

# Design Document

For:

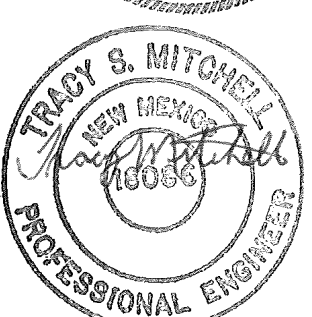
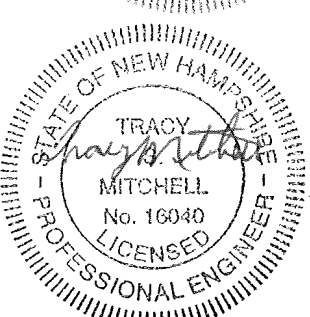
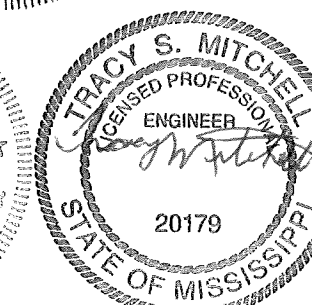
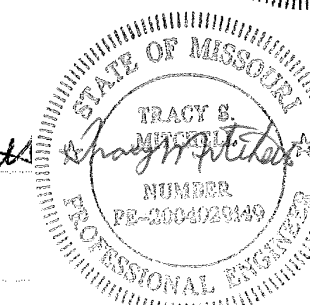
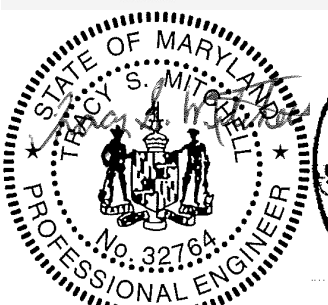
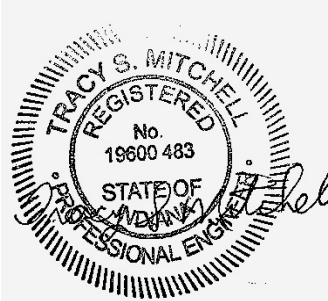
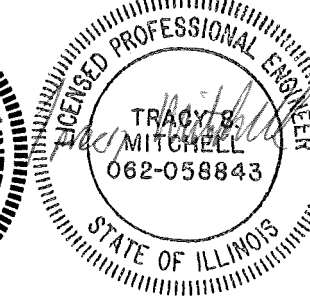
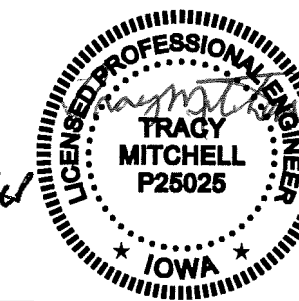
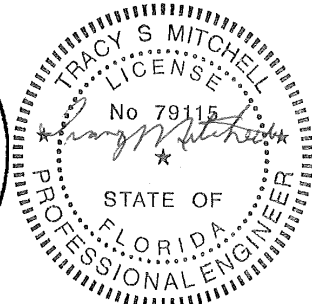
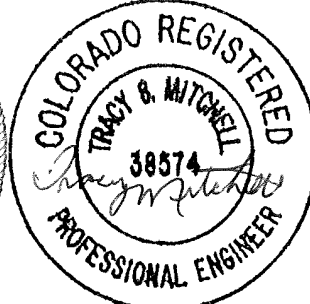
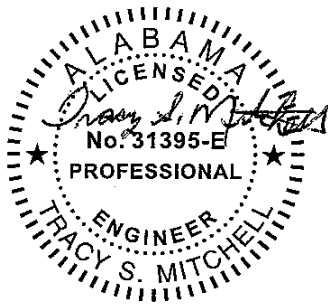
Ground Mount Shade Structure

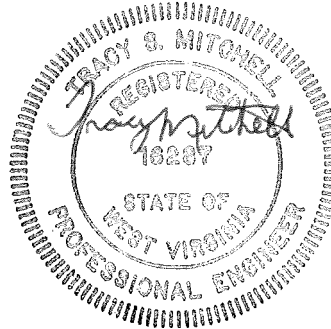
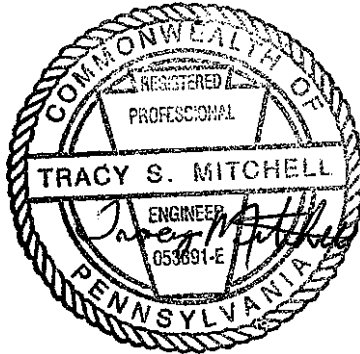
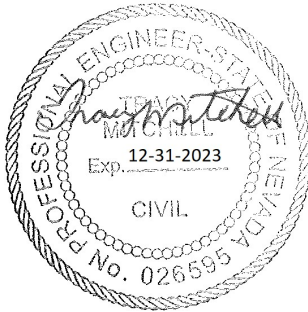
5 Modules

Exposure Category – B (6.16 ft x 3.42 ft)

ASCE 7-10 & ASCE 7-16

This Document Approved for the below:





