



2141 E BROADWAY ROAD, STE 207
TEMPE, AZ 85282
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Design Documents

Project:

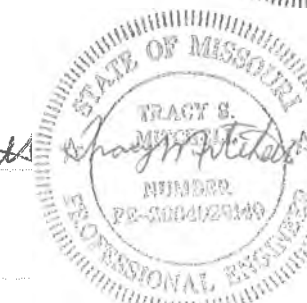
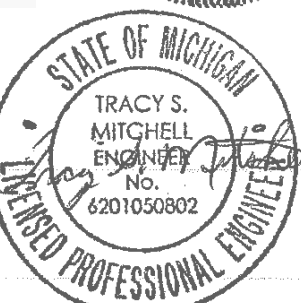
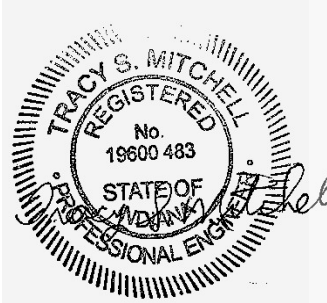
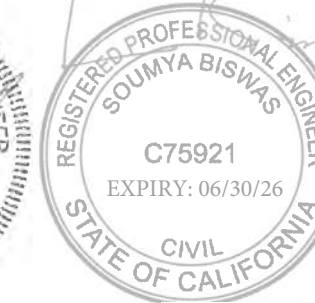
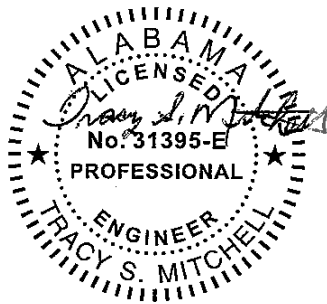
K2 Ground Mount

Schedule 40 PV Structure

Project No. AZ20170

Date: June 02, 2025

This Document Approved for the below:



This Document is Approved for the State of Arizona



Expiry - 03/31/2027



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4 MODULES 40 SCH.

	GM Solar Shade				
	JOB NAME JOB NO.	→ →	AZ20170	DATE CHECKER	→ → 10 July 2024 SAM

CRITERIA

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

- [A] - **GOVERNING CODE** → IBC 2015, ACI 318-14, ASCE 7-10, CBC 2016 & IBC 2018, ACI 318-14, ASCE 7-16, CBC 2019.
- [B] - **MODULE AREA** → 28.125 Square Foot.
- [C] - **WIND SPEED (MPH)** → 90,95,100,105,110,115,120,130,140,150 & 160 mph for exposure B & C
- [D] - **SNOW LOAD (PSF)** → 0 PSF TO 70 PSF (in increments of 10 psf)
- [E] - **TILT ANGLE** → 5 DEGREE TO 35 DEGREE (in increments of 5 Degree)
- [F] - **FOUNDATION** → POLE FOOTING
→ HELICAL PILES (US Helicals Cataloge)
→ KRINNER GROUND SCREW

- [G] - **SOIL- ASSUMPTION** → **SOIL BEARING**
Bottoms of bearing footings shall bear on Undisturbed Native Soil
(Refer tables for exact pile depths)
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

[H] - ASSUMPTION

- 3" Dia pipe beam Sch. 40 or Mechanical tubing option with 45 ksi yield strength, 8 gauge and galvanized.



Three span condition

- 3" Dia pipe Column Sch. 40 or Mechanical tubing option with 45 ksi yield strength, 8 gauge and galvanized.

Base fix & Top Free

- Yield Strss of 3" dia pipe (Sch. 40) - Fy = 35 ksi & Fu = 58 ksi
→ Yield Strss of krinner ground screw- Fy = 35 ksi

- Beam Deflection → L/120
→ Column Deflection → 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.

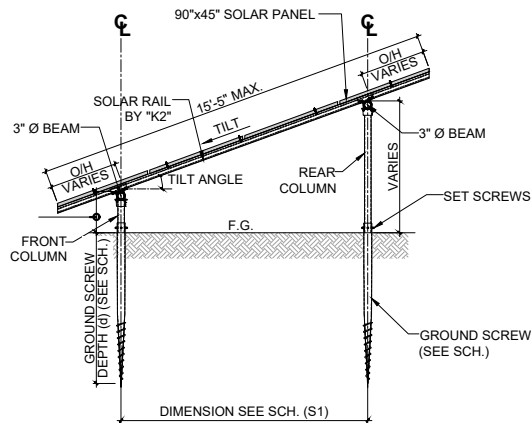
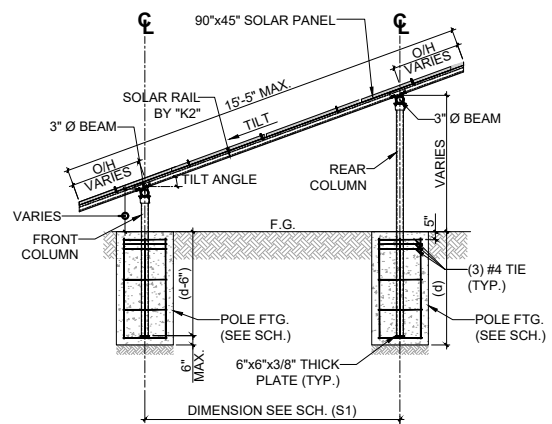
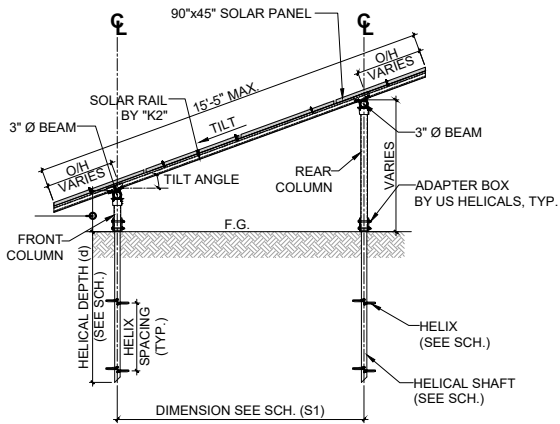
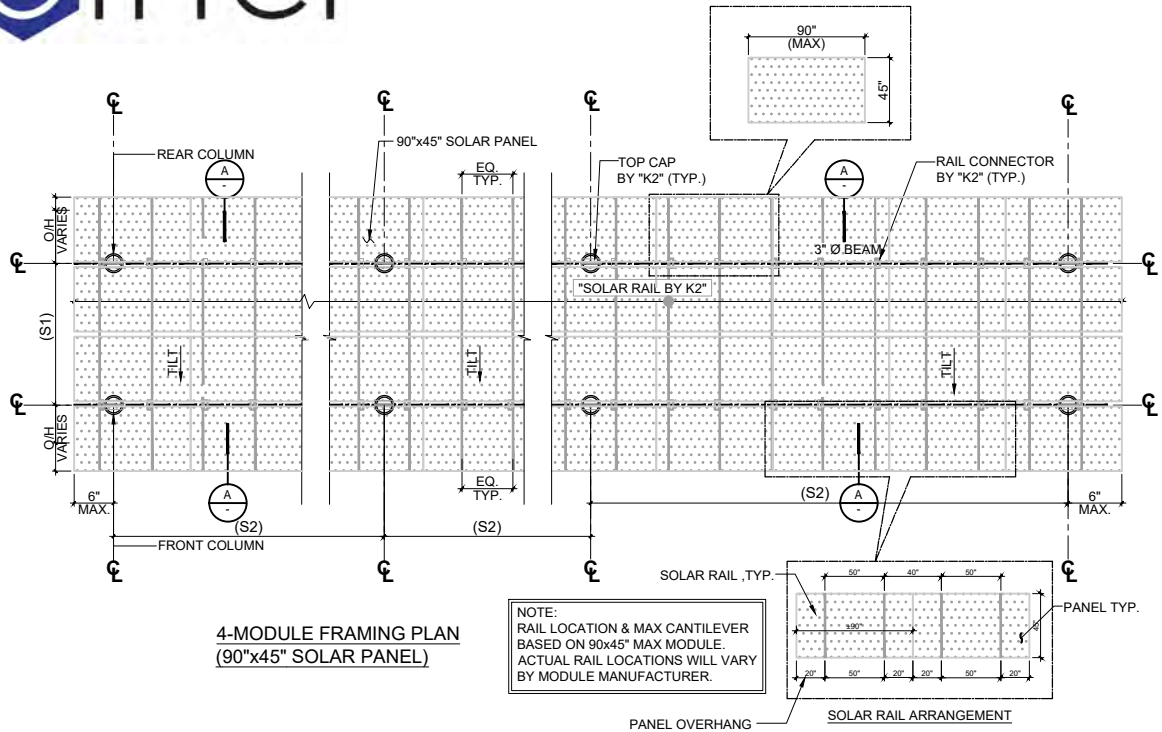
- Structural concrete shall be designed in accordance with the 'Building Code requirements for reinforced concrete (ACI 318-14).

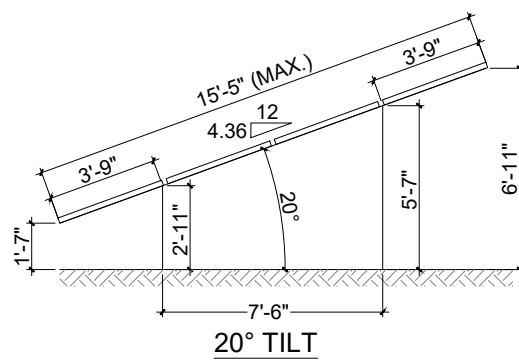
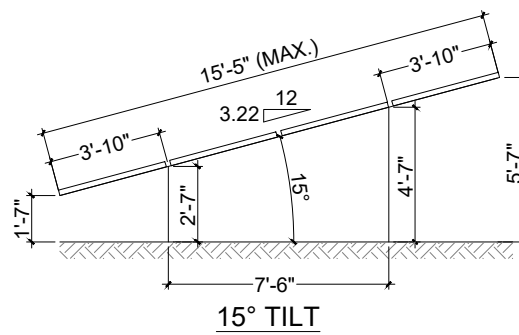
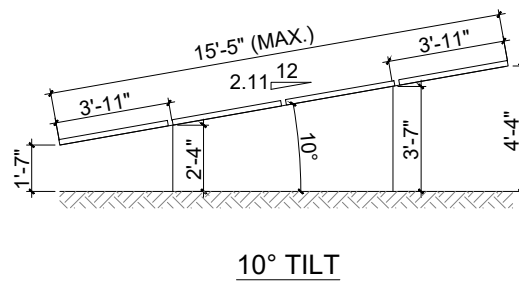
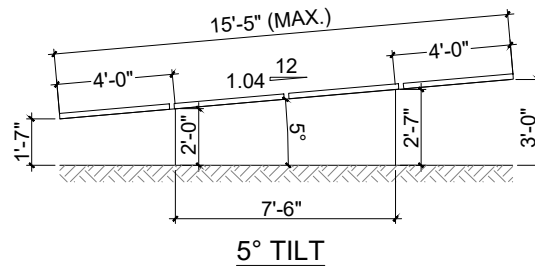
- The reinforcement of ASTM A615 Grade 60 shall be used in all the concrete structures.

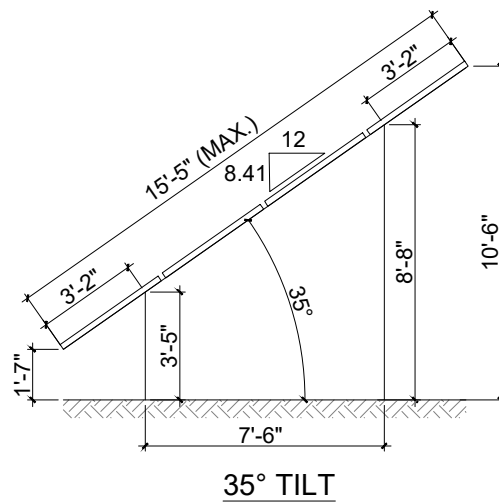
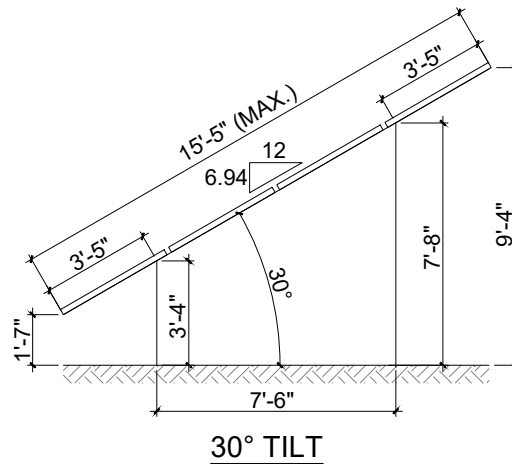
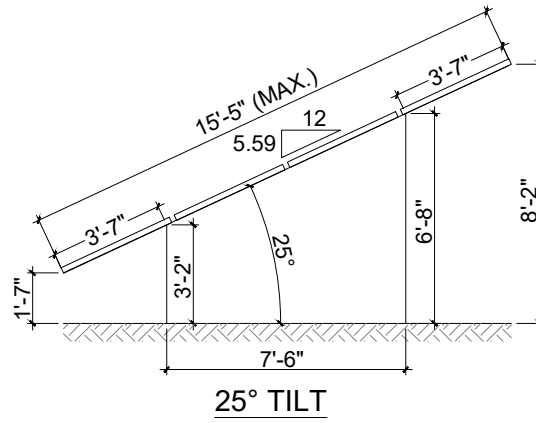
- Structural steel shall be designed in accordance with the specification given in steel construction manual - AISC 14th edition - ASD Method.

[I] - Pole foundation Assumptions and Limitations:

- The references used in the different analysis methods in this program are as follows:-
International Building Code (IBC) 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 - Fy = 60 ksi
- Compression values are based on fully laterally supported piles (full embeded in soil), if not, contact engineer department for calculations.
- All Design performed using ASD Method.









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Exposure B, ASCE 7-16, SCH 40- GM Chart for 4
Modules 90-160 Mph

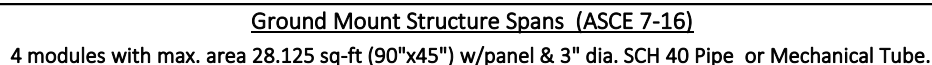


Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→		July 5, 2024
JOB NO.	→	A220170	CHECKER	→		SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hange (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.												
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)								
								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.No's (D)(in)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625				
1	90	B	5	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	508	1120	2.24	YES			
2				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	385	1429	2.85	YES			
3				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	327	1692	3.38	YES			
4				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1878	3.76	YES			
5				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	222	1810	3.62	YES			
6				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	195	1855	3.71	YES			
7				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	163	1810	3.62	YES			
8			10	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	553	1107	2.21	YES			
9				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	426	1410	2.82	YES			
10				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	358	1673	3.34	YES			
11				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1855	3.71	YES			
12				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1791	3.58	YES			
13				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	213	1832	3.67	YES			
14				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	181	1791	3.58	YES			
15			15	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1098	2.19	YES			
16				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	503	1397	2.79	YES			
17				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	426	1655	3.31	YES			
18				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	367	1837	3.67	YES			
19				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1773	3.55	YES			
20				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	249	1814	3.63	YES			
21				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	213	1773	3.55	YES			
22			20	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	703	1084	2.17	YES			
23				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	540	1383	2.77	YES			
24				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	454	1637	3.27	YES			
25				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1819	3.64	YES			
26				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1755	3.51	YES			
27				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	268	1796	3.59	YES			
28				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	227	1755	3.51	YES			
29			25	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	762	1061	2.12	YES			
30				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	585	1351	2.7	YES			
31				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	494	1601	3.2	YES			
32				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1796	3.59	YES			
33				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1714	3.43	YES			
34				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1755	3.51	YES			
35				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	249	1714	3.43	YES			
36			30	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	771	1039	2.08	YES			
37				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	590	1324	2.64	YES			
38				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	499	1565	3.13	YES			
39				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1737	3.47	YES			
40				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	340	1678	3.35	YES			
41				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	295	1714	3.43	YES			
42				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	249	1673	3.35	YES			
43			35	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	717	1007	2.01	YES			
44				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	549	1279	2.56	YES			
45				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	449	1542	3.08	YES			
46				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1678	3.36	YES			
47	41-50	7'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1619	3.24	YES					
48	51-60	6'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	277	1660	3.32	YES					
49	61-70	5'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	231	1619	3.24	YES					



SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																	US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column			Actual Force (kg)				
					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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625			
50	95	B	5	0-10	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	585	1120	2.24	YES	
51				11-20	13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	449	1429	2.85	YES	
52				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	381	1692	3.38	YES	
53				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1878	3.76	YES	
54				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	259	1810	3.62	YES	
55				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	227	1855	3.71	YES	
56			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	190	1810	3.62	YES		
57			10	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	639	1107	2.21	YES	
58				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	490	1410	2.82	YES	
59				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	413	1673	3.34	YES	
60				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	358	1855	3.71	YES	
61				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1791	3.58	YES	
62				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1832	3.67	YES	
63			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	209	1791	3.58	YES		
64			15	0-10	17'-0	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	753	1098	2.19	YES	
65				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	576	1397	2.79	YES	
66				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	490	1655	3.31	YES	
67				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1837	3.67	YES	
68				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1773	3.55	YES	
69				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1814	3.63	YES	
70			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1773	3.55	YES		
71			20	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	1084	2.17	YES	
72				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	617	1383	2.77	YES	
73				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	522	1637	3.27	YES	
74				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1819	3.64	YES	
75				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1755	3.51	YES	
76				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1796	3.59	YES	
77			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	259	1755	3.51	YES		
78			25	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	871	1061	2.12	YES	
79				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	667	1351	2.7	YES	
80	21-30	11'-0"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	567	1601	3.2	YES			
81	31-40	9'-6"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1778	3.56	YES			
82	41-50	7'-6"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	385	1714	3.43	YES			
83	51-60	6'-6"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1755	3.51	YES			
84	61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1714	3.43	YES				
85	30	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	880	1039	2.08	YES			
86		11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	671	1324	2.64	YES			
87		21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	571	1565	3.13	YES			
88		31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1737	3.47	YES			
89		41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	390	1678	3.35	YES			
90		51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1714	3.43	YES			
91	61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	286	1673	3.35	YES				
92	35	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	1007	2.01	YES			
93		11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	630	1279	2.56	YES			
94		21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	517	1542	3.08	YES			
95		31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1678	3.36	YES			
96		41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1619	3.24	YES			
97		51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1660	3.32	YES			
98	61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	268	1619	3.24	YES				

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eiffel STRUCTURAL ENGINEERS Ground Mount Structure Spans (ASCE 7-16) 4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.																													
JOB NAME		→		AZ20170												DATE		→		July 5, 2024 SAM									
JOB NO.		→																											
SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size						Krinrer Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column		Actual Force (kg)					
					[S1] (ft-in)	[S2] (ft-in)			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.No's (D)(in)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625
99	100	B	5	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	671	1120	2.24	YES
100				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	512	1429	2.85	YES
101				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	435	1692	3.38	YES
102				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	376	1878	3.76	YES
103				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	295	1810	3.62	YES
104				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	259	1855	3.71	YES
105				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	218	1810	3.62	YES
106				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	730	1107	2.21	YES
107				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	558	1410	2.82	YES
108				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	472	1673	3.34	YES
109				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	408	1855	3.71	YES
110				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	322	1791	3.58	YES
111				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1832	3.67	YES
112				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	236	1791	3.58	YES
113			0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	857	1098	2.19	YES	
114			11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	653	1397	2.79	YES	
115			21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	553	1655	3.31	YES	
116			31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1837	3.67	YES	
117			41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	376	1773	3.55	YES	
118			51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1814	3.63	YES	
119			61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	277	1773	3.55	YES	
120			0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	912	1084	2.17	YES	
121			11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	698	1383	2.77	YES	
122			21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	590	1637	3.27	YES	
123			31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1819	3.64	YES	
124			41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1755	3.51	YES	
125			51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1796	3.59	YES	
126			61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	295	1755	3.51	YES	
127			0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	989	1061	2.12	YES	
128			11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	753	1351	2.7	YES	
129			21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	639	1601	3.2	YES	
130			31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	553	1778	3.56	YES	
131			41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	435	1714	3.43	YES	
132			51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	376	1755	3.51	YES	
133			61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1714	3.43	YES	
134			0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	993	1039	2.08	YES	
135			11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	762	1324	2.64	YES	
136			21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	644	1565	3.13	YES	
137			31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	558	1737	3.47	YES	
138			41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	440	1678	3.35	YES	
139			51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	381	1714	3.43	YES	
140			61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	322	1673	3.35	YES	
141		0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	930	1007	2.01	YES		
142	11-20	13'-0"		0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	712	1279	2.56	YES			
143	21-30	11'-0"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	585	1542	3.08	YES			
144	31-40	9'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1678	3.36	YES			
145	41-50	7'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	408	1619	3.24	YES			
146	51-60	6'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1660	3.32	YES			
147	61-70	5'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	299	1619	3.24	YES			
NOTE:																													
1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).																													
2 If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.																													
3 Top Cap is reviewed only for the uplift value provided in Report.																													
4 Factor of Safety (FOS) = 1.2																													
5 Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.																													
6 Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi																													
7 Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)																													
8 Bracing not required.																													

