Project Number: U2716-0217-201

April 22, 2021

Sunmodo
14800 NE 65th Street
Vancouver, WA 98682

REFERENCE: Sunmodo Sunturf Ground Mount A7 (85x45)
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 2015 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 7-10)
- Design wind speed for risk category I structures: 110 mph
- Wind exposure: C
- Ground snow load: 50 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	3056	1.5	4584
LATERAL	2023	2	4046

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.

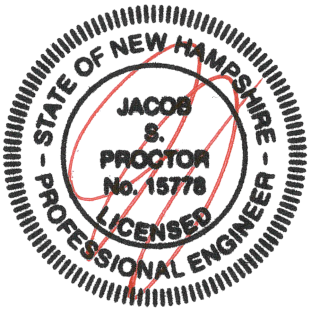
Very truly yours,

VECTOR STRUCTURAL ENGINEERING, LLC
NH Firm License: COA 01838

Jacob Proctor, P.E.
License: 15778 - Expires: 09/30/2021
Project Engineer

Enclosures

JSP/stb



04/22/2021

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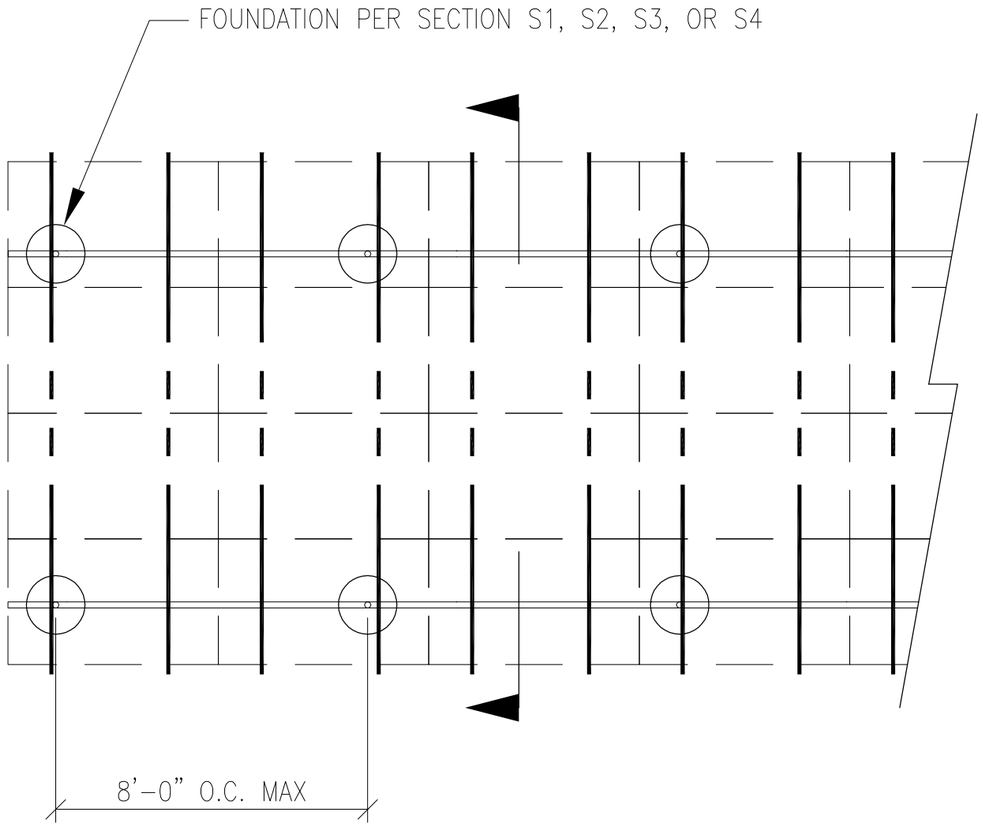
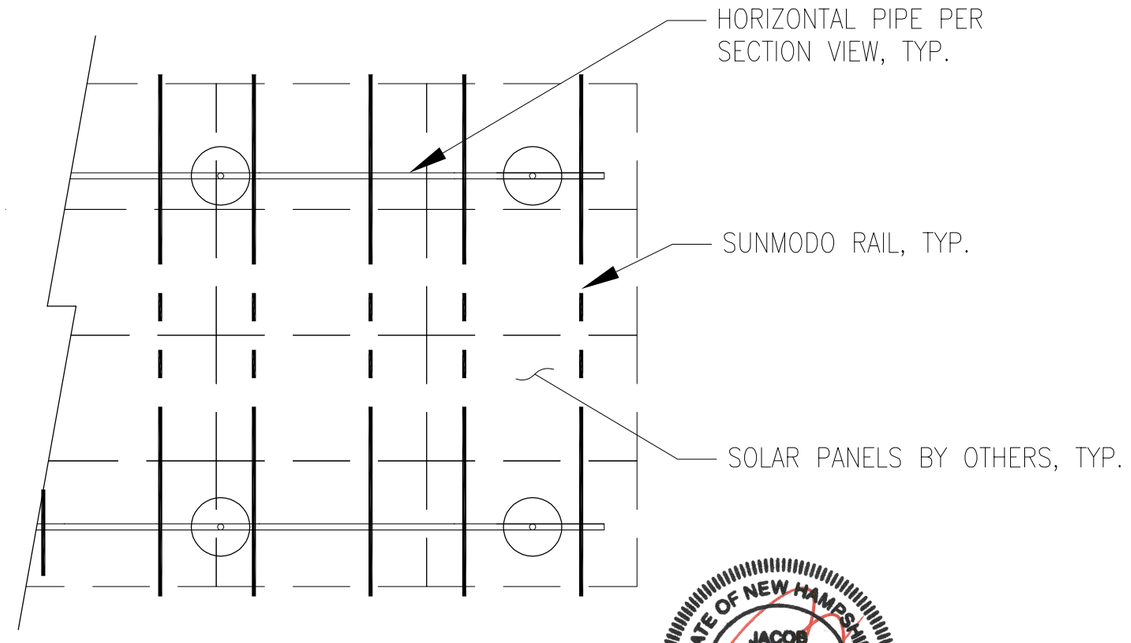
JOB NO. U2716-0217-201

PROJECT SUNMODO SUNTURF GROUND MOUNTS A7

SUBJECT ALL OPTIONS





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04/22/2021

PV ARRAY PLAN

N.T.S.

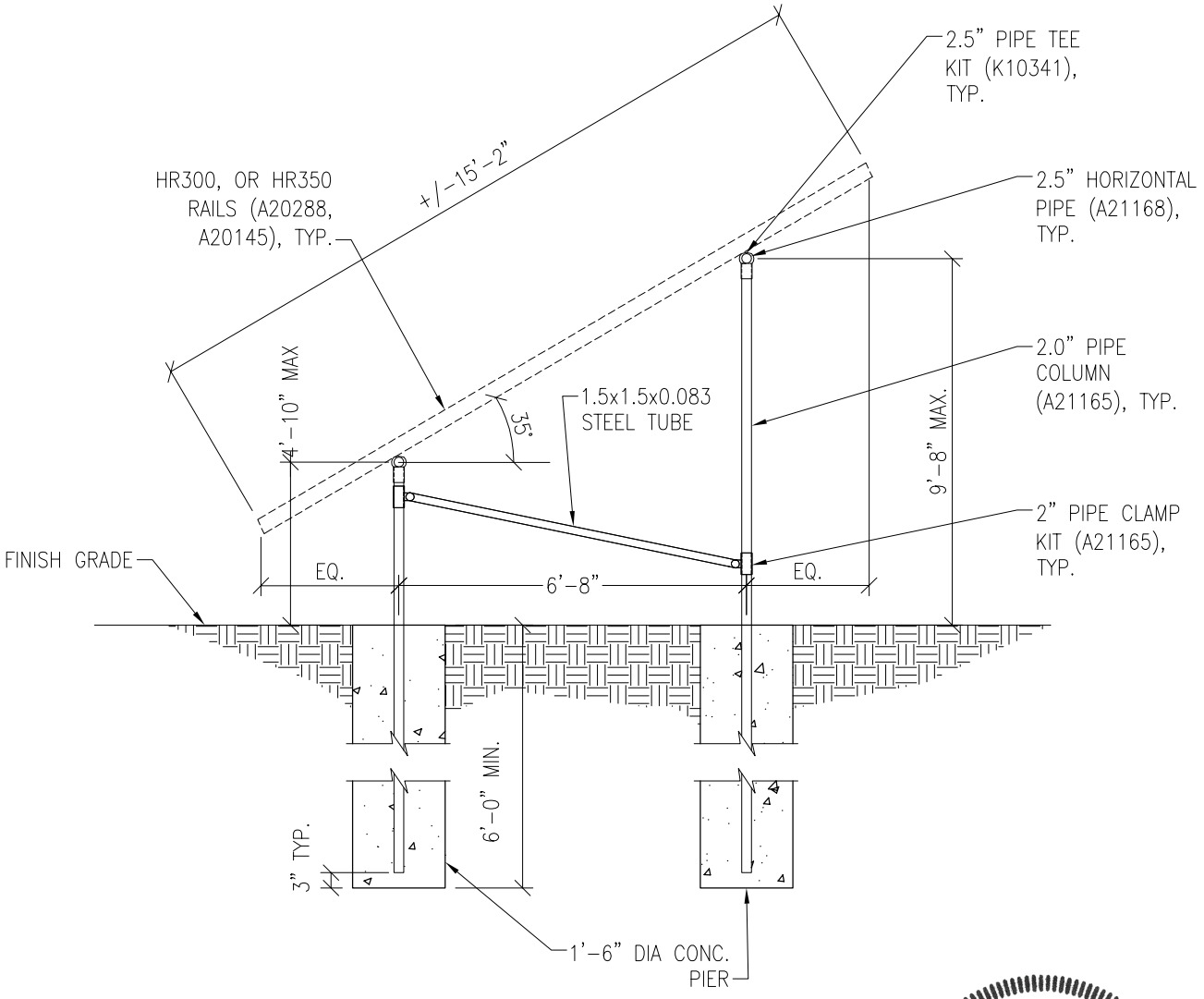
P1

VECTOR ENGINEERS

JOB NO. U2716-0217-201

PROJECT SUNMODO SUNTURF GROUND MOUNTS A7

SUBJECT DRILLED PIER OPTION



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STATE OF NEW HAMPSHIRE - JACOB S. PROCTOR No. 15778 LICENSED PROFESSIONAL ENGINEER -

PV ARRAY SECTION

N.T.S.

S1

04/22/2021

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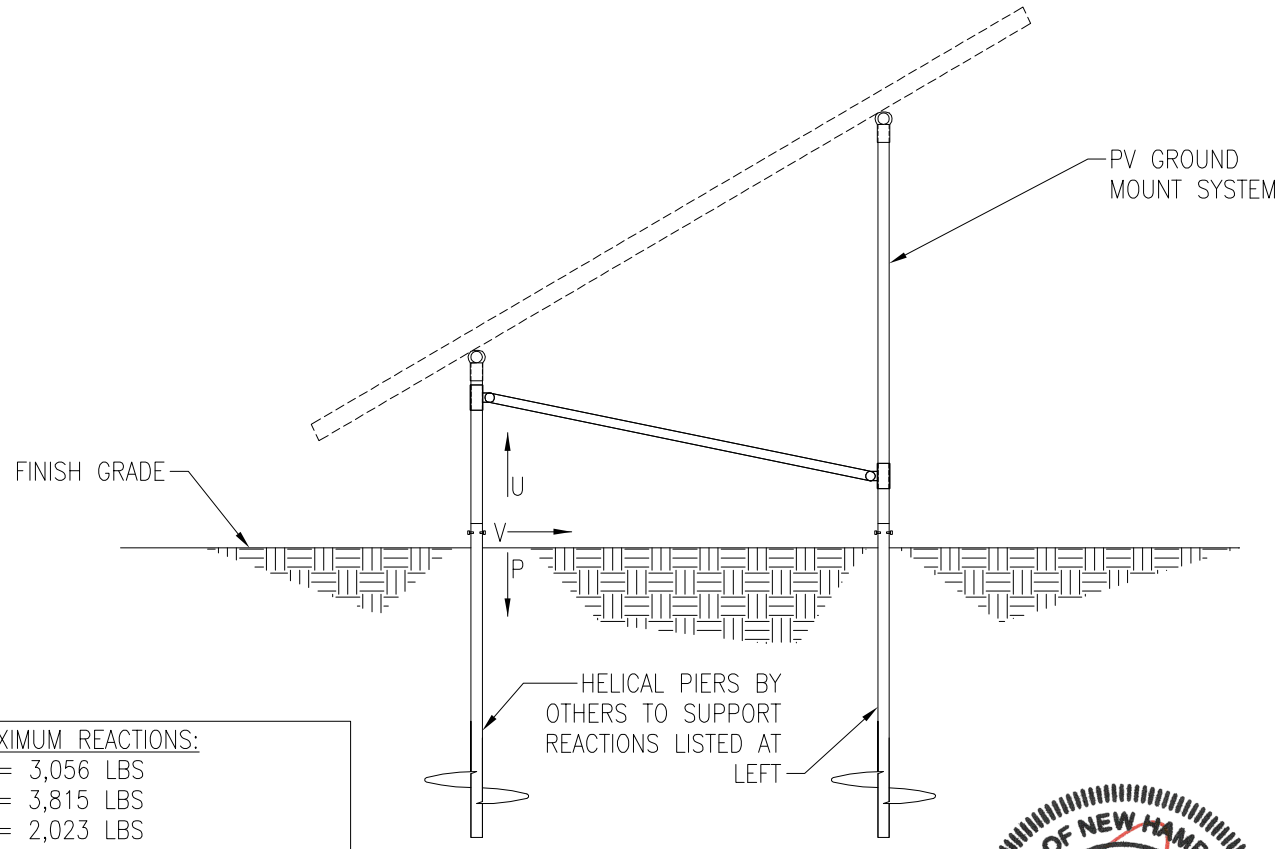
JOB NO. U2716-0217-201

PROJECT SUNMODO SUNTURF GROUND MOUNTS A7

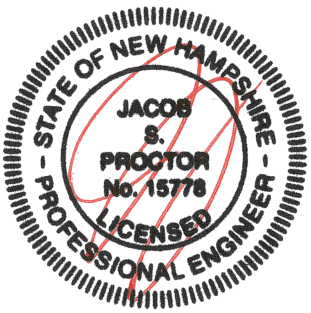
SUBJECT HELICAL PIER OPTION

NOTES:

1. For ground mount components see Section S1.
2. A minimum of (1) installed helical pier must be tested as follows:
   - 2.1. Safety factor for uplift to be 1.5
   - 2.2. S.F. for lateral loads to be 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 = 3,056 LBS
P = 3,815 LBS
V = 2,023 LBS



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PV ARRAY SECTION 04/22/2021

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S2

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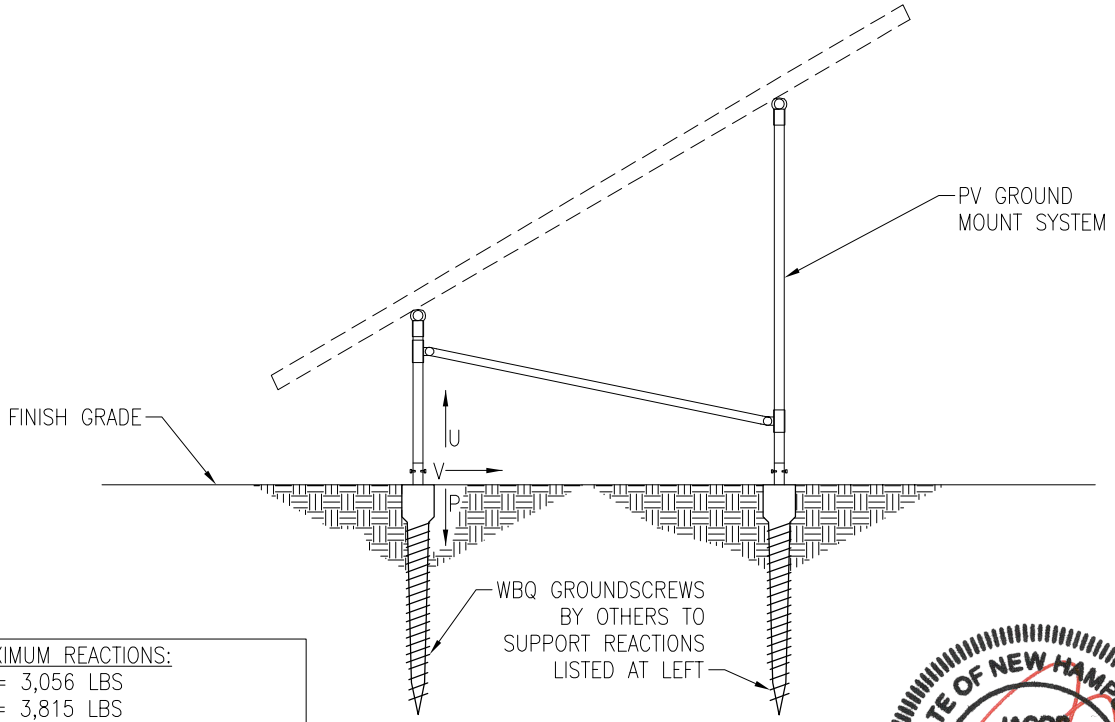
JOB NO. U2716-217-201

PROJECT SUNMODO SUNTURF GROUND MOUNTS A7

SUBJECT GROUND SCREW OPTION

NOTES:

1. For ground mount components see Section S1.
2. A minimum of (1) installed ground screw must be tested as follows:
   - 2.1. Safety factor for uplift to be 1.5
   - 2.2. S.F. for lateral loads to be 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 = 3,056 LBS
P = 3,815 LBS
V = 2,023 LBS

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

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PV ARRAY SECTION

N.T.S.