EXP. 03/31/2024

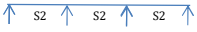


05/09/2022

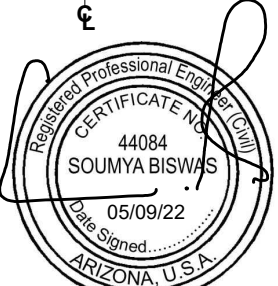
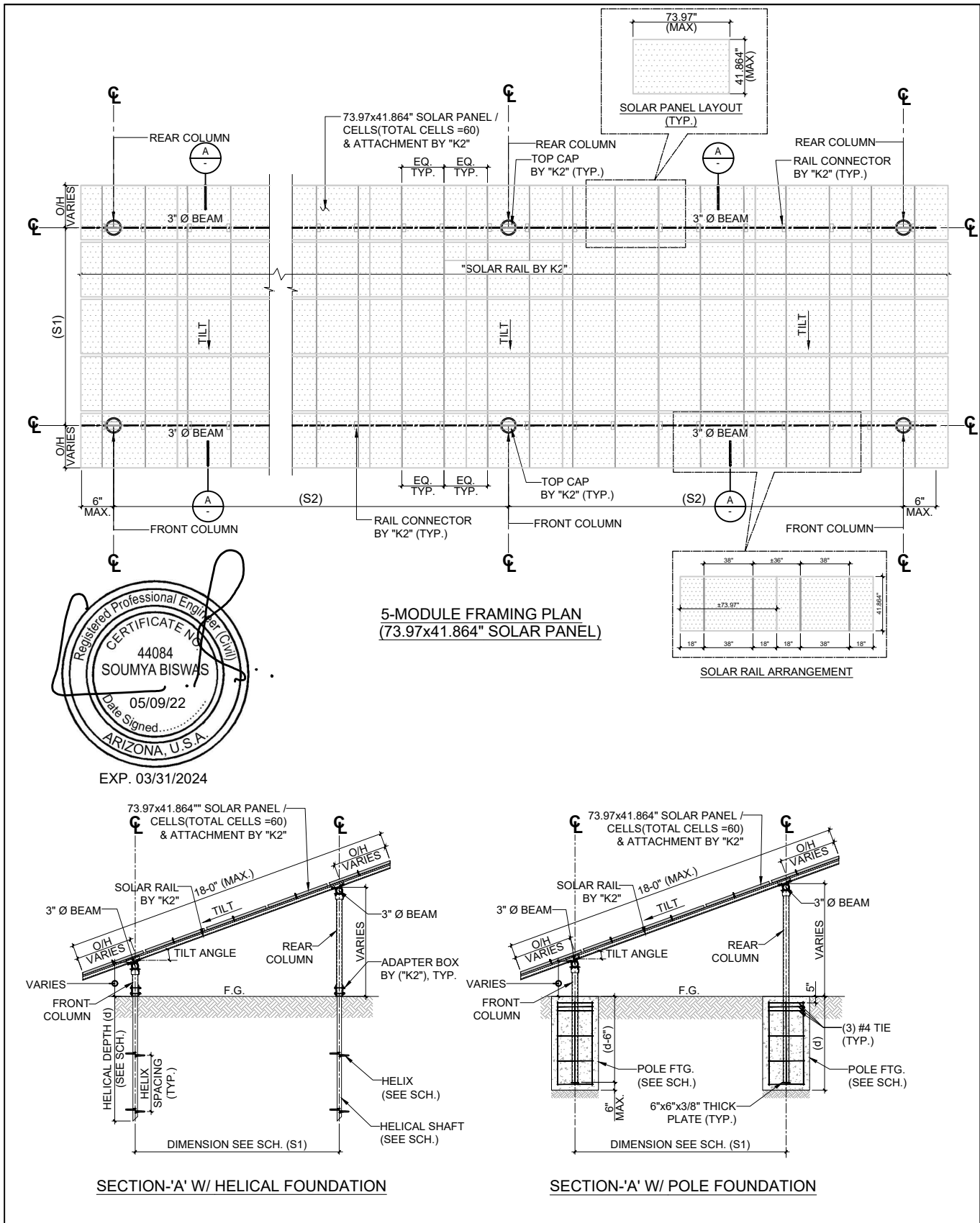
JOB NAME	→ Tyler Wiggins Everest	DATE	→ May 9, 2022
JOB NO.	→ AZ20170	CHECKER	→ SAM

**CRITERIA**

The system must allow for 4 modules & 5 modules installed in a landscape orientation.

- [A] - **GOVERNING CODE** → IBC 2015, ACI 318-14 & ASCE 7-10 & IBC 2018, ACI 318-14 & ASCE 7-16
- [B] - **WIND SPEED (MPH)** → 90 MPH TO 120 MPH (in increments of 5 mph)
- [C] - **SNOW LOAD (PSF)** → 0 PSF TO 70 PSF (in increments of 10 psf)
- [D] - **TILT ANGLE** → 5 DEGREE TO 25 DEGREE (in increments of 5 Degree)
- [E] - **FOUNDATION** → POLE FOOTING  
→ HELICAL PILES (GOLIATH TECH Pile Cataloge)
- [F] - **SOIL-ASSUMPTION** → **SOIL BEARING**  
  - Bottoms of bearing footings shall bear on Undisturbed Native Soil  
4'-6 Below Existing Grade  
Design Soil Pressure 2000 Psf. per Table 1806.2 of IBC
  - **CLASS OF MATERIALS**  
Sand, silty sand, clayey sand, silty gravel and clayey gravel  
(SW, SP, SM, SC, GM and GC)
  - **LATERAL BEARING (psf/f below natural grade)**  
150 psf
  - **Coefficient of friction** 0.25
- [G] - **ASSUMPTION**
  - 3" Dia pipe beam → Three span condition 
  - 3" Dia pipe column → Base fix & Top Free
  - Beam Deflection
  - Column Deflection → L/120  
→ H/120
  - Loads are calculated for the Framing members provided & they are checked in bending, shear and deflection. The posts/column are designed as compression members and checked for compressive stresses.
  - Structural concrete shall be designed in accordance with the 'Building Code requirements for reinforced concrete (ACI 318-14).
  - The reinforcement of ASTM A615 Grade 60 shall be used in all the concrete structures.
  - Structural steel shall be designed in accordance with the specification given in steel construction manual - AISC 14th edition - ASD Method.
  - **Ground mount shade structure design for 4 - modules (6.16ft x 3.42ft) w/ 60cells/panels.**
  - **The Tables below assume the ultimate strength of Steel Top Bracket connectors meet the values and the minimum requirements for loading taken in teh calcs and criteria required to resist the member forces. All spacings between helicals are designed under this assumption. Manufacturer shall verify and certify compliance with these tabulated ultimate strength values to match or exceed the design assumptions in calculations thru adequate testing and lab data.**
- [H] - **Pole foundation Assumptions and Limitations:**
  - The references used in the different analysis methods in this program are as follows:-  
International Building Code (IBC) 2015,/2018 Section 1807.3.2.1, pages 403-404
  - This program will handle both horizontally as well as vertically applied loads. The vertical load may have an associated eccentricity which results in an additional overturning moment which is always assumed to add directly to the overturning moment produced by the horizontal load.
  - This program assumes that the top of the pier is at or above the top of the ground surface level.
  - This program assumes that the actual resisting surface is at or below the ground surface level.
  - This accounts for any weak soil or any soil which may be removed at the top
  - Yield strength of 2-7/8" dia piles -  $F_y = 60$  ksi
  - Compression values are based on fully laterally supported piles ( full embedded in soil), if not, contact engineer department for calculations.
  - All Design performed using ASD Method.