	Ground Mount Structure Spans (ASCE 7-16) 4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.									
	JOB NAME JOB NO.	→ →	A220170	DATE CHECKER	→ →	July 5, 2024 SAM				

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation														US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)					
								Pole Footing Size					US Helical Size					Krinner Ground Screws G114x1600.												
								Front Column		Rear Column			Front Column		Rear Column			Front Column		Rear Column										
					[S1] (ft-in)	[S2] (ft-in)	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/No's (D)/(in)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625			
148				0-10			17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	762	1120	2.24	YES
149				11-20			13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	580	1429	2.85	YES
150				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	490	1692	3.38	YES
151				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1878	3.76	YES
152				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1810	3.62	YES
153				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1855	3.71	YES
154				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1810	3.62	YES
155				0-10			17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	1107	2.21	YES
156				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	630	1410	2.82	YES
157				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	535	1673	3.34	YES
158				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1855	3.71	YES
159				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1791	3.58	YES
160				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1832	3.67	YES
161				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	268	1791	3.58	YES
162				0-10			17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	961	1098	2.19	YES
163				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	735	1397	2.79	YES
164				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	621	1655	3.31	YES
165				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	540	1837	3.67	YES
166				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1773	3.55	YES
167				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	367	1814	3.63	YES
168				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1773	3.55	YES
169				0-10			17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1025	1084	2.17	YES
170				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	785	1383	2.77	YES
171				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	662	1637	3.27	YES
172				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1819	3.64	YES
173				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	454	1755	3.51	YES
174				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	390	1796	3.59	YES
175				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1755	3.51	YES
176				0-10			16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1043	997.7	2	YES
177				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1351	2.7	YES
178				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	717	1601	3.2	YES
179				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	617	1778	3.56	YES
180				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1714	3.43	YES
181				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1755	3.51	YES
182				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	358	1714	3.43	YES
183				0-10			16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1052	979.6	1.95	YES
184				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	1324	2.64	YES
185				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	721	1565	3.13	YES
186				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1737	3.47	YES
187				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	494	1678	3.35	YES
188				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1714	3.43	YES
189				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1673	3.35	YES
190				0-10			16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	980	947.8	1.9	YES
191				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	1279	2.56	YES
192				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	662	1542	3.08	YES
193				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	585	1678	3.36	YES
194				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1619	3.24	YES
195				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	399	1660	3.32	YES
196				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8																			



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

→

A220170

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→

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July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation														US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)				
								Pole Footing Size				US Helical Size				Krinner Ground Screws G114x1600.				Actual Force (kg)									
								Front Column		Rear Column		Front Column		Rear Column		Front Column		Rear Column											
					[S1] (ft-in)	[S2] (ft-in)		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 DiaNo's (D)(in)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
197	110	B	5	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	1120	2.24	YES
198				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	653	1429	2.85	YES
199				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	553	1692	3.38	YES
200				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1878	3.76	YES
201				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	376	1810	3.62	YES
202				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1855	3.71	YES
203				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	277	1810	3.62	YES
204			10	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	925	1107	2.21	YES
205				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	707	1410	2.82	YES
206				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	599	1673	3.34	YES
207				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1855	3.71	YES
208				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	408	1791	3.58	YES
209				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1832	3.67	YES
210				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	299	1791	3.58	YES
211			15	0-10	7'6"	16'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1043	1066	2.13	YES
212				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	1397	2.79	YES
213				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	698	1655	3.31	YES
214				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1837	3.67	YES
215				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1773	3.55	YES
216				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	413	1814	3.63	YES
217				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1773	3.55	YES
218			20	0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1075	1020	2.04	YES
219				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	875	1383	2.77	YES
220				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	739	1637	3.27	YES
221				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	639	1819	3.64	YES
222				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	503	1755	3.51	YES
223				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	435	1796	3.59	YES
224				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1755	3.51	YES
225			25	0-10	7'6"	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1125	970.5	1.94	YES
226				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	943	1351	2.7	YES
227				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	1601	3.2	YES
228				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1778	3.56	YES
229				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1714	3.43	YES
230				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	472	1755	3.51	YES
231				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	399	1714	3.43	YES
232			30	0-10	7'6"	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1098	916.1	1.83	YES
233				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	948	1324	2.64	YES
234				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	1565	3.13	YES
235				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	694	1737	3.47	YES
236				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1678	3.35	YES
237				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1714	3.43	YES
238				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1673	3.35	YES
239			35	0-10	7'6"	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1025	888.9	1.78	YES
240				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	889	1279	2.56	YES
241				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	739	1542	3.08	YES
242				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"																



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME
JOB NO. → A220170

DATE
CHECKER →

July 5, 2024
SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hangs (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)			
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column			Rear Column			Formt Column		Rear Column		Actual Force (kg)						
					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/no's (D)(in) Helix	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625					
246	115	B	5	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	952	1120	2.24	YES	
247				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	726	1429	2.85	YES	
248				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	617	1692	3.38	YES	
249				31-40			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	531	1878	3.76	YES	
250				41-50			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	422	1810	3.62	YES	
251				51-60			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1855	3.71	YES	
252				61-70			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	308	1810	3.62	YES	
253				10	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1029	1107	2.21	YES
254					11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	785	1410	2.82	YES
255					21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	667	1673	3.34	YES
256					31-40			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	576	1855	3.71	YES
257					41-50			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	454	1791	3.58	YES
258					51-60			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	395	1832	3.67	YES
259					61-70			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	331	1791	3.58	YES
260			15	0-10	7'6"	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1088	997.7	2	YES	
261				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	912	1397	2.79	YES	
262				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	771	1655	3.31	YES	
263				31-40			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	667	1837	3.67	YES	
264				41-50			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	526	1773	3.55	YES	
265				51-60			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1814	3.63	YES	
266				61-70			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	385	1773	3.55	YES	
267			20	0-10	7'6"	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1120	956.9	1.91	YES	
268				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	971	1383	2.77	YES	
269				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	1637	3.27	YES	
270				31-40			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	707	1819	3.64	YES	
271				41-50			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1755	3.51	YES	
272				51-60			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	485	1796	3.59	YES	
273				61-70			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	408	1755	3.51	YES	
274			25	0-10	7'6"	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1166	907	1.81	YES	
275				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1043	1351	2.7	YES	
276				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	884	1601	3.2	YES	
277				31-40			0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	762	1778	3.56	YES	
278				41-50			0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1714	3.43	YES	
279				51-60			0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	552	1755	3.51	YES	
280				61-70			0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	440	1714	3.43	YES	
281			30	0-10	7'6"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1175	884.4	1.77	YES	
282				11-20			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1052	1324	2.64	YES	
283				21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	889	1565	3.13	YES	
284				31-40			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	766	1737	3.47	YES	
285				41-50			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	608	1678	3.35	YES	
286				51-60			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	526	1714	3.43	YES	
287				61-70			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1673	3.35	YES	
288			35	0-10	7'6"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1098	857.1	1.71	YES	
289				11-20			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	984	1279	2.56	YES	
290				21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	1542	3.08	YES	
291				31-40			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	721	1678	3.36	YES	
292	41-50	0'-6"		2'-0"			3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	567	1619	3.24	YES			
293	51-60	0'-6"		2'-0"			3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	490	1660	3.32	YES			
294	61-70	0'-6"		2'-0"			3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	417	1619	3.24	YES			



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME
JOB NO.

→
→

A220170

DATE
CHECKER

→
→

July 5, 2024
SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang- (ft-in)	Foundation																								US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size												Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Formt Column		Rear Column		Actual Force (kg)										
								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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625							
295				0-10		16'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1020	1084	2.17			YES					
296				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	1429	2.85			YES					
297				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	680	1692	3.38			YES					
298				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	590	1878	3.76			YES					
299				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1810	3.62			YES					
300				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1855	3.71			YES					
301				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1810	3.62			YES					
302				0-10		16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1070	1043	2.08			YES					
303				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	871	1410	2.82			YES					
304				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	735	1673	3.34			YES					
305				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1855	3.71			YES					
306				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	503	1791	3.58			YES					
307				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1832	3.67			YES					
308				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1791	3.58			YES					
309				0-10		14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1125	934.2	1.87			YES					
310				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1007	1397	2.79			YES					
311				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1655	3.31			YES					
312				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	735	1837	3.67			YES					
313				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	580	1773	3.55			YES					
314				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	503	1814	3.63			YES					
315				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1773	3.55			YES					
316				0-10		14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1193	925.2	1.85			YES					
317				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1070	1383	2.77			YES					
318				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	902	1637	3.27			YES					
319				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1819	3.64			YES					
320				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1755	3.51			YES					
321				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1796	3.59			YES					
322				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	454	1755	3.51			YES					
323				0-10		14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1238	875.3	1.75			YES					
324				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1152	1351	2.7			YES					
325				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	975	1601	3.2			YES					
326				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1778	3.56			YES					
327				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	662	1714	3.43			YES					
328				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	576	1755	3.51			YES					
329				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	485	1714	3.43			YES					
330				0-10		13'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1202	825.4	1.65			YES					
331				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1156	1324	2.64			YES					
332				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	980	1565	3.13			YES					
333				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	844	1737	3.47			YES					
334				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	667	1678	3.35			YES					
335				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	580	1714	3.43			YES					
336				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	490	1673	3.35			YES					
337				0-10		14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1125	798.2	1.6			YES					
338				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1084	1279	2.56			YES					
339				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	902	1542	3.08			YES					
340				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	794	1678	3.36			YES					
341				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	626	1619	3.24			YES					
342				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1660	3.32			YES					
343				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	45										



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→		July 5, 2024
JOB NO.	→	A220170	CHECKER	→		SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size				US Helical Size				Krinner Ground Screws G114x1600.				Actual Force (kg)									
								Front Column		Rear Column		Front Column		Rear Column		Front Column		Rear Column		Uplift Force		Downward		Horiz.					
					[S1] (ft-in)	[S2] (ft-in)		Dia. (D) (ft)	Depth (d) (ft)	#S Reinf. Spacing	Dia. (D) (ft)	Depth (d) (ft)	#S Reinf. Spacing	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (in)	Depth (d) (ft-in)	Shaft Dia.No's (D)(in) Helix	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
344	130	B	5	0-10	7'6"	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1120	988.7	1.97	YES
345				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	971	1429	2.85	YES
346				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	1692	3.38	YES
347				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	712	1878	3.76	YES
348				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	562	1810	3.62	YES
349				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	485	1855	3.71	YES
350				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	413	1810	3.62	YES
351			10	0-10	7'6"	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1166	943.3	1.89	YES
352				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1048	1410	2.82	YES
353				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	884	1673	3.34	YES
354				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1855	3.71	YES
355				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1791	3.58	YES
356				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	522	1832	3.67	YES
357				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	444	1791	3.58	YES
358			15	0-10	7'6"	13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1256	870.7	1.74	YES
359				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1206	1397	2.79	YES
360				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1020	1655	3.31	YES
361				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	884	1837	3.67	YES
362				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	698	1773	3.55	YES
363				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1814	3.63	YES
364				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	512	1773	3.55	YES
365			20	0-10	7'6"	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1279	829.9	1.66	YES
366				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1279	1383	2.77	YES
367				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1084	1637	3.27	YES
368				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	934	1819	3.64	YES
369				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	739	1755	3.51	YES
370				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	639	1796	3.59	YES
371				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	540	1755	3.51	YES
372			25	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1324	780	1.56	YES
373				11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1324	1302	2.6	YES
374				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1166	1601	3.2	YES
375				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1007	1778	3.56	YES
376				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	794	1714	3.43	YES
377				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1755	3.51	YES
378				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	580	1714	3.43	YES
379			30	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1329	761.9	1.53	YES
380				11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1329	1270	2.54	YES
381				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1170	1565	3.13	YES
382				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1011	1737	3.47	YES
383				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1678	3.35	YES
384				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1714	3.43	YES
385				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	585	1673	3.35	YES
386			35	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1247	739.2	1.48	YES
387				11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1247	1229	2.46	YES
388				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1084	1542	3.08	YES
389		35	31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	948	1678	3.36	YES	
390	41-50		7'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	748	1619	3.24	YES		
391	51-60		6'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	649	1660	3.32	YES		
392	61-70		5'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1619	3.24	YES		



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

A220170

DATE

CHECKER

→

July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation														US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)					
								Pole Footing Size						US Helical Size													Krinner Ground Screws G114x1600.			
								Front Column			Rear Column			Front Column				Rear Column				Formt. Column		Rear Column		Actual Force (kg)				
					[S1] (ft-in)	[S2] (ft-in)			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.No's (D)(in)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
393	140	B	5	0-10	7'6"	14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1238	920.6	1.84	YES	
394				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1152	1429	2.85	YES	
395				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	975	1692	3.38	YES	
396				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1878	3.76	YES
397				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	662	1810	3.62	YES
398				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	576	1855	3.71	YES
399				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	485	1810	3.62	YES
400			10	0-10	7'6"	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1283	879.8	1.76	YES	
401				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1238	1410	2.82	YES	
402				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1048	1673	3.34	YES	
403				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	902	1855	3.71	YES
404				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	712	1791	3.58	YES
405				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	617	1832	3.67	YES
406				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	522	1791	3.58	YES
407			15	0-10	7'6"	12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1370	807.3	1.61	YES	
408				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1370	1342	2.68	YES	
409				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1206	1655	3.31	YES	
410				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1039	1837	3.67	YES
411				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	1773	3.55	YES
412				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	712	1814	3.63	YES
413				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1773	3.55	YES
414			20	0-10	7'6"	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1392	766.4	1.53	YES	
415				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1392	1274	2.55	YES	
416				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1274	1637	3.27	YES	
417				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1102	1819	3.64	YES
418				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	871	1755	3.51	YES
419				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	753	1796	3.59	YES
420				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	639	1755	3.51	YES
421			25	0-10	7'6"	11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1429	716.6	1.44	YES	
422				11-20			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1429	1197	2.39	YES	
423				21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1370	1601	3.2	YES	
424				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1184	1778	3.56	YES
425				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	934	1714	3.43	YES
426				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1755	3.51	YES
427				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	685	1714	3.43	YES
428			30	0-10	7'6"	11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1438	702.9	1.41	YES	
429				11-20			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1438	1170	2.34	YES	
430				21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1374	1565	3.13	YES	
431				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1188	1737	3.47	YES
432				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	939	1678	3.35	YES
433				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	1714	3.43	YES
434				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1673	3.35	YES
435			35	0-10	7'6"	11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1347	680.3	1.36	YES	
436				11-20			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1347	1129	2.26	YES	
437				21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1274	1542	3.08	YES	
438	31-40	9'-6"		0'-6"			2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1116	1678	3.36	YES		
439	41-50	7'-6"		0'-6"			2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	880	1619	3.24	YES		
440	51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	762	1660	3.32	YES					
441	61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	644	1619	3.24	YES					



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME
JOB NO.

→
→

A220170

DATE
CHECKER

→
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July 5, 2024
SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)				
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.											
								Front Column			Rear Column			Front Column			Rear Column			Formt. Column		Rear Column		Actual Force (kg)							
					[S1] (ft-in)	[S2] (ft-in)			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.No's (D)(in)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625		
442	150	B	5	0-10	7'6"			12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1293	820.9	1.65	YES
443				11-20				12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1293	1370	2.74	YES
444				21-30				11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1138	1692	3.38	YES
445				31-40				9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	980	1878	3.76	YES
446				41-50				7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1810	3.62	YES
447				51-60				6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1855	3.71	YES
448				61-70				5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	567	1810	3.62	YES
449				10				0-10	12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1388	811.8	1.63
450			11-20					12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1388	1356	2.71	YES
451			21-30					11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1220	1673	3.34	YES
452			31-40					9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1057	1855	3.71	YES
453			41-50					7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1791	3.58	YES
454			51-60					6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	721	1832	3.67	YES
409-50			61-70	5'-6"				0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	612	1791	3.58	YES	
456			15	0-10				11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1465	739.2	1.48	YES
457				11-20				11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1465	1234	2.47	YES
458				21-30				11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1401	1655	3.31	YES
459				31-40				9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1211	1837	3.67	YES
460				41-50				7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	957	1773	3.55	YES
461				51-60				6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1814	3.63	YES
462				61-70				5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	703	1773	3.55	YES
463			20	0-10				11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1483	702.9	1.41	YES
464				11-20				11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1483	1170	2.34	YES
465				21-30				11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1483	1637	3.27	YES
466				31-40				9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1279	1819	3.64	YES
467				41-50				7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1011	1755	3.51	YES
468				51-60				6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	875	1796	3.59	YES
469				61-70				5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	739	1755	3.51	YES
470			25	0-10				10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1515	657.6	1.31	YES
471				11-20				10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1515	1093	2.19	YES
472				21-30				10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1515	1528	3.06	YES
473				31-40				9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1374	1778	3.56	YES
474				41-50				7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1084	1714	3.43	YES
475				51-60				6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	939	1755	3.51	YES
476				61-70				5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	794	1714	3.43	YES
477			30	0-10				10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1524	664	1.28	YES
478				11-20				10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1524	1066	2.14	YES
479				21-30				10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1524	1492	2.99	YES
480				31-40				9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1379	1737	3.47	YES
481				41-50				7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1088	1678	3.35	YES
482				51-60				6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	943	1714	3.43	YES
483				61-70				5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1673	3.35	YES
484			35	0-10				10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1429	621.3	1.24	YES
485	11-20	10'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1429	1034	2.07	YES					
486	21-30	10'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1415	1469	2.94	YES					
487	31-40	9'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1293	1678	3.36	YES					
488	41-50	7'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1020	1619	3.24	YES					
489	51-60	6'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	884	1660	3.32	YES					
490	61-70	5'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	748	1619	3.24	YES					



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

A220170

DATE

CHECKER

→

July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																			US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
								Pole Footing Size					US Helical Size									Krinner Ground Screws G114x1600.								
								Front Column			Rear Column		Front Column			Rear Column			Front Column		Rear Column			Actual Force (kg)						
					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.No's (D)(in) Helix	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625					
491	160	B	5	0-10	7'6"	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1429	789.1	1.58	YES	
492				11-20		12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1429	1315	2.63	YES	
493				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1311	1692	3.38	YES	
494				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1134	1878	3.76	YES	
495				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	893	1810	3.62	YES	
496				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	776	1855	3.71	YES	
497				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	653	1810	3.62	YES	
498			10	0-10	7'6"	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1469	748.3	1.5	YES	
499				11-20		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1469	1247	2.49	YES	
500				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1406	1673	3.34	YES	
501				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1215	1855	3.71	YES	
502				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	957	1791	3.58	YES	
503				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	830	1832	3.67	YES	
504				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	703	1791	3.58	YES	
505			15	0-10	7'6"	10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1537	675.7	1.35	YES	
506				11-20		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1537	1129	2.25	YES	
507				21-30		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1537	1578	3.16	YES	
508				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1392	1837	3.67	YES	
509				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1098	1773	3.55	YES	
510				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	952	1814	3.63	YES	
511				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	808	1773	3.55	YES	
512			20	0-10	7'6"	10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1551	639.5	1.27	YES	
513				11-20		10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1551	1061	2.13	YES	
514				21-30		10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1551	1488	2.98	YES	
515				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1474	1819	3.64	YES	
516				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1161	1755	3.51	YES	
517				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1007	1796	3.59	YES	
518				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	853	1755	3.51	YES	
519			25	0-10	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1574	594.1	1.19	YES	
520				11-20		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1574	988.7	1.98	YES	
521				21-30		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1574	1383	2.77	YES	
522				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1574	1778	3.56	YES	
523				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1243	1714	3.43	YES	
524				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1079	1755	3.51	YES	
525				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	912	1714	3.43	YES	
526			30	0-10	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1583	580.5	1.16	YES	
527				11-20		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1583	966	1.93	YES	
528				21-30		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1583	1351	2.7	YES	
529				31-40		9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1583	1737	3.47	YES	
530				41-50		7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1252	1678	3.35	YES	
531				51-60		6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1084	1714	3.43	YES	
532				61-70		5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	916	1673	3.35	YES	
533			35	0-10	7'6"	9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1488	562.4	1.12	YES	
534				11-20		9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1488	934.2	1.87	YES	
535				21-30		9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1474	1329	2.66	YES	
536	31-40	9'-6"		0'-6"		2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1488	1678	3.36	YES			
537	41-50	7'-6"		0'-6"		2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1175	1619	3.24	YES			
538	51-60	6'-6"		0'-6"		2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	1016	1660	3.32	YES			
539	61-70	5'-6"		0'-6"		2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7"	2-7/8"	2	8	7"	4.5	63	4.5	63	862	1619	3.24	YES			



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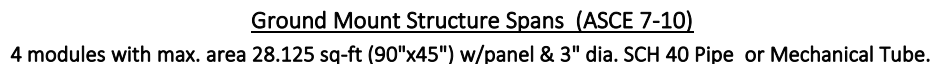
Exposure B, ASCE 7-10, SCH 40- GM Chart for 4
Modules 90-160 Mph

Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→	A220170	DATE	→	July 5, 2024
JOB NO.	→		CHECKER	→	SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column							
					Dia. (D) (ft)	Depth (d) (ft)	#S Reinf. Spacing	Dia. (D) (ft)	Depth (d) (ft)	#S Reinf. Spacing	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (in)	Depth (d) (ft-in)	Shaft Dia.No's (D)(in) Helix	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625				
1				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	508	1120	2.24	YES
2				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	385	1429	2.85	YES
3				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	327	1692	3.38	YES
4				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1878	3.76	YES
5			5	41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	222	1810	3.62	YES
6				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	195	1855	3.71	YES
7				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	163	1810	3.62	YES
8				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	553	1107	2.21	YES
9				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	426	1410	2.82	YES
10				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	358	1673	3.34	YES
11				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1855	3.71	YES
12				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1791	3.58	YES
13				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	213	1832	3.67	YES
14				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	181	1791	3.58	YES
15				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1098	2.19	YES
16				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	503	1397	2.79	YES
17				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	426	1655	3.31	YES
18				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	367	1837	3.67	YES
19				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1773	3.55	YES
20				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	249	1814	3.63	YES
21				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	213	1773	3.55	YES
22				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	703	1084	2.17	YES
23				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	540	1383	2.77	YES
24				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	454	1637	3.27	YES
25				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1819	3.64	YES
26				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1755	3.51	YES
27				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	268	1796	3.59	YES
28				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	227	1755	3.51	YES
29				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	762	1061	2.12	YES
30				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	585	1351	2.7	YES
31				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	494	1601	3.2	YES
32				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1796	3.59	YES
33				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1714	3.43	YES
34				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1755	3.51	YES
35				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	249	1714	3.43	YES
36				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	771	1039	2.08	YES
37				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	590	1324	2.64	YES
38				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	499	1565	3.13	YES
39				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1737	3.47	YES
40				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	340	1678	3.35	YES
41				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	295	1714	3.43	YES
42				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	249	1673	3.35	YES
43				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	717	1007	2.01	YES
44				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	549	1279	2.56	YES
45				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	449	1542	3.08	YES
46				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1678	3.36	YES
47				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1619	3.24	YES
48				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	277	1660	3.32	YES
49				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	231	1619	3.24	YES



SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hange (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)					
					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)	Uplift Force	Downward	Horiz.	Average Uplift Force= 1950 kg (1625 kg FOS) 1950 1625			
50	95	B	5	0-10	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	585	1120	2.24	YES	
51				11-20	13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	449	1429	2.85	YES	
52				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	381	1692	3.38	YES	
53				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1878	3.76	YES	
54				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	259	1810	3.62	YES	
55				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	227	1855	3.71	YES	
56				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	190	1810	3.62	YES	
57				10	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	639	1107	2.21	YES
58					11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	490	1410	2.82	YES
59					21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	413	1673	3.34	YES
60					31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	358	1855	3.71	YES
61					41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1791	3.58	YES
62			51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1832	3.67	YES	
63			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	209	1791	3.58	YES		
64			15	0-10	17'-0	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	753	1098	2.19	YES	
65				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	576	1397	2.79	YES	
66				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	490	1655	3.31	YES	
67				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1837	3.67	YES	
68				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1773	3.55	YES	
69				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1814	3.63	YES	
70			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1773	3.55	YES		
71			20	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	1084	2.17	YES	
72				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	617	1383	2.77	YES	
73				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	522	1637	3.27	YES	
74				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1819	3.64	YES	
75				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1755	3.51	YES	
76				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1796	3.59	YES	
77			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	259	1755	3.51	YES		
78			25	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	871	1061	2.12	YES	
79				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	667	1351	2.7	YES	
80				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	567	1601	3.2	YES	
81				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1778	3.56	YES	
82				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	385	1714	3.43	YES	
83				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1755	3.51	YES	
84			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1714	3.43	YES		
85			30	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	880	1039	2.08	YES	
86				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	671	1324	2.64	YES	
87				21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	571	1565	3.13	YES	
88				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1737	3.47	YES	
89				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	390	1678	3.35	YES	
90				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1714	3.43	YES	
91			61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	286	1673	3.35	YES		
92			35	0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	1007	2.01	YES	
93				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	630	1279	2.56	YES	
94				21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	517	1542	3.08	YES	
95				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1678	3.36	YES	
96				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1619	3.24	YES	
97				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1660	3.32	YES	
98	61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	268	1619	3.24	YES				

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Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→		July 5, 2024
JOB NO.	→	A220170	CHECKER	→		SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.									
					Front Column			Rear Column			Front Column			Rear Column			Formt Column		Rear Column		Actual Force (kg)								
					[S1] (ft-in)	[S2] (ft-in)		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)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
99				0-10		17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	671	1120	2.24	YES
100				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	512	1429	2.85	YES
101				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	435	1692	3.38	YES
102				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1878	3.76	YES
103			5	41-50	7'-6"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	295	1810	3.62	YES
104				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	259	1855	3.71	YES
105				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	218	1810	3.62	YES
106				0-10		17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	730	1107	2.21	YES
107				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	558	1410	2.82	YES
108				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	472	1673	3.34	YES
109				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	408	1855	3.71	YES
110			10	41-50	7'-6"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1791	3.58	YES
111				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	281	1832	3.67	YES
112				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	236	1791	3.58	YES
113				0-10		17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	857	1098	2.19	YES
114				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	653	1397	2.79	YES
115				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	553	1655	3.31	YES
116				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	476	1837	3.67	YES
117			15	41-50	7'-6"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1773	3.55	YES
118				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	327	1814	3.63	YES
119				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	277	1773	3.55	YES
120				0-10		17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	912	1084	2.17	YES
121				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	698	1383	2.77	YES
122				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	590	1637	3.27	YES
123				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	508	1819	3.64	YES
124			20	41-50	7'-6"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1755	3.51	YES
125				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	349	1796	3.59	YES
126				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	295	1755	3.51	YES
127				0-10		17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	989	1061	2.12	YES
128				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	753	1351	2.7	YES
129				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	639	1601	3.2	YES
130				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	553	1778	3.56	YES
131			25	41-50	7'-6"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1714	3.43	YES
132				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1755	3.51	YES
133				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	317	1714	3.43	YES
134				0-10		17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	993	1039	2.08	YES
135				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	762	1324	2.64	YES
136				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	644	1565	3.13	YES
137				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1737	3.47	YES
138			30	41-50	7'-6"	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	440	1678	3.35	YES
139				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	381	1714	3.43	YES
140				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1673	3.35	YES
141				0-10		17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	930	1007	2.01	YES
142				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	712	1279	2.56	YES
143				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	585	1542	3.08	YES
144				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	517	1678	3.36	YES
145			35	41-50	7'-6"	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	408	1619	3.24	YES
146				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	354	1660	3.32	YES
147				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	299	1619	3.24	YES

Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→		July 5, 2024
JOB NO.	→	A220170	CHECKER	→		SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical TUB Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.				Actual Force (kg)								
								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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625			
148	105	B	5	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	762	1120	2.24	YES			
149				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	580	1429	2.85	YES			
150				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	490	1692	3.38	YES			
151				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1878	3.76	YES			
152				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	336	1810	3.62	YES			
153				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	290	1855	3.71	YES			
154				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	245	1810	3.62	YES			
155			10	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	1107	2.21	YES			
156				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	630	1410	2.82	YES			
157				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	535	1673	3.34	YES			
158				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1855	3.71	YES			
159				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1791	3.58	YES			
160				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	317	1832	3.67	YES			
161				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	268	1791	3.58	YES			
162			15	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	961	1098	2.19	YES			
163				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	735	1397	2.79	YES			
164				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	621	1655	3.31	YES			
165				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1837	3.67	YES			
166				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1773	3.55	YES			
167				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1814	3.63	YES			
168				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	313	1773	3.55	YES			
169			20	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1025	1084	2.17	YES			
170				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	785	1383	2.77	YES			
171				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	662	1637	3.27	YES			
172				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1819	3.64	YES			
173				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	454	1755	3.51	YES			
174				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	390	1796	3.59	YES			
175				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	331	1755	3.51	YES			
176			25	0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1043	997.7	2	YES			
177				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1351	2.7	YES			
178				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	717	1601	3.2	YES			
179				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1778	3.56	YES			
180				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	490	1714	3.43	YES			
181				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	422	1755	3.51	YES			
182				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	358	1714	3.43	YES			
183			30	0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1052	979.6	1.95	YES			
184				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1324	2.64	YES			
185				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	721	1565	3.13	YES			
186				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	621	1737	3.47	YES			
187				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	494	1678	3.35	YES			
188				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1714	3.43	YES			
189	61-70	5'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1673	3.35	YES					
190	35	0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	980	947.8	1.9	YES					
191		11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	1279	2.56	YES					
192		21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	662	1542	3.08	YES					
193		31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1678	3.36	YES					
194		41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1619	3.24	YES					
195		51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	399	1660	3.32	YES					
196		61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	336	1619	3.24	YES					

Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→	A220170	DATE	→	July 5, 2024
JOB NO.	→		CHECKER	→	SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hange (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)																																																			
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.																																																										
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)																																																						
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625																																																	
197	110	B	5	0-10 11-20 21-30 31-40 41-50 51-60 61-70	7'6"	17'-0" 13'-0" 11'-0" 9'-6" 7'-6" 6'-6" 5'-6"	0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	2'-0" 2'-0" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6"	8" 8" 8" 8" 8" 8" 8"	2'-0" 2'-0" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6"	8" 8" 8" 8" 8" 8" 8"	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	853 653 553 476 376 327 277	1120 1429 1692 1878 1810 1855 1810	2.24 2.85 3.38 3.76 3.62 3.71 3.62	YES																																																		
198																																																				YES																										
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203																																																				YES																										
204																												10	0-10 11-20 21-30 31-40 41-50 51-60 61-70	7'6"	17'-0" 13'-0" 11'-0" 9'-6" 7'-6" 6'-6" 5'-6"	0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6"	8" 8" 8" 8" 8" 8" 8"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	3'-0" 3'-0" 3'-0" 3'-0" 3'-0" 3'-0" 3'-0"	8" 8" 8" 8" 8" 8" 8"	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	925 707 599 517 408 354 299	1107 1410 1673 1855 1791 1832 1791	2.21 2.82 3.34 3.71 3.58 3.67 3.58	YES																								
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211			15	0-10 11-20 21-30 31-40 41-50 51-60 61-70	7'6"	16'-6" 13'-0" 11'-0" 9'-6" 7'-6" 6'-6" 5'-6"	0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6"	8" 8" 8" 8" 8" 8" 8"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	3'-0" 3'-0" 3'-0" 3'-0" 3'-0" 3'-0" 3'-0"	8" 8" 8" 8" 8" 8" 8"	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	1043 821 698 603 476 413 349	1066 1397 1655 1837 1773 1814 1773																											2.13 2.79 3.31 3.67 3.55 3.63 3.55	YES																							
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218																												20	0-10 11-20 21-30 31-40 41-50 51-60 61-70	7'6"	16'-0" 13'-0" 11'-0" 9'-6" 7'-6" 6'-6" 5'-6"	0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6"	8" 8" 8" 8" 8" 8" 8"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	3'-0" 3'-0" 3'-6" 3'-6" 3'-6" 3'-6" 3'-6"	8" 8" 8" 8" 8" 8" 8"	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	1075 875 739 639 503 435 372	1020 1383 1637 1819 1755 1796 1755	2.04 2.77 3.27 3.64 3.51 3.59 3.51		YES																							
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225			25	0-10 11-20 21-30 31-40 41-50 51-60 61-70	7'6"	15'-6" 13'-0" 11'-0" 9'-6" 7'-6" 6'-6" 5'-6"	0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6"	8" 8" 8" 8" 8" 8" 8"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	3'-6" 3'-6" 3'-6" 3'-6" 3'-6" 3'-6" 3'-6"	8" 8" 8" 8" 8" 8" 8"	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	1125 943 798 689 544 472 399	970.5 1351 1601 1778 1714 1755 1714																											1.94 2.7 3.2 3.56 3.43 3.51 3.43	YES																							
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231																																																				YES																										
232																												30	0-10 11-20 21-30 31-40 41-50 51-60 61-70	7'6"	15'-0" 13'-0" 11'-0" 9'-6" 7'-6" 6'-6" 5'-6"	0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6"	8" 8" 8" 8" 8" 8" 8"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	4'-0" 4'-0" 4'-0" 4'-0" 4'-0" 4'-0" 4'-0"	8" 8" 8" 8" 8" 8" 8"	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8" 2-7/8"	1 1 1 2 2 2 2	10 10 10 8 8 8 8	9' 9' 9' 7' 7' 7' 7'	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	4.5 4.5 4.5 4.5 4.5 4.5 4.5	63 63 63 63 63 63 63	1098 948 803 694 549 476 404	916.1 1324 1565 1737 1678 1714 1673	1.83 2.64 3.13 3.47 3.35 3.43 3.35		YES																							
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238																									YES																																																					
239	35	0-10 11-20 21-30 31-40 41-50 51-60 61-70	7'6"	15'-0" 13'-0" 11'-0" 9'-6" 7'-6" 6'-6" 5'-6"	0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6" 0'-6"	2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0"	2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6" 2'-6"	8" 8" 8" 8" 8" 8" 8"	2'-0" 2'-0" 2'-0" 2'-0" 																																																																					

NOTE:



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	A220170	CHECKER	→	
					July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation														US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)				
								Pole Footing Size					US Helical Size					Krinrer Ground Screws G114x1600.											
								Front Column		Rear Column			Front Column		Rear Column			Front Column		Rear Column									
					[S1] (ft-in)	[S2] (ft-in)		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.No's (D)(in)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
246	115	B	5	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	952	1120	2.24	YES
247				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	726	1429	2.85	YES
248				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	617	1692	3.38	YES
249				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1878	3.76	YES
250				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1810	3.62	YES
251				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1855	3.71	YES
252				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1810	3.62	YES
253			10	0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1029	1107	2.21	YES
254				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	785	1410	2.82	YES
255				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	667	1673	3.34	YES
256				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	576	1855	3.71	YES
257				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	454	1791	3.58	YES
258				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1832	3.67	YES
259				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1791	3.58	YES
260			15	0-10	7'6"	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1088	997.7	2	YES
261				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	912	1397	2.79	YES
262				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	771	1655	3.31	YES
263				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	667	1837	3.67	YES
264				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	526	1773	3.55	YES
265				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1814	3.63	YES
266				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	385	1773	3.55	YES
267			20	0-10	7'6"	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1120	956.9	1.91	YES
268				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	971	1383	2.77	YES
269				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	1637	3.27	YES
270				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	707	1819	3.64	YES
271				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	558	1755	3.51	YES
272				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	485	1796	3.59	YES
273				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	408	1755	3.51	YES
274			25	0-10	7'6"	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1166	907	1.81	YES
275				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1043	1351	2.7	YES
276				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	884	1601	3.2	YES
277				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	762	1778	3.56	YES
278				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1714	3.43	YES
279				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	552	1755	3.51	YES
280				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	440	1714	3.43	YES
281			30	0-10	7'6"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1175	884.4	1.77	YES
282				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1052	1324	2.64	YES
283				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	889	1565	3.13	YES
284				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1737	3.47	YES
285				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	608	1678	3.35	YES
286				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	526	1714	3.43	YES
287				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	444	1673	3.35	YES
288			35	0-10	7'6"	14'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1098	857.1	1.71	YES
289				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	984	1279	2.56	YES
290				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	1542	3.08	YES
291				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	721	1678	3.36	YES
292	41-50	7'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	567	1619	3.24	YES		
293	51-60	6'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1660	3.32	YES		
294	61-70	5'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1619	3.24	YES		

Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME JOB NO.	→	A220170	DATE CHECKER	→	July 5, 2024 SAM
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SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column			Rear Column			Formt Column		Rear Column								
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
295				0-10			16'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1020	1084	2.17	YES
296				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	1429	2.85	YES
297				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	680	1692	3.38	YES
298				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	590	1878	3.76	YES
299				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1810	3.62	YES
300				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1855	3.71	YES
301				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1810	3.62	YES
302				0-10			16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1070	1043	2.08	YES
303				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	871	1410	2.82	YES
304				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	735	1673	3.34	YES
305				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1855	3.71	YES
306				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	503	1791	3.58	YES
307				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1832	3.67	YES
308				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1791	3.58	YES
309				0-10			14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1125	934.2	1.87	YES
310				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1007	1397	2.79	YES
311				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1655	3.31	YES
312				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	735	1837	3.67	YES
313				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	580	1773	3.55	YES
314				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	503	1814	3.63	YES
315				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1773	3.55	YES
316				0-10			14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1193	925.2	1.85	YES
317				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1070	1383	2.77	YES
318				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	902	1637	3.27	YES
319				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1819	3.64	YES
320				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1755	3.51	YES
321				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1796	3.59	YES
322				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	454	1755	3.51	YES
323				0-10			14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1238	875.3	1.75	YES
324				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1152	1351	2.7	YES
325				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	975	1601	3.2	YES
326				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1778	3.56	YES
327				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	662	1714	3.43	YES
328				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	576	1755	3.51	YES
329				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	485	1714	3.43	YES
330				0-10			13'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1202	825.4	1.65	YES
331				11-20			13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1156	1324	2.64	YES
332				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	980	1565	3.13	YES
333				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	844	1737	3.47	YES
334				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	667	1678	3.35	YES
335				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	580	1714	3.43	YES
336				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	490	1673	3.35	YES
337				0-10			14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1125	798.2	1.6	YES
338				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1084	1279	2.56	YES
339				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	902	1542	3.08	YES
340				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	794	1678	3.36	YES
341				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	626	1619	3.24	YES
342				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1660	3.32	YES
343				61-70	</																									



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→		July 5, 2024
JOB NO.	→	A220170	CHECKER	→		SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column							
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625
344	130	B	5	0-10	7'6"	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1120	988.7	1.97	YES
345				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	971	1429	2.85	YES
346				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	1692	3.38	YES
347				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	712	1878	3.76	YES
348				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	562	1810	3.62	YES
349				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	485	1855	3.71	YES
350				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1810	3.62	YES
351			10	0-10	7'6"	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1166	943.3	1.89	YES
352				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1048	1410	2.82	YES
353				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	884	1673	3.34	YES
354				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	766	1855	3.71	YES
355				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1791	3.58	YES
356				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	522	1832	3.67	YES
357				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1791	3.58	YES
358			15	0-10	7'6"	13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1256	870.7	1.74	YES
359				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1206	1397	2.79	YES
360				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1020	1655	3.31	YES
361				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	884	1837	3.67	YES
362				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	698	1773	3.55	YES
363				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1814	3.63	YES
364				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	512	1773	3.55	YES
365			20	0-10	7'6"	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1279	829.9	1.66	YES
366				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1279	1383	2.77	YES
367				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1084	1637	3.27	YES
368				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	934	1819	3.64	YES
369				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	739	1755	3.51	YES
370				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	639	1796	3.59	YES
371				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1755	3.51	YES
372			25	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1324	780	1.56	YES
373				11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1324	1302	2.6	YES
374				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1166	1601	3.2	YES
375				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1007	1778	3.56	YES
376				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	794	1714	3.43	YES
377				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	689	1755	3.51	YES
378				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	580	1714	3.43	YES
379			30	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1329	761.9	1.53	YES
380				11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1329	1270	2.54	YES
381				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1170	1565	3.13	YES
382				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1011	1737	3.47	YES
383				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1678	3.35	YES
384				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	689	1714	3.43	YES
385				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1673	3.35	YES
386			35	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1247	739.2	1.48	YES
387				11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1247	1229	2.46	YES
388				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1084	1542	3.08	YES
389				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	948	1678	3.36	YES
390	41-50	7'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	748	1619	3.24	YES		
391	51-60	6'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	649	1660	3.32	YES		
392	61-70	5'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	549	1619	3.24	YES		

Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→		July 5, 2024
JOB NO.	→	A220170	CHECKER	→		SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.				Actual Force (kg)								
								Front Column			Rear Column			Front Column			Rear Column			Formt Column		Rear Column		Uplift Force								
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625			
393				0-10		14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1238	920.6	1.84	YES			
394				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1152	1429	2.85	YES			
395				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	975	1692	3.38	YES			
396			5	31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1878	3.76	YES			
397				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	662	1810	3.62	YES			
398				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	576	1855	3.71	YES			
399				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	485	1810	3.62	YES			
400				0-10		13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1283	879.8	1.76	YES			
401				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1238	1410	2.82	YES			
402				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1048	1673	3.34	YES			
403			10	31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	902	1855	3.71	YES			
404				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	712	1791	3.58	YES			
405				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1832	3.67	YES			
406				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	522	1791	3.58	YES			
407				0-10		12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1370	807.3	1.61	YES			
408				11-20		12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1370	1342	2.68	YES			
409				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1206	1655	3.31	YES			
410			15	31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1039	1837	3.67	YES			
411				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1773	3.55	YES			
412				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	712	1814	3.63	YES			
413				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1773	3.55	YES			
414				0-10		12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1392	766.4	1.53	YES			
415				11-20		12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1392	1274	2.55	YES			
416				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1274	1637	3.27	YES			
417			20	31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1102	1819	3.64	YES			
418				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	871	1755	3.51	YES			
419				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	753	1796	3.59	YES			
420				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	639	1755	3.51	YES			
421				0-10		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1429	716.6	1.44	YES			
422				11-20		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1429	1197	2.39	YES			
423				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1370	1601	3.2	YES			
424			25	31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1184	1778	3.56	YES			
425				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	934	1714	3.43	YES			
426				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1755	3.51	YES			
427				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	685	1714	3.43	YES			
428				0-10		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1438	702.9	1.41	YES			
429				11-20		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1438	1170	2.34	YES			
430				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1374	1565	3.13	YES			
431			30	31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1188	1737	3.47	YES			
432				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	939	1678	3.35	YES			
433				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	812	1714	3.43	YES			
434				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	689	1673	3.35	YES			
435				0-10		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1347	680.3	1.36	YES			
436				11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1347	1129	2.26	YES			
437				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1274	1542	3.08	YES			
438			35	31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1116	1678	3.36	YES			
439				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	880	1619	3.24	YES			
440				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	762	1660	3.32	YES			
441				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	644	1619	3.24	YES			



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→		July 5, 2024
JOB NO.	→	A220170	CHECKER	→		SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.												
								Front Column			Rear Column			Front Column			Rear Column			Formt Column		Rear Column										
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625			
442	150	B	5	0-10	7'6"	12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1293	820.9	1.65	YES			
443				11-20		12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1293	1370	2.74	YES			
444				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1138	1692	3.38	YES			
445				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	980	1878	3.76	YES			
446				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	1810	3.62	YES			
447				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1855	3.71	YES			
448				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	567	1810	3.62	YES			
449			10	0-10	7'6"	12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1388	811.8	1.63	YES			
450				11-20		12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1388	1356	2.71	YES			
451				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1220	1673	3.34	YES			
452				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1057	1855	3.71	YES			
453				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1791	3.58	YES			
454				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	721	1832	3.67	YES			
409:50				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	612	1791	3.58	YES			
456			15	0-10	7'6"	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1465	739.2	1.48	YES			
457				11-20		11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1465	1234	2.47	YES			
458				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1401	1655	3.31	YES			
459				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1211	1837	3.67	YES			
460				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	957	1773	3.55	YES			
461				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	830	1814	3.63	YES			
462				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	703	1773	3.55	YES			
463			20	0-10	7'6"	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1483	702.9	1.41	YES			
464				11-20		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1483	1170	2.34	YES			
465				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1483	1637	3.27	YES			
466				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1279	1819	3.64	YES			
467				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1011	1755	3.51	YES			
468				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	875	1796	3.59	YES			
469				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	739	1755	3.51	YES			
470			25	0-10	7'6"	10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1515	657.6	1.31	YES			
471				11-20		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1515	1093	2.19	YES			
472				21-30		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1515	1528	3.06	YES			
473				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1374	1778	3.56	YES			
474				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1084	1714	3.43	YES			
475				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	939	1755	3.51	YES			
476				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	794	1714	3.43	YES			
477			30	0-10	7'6"	10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1524	664	1.28	YES			
478				11-20		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1524	1066	2.14	YES			
479				21-30		10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1524	1492	2.99	YES			
480				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1379	1737	3.47	YES			
481				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1088	1678	3.35	YES			
482				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	943	1714	3.43	YES			
483				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1673	3.35	YES			
484			35	0-10	7'6"	10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1429	621.3	1.24	YES			
485				11-20		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1429	1034	2.07	YES			
486				21-30		10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1415	1469	2.94	YES			
487	31-40	9'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1293	1678	3.36	YES					
488	41-50	7'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1020	1619	3.24	YES					
489	51-60	6'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	884	1660	3.32	YES					
490	61-70	5'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	748	1619	3.24	YES					

Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME JOB NO.	→ →	A220170	DATE CHECKER	→ →	July 5, 2024 SAM
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SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)			
								Pole Footing Size						US Helical Size						Krinmer Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column								
					[S1] (ft-in)	[S2] (ft-in)			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.No's (D)(in)	Helix Dia. (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
491	160	B	5	0-10	7'6"	7'6"	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1429	789.1	1.58	YES
492				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1429	1315	2.63	YES
493				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1311	1692	3.38	YES
494				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1134	1878	3.76	YES
495				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	893	1810	3.62	YES
496				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1855	3.71	YES
497				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	653	1810	3.62	YES
498			10	0-10	7'6"	7'6"	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1469	748.3	1.5	YES
499				11-20			11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1469	1247	2.49	YES
500				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1406	1673	3.34	YES
501				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1215	1855	3.71	YES
502				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	957	1791	3.58	YES
503				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1832	3.67	YES
504				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	703	1791	3.58	YES
505			15	0-10	7'6"	7'6"	10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1537	675.7	1.35	YES
506				11-20			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1537	1129	2.25	YES
507				21-30			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1537	1578	3.16	YES
508				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1392	1837	3.67	YES
509				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1098	1773	3.55	YES
510				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	952	1814	3.63	YES
511				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	808	1773	3.55	YES
512			20	0-10	7'6"	7'6"	10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1551	639.5	1.27	YES
513				11-20			10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1551	1061	2.13	YES
514				21-30			10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1551	1488	2.98	YES
515				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1474	1819	3.64	YES
516				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1161	1755	3.51	YES
517				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1007	1796	3.59	YES
518				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	853	1755	3.51	YES
519			25	0-10	7'6"	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	594.1	1.19	YES
520				11-20			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	988.7	1.98	YES
521				21-30			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1383	2.77	YES
522				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1778	3.56	YES
523				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1243	1714	3.43	YES
524				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1079	1755	3.51	YES
525				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	912	1714	3.43	YES
526			30	0-10	7'6"	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1583	580.5	1.16	YES
527				11-20			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1583	966	1.93	YES
528				21-30			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1583	1351	2.7	YES
529				31-40			9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1583	1737	3.47	YES
530				41-50			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1252	1678	3.35	YES
531				51-60			6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1084	1714	3.43	YES
532				61-70			5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	916	1673	3.35	YES
533			35	0-10	7'6"	7'6"	9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1488	562.4	1.12	YES
534				11-20			9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1488	934.2	1.87	YES
535	21-30	9'-6"		0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1474	1329	2.66	YES		
536	31-40	9'-6"		0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1488	1678	3.36	YES		
537	41-50	7'-6"		0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1175	1619	3.24	YES		
538	51-60	6'-6"		0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1016	1660	3.32	YES		
539	61-70	5'-6"		0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	862	1619	3.24	YES		



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Exposure C, ASCE 7-16, SCH 40- GM Chart for 4 Modules 90-160 Mph



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size					US Helical Size						Krinner Ground Screws G114x1600.										
								Front Column			Rear Column		Front Column			Rear Column			Fornr Column		Rear Column								
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625
1				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	658	1120	2.24	YES
2				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	503	1429	2.85	YES
3				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	426	1692	3.38	YES
4				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1878	3.76	YES
5				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	290	1810	3.62	YES
6				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	249	1855	3.71	YES
7				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	213	1810	3.62	YES
8				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	717	1107	2.21	YES
9				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	549	1410	2.82	YES
10				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	463	1673	3.34	YES
11				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	399	1855	3.71	YES
12				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	317	1791	3.58	YES
13				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	272	1832	3.67	YES
14				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	231	1791	3.58	YES
15				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	1098	2.19	YES
16				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	639	1397	2.79	YES
17				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	567	1728	3.46	YES
18				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	467	1837	3.67	YES
19				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1773	3.55	YES
20				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1814	3.63	YES
21				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	272	1773	3.55	YES
22				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	893	1084	2.17	YES
23				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	685	1383	2.77	YES
24				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	603	1710	3.42	YES
25				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	499	1819	3.64	YES
26				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	395	1755	3.51	YES
27				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1796	3.59	YES
28				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	317	1914	3.83	YES
29				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	966	1061	2.12	YES
30				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	739	1351	2.7	YES
31				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	626	1601	3.2	YES
32				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1873	3.74	YES
33				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1714	3.43	YES
34				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	355	1755	3.51	YES
35				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	313	1714	3.43	YES
36				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1002	1070	2.14	YES
37				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	776	1374	2.75	YES
38				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	630	1565	3.13	YES
39				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	544	1737	3.47	YES
40				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	431	1678	3.35	YES
41				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1714	3.43	YES
42				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	317	1673	3.35	YES
43				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	912	1007	2.01	YES
44				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	698	1279	2.56	YES
45				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	576	1542	3.08	YES
46				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	508	1678	3.36	YES
47				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1619	3.24	YES
48				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	349	1660	3.32	YES
49				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	349	1914	3.83	YES



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.						Actual Force (kg)				
							Front Column			Rear Column			Front Column			Rear Column			Front Column			Rear Column							
							[S1] (ft-in)	[S2] (ft-in)		Dia. (D) (d) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Dia. (D) (d) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (D) (in)	Depth (d) (ft-in)	Shaft Dia. (D) (in)	No's Helix	Helix Dia. (D) (in)	Depth (d) (ft-in)	Dia (in)	Length (in)	Dia (in)	Length (in)	Uplift Force	Downward
50				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	753	1120	2.24	YES
51				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	576	1429	2.85	YES
52				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	490	1692	3.38	YES
53				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1878	3.76	YES
54				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1810	3.62	YES
55				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1855	3.71	YES
56				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1810	3.62	YES
57				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	1107	2.21	YES
58				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	626	1410	2.82	YES
59				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	531	1673	3.34	YES
60				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1855	3.71	YES
61				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1791	3.58	YES
62				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1832	3.67	YES
63				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	263	1791	3.58	YES
64				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	957	1098	2.19	YES
65				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	730	1397	2.79	YES
66				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	617	1655	3.31	YES
67				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	535	1837	3.67	YES
68				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1773	3.55	YES
69				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	367	1814	3.63	YES
70				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1773	3.55	YES
71				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1016	1084	2.17	YES
72				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	780	1383	2.77	YES
73				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1637	3.27	YES
74				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	567	1819	3.64	YES
75				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1755	3.51	YES
76				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	390	1796	3.59	YES
77				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1755	3.51	YES
78				0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1034	997	2	YES
79				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	1351	2.7	YES
80				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	712	1601	3.2	YES
81				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	617	1778	3.56	YES
82				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	487	1714	3.43	YES
83				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1755	3.51	YES
84				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1714	3.43	YES
85				0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1043	979.6	1.95	YES
86				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1324	2.64	YES
87				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	717	1565	3.13	YES
88				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1737	3.47	YES
89				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1678	3.35	YES
90				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1714	3.43	YES
91				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	358	1673	3.35	YES
92				0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	975	947.8	1.9	YES
93				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	794	1279	2.56	YES
94				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1542	3.08	YES
95				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	580	1678	3.36	YES
96				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1619	3.24	YES
97				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1660	3.32	YES
98				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1619	3.24	YES