S3

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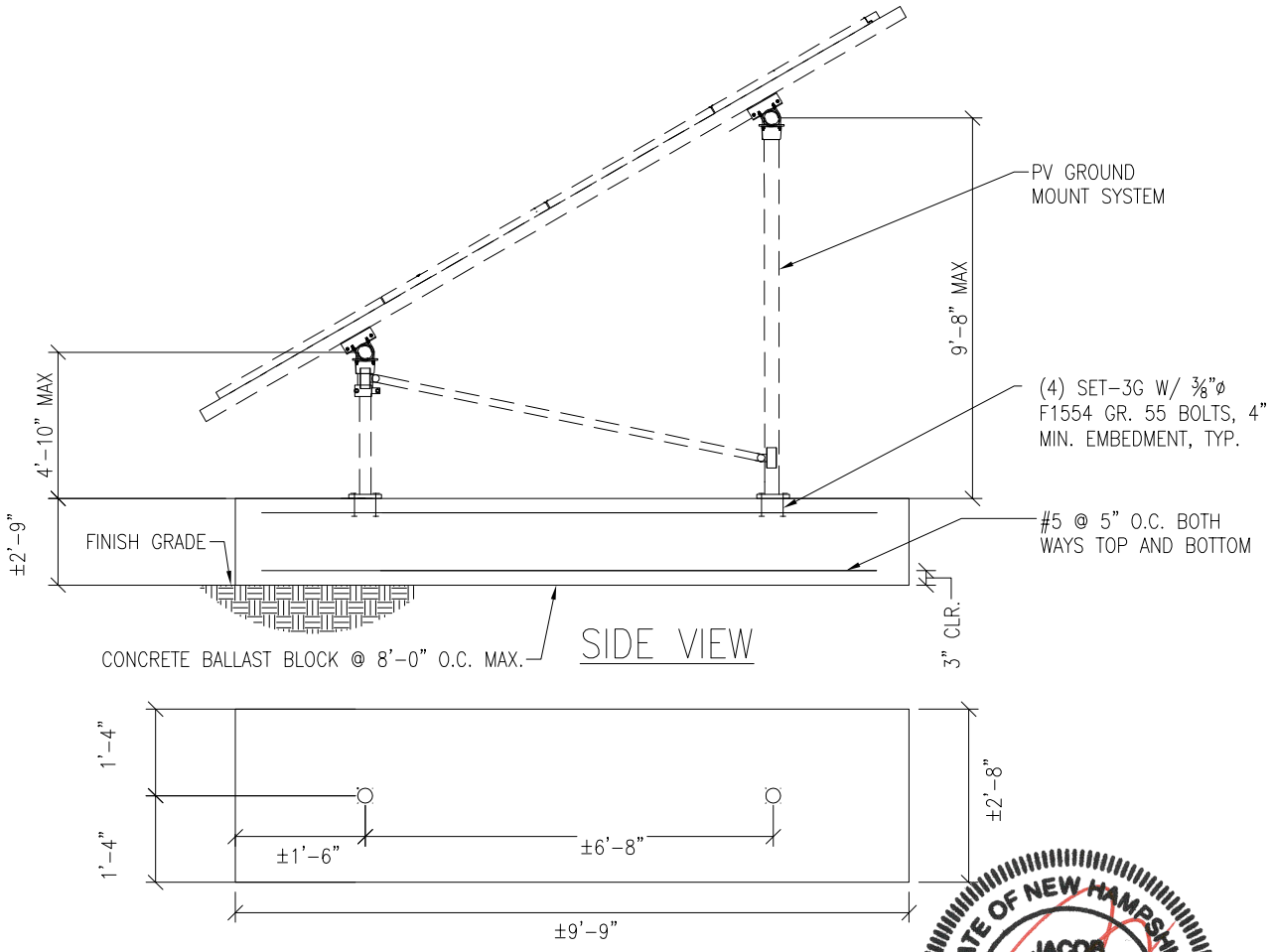
JOB NO. U2716-0217-201

PROJECT SUNMODO SUNTURF GROUND MOUNTS A7

SUBJECT BALLASTED BLOCK OPTION

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



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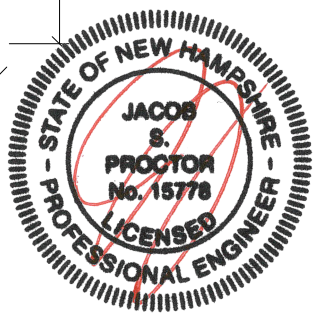

PV ARRAY SECTION 04/22/2021

N.T.S.

S4

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JOB NO.: U2716-0217-201 **DESIGNED:** STB
DATE: 06/25/20

PROJECT: A7 – 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]:	50.0	(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]:	30	(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]:	19	(Equation 7.4-1)
Design Snow Load, S [psf]:	19	

JOB NO.: U2716-0217-201 **DESIGNED:** STB
DATE: 06/25/20

PROJECT: A7 – Sunmodo Sunturf GM **SUBJECT:** Wind Pressure

Design Wind Load:

ASCE 7 Standard:	10	
Basic Wind Speed, V [mph]:	110	
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]:	22.4	(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)	-34.2	-34.2
Case 2 (γ = 0°, Load Case B)	-46.3	-10.8
Case 3 (γ = 180°, Load Case A)	39.9	41.2
Case 4 (γ = 180°, Load Case B)	50.7	20.3

JOB NO.: U2716-0217-201 **DESIGNED:** STB

Foundation Option 1: Drilled Concrete Pier

JOB NO.: U2716-0217-201
SUBJECT: CONC. PIER

PROJECT: A7 - Sunturf Ground Mount

DRILLED CONCRETE PIER DESIGN

Column Reactions:

Max. Shear, V [k]:	2.0	Max. Down, P_d [k]:	3.8
Max. Moment, M [k-ft]:	0.0	Max. Uplift, P_u [k]:	3.1

Pier Properties:

Pier Shape:	Round		
Pier Diameter, b [ft]:	1.5	Volume of Concrete [ft^3]:	11
Top of Pier Elevation [ft]:	0.00	Volume of Concrete [yd^3]:	0.4
Pier Depth, d [ft]:	6.0	Weight of Concrete [k]:	1.6

Soil Properties:

Allow. Bearing Pressure [psf]:	1,500	Optional Parameters for Uplift:	
1/3 increase for short term loads?	No		
		Skin Friction* [psf]:	250
Lateral Bearing, S [pcf]:	150	Top Length to Ignore [ft]:	0
Max. Lateral Bearing (opt'l) [psf]:		1/3 increase for short term loads?	No
Top Depth to Ignore [ft]:	0		
1/3 increase for short term loads?	No	Combine w/ Bearing:	No
1/2" deflection at t/o pier allowed:	Yes		

*per IBC Section 1810.3.3.1.4

Check Bearing:

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

Check Uplift:

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

Check Lateral Bearing:

Top of Pier Constrained?:	No	IBC Section1807.3.2.1
Applied Lateral Force, P [lb]:	2,023	
Point of Application, h [ft]:	0.0	
$S_{\_max}$ [psf]:		
S [psf]:	600	
A = 2.34*P/(Sb):	5.26	
Required Pier Depth, d_{reqd} [ft]:	5.30	IBC Eq. 18-1

Result: **Lateral bearing capacity OK.**

JOB NO.: U2716-0217-201 **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. A minimum of one ground screw or helical pier must be tested.

Load (ASD)	Value (lbs)	Factor of Safety	Test Value (lbs)
UPLIFT	3056	1.5	4584
LATERAL	2023	2	4046

JOB NO.: U2716-0217-201 **DESIGNED:** STB

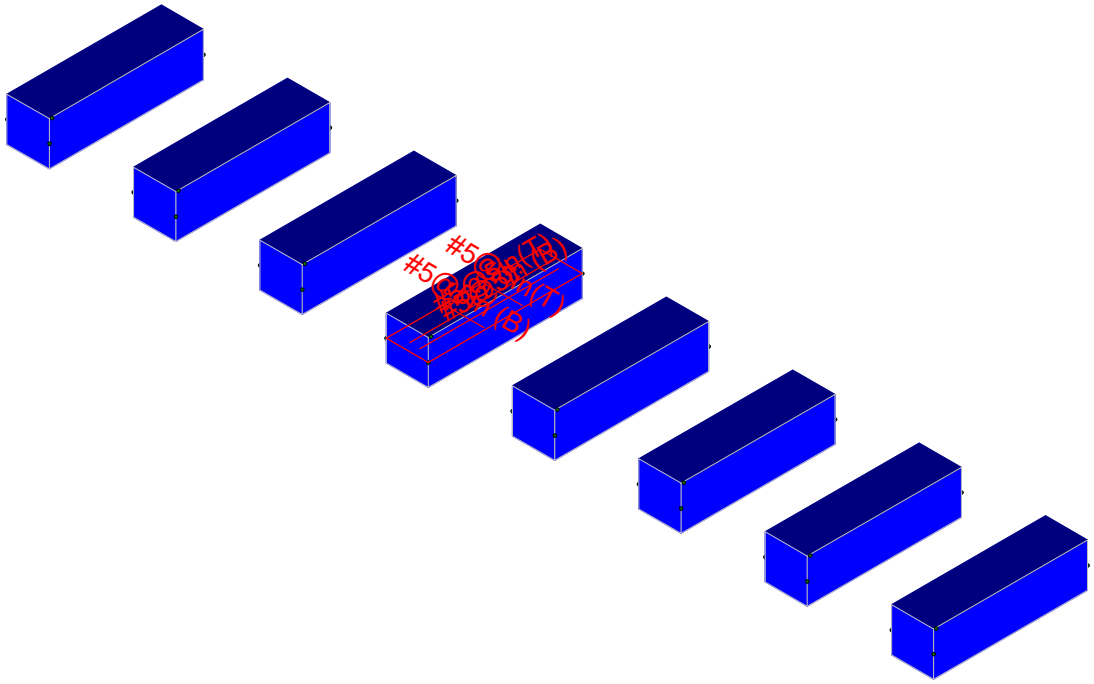
Foundation Option 3: Ground Screw

- 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. A minimum of one ground screw or helical pier must be tested.

Load (ASD)	Value (lbs)	Factor of Safety	Test Value (lbs)
UPLIFT	3056	1.5	4584
LATERAL	2023	2	4046

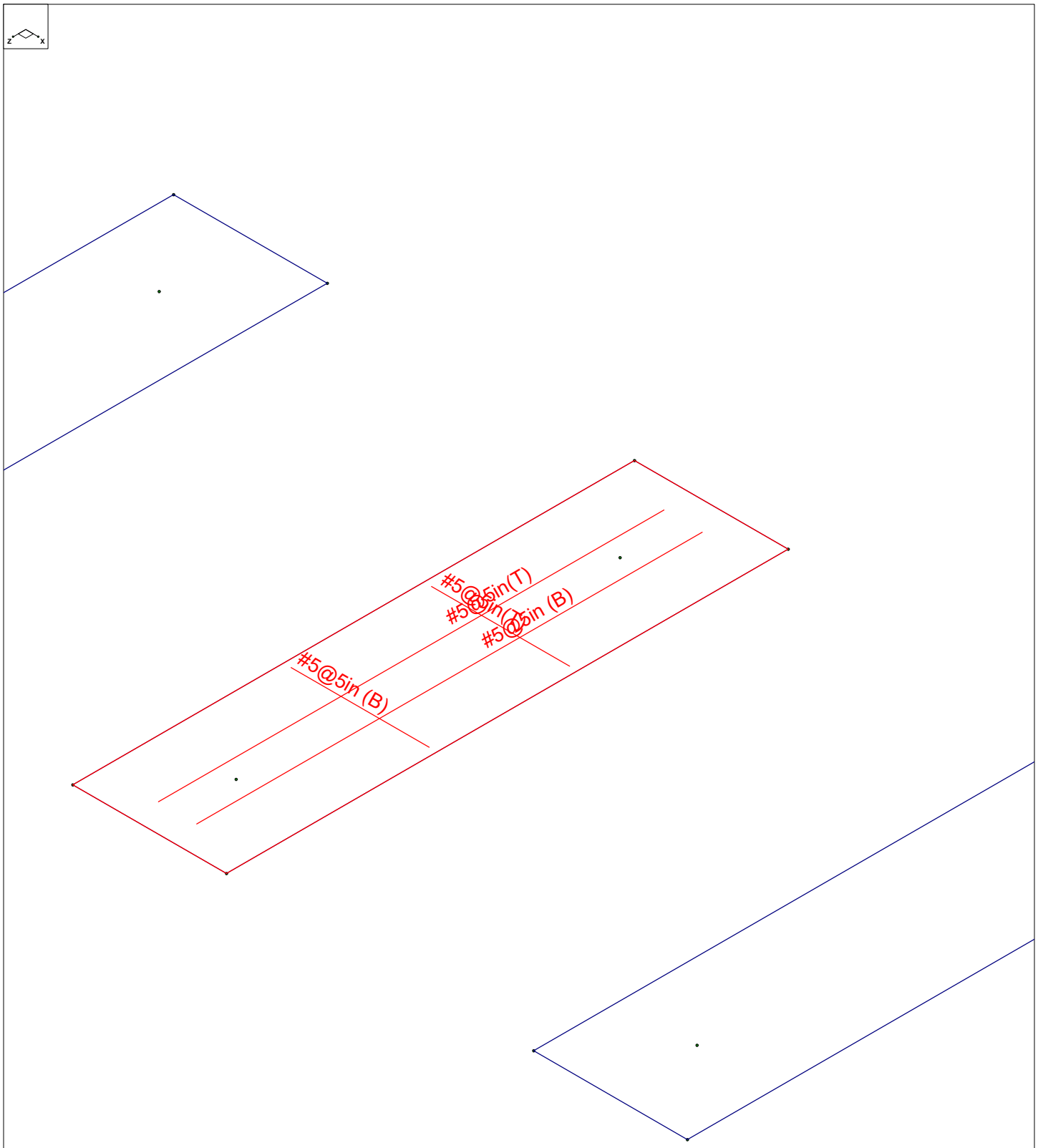
JOB NO.: U2716-0217-201 **DESIGNED:** STB