DRAWN	A.K.	SCALE	NT.5
DESIGN	A.D.	DATE	MAY-09-2022
CHECKED	SAM		



EXP. 03/31/2024

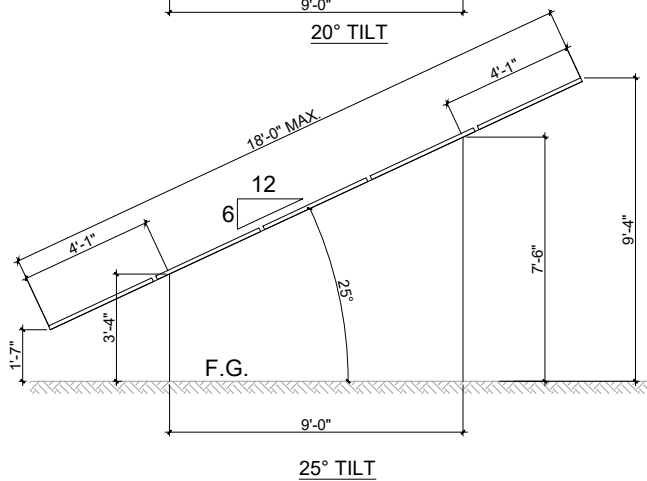
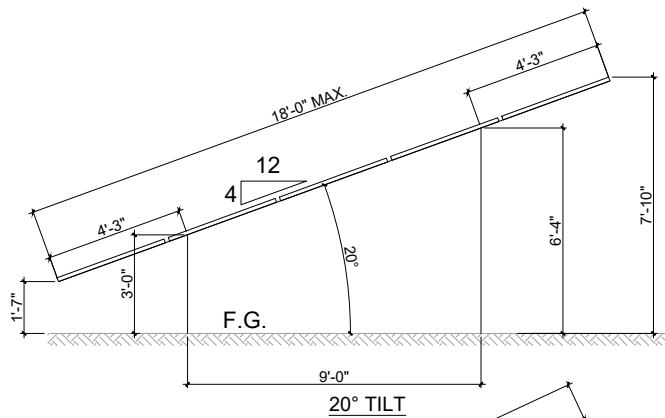
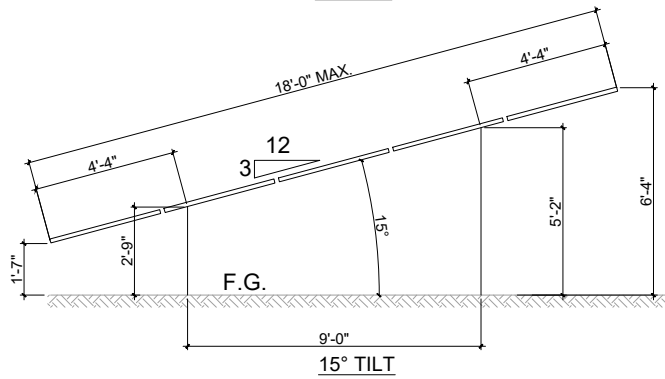
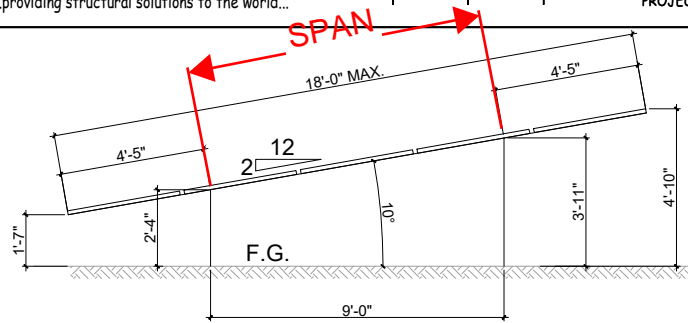
DRAWN	A.K.	SCALE	N.T.5
DESIGN	A.D.	DATE	MAY-09-2022
CHECKED	SAM		

PROJECT  
TYLER WIGGINS EVEREST  
ARIZONA

DRAWING TITLE  
5-MODULE SOLAR  
FRAME LINE DIAGRAM

PROJECT # AZ20170

DRG# SK-2



5-MODULE SOLAR FRAME LINE DIAGRAM  
(73.97x41.864" SOLAR PANEL)