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→	DATE	→
JOB NO.	→	CHECKER	→
AZ20170			
STRUCTURAL ENGINEERS		July 5, 2024	
		SAM	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.											
								Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column		Actual Force (kg)							
								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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625		
99				0-10			17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	857	1120	2.24	YES	
100				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1429	2.85	YES	
101				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	553	1692	3.38	YES	
102				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	481	1878	3.76	YES	
103				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	376	1810	3.62	YES	
104				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1855	3.71	YES	
105				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	277	1810	3.62	YES	
106				0-10			17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	930	1107	2.21	YES	
107				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	712	1410	2.82	YES	
108				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	603	1673	3.34	YES	
109				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	522	1855	3.71	YES	
110				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	408	1791	3.58	YES	
111				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1832	3.67	YES	
112				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	299	1791	3.58	YES	
113				0-10			16'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1048	1066	2.13	YES	
114				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	1397	2.79	YES	
115				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	698	1655	3.31	YES	
116				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1837	3.67	YES	
117				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1773	3.55	YES	
118				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	413	1814	3.63	YES	
119				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1773	3.55	YES	
120				0-10			16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1079	1020	2.04	YES	
121				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	880	1383	2.77	YES	
122				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	744	1637	3.27	YES	
123				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	644	1819	3.64	YES	
124				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1755	3.51	YES	
125				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	440	1796	3.59	YES	
126				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1755	3.51	YES	
127				0-10			15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1093	938.8	1.87	YES	
128				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	948	1351	2.7	YES	
129				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	1601	3.2	YES	
130				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	694	1778	3.56	YES	
131				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1714	3.43	YES	
132				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	472	1755	3.51	YES	
133				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	399	1714	3.43	YES	
134				0-10			15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1102	916.1	1.83	YES	
135				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	952	1324	2.64	YES	
136				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	1565	3.13	YES	
137				31-40		7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	698	1737	3.47	YES	
138				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1678	3.35	YES	
139				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1714	3.43	YES	
140				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1673	3.35	YES	
141				0-10			15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1066	916.1	1.84	YES	
142				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	893	1279	2.56	YES	
143				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	739	1542	3.08	YES	
144				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	653	1678	3.36	YES	
145				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1619	3.24	YES	
146				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	444	1660	3.32	YES	
147																															



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.						Actual Force (kg)			
							Front Column			Rear Column			Front Column			Rear Column			Formt Column		Rear Column							
					[S1] (ft-in)	[S2] (ft-in)	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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625
148				0-10	17'-0"	0'-6"	2'-0"	2'-5"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	966	1120	2.24	YES
149				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	739	1429	2.85	YES
150				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	626	1692	3.38	YES
151				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	540	1878	3.76	YES
152				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1810	3.62	YES
153				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	367	1855	3.71	YES
154				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1810	3.62	YES
155				0-10	16'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1011	1075	2.15	YES
156				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	1410	2.82	YES
157				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	676	1673	3.34	YES
158				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	585	1855	3.71	YES
159				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1791	3.58	YES
160				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	399	1832	3.67	YES
161				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1791	3.58	YES
162				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1102	997.7	2	YES
163				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	925	1397	2.79	YES
164				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	785	1655	3.31	YES
165				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	676	1837	3.67	YES
166				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	535	1773	3.55	YES
167				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1814	3.63	YES
168				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	390	1773	3.55	YES
169				0-10	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1134	956.9	1.91	YES
170				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	984	1383	2.77	YES
171				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1637	3.27	YES
172				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	717	1819	3.64	YES
173				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	565	1755	3.51	YES
174				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1796	3.59	YES
175				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1755	3.51	YES
176				0-10	14'-5"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1184	907	1.81	YES
177				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1061	1351	2.7	YES
178				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	898	1601	3.2	YES
179				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1778	3.56	YES
180				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	612	1714	3.43	YES
181				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1755	3.51	YES
182				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1714	3.43	YES
183				0-10	14'-5"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1188	884.4	1.77	YES
184				11-20	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1066	1324	2.64	YES
185				21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	902	1565	3.13	YES
186				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1737	3.47	YES
187				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	617	1678	3.35	YES
188				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	535	1714	3.43	YES
189				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1673	3.35	YES
190				0-10	15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1152	888.9	1.78	YES
191				11-20	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	998	1279	2.56	YES
192				21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1542	3.08	YES
193				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	730	1678	3.36	YES
194				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	576	1619	3.24	YES
195				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	499	1660	3.32	YES
196				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1619	3.24	YES

NOTE:

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top cap = 1950 kg, uplift force of top cap 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 US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- 8 Bracing not required



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)			
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.				Actual Force (kg)						
							Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column								
							[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward
197				0-10	7'6"	16'-6"	0'-6"	2'-0"	2'-5"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1048	1084	2.17	YES
198				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	1429	2.85	YES
199				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	698	1692	3.38	YES
200				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1878	3.76	YES
201				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	476	1810	3.62	YES
202				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1855	3.71	YES
203				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	349	1810	3.62	YES
204				0-10	7'6"	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1061	1007	2.02	YES
205				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	889	1410	2.82	YES
206				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	753	1673	3.34	YES
207				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	653	1855	3.71	YES
208				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	512	1791	3.58	YES
209				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1832	3.67	YES
210				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1791	3.58	YES
211				0-10	7'6"	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1152	934.2	1.87	YES
212				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1029	1397	2.79	YES
213				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	871	1655	3.31	YES
214				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	753	1837	3.67	YES
215				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	594	1773	3.55	YES
216				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	517	1814	3.63	YES
217				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1773	3.55	YES
218				0-10	7'6"	14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1179	893.4	1.79	YES
219				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1093	1383	2.77	YES
220				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	925	1637	3.27	YES
221				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1819	3.64	YES
222				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	630	1755	3.51	YES
223				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	549	1796	3.59	YES
224				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1755	3.51	YES
225				0-10	7'6"	13'-5"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1220	843.5	1.69	YES
226				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1175	1351	2.7	YES
227				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	998	1601	3.2	YES
228				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	862	1778	3.56	YES
229				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	680	1714	3.43	YES
230				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	590	1755	3.51	YES
231				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	449	1714	3.43	YES
232				0-10	7'6"	13'-5"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1229	825.4	1.65	YES
233				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1184	1324	2.64	YES
234				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1002	1565	3.13	YES
235				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	866	1737	3.47	YES
236				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	685	1678	3.35	YES
237				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	594	1714	3.43	YES
238				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	499	1673	3.35	YES
239				0-10	7'6"	14'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1193	829.9	1.66	YES
240				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1107	1279	2.56	YES
241				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	925	1542	3.08	YES
242				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	812	1678	3.36	YES
243				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	639	1619	3.24	YES
244				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	553	1660	3.32	YES
245				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	467	1619	3.24	YES



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.						Actual Force (kg)				
							Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Uplift Force		Downward		Horiz.		
[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625					
246				0-10	7'6"	15'-6"	0'-6"	2'-0"	2'-5"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1093	1020	2.04	YES
247				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	916	1429	2.85	YES
248				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	776	1692	3.38	YES
249				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1878	3.76	YES
250				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	526	1810	3.62	YES
251				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1855	3.71	YES
252				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	384	1810	3.62	YES
253				0-10	7'6"	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1138	975.1	1.95	YES
254				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	989	1410	2.82	YES
255				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1673	3.34	YES
256				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	721	1855	3.71	YES
257				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1791	3.58	YES
258				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	494	1832	3.67	YES
259				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1791	3.58	YES
260				0-10	7'6"	14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1229	902.5	1.8	YES
261				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1138	1397	2.79	YES
262				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	966	1655	3.31	YES
263				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1837	3.67	YES
264				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	658	1773	3.55	YES
265				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1814	3.63	YES
266				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	481	1773	3.55	YES
267				0-10	7'6"	13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1256	861.7	1.72	YES
268				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1211	1383	2.77	YES
269				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1025	1637	3.27	YES
270				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	884	1819	3.64	YES
271				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	698	1755	3.51	YES
272				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1796	3.59	YES
273				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	512	1755	3.51	YES
274				0-10	7'6"	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1302	811.8	1.62	YES
275				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1302	1351	2.7	YES
276				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1098	1601	3.2	YES
277				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	948	1778	3.56	YES
278				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	748	1714	3.43	YES
279				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	649	1755	3.51	YES
280				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1714	3.43	YES
281				0-10	7'6"	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1306	793.7	1.59	YES
282				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1306	1324	2.64	YES
283				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1107	1565	3.13	YES
284				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	957	1737	3.47	YES
285				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	753	1678	3.35	YES
286				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	653	1714	3.43	YES
287				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	553	1673	3.35	YES
288				0-10	7'6"	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1224	771	1.54	YES
289				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1224	1279	2.56	YES
290				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1020	1542	3.08	YES
291				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	893	1678	3.36	YES
292				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	707	1619	3.24	YES
293				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	612	1660	3.32	YES
294				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1619	3.24	YES



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hange (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size																Krinner Ground Screws G114x1600.
								Front Column			Rear Column			Front Column				Rear Column				Fornr Column		Rear Column		Actual Force (kg)				
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward
295	120	C	5	0-10	7'6"	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1125	952.4	1.91	YES	
296				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1010	1429	2.85	YES	
297				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	1692	3.38	YES	
298				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	739	1878	3.76	YES	
299				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	585	1810	3.62	YES	
300				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	503	1855	3.71	YES	
301			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1810	3.62	YES			
302			10	0-10	7'6"	14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1170	911.6	1.82	YES	
303				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1088	1410	2.82	YES	
304				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	921	1673	3.34	YES	
305				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	794	1855	3.71	YES	
306				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1791	3.58	YES	
307				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1832	3.67	YES	
308			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1791	3.58	YES			
309			15	0-10	7'6"	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1256	839	1.68	YES	
310				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1256	1397	2.79	YES	
311				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1061	1655	3.31	YES	
312				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	916	1837	3.67	YES	
313				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	726	1773	3.55	YES	
314				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1814	3.63	YES	
315			61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1773	3.55	YES			
316			20	0-10	7'6"	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1329	829.9	1.66	YES	
317				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1329	1383	2.77	YES	
318				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1125	1637	3.27	YES	
319				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	971	1819	3.64	YES	
320				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1755	3.51	YES	
321				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1796	3.59	YES	
322			61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	512	1755	3.51	YES			
323			25	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1374	780	1.56	YES	
324				11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1374	1302	2.6	YES	
325				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1206	1601	3.2	YES	
326				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1043	1778	3.56	YES	
327				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1714	3.43	YES	
328				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	712	1755	3.51	YES	
329			61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1714	3.43	YES			
330			30	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1379	761.9	1.53	YES	
331	11-20	12'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1379	1270	2.54	YES			
332	21-30	11'-0"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1215	1565	3.13	YES			
333	31-40	9'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1048	1737	3.47	YES			
334	41-50	7'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1678	3.35	YES			
335	51-60	6'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	717	1714	3.43	YES			
336	61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	608	1673	3.35	YES					
337	35	0-10	7'6"	12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1293	739.2	1.48	YES			
338		11-20		12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1293	1229	2.46	YES			
339		21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1125	1542	3.08	YES			
340		31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	984	1678	3.36	YES			
341		41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1619	3.24	YES			
342		51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1660	3.32	YES			
343	61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	567	1619	3.24	YES					



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.							
								Front Column			Rear Column			Front Column				Rear Column				Formt Column		Rear Column		Actual Force (kg)			
								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)	Uplift Force	Downward	Horiz.	
344	130	C	5	0-10	7'6"	13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1261	888.9	1.78	YES
345				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1211	1429	2.85	YES
346				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1025	1692	3.38	YES
347				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	884	1878	3.76	YES
348				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	698	1810	3.62	YES
349				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	608	1855	3.71	YES
350				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	512	1810	3.62	YES
351			10	0-10	7'6"	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1302	848.1	1.69	YES
352				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1310	1410	2.82	YES
353				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1102	1673	3.34	YES
354				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	952	1855	3.71	YES
355				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	753	1791	3.58	YES
356				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	653	1832	3.67	YES
357				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	553	1791	3.58	YES
358			15	0-10	7'6"	12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1383	775.5	1.55	YES
359				11-20		12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1383	1288	2.58	YES
360				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1270	1655	3.31	YES
361				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1093	1837	3.67	YES
362				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	886	1773	3.55	YES
363				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	748	1814	3.63	YES
364				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	635	1773	3.55	YES
365			20	0-10	7'6"	11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1401	734.7	1.47	YES
366				11-20		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1401	1224	2.44	YES
367				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1342	1637	3.27	YES
368				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1196	1819	3.64	YES
369				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	916	1755	3.51	YES
370				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	794	1796	3.59	YES
371				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1755	3.51	YES
372			25	0-10	7'6"	11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1506	716.6	1.44	YES
373				11-20		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1506	1197	2.39	YES
374				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1438	1601	3.2	YES
375				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1243	1778	3.56	YES
376				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	980	1714	3.43	YES
377				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1755	3.51	YES
378				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	721	1714	3.43	YES
379			30	0-10	7'6"	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1447	671.2	1.35	YES
380				11-20		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1447	1120	2.24	YES
381				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1447	1565	3.13	YES
382				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1252	1737	3.47	YES
383				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	989	1678	3.35	YES
384				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	857	1714	3.43	YES
385				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	726	1673	3.35	YES
386			35	0-10	7'6"	11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1420	680.3	1.36	YES
387				11-20		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1420	1129	2.26	YES
388	21-30	11'-0"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1342	1542	3.08	YES		
389	31-40	9'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1170	1678	3.36	YES		
390	41-50	7'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	925	1619	3.24	YES		
391	51-60	6'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1660	3.32	YES		
392	61-70	5'-6"		0'-6"		2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	680	1619	3.24	YES		



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hange (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)			
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.						Actual Force (kg)						
							Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column										
							[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625
393				0-10			12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1374	820.9	1.65		YES
394				11-20			12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1374	1370	2.74		YES
395				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1211	1692	3.38		YES
396				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1043	1878	3.76		YES
397				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1810	3.62		YES
398				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	717	1855	3.71		YES
399				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1810	3.62		YES
400				0-10			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1415	780	1.56		YES
401				11-20			12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1415	1302	2.6		YES
402				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1257	1673	3.34		YES
403				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1120	1855	3.71		YES
404				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	884	1791	3.58		YES
405				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1832	3.67		YES
406				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	649	1791	3.58		YES
407				0-10			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1492	707.5	1.42		YES
408				11-20			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1492	1184	2.36		YES
409				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1492	1655	3.31		YES
410				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1288	1837	3.67		YES
411				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1016	1773	3.55		YES
412				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	880	1814	3.63		YES
413				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	744	1773	3.55		YES
414				0-10			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	702.9	1.41		YES
415				11-20			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1170	2.34		YES
416				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1637	3.27		YES
417				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1361	1819	3.64		YES
418				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1075	1755	3.51		YES
419				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	930	1796	3.59		YES
420				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1755	3.51		YES
421				0-10			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	657.6	1.31		YES
422				11-20			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	1093	2.19		YES
423				21-30			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	1528	3.06		YES
424				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1456	1778	3.56		YES
425				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1152	1714	3.43		YES
426				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	998	1755	3.51		YES
427				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1714	3.43		YES
428				0-10			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1619	644	1.28		YES
429				11-20			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1619	1066	2.14		YES
430				21-30			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1619	1492	2.99		YES
431				31-40			9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1465	1737	3.47		YES
432				41-50			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1156	1678	3.35		YES
433				51-60			6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1002	1714	3.43		YES
434				61-70			5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1673	3.35		YES
435				0-10			10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1519	621.3	1.24		YES
436				11-20			10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1519	1034	2.07		YES
437				21-30			10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1506	1469	2.94		YES
438				31-40			9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1374	1678	3.36		YES
439				41-50			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1084	1619	3.24		YES
440				51-60																											



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→	DATE	→
JOB NO.	→	CHECKER	→
AZ20170			
STRUCTURAL ENGINEERS		July 5, 2024	
		SAM	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column		Uplift Force		Actual Force (kg)				
								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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
442				0-10		11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1469	757.4	1.51	YES	
443				11-20		11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1469	1261	2.53	YES	
444				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1401	1692	3.38	YES	
445				31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1215	1878	3.76	YES	
446				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	961	1810	3.62	YES	
447				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1855	3.71	YES	
448				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	701	1810	3.62	YES	
449				0-10		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	716.6	1.43	YES	
450				11-20		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	1193	2.39	YES	
451				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	1673	3.34	YES	
452				31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1306	1855	3.71	YES	
453				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1029	1791	3.58	YES	
454				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	893	1832	3.67	YES	
455				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	753	1791	3.58	YES	
456				0-10		10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	644	1.29	YES	
457				11-20		10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1075	2.15	YES	
458				21-30		10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1506	3.01	YES	
459				31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1492	1837	3.67	YES	
460				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1179	1773	3.55	YES	
461				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1020	1814	3.63	YES	
462				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	866	1773	3.55	YES	
463				0-10		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1578	607.7	1.21	YES	
464				11-20		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1578	1011	2.02	YES	
465				21-30		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1578	1415	2.83	YES	
466				31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1578	1819	3.64	YES	
467				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1247	1755	3.51	YES	
468				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1079	1796	3.59	YES	
469				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	912	1755	3.51	YES	
470				0-10		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1601	562.4	1.12	YES	
471				11-20		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1601	934.2	1.87	YES	
472				21-30		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1601	1311	2.62	YES	
473				31-40	7'6"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1601	1683	3.37	YES	
474				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1333	1714	3.43	YES	
475				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1156	1755	3.51	YES	
476				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	980	1714	3.43	YES	
477				0-10		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	548.8	1.1	YES	
478				11-20		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	916.1	1.83	YES	
479				21-30		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	1279	2.56	YES	
480				31-40	7'6"	9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	1646	3.29	YES	
481				41-50		7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1342	1678	3.35	YES	
482				51-60		6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1161	1714	3.43	YES	
483				61-70		5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	984	1673	3.35	YES	
484				0-10		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	530.6	1.07	YES	
485				11-20	7'6"	9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	884.4	1.77	YES	
486				21-30		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1497	1236	2.52	YES	
487				31-40		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	1592	3.18	YES	
488				41-50		7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1256	1619	3.24	YES	
489				51-60		6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1088	1660	3.32	YES	
490				61-70		5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	921	1619	3.24	YES	



Ground Mount Structure Spans (ASCE 7-16)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.						Actual Force (kg)					
							Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column									
							[S1] (ft-in)	[S2] (ft-in)		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)		Uplift Force	Downward
491	160	C	5	0-10	7'6"	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1546	689.3	1.38		YES
492				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1546	1152	2.3		YES
493				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1546	1615	3.23		YES
494				31-40			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1397	1878	3.76		YES
495				41-50			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1102	1810	3.62		YES
496				51-60			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	957	1855	3.71		YES
497				61-70			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1810	3.62		YES
498			0-10	7'6"	10	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1578	653.1	1.3		YES	
499			11-20			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1578	1084	2.17		YES	
500			21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1578	1519	3.04		YES	
501			31-40			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1457	1855	3.71		YES	
502			41-50			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1184	1791	3.58		YES	
503			51-60			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1025	1832	3.67		YES	
504			61-70			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	866	1791	3.58		YES	
505			0-10	7'6"	15	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1624	580.5	1.16		YES	
506			11-20			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1624	966	1.93		YES	
507			21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1624	1351	2.71		YES	
508			31-40			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1624	1741	3.48		YES	
509			41-50			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1351	1773	3.55		YES	
510			51-60			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1175	1814	3.63		YES	
511			61-70			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	993	1773	3.55		YES	
512			0-10	7'6"	20	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1619	544.2	1.08		YES
513			11-20			8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1619	902.5	1.81		YES
514			21-30			8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1619	1265	2.53		YES
515			31-40			8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1619	1628	3.25		YES
516			41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1429	1755	3.51		YES
517			51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1238	1796	3.59		YES
518			61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1048	1755	3.51		YES
519			0-10	7'6"	25	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1528	467.1	0.94		YES
520			11-20			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1528	780	1.56		YES
521			21-30			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1528	1093	2.19		YES
522			31-40			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1528	1401	2.81		YES
523			41-50			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1528	1714	3.43		YES
524			51-60			6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1324	1755	3.51		YES
525			61-70			5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1120	1714	3.43		YES
526			0-10	7'6"	30	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1537	458	0.92		YES
527			11-20			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1537	761.9	1.52		YES
528			21-30			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1537	1066	2.14		YES
529			31-40			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1537	1370	2.74		YES
530			41-50			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1537	1678	3.35		YES
531			51-60			6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1333	1714	3.43		YES
532			61-70			5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1125	1673	3.35		YES
533			0-10	7'6"	35	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1442	444.4	0.89		YES
534	11-20	7'-6"	0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1442	739.2	1.47		YES		
535	21-30	7'-6"	0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1433	1052	2.1		YES		
536	31-40	7'-6"	0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1442	1324	2.65		YES		
537	41-50	7'-6"	0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1442	1619	3.24		YES		
538	51-60	6'-6"	0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1247	1660	3.32		YES		
539	61-70	5'-6"	0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1057	1619	3.24		YES		



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Exposure C, ASCE 7-10, SCH 40- GM Chart for 4 Modules 90-160 Mph



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
								Pole Footing Size					US Helical Size								Krinner Ground Screws G114x1600.								
								Front Column			Rear Column		Front Column				Rear Column				Fornr Column		Rear Column		Actual Force (kg)				
					[S1] (ft-in)	[S2] (ft-in)			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)	Uplift Force	Downward	Horiz.
1				0-10	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1120	2.24	YES	
2				11-20	13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	503	1429	2.85	YES	
3				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	426	1692	3.38	YES	
4				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	367	1878	3.76	YES	
5				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1810	3.62	YES	
6				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	249	1855	3.71	YES	
7				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	213	1810	3.62	YES	
8				0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	717	1107	2.21	YES	
9				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	549	1410	2.82	YES	
10				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	463	1673	3.34	YES	
11				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	399	1855	3.71	YES	
12				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1791	3.58	YES	
13				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	272	1832	3.67	YES	
14				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	231	1791	3.58	YES	
15				0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	1098	2.19	YES	
16				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	639	1397	2.79	YES	
17				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	567	1728	3.46	YES	
18				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	467	1837	3.67	YES	
19				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1773	3.55	YES	
20				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	322	1814	3.63	YES	
21				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	272	1773	3.55	YES	
22				0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	893	1084	2.17	YES	
23				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	685	1383	2.77	YES	
24				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	603	1710	3.42	YES	
25				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	499	1819	3.64	YES	
26				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1755	3.51	YES	
27				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	340	1796	3.59	YES	
28				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1914	3.83	YES	
29				0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	966	1061	2.12	YES	
30				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	739	1351	2.7	YES	
31				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	626	1601	3.2	YES	
32				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1873	3.74	YES	
33				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1714	3.43	YES	
34				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	355	1755	3.51	YES	
35				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1714	3.43	YES	
36				0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1002	1070	2.14	YES	
37				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	776	1374	2.75	YES	
38				21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	630	1565	3.13	YES	
39				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1737	3.47	YES	
40				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1678	3.35	YES	
41				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1714	3.43	YES	
42				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1673	3.35	YES	
43				0-10	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	912	1007	2.01	YES	
44				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	698	1279	2.56	YES	
45				21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	576	1542	3.08	YES	
46				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1678	3.36	YES	
47				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1619	3.24	YES	
48				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1660	3.32	YES	
49				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1914	3.83	YES	



