1	0	1	0	1
11	N110A	max	6.852	15	1857.872	10	80.591	3	0	1	0	1	0	1
12		min	-20.142	12	-589.307	17	-92.537	5	0	1	0	1	0	1
13	N121	max	.841	20	3475.644	5	1944.8...	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	-.973	13	-2943.915	16	-1645....	3	0	1	0	1	0	1
15	N122	max	8.022	16	1728.781	10	80.906	3	0	1	0	1	0	1
16		min	-8.884	5	-511.439	17	-93.401	5	0	1	0	1	0	1
17	N133B	max	.978	17	3469.018	5	1958.0...	5	0	1	0	1	0	1
18		min	-1.053	16	-2920.149	16	-1654....	3	0	1	0	1	0	1
19	N134B	max	4.014	16	1730.596	10	80.929	3	0	1	0	1	0	1
20		min	-4.55	5	-505.748	17	-93.371	5	0	1	0	1	0	1
21	N151	max	.976	14	3478.692	5	1946.5...	5	0	1	0	1	0	1
22		min	-.502	17	-2947.656	16	-1646....	3	0	1	0	1	0	1
23	N152	max	8.889	5	1731.863	10	80.944	3	0	1	0	1	0	1
24		min	-7.911	16	-513.686	17	-93.425	5	0	1	0	1	0	1
25	N143A	max	3.626	11	3517.385	5	2069.5...	5	0	1	0	1	0	1
26		min	-2.149	16	-2913.761	16	-1746....	3	0	1	0	1	0	1
27	N144A	max	19.845	12	1852.943	10	80.531	3	0	1	0	1	0	1
28		min	-6.147	15	-587.384	17	-92.502	5	0	1	0	1	0	1
29	N149A	max	96.185	16	3001.373	5	1599.1...	5	0	1	0	1	0	1
30		min	-96.479	11	-2535.049	16	-1351....	3	0	1	0	1	0	1
31	N150A	max	12.692	15	1394.602	10	71.402	3	0	1	0	1	0	1
32		min	-17.099	5	-416.591	17	-82.254	5	0	1	0	1	0	1
33	Totals:	max	.018	7	28851.675	11	14422....	5						
34		min	-.018	8	-15680.985	15	-12170...	15						

Envelope AISC 14th(360-10): 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...	.274	52.073	17	.237	52.645		5	16486.797	23232.186	1397.505	1397.505	1....	H1-1b
2	M6	Pipe 2.0 A2...	.814	3.477	5	.249	0		5	6062.107	23232.186	1397.505	1397.505	1....	H1-1a
3	M13	Pipe 2.5 A2...	.482	63.25	12	.235	97.75		5	11641.036	28358.413	2081.747	2081.747	1	H1-1b
4	M14	Pipe 2.5 A2...	.437	170....	11	.232	97.75		11	11641.036	28358.413	2081.747	2081.747	1....	H1-1b
5	M15	1.5x1.5x0.083	.732	48.694	5	.042	93.493	y	11	2716.455	14085.15	624.421	624.421	1....	H1-1a
6	M80	Pipe 2.0 A2...	.307	52.073	17	.282	52.645		5	16486.797	23232.186	1397.505	1397.505	1....	H1-1b
7	M81	Pipe 2.0 A2...	.963	3.477	5	.304	0		5	6062.107	23232.186	1397.505	1397.505	1....	H1-1a
8	M82	1.5x1.5x0.083	.894	48.694	5	.004	0	y	5	2716.455	14085.15	624.421	624.421	1....	H1-1a
9	M50	Pipe 2.0 A2...	.309	52.073	17	.299	52.645		5	16486.797	23232.186	1397.505	1397.505	1....	H1-1b
10	M51	Pipe 2.0 A2...	.995	3.477	5	.322	0		5	6062.107	23232.186	1397.505	1397.505	1....	H1-1a
11	M52	1.5x1.5x0.083	.946	48.694	5	.006	93.493	y	13	2716.455	14085.15	624.421	624.421	1....	H1-1a
12	M56A	Pipe 2.0 A2...	.308	52.073	17	.280	52.645		5	16486.797	23232.186	1397.505	1397.505	1....	H1-1b
13	M57A	Pipe 2.0 A2...	.961	3.477	5	.302	0		5	6062.107	23232.186	1397.505	1397.505	1....	H1-1a
14	M58A	1.5x1.5x0.083	.888	48.694	5	.007	93.493	y	4	2716.455	14085.15	624.421	624.421	1....	H1-1a
15	M68	Pipe 2.0 A2...	.307	52.073	17	.282	52.645		5	16486.797	23232.186	1397.505	1397.505	1....	H1-1b
16	M69	Pipe 2.0 A2...	.963	3.477	5	.305	0		5	6062.107	23232.186	1397.505	1397.505	1....	H1-1a
17	M70	1.5x1.5x0.083	.894	48.694	5	.004	93.493	y	4	2716.455	14085.15	624.421	624.421	1....	H1-1a
18	M68A	Pipe 2.5 A2...	.501	58.125	6	.142	129....		6	11641.036	28358.413	2081.747	2081.747	2....	H1-1b
19	M69A	Pipe 2.5 A2...	.476	128	12	.232	94		5	11641.036	28358.413	2081.747	2081.747	1	H1-1b
20	M70A	Pipe 2.5 A2...	.556	58.125	11	.161	129....		11	11641.036	28358.413	2081.747	2081.747	2....	H1-1b
21	M71	Pipe 2.5 A2...	.464	166	11	.231	94		11	11641.036	28358.413	2081.747	2081.747	1....	H1-1b
22	M73	Pipe 2.0 A2...	.308	52.073	17	.281	52.645		5	16486.797	23232.186	1397.505	1397.505	1....	H1-1b
23	M74	Pipe 2.0 A2...	.962	3.477	5	.302	0		5	6062.107	23232.186	1397.505	1397.505	1....	H1-1a
24	M75	1.5x1.5x0.083	.888	48.694	5	.007	93.493	y	4	2716.455	14085.15	624.421	624.421	1....	H1-1a
25	M69C	Pipe 2.0 A2...	.308	52.073	17	.299	52.645		5	16486.797	23232.186	1397.505	1397.505	1....	H1-1b
26	M70C	Pipe 2.0 A2...	.993	3.477	5	.321	0		5	6062.107	23232.186	1397.505	1397.505	1....	H1-1a
27	M71B	1.5x1.5x0.083	.944	48.694	5	.006	93.493	y	12	2716.455	14085.15	624.421	624.421	1....	H1-1a
28	M72A	Pipe 2.0 A2...	.274	52.073	17	.237	52.645		5	16486.797	23232.186	1397.505	1397.505	1....	H1-1b
29	M73A	Pipe 2.0 A2...	.816	3.477	5	.250	0		5	6062.107	23232.186	1397.505	1397.505	1....	H1-1a
30	M74A	1.5x1.5x0.083	.733	48.694	5	.042	93.493	y	11	2716.455	14085.15	624.421	624.421	1....	H1-1a