EXP. 03/31/2024



**GM SOLAR SHADE-CHART (ASCE 7-10) - [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME → Tyler Wiggins Everest  
 JOB NO. → AZ20170

DATE CHECKER →

May 9, 2022  
 SAM

SR- No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg.)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation														Top Bracket Connection by K2 (See note 1,2,3,4,5)					
							Support @ Base Pole footing	Support @ Base Helical Pile	[S1] (ft- in)	[S2] (ft- in)	Pipe over- hang (OH) (ft- in)	Pole Footing Size						Helical Size						Welded Ground Screw (Model No.-5)						
												Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column				
												Dia. (D) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Dia. (D) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (in)	Depth (d) (ft- in)	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (in)		Depth (d) (ft- in)	Dia (in)	Length (in)	Dia (in)	Length (in)
1	1				0					19'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES

**NOTE:**  
 1 Top bracket connector design to be provided by K2. Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load test report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw  
 2 If Actual force is greater than Average force. Please contact K2 For special engineering design of Top bracket connection.  
 3 TOP bracket connector is reviewed only for the uplift value provided in Report prepared by K2.  
 4 Factor of Safety (FOS) = 1.2  
 5 Uplift force of top bracket = 1950 kg uplift force of top bracket with factor of safety = 1950 kg/1.2 = 1625 kg.  
 6 Yield Strs of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi  
 7 Yield Strs of 2.7/8" dia Helical pipe - Fy = 60 ksi (refer Goliath Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-10)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME → Tyler Wiggins Everest  
 JOB NO. → AZ220170

DATE CHECKER →

May 9, 2022  
 SAM

SR No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg.)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation												Top Bracket Connection by K2 (See note 1,2,3,4,5)							
							Support @ Base Pole Footing	Support @ Base Helical Pile	[S1] (ft-in)	[S2] (ft-in)	Pole Footing Size			Helical Size						Welded Ground Screw (Model No.-5)			Average Uplift force- 1950 kg (1625 kg w/ FOS)							
											Front Column	Depth (d) (ft)	#5 Reinf. Spacing	Front Column	Depth (d) (ft)	#5 Reinf. Spacing	Front Column	Depth (d) (ft)	#5 Reinf. Spacing	Front Column	Depth (d) (ft)	#5 Reinf. Spacing		Front Column	Depth (d) (ft)	#5 Reinf. Spacing	Front Column	Depth (d) (ft)	#5 Reinf. Spacing	
1	10	A & B	B	0	0	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2	10	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3	10	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
4	10	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
5	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6	10	A & B	B	0	0	≤ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
7	10	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
8	10	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
9	10	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
10	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
11	10	A & B	B	0	0	≤ 6	NO	NO	9'-0"	15'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
12	10	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	15'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
13	10	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	15'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
14	10	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	15'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	15'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
16	10	A & B	B	0	0	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
17	10	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
18	10	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
19	10	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
20	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
21	10	A & B	B	0	0	≤ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
22	10	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
23	10	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
24	10	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
25	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
26	10	A & B	B	0	0	≤ 6	NO	NO	9'-0"	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
27	10	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
28	10	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
29	10	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	13'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
30	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	13'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
31	10	A & B	B	0	0	≤ 6	NO	NO	9'-0"	12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
32	10	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
33	10	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
34	10	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	12'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
35	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	12'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES

- NOTE:-**
- 1 Top bracket connector design to be provided by "K2". Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw
  - 2 If Actual force is greater than Average force, Please contact K2 For special engineering design of Top bracket connection.
  - 3 TOP bracket connector is reviewed only for the uplift value provided in Report prepared by "K2".
  - 4 Factor of Safety (FOS) = 1.2
  - 5 Uplift force of top bracket = 1950 kg, uplift force of top bracket with factor of safety = 1950 kg 1.2 = 1625 kg.
  - 6 Yield Stress of 3" dia pipe - Fy = 33 ksi & Fu = 58 ksi
  - 7 Yield Stress of 2-7/8" dia Helical pipe - Fy = 60 ksi (refer Goliath Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-10)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME → Tyler Wiggins Everest  
JOB NO. → AZ220170

DATE CHECKER →

May 9, 2022  
SAM

SR- No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg.)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Pipe overhang (OH) (ft-in)	Foundation												Top Bracket Connection by K2 (See note 1,2,3,4,5)						
							Support @ Base Pole footing	Support @ Base Helical Pile	[S1] (ft-in)	[S2] (ft-in)		Pole Footing Size						Helical Size						Welded Ground Screw (Model No.-5)				Average Uplift force- 1950 kg (1625 kg w/ FOS)		
												Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column				
Dia. (D) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Dia. (D) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (in)	Depth (d) (ft-in)	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)													
1	120	A & B	B	05-10	0	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2					1-10					14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3					11-20					14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
4					21-30					10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
5					31-40					9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6					41-50					8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
7					51-60					7'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
8					61-70					7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
9					0					13'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
10					1-10					13'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
11					11-20					13'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
12					21-30					10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
13					31-40					9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
14					41-50					8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15					51-60					7'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
16					61-70					7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
17				0	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES					
18				1-10	13'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES					
19				11-20	10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES					
20				21-30	9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
21				31-40	8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
22				41-50	7'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
23				51-60	7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
24				61-70	7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
25				0	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES					
26				1-10	12'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES					
27				11-20	12'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES					
28				21-30	10'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
29				31-40	9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
30				41-50	8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
31				51-60	7'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					
32				61-70	7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES					