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hange (ft-in)	Foundation																								US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.				Actual Force (kg)											
							Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column													
							[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1625			
50				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	753	1120	2.24	YES					
51				11-20		13'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	576	1429	2.85	YES					
52				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	490	1692	3.38	YES					
53				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1878	3.76	YES					
54				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1810	3.62	YES					
55				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1855	3.71	YES					
56				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1810	3.62	YES					
57				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	1107	2.21	YES					
58				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	626	1410	2.82	YES					
59				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	531	1673	3.34	YES					
60				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1855	3.71	YES					
61				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1791	3.58	YES					
62				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1832	3.67	YES					
63				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	263	1791	3.58	YES					
64				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	957	1098	2.19	YES					
65				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	730	1397	2.79	YES					
66				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	617	1655	3.31	YES					
67				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	535	1837	3.67	YES					
68				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1773	3.55	YES					
69				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	367	1814	3.63	YES					
70				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1773	3.55	YES					
71				0-10	7'6"	17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1016	1084	2.17	YES					
72				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	780	1383	2.77	YES					
73				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1637	3.27	YES					
74				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	567	1819	3.64	YES					
75				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1755	3.51	YES					
76				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	390	1796	3.59	YES					
77				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1755	3.51	YES					
78				0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1034	997	2	YES					
79				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	1351	2.7	YES					
80				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	712	1601	3.2	YES					
81				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	617	1778	3.56	YES					
82				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	487	1714	3.43	YES					
83				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1755	3.51	YES					
84				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1714	3.43	YES					
85				0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1043	979.6	1.95	YES					
86				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1324	2.64	YES					
87				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	717	1565	3.13	YES					
88				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1737	3.47	YES					
89				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1678	3.35	YES					
90				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1714	3.43	YES					
91				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	358	1673	3.35	YES					
92				0-10	7'6"	16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	975	947.8	1.9	YES					
93				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	794	1279	2.56	YES					
94				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1542	3.08	YES					
95				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	580	1678	3.36	YES					
96				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1619	3.24	YES					
97				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1660	3.32	YES					
98				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	336	1619	3.24	YES					



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hange (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)					
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force
99				0-10		17'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	857	1120	2.24	YES
100				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	658	1429	2.85	YES
101				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	553	1692	3.38	YES
102			5	31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	481	1878	3.76	YES
103				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	376	1810	3.62	YES
104				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1855	3.71	YES
105				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	277	1810	3.62	YES
106				0-10		17'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	930	1107	2.21	YES
107				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	712	1410	2.82	YES
108				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	603	1673	3.34	YES
109			10	31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	522	1855	3.71	YES
110				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	408	1791	3.58	YES
111				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1832	3.67	YES
112				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	299	1791	3.58	YES
113				0-10		16'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1048	1066	2.13	YES
114				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	1397	2.79	YES
115				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	698	1655	3.31	YES
116			15	31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1837	3.67	YES
117				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1773	3.55	YES
118				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	413	1814	3.63	YES
119				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1773	3.55	YES
120				0-10		16'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1079	1020	2.04	YES
121				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	880	1383	2.77	YES
122				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	744	1637	3.27	YES
123			20	31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	644	1819	3.64	YES
124				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1755	3.51	YES
125				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	440	1796	3.59	YES
126				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1755	3.51	YES
127				0-10		15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1093	938.8	1.87	YES
128				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	948	1351	2.7	YES
129				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	1601	3.2	YES
130			25	31-40	7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	694	1778	3.56	YES
131				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1714	3.43	YES
132				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	472	1755	3.51	YES
133				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	399	1714	3.43	YES
134				0-10		15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1102	916.1	1.83	YES
135				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	952	1324	2.64	YES
136				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	1565	3.13	YES
137			30	31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	698	1737	3.47	YES
138				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1678	3.35	YES
139				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1714	3.43	YES
140				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1673	3.35	YES
141				0-10		15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1066	916.1	1.84	YES
142				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	893	1279	2.56	YES
143				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	739	1542	3.08	YES
144			35	31-40	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	653	1678	3.36	YES
145				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1619	3.24	YES
146				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	444	1660	3.32	YES
147				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63						



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column				Rear Column				Fornrt Column		Rear Column							
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.
148				0-10			17'-0"	0'-6"	2'-0"	2'-5"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	966	1120	2.24		YES
149				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	739	1429	2.85		YES
150				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	626	1692	3.38		YES
151				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1878	3.76		YES
152				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1810	3.62		YES
153				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1855	3.71		YES
154				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	313	1810	3.62		YES
155				0-10			16'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1011	1075	2.15		YES
156				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	1410	2.82		YES
157				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	676	1673	3.34		YES
158				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1855	3.71		YES
159				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1791	3.58		YES
160				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	399	1832	3.67		YES
161				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	336	1791	3.58		YES
162				0-10			15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1102	997.7	2		YES
163				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	925	1397	2.79		YES
164				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	785	1655	3.31		YES
165				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	676	1837	3.67		YES
166				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1773	3.55		YES
167				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1814	3.63		YES
168				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	390	1773	3.55		YES
169				0-10			15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1134	956.9	1.91		YES
170				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	984	1383	2.77		YES
171				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1637	3.27		YES
172				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	717	1819	3.64		YES
173				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	565	1755	3.51		YES
174				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	490	1796	3.59		YES
175				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	417	1755	3.51		YES
176				0-10			14'-5"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1184	907	1.81		YES
177				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1061	1351	2.7		YES
178				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	898	1601	3.2		YES
179				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	1778	3.56		YES
180				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	612	1714	3.43		YES
181				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	531	1755	3.51		YES
182				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	449	1714	3.43		YES
183				0-10			14'-5 "	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1188	884.4	1.77		YES
184				11-20			13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1066	1324	2.64		YES
185				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	902	1565	3.13		YES
186				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1737	3.47		YES
187				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1678	3.35		YES
188				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1714	3.43		YES
189				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	449	1673	3.35		YES
190				0-10			15'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1152	888.9	1.78		YES
191				11-20			13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	998	1279	2.56		YES
192				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1542	3.08		YES
193				31-40		7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	730	1678	3.36		YES
194				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	576	1619	3.24		YES
195				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"</																



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.						Actual Force (kg)			
							Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Uplift Force					
							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)	Uplift Force	Downward	Horiz.	
					[S1] (ft-in)	[S2] (ft-in)																		Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625				
197				0-10	16'-6"	0'-6"	2'-0"	2'-5"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1048	1084	2.17	YES
198				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	1429	2.85	YES
199			5	21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	698	1692	3.38	YES
200				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1878	3.76	YES
201				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1810	3.62	YES
202				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	413	1855	3.71	YES
203				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1810	3.62	YES
204			10	0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1061	1007	2.02	YES
205				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	889	1410	2.82	YES
206				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	753	1673	3.34	YES
207				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	653	1855	3.71	YES
208				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	512	1791	3.58	YES
209				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	444	1832	3.67	YES
210				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	376	1791	3.58	YES
211			15	0-10	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1152	934.2	1.87	YES
212				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1029	1397	2.79	YES
213				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	871	1655	3.31	YES
214				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	753	1837	3.67	YES
215				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	594	1773	3.55	YES
216				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1814	3.63	YES
217				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	435	1773	3.55	YES
218			20	0-10	14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1179	893.4	1.79	YES
219				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1093	1383	2.77	YES
220				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	925	1637	3.27	YES
221				31-40	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1819	3.64	YES
222				41-50	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	630	1755	3.51	YES
223				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1796	3.59	YES
224				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1755	3.51	YES
225			25	0-10	13'-5"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1220	843.5	1.69	YES
226				11-20	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1175	1351	2.7	YES
227				21-30	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	998	1601	3.2	YES
228				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	862	1778	3.56	YES
229				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	680	1714	3.43	YES
230				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	590	1755	3.51	YES
231				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1714	3.43	YES
232			30	0-10	13'-5"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1229	825.4	1.65	YES
233				11-20	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1184	1324	2.64	YES
234				21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1002	1565	3.13	YES
235				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	866	1737	3.47	YES
236				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	685	1678	3.35	YES
237				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	594	1714	3.43	YES
238				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	499	1673	3.35	YES
239			35	0-10	14'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1193	829.9	1.66	YES
240				11-20	13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1107	1279	2.56	YES
241				21-30	11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	925	1542	3.08	YES
242				31-40	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	1678	3.36	YES
243				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	639	1619	3.24	YES
244				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	553	1660	3.32	YES
245				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	467	1619	3.24	YES



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)					
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force
246				0-10		15'-6"	0'-6"	2'-0"	2'-5"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1093	1020	2.04	YES
247				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	916	1429	2.85	YES
248				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	776	1692	3.38	YES
249				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1878	3.76	YES
250				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	526	1810	3.62	YES
251				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1855	3.71	YES
252				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	384	1810	3.62	YES
253				0-10		15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1138	975.1	1.95	YES
254				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	989	1410	2.82	YES
255				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1673	3.34	YES
256				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	721	1855	3.71	YES
257				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1791	3.58	YES
258				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	494	1832	3.67	YES
259				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	417	1791	3.58	YES
260				0-10		14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1229	902.5	1.8	YES
261				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1138	1397	2.79	YES
262				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	966	1655	3.31	YES
263				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1837	3.67	YES
264				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	658	1773	3.55	YES
265				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1814	3.63	YES
266				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	481	1773	3.55	YES
267				0-10		13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1256	861.7	1.72	YES
268				11-20		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1211	1383	2.77	YES
269				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1025	1637	3.27	YES
270				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	884	1819	3.64	YES
271				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	698	1755	3.51	YES
272				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1796	3.59	YES
273				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	512	1755	3.51	YES
274				0-10		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1302	811.8	1.62	YES
275				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1302	1351	2.7	YES
276				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1098	1601	3.2	YES
277				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	948	1778	3.56	YES
278				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	748	1714	3.43	YES
279				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	649	1755	3.51	YES
280				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	549	1714	3.43	YES
281				0-10		13'-0 "	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1306	793.7	1.59	YES
282				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1306	1324	2.64	YES
283				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1107	1565	3.13	YES
284				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	957	1737	3.47	YES
285				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	753	1678	3.35	YES
286				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	653	1714	3.43	YES
287				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	553	1673	3.35	YES
288				0-10		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1224	771	1.54	YES
289				11-20		13'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1224	1279	2.56	YES
290				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1020	1542	3.08	YES
291				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	893	1678	3.36	YES
292				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	707	1619	3.24	YES
293				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	612	1660	3.32	YES
294				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	517	1619	3.24	YES



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hange (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)			
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column		Actual Force (kg)						
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
295				0-10			14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1125	952.4	1.91	YES
296				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1010	1429	2.85	YES
297				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	1692	3.38	YES
298				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	739	1878	3.76	YES
299				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	585	1810	3.62	YES
300				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	503	1855	3.71	YES
301				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1810	3.62	YES
302				0-10			14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1170	911.6	1.82	YES
303				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1088	1410	2.82	YES
304				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	921	1673	3.34	YES
305				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	794	1855	3.71	YES
306				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1791	3.58	YES
307				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1832	3.67	YES
308				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1791	3.58	YES
309				0-10			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1256	839	1.68	YES
310				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1256	1397	2.79	YES
311				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1061	1655	3.31	YES
312				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	916	1837	3.67	YES
313				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	726	1773	3.55	YES
314				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1814	3.63	YES
315				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1773	3.55	YES
316				0-10			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1329	829.9	1.66	YES
317				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1329	1383	2.77	YES
318				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1125	1637	3.27	YES
319				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	971	1819	3.64	YES
320				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1755	3.51	YES
321				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1796	3.59	YES
322				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	512	1755	3.51	YES
323				0-10			12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1374	780	1.56	YES
324				11-20			12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1374	1302	2.6	YES
325				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1206	1601	3.2	YES
326				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1043	1778	3.56	YES
327				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1714	3.43	YES
328				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	712	1755	3.51	YES
329				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1714	3.43	YES
330				0-10			12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1379	761.9	1.53	YES
331				11-20			12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1379	1270	2.54	YES
332				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1215	1565	3.13	YES
333				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1048	1737	3.47	YES
334				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1678	3.35	YES
335				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	717	1714	3.43	YES
336				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	608	1673	3.35	YES
337				0-10			12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1293	739.2	1.48	YES
338				11-20			12'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1293	1229	2.46	YES
339				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1125	1542	3.08	YES
340				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	984	1678	3.36	YES
341				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1619	3.24	YES
342				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1660	3.32	YES
343				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	567	1619		

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)				
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.				Actual Force (kg)							
							Front Column			Rear Column			Front Column			Rear Column			Formt. Column		Rear Column									
							[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.
344				0-10	7'6"		13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1261	888.9	1.78	YES
345				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1211	1429	2.85	YES
346				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1025	1692	3.38	YES
347				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	884	1878	3.76	YES
348				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	698	1810	3.62	YES
349				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	608	1855	3.71	YES
350				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	512	1810	3.62	YES
351				0-10	7'6"		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1302	848.1	1.69	YES
352				11-20			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1310	1410	2.82	YES
353				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	1102	1673	3.34	YES
354				31-40			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	952	1855	3.71	YES
355				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	753	1791	3.58	YES
356				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	653	1832	3.67	YES
357				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	553	1791	3.58	YES
358				0-10	7'6"		12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1383	775.5	1.55	YES
359				11-20			12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1383	1288	2.58	YES
360				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1270	1655	3.31	YES
361				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1093	1837	3.67	YES
362				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	886	1773	3.55	YES
363				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	748	1814	3.63	YES
364				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1773	3.55	YES
365				0-10	7'6"		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1401	734.7	1.47	YES
366				11-20			11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1401	1224	2.44	YES
367				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1342	1637	3.27	YES
368				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1196	1819	3.64	YES
369				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	916	1755	3.51	YES
370				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	794	1796	3.59	YES
371				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1755	3.51	YES
372				0-10	7'6"		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1506	716.6	1.44	YES
373				11-20			11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1506	1197	2.39	YES
374				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1438	1601	3.2	YES
375				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1243	1778	3.56	YES
376				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	980	1714	3.43	YES
377				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1755	3.51	YES
378				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	721	1714	3.43	YES
379				0-10	7'6"		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1447	671.2	1.35	YES
380				11-20			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1447	1120	2.24	YES
381				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1447	1565	3.13	YES
382				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1252	1737	3.47	YES
383				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	989	1678	3.35	YES
384				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	857	1714	3.43	YES
385				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	726	1673	3.35	YES
386				0-10	7'6"		11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1420	680.3	1.36	YES
387				11-20			11'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1420	1129	2.26	YES
388				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1342	1542	3.08	YES
389				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	1170	1678	3.36	YES
390				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	925	1619	3.24	YES
391				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1660	3.32	YES	
392				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	680	1619	3.24	YES	



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size					US Helical Size					Krinner Ground Screws G114x1600.												
								Front Column			Rear Column		Front Column			Rear Column		Front Column		Rear Column		Front Column		Rear Column						
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1950 1625	
393				0-10			12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1374	820.9	1.65	YES
394				11-20			12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1374	1370	2.74	YES
395				21-30			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	1211	1692	3.38	YES
396				31-40		7'6"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1043	1878	3.76	YES
397				41-50			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1810	3.62	YES
398				51-60			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	717	1855	3.71	YES
399				61-70			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1810	3.62	YES
400				0-10			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1415	780	1.56	YES
401				11-20			12'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1415	1302	2.6	YES
402				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1257	1673	3.34	YES
403				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1120	1855	3.71	YES
404				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	884	1791	3.58	YES
405				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1832	3.67	YES
406				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	649	1791	3.58	YES
407				0-10			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1492	707.5	1.42	YES
408				11-20			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1492	1184	2.36	YES
409				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1492	1655	3.31	YES
410				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1288	1837	3.67	YES
411				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1016	1773	3.55	YES
412				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	880	1814	3.63	YES
413				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	744	1773	3.55	YES
414				0-10			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	702.9	1.41	YES
415				11-20			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1170	2.34	YES
416				21-30			11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1637	3.27	YES
417				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1361	1819	3.64	YES
418				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1075	1755	3.51	YES
419				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	930	1796	3.59	YES
420				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1755	3.51	YES
421				0-10			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	657.6	1.31	YES
422				11-20			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	1093	2.19	YES
423				21-30			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	1528	3.06	YES
424				31-40			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1456	1778	3.56	YES
425				41-50			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1152	1714	3.43	YES
426				51-60			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	998	1755	3.51	YES
427				61-70			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1714	3.43	YES
428				0-10			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1619	644	1.28	YES
429				11-20			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1619	1066	2.14	YES
430				21-30			10'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1619	1492	2.99	YES
431				31-40			9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1465	1737	3.47	YES
432				41-50			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1156	1678	3.35	YES
433				51-60			6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1002	1714	3.43	YES
434				61-70			5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1673	3.35	YES
435				0-10			10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1519	621.3	1.24	YES
436				11-20			10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1519	1034	2.07	YES
437				21-30			10'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1506	1469	2.94	YES
438				31-40			9'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1374	1678	3.36	YES
439				41-50			7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1084	1619	3.24	YES
440				51-60			6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5							



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→	DATE	→
JOB NO.	→	CHECKER	→
AZ20170			
		July 5, 2024	
		SAM	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																								US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.													
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Front Column		Rear Column		Front Column		Rear Column			
					[S1] (ft-in)	[S2] (ft-in)			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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)					
442				0-10	7'6"	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1469	757.4	1.51	YES						
443				11-20		11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1469	1261	2.53	YES						
444				21-30		11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1401	1692	3.38	YES						
445				31-40		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1215	1878	3.76	YES						
446				41-50		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	961	1810	3.62	YES						
447				51-60		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1855	3.71	YES						
448				61-70		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	701	1810	3.62	YES						
449				0-10	7'6"	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	716.6	1.43	YES						
450				11-20		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	1193	2.39	YES						
451				21-30		11'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	1673	3.34	YES						
452				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1306	1855	3.71	YES						
453				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1029	1791	3.58	YES						
454				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	893	1832	3.67	YES						
455				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	753	1791	3.58	YES						
456				0-10	7'6"	10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	644	1.29	YES						
457				11-20		10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1075	2.15	YES						
458				21-30		10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1574	1506	3.01	YES						
459				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1492	1837	3.67	YES						
460				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1179	1773	3.55	YES						
461				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1020	1814	3.63	YES						
462				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	866	1773	3.55	YES						
463				0-10	7'6"	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1578	607.7	1.21	YES						
464				11-20		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1578	1011	2.02	YES						
465				21-30		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1578	1415	2.83	YES						
466				31-40		9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1578	1819	3.64	YES						
467				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1247	1755	3.51	YES						
468				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1079	1796	3.59	YES						
469				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	912	1755	3.51	YES						
470				0-10	7'6"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1601	562.4	1.12	YES						
471				11-20		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1601	934.2	1.87	YES						
472				21-30		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1601	1311	2.62	YES						
473				31-40		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1601	1683	3.37	YES						
474				41-50		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1333	1714	3.43	YES						
475				51-60		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1156	1755	3.51	YES						
476				61-70		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	980	1714	3.43	YES						
477				0-10	7'6"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	548.8	1.1	YES						
478				11-20		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	916.1	1.83	YES						
479				21-30		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	1279	2.56	YES						
480				31-40		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1610	1646	3.29	YES						
481				41-50		7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1342	1678	3.35	YES						
482				51-60		6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1161	1714	3.43	YES						
483				61-70		5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	984	1673	3.35	YES						
484				0-10	7'6"	9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	530.6	1.07	YES						
485				11-20		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	884.4	1.77	YES						
486				21-30		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1497	1236	2.52	YES						
487				31-40		9'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1510	1592	3.18	YES						
488				41-50		7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1256	1619	3.24	YES						
489				51-60		6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	1088	1660	3.32	YES						
490				61-70		5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	921	1619	3.24	YES						



Ground Mount Structure Spans (ASCE 7-10)

4 modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

STRUCTURAL ENGINEERS	JOB NAME	→	AZ20170	DATE	→	July 5, 2024 SAM
	JOB NO.	→		CHECKER	→	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			K2 Systems Top Cap (See note 1,2,3,4,5)
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.						Actual Force (kg)			
							Front Column			Rear Column			Front Column			Rear Column			Front Column			Rear Column			Uplift Force	Downward	Horiz.	
							[S1] (ft-in)	[S2] (ft-in)		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)	
491				0-10	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1546	689.3	1.38	YES
492				11-20	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1546	1152	2.3	YES
493				21-30	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1546	1615	3.23	YES
494			5	31-40	7'6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1397	1878	3.76	YES
495				41-50	7'6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1102	1810	3.62	YES
496				51-60	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	957	1855	3.71	YES
497				61-70	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	807	1810	3.62	YES
498				0-10	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1578	653.1	1.3	YES
499				11-20	10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1578	1084	2.17	YES
500				21-30	10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1578	1519	3.04	YES
501				31-40	7'6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1457	1855	3.71	YES
502				41-50	7'6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1184	1791	3.58	YES
503				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1025	1832	3.67	YES
504				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	866	1791	3.58	YES
505				0-10	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1624	580.5	1.16	YES
506				11-20	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1624	966	1.93	YES
507				21-30	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1624	1351	2.71	YES
508				31-40	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1624	1741	3.48	YES
509				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1351	1773	3.55	YES
510				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1175	1814	3.63	YES
511				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	993	1773	3.55	YES
512				0-10	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1619	544.2	1.08	YES
513				11-20	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1619	902.5	1.81	YES
514				21-30	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1619	1265	2.53	YES
515				31-40	8'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1619	1628	3.25	YES
516				41-50	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1429	1755	3.51	YES
517				51-60	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1238	1796	3.59	YES
518				61-70	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1048	1755	3.51	YES
519				0-10	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1528	467.1	0.94	YES
520				11-20	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1528	780	1.56	YES
521				21-30	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1528	1093	2.19	YES
522				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1528	1401	2.81	YES
523				41-50	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1528	1714	3.43	YES
524				51-60	6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1324	1755	3.51	YES
525				61-70	5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1120	1714	3.43	YES
526				0-10	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1537	458	0.92	YES
527				11-20	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1537	761.9	1.52	YES
528				21-30	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1537	1066	2.14	YES
529				31-40	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1537	1370	2.74	YES
530				41-50	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1537	1678	3.35	YES
531				51-60	6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1333	1714	3.43	YES
532				61-70	5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1125	1673	3.35	YES
533				0-10	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1442	444.4	0.89	YES
534				11-20	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1442	739.2	1.47	YES
535				21-30	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1433	1052	2.1	YES
536				31-40	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1442	1324	2.65	YES
537				41-50	7'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1442	1619	3.24	YES
538				51-60	6'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1247	1660	3.32	YES
539				61-70	5'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7"	2'-7/8"	2	8	7"	4.5	63	4.5	63	1057	1619	3.24	YES



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5 MODULES 40 SCH.

	GM Solar Shade				
	JOB NAME JOB NO.	→ →	AZ20170	DATE CHECKER	→ → 10 July 2024 SAM

CRITERIA

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

[A] - **GOVERNING CODE** → IBC 2015, ACI 318-14, ASCE 7-10, CBC 2016 & IBC 2018, ACI 318-14, ASCE 7-16, CBC 2019.

[B] - **MODULE AREA** → 28.125 Square Foot.

[C] - **WIND SPEED (MPH)** → 90,95,100,105,110,115,120,130,140,150 & 160 mph for exposure B & C

[D] - **SNOW LOAD (PSF)** → 0 PSF TO 70 PSF (in increments of 10 psf)

[E] - **TILT ANGLE** → 5 DEGREE TO 30 DEGREE (in increments of 5 Degree)

[F] - **FOUNDATION** → POLE FOOTING

→ HELICAL PILES (US Helicals Cataloge)

→ KRINNER GROUND SCREW

[G] - **SOIL- ASSUMPTION** → **SOIL BEARING**

Bottoms of bearing footings shall bear on Undisturbed Native Soil

(Refer tables for exact pile depths)

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/ft below natural grade)**

150 psf

→ **Coefficient of friction**

0.25

[H] - **ASSUMPTION**

→ 3" Dia pipe beam Sch. 40 or Mechanical tubing option with 45 ksi yield strength, 8 gauge and galvanized.

→ 3" Dia pipe Column Sch. 40 or Mechanical tubing option with 45 ksi yield strength, 8 gauge and galvanized.