Foundation Option 4: Ballasted Block



Results for LC 2, 1.0 D

Vector Structural Engineeri...		SK - 2
STB	Ground Mount	Apr 6, 2021 at 10:50 AM
U2716.0219.201		Sunmodo Sunturf A7 v3 85x45.r3d



Results for LC 2, 1.0 D

Vector Structural Engineeri...	Ground Mount	SK - 1
STB		Apr 6, 2021 at 10:50 AM
U2716.0219.201		Sunmodo Sunturf A7 v3 85x45.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	0
Concrete Rebar Set	Rectangular
Concrete Code	ASTM A615
HR Steel Pile Code	ACI 318-14
Wood Pile Code	AISC 14th (360-10): ASD AWC NDS-15: ASD

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/...	Density[k/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	.11	3000	.75	60000	60000
5	Conc3500LW	2252	979	.15	.6	.11	3500	.75	60000	60000
6	Conc4000LW	2408	1047	.15	.6	.11	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	18	5	18	5	1	Optimize

Soil Definitions

	Label	Subgrade Modulus[k/ft^3]	Allowable Bearing[psf]	Depth Properties	Default?
1	Default	172.8	1500	None	Yes

Point Loads and Moments (Cat 1 : DL)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1_1	X	-8.369
2	R3D_N1_1	Y	153.254
3	R3D_N1_1	Z	1.179
4	R3D_N2_1	X	-11.628
5	R3D_N2_1	Y	120.698
6	R3D_N115	Y	255.869
7	R3D_N116	Y	235.09
8	R3D_N99	X	1.348

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

	Label	Direction	Magnitude[lb,lb-ft]
9	R3D_N99	Y	294.212
10	R3D_N99	Z	-2.415
11	R3D_N100	X	3.157
12	R3D_N100	Y	251.845
13	R3D_N105A	Y	255.891
14	R3D_N106A	Y	234.765
15	R3D_N111A_1	Y	263.32
16	R3D_N112A_1	Y	238.907
17	R3D_N117A_1	Y	263.298
18	R3D_N118A_1	Y	239.04
19	R3D_N123_1	X	-1.413
20	R3D_N123_1	Y	293.819
21	R3D_N123_1	Z	-2.465
22	R3D_N124_1	X	-3.294
23	R3D_N124_1	Y	251.679
24	R3D_N155	X	8.479
25	R3D_N155	Y	158.406
26	R3D_N155	Z	1.119
27	R3D_N156	X	11.497
28	R3D_N156	Y	125.155

Point Loads and Moments (Cat 6 : RLL)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1_1	X	-31.762
2	R3D_N1_1	Y	438.164
3	R3D_N1_1	Z	4.818
4	R3D_N2_1	X	-48.023
5	R3D_N2_1	Y	415.874
6	R3D_N115	X	-1.034
7	R3D_N115	Y	940.77
8	R3D_N115	Z	3.439
9	R3D_N116	X	-3.401
10	R3D_N116	Y	895.756
11	R3D_N99	X	4.861
12	R3D_N99	Y	1058.007
13	R3D_N99	Z	-9.91
14	R3D_N100	X	13.223
15	R3D_N100	Y	968.632
16	R3D_N105A	Y	940.89
17	R3D_N105A	Z	2.765
18	R3D_N106A	X	3.511
19	R3D_N106A	Y	894.319
20	R3D_N111A_1	X	1.204
21	R3D_N111A_1	Y	966.504
22	R3D_N111A_1	Z	2.11
23	R3D_N112A_1	X	3.372
24	R3D_N112A_1	Y	912.607
25	R3D_N117A_1	Y	966.461
26	R3D_N117A_1	Z	2.352
27	R3D_N118A_1	X	-2.554
28	R3D_N118A_1	Y	913.188
29	R3D_N123_1	X	-5.172
30	R3D_N123_1	Y	1056.684
31	R3D_N123_1	Z	-10.149
32	R3D_N124_1	X	-13.937
33	R3D_N124_1	Y	967.947

Point Loads and Moments (Cat 6 : RLL) (Continued)

	Label	Direction	Magnitude[lb,lb-ft]
34	R3D_N155	X	32.219
35	R3D_N155	Y	459.709
36	R3D_N155	Z	4.58
37	R3D_N156	X	47.479
38	R3D_N156	Y	434.419

Point Loads and Moments (Cat 16 : OL1)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1_1	X	46.803
2	R3D_N1_1	Y	-1886.665
3	R3D_N1_1	Z	1077.52
4	R3D_N2_1	X	62.535
5	R3D_N2_1	Y	379.936
6	R3D_N2_1	Z	-96.496
7	R3D_N115	X	4.023
8	R3D_N115	Y	-4248.758
9	R3D_N115	Z	2451.971
10	R3D_N116	X	-3.769
11	R3D_N116	Y	949.726
12	R3D_N116	Z	-159.296
13	R3D_N99	X	-8.606
14	R3D_N99	Y	-4870.648
15	R3D_N99	Z	2840.625
16	R3D_N100	X	-30.486
17	R3D_N100	Y	1182.726
18	R3D_N100	Z	-156.941
19	R3D_N105A	X	-3.799
20	R3D_N105A	Y	-4251.172
21	R3D_N105A	Z	2454.9
22	R3D_N106A	X	4.24
23	R3D_N106A	Y	953.92
24	R3D_N106A	Z	-159.78
25	R3D_N111A_1	X	-3.858
26	R3D_N111A_1	Y	-4358.676
27	R3D_N111A_1	Z	2513.955
28	R3D_N112A_1	X	1.346
29	R3D_N112A_1	Y	978.807
30	R3D_N112A_1	Z	-160.262
31	R3D_N117A_1	X	2.971
32	R3D_N117A_1	Y	-4357.21
33	R3D_N117A_1	Z	2512.212
34	R3D_N118A_1	Y	976.911
35	R3D_N118A_1	Z	-160.066
36	R3D_N123_1	X	9.71
37	R3D_N123_1	Y	-4864.371
38	R3D_N123_1	Z	2838.993
39	R3D_N124_1	X	30.73
40	R3D_N124_1	Y	1182.303
41	R3D_N124_1	Z	-157.956
42	R3D_N155	X	-48.116
43	R3D_N155	Y	-1985.065
44	R3D_N155	Z	1133.226
45	R3D_N156	X	-64.257
46	R3D_N156	Y	404.225
47	R3D_N156	Z	-99.185

Point Loads and Moments (Cat 17 : OL2)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1_1	X	62.856
2	R3D_N1_1	Y	-2098.555
3	R3D_N1_1	Z	898.287
4	R3D_N2_1	X	-3.794
5	R3D_N2_1	Y	843.195
6	R3D_N2_1	Z	-80.362
7	R3D_N115	X	5.005
8	R3D_N115	Y	-4733.341
9	R3D_N115	Z	2057.154
10	R3D_N116	X	-10.017
11	R3D_N116	Y	1974.208
12	R3D_N116	Z	-133.563
13	R3D_N99	X	-11.517
14	R3D_N99	Y	-5410.174
15	R3D_N99	Z	2385.062
16	R3D_N100	X	-14.033
17	R3D_N100	Y	2308.797
18	R3D_N100	Z	-132.124
19	R3D_N105A	X	-4.705
20	R3D_N105A	Y	-4736.619
21	R3D_N105A	Z	2061.134
22	R3D_N106A	X	10.874
23	R3D_N106A	Y	1978.805
24	R3D_N106A	Z	-134.148
25	R3D_N111A_1	X	-4.984
26	R3D_N111A_1	Y	-4850.851
27	R3D_N111A_1	Z	2100.54
28	R3D_N112A_1	X	7.854
29	R3D_N112A_1	Y	2020.098
30	R3D_N112A_1	Z	-133.81
31	R3D_N117A_1	X	3.878
32	R3D_N117A_1	Y	-4849.158
33	R3D_N117A_1	Z	2098.328
34	R3D_N118A_1	X	-3.974
35	R3D_N118A_1	Y	2018.263
36	R3D_N118A_1	Z	-133.564
37	R3D_N123_1	X	12.938
38	R3D_N123_1	Y	-5403.971
39	R3D_N123_1	Z	2384.324
40	R3D_N124_1	X	13.057
41	R3D_N124_1	Y	2309.349
42	R3D_N124_1	Z	-133.098
43	R3D_N155	X	-64.44
44	R3D_N155	Y	-2207.854
45	R3D_N155	Z	945.35
46	R3D_N156	X	1.004
47	R3D_N156	Y	888.925
48	R3D_N156	Z	-82.64

Point Loads and Moments (Cat 18 : OL3)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1_1	X	-56.364
2	R3D_N1_1	Y	2256.14
3	R3D_N1_1	Z	-1277.541
4	R3D_N2_1	X	-72.095
5	R3D_N2_1	Y	-469.743

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

	Label	Direction	Magnitude[lb,lb-ft]
6	R3D_N2_1	Z	114.406
7	R3D_N115	X	-4.83
8	R3D_N115	Y	5081.085
9	R3D_N115	Z	-2907.61
10	R3D_N116	X	4.72
11	R3D_N116	Y	-1169.326
12	R3D_N116	Z	188.895
13	R3D_N99	X	10.362
14	R3D_N99	Y	5824.217
15	R3D_N99	Z	-3368.553
16	R3D_N100	X	35.729
17	R3D_N100	Y	-1450.717
18	R3D_N100	Z	186.122
19	R3D_N105A	X	4.56
20	R3D_N105A	Y	5083.993
21	R3D_N105A	Z	-2911.139
22	R3D_N106A	X	-5.296
23	R3D_N106A	Y	-1174.339
24	R3D_N106A	Z	189.475
25	R3D_N111A_1	X	4.639
26	R3D_N111A_1	Y	5212.354
27	R3D_N111A_1	Z	-2980.797
28	R3D_N112A_1	X	-1.842
29	R3D_N112A_1	Y	-1204.598
30	R3D_N112A_1	Z	190.02
31	R3D_N117A_1	X	-3.574
32	R3D_N117A_1	Y	5210.599
33	R3D_N117A_1	Z	-2978.703
34	R3D_N118A_1	Y	-1202.341
35	R3D_N118A_1	Z	189.784
36	R3D_N123_1	X	-11.69
37	R3D_N123_1	Y	5816.739
38	R3D_N123_1	Z	-3366.641
39	R3D_N124_1	X	-35.974
40	R3D_N124_1	Y	-1450.249
41	R3D_N124_1	Z	187.329
42	R3D_N155	X	57.939
43	R3D_N155	Y	2373.805
44	R3D_N155	Z	-1343.611
45	R3D_N156	X	74.186
46	R3D_N156	Y	-499.473
47	R3D_N156	Z	117.595

Point Loads and Moments (Cat 19 : OL4)

	Label	Direction	Magnitude[lb,lb-ft]
1	R3D_N1_1	X	-28.214
2	R3D_N1_1	Y	1510.023
3	R3D_N1_1	Z	-1119.525
4	R3D_N2_1	X	-112.865
5	R3D_N2_1	Y	56.077
6	R3D_N2_1	Z	100.33
7	R3D_N115	X	-2.766
8	R3D_N115	Y	3394.217
9	R3D_N115	Z	-2536.389
10	R3D_N116	X	-1.971
11	R3D_N116	Y	25.835

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

	Label	Direction	Magnitude[lb,lb-ft]
12	R3D_N116	Z	164.852
13	R3D_N99	X	5.222
14	R3D_N99	Y	3904.718
15	R3D_N99	Z	-2936.851
16	R3D_N100	X	41.422
17	R3D_N100	Y	-96.064
18	R3D_N100	Z	161.956
19	R3D_N105A	X	2.63
20	R3D_N105A	Y	3395.642
21	R3D_N105A	Z	-2538.114
22	R3D_N106A	X	1.879
23	R3D_N106A	Y	22.419
24	R3D_N106A	Z	165.199
25	R3D_N111A_1	X	2.495
26	R3D_N111A_1	Y	3486.261
27	R3D_N111A_1	Z	-2607.885
28	R3D_N112A_1	X	4.367
29	R3D_N112A_1	Y	14.156
30	R3D_N112A_1	Z	166.334
31	R3D_N117A_1	X	-1.887
32	R3D_N117A_1	Y	3485.142
33	R3D_N117A_1	Z	-2606.725
34	R3D_N118A_1	X	-4.338
35	R3D_N118A_1	Y	15.908
36	R3D_N118A_1	Z	166.2
37	R3D_N123_1	X	-5.942
38	R3D_N123_1	Y	3899.026
39	R3D_N123_1	Z	-2934.623
40	R3D_N124_1	X	-42.684
41	R3D_N124_1	Y	-94.851
42	R3D_N124_1	Z	162.9
43	R3D_N155	X	29.159
44	R3D_N155	Y	1588.909
45	R3D_N155	Z	-1176.869
46	R3D_N156	X	113.493
47	R3D_N156	Y	52.663
48	R3D_N156	Z	103.091

Slabs

	Label	Thickness [in]	Material	Local Axis Angle ...	Analysis Offset [in]	Passive Pressur...	Soil Overburden [psf]
1	S1	33	Conc2500NW	0	0	0	0
2	S2	33	Conc2500NW	0	0	0	0
3	S3	33	Conc2500NW	0	0	0	0
4	S4	33	Conc2500NW	0	0	0	0
5	S5	33	Conc2500NW	0	0	0	0
6	S6	33	Conc2500NW	0	0	0	0
7	S7	33	Conc2500NW	0	0	0	0
8	S8	33	Conc2500NW	0	0	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	ASD Loads																								
2	1.0 D	Yes	Yes		1.5	DL	1																		
3	1.0 D + 1....	Yes	Yes		1.5	DL	1	RLL	1																
4	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL1	.6														
5	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL2	.6														

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...
6	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL3	.6														
7	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL		OL4	.6														
8	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL1	.45														
9	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL2	.45														
10	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL3	.45														
11	1.0 D + 0....	Yes	Yes		1.5	DL	1	RLL	.75	OL4	.45														
12	0.9 D + 0....	Yes	Yes			DL	.9	RLL		OL1	.6														
13	0.9 D + 0....	Yes	Yes			DL	.9	RLL		OL2	.6														
14	0.9 D + 0....	Yes	Yes			DL	.9	RLL		OL3	.6														
15	0.9 D + 0....	Yes	Yes			DL	.9	RLL		OL4	.6														
16																									
17	LRFD Loa...																								
18	1.4 D	Yes				DL	1.4	RLL																	
19	1.2 D + 1....	Yes				DL	1.2	RLL	1.6	OL1	.5														
20	1.2 D + 1....	Yes				DL	1.2	RLL	1.6	OL2	.5														
21	1.2 D + 1....	Yes				DL	1.2	RLL	1.6	OL3	.5														
22	1.2 D + 1....	Yes				DL	1.2	RLL	1.6	OL4	.5														
23	1.2 D + 1....	Yes				DL	1.2	RLL		OL1	1														
24	1.2 D + 1....	Yes				DL	1.2	RLL		OL2	1														
25	1.2 D + 1....	Yes				DL	1.2	RLL		OL3	1														
26	1.2 D + 1....	Yes				DL	1.2	RLL		OL4	1														
27	1.0 D + 1....	Yes				DL	1	RLL		OL1	1														
28	1.0 D + 1....	Yes				DL	1	RLL		OL2	1														
29	1.0 D + 1....	Yes				DL	1	RLL		OL3	1														
30	1.0 D + 1....	Yes				DL	1	RLL		OL4	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	28		
2	RLL	38		
3	OL1	47		
4	OL2	48		
5	OL3	47		
6	OL4	48		