**NOTE:-**  
 1 Top bracket connector design to be provided by "K2". Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load test report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw  
 2 If Actual force is greater than Average force, Please contact K2 For special engineering design of Top bracket connection.  
 3 TOP bracket connector is reviewed only for the uplift value provided in Report prepared by "K2"  
 4 Factor of Safety (FOS) = 1.2  
 5 Uplift force of top bracket = 1950 kg, uplift force of top bracket with factor of safety = 1950 kg/1.2 = 1625 kg  
 6 Yield Stns of 3" dia pipe - Fy = 33 ksi & Fu = 58 ksi  
 7 Yield Stns of 2-7/8" dia Helical pipe - Fy = 60 ksi (refer Galath Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-16)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME → Tyler Wiggins Everest  
 JOB NO. → AZ20170

DATE CHECKER →

May 9, 2022  
 SAM

SR- No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg.)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation														Top Bracket Connection by K2 (See note 1,2,3,4,5)					
							Support @ Base Pole footing	Support @ Base Helical Pile	[S1] (ft- in)	[S2] (ft- in)	Pole Footing Size			Helical Size				Welded Ground Screw (Model No.-5)				Average Uplift force- 1950 kg (1625 kg w/ FOS)								
											Front Column	Rear Column	#5 Reinf. Spacing	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column		Length (in)	Length (in)						
1	0									19'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2	1-10									17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3	11-20									13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
4	21-30			05-10			NO	NO		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
5	31-40									9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6	41-50									8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
7	51-60									7'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
8	61-70									7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
9	0									18'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
10	1-10									17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
11	11-20									13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
12	21-30			11-15			NO	NO		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
13	31-40									9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
14	41-50									8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15	51-60									7'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
16	61-70									7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
17	0									18'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
18	1-10									17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
19	11-20									13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
20	21-30			16-20			NO	NO		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
21	31-40									9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
22	41-50									8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
23	51-60									7'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
24	61-70									7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
25	0									17'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
26	1-10									17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
27	11-20									13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
28	21-30			21-25			NO	NO		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
29	31-40									9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
30	41-50									8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
31	51-60									7'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
32	61-70									7'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES

- NOTE:**
- 1 Top bracket connector design to be provided by K2. Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load test report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw
  - 2 If Actual force is greater than Average force. Please contact K2 For special engineering design of Top bracket connection.
  - 3 TOP bracket connector is reviewed only for the uplift value provided in Report prepared by K2.
  - 4 Factor of Safety (FOS) = 1.2
  - 5 Uplift force of top bracket = 1950 kg uplift force of top bracket with factor of safety = 1950 kg/1.2 = 1625 kg.
  - 6 Yield Stres of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
  - 7 Yield Stres of 2.7/8" dia Helical pipe - Fy = 60 ksi (refer Goliath Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-16)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME: Tyler Wiggins Everest  
 JOB NO.: AZ220170  
 DATE CHECKER: →  
 May 9, 2022 SAM

SR No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation												Top Bracket Connection by K2 (See note 1,2,3,4,5)							
							Support @ Base Pole Footing	Support @ Base Helical Pile	[S1] (ft-in)	[S2] (ft-in)	Pole Footing Size			Helical Size						Welded Ground Screw (Model No.-5)			Average Uplift force- 1950 kg (1625 kg w/ FOS)							
											Front Column	Rear Column	#5 Reinf. Spacing	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column									
1	10	A & B	B	0	0	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2	10	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3	10	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
4	10	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
5	10	A & B	B	61-70	7-0"	≤ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6	10	A & B	B	0	0	≥ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
7	10	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
8	10	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
9	10	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
10	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
11	10	A & B	B	0	0	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
12	10	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
13	10	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
14	10	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
16	10	A & B	B	0	0	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
17	10	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
18	10	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
19	10	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
20	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
21	10	A & B	B	0	0	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
22	10	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
23	10	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
24	10	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
25	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
26	10	A & B	B	0	0	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
27	10	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
28	10	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
29	10	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
30	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
31	10	A & B	B	0	0	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
32	10	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
33	10	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
34	10	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
35	10	A & B	B	61-70	7-0"	≥ 6	NO	NO	9'-0"	14'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES

**NOTE:-**  
 1 Top bracket connector design to be provided by "K2". Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw  
 2 If Actual force is greater than Average force, Please contact K2 For special engineering design of Top bracket connection.  
 3 TOP bracket connector is reviewed only for the uplift value provided in Report prepared by "K2".  
 4 Factor of Safety (FOS) = 1.2  
 5 Uplift force of top bracket = 1950 kg, uplift force of top bracket with factor of safety = 1950 kg 1.2 = 1625 kg.  
 6 Yield Stress of 3" dia pipe - Fy = 33 ksi & Fu = 58 ksi  
 7 Yield Stress of 2-7/8" dia Helical pipe - Fy = 60 ksi (refer Galath Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-16)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME → Tyler Wiggins Everest  
 JOB NO. → AZ220170

DATE CHECKER →

May 9, 2022  
 SAM

SR- No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg.)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation												Top Bracket Connection by K2 (See note 1,2,3,4,5)							
							Support @ Base Pole footing	Support @ Base Helical Pile	[S1] (ft-in)	[S2] (ft-in)	Pipe overhang (OH) (ft-in)	Pole Footing Size						Helical Size						Welded Ground Screw (Model No.-5)				Average Uplift force- 1950 kg (1625 kg w/ FOS)		
												Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column				
Dia. (D) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Dia. (D) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (in)	Depth (d) (ft-in)	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)													
1	120	A & B	B	05-10	0	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2					14'-6"					0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES	
3					13'-0"					0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES	
4					10'-6"					0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES	
5					9'-6"					0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES	
6					8'-6"					0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES	
7					7'-6"					0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES	
8					7'-0"					0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES	
9					13'-6"					0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES	
10					13'-0"					0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES	
11					11'-20"					0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES	
12					10'-6"					0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES	
13					9'-6"					0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES	
14					8'-6"					0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES	
15					7'-6"					0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES	
16					61-70"					0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES	
17				0	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES						
18				1-10"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES						
19				11-20"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES						
20				21-30"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES						
21				31-40"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES						
22				41-50"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES						
23				51-60"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES						
24				61-70"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES						
25				0	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES						
26				1-10"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES						
27				11-20"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES						
28				21-30"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES						
29				31-40"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES						
30				41-50"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES						
31				51-60"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES						
32				61-70"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES						