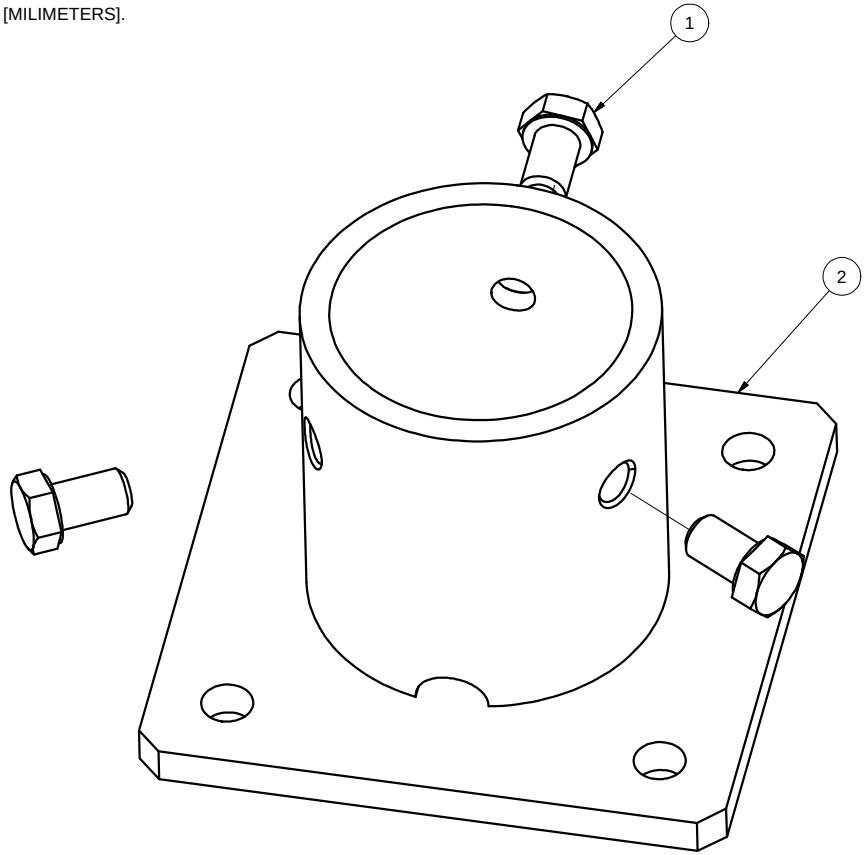
Envelope AA ADM1-15: ASD - Building Aluminum Code Checks