Base fix & Top Free

→ Yield Strss of 3" dia pipe (Sch. 40) - Fy = 35 ksi & Fu = 58 ksi

→ Yield Strss of krinner ground screw- Fy = 35 ksi

→ Beam Deflection → L/120

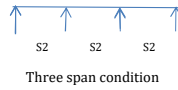
→ Column Deflection → H/120

→ 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.



[I] - **Pole foundation Assumptions and Limitations:**

→ The references used in the different analysis methods in this program are as follows:-
International Building Code (IBC) 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.

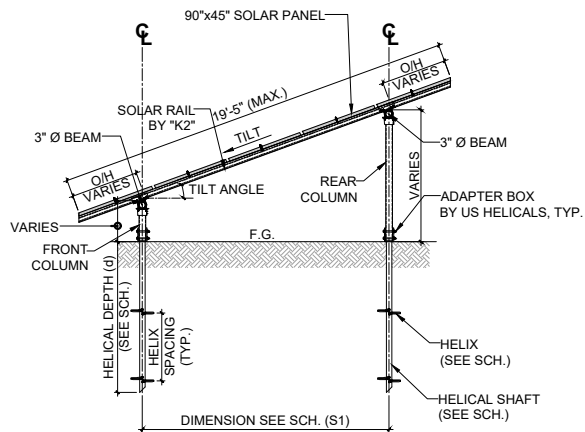
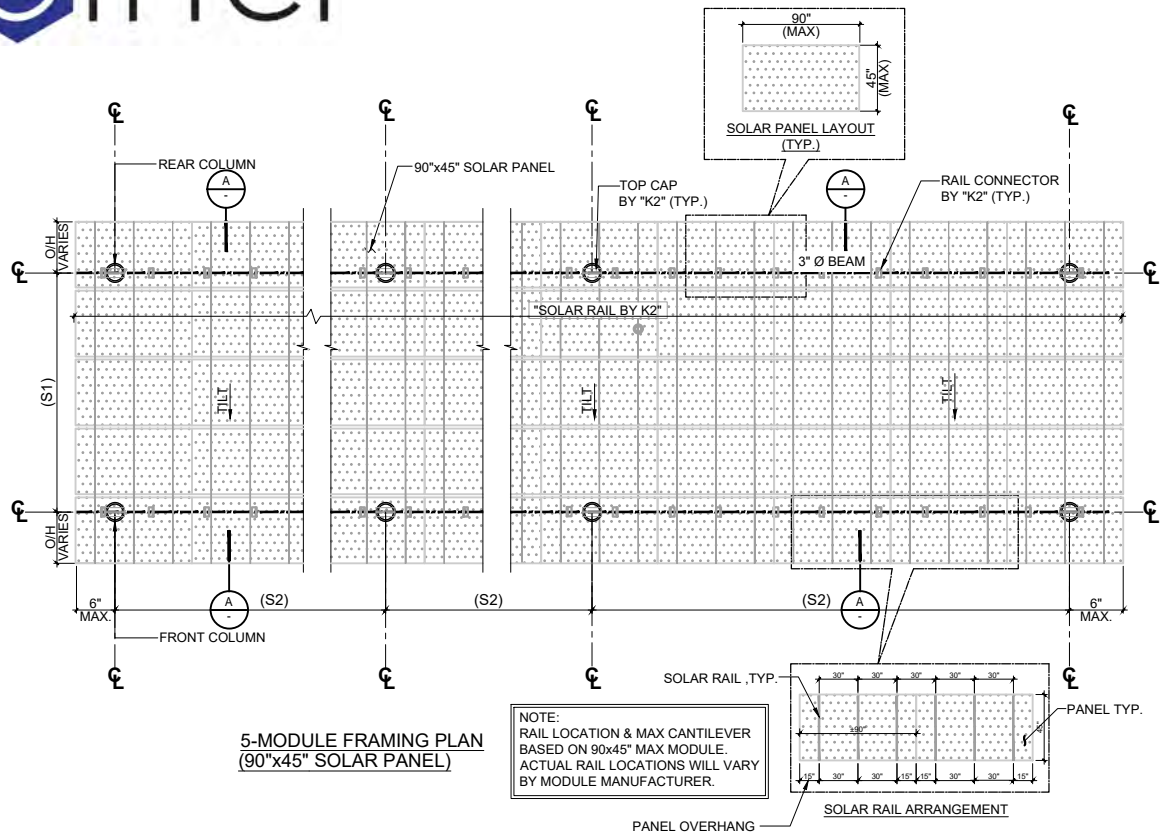
→ This program assumes that the actual resisting surface is at or below the ground surface level.

→ This accounts for any weak soil or any soil which may be removed at the top

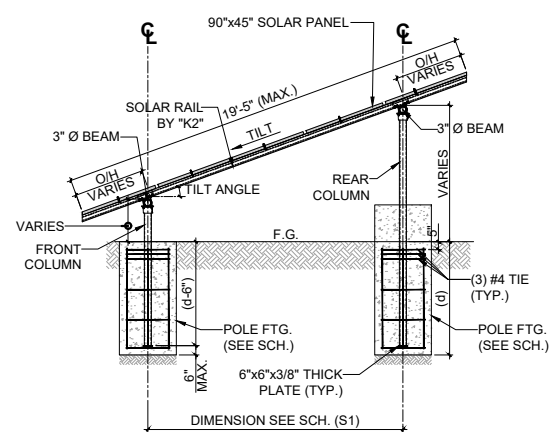
→ Yield strength of 2-7/8" dia piles - Fy = 60 ksi

→ Compression values are based on fully laterally supported piles (full embedded in soil), if not, contact engineer department for calculations.

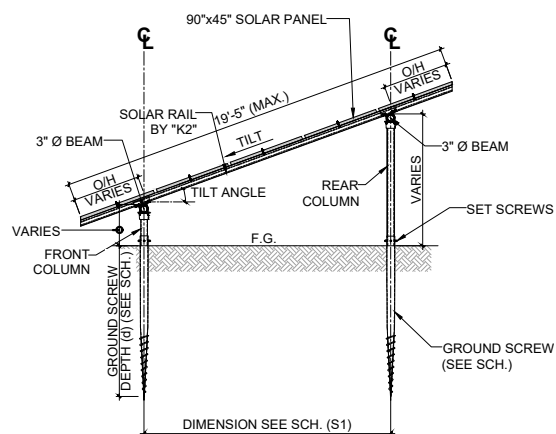
→ All Design performed using ASD Method.



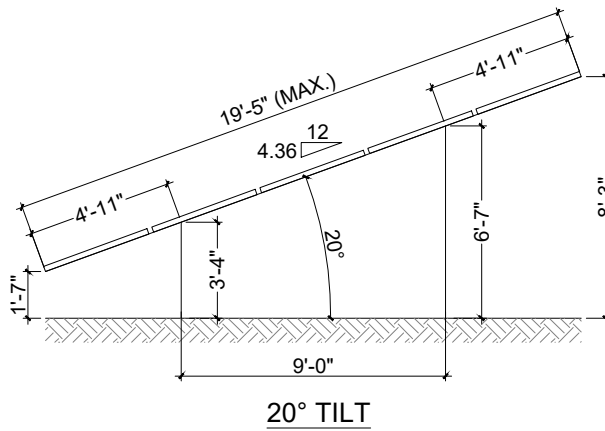
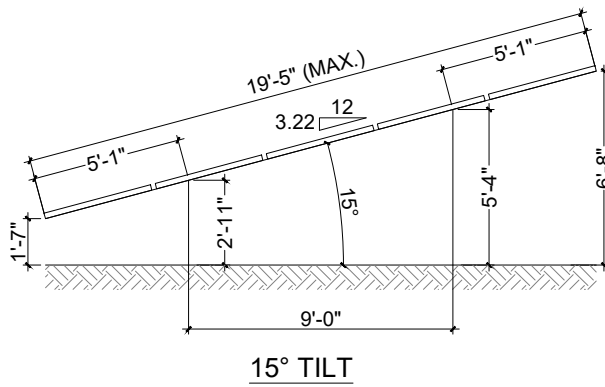
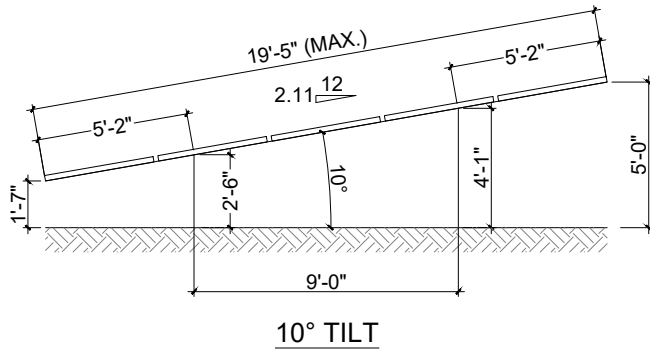
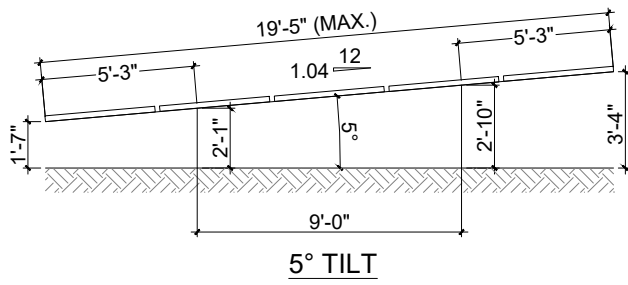
SECTION-'A' W/ HELICAL FOUNDATION

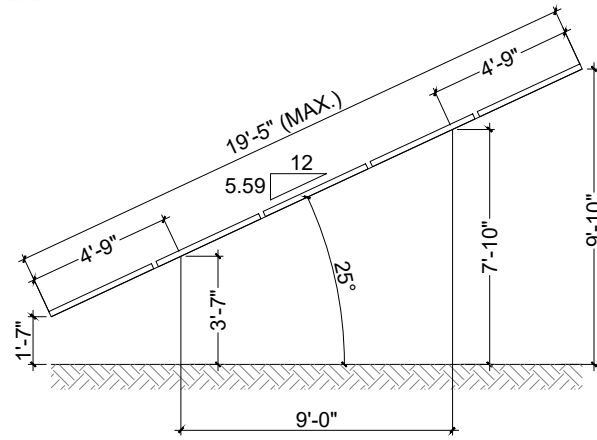


SECTION-'A' W/ POLE FOUNDATION

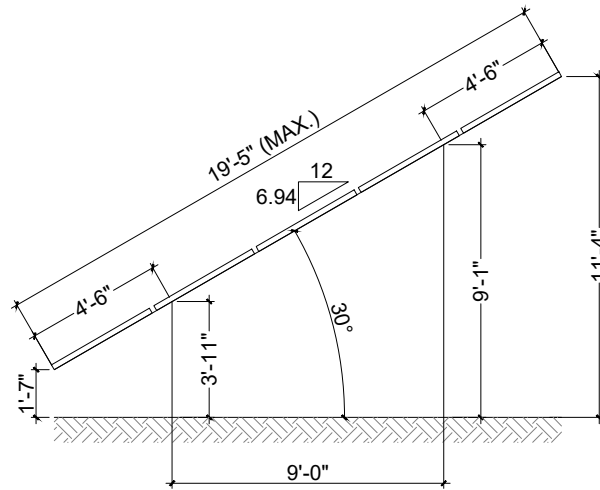


SECTION-'A' W/ GROUND SCREW





25° TILT



30° TILT



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Exposure B, ASCE 7-16, SCH 40- GM Chart for 5 Modules 90-160 Mph



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME JOB NO.	→ →	AZ20170	DATE CHECKER	→ →	July 5, 2024 SAM
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SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.							
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column		Actual Force (kg)			
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)
1				0-10	15'-6"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	590	1765	2.53	YES	
2				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	458	1642	3.29	YES	
3				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1828	3.65	YES	
4				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	286	1855	3.71	YES	
5				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	227	1819	3.63	YES	
6				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	190	1791	3.58	YES	
7				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	172	1859	3.72	YES	
8				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	649	1256	2.51	YES	
9				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	503	1628	3.26	YES	
10				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	395	1810	3.62	YES	
11				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	313	1841	3.68	YES	
12				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	250	1800	3.6	YES	
13				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	209	1773	3.55	YES	
14				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	186	1841	3.69	YES	
15				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	766	1247	2.49	YES	
16				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	594	1615	3.23	YES	
17				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	472	1796	3.59	YES	
18				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1823	3.65	YES	
19				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	295	1787	3.57	YES	
20				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	245	1760	3.52	YES	
21				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	222	1828	3.66	YES	
22				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	812	1224	2.45	YES	
23				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	630	1587	3.17	YES	
24				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	499	1764	3.53	YES	
25				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	395	1791	3.59	YES	
26				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	313	1755	3.51	YES	
27				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	263	1728	3.46	YES	
28				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	236	1796	3.59	YES	
29				0-10	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1125	2.25	YES	
30				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	689	1560	3.12	YES	
31				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	544	1732	3.47	YES	
32				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	431	1764	3.52	YES	
33				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	345	1723	3.45	YES	
34				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	286	1701	3.4	YES	
35				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	259	1764	3.53	YES	
36				0-10	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1098	2.2	YES	
37				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	689	1519	3.04	YES	
38				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	549	1687	3.38	YES	
39				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	431	1714	3.43	YES	
40				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	345	1678	3.36	YES	
41				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	286	1655	3.31	YES	
42				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	259	1719	3.44	YES	

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" for special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.								
								Front Column			Rear Column			Front Column			Rear Column			Formt Column		Rear Column		Actual Force (kg)				
								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)	Uplift Force	Downward	Horiz.
[S1] (ft-in)	[S2] (ft-in)																			1950	1625							
43	95	B	5	0-10	15'-6"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	685	1265	2.53	YES
44				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	531	1642	3.29	YES
45				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1828	3.65	YES
46				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1855	3.71	YES
47				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	263	1819	3.63	YES
48				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	222	1791	3.58	YES
49				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	200	1859	3.72	YES
50			10	0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	744	1256	2.51	YES
51				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	576	1628	3.26	YES
52				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1810	3.62	YES
53				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1841	3.68	YES
54				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1800	3.6	YES
55				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	240	1773	3.55	YES
56				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	218	1841	3.69	YES
57			15	0-10	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1206	2.41	YES
58				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	680	1615	3.23	YES
59				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	540	1796	3.59	YES
60				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1823	3.65	YES
61				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	340	1787	3.57	YES
62				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1760	3.52	YES
63				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	254	1828	3.66	YES
64			20	0-10	14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	1107	2.21	YES
65				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	721	1587	3.17	YES
66				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1764	3.53	YES
67				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1791	3.59	YES
68				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	358	1755	3.51	YES
69				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	299	1728	3.46	YES
70				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	272	1796	3.59	YES
71			25	0-10	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1011	2.02	YES
72				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	785	1560	3.12	YES
73				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1732	3.47	YES
74				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1764	3.52	YES
75				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1723	3.45	YES
76				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1701	3.4	YES
77				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	295	1764	3.53	YES
78			30	0-10	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	984	1.97	YES
79				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	1519	3.04	YES
80				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1687	3.38	YES
81				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	494	1714	3.43	YES
82				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1678	3.36	YES
83				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1655	3.31	YES
84				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	295	1719	3.44	YES



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME JOB NO.	→ →	AZ20170	DATE CHECKER	→ →	July 5, 2024 SAM
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SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Actual Force (kg)						
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.				
Average Uplift Force= 1950 kg (1625 kg w/ FOS)																																
1950 1625																																
85				0-10			15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	780	1265	2.53	YES		
86				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	603	1642	3.29	YES		
87				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	476	1828	3.65	YES		
88				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1855	3.71	YES		
89				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	304	1819	3.63	YES		
90				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	249	1791	3.58	YES		
91				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	227	1859	3.72	YES		
92				0-10			15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1256	2.51	YES		
93				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	658	1628	3.26	YES		
94				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	522	1810	3.62	YES		
95				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1841	3.68	YES		
96				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	327	1800	3.6	YES		
97				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	272	1773	3.55	YES		
98				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	245	1841	3.69	YES		
99				0-10			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1043	2.09	YES		
100				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	771	1615	3.23	YES		
101				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	612	1796	3.59	YES		
102				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	481	1823	3.65	YES		
103				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	385	1787	3.57	YES		
104				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1760	3.52	YES		
105				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	290	1828	3.66	YES		
106				0-10			12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	989	1.97	YES		
107				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	1587	3.17	YES		
108				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	644	1764	3.53	YES		
109				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	508	1791	3.59	YES		
110				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	408	1755	3.51	YES		
111				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1728	3.46	YES		
112				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	304	1796	3.59	YES		
113				0-10			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	894	1.79	YES		
114				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1497	2.99	YES		
115				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	703	1732	3.47	YES		
116				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	553	1764	3.52	YES		
117				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1723	3.45	YES		
118				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1701	3.4	YES		
119				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	331	1764	3.53	YES		
120				0-10			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	871	1.74	YES		
121				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1456	2.92	YES		
122				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	703	1687	3.38	YES		
123				31-40			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1714	3.43	YES		
124				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1678	3.36	YES		
125				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1655	3.31	YES		
126				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	336	1719	3.44	YES		

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.						
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Actual Force (kg)		
					[S1] (ft-in)	[S2] (ft-in)			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)		
127				0-10	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1224	2.45	YES
128				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	680	1642	3.29	YES
129				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1828	3.65	YES
130				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1855	3.71	YES
131				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1819	3.63	YES
132				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	286	1791	3.58	YES
133				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	254	1859	3.72	YES
134				0-10	13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1093	2.19	YES
135				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	744	1628	3.26	YES
136				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1810	3.62	YES
137				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1841	3.68	YES
138				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1800	3.6	YES
139				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	308	1773	3.55	YES
140				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	277	1841	3.69	YES
141				0-10	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	925	1.85	YES
142				11-20	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1546	3.1	YES
143				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	685	1796	3.59	YES
144				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1823	3.65	YES
145				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1787	3.57	YES
146				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1760	3.52	YES
147				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	327	1828	3.66	YES
148				0-10	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	871	1.74	YES
149				11-20	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	1456	2.91	YES
150				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	726	1764	3.53	YES
151				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1791	3.59	YES
152				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1755	3.51	YES
153				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	381	1728	3.46	YES
154				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	345	1796	3.59	YES
155				0-10	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	776	1.56	YES
156				11-20	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1302	2.6	YES
157				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	785	1732	3.47	YES
158				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	621	1764	3.52	YES
159				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	499	1723	3.45	YES
160				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1701	3.4	YES
161				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1764	3.53	YES
162				0-10	10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	757	1.21	YES
163				11-20	10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1265	2.54	YES
164				21-30	9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1687	3.38	YES
165				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	621	1714	3.43	YES
166				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	499	1678	3.36	YES
167				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	417	1655	3.31	YES
168				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1719	3.44	YES

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column				Actual Force (kg)				
					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)	Uplift Force	Downward	Horiz.							
					[S1] (ft-in)	[S2] (ft-in)																						Average Uplift force= 1950 kg (1625 kg w/ FOS)				
																							1950 1625									
169				0-10		13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1061	2.12	YES			
170				11-20		12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	766	1642	3.29	YES			
171				21-30	9'-0"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	608	1828	3.65	YES			
172				31-40		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1855	3.71	YES			
173				41-50		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	381	1819	3.63	YES			
174				51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1791	3.58	YES			
175				61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	286	1859	3.72	YES			
176				0-10			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	971	1.94	YES		
177				11-20		12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1628	3.26	YES			
178				21-30	9'-0"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	658	1810	3.62	YES			
179				31-40		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1841	3.68	YES			
180				41-50		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1800	3.6	YES			
181				51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	345	1773	3.55	YES			
182				61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1841	3.69	YES			
183				0-10			10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	844	1.69	YES		
184				11-20		10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1415	2.83	YES			
185				21-30	9'-0"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1796	3.59	YES			
186				31-40		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1823	3.65	YES			
187				41-50		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	485	1787	3.57	YES			
188				51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1760	3.52	YES			
189				61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1828	3.66	YES			
190				0-10			10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	789	1.58	YES		
191				11-20		10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1324	2.65	YES			
192				21-30	9'-0"	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1764	3.53	YES			
193				31-40		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	639	1791	3.59	YES			
194				41-50		6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1755	3.51	YES			
195				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1728	3.46	YES			
196				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	381	1796	3.59	YES			
197				0-10			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	698	1.4	YES		
198				11-20		9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1170	2.34	YES			
199				21-30	9'-0"	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1642	3.29	YES			
200				31-40		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1764	3.52	YES			
201				41-50		6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	553	1723	3.45	YES			
202				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1701	3.4	YES			
203				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	413	1764	3.53	YES			
204				0-10			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	681	1.37	YES		
205				11-20		9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1143	2.28	YES			
206				21-30	9'-0"	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1601	3.2	YES			
207				31-40		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	694	1714	3.43	YES			
208				41-50		6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	553	1678	3.36	YES			
209				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1655	3.31	YES			
210				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1719	3.44	YES			

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column				Actual Force (kg)				
								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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS) 1625			
211				0-10	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	980	1.96	YES				
212				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	1642	3.29	YES				
213				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	676	1828	3.65	YES				
214				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1855	3.71	YES				
215				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1819	3.63	YES				
216				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1791	3.58	YES				
217				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	317	1859	3.72	YES				
218				0-10	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	889	1.78	YES				
219				11-20	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1492	2.98	YES				
220				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	730	1810	3.62	YES				
221				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	576	1841	3.68	YES				
222				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1800	3.6	YES				
223				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	385	1773	3.55	YES				
224				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	345	1841	3.69	YES				
225				0-10	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	762	1.53	YES				
226				11-20	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1279	2.56	YES				
227				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1796	3.59	YES				
228				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1823	3.65	YES				
229				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	535	1787	3.57	YES				
230				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	449	1760	3.52	YES				
231				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1828	3.66	YES				
232				0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	712	1.42	YES				
233				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1193	2.38	YES				
234				21-30	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1669	3.34	YES				
235				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	707	1791	3.59	YES				
236				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	567	1755	3.51	YES				
237				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	472	1728	3.46	YES				
238				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	422	1796	3.59	YES				
239				0-10	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	621	1.24	YES				
240				11-20	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	1043	2.08	YES				
241				21-30	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	816	1460	2.92	YES				
242				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1764	3.52	YES				
243				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	612	1723	3.45	YES				
244				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1701	3.4	YES				
245				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1764	3.53	YES				
246				0-10	8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	608	1.21	YES				
247				11-20	8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	1016	2.03	YES				
248				21-30	8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	816	1424	2.84	YES				
249				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1714	3.43	YES				
250				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	612	1678	3.36	YES				
251				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	512	1655	3.31	YES				
252				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1719	3.44	YES				

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																								US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
								Pole Footing Size						US Helical Size								Krrinner Ground Screws G114x1600.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column		Actual Force (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
								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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
[S1] (ft-in)	[S2] (ft-in)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" for special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.								
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)				
								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)	Uplift Force	Downward	Horiz.
[S1] (ft-in)	[S2] (ft-in)																				1950 1625							
295	130	B	5	0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	735	1.47	YES
296				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	1234	2.47	YES
297				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	853	1728	3.46	YES
298				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	707	1855	3.71	YES
299				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	567	1819	3.63	YES
300				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	472	1791	3.58	YES
301				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1859	3.72	YES
302			10	0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	649	1.3	YES
303				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	1084	2.17	YES
304				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	816	1524	3.05	YES
305				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1596	3.19	YES
306				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	762	1800	3.6	YES
307				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	635	1773	3.55	YES
308				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1841	3.69	YES
309			15	0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	563	1.12	YES
310				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	944	1.89	YES
311				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1324	2.64	YES
312				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1701	3.41	YES
313				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	707	1787	3.57	YES
314				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	590	1760	3.52	YES
315				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1828	3.66	YES
316			20	0-10	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	513	1.02	YES
317				11-20	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	862	1.72	YES
318				21-30	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1206	2.41	YES
319				31-40	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1556	3.11	YES
320				41-50	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	744	1755	3.51	YES
321				51-60	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1728	3.46	YES
322				61-70	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	558	1796	3.59	YES
323			25	0-10	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	468	0.93	YES
324				11-20	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	780	1.56	YES
325				21-30	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1098	2.19	YES
326				31-40	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1410	2.82	YES
327				41-50	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1723	3.45	YES
328				51-60	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1701	3.4	YES
329				61-70	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1764	3.53	YES
330			30	0-10	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	454	0.91	YES
331				11-20	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	762	1.52	YES
332				21-30	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1066	2.13	YES
333				31-40	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1374	2.74	YES
334				41-50	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1678	3.36	YES
335				51-60	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1655	3.31	YES
336				61-70	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1719	3.44	YES