**NOTE:-**  
 1 Top bracket connector design to be provided by K2. Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load test report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw  
 2 If Actual force is greater than Average force, Please contact K2 For special engineering design of Top bracket connection.  
 3 TOP bracket connector is reviewed only for the uplift value provided in Report prepared by K2  
 4 Factor of Safety (FOS) = 1.2  
 5 Uplift force of top bracket = 1950 kg, uplift force of top bracket with factor of safety = 1950 kg/1.2 = 1625 kg  
 6 Yield Stns of 3" dia pipe - Fy = 33 ksi & Fu = 58 ksi  
 7 Yield Stns of 2-7/8" dia Helical pipe - Fy = 60 ksi (refer Galath Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-10)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME: Tyler Wiggins Everest  
 JOB NO.: AZ220170  
 DATE CHECKER: SAM  
 May 9, 2022

SR. No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg.)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace	Support @ Base Pole Footing	Support @ Base Helical Pole	3" Pipe SCH 40 Column Spacing		Foundation												Top Bracket Connection by "K2" (see note 1,2,3,4,5)					
										[S1] (ft-in)	[S2] (ft-in)	Pole Footing Size				Helical Size				Welded Ground Screw (Model No.-5)				Average Uplift force- 1950 kg (1625 kg w/ FDS)					
												Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column										
										Di.a (ft)	Depth (ft)	#5 Reinf. Spacing	Di.a (ft)	Depth (ft)	#5 Reinf. Spacing	Shaft Dia. (ft)	No's Helix	Helix Dia. (in)	Depth (ft)	Shaft Dia. (ft)	No's Helix	Helix Dia. (in)	Depth (ft)	Di.a (in)	Length (in)	Di.a (in)	Length (in)		
1	0				0				21'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2	1-10				1-10				18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3	11-20				11-20				14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
4	21-30				21-30		NO	NO	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
5	31-40				31-40				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6	41-50				41-50				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
7	51-60				51-60				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
8	61-70				61-70				8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
9	0				0				20'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
10	1-10				1-10				18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
11	11-20				11-20				14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
12	21-30				21-30		NO	NO	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
13	31-40				31-40				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
14	41-50				41-50				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15	51-60				51-60				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
16	61-70				61-70				8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
17	0				0				20'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
18	1-10				1-10				18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
19	11-20				11-20				14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
20	21-30				21-30		NO	NO	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
21	31-40				31-40				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
22	41-50				41-50				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
23	51-60				51-60				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
24	61-70				61-70				8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
25	0				0				19'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
26	1-10				1-10				18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
27	11-20				11-20		NO	NO	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
28	21-30				21-30				12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
29	31-40				31-40				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
30	41-50				41-50				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
31	51-60				51-60				9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
32	61-70				61-70				8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES

**NOTE:**  
 1 Top bracket connector design to be provided by "K2". Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load test report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw  
 2 If Actual force is greater than Average force, Please contact K2 For special engineering design of Top bracket connection.  
 3 TOP bracket connector is reviewed only for the uplift value in Report prepared by "K2"  
 4 Factor of Safety (FOS) = 1.2  
 5 Uplift force of top bracket = 1950 kg, uplift force of top bracket with factor of safety = 1950 kg/1.2 = 1625 kg  
 6 Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi  
 7 Yield Stress of 2-7/8" dia Helical pipe - Fy = 60 ksi (refer Geotith Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-10)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME: Tyler Wiggins Everest  
 JOB NO.: AZ20170  
 DATE CHECKER: May 9, 2022 SAM

SR- No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation												Top Bracket Connection by "K2" (see note 1,2,3,4,5)							
							Support @ Base	Support @ Base	16ft On	12ft On	Pole Footing Size				Helical Size				Welded Ground Screw (Model No.-5)				Average Uplift force- 1950 kg (1625 kg w/ FDS)							
							Support @ Base	Support @ Base	16ft On	12ft On	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column										
1	105	A & B	B	05-10	0	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2	105	A & B	B	05-10	1-10	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3	105	A & B	B	05-10	11-20	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
4	105	A & B	B	05-10	21-30	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
5	105	A & B	B	05-10	31-40	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6	105	A & B	B	05-10	41-50	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
7	105	A & B	B	05-10	51-60	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
8	105	A & B	B	05-10	61-70	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
9	105	A & B	B	05-10	0	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
10	105	A & B	B	05-10	1-10	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
11	105	A & B	B	05-10	11-20	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
12	105	A & B	B	05-10	21-30	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
13	105	A & B	B	05-10	31-40	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
14	105	A & B	B	05-10	41-50	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15	105	A & B	B	05-10	51-60	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
16	105	A & B	B	05-10	61-70	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
17	105	A & B	B	05-10	0	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
18	105	A & B	B	05-10	1-10	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
19	105	A & B	B	05-10	11-20	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
20	105	A & B	B	05-10	21-30	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
21	105	A & B	B	05-10	31-40	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
22	105	A & B	B	05-10	41-50	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
23	105	A & B	B	05-10	51-60	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
24	105	A & B	B	05-10	61-70	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
25	105	A & B	B	05-10	0	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
26	105	A & B	B	05-10	1-10	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
27	105	A & B	B	05-10	11-20	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
28	105	A & B	B	05-10	21-30	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'-0"	2'-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
29	105	A & B	B	05-10	31-40	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
30	105	A & B	B	05-10	41-50	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
31	105	A & B	B	05-10	51-60	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
32	105	A & B	B	05-10	61-70	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2'-7/8"	2	10	9'-0"	2'-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES

NOTE: 1 Top bracket connector design to be provided by "K2". Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load test report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw  
 2 If Actual force is greater than Average force. Please contact K2 For special engineering design of Top bracket connection.  
 3 Top bracket connector is reviewed only for the uplift value provided in Report prepared by "K2"  
 4 Factor of Safety (FOS) = 1.2  
 5 Uplift force of top bracket = 1950 kg, uplift force of top bracket with factor of safety = 1950 kg/1.2 = 1625 kg  
 6 Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi  
 7 Yield Stress of 2-7/8" dia Helical pipe - Fy = 60 ksi (refer Galvalith Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-10)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME → Tyler Wiggins Everest  
JOB NO. → AZ20170

DATE CHECKER →

May 9, 2022  
SAM

SR. No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg)	Roof Snow Load	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation												Top Bracket Connection by "K2" (see note 1,2,3,4,5)							
							Support @ Base	Support @ Top	16x16	18x18	Pole Footing Size				Helical Size				Welded Ground Screw (Model No.-5)											
											Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column												
1	120	A & B	B	0	0	≤ 6	NO	NO	9'-0"	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
2				1-10	1-10					17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3				11-20	11-20					14'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
4				21-30	21-30					12'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
5				31-40	31-40					9'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6				41-50	41-50					9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
7				51-60	51-60					8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
8				61-70	61-70					16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
9				0	1-10					16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
10				1-10	11-20					14'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
11				11-20	21-30					12'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
12				21-30	31-40					11'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
13				31-40	41-50					9'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
14				41-50	51-60					9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15				51-60	61-70					8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
16				61-70	0					15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
17				0	1-10					15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
18				1-10	11-20					14'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
19				11-20	21-30					12'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
20				21-30	31-40					11'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
21				31-40	41-50					9'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
22				41-50	51-60					9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
23				51-60	61-70					8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
24				61-70	0	≥ 6				16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
25				0	1-10					16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
26				1-10	11-20					14'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
27				11-20	21-30					12'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
28				21-30	31-40					11'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
29				31-40	41-50					9'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
30				41-50	51-60					9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
31				51-60	61-70					8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
32				61-70	0					15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES

- NOTE:**
- 1 Top bracket connector design to be provided by "K2". Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load test report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw
  - 2 If Actual force is greater than Average force, Please contact K2 For special engineering design of Top bracket connection.
  - 3 TOP bracket connector is reviewed only for the uplift value provided in Report prepared by "K2".
  - 4 Factor of Safety (FOS) = 1.2
  - 5 Uplift force of top bracket = 1950 kg, uplift force of top bracket with factor of safety = 1950 kg 1.2 = 1625 kg
  - 6 Yield Stress of 3" dia pipe - Fy = 58 ksi & Fu = 58 ksi
  - 7 Yield Stress of 2-7/8" dia Helical pipe - Fy = 60 ksi (refer Galath Tech Helical Chart)



**GM SOLAR SHADE-CHART (ASCE 7-16)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME → Tyler Wiggins Everest  
JOB NO. → AZ220170

DATE CHECKER →

May 9, 2022  
SAM

SR- No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg.)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation												Top Bracket Connection by "K2" (see note 1,2,3,4,5)							
							Support @ Base Pole Footing	Support @ Base Helical Pile	[S1] (ft-in)	[S2] (ft-in)	Pole Footing Size			Helical Size						Welded Ground Screw (Model No.-5)										
											Front Column	Rear Column	#5 Reinf. Spacing	Front Column	Rear Column	No's Helix	Helix Dia. (in)	Depth (d) (ft-in)	Shaft Dia. (D)(in)	No's Helix	Helix Dia. (in)	Depth (d) (ft-in)		Front Column	Rear Column	Length (in)				
1	0			05-10	0	≤ 6	NO	NO	9'-0"	21'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2	1-10			05-10	11-20	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3	11-20			05-10	21-30	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
4	21-30			05-10	31-40	≤ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
5	31-40			05-10	41-50	≤ 6	NO	NO	9'-0"	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6	41-50			05-10	51-60	≤ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
7	51-60			05-10	61-70	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
8	61-70			05-10	0	≥ 6	NO	NO	9'-0"	20'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
9	0			11-15	1-10	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
10	1-10			11-15	11-20	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
11	11-20			11-15	21-30	≤ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
12	21-30			11-15	31-40	≤ 6	NO	NO	9'-0"	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
13	31-40			11-15	41-50	≤ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
14	41-50			11-15	51-60	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15	51-60			11-15	61-70	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
16	61-70			11-15	0	≥ 6	NO	NO	9'-0"	19'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
17	0			16-20	1-10	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
18	1-10			16-20	11-20	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
19	11-20			16-20	21-30	≤ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
20	21-30			16-20	31-40	≤ 6	NO	NO	9'-0"	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
21	31-40			16-20	41-50	≤ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
22	41-50			16-20	51-60	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
23	51-60			16-20	61-70	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
24	61-70			16-20	0	≥ 6	NO	NO	9'-0"	20'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
25	0			21-25	1-10	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
26	1-10			21-25	11-20	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
27	11-20			21-25	21-30	≤ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
28	21-30			21-25	31-40	≤ 6	NO	NO	9'-0"	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
29	31-40			21-25	41-50	≤ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
30	41-50			21-25	51-60	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
31	51-60			21-25	61-70	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
32	61-70			21-25	0	≥ 6	NO	NO	9'-0"	19'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
1	0			100	0	≤ 6	NO	NO	9'-0"	20'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2	1-10			100	11-20	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
3	11-20			100	21-30	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
4	21-30			100	31-40	≤ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
5	31-40			100	41-50	≤ 6	NO	NO	9'-0"	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6	41-50			100	51-60	≤ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
7	51-60			100	61-70	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
8	61-70			100	0	≥ 6	NO	NO	9'-0"	20'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
9	0			100	1-10	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
10	1-10			100	11-20	≤ 6	NO	NO	9'-0"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
11	11-20			100	21-30	≤ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
12	21-30			100	31-40	≤ 6	NO	NO																						