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	Pnc/O...	Pnt/Om...	Mny/O...	Mnz/O...	Vny/O...	Vnz/O...	Cb	Eqn
1	M19	RT1.5x2x...	.177	52.977	11	.024	0	z	5	2260.001	19411....	770.742	927.083	6090.199	4101.563	1....	H.1-1
2	M16	HR300	.804	82.515	5	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
3	M35	HR300	.789	80.796	11	.114	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
4	M38	HR300	.818	87.672	16	.107	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
5	M41	HR300	.774	34.381	12	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
6	M44	HR300	.802	84.234	11	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
7	M47	HR300	.774	34.381	12	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
8	M50A	HR300	.786	84.234	11	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
9	M53	HR300	.788	84.234	11	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
10	M56	HR300	.774	34.381	12	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
11	M59	HR300	.803	84.234	11	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
12	M62	HR300	.774	34.381	12	.104	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
13	M65	HR300	.819	87.672	16	.106	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
14	M68B	HR300	.793	80.796	11	.114	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
15	M71A	HR300	.790	82.515	5	.101	36.1	y	12	3887.213	14342....	494.953	934.619	6236.364	2843.273	1	H.1-1
16	M75A	RT1.5x2x...	.178	53.045	11	.024	0	z	5	2254.199	19411....	770.742	927.083	6090.199	4101.563	1....	H.1-1

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

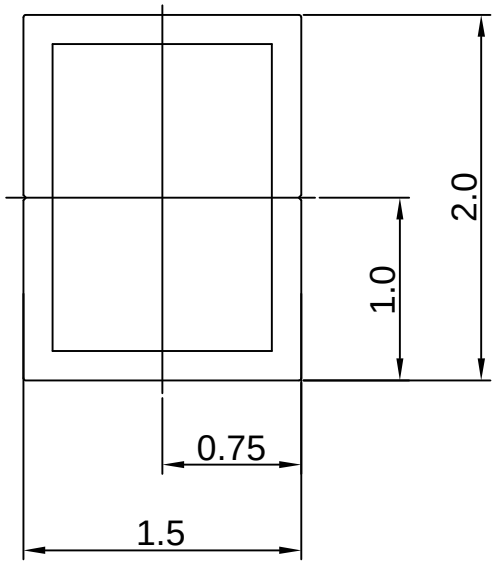
TITLE: 2" PIPE BASE KIT

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:

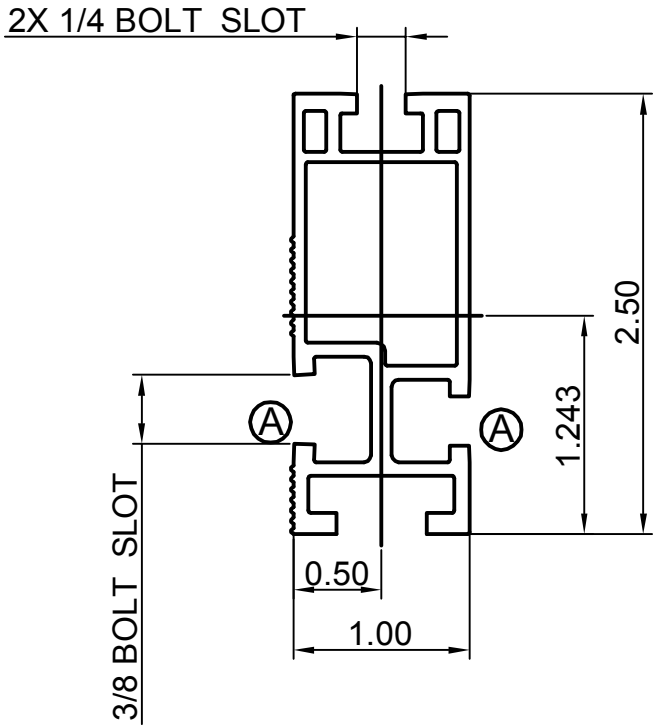
Weight: 1.156 lbs/ft
Area: 0.992 in^2
Perimeter: 12.601 in
Bounding Box: X: -1.000,1.000
Y: -0.750, 0.750
Centroid:(0.000,0.000)
Moments of Inertia(in^4): Ix=0.506,Iy=0.322
Section modulus in bending(in^3): Wx=0.675,Wy=0.322
Radii of Gyration: X: 0.714, Y: 0.570

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.