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME
JOB NO. →
→ A220170DATE
CHECKER →
→July 5, 2024
SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.						
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column		Actual Force (kg)		
					[S1] (ft-in)	[S2] (ft-in)			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)		
					Average Uplift force= 1950 kg (1625 kg w/ FOS)																							
1950																												
1625																												
337	140	B	5	0-10	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	613	1.22	YES
338				11-20	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	1025	2.05	YES
339				21-30	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1442	2.88	YES
340				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1855	3.71	YES
341				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1819	3.63	YES
342				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	558	1791	3.58	YES
343				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	503	1859	3.72	YES
344			10	0-10	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	567	1.13	YES
345				11-20	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	948	1.9	YES
346				21-30	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1333	2.67	YES
347				31-40	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1719	3.43	YES
348				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	726	1800	3.6	YES
349				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	603	1773	3.55	YES
350				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1841	3.69	YES
351			15	0-10	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	481	0.97	YES
352				11-20	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	808	1.61	YES
353				21-30	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1134	2.27	YES
354				31-40	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1460	2.92	YES
355				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1787	3.57	YES
356				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	694	1760	3.52	YES
357				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1828	3.66	YES
358			20	0-10	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	435	0.87	YES
359				11-20	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	726	1.46	YES
360				21-30	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1020	2.04	YES
361				31-40	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1315	2.63	YES
362				41-50	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1610	3.22	YES
363				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	730	1728	3.46	YES
364				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	658	1796	3.59	YES
365			25	0-10	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	390	0.78	YES
366				11-20	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	649	1.3	YES
367				21-30	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	912	1.83	YES
368				31-40	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1175	2.35	YES
369				41-50	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1438	2.88	YES
370				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1701	3.4	YES
371				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	707	1764	3.53	YES
372			30	0-10	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	376	0.76	YES
373				11-20	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	635	1.27	YES
374				21-30	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	889	1.78	YES
375				31-40	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1143	2.29	YES
376				41-50	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1397	2.8	YES
377				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1655	3.31	YES
378				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	712	1719	3.44	YES



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME JOB NO.	→ →	AZ20170	DATE CHECKER	→ →	July 5, 2024 SAM
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SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.							
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Actual Force (kg)			
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force
379	150	B	5	0-10	9'-0"	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	531	1.06	YES
380				11-20		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	889	1.78	YES
381				21-30		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1252	2.5	YES
382				31-40		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1610	3.22	YES
383				41-50		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	785	1819	3.63	YES
384				51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	653	1791	3.58	YES
385				61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	590	1859	3.72	YES
386			10	0-10		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	844	486	0.97	YES
387				11-20		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	844	816	1.63	YES
388				21-30		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	844	1143	2.29	YES
389				31-40		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	844	1469	2.94	YES
390				41-50		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	844	1800	3.6	YES
391				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	703	1773	3.55	YES
392				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	630	1841	3.69	YES
393			15	0-10		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	404	0.8	YES
394				11-20		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	672	1.35	YES
395				21-30		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	943	1.89	YES
396				31-40		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1215	2.43	YES
397				41-50		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1488	2.98	YES
398				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1760	3.52	YES
399				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	726	1828	3.66	YES
400			20	0-10		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	395	0.79	YES
401				11-20		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	662	1.32	YES
402				21-30		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	930	1.85	YES
403				31-40		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1197	2.39	YES
404				41-50		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1460	2.93	YES
405				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1728	3.46	YES
406				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	762	1796	3.59	YES
407			25	0-10		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	349	0.7	YES
408				11-20		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	585	1.17	YES
409				21-30		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	821	1.64	YES
410				31-40		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1057	2.11	YES
411				41-50		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1293	2.59	YES
412				51-60		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1528	3.06	YES
413				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1764	3.53	YES
414			30	0-10		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	263	0.53	YES
415				11-20		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	571	1.14	YES
416				21-30		4'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	799	1.6	YES
417				31-40		4'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1029	2.06	YES
418				41-50		4'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1261	2.52	YES
419				51-60		4'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1488	2.98	YES
420				61-70		4'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1719	3.44	YES

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.						
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Actual Force (kg)		
					[S1] (ft-in)	[S2] (ft-in)			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)	Uplift Force	Downward
421	160	B	5	0-10	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	449	0.9	YES
422				11-20	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	753	1.51	YES
423				21-30	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1057	2.11	YES
424				31-40	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1361	2.72	YES
425				41-50	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1664	3.33	YES
426				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	753	1791	3.58	YES
427				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	676	1859	3.72	YES
428			10	0-10	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	404	0.81	YES
429				11-20	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	680	1.36	YES
430				21-30	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	952	1.9	YES
431				31-40	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1224	2.45	YES
432				41-50	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1501	3	YES
433				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1773	3.55	YES
434				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	730	1841	3.69	YES
435			15	0-10	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	363	0.72	YES
436				11-20	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	608	1.21	YES
437				21-30	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	848	1.7	YES
438				31-40	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1093	2.19	YES
439				41-50	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1338	2.68	YES
440				51-60	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1583	3.17	YES
441				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1828	3.66	YES
442			20	0-10	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	780	317	0.63	YES
443				11-20	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	780	531	1.06	YES
444				21-30	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	744	1.49	YES
445				31-40	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	957	1.91	YES
446				41-50	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1170	2.34	YES
447				51-60	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1383	2.77	YES
448				61-70	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1596	3.19	YES
449			25	0-10	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	313	0.62	YES
450				11-20	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	522	1.04	YES
451				21-30	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	731	1.46	YES
452				31-40	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	939	1.88	YES
453				41-50	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1152	2.3	YES
454				51-60	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1361	2.72	YES
455				61-70	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1569	3.14	YES
456			30	0-10	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	304	0.61	YES
457				11-20	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	508	1.02	YES
458				21-30	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	712	1.42	YES
459				31-40	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	917	1.83	YES
460				41-50	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1120	2.24	YES
461				51-60	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1324	2.65	YES
462				61-70	4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1528	3.06	YES

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" for special engineering design of Top Cap.
- Top Cap is



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Exposure B, ASCE 7-10, SCH 40- GM Chart for 5
Modules 90-160 Mph



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column								
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.				
																												Actual Force (kg)			Average Uplift force= 1950 kg (1625 kg w/ FOS)	
1				0-10	15'-6"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	590	1265	2.53	YES				
2				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	458	1642	3.29	YES				
3				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1828	3.65	YES				
4				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	286	1855	3.71	YES				
5				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	227	1819	3.63	YES				
6				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	190	1791	3.58	YES				
7				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	172	1859	3.72	YES				
8				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	649	1256	2.51	YES				
9				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	503	1628	3.26	YES				
10				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1810	3.62	YES				
11				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1841	3.68	YES				
12				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	250	1800	3.6	YES				
13				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	209	1773	3.55	YES				
14				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	186	1841	3.69	YES				
15				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	766	1247	2.49	YES				
16				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	594	1615	3.23	YES				
17				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	472	1796	3.59	YES				
18				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1823	3.65	YES				
19				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	295	1787	3.57	YES				
20				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1760	3.52	YES				
21				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	222	1828	3.66	YES				
22				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	812	1224	2.45	YES				
23				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	630	1587	3.17	YES				
24				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	499	1764	3.53	YES				
25				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1791	3.59	YES				
26				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1755	3.51	YES				
27				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	263	1728	3.46	YES				
28				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	236	1796	3.59	YES				
29				0-10	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1125	2.25	YES				
30				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	689	1560	3.12	YES				
31				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1732	3.47	YES				
32				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1764	3.52	YES				
33				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	345	1723	3.45	YES				
34				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	286	1701	3.4	YES				
35				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	259	1764	3.53	YES				
36				0-10	14'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1098	2.2	YES				
37				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	689	1519	3.04	YES				
38				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	549	1687	3.38	YES				
39				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1714	3.43	YES				
40				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	345	1678	3.36	YES				
41				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	286	1655	3.31	YES				
42				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	259	1719	3.44	YES				

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size										Krinner Ground Screws G114x1600.								
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Actual Force (kg)						
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	
																											1950 1625					
43				0-10	15'-6"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	685	1265	2.53	YES				
44				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	531	1642	3.29	YES				
45				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	417	1828	3.65	YES				
46				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	331	1855	3.71	YES				
47				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	263	1819	3.63	YES				
48				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	222	1791	3.58	YES				
49				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	200	1859	3.72	YES				
50				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	744	1256	2.51	YES				
51				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	576	1628	3.26	YES				
52				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1810	3.62	YES				
53				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1841	3.68	YES				
54				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	290	1800	3.6	YES				
55				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	240	1773	3.55	YES				
56				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	218	1841	3.69	YES				
57				0-10	15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1206	2.41	YES				
58				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	680	1615	3.23	YES				
59				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1796	3.59	YES				
60				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1823	3.65	YES				
61				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1787	3.57	YES				
62				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	281	1760	3.52	YES				
63				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	254	1828	3.66	YES				
64				0-10	14'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	1107	2.21	YES				
65				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	721	1587	3.17	YES				
66				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1764	3.53	YES				
67				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	449	1791	3.59	YES				
68				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	358	1755	3.51	YES				
69				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	299	1728	3.46	YES				
70				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	272	1796	3.59	YES				
71				0-10	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1011	2.02	YES				
72				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	785	1560	3.12	YES				
73				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	621	1732	3.47	YES				
74				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	490	1764	3.52	YES				
75				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	395	1723	3.45	YES				
76				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	327	1701	3.4	YES				
77				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	295	1764	3.53	YES				
78				0-10	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	984	1.97	YES				
79				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	1519	3.04	YES				
80				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	626	1687	3.38	YES				
81				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	494	1714	3.43	YES				
82				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	395	1678	3.36	YES				
83				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	327	1655	3.31	YES				
84				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	295	1719	3.44	YES				



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)					
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.												
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)								
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)			
																															1950 1625	
85				0-10			15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	780	1265	2.53			YES
86				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	603	1642	3.29			YES
87				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	476	1828	3.65			YES
88				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1855	3.71			YES
89				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	304	1819	3.63			YES
90				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	249	1791	3.58			YES
91				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	227	1859	3.72			YES
92				0-10			15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1256	2.51			YES
93				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	658	1628	3.26			YES
94				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	522	1810	3.62			YES
95				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1841	3.68			YES
96				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	327	1800	3.6			YES
97				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	272	1773	3.55			YES
98				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	245	1841	3.69			YES
99				0-10			13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1043	2.09			YES
100				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	771	1615	3.23			YES
101				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	612	1796	3.59			YES
102				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	481	1823	3.65			YES
103				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	385	1787	3.57			YES
104				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1760	3.52			YES
105				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	290	1828	3.66			YES
106				0-10			12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	989	1.97			YES
107				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	1587	3.17			YES
108				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	644	1764	3.53			YES
109				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	508	1791	3.59			YES
110				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	408	1755	3.51			YES
111				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1728	3.46			YES
112				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	304	1796	3.59			YES
113				0-10			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	894	1.79			YES
114				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1497	2.99			YES
115				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	703	1732	3.47			YES
116				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	553	1764	3.52			YES
117				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1723	3.45			YES
118				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1701	3.4			YES
119				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	331	1764	3.53			YES
120				0-10			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	871	1.74			YES
121				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1456	2.92			YES
122				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	703	1687	3.38			YES
123				31-40			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1714	3.43			YES
124				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1678	3.36			YES
125				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1655	3.31			YES
126				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	336	1719	3.44			YES

NOTE:

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- 6 Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- 7 Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- 8 Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)					
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.												
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)								
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)
127				0-10			15'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1224	2.45			YES
128				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	680	1642	3.29			YES
129				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	540	1828	3.65			YES
130				31-40	9'-0"		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1855	3.71			YES
131				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	340	1819	3.63			YES
132				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	286	1791	3.58			YES
133				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	254	1859	3.72			YES
134				0-10			13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1093	2.19			YES
135				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	744	1628	3.26			YES
136				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	585	1810	3.62			YES
137				31-40	9'-0"		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1841	3.68			YES
138				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1800	3.6			YES
139				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	308	1773	3.55			YES
140				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	277	1841	3.69			YES
141				0-10			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	925	1.85			YES
142				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1546	3.1			YES
143				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	685	1796	3.59			YES
144				31-40	9'-0"		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	540	1823	3.65			YES
145				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	435	1787	3.57			YES
146				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1760	3.52			YES
147				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1828	3.66			YES
148				0-10			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	871	1.74			YES
149				11-20			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	1456	2.91			YES
150				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	726	1764	3.53			YES
151				31-40	9'-0"		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1791	3.59			YES
152				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	458	1755	3.51			YES
153				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	381	1728	3.46			YES
154				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	345	1796	3.59			YES
155				0-10			10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	776	1.56			YES
156				11-20			10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1302	2.6			YES
157				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	785	1732	3.47			YES
158				31-40	9'-0"		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1764	3.52			YES
159				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	499	1723	3.45			YES
160				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	413	1701	3.4			YES
161				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1764	3.53			YES
162				0-10			10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	757	1.21			YES
163				11-20			10'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1265	2.54			YES
164				21-30			9'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1687	3.38			YES
165				31-40	9'-0"		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1714	3.43			YES
166				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	499	1678	3.36			YES
167				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1655	3.31			YES
168				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	372	1719	3.44			YES

NOTE:

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top cap = 1950 kg, uplift force of top cap 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 US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- 8 Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
								Front Column			Rear Column			Front Column			Rear Column			Front Column			Rear Column			Actual Force (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
								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)	Uplift Force	Downward	Horiz.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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[S1] (ft-in)	[S2] (ft-in)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
							Pole Footing Size						US Helical Size										Krriner Ground Screws G114x1600.								
							Front Column			Rear Column			Front Column				Rear Column				Forrit Column		Rear Column		Actual Force (kg)						
							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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)			
211				0-10	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	980	1.96	YES			
212				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1642	3.29	YES			
213				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	676	1828	3.65	YES			
214				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	531	1855	3.71	YES			
215				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1819	3.63	YES			
216				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	354	1791	3.58	YES			
217				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	317	1859	3.72	YES			
218				0-10	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	889	1.78	YES			
219				11-20	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1492	2.98	YES			
220				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	730	1810	3.62	YES			
221				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	576	1841	3.68	YES			
222				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1800	3.6	YES			
223				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	385	1773	3.55	YES			
224				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	345	1841	3.69	YES			
225				0-10	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	762	1.53	YES			
226				11-20	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1279	2.56	YES			
227				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1796	3.59	YES			
228				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1823	3.65	YES			
229				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1787	3.57	YES			
230				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	449	1760	3.52	YES			
231				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1828	3.66	YES			
232				0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	712	1.42	YES			
233				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1193	2.38	YES			
234				21-30	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1669	3.34	YES			
235				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	707	1791	3.59	YES			
236				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	567	1755	3.51	YES			
237				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	472	1728	3.46	YES			
238				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	422	1796	3.59	YES			
239				0-10	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	621	1.24	YES			
240				11-20	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	1043	2.08	YES			
241				21-30	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	816	1460	2.92	YES			
242				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	766	1764	3.52	YES			
243				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	612	1723	3.45	YES			
244				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	508	1701	3.4	YES			
245				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1764	3.53	YES			
246				0-10	8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	608	1.21	YES			
247				11-20	8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	1016	2.03	YES			
248				21-30	8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	816	1424	2.84	YES			
249				31-40	7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	766	1714	3.43	YES			
250				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	612	1678	3.36	YES			
251				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	512	1655	3.31	YES			
252				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1719	3.44	YES			

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 lbs (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	July 5, 2024
JOB NO.	→	AZ20170	CHECKER	→	SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Bearn Pipe over- hange (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.								
								Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column		Actual Force (kg)				
					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)	Uplift Force	Downward	Horiz.			
					[S1] (ft-in)	[S2] (ft-in)																				Average Uplift Force= 1950 kg (1625 kg w/ FOS)		
																						1950 1625						
253				0-10	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	858	1.71	YES
254				11-20	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	1438	2.88	YES
255				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	748	1828	3.65	YES
256				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	590	1855	3.71	YES
257				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	472	1819	3.63	YES
258				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	395	1791	3.58	YES
259				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	354	1859	3.72	YES
260				0-10	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	812	1.62	YES
261				11-20	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1356	2.72	YES
262				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1810	3.62	YES
263				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	639	1841	3.68	YES
264				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1800	3.6	YES
265				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1773	3.55	YES
266				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	381	1841	3.69	YES
267				0-10	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	685	1.37	YES
268				11-20	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	1143	2.29	YES
269				21-30	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1605	3.21	YES
270				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	739	1823	3.65	YES
271				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	590	1787	3.57	YES
272				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	494	1760	3.52	YES
273				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	444	1828	3.66	YES
274				0-10	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	631	1.27	YES
275				11-20	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1057	2.12	YES
276				21-30	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1488	2.97	YES
277				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1791	3.59	YES
278				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1755	3.51	YES
279				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1728	3.46	YES
280				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	467	1796	3.59	YES
281				0-10	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	585	1.17	YES
282				11-20	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	975	1.95	YES
283				21-30	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1370	2.74	YES
284				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1764	3.52	YES
285				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	676	1723	3.45	YES
286				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	562	1701	3.4	YES
287				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	503	1764	3.53	YES
288				0-10	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	567	1.13	YES
289				11-20	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	953	1.9	YES
290				21-30	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1333	2.67	YES
291				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1714	3.43	YES
292				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	676	1678	3.36	YES
293				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	562	1655	3.31	YES
294				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1719	3.44	YES

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average Force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top Cap = 1950 kg, uplift force of top cap with factor of safety = $1950 \text{ kg} \times 1.2 = 1625 \text{ kg}$.
- 6 Yield Stress of 3" dia pipe - $F_y = 35 \text{ ksi}$ and $F_u = 58 \text{ ksi}$
- 7 Yield Stress of 2-7/8" dia US Helical pipe - $F_y = 60 \text{ ksi}$ (refer US Helical Chart)
- 8 Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column								
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	
								Average Uplift force= 1950 kg (1625 kg w/ FOS)																								
																								1950 1625								
295				0-10			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	735	1.47	YES		
296				11-20			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1234	2.47	YES		
297				21-30			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	853	1728	3.46	YES		
298				31-40			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	707	1855	3.71	YES		
299				41-50			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	567	1819	3.63	YES		
300				51-60			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	472	1791	3.58	YES		
301				61-70			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1859	3.72	YES		
302				0-10			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	649	1.3	YES		
303				11-20			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	1084	2.17	YES		
304				21-30			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	816	1524	3.05	YES		
305				31-40			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1596	3.19	YES		
306				41-50			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	762	1800	3.6	YES		
307				51-60			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1773	3.55	YES		
308				61-70			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1841	3.69	YES		
309				0-10			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	563	1.12	YES		
310				11-20			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	944	1.89	YES		
311				21-30			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1324	2.64	YES		
312				31-40			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1701	3.41	YES		
313				41-50			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	707	1787	3.57	YES		
314				51-60			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	590	1760	3.52	YES		
315				61-70			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	531	1828	3.66	YES		
316				0-10			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	513	1.02	YES		
317				11-20			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	862	1.72	YES		
318				21-30			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1206	2.41	YES		
319				31-40			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1556	3.11	YES		
320				41-50			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	744	1755	3.51	YES		
321				51-60			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	621	1728	3.46	YES		
322				61-70			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1796	3.59	YES		
323				0-10			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	803	468	0.93	YES		
324				11-20			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	803	780	1.56	YES		
325				21-30			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1098	2.19	YES		
326				31-40			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1410	2.82	YES		
327				41-50			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1723	3.45	YES		
328				51-60			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1701	3.4	YES		
329				61-70			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1764	3.53	YES		
330				0-10			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	454	0.91	YES		
331				11-20			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	762	1.52	YES		
332				21-30			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1066	2.13	YES		
333				31-40			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1374	2.74	YES		
334				41-50			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1678	3.36	YES		
335				51-60			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1655	3.31	YES		
336				61-70			9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1719	3.44	YES		

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)				
							Pole Footing Size						US Helical Size						Krrinner Ground Screws G114x1600.				Actual Force (kg)							
							Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Uplift Force	Downward	Horiz.					
							[S1] (ft-in)	[S2] (ft-in)		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)			
																							Average Uplift force= 1950 kg (1625 kg w/ FOS)							
																							1950 1625							
337	140	B	5	0-10	9'-0"		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	613	1.22	YES
338				11-20			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	1025	2.05	YES
339				21-30			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1442	2.88	YES
340				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1855	3.71	YES
341				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1819	3.63	YES
342				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1791	3.58	YES
343				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	503	1859	3.72	YES
344			10	0-10	9'-0"		7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	844	567	1.13	YES
345				11-20			7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	844	948	1.9	YES
346				21-30			7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	844	1333	2.67	YES
347				31-40			7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	844	1719	3.43	YES
348				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	726	1800	3.6	YES
349				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1773	3.55	YES
350				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	544	1841	3.69	YES
351			15	0-10	9'-0"		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	481	0.97	YES
352				11-20			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	808	1.61	YES
353				21-30			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1134	2.27	YES
354				31-40			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1460	2.92	YES
355				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1787	3.57	YES
356				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	694	1760	3.52	YES
357				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	626	1828	3.66	YES
358			20	0-10	9'-0"		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	803	435	0.87	YES
359				11-20			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	803	726	1.46	YES
360				21-30			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1020	2.04	YES
361				31-40			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1315	2.63	YES
362				41-50			5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1610	3.22	YES
363				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	730	1728	3.46	YES
364				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	658	1796	3.59	YES
365			25	0-10	9'-0"		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	390	0.78	YES
366				11-20			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	649	1.3	YES
367				21-30			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	912	1.83	YES
368				31-40			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1175	2.35	YES
369				41-50			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1438	2.88	YES
370				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1701	3.4	YES
371				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	707	1764	3.53	YES
372			30	0-10	9'-0"		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	376	0.76	YES
373				11-20			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	635	1.27	YES
374				21-30			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	889	1.78	YES
375				31-40			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1143	2.29	YES
376				41-50			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1397	2.8	YES
377				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1655	3.31	YES
378	61-70	4'-6"		0'-6"			2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	712	1719	3.44	YES		



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.											
								Front Column			Rear Column			Front Column			Rear Column			Formt. Column		Rear Column		Actual Force (kg)							
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.
Average Uplift force= 1950 kg (1625 kg w/ FOS)																															
1950 1625																															
379	150	B	5	0-10	9'-0"		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	531	1.06	YES	
380				11-20			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	889	1.78	YES	
381				21-30			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1252	2.5	YES	
382				31-40			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1610	3.22	YES	
383				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	785	1819	3.63	YES	
384				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	653	1791	3.58	YES	
385				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	590	1859	3.72	YES	
386			10	0-10	9'-0"		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	486	0.97	YES	
387				11-20			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	816	1.63	YES	
388				21-30			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1143	2.29	YES	
389				31-40			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1469	2.94	YES	
390				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1800	3.6	YES	
391				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	703	1773	3.55	YES	
392				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	630	1841	3.69	YES	
393			15	0-10	9'-0"		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	404	0.8	YES	
394				11-20			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	672	1.35	YES	
395				21-30			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	943	1.89	YES	
396				31-40			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1215	2.43	YES	
397				41-50			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1488	2.98	YES	
398				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1760	3.52	YES	
399				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	726	1828	3.66	YES	
400			20	0-10	9'-0"		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	395	0.79	YES	
401				11-20			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	662	1.32	YES	
402				21-30			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	930	1.85	YES	
403				31-40			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1197	2.39	YES	
404				41-50			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1460	2.93	YES	
405				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1728	3.46	YES	
406				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	762	1796	3.59	YES	
407			25	0-10	9'-0"		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	349	0.7	YES	
408				11-20			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	585	1.17	YES	
409				21-30			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	821	1.64	YES	
410				31-40			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	1057	2.11	YES	
411				41-50			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	1293	2.59	YES	
412				51-60			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	1528	3.06	YES	
413				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	1764	3.53	YES	
414			30	0-10	9'-0"		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	263	0.53	YES	
415				11-20			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	571	1.14	YES	
416				21-30			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	799	1.6	YES	
417				31-40			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1029	2.06	YES	
418				41-50			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1261	2.52	YES	
419				51-60			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1488	2.98	YES	
420				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1719	3.44	YES	