Strip Reinforcing

	Label	UC Top	LC	Top Bars	Governing ...	UC Bot	LC	Bot B...	Gover...	UC Shear	LC	Governing De...
1	DS1	.009	21	#5@5in	DS1-X26	.009	28	#5@5in	DS1-...	.028	28	DS1-X15
2	DS2	0	27	#5@5in	DS2-X25	.002	21	#5@5in	DS2-...	.005	21	DS2-X25

Slab Overturning Safety Factors (By Combination)

	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	2	S1	0	0	51783.389	0	14243.621	9.999+	9.999+
2	2	S2	0	0	53078.651	0	14539.045	9.999+	9.999+
3	2	S3	0	0	52883.704	0	14477.565	9.999+	9.999+
4	2	S4	0	0	52929.637	0	14492.992	9.999+	9.999+
5	2	S5	0	0	52930.704	0	14493.141	9.999+	9.999+
6	2	S6	0	0	52886.35	0	14477.969	9.999+	9.999+
7	2	S7	0	0	53076.518	0	14563.633	9.999+	9.999+
8	2	S8	0	0	51828.15	0	14146.507	9.999+	9.999+

Slab Overturning Safety Factors (By Combination) (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
9	3	S1	0	0	55921.357	0	15601.748	9.999+	9.999+
10	3	S2	0	0	62717.779	0	17191.5	9.999+	9.999+
11	3	S3	0	0	61759.172	0	16914.853	9.999+	9.999+
12	3	S4	0	0	61994.736	0	16985.888	9.999+	9.999+
13	3	S5	0	0	62001.194	0	17006.364	9.999+	9.999+
14	3	S6	0	0	61775.338	0	16938.866	9.999+	9.999+
15	3	S7	0	0	62707.243	0	17315.691	9.999+	9.999+
16	3	S8	0	0	56152.569	0	15119.508	9.999+	9.999+
17	4	S1	0	10521.426	51971.124	1385.791	14243.621	4.94	9.999+
18	4	S2	0	27229.847	53328.884	3014.84	14563.821	1.958	4.831
19	4	S3	0	23759.203	52983.67	2638.53	14477.565	2.23	5.487
20	4	S4	0	24360.22	53050.55	2708.04	14492.992	2.178	5.352
21	4	S5	0	24352.194	53050.574	2709.142	14493.141	2.178	5.35
22	4	S6	0	23747.116	52983.98	2639.645	14477.969	2.231	5.485
23	4	S7	0	27195.101	53325.568	3012.38	14563.633	1.961	4.835
24	4	S8	0	11069.206	52020.048	1450.087	14256.37	4.7	9.831
25	5	S1	0	10873.638	51971.124	1101.742	14243.621	4.78	9.999+
26	5	S2	0	28149.319	53328.884	2523.259	14563.821	1.894	5.772
27	5	S3	0	24608.068	52983.67	2216.43	14477.565	2.153	6.532
28	5	S4	0	25196.223	53050.55	2269.338	14492.992	2.105	6.386
29	5	S5	0	25186.334	53050.574	2264.875	14493.141	2.106	6.399
30	5	S6	0	24590.544	52983.98	2215.577	14477.969	2.155	6.535
31	5	S7	0	28115.605	53325.568	2518.589	14563.633	1.897	5.782
32	5	S8	0	11441.942	52020.048	1159.814	14256.37	4.546	9.999+
33	6	S1	0	2101.072	51783.389	0	15884.698	9.999+	9.999+
34	6	S2	0	6899.065	53078.651	0	17961.795	7.694	9.999+
35	6	S3	0	5473.942	52883.704	0	17606.503	9.661	9.999+
36	6	S4	0	5615.818	52929.637	0	17694.582	9.425	9.999+
37	6	S5	0	5603.244	52930.704	0	17705.645	9.446	9.999+
38	6	S6	0	5447.023	52886.35	0	17607.557	9.709	9.999+
39	6	S7	0	6898.707	53076.518	0	18135.471	7.694	9.999+
40	6	S8	0	2240.21	51828.15	0	15427.966	9.999+	9.999+
41	7	S1	0	0	51813.818	0	15729.282	9.999+	9.999+
42	7	S2	0	1344.62	53078.651	0	17509.006	9.999+	9.999+
43	7	S3	0	578.487	52883.704	0	17204.575	9.999+	9.999+
44	7	S4	0	646.546	52929.637	0	17282.005	9.999+	9.999+
45	7	S5	0	637.244	52930.704	0	17304.254	9.999+	9.999+
46	7	S6	0	560.653	52886.35	0	17221.828	9.999+	9.999+
47	7	S7	0	1338.787	53076.518	0	17687.207	9.999+	9.999+
48	7	S8	0	1.592	51828.15	0	15224.388	9.999+	9.999+
49	8	S1	0	7891.069	55112.811	1039.344	15262.217	6.984	9.999+
50	8	S2	0	20422.385	60919.361	2261.13	16627.758	2.983	7.354
51	8	S3	0	17819.403	59747.052	1978.898	16305.531	3.353	8.24
52	8	S4	0	18270.165	59992.743	2031.03	16381.541	3.284	8.066
53	8	S5	0	18264.145	59992.664	2031.856	16378.058	3.285	8.061
54	8	S6	0	17810.337	59746.86	1979.105	16305.349	3.355	8.239
55	8	S7	0	20396.326	60907.659	2259.285	16627.677	2.986	7.36
56	8	S8	0	8301.905	55315.055	1087.565	15314.875	6.663	9.999+
57	9	S1	0	8155.229	55112.811	826.307	15262.217	6.758	9.999+
58	9	S2	0	21111.989	60919.361	1892.444	16627.758	2.886	8.786
59	9	S3	0	18456.051	59747.052	1662.323	16305.531	3.237	9.809
60	9	S4	0	18897.168	59992.743	1702.004	16362.664	3.175	9.614
61	9	S5	0	18889.75	59992.664	1698.656	16367.523	3.176	9.636
62	9	S6	0	18442.908	59746.86	1661.682	16305.349	3.24	9.813
63	9	S7	0	21086.703	60907.659	1888.942	16627.677	2.888	8.803
64	9	S8	0	8581.457	55315.055	869.86	15314.875	6.446	9.999+
65	10	S1	0	1575.804	54886.865	0	16493.024	9.999+	9.999+

Slab Overturning Safety Factors (By Combination) (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
66	10	S2	0	5174.299	60307.997	0	19095.449	9.999+	9.999+
67	10	S3	0	4105.456	59540.305	0	18652.234	9.999+	9.999+
68	10	S4	0	4211.863	59728.461	0	18763.856	9.999+	9.999+
69	10	S5	0	4202.433	59733.571	0	18787.436	9.999+	9.999+
70	10	S6	0	4085.267	59553.091	0	18670.833	9.999+	9.999+
71	10	S7	0	5174.03	60299.562	0	19306.555	9.999+	9.999+
72	10	S8	0	1680.157	55071.464	0	15837.352	9.999+	9.999+
73	11	S1	0	0	54909.687	0	16376.462	9.999+	9.999+
74	11	S2	0	1008.465	60307.997	0	18755.857	9.999+	9.999+
75	11	S3	0	433.865	59540.305	0	18350.788	9.999+	9.999+
76	11	S4	0	484.91	59728.461	0	18454.423	9.999+	9.999+
77	11	S5	0	477.933	59733.571	0	18486.392	9.999+	9.999+
78	11	S6	0	420.49	59553.091	0	18381.536	9.999+	9.999+
79	11	S7	0	1004.09	60299.562	0	18970.357	9.999+	9.999+
80	11	S8	0	1.194	55071.464	0	15684.669	9.999+	9.999+
81	12	S1	0	10521.426	46774.011	1385.791	12819.259	4.446	9.25
82	12	S2	0	27229.847	47995.996	3014.84	13107.439	1.763	4.348
83	12	S3	0	23759.203	47685.303	2638.53	13029.808	2.007	4.938
84	12	S4	0	24360.22	47745.495	2708.04	13043.693	1.96	4.817
85	12	S5	0	24352.194	47745.516	2709.142	13043.827	1.961	4.815
86	12	S6	0	23747.116	47685.582	2639.645	13030.172	2.008	4.936
87	12	S7	0	27195.101	47993.011	3012.38	13107.27	1.765	4.351
88	12	S8	0	11069.206	46818.043	1450.087	12830.733	4.23	8.848
89	13	S1	0	10873.638	46774.011	1101.742	12819.259	4.302	9.999+
90	13	S2	0	28149.319	47995.996	2523.259	13107.439	1.705	5.195
91	13	S3	0	24608.068	47685.303	2216.43	13029.808	1.938	5.879
92	13	S4	0	25196.223	47745.495	2269.338	13043.693	1.895	5.748
93	13	S5	0	25186.334	47745.516	2264.875	13043.827	1.896	5.759
94	13	S6	0	24590.544	47685.582	2215.577	13030.172	1.939	5.881
95	13	S7	0	28115.605	47993.011	2518.589	13107.27	1.707	5.204
96	13	S8	0	11441.942	46818.043	1159.814	12830.733	4.092	9.999+
97	14	S1	0	2101.072	46605.05	0	14460.336	9.999+	9.999+
98	14	S2	0	6899.065	47770.786	0	16507.891	6.924	9.999+
99	14	S3	0	5473.942	47595.333	0	16158.746	8.695	9.999+
100	14	S4	0	5615.818	47636.673	0	16245.283	8.483	9.999+
101	14	S5	0	5603.244	47637.633	0	16256.331	8.502	9.999+
102	14	S6	0	5447.023	47597.715	0	16159.761	8.738	9.999+
103	14	S7	0	6898.707	47768.866	0	16679.108	6.924	9.999+
104	14	S8	0	2240.21	46645.335	0	14013.316	9.999+	9.999+
105	15	S1	0	0	46635.479	0	14304.92	9.999+	9.999+
106	15	S2	0	1344.62	47770.786	0	16055.101	9.999+	9.999+
107	15	S3	0	578.487	47595.333	0	15756.818	9.999+	9.999+
108	15	S4	0	646.546	47636.673	0	15832.705	9.999+	9.999+
109	15	S5	0	637.244	47637.633	0	15854.94	9.999+	9.999+
110	15	S6	0	560.653	47597.715	0	15774.031	9.999+	9.999+
111	15	S7	0	1338.787	47768.866	0	16230.843	9.999+	9.999+
112	15	S8	0	1.592	46645.335	0	13809.737	9.999+	9.999+

Slab Sliding Safety Factors (By Combination)

	LC	Slab	Angle[deg]	Va-xx[lb]	Vr-xx[lb]	Va-zz[lb]	Vr-zz[lb]	SR-xx	SR-zz
1	2	S1	0	19.998	3192.441	1.179	3192.441	9.999+	9.999+
2	2	S2	0	4.505	3274.072	2.415	3274.072	9.999+	9.999+
3	2	S3	0	0	3257.452	0	3257.452	9.999+	9.999+
4	2	S4	0	0	3260.923	0	3260.923	9.999+	9.999+
5	2	S5	0	0	3260.957	0	3260.957	9.999+	9.999+
6	2	S6	0	0	3257.543	0	3257.543	9.999+	9.999+

Slab Sliding Safety Factors (By Combination) (Continued)

	LC	Slab	Angle[deg]	Va-xx[lb]	Vr-xx[lb]	Va-zz[lb]	Vr-zz[lb]	SR-xx	SR-zz
7	2	S7	0	4.707	3273.905	2.465	3273.905	9.999+	9.999+
8	2	S8	0	19.975	3195.324	1.119	3195.324	9.999+	9.999+
9	3	S1	0	99.783	3448.652	5.997	3448.652	9.999+	9.999+
10	3	S2	0	22.589	3882.064	12.325	3882.064	9.999+	9.999+
11	3	S3	0	3.511	3808.015	2.765	3808.015	9.999+	9.999+
12	3	S4	0	4.576	3824.656	2.11	3824.656	9.999+	9.999+
13	3	S5	0	2.554	3824.852	2.352	3824.852	9.999+	9.999+
14	3	S6	0	4.435	3808.501	3.439	3808.501	9.999+	9.999+
15	3	S7	0	23.817	3881.294	12.614	3881.294	9.999+	9.999+
16	3	S8	0	99.673	3463.562	5.699	3463.562	9.999+	9.999+
17	4	S1	0	45.605	2921.23	589.793	2921.23	9.999+	4.953
18	4	S2	0	18.95	2610.246	1607.795	2610.246	9.999+	1.623
19	4	S3	0	.265	2663.947	1377.072	2663.947	9.999+	1.935
20	4	S4	0	1.507	2652.547	1412.215	2652.547	9.999+	1.878
21	4	S5	0	1.783	2652.503	1411.288	2652.503	9.999+	1.879
22	4	S6	0	.152	2663.717	1375.605	2663.717	9.999+	1.936
23	4	S7	0	19.557	2611.133	1606.157	2611.133	9.999+	1.626
24	4	S8	0	47.448	2910.772	621.544	2910.772	9.999+	4.683
25	5	S1	0	15.44	2966.476	491.934	2966.476	9.999+	6.03
26	5	S2	0	10.825	2715.825	1349.348	2715.825	9.999+	2.013
27	5	S3	0	3.701	2761.046	1156.191	2761.046	9.999+	2.388
28	5	S4	0	1.722	2751.388	1180.038	2751.388	9.999+	2.332
29	5	S5	0	.058	2751.396	1178.858	2751.396	9.999+	2.334
30	5	S6	0	3.007	2760.899	1154.154	2760.899	9.999+	2.392
31	5	S7	0	10.889	2716.873	1348.271	2716.873	9.999+	2.015
32	5	S8	0	18.087	2957.916	518.745	2957.916	9.999+	5.702
33	6	S1	0	97.074	3513.993	696.702	3513.993	9.999+	5.044
34	6	S2	0	32.159	4061.302	1911.874	4061.302	9.999+	2.124
35	6	S3	0	.442	3961.19	1632.999	3961.19	9.999+	2.426
36	6	S4	0	1.678	3982.319	1674.466	3982.319	9.999+	2.378
37	6	S5	0	2.144	3982.443	1673.351	3982.443	9.999+	2.38
38	6	S6	0	.066	3961.66	1631.229	3961.66	9.999+	2.429
39	6	S7	0	33.306	4059.873	1910.053	4059.873	9.999+	2.126
40	6	S8	0	99.25	3532.703	734.49	3532.703	9.999+	4.81
41	7	S1	0	104.645	3474.339	610.338	3474.339	9.999+	5.692
42	7	S2	0	32.491	3959.63	1667.352	3959.63	9.999+	2.375
43	7	S3	0	2.705	3872.703	1423.749	3872.703	9.999+	2.72
44	7	S4	0	4.117	3890.998	1464.931	3890.998	9.999+	2.656
45	7	S5	0	3.735	3891.146	1464.315	3891.146	9.999+	2.657
46	7	S6	0	2.842	3873.152	1422.922	3873.152	9.999+	2.722
47	7	S7	0	33.883	3958.656	1665.498	3958.656	9.999+	2.377
48	7	S8	0	105.567	3490.807	643.147	3490.807	9.999+	5.428
49	8	S1	0	30.635	3181.191	446.253	3181.191	9.999+	7.129
50	8	S2	0	.476	3232.197	1197.81	3232.197	9.999+	2.698
51	8	S3	0	2.832	3225.245	1034.878	3225.245	9.999+	3.117
52	8	S4	0	2.302	3227.441	1060.744	3227.441	9.999+	3.043
53	8	S5	0	.578	3227.537	1060.23	3227.537	9.999+	3.044
54	8	S6	0	3.212	3225.392	1034.283	3225.392	9.999+	3.118
55	8	S7	0	.841	3232.367	1196.39	3232.367	9.999+	2.702
56	8	S8	0	29.181	3183.089	469.873	3183.089	9.999+	6.774
57	9	S1	0	53.259	3215.126	372.859	3215.126	9.999+	8.623
58	9	S2	0	6.57	3311.38	1003.974	3311.38	9.999+	3.298
59	9	S3	0	5.41	3298.069	869.218	3298.069	9.999+	3.794
60	9	S4	0	4.724	3301.571	886.611	3301.571	9.999+	3.724
61	9	S5	0	1.959	3301.707	885.907	3301.707	9.999+	3.727
62	9	S6	0	5.582	3298.278	868.195	3298.278	9.999+	3.799
63	9	S7	0	7.342	3311.673	1002.975	3311.673	9.999+	3.302