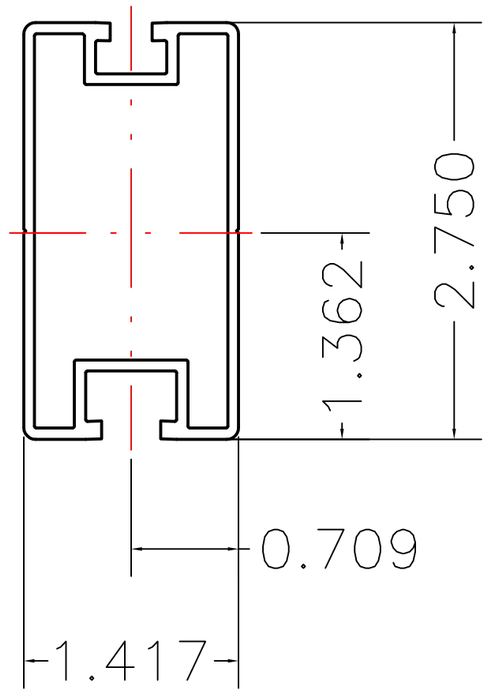
Section properties:

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	

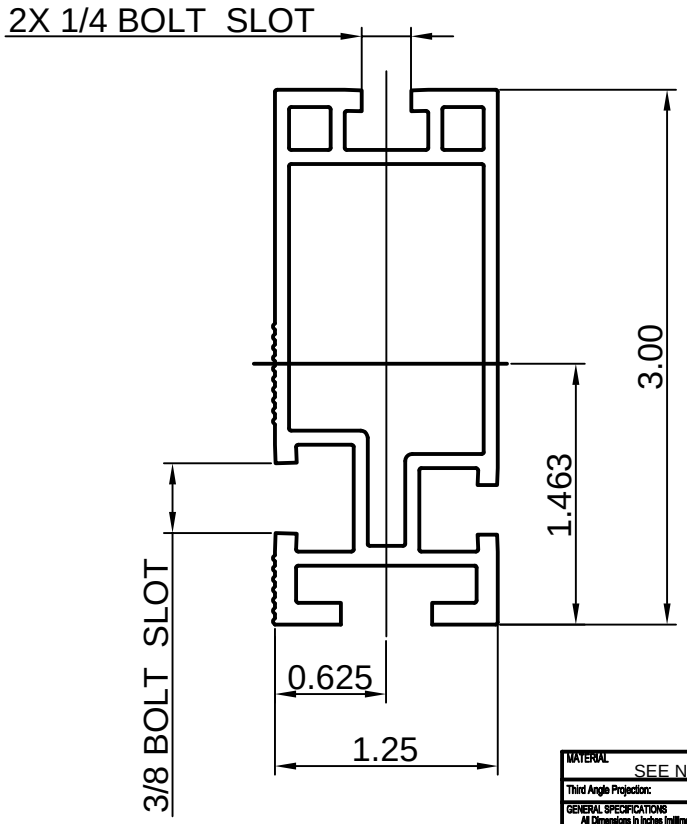
SunModo Corp.
14800 NE 65TH STREET, VANCOUVER WA 98682

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:

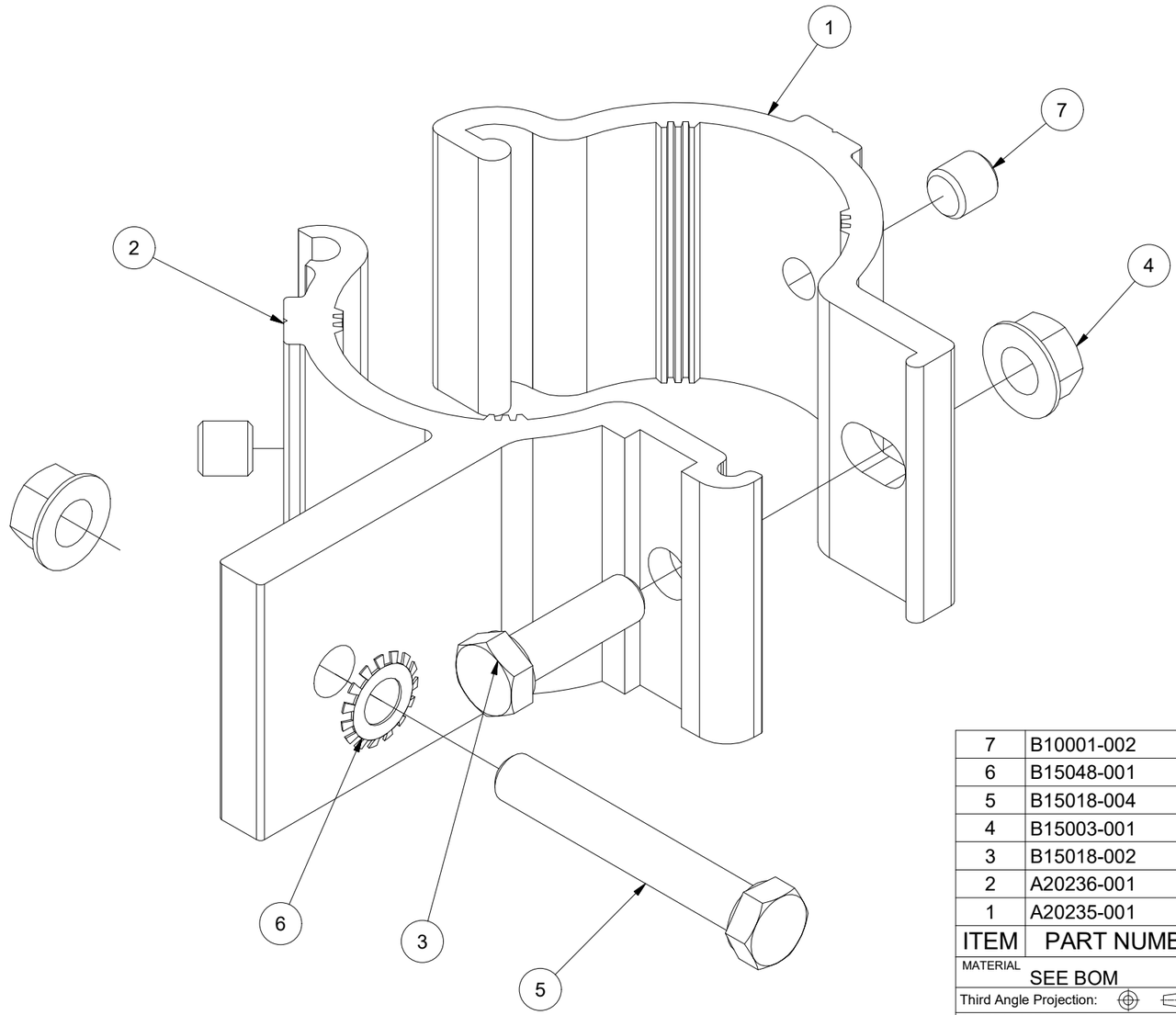
Weight: 1.151 lbs/ft
Area: 0.980 in^2
Perimeter: 22.104 in
Bounding Box: X: -0.625,0.625
Y: -1.463,1.537
Centroid:(0.000,0.000)
Moments of Inertia(in^4): Ix=1.047,Iy=0.207
Section modulus in bending(in^3): Wx=0.681,Wy=0.331
Radii of Gyration: X: 1.034, Y: 0.460

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.

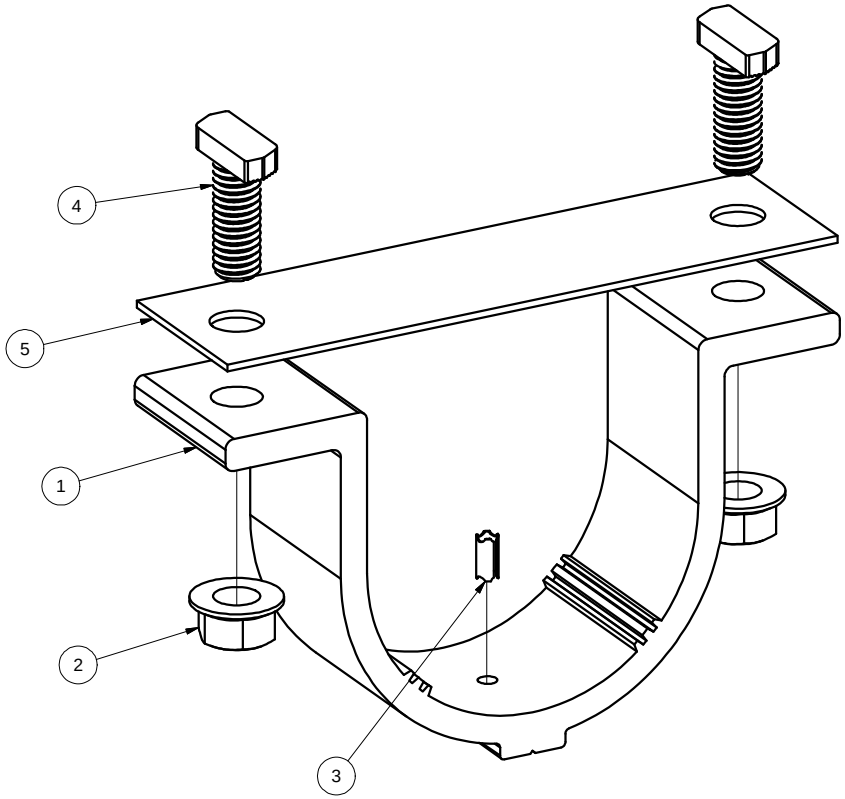
1905 E 5TH STREET, STE A, VANCOUVER, WA 98661

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.