**GM SOLAR SHADE-CHART (ASCE 7-16)- [ARIZONA]**

**5 - Modules (6.16ft x 3.49ft) w/60cells/panels & 3" dia. SCH 40 Pipe.**

JOB NAME: Tyler Wiggins Everest  
 JOB NO.: AZ220170

DATE CHECKER: →

May 9, 2022  
 SAM

SR No's	Wind Speed (mph)	Seismic Category	Exposure Category	Tilt Angle (Deg)	Roof Snow Load (psf)	Mean Roof Height (ft)	3" Pipe Tie Brace		3" Pipe SCH 40 Column Spacing		Foundation												Top Bracket Connection by "K2" (see note 1,2,3,4,5)	Average Uplift force: 1950 kg (1625 kg w/ FOS)						
							Support @ Base Pole footing	Support @ Base Helical Pile	[S1] (ft-in)	[S2] (ft-in)	Pole Footing Size			Helical Size						Welded Ground Screw (Model No.-5)										
											Front Column	Depth (d) (ft)	#S Reinf. Spacing	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column	Front Column	Rear Column									
1	105	A & B	B	0	0	≤ 6	NO	NO	9'-0"	19'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
2	105	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
3	105	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
4	105	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
5	105	A & B	B	61-70	61-70	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
6	110	A & B	B	0	0	≥ 6	NO	NO	9'-0"	18'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
7	110	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	17'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
8	110	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
9	110	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
10	110	A & B	B	61-70	61-70	≥ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	12	10'-6"	2-7/8"	2	12	10'-6"	4.5	80	4.5	80	YES
11	110	A & B	B	0	0	≥ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
12	110	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	16'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
13	110	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
14	110	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
15	110	A & B	B	61-70	61-70	≥ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	12	10'-6"	2-7/8"	2	12	10'-6"	4.5	80	4.5	80	YES
16	115	A & B	B	0	0	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'-0"	2-7/8"	1	10	9'-0"	4.5	80	4.5	80	YES
17	115	A & B	B	1-10	11-20	≤ 6	NO	NO	9'-0"	18'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
18	115	A & B	B	21-30	31-40	≤ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
19	115	A & B	B	41-50	51-60	≤ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
20	115	A & B	B	61-70	61-70	≤ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-6"	3'-0"	8"	2'-6"	3'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
21	115	A & B	B	0	0	≥ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
22	115	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	16'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
23	115	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
24	115	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
25	115	A & B	B	61-70	61-70	≥ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-0"	8"	2-7/8"	2	12	10'-6"	2-7/8"	2	12	10'-6"	4.5	80	4.5	80	YES
26	115	A & B	B	0	0	≥ 6	NO	NO	9'-0"	16'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
27	115	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	15'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
28	115	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
29	115	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
30	115	A & B	B	61-70	61-70	≥ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	12	10'-6"	2-7/8"	2	12	10'-6"	4.5	80	4.5	80	YES
31	115	A & B	B	0	0	≥ 6	NO	NO	9'-0"	17'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
32	115	A & B	B	1-10	11-20	≥ 6	NO	NO	9'-0"	16'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'-6"	2-7/8"	2	8	7'-6"	4.5	80	4.5	80	YES
33	115	A & B	B	21-30	31-40	≥ 6	NO	NO	9'-0"	12'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
34	115	A & B	B	41-50	51-60	≥ 6	NO	NO	9'-0"	9'-0"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	10	9'-0"	2-7/8"	2	10	9'-0"	4.5	80	4.5	80	YES
35	115	A & B	B	61-70	61-70	≥ 6	NO	NO	9'-0"	8'-6"	0'-6"	2'-6"	3'-6"	8"	2'-6"	4'-6"	8"	2-7/8"	2	12	10'-6"	2-7/8"	2	12	10'-6"	4.5	80	4.5	80	YES

NOTE:  
 1 Top bracket connector design to be provided by "K2". Average Force of top bracket = 1950 kg (4299 lbs). Refer to Load report K2 North America Residential Ground Mount Top Cap 3/8" - 16 UNC x 5/8" set screw  
 2 If Actual force is greater than Average force. Please contact K2 For special engineering design of Top bracket connection.  
 3 TOP bracket connector is reviewed only for the uplift value provided in Report prepared by "K2".  
 4 Factor of Safety (FOS) = 1.2  
 5 Uplift force of top bracket = 1950 kg, uplift force of top bracket with factor of safety = 1950 kg 1.2 = 1625 kg.  
 6 Yield Stress of 3" dia pipe - Fy = 33 ksi & Fu = 58 ksi  
 7 Yield Stress of 2-7/8" dia Helical pipe - Fy = 60 ksi (refer Galvalith Tech Helical Chart)