Slab Sliding Safety Factors (By Combination) (Continued)

	LC	Slab	Angle[deg]	Va-xx[lb]	Vr-xx[lb]	Va-zz[lb]	Vr-zz[lb]	SR-xx	SR-zz
64	9	S8	0	51.202	3218.447	392.773	3218.447	9.999+	8.194
65	10	S1	0	137.644	3625.763	518.619	3625.763	9.999+	6.991
66	10	S2	0	38.809	4320.489	1441.942	4320.489	9.999+	2.996
67	10	S3	0	2.302	4198.177	1222.675	4198.177	9.999+	3.434
68	10	S4	0	4.691	4224.77	1254.267	4224.77	9.999+	3.368
69	10	S5	0	3.524	4224.993	1253.25	4224.993	9.999+	3.371
70	10	S6	0	3.376	4198.849	1220.843	4198.849	9.999+	3.439
71	10	S7	0	40.488	4318.923	1440.767	4318.923	9.999+	2.998
72	10	S8	0	139.205	3649.537	547.153	3649.537	9.999+	6.67
73	11	S1	0	143.322	3596.023	453.846	3596.023	9.999+	7.923
74	11	S2	0	39.057	4244.235	1258.551	4244.235	9.999+	3.372
75	11	S3	0	4.662	4131.812	1065.738	4131.812	9.999+	3.877
76	11	S4	0	6.52	4156.279	1097.115	4156.279	9.999+	3.788
77	11	S5	0	4.717	4156.52	1096.473	4156.52	9.999+	3.791
78	11	S6	0	5.458	4132.469	1064.612	4132.469	9.999+	3.882
79	11	S7	0	40.921	4243.01	1257.352	4243.01	9.999+	3.375
80	11	S8	0	143.942	3618.115	478.646	3618.115	9.999+	7.559
81	12	S1	0	47.605	2601.986	589.675	2601.986	9.999+	4.413
82	12	S2	0	19.401	2282.839	1608.037	2282.839	9.999+	1.42
83	12	S3	0	.265	2338.202	1377.072	2338.202	9.999+	1.698
84	12	S4	0	1.507	2326.455	1412.215	2326.455	9.999+	1.647
85	12	S5	0	1.783	2326.407	1411.288	2326.407	9.999+	1.648
86	12	S6	0	.152	2337.963	1375.605	2337.963	9.999+	1.7
87	12	S7	0	20.027	2283.742	1606.404	2283.742	9.999+	1.422
88	12	S8	0	49.446	2591.24	621.432	2591.24	9.999+	4.17
89	13	S1	0	17.44	2647.232	491.816	2647.232	9.999+	5.383
90	13	S2	0	11.276	2388.417	1349.589	2388.417	9.999+	1.77
91	13	S3	0	3.701	2435.3	1156.191	2435.3	9.999+	2.106
92	13	S4	0	1.722	2425.295	1180.038	2425.295	9.999+	2.055
93	13	S5	0	.058	2425.3	1178.858	2425.3	9.999+	2.057
94	13	S6	0	3.007	2435.145	1154.154	2435.145	9.999+	2.11
95	13	S7	0	11.36	2389.482	1348.517	2389.482	9.999+	1.772
96	13	S8	0	20.084	2638.384	518.633	2638.384	9.999+	5.087
97	14	S1	0	95.074	3194.749	696.82	3194.749	9.999+	4.585
98	14	S2	0	31.709	3733.895	1911.632	3733.895	9.999+	1.953
99	14	S3	0	.442	3635.445	1632.999	3635.445	9.999+	2.226
100	14	S4	0	1.678	3656.227	1674.466	3656.227	9.999+	2.184
101	14	S5	0	2.144	3656.348	1673.351	3656.348	9.999+	2.185
102	14	S6	0	.066	3635.905	1631.229	3635.905	9.999+	2.229
103	14	S7	0	32.835	3732.482	1909.806	3732.482	9.999+	1.954
104	14	S8	0	97.253	3213.171	734.602	3213.171	9.999+	4.374
105	15	S1	0	102.645	3155.095	610.456	3155.095	9.999+	5.168
106	15	S2	0	32.041	3632.223	1667.111	3632.223	9.999+	2.179
107	15	S3	0	2.705	3546.958	1423.749	3546.958	9.999+	2.491
108	15	S4	0	4.117	3564.906	1464.931	3564.906	9.999+	2.433
109	15	S5	0	3.735	3565.05	1464.315	3565.05	9.999+	2.435
110	15	S6	0	2.842	3547.398	1422.922	3547.398	9.999+	2.493
111	15	S7	0	33.412	3631.266	1665.252	3631.266	9.999+	2.181
112	15	S8	0	103.569	3171.274	643.259	3171.274	9.999+	4.93

Envelope Slab Soil Pressures

	Label	UC	LC	Soil Pressure[psf]	Allowable Bearing[psf]	Point
1	S1	.386	6	578.407	1500	N226
2	S2	.573	6	858.9	1500	N233
3	S3	.532	6	797.532	1500	N240
4	S4	.539	6	807.797	1500	N247

Envelope Slab Soil Pressures (Continued)

	Label	UC	LC	Soil Pressure[psf]	Allowable Bearing[psf]	Point
5	S5	.538	6	807.615	1500	N254
6	S6	.531	6	797.197	1500	N261
7	S7	.572	6	858.334	1500	N268
8	S8	.392	6	587.647	1500	N275

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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 55
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): 33.00
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

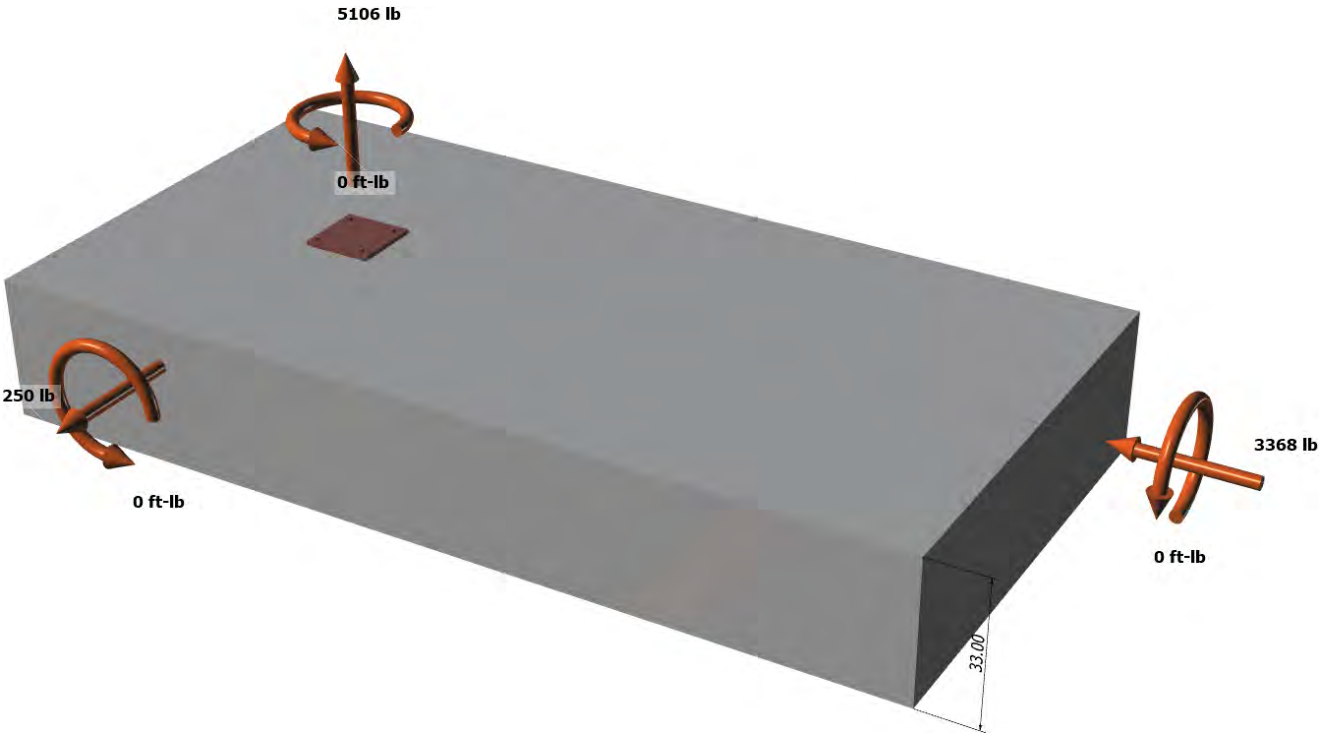
Recommended Anchor
Anchor Name: SET-3G - SET-3G w/ 3/8"Ø F1554 Gr. 55
Code Report: ICC-ES ESR-4057

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

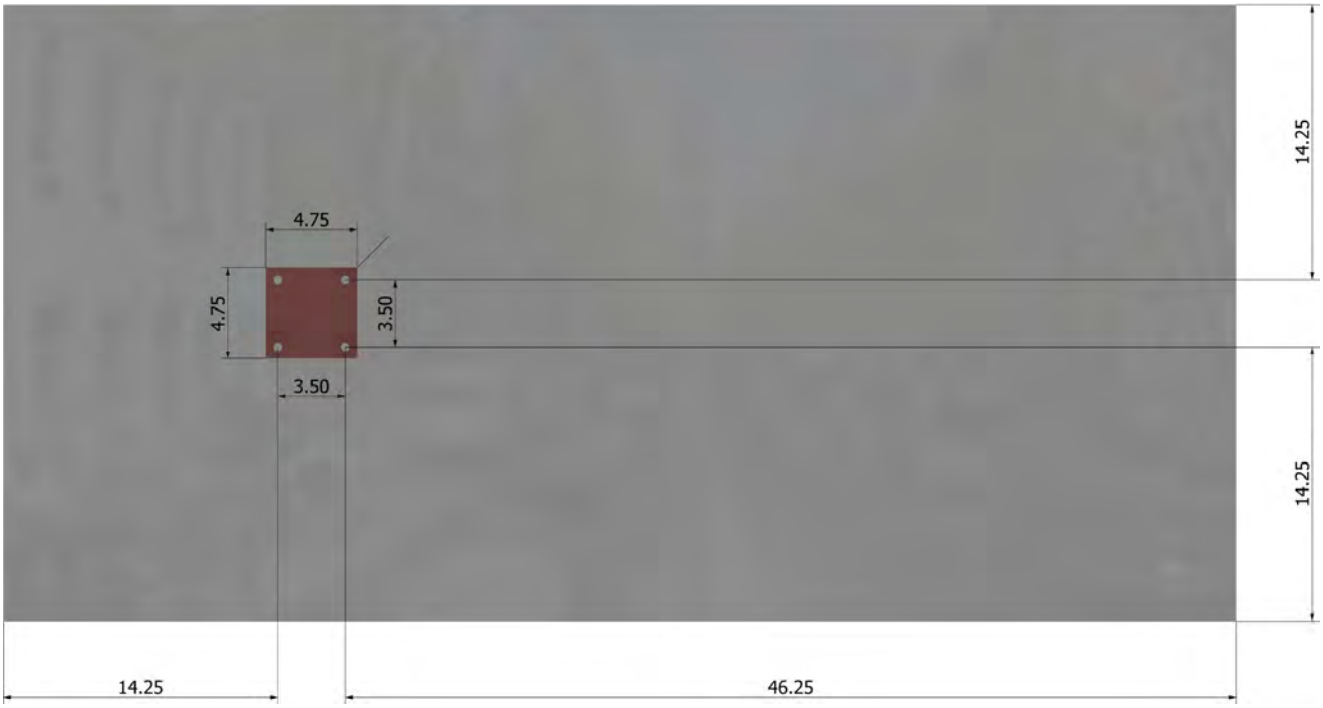
Strength level loads:

N_{ua} [lb]: 5106
V_{uax} [lb]: 250
V_{uay} [lb]: -3368
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

<Figure 1>



<Figure 2>



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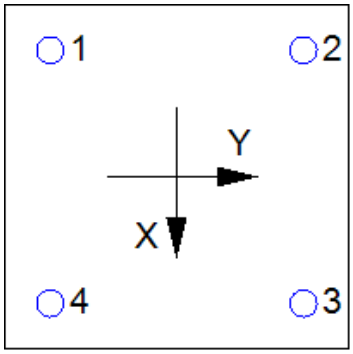
E-mail:			

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	1276.5	62.5	-842.0	844.3
2	1276.5	62.5	-842.0	844.3
3	1276.5	62.5	-842.0	844.3
4	1276.5	62.5	-842.0	844.3
Sum	5106.0	250.0	-3368.0	3377.3

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 5106
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)
5850	0.75	4388

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	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. 17.3.1 & Eq. 17.4.2.1b)

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	14.25	1.000	1.000	1.00	1.000	6800	0.65	7374

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	4.000	6343

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

A_{Na} (in^2)	A_{Na0} (in^2)	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	14.25	1.000	1.000	1.000	6343	0.55	6176

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

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
3510	1.0	0.65	2282

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	17.75	24294

$\phi V_{cbgx} = \phi\,(A_{Vc} / A_{Vco})\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{bx}$ (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)
1181.48	1417.78	1.000	0.861	1.000	1.000	24294	0.70	12195

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	17.75	24294

$\phi V_{cbgy} = \phi\,(A_{Vc} / A_{Vco})\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{by}$ (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)
852.00	1417.78	1.000	0.861	1.000	1.000	24294	0.70	8794

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	14.25	17475

$\phi V_{cbgx} = \phi\,(2)(A_{Vc} / A_{Vco})\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{by}$ (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)
684.00	913.78	1.000	1.000	1.000	1.000	17475	0.70	18313

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	14.25	17475

$\phi V_{cbgy} = \phi\,(2)(A_{Vc} / A_{Vco})\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{bx}$ (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)
836.30	913.78	1.000	1.000	1.000	1.000	17475	0.70	22391