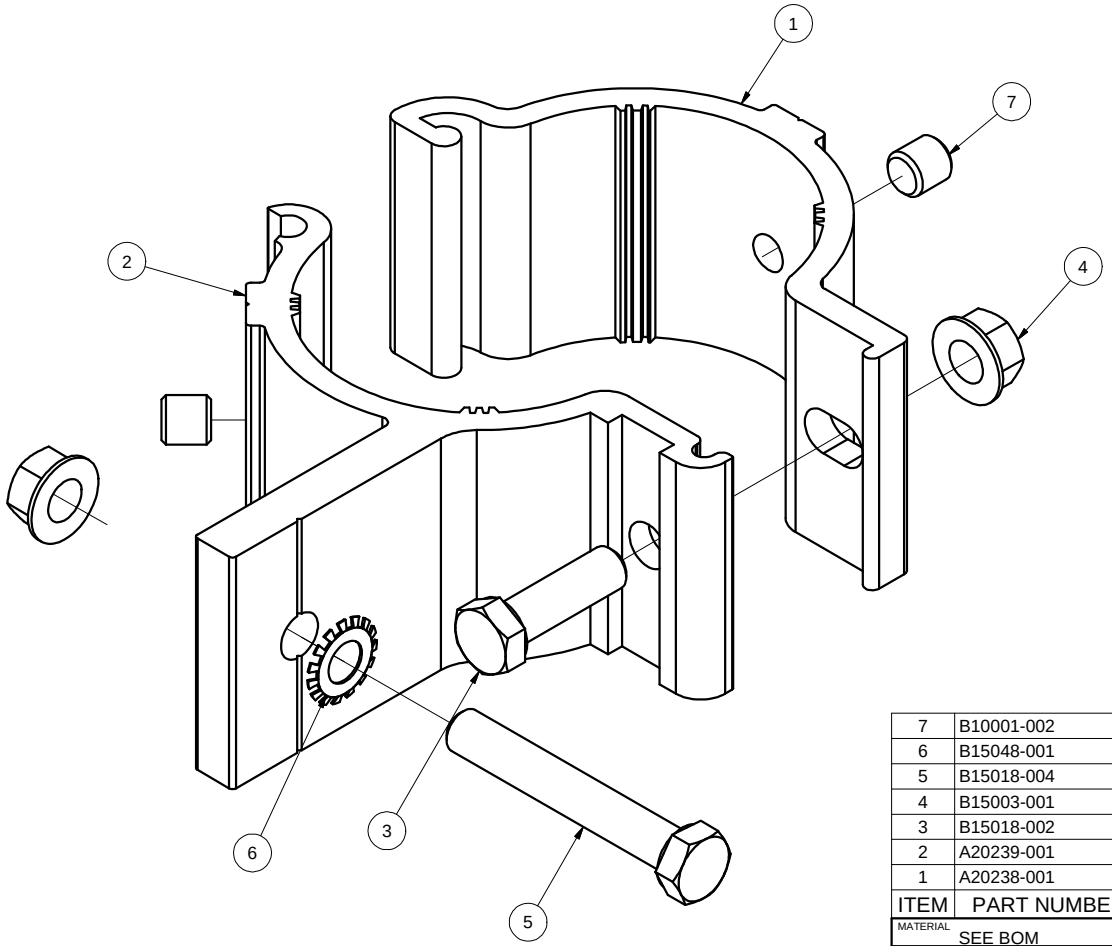
14800 NE 65TH STREET, VANCOUVER WA 98682