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	6343	11230

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)
15722

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	1277	4388	0.29	Pass
Concrete breakout	5106	7374	0.69	Pass
Adhesive	**5106**	**6176**	**0.83**	**Pass (Governs)**

Shear	Factored Load, V_{ua} (lb)	Design Strength, ϕV_n (lb)	Ratio	Status
Steel	844	2282	0.37	Pass
T Concrete breakout x+	250	12195	0.02	Pass
T Concrete breakout y-	3368	8794	0.38	Pass
|| Concrete breakout y-	125	18313	0.01	Pass
|| Concrete breakout x-	1684	22391	0.08	Pass
Concrete breakout, combined	**-**	**-**	**0.38**	**Pass (Governs)**
Pryout	3377	15722	0.21	Pass

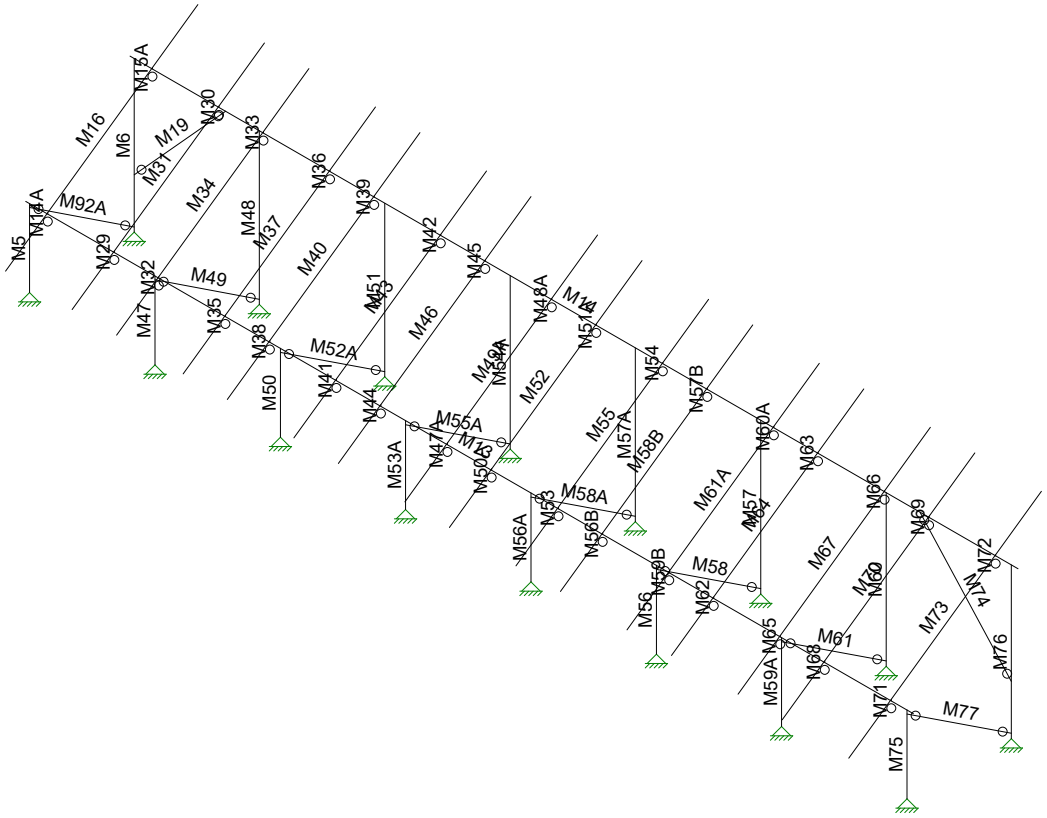
Interaction check	$(N_{ua}/\phi N_{ua})^{5/3}$	$(V_{ua}/\phi V_{ua})^{5/3}$	Combined Ratio	Permissible	Status
Sec. R17.6	0.73	0.20	93.1%	1.0	Pass

SET-3G w/ 3/8"Ø F1554 Gr. 55 with hef = 4.000 inch meets the selected design criteria.

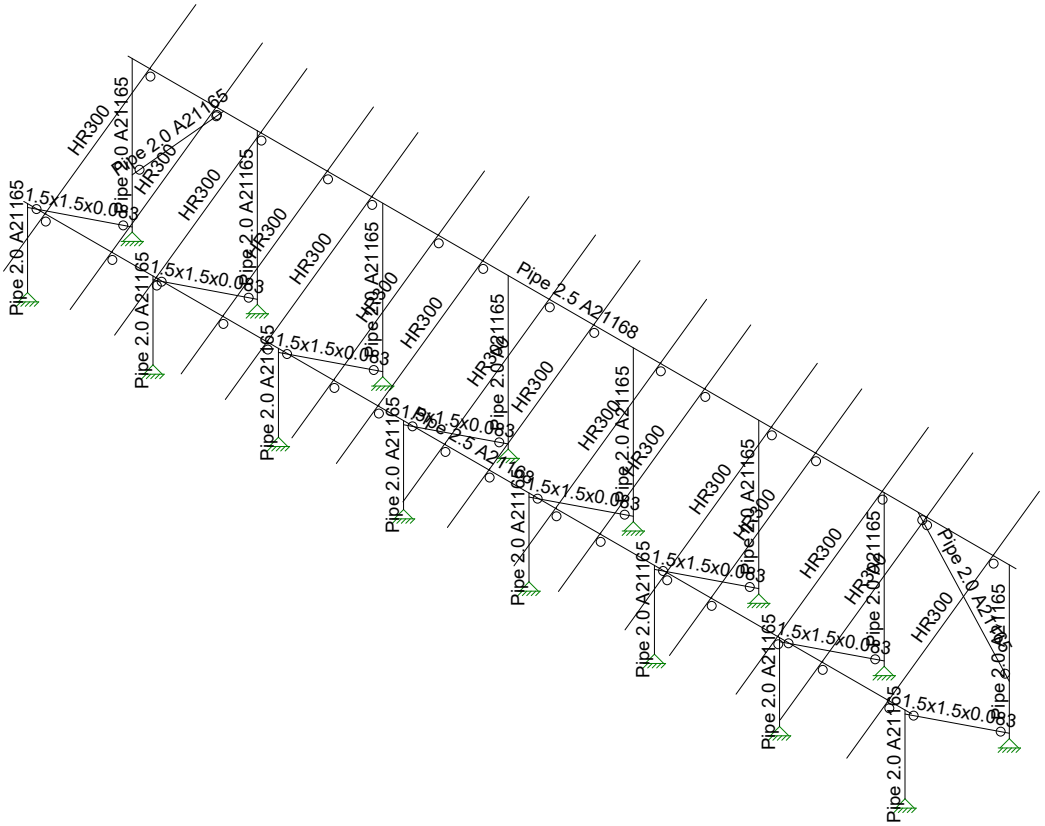
12. Warnings

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

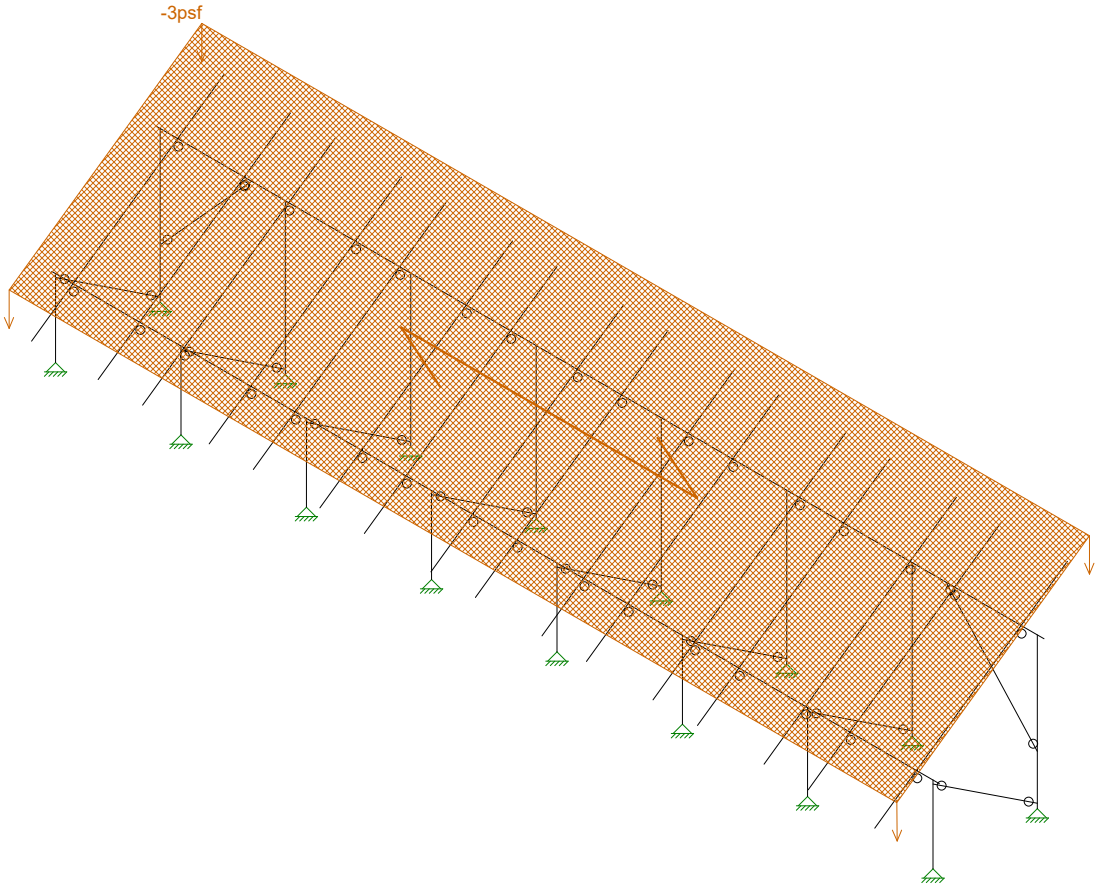
- Refer to manufacturer's product literature for hole cleaning and installation instructions.



Vector Structural Engineeri...		SK - 3
STB	Roof Mount	Apr 6, 2021 at 10:44 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d

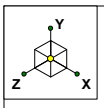


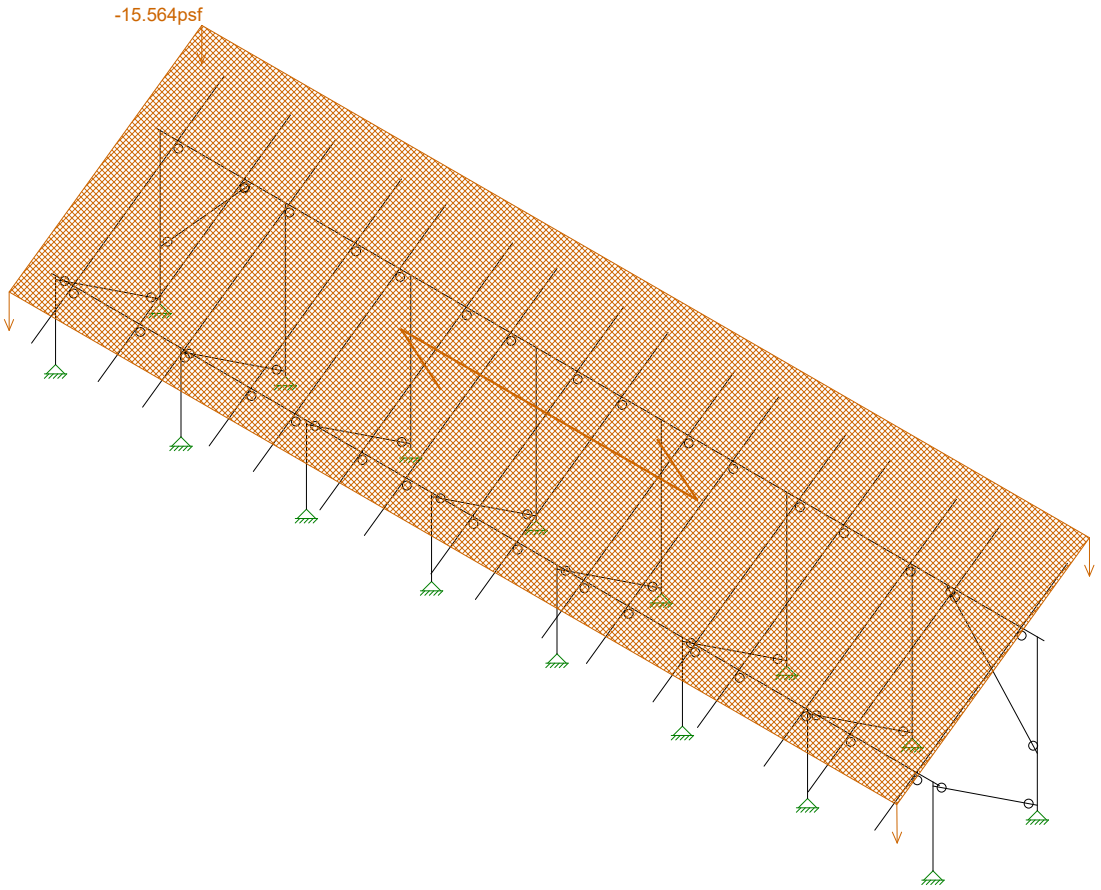
Vector Structural Engineeri...		SK - 4
STB	Roof Mount	Apr 6, 2021 at 10:44 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d



Loads: BLC 2, Solar Panel Weight

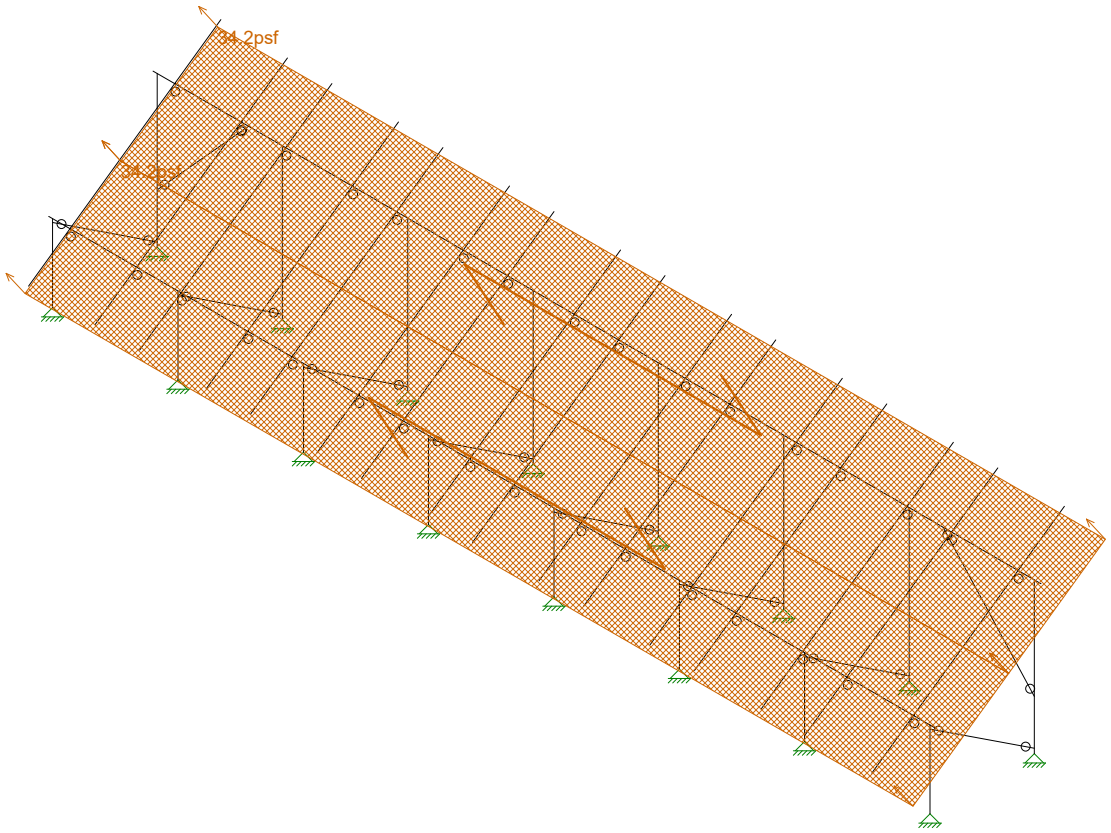
Vector Structural Engineeri...		SK - 5
STB	Roof Mount	Apr 6, 2021 at 10:44 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d





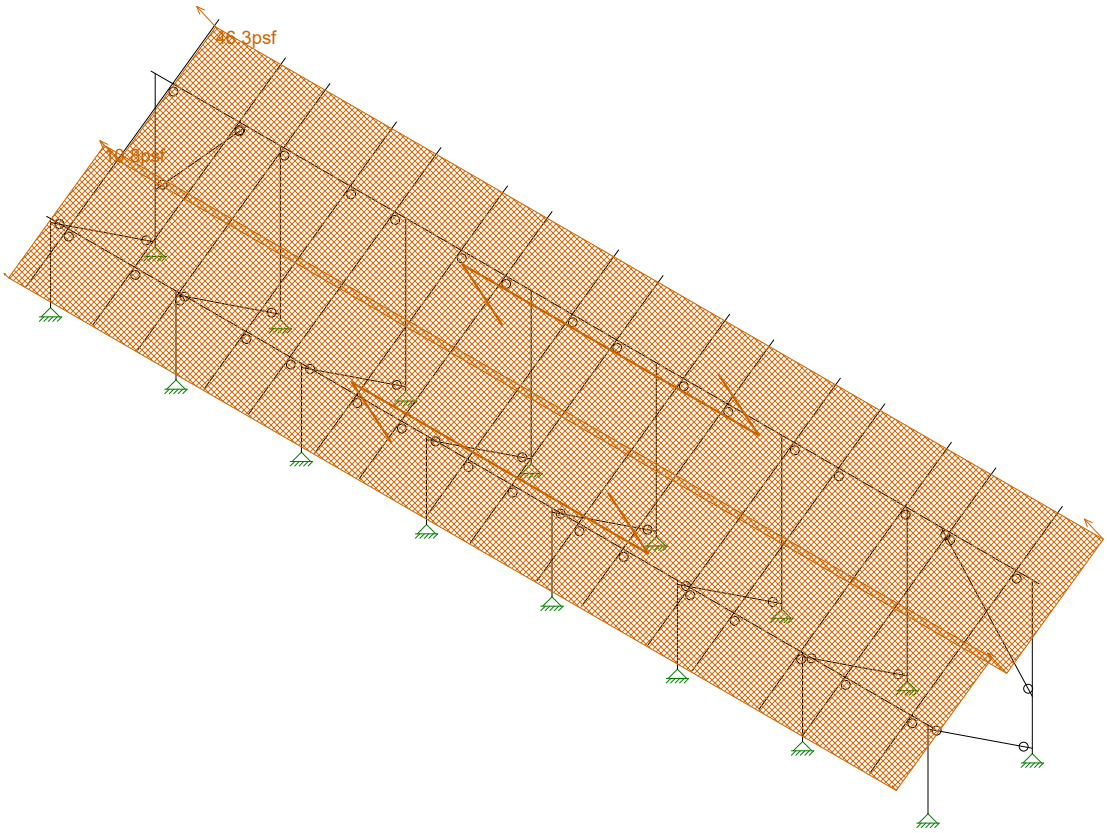
Loads: BLC 3, Roof Live/Snow

Vector Structural Engineeri...		SK - 6
STB	Roof Mount	Apr 6, 2021 at 10:44 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d



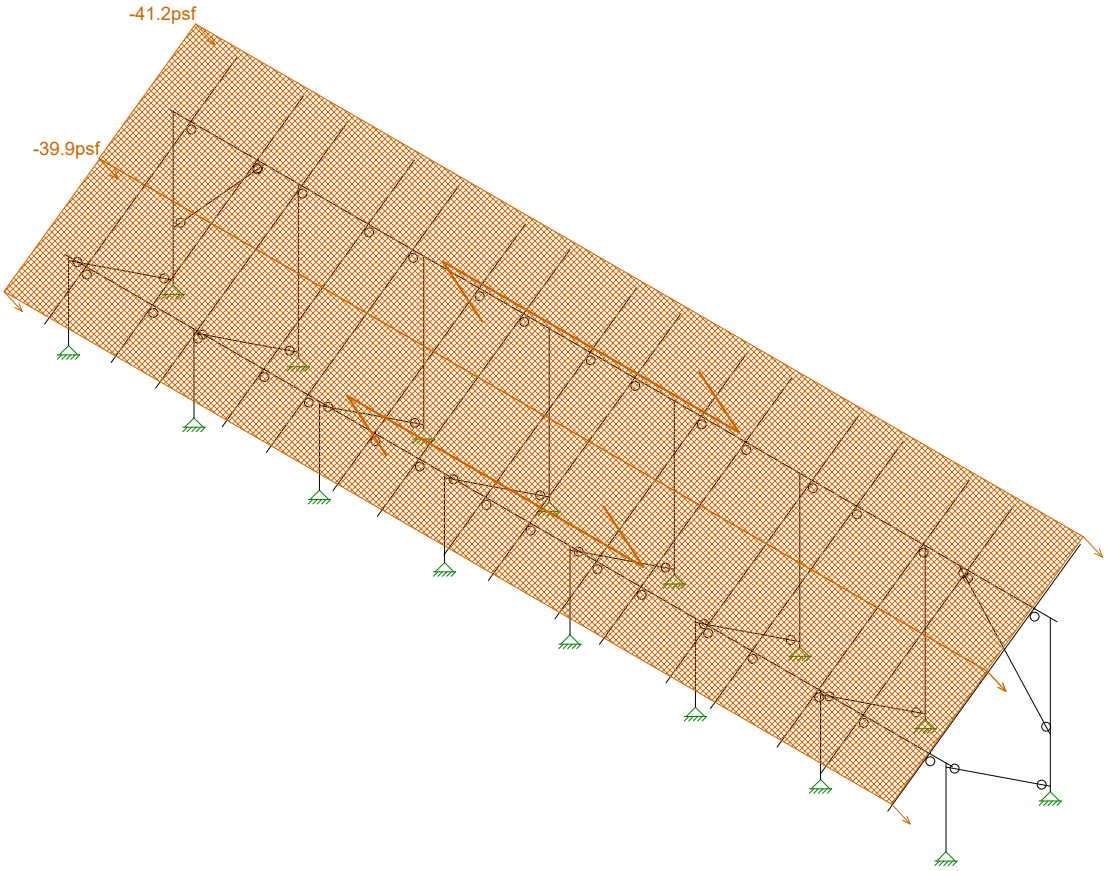
Loads: BLC 4, Wind 1

Vector Structural Engineeri...		SK - 7
STB	Roof Mount	Apr 6, 2021 at 10:45 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d



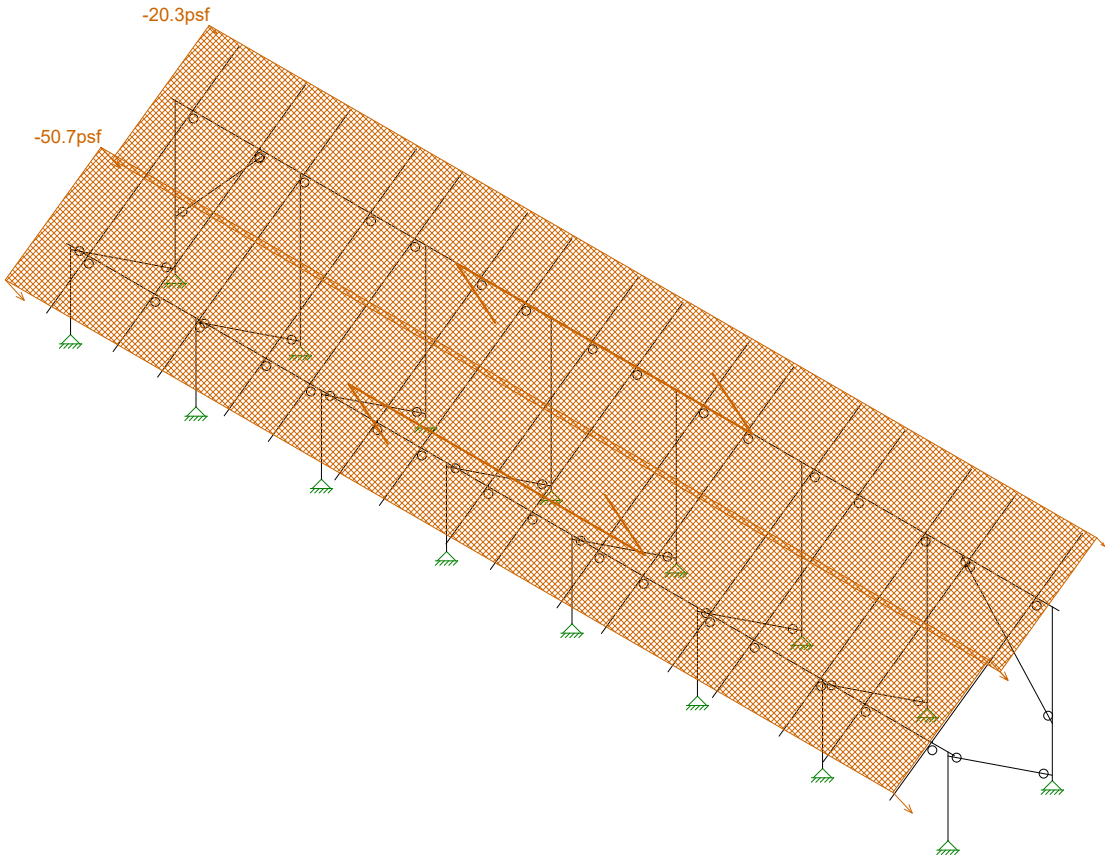
Loads: BLC 5, Wind 2

Vector Structural Engineeri...		SK - 8
STB	Roof Mount	Apr 6, 2021 at 10:45 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d



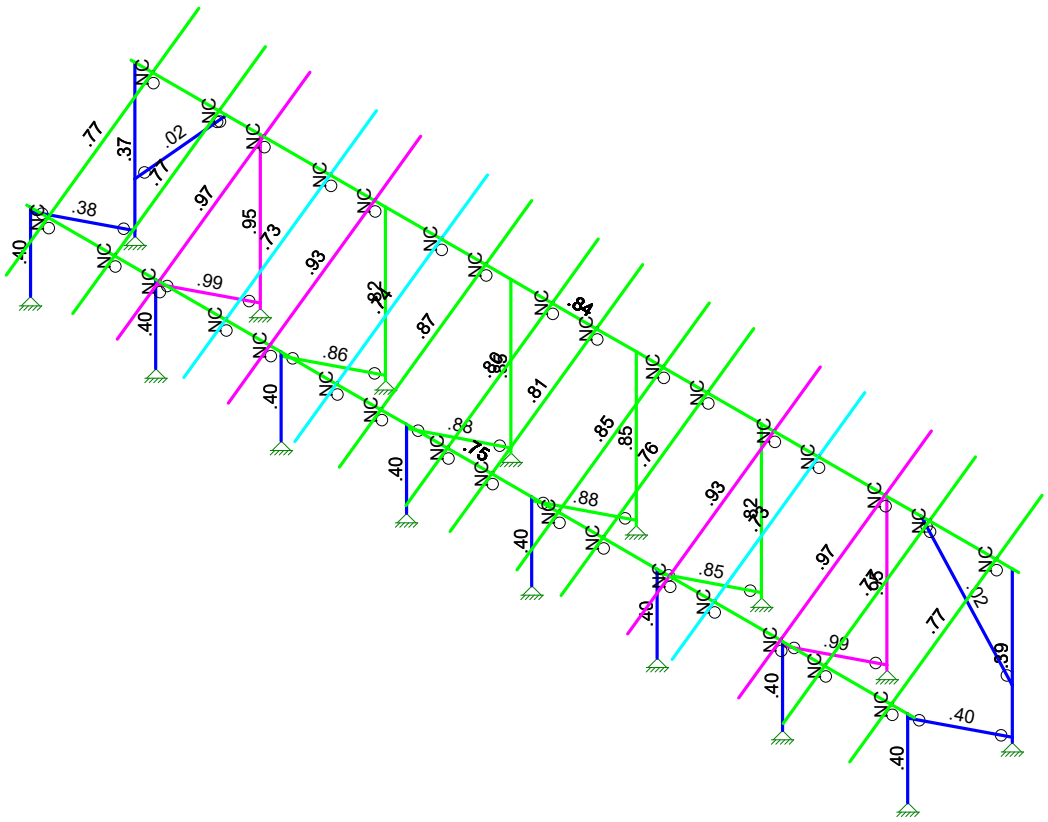
Loads: BLC 6, Wind 3

Vector Structural Engineeri...		SK - 9
STB	Roof Mount	Apr 6, 2021 at 10:45 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d