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

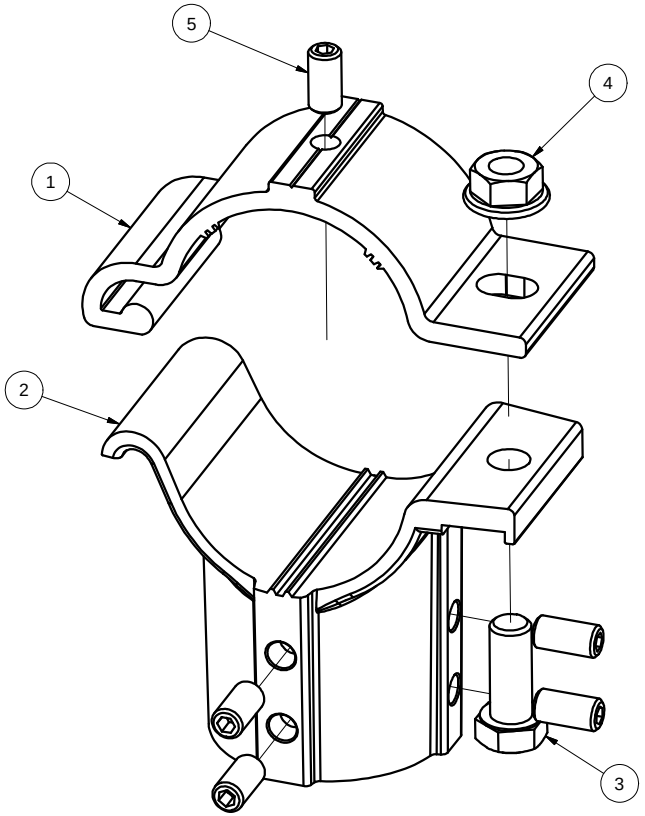
B

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.

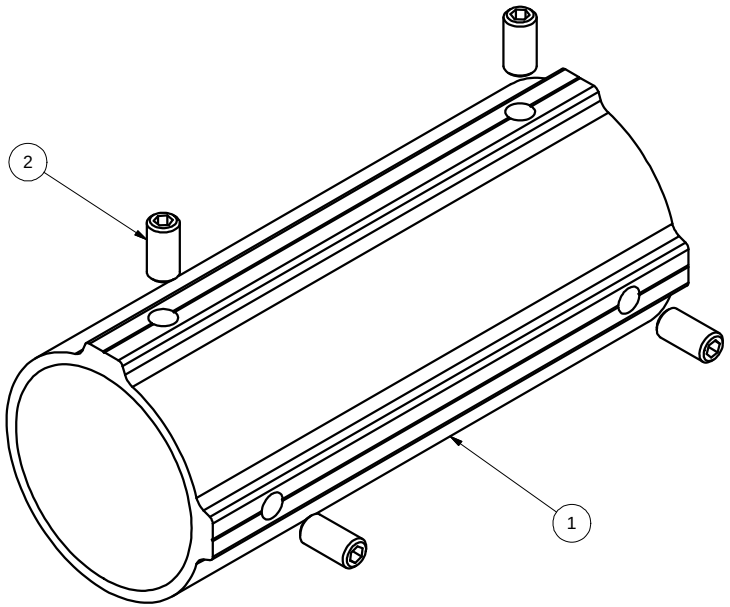
14800 NE 65TH STREET, VANCOUVER WA 98682

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

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].

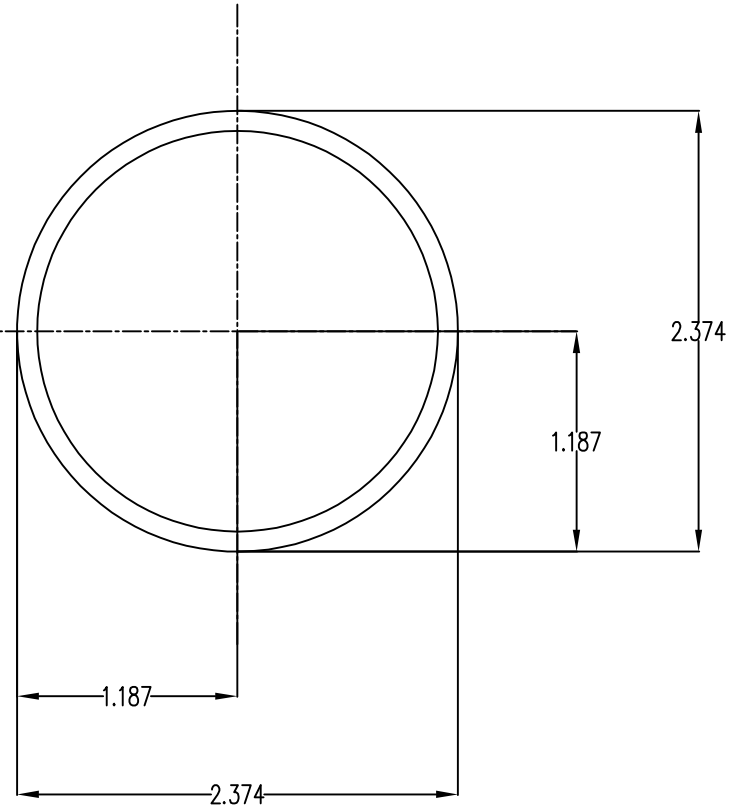
2. MATERAIL:HIGH STRENGTH STEEL PIPE OR TUBE.

3. FINISH: HOT DIP GALVANIZE PER ASTM A123 / A123M - 02.

   MINIMUM 50 KSI YIELD STRESS.