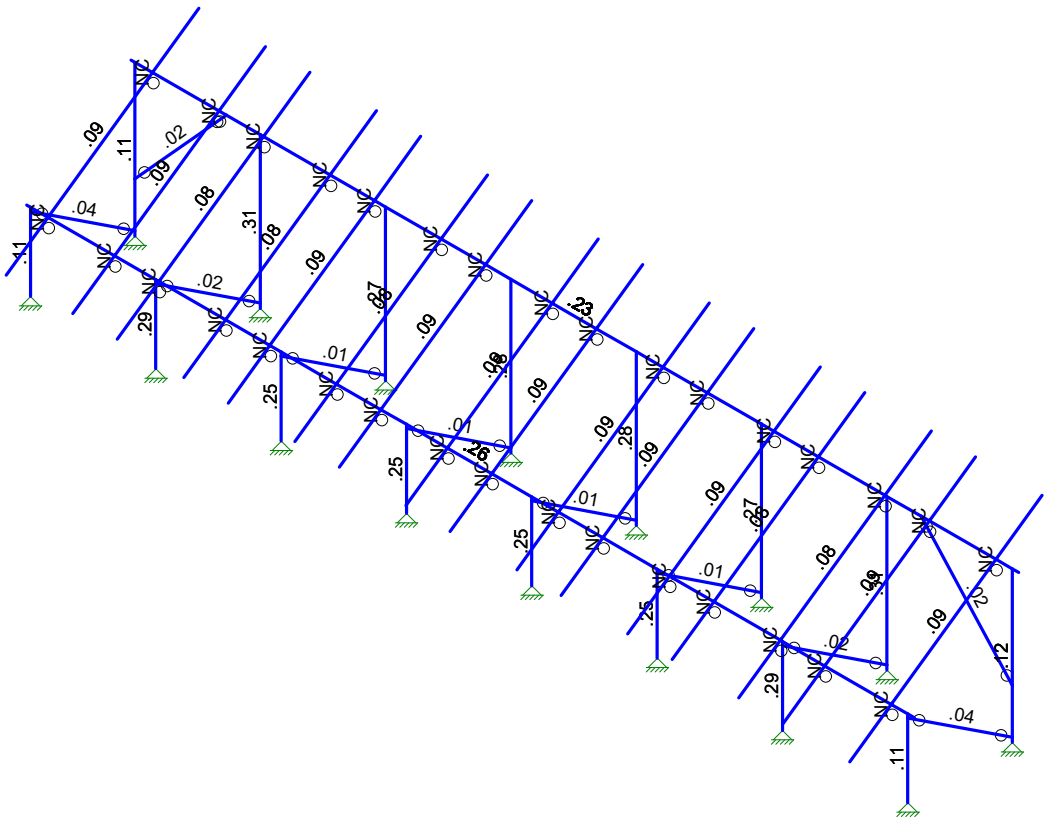
Loads: BLC 7, Wind 4

Vector Structural Engineeri...		SK - 10
STB	Roof Mount	Apr 6, 2021 at 10:45 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Vector Structural Engineeri...		SK - 1
STB	Roof Mount	Apr 6, 2021 at 10:44 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Vector Structural Engineeri...		SK - 2
STB	Roof Mount	Apr 6, 2021 at 10:44 AM
U2716-0217-201		Sunmodo Sunturf A7 v3 85x45.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 S100-12: 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
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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[k/ft^3]	Yield[psi]	Ry	Fu[psi]	Rt
1	A992	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36000	1.5	58000	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	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	.49	35000	1.6	60000	1.2
7	A1085	29000	11154	.3	.65	.49	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	.173	Table B.4-1	1	19000	16000	13000	12000	141
2	6061-T6	10100	3787.5	.33	1.3	.173	Table B.4-2	1	38000	35000	35000	24000	141
3	6063-T5	10100	3787.5	.33	1.3	.173	Table B.4-2	1	22000	16000	16000	13000	141
4	6063-T6	10100	3787.5	.33	1.3	.173	Table B.4-2	1	30000	25000	25000	19000	141
5	5052-H34	10200	3787.5	.33	1.3	.173	Table B.4-1	1	34000	26000	24000	20000	141
6	6061-T6 W	10100	3787.5	.33	1.3	.173	Table B.4-1	1	24000	15000	15000	15000	141
7	6005-T5	10100	3787.5	.33	1.3	.173	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	.74	.253	.727	.578
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	-19

Member Area Loads (BLC 4 : Wind 1)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N119B	N120B	N200	Perp	B-C	34.2
2	N119B	N196	N199	N120B	Perp	B-C	34.2

Member Area Loads (BLC 5 : Wind 2)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N119B	N120B	N200	Perp	B-C	46.3
2	N119B	N196	N199	N120B	Perp	B-C	10.8

Member Area Loads (BLC 6 : Wind 3)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N119B	N120B	N200	Perp	B-C	-41.2
2	N119B	N196	N199	N120B	Perp	B-C	-39.9

Member Area Loads (BLC 7 : Wind 4)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N197	N119B	N120B	N200	Perp	B-C	-20.3
2	N119B	N196	N199	N120B	Perp	B-C	-50.7

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	
3	Roof Live/Snow	RLL							1	
4	Wind 1	OL1							2	
5	Wind 2	OL2							2	
6	Wind 3	OL3							2	
7	Wind 4	OL4							2	
8	BLC 2 Transient Area ...	None						40		
9	BLC 3 Transient Area ...	None						40		
10	BLC 4 Transient Area ...	None						192		
11	BLC 5 Transient Area ...	None						192		
12	BLC 6 Transient Area ...	None						192		
13	BLC 7 Transient Area ...	None						192		

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	ASD Loads		Y																					
2	1.0 D		Y		DL	1																		
3	1.0 D + 1.0 S		Y		DL	1	RLL	1																
4	1.0 D + 0.6 W1		Y		DL	1	RLL		OL1	.6														
5	1.0 D + 0.6 W2		Y		DL	1	RLL		OL2	.6														
6	1.0 D + 0.6 W3		Y		DL	1	RLL		OL3	.6														
7	1.0 D + 0.6 W4		Y		DL	1	RLL		OL4	.6														
8	1.0 D + 0.45 W1 + 0....		Y		DL	1	RLL	.75	OL1	.45														
9	1.0 D + 0.45 W2 + 0....		Y		DL	1	RLL	.75	OL2	.45														
10	1.0 D + 0.45 W3 + 0....		Y		DL	1	RLL	.75	OL3	.45														
11	1.0 D + 0.45 W4 + 0....		Y		DL	1	RLL	.75	OL4	.45														
12	0.6 D + 0.6 W1		Y		DL	.6	RLL		OL1	.6														
13	0.6 D + 0.6 W2		Y		DL	.6	RLL		OL2	.6														
14	0.6 D + 0.6 W3		Y		DL	.6	RLL		OL3	.6														
15	0.6 D + 0.6 W4		Y		DL	.6	RLL		OL4	.6														
16			Y																					
17	LRFD Loads		Y																					
18	1.4 D	Yes	Y		DL	1.4	RLL																	
19	1.2 D + 1.6 S + 0.5 W1	Yes	Y		DL	1.2	RLL	1.6	OL1	.5														
20	1.2 D + 1.6 S + 0.5 W2	Yes	Y		DL	1.2	RLL	1.6	OL2	.5														
21	1.2 D + 1.6 S + 0.5 W3	Yes	Y		DL	1.2	RLL	1.6	OL3	.5														
22	1.2 D + 1.6 S + 0.5 W4	Yes	Y		DL	1.2	RLL	1.6	OL4	.5														
23	1.2 D + 1.0 W1	Yes	Y		DL	1.2	RLL		OL1	1														
24	1.2 D + 1.0 W2	Yes	Y		DL	1.2	RLL		OL2	1														
25	1.2 D + 1.0 W3	Yes	Y		DL	1.2	RLL		OL3	1														
26	1.2 D + 1.0 W4	Yes	Y		DL	1.2	RLL		OL4	1														
27	0.9 D + 1.0 W1	Yes	Y		DL	.9	RLL		OL1	1														
28	0.9 D + 1.0 W2	Yes	Y		DL	.9	RLL		OL2	1														
29	0.9 D + 1.0 W3	Yes	Y		DL	.9	RLL		OL3	1														
30	0.9 D + 1.0 W4	Yes	Y		DL	.9	RLL		OL4	1														

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb...	LC	MZ [lb-ft]	LC
1	N2	max	147.32	22	1234.43	20	96.487	23	0	30	0	30	0	30
2		min	-51.776	27	-374.929	29	-115.7...	25	0	18	0	18	0	18
3	N1	max	64.09	21	2423.997	25	1277.3...	29	0	30	0	30	0	30
4		min	-71.757	28	-1979.365	28	-1078....	23	0	18	0	18	0	18
5	N115	max	4.166	25	5416.672	25	2907.1...	25	0	30	0	30	0	30
6		min	-5.315	28	-4493.794	28	-2455....	23	0	18	0	18	0	18
7	N116	max	11.048	20	2706.732	20	162.09	23	0	30	0	30	0	30
8		min	-4.015	29	-990.273	29	-188.3...	25	0	18	0	18	0	18
9	N99	max	9.377	28	6247.139	25	3368.0...	25	0	30	0	30	0	30
10		min	-15.601	21	-5106.329	28	-2842....	27	0	18	0	18	0	18
11	N100	max	27.282	27	3012.048	20	161.55	23	0	30	0	30	0	30
12		min	-45.889	22	-1257.153	29	-182.9...	25	0	18	0	18	0	18
13	N105A	max	4.204	28	5418.56	25	2910.9...	25	0	30	0	30	0	30
14		min	-5.309	25	-4497.223	28	-2457....	23	0	18	0	18	0	18
15	N106A	max	5.474	29	2705.74	20	162.59	23	0	30	0	30	0	30
16		min	-11.434	20	-994.094	29	-188.93	25	0	18	0	18	0	18
17	N111A	max	4.185	28	5569.98	25	2978.7...	25	0	30	0	30	0	30
18		min	-5.795	25	-4598.755	28	-2517....	23	0	18	0	18	0	18
19	N112A	max	1.803	29	2764.437	20	163.294	23	0	30	0	30	0	30
20		min	-9.901	20	-1029.084	29	-189.2...	25	0	18	0	18	0	18
21	N117A	max	3.199	21	5569.058	25	2976.4...	25	0	30	0	30	0	30

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb...	LC	MZ [lb-ft]	LC
22		min	-3.984	28	-4596.967	28	-2516....	23	0	18	0	18	0	18
23	N118A	max	6.934	22	2764.931	20	163.09	23	0	30	0	30	0	30
24		min	.111	27	-1027.498	29	-189.0...	25	0	18	0	18	0	18
25	N123	max	15.876	21	6241.424	25	3366.4...	25	0	30	0	30	0	30
26		min	-11.602	28	-5098.975	28	-2841....	27	0	18	0	18	0	18
27	N124	max	47.949	22	3010.666	20	162.557	23	0	30	0	30	0	30
28		min	-26.987	27	-1256.39	29	-184.1...	25	0	18	0	18	0	18
29	N155	max	73.734	28	2544.442	25	1343.3...	29	0	30	0	30	0	30
30		min	-64.302	21	-2085.849	28	-1134....	23	0	18	0	18	0	18
31	N156	max	53.731	27	1292.238	20	99.264	23	0	30	0	30	0	30
32		min	-146.4...	22	-400.108	29	-118.7...	25	0	18	0	18	0	18
33	Totals:	max	.001	30	39649.279	21	19770...	29						
34		min	-.005	20	-20542.281	27	-1667...	27						

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...	.582	56.551	22	.181	56.551		25	15639.109	23232.186	1397.505	1397.505	1....	H1-1b
2	M6	Pipe 2.0 A2...	.605	115.23	25	.198	0		25	5650.978	23232.186	1397.505	1397.505	1....	H1-1a
3	M13	Pipe 2.5 A2...	1.171	290....	26	.438	99.167		25	14032.946	28358.413	2081.747	2081.747	1	H1-1b
4	M14	Pipe 2.5 A2...	1.220	290....	21	.375	99.167		25	14032.946	28358.413	2081.747	2081.747	1	H1-1b
5	M19	Pipe 2.0 A2...	.019	53.266	19	.034	104....		26	6889.603	23232.186	1397.505	1397.505	1....	H1-1b
6	M92A	1.5x1.5x0.083	.630	49.926	25	.068	95.859	y	21	2584.05	14085.15	624.421	624.421	1....	H1-1a
7	M56	Pipe 2.0 A2...	.666	55.936	29	.415	56.551		25	15639.109	23232.186	1397.505	1397.505	1....	H1-1b
8	M57	Pipe 2.0 A2...	1.374	2.401	25	.469	0		25	5650.978	23232.186	1397.505	1397.505	1....	H1-1a
9	M58	1.5x1.5x0.083	1.422	49.926	25	.016	0	y	24	2584.05	14085.15	624.421	624.421	1....	H1-1a
10	M47	Pipe 2.0 A2...	.673	55.936	29	.489	56.551		25	15639.109	23232.186	1397.505	1397.505	1....	H1-1b
11	M48	Pipe 2.0 A2...	1.592	2.401	25	.548	0		25	5650.978	23232.186	1397.505	1397.505	1....	H1-1a
12	M49	1.5x1.5x0.083	1.648	49.926	25	.030	95.859	y	21	2584.05	14085.15	624.421	624.421	1....	H1-1a
13	M50	Pipe 2.0 A2...	.668	55.936	29	.415	56.551		25	15639.109	23232.186	1397.505	1397.505	1....	H1-1b
14	M51	Pipe 2.0 A2...	1.375	2.401	25	.469	0		25	5650.978	23232.186	1397.505	1397.505	1....	H1-1a
15	M52A	1.5x1.5x0.083	1.423	49.926	25	.015	0	y	24	2584.05	14085.15	624.421	624.421	1....	H1-1a
16	M53A	Pipe 2.0 A2...	.671	55.936	29	.426	56.551		25	15639.109	23232.186	1397.505	1397.505	2....	H1-1b
17	M54A	Pipe 2.0 A2...	1.415	2.401	25	.484	0		25	5650.978	23232.186	1397.505	1397.505	1....	H1-1a
18	M55A	1.5x1.5x0.083	1.460	49.926	25	.011	0	y	24	2584.05	14085.15	624.421	624.421	1....	H1-1a
19	M56A	Pipe 2.0 A2...	.671	55.936	29	.425	56.551		25	15639.109	23232.186	1397.505	1397.505	1....	H1-1b
20	M57A	Pipe 2.0 A2...	1.415	2.401	25	.484	0		25	5650.978	23232.186	1397.505	1397.505	1....	H1-1a
21	M58A	1.5x1.5x0.083	1.459	49.926	25	.008	95.859	y	24	2584.05	14085.15	624.421	624.421	1....	H1-1a
22	M59A	Pipe 2.0 A2...	.678	55.936	29	.488	56.551		25	15639.109	23232.186	1397.505	1397.505	1....	H1-1b
23	M60	Pipe 2.0 A2...	1.590	2.401	25	.548	0		25	5650.978	23232.186	1397.505	1397.505	1....	H1-1a
24	M61	1.5x1.5x0.083	1.646	49.926	25	.029	0	y	21	2584.05	14085.15	624.421	624.421	1....	H1-1a
25	M74	Pipe 2.0 A2...	.019	53.181	19	.030	104....		26	6911.776	23232.186	1397.505	1397.505	1....	H1-1b
26	M75	Pipe 2.0 A2...	.585	56.551	26	.191	56.551		25	15639.109	23232.186	1397.505	1397.505	1....	H1-1b
27	M76	Pipe 2.0 A2...	.635	2.401	25	.208	0		25	5650.978	23232.186	1397.505	1397.505	1....	H1-1a
28	M77	1.5x1.5x0.083	.662	49.926	25	.071	95.859	y	21	2584.05	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	M16	HR300	1.186	136.8...	28	.154	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	1....	H.1-1
2	M31	HR300	1.182	39.375	26	.145	41.25	y	26	7923.866	14429....	560.361	934.132	5656.689	2605.145	2....	H.1-1
3	M34	HR300	1.622	136.8...	28	.127	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	1....	H.1-1
4	M37	HR300	1.109	136.8...	25	.127	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	2....	H.1-1
5	M40	HR300	1.562	136.8...	28	.139	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	1....	H.1-1
6	M43	HR300	1.098	39.375	26	.131	41.25	y	26	7923.866	14429....	560.361	934.132	5656.689	2605.145	2....	H.1-1
7	M46	HR300	1.461	136.8...	28	.147	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	2	H.1-1

Envelope AA ADM1-15: ASD - Building Aluminum Code Checks (Continued)

	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
8	M49A	HR300	1.207	136.8...	28	.140	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	2	H.1-1
9	M52	HR300	1.250	136.8...	28	.142	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	2	H.1-1
10	M55	HR300	1.425	136.8...	28	.146	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	2	H.1-1
11	M58B	HR300	1.107	136.8...	21	.133	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	2...	H.1-1
12	M61A	HR300	1.550	136.8...	28	.141	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	1...	H.1-1
13	M64	HR300	1.105	136.8...	25	.126	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	2...	H.1-1
14	M67	HR300	1.631	136.8...	28	.131	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	1...	H.1-1
15	M70	HR300	1.182	39.375	26	.144	41.25	y	26	7923.866	14429....	560.361	934.132	5656.689	2605.145	2...	H.1-1
16	M73	HR300	1.183	136.8...	28	.153	41.25	y	26	3912.131	14429....	560.361	934.132	5656.689	2605.145	1...	H.1-1