4. BREAK ALL BURRS AND SHARP EDGES.

5. ALL WELDING MUST BE IN COMPLIANCE WITH AWS CODE D1;1.



Section properties:

Weight: 2.641 lbs/ft
Area: 0.776 in^2
Perimeter: 14.238 in
Bounding Box: X: -1.187,1.187
Y: -1.187,1.187
Centroid:(0.000,0.000)
Moments of Inertia(in^4): Ix=0.499,Iy=0.499
Section modulus in bending(in^3): Wx=0.420,Wy=0.420
Radii of Gyration: X: 0.802, Y: 0.802

MATERIAL: SEE NOTES		**Sunmodo Corp.**	
Third Angle Projection:		14800 NE 65TH STREET, VANCOUVER WA 98682	
GENERAL SPECIFICATIONS All Dimensions in Inches [millimeters] Tolerances XXXX ±0.01 [0.25mm] XXX ±0.02 [0.50mm] XX ±0.039 [1.0mm] Unless otherwise spec'd	Break all sharp edges .010-.020 unless otherwise specified.	TITLE: PIPE, HSS, 2.375" OD X 12 GAUGE,L=XXX	
DRAWN BY: LWF	DATE: 04/03/2019	B	DRAWING NUMBER: A21165
CHECKED BY			
APPROVALS		SCALE: NONE	SHEET 1 of 1

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS SHOWN ARE INCHES [MILIMETERS].

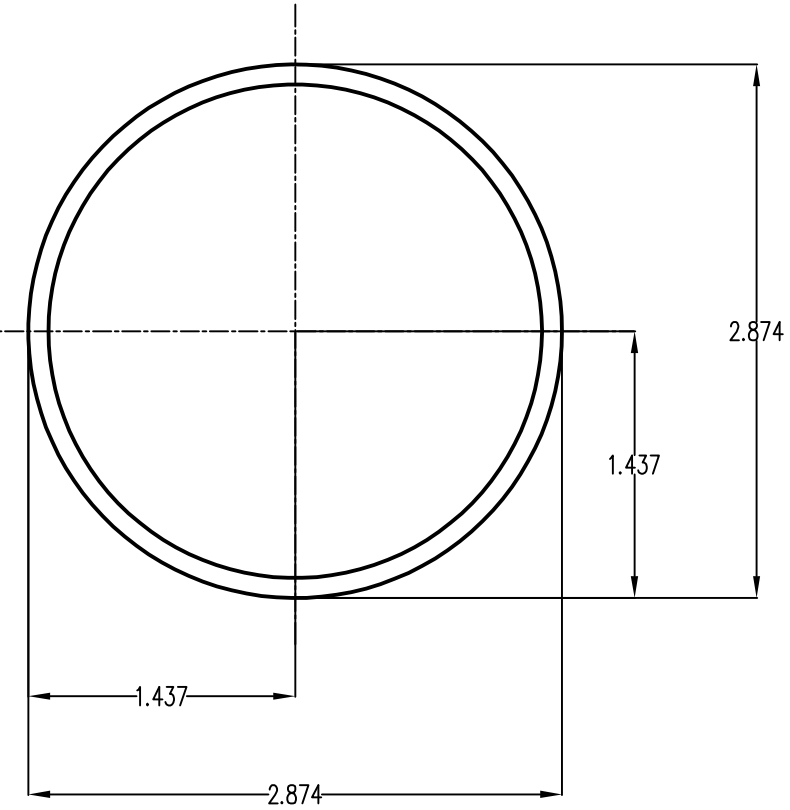
2. MATERAIL:HIGH STRENGTH STEEL PIPE OR TUBE.

3. FINISH: HOT DIP GALVANIZE PER ASTM A123 / A123M - 02.

   MINIMUM 50 KSI YIELD STRESS.

4. BREAK ALL BURRS AND SHARP EDGES.

5. ALL WELDING MUST BE IN COMPLIANCE WITH AWS CODE D1;1.



Section properties:

Weight: 3.201 lbs/ft
Area: 0.941 in^2
Perimeter: 17.378 in
Bounding Box: X: -1.437,1.437
Y: -1.437,1.437
Centroid:(0.000,0.000)
Moments of Inertia(in^4): Ix=0.901,Iy=0.901
Section modulus in bending(in^3): Wx=0.627,Wy=0.627
Radii of Gyration: X: 0.979, Y: 0.979

MATERIAL: SEE NOTES		**Sunmodo Corp.**	
Third Angle Projection:		14800 NE 65TH STREET, VANCOUVER WA 98682	
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: PIPE, HSS, 2.875" OD X 12 GAUGE,L=XXX	
DRAWN BY: LWF	DATE: 04/03/2019	B	DRAWING NUMBER: A21168
CHECKED BY			
APPROVALS		SCALE: NONE	SHEET 1 of 1