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)					
								Pole Footing Size						US Helical Size															Krriner Ground Screws G114x1600.			
								Front Column			Rear Column			Front Column				Rear Column						Forint Column		Rear Column			Actual Force (kg)			
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	
																															Average Uplift force= 1950 kg (1625 kg w/ FOS)	
																							1950 1625									
421	160	B	5	0-10	9'-0"		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	449	0.9			YES
422				11-20			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	753	1.51			YES
423				21-30			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1057	2.11			YES
424				31-40			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1361	2.72			YES
425				41-50			5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1664	3.33			YES
426				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	753	1791	3.58			YES
427				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	676	1859	3.72			YES
428			10	0-10	9'-0"		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	404	0.81			YES
429				11-20			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	680	1.36			YES
430				21-30			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	952	1.9			YES
431				31-40			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1224	2.45			YES
432				41-50			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1501	3			YES
433				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1773	3.55			YES
434				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	730	1841	3.69			YES
435			15	0-10	9'-0"		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	363	0.72			YES
436				11-20			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	608	1.21			YES
437				21-30			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	848	1.7			YES
438				31-40			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1093	2.19			YES
439				41-50			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1338	2.68			YES
440				51-60			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1583	3.17			YES
441				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1828	3.66			YES
442			20	0-10	9'-0"		4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	780	317	0.63			YES
443				11-20			4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	780	531	1.06			YES
444				21-30			4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	744	1.49			YES
445				31-40			4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	957	1.91			YES
446				41-50			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1170	2.34			YES
447				51-60			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1383	2.77			YES
448				61-70			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1596	3.19			YES
449			25	0-10	9'-0"		4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	313	0.62			YES
450				11-20			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	522	1.04			YES
451				21-30			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	731	1.46			YES
452				31-40			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	939	1.88			YES
453				41-50			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1152	2.3			YES
454				51-60			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1361	2.72			YES
455				61-70			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1569	3.14			YES
456			30	0-10	9'-0"		4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	304	0.61			YES
457				11-20			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	508	1.02			YES
458				21-30			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	712	1.42			YES
459				31-40			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	917	1.83			YES
460				41-50			4'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1120	2.24			YES
461	51-60	4'-0"		0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1324	2.65			YES		
462	61-70	4'-0"		0'-6"			2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1528	3.06			YES		



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Exposure C, ASCE 7-16, SCH 40- GM Chart for 5 Modules 90-160 Mph



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column				Actual Force (kg)			
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)		
1				0-10	15'-6"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	762	1265	2.53	YES			
2				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	590	1642	3.29	YES			
3				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	467	1828	3.65	YES			
4				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	367	1855	3.71	YES			
5				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	295	1819	3.63	YES			
6				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	245	1791	3.58	YES			
7				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	222	1859	3.72	YES			
8				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1256	2.51	YES			
9				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	644	1628	3.26	YES			
10				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	508	1810	3.62	YES			
11				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1841	3.68	YES			
12				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	322	1800	3.6	YES			
13				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	268	1773	3.55	YES			
14				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	240	1841	3.69	YES			
15				0-10	13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1084	2.17	YES			
16				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	644	1628	3.26	YES			
17				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	599	1796	3.59	YES			
18				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	472	1823	3.65	YES			
19				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	376	1787	3.57	YES			
20				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1760	3.52	YES			
21				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	281	1828	3.66	YES			
22				0-10	12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	988.7	1.97	YES			
23				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	1587	3.17	YES			
24				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	630	1764	3.53	YES			
25				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	499	1791	3.59	YES			
26				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	399	1755	3.51	YES			
27				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	331	1728	3.46	YES			
28				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	299	1796	3.59	YES			
29				0-10	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	895	1.79	YES			
30				11-20	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1497	2.99	YES			
31				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1732	3.47	YES			
32				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1764	3.52	YES			
33				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	435	1723	3.45	YES			
34				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1701	3.4	YES			
35				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1764	3.53	YES			
36				0-10	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	871	1.74	YES			
37				11-20	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1456	2.92	YES			
38				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1687	3.38	YES			
39				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1714	3.43	YES			
40				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	435	1678	3.36	YES			
41				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1655	3.31	YES			
42				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	327	1719	3.44	YES			

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)					
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.												
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)								
								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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)			
43				0-10			15'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1224	2.45			YES
44				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	676	1642	3.29			YES
45				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1828	3.65			YES
46				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	422	1855	3.71			YES
47				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1819	3.63			YES
48				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	281	1791	3.58			YES
49				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	254	1859	3.72			YES
50				0-10			13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1093	2.19			YES
51				11-20			12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	735	1628	3.26			YES
52				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1810	3.62			YES
53				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1841	3.68			YES
54				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1800	3.6			YES
55				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	308	1773	3.55			YES
56				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	277	1841	3.69			YES
57				0-10			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	925	1.85			YES
58				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	1546	3.1			YES
59				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	680	1796	3.59			YES
60				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1823	3.65			YES
61				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	431	1787	3.57			YES
62				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	358	1760	3.52			YES
63				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1828	3.66			YES
64				0-10			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	871	1.74			YES
65				11-20			11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1456	2.91			YES
66				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	721	1764	3.53			YES
67				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	567	1791	3.59			YES
68				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	454	1755	3.51			YES
69				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1728	3.46			YES
70				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1796	3.59			YES
71				0-10			10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	775.5	1.56			YES
72				11-20			10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	1302	2.6			YES
73				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1732	3.47			YES
74				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1764	3.52			YES
75				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	494	1723	3.45			YES
76				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1701	3.4			YES
77				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1764	3.53			YES
78				0-10			10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	757.4	1.51			YES
79				11-20			10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	1265	2.54			YES
80				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	785	1687	3.38			YES
81				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1714	3.43			YES
82				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	494	1678	3.36			YES
83				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1655	3.31			YES
84				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1719	3.44			YES

NOTE:

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top cap = 1950 kg, uplift force of top cap 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 US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- 8 Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)			
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)						
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)	
85	100	C	5	0-10	9'-0"	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1061	2.12	YES	
86				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	735	1574	3.15	YES	
87				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	608	1828	3.65	YES
88				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	481	1855	3.71	YES
89				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	385	1819	3.63	YES
90				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1791	3.58	YES
91				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	290	1859	3.72	YES
92			10	0-10	9'-0"	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	971	1.94	YES	
93				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	1560	3.12	YES
94				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	662	1810	3.62	YES
95				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	522	1841	3.68	YES
96				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	417	1800	3.6	YES
97				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	349	1773	3.55	YES
98				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	313	1841	3.69	YES
99			15	0-10	9'-0"	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	844	1.69	YES	
100				11-20			10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1415	2.83	YES
101				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	771	1796	3.59	YES
102				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	608	1823	3.65	YES
103				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	485	1787	3.57	YES
104				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1760	3.52	YES
105				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1828	3.66	YES
106			20	0-10	9'-0"	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	790	1.58	YES	
107				11-20			10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	853	1324	2.65	YES
108				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	812	1764	3.53	YES
109				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	639	1791	3.59	YES
110				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	512	1755	3.51	YES
111				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	426	1728	3.46	YES
112				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	385	1796	3.59	YES
113			25	0-10	9'-0"	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	698.4	1.4	YES	
114				11-20			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1170	2.34	YES
115				21-30			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1642	3.29	YES
116				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	694	1764	3.52	YES
117				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	553	1723	3.45	YES
118				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1701	3.4	YES
119				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	417	1764	3.53	YES
120			30	0-10	9'-0"	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	680.3	1.37	YES	
121				11-20			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1143	2.28	YES
122				21-30			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1601	3.2	YES
123				31-40			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	698	1714	3.43	YES
124				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1678	3.36	YES
125				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	463	1655	3.31	YES
126				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	417	1719	3.44	YES

NOTE:

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.</



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

→

AZ20170

DATE

CHECKER

→

→

July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
							Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.						Actual Force (kg)			Average Uplift force= 1950 kg (1625 kg w/ FOS)	
							Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column								
							[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	
127	105	C	5	0-10	9'-0"		11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	938.8	1.88	YES	
128				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1574	3.15	YES	
129				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	685	1828	3.65	YES	
130				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	540	1855	3.71	YES	
131				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1819	3.63	YES	
132				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	358	1791	3.58	YES	
133				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	322	1859	3.72	YES	
134			10	0-10	9'-0"		10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	848	1.7	YES	
135				11-20			10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	1424	2.85	YES	
136				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	739	1810	3.62	YES	
137				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	585	1841	3.68	YES	
138				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	467	1800	3.6	YES	
139				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	390	1773	3.55	YES	
140				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1841	3.69	YES	
141			15	0-10	9'-0"		9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	721.1	1.45	YES	
142				11-20			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	816	1211	2.42	YES	
143				21-30			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	816	1701	3.4	YES	
144				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	680	1823	3.65	YES	
145				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	544	1787	3.57	YES	
146				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	454	1760	3.52	YES	
147				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	408	1828	3.66	YES	
148			20	0-10	9'-0"		8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	812	671.2	1.34	YES	
149				11-20			8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	812	1125	2.25	YES	
150				21-30			8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	1578	3.16	YES	
151				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	717	1791	3.59	YES	
152				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1755	3.51	YES	
153				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1728	3.46	YES	
154				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	431	1796	3.59	YES	
155			25	0-10	9'-0"		8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	621.3	1.24	YES	
156				11-20			8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	1043	2.08	YES	
157				21-30			8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1460	2.92	YES	
158				31-40			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1764	3.52	YES	
159				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1723	3.45	YES	
160				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1701	3.4	YES	
161				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	467	1764	3.53	YES	
162			30	0-10	9'-0"		8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	607.7	1.21	YES	
163				11-20			8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	1016	2.03	YES	
164				21-30			8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1424	2.84	YES	
165				31-40			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1714	3.43	YES	
166				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	621	1678	3.36	YES	
167				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	517	1655	3.31	YES	
168				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	467	1719	3.44	YES	



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.								
								Front Column			Rear Column			Front Column				Rear Column				Fornt. Column		Rear Column		Actual Force (kg)				
					[S1] (ft-in)	[S2] (ft-in)			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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)
169				0-10	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	844	857	1.71	YES		
170				11-20	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	844	1438	2.88	YES		
171				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	762	1828	3.65	YES		
172				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1855	3.71	YES		
173				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	481	1819	3.63	YES		
174				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1791	3.58	YES		
175				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1859	3.72	YES		
176				0-10	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	771	1.54	YES		
177				11-20	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	1288	2.58	YES		
178				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1810	3.62	YES		
179				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	653	1841	3.68	YES		
180				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	522	1800	3.6	YES		
181				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1773	3.55	YES		
182				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	390	1841	3.69	YES		
183				0-10	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	644	1.28	YES		
184				11-20	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	1079	2.15	YES		
185				21-30	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1510	3.02	YES		
186				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	757	1823	3.65	YES		
187				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	603	1787	3.57	YES		
188				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	503	1760	3.52	YES		
189				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	454	1828	3.66	YES		
190				0-10	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	630	1.27	YES		
191				11-20	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1057	2.12	YES		
192				21-30	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1488	2.97	YES		
193				31-40	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	794	1791	3.59	YES		
194				41-50	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1755	3.51	YES		
195				51-60	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	531	1728	3.46	YES		
196				61-70	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	476	1796	3.59	YES		
197				0-10	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	803	544	1.09	YES		
198				11-20	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	803	912	1.82	YES		
199				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1279	2.56	YES		
200				31-40	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	803	1646	3.29	YES		
201				41-50	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	689	1723	3.45	YES		
202				51-60	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	576	1701	3.4	YES		
203				61-70	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	517	1764	3.53	YES		
204				0-10	7'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	531	1.06	YES		
205				11-20	7'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	889	1.77	YES		
206				21-30	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1273	2.49	YES		
207				31-40	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1601	3.43	YES		
208				41-50	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	689	1678	3.36	YES		
209				51-60	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	576	1655	3.31	YES		
210				61-70	9'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	517	1719	3.44	YES		

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

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AZ20170

DATE

CHECKER

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July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size					US Helical Size								Krinner Ground Screws G114x1600.								
								Front Column			Rear Column		Front Column				Rear Column				Fornr. Column		Rear Column		Actual Force (kg)				
					[S1] (ft-in)	[S2] (ft-in)			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)	Uplift Force	Downward	Horiz.
																										1950 1625			
211	115	C	5	0-10	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	778	1.55	YES	
212				11-20	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1302	2.6	YES	
213				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1828	3.65	YES	
214				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1855	3.71	YES	
215				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1819	3.63	YES	
216				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1791	3.58	YES	
217				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1859	3.72	YES	
218			10	0-10	9'-0"	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	689	1.37	YES
219				11-20	9'-0"	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	1152	2.31	YES
220				21-30	9'-0"	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1619	3.24	YES
221				31-40	9'-0"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	721	1841	3.68	YES
222				41-50	9'-0"	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	580	1800	3.6	YES
223				51-60	9'-0"	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	481	1773	3.55	YES
224				61-70	9'-0"	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1841	3.69	YES
225			15	0-10	9'-0"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	603	1.21	YES
226				11-20	9'-0"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1011	2.02	YES
227				21-30	9'-0"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1415	2.83	YES
228				31-40	9'-0"	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1823	3.65	YES
229				41-50	9'-0"	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	667	1787	3.57	YES
230				51-60	9'-0"	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1760	3.52	YES
231				61-70	9'-0"	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	503	1828	3.66	YES
232			20	0-10	9'-0"	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	553	1.11	YES
233				11-20	9'-0"	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	926	1.85	YES
234				21-30	9'-0"	7'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1302	2.6	YES
235				31-40	9'-0"	7'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1673	3.35	YES
236				41-50	9'-0"	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	703	1755	3.51	YES
237				51-60	9'-0"	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1728	3.46	YES
238				61-70	9'-0"	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	526	1796	3.59	YES
239			25	0-10	9'-0"	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	503	1.01	YES
240				11-20	9'-0"	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	850	1.69	YES
241				21-30	9'-0"	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1188	2.37	YES
242				31-40	9'-0"	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1528	3.06	YES
243				41-50	9'-0"	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	762	1723	3.45	YES
244				51-60	9'-0"	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1701	3.4	YES
245				61-70	9'-0"	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1764	3.53	YES
246			30	0-10	9'-0"	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	495	0.98	YES
247				11-20	9'-0"	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	825	1.77	YES
248				21-30	9'-0"	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1156	2.31	YES
249	31-40	9'-0"		6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1488	2.98	YES		
250	41-50	9'-0"		6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	762	1678	3.36	YES		
251	51-60	9'-0"		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1655	3.31	YES		
252	61-70	9'-0"		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1719	3.44	YES		



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)			
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)						
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward
253				0-10			8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	694	1.39	YES
254				11-20			8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1166	2.33	YES
255				21-30			8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1633	3.27	YES
256				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	739	1855	3.71	YES
257				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	590	1819	3.63	YES
258				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	490	1791	3.58	YES
259				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1859	3.72	YES
260				0-10			8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	649	1.3	YES
261				11-20			8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1084	2.17	YES
262				21-30			8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1524	3.05	YES
263				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1841	3.68	YES
264				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1800	3.6	YES
265				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	531	1773	3.55	YES
266				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	476	1841	3.69	YES
267				0-10			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	521.5	1.04	YES
268				11-20			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	876	1.75	YES
269				21-30			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1229	2.46	YES
270				31-40			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1583	3.16	YES
271				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	735	1787	3.57	YES
272				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	612	1760	3.52	YES
273				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	553	1828	3.66	YES
274				0-10			6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	512.5	1.02	YES
275				11-20			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	862	1.72	YES
276				21-30			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1206	2.41	YES
277				31-40			6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1556	3.11	YES
278				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	771	1755	3.51	YES
279				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	644	1728	3.46	YES
280				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	580	1796	3.59	YES
281				0-10			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	468	0.93	YES
282				11-20			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	780	1.56	YES
283				21-30			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1098	2.19	YES
284				31-40			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1410	2.82	YES
285				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1723	3.45	YES
286				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	694	1701	3.4	YES
287				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	626	1764	3.53	YES
288				0-10			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	454	0.91	YES
289				11-20			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	762	1.52	YES
290				21-30			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1066	2.13	YES
291				31-40			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1374	2.74	YES
292				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1678	3.36	YES
293				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	698	1655	3.31	YES
294				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	626	1719	3.44	YES

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)		
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.									
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)					
					[S1] (ft-in)	[S2] (ft-in)			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)	Uplift Force	Downward	Horiz.
																									1950 1625				
295				0-10	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	572	1.14	YES	
296				11-20	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	957	1.92	YES	
297				21-30	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1347	2.69	YES	
298				31-40	7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1732	3.46	YES	
299				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	707	1819	3.63	YES	
300				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	590	1791	3.58	YES	
301				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1859	3.72	YES	
302				0-10	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	527	1.05	YES	
303				11-20	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	885	1.76	YES	
304				21-30	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1238	2.48	YES	
305				31-40	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1596	3.19	YES	
306				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	762	1800	3.6	YES	
307				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	635	1773	3.55	YES	
308				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1841	3.69	YES	
309				0-10	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	440	0.88	YES	
310				11-20	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	740	1.48	YES	
311				21-30	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1039	2.08	YES	
312				31-40	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1338	2.68	YES	
313				41-50	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1637	3.27	YES	
314				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	730	1760	3.52	YES	
315				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	658	1828	3.66	YES	
316				0-10	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	436	0.87	YES	
317				11-20	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	726	1.46	YES	
318				21-30	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1020	2.04	YES	
319				31-40	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1315	2.63	YES	
320				41-50	5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1610	3.22	YES	
321				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1728	3.46	YES	
322				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1796	3.59	YES	
323				0-10	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	390	0.78	YES	
324				11-20	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	650	1.3	YES	
325				21-30	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	912	1.83	YES	
326				31-40	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1175	2.35	YES	
327				41-50	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1438	2.88	YES	
328				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1701	3.4	YES	
329				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	744	1764	3.53	YES	
330				0-10	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	377	0.76	YES	
331				11-20	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	635	1.27	YES	
332				21-30	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	890	1.78	YES	
333				31-40	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1143	2.29	YES	
334				41-50	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1397	2.8	YES	
335				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1655	3.31	YES	
336				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	748	1719	3.44	YES	



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

→

AZ20170

DATE

CHECKER

→

→

July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)			
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.								
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column		Actual Force (kg)				
								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)	Uplift Force			Downward	Horiz.
					[S1] (ft-in)	[S2] (ft-in)																						Average Uplift force= 1950 kg (1625 kg w/ FOS)		
																												1950 1625		
337	140	C	5	0-10	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	490	0.98	YES		
338				11-20	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	821	1.64	YES		
339				21-30	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1152	2.31	YES		
340				31-40	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1483	2.97	YES		
341				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1819	3.63	YES		
342				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	694	1791	3.58	YES		
343				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1859	3.72	YES		
344			10	0-10	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	445	0.89	YES		
345				11-20	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	821	750	1.76	YES		
346				21-30	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	1048	2.1	YES		
347				31-40	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	1347	2.7	YES		
348				41-50	5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	821	1651	3.3	YES		
349				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	748	1773	3.55	YES		
350				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	671	1841	3.69	YES		
351			15	0-10	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	771	363	0.72	YES		
352				11-20	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	771	608	1.21	YES		
353				21-30	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	771	850	1.7	YES		
354				31-40	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	771	1093	2.19	YES		
355				41-50	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	771	1338	2.68	YES		
356				51-60	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	771	1583	3.17	YES		
357				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	771	1828	3.66	YES		
358			20	0-10	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	812	358	0.71	YES		
359				11-20	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	812	595	1.19	YES		
360				21-30	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	835	1.67	YES		
361				31-40	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	1075	2.15	YES		
362				41-50	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	1315	2.63	YES		
363				51-60	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	1556	3.11	YES		
364				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	1796	3.59	YES		
365			25	0-10	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	776	313	0.62	YES		
366				11-20	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	776	522	1.04	YES		
367				21-30	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	730	1.46	YES		
368				31-40	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	940	1.88	YES		
369				41-50	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1438	2.88	YES		
370				51-60	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1361	2.72	YES		
371				61-70	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1569	3.14	YES		
372			30	0-10	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	780	304	0.61	YES		
373				11-20	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	780	508	1.02	YES		
374				21-30	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	712	1.42	YES		
375				31-40	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	917	1.83	YES		
376	41-50	4'-0"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1120	2.24	YES				
377	51-60	4'-0"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1324	2.65	YES				
378	61-70	4'-0"		0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1528	3.06	YES				



Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→	DATE	→
JOB NO.	→	CHECKER	→
AZ20170		July 5, 2024 SAM	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Actual Force (kg)						
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)			
379				0-10	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	408	0.82	YES				
380				11-20	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	807	685	1.37	YES				
381				21-30	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	962	1.92	YES				
382				31-40	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1238	2.48	YES				
383				41-50	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1515	3.03	YES				
384				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	807	1791	3.58	YES				
385				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	726	1859	3.72	YES				
386				0-10	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	780	363	0.73	YES				
387				11-20	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	780	612	1.76	YES				
388				21-30	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	858	1.71	YES				
389				31-40	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1102	2.21	YES				
390				41-50	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1351	2.7	YES				
391				51-60	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1596	3.19	YES				
392				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1841	3.69	YES				
393				0-10	4'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	322	0.64	YES				
394				11-20	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	540	1.08	YES				
395				21-30	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	758	1.7	YES				
396				31-40	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	976	1.95	YES				
397				41-50	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1188	2.38	YES				
398				51-60	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1406	2.82	YES				
399				61-70	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1624	3.25	YES				
400				0-10	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	318	0.63	YES				
401				11-20	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	530	1.06	YES				
402				21-30	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	745	1.49	YES				
403				31-40	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	957	1.91	YES				
404				41-50	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1170	2.34	YES				
405				51-60	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1383	2.77	YES				
406				61-70	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1596	3.19	YES				
407				0-10	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	273	0.54	YES				
408				11-20	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	454	0.91	YES				
409				21-30	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	640	1.28	YES				
410				31-40	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	821	1.65	YES				
411				41-50	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1007	2.01	YES				
412				51-60	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1188	2.31	YES				
413				61-70	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1374	2.75	YES				
414				0-10	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	263	0.53	YES				
415				11-20	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	789	445	0.89	YES				
416				21-30	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	622	1.24	YES				
417				31-40	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	803	1.6	YES				
418				41-50	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	980	1.96	YES				
419				51-60	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1156	2.32	YES				
420				61-70	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	789	1338	2.67	YES				

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



Ground Mount Structure Spans (ASCE 7-16)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

→

AZ20170

DATE

CHECKER

→

→

July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																								US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.																
					Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)															
					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)	Uplift Force	Downward	Horiz.										
																											Average Uplift force= 1950 kg (1625 kg w/ FOS)									
																					1950	1625														
421				0-10	9'-0"	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	368	0.73	YES							
422				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	617	1.23	YES							
423				21-30			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	866	1.73	YES							
424				31-40			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1116	2.23	YES							
425				41-50			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1361	2.73	YES							
426				51-60			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1610	3.22	YES							
427				61-70			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1859	3.72	YES							
428				0-10	9'-0"	4'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	322	0.65	YES							
429				11-20			0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	545	1.08	YES							
430				21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	762	1.52	YES							
431				31-40			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	980	1.96	YES							
432				41-50			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1202	2.4	YES							
433				51-60			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1420	2.84	YES							
434				61-70			0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1637	3.27	YES							
435				0-10	9'-0"	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	282	0.56	YES							
436				11-20			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	472	0.94	YES							
437				21-30			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	663	1.32	YES							
438				31-40			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	853	1.7	YES							
439				41-50			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1043	2.08	YES							
440				51-60			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1234	2.46	YES							
441				61-70			0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1420	2.84	YES							
442	160	C		0-10	9'-0"	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	277	0.55	YES							
443	11-20		0'-6"	2'-0"			3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	436	0.93	YES									
444	21-30		0'-6"	2'-0"			3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	650	1.3	YES									
445	31-40		0'-6"	2'-0"			3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	835	1.67	YES									
446	41-50		0'-6"	2'-0"			3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1025	2.05	YES									
447	51-60		0'-6"	2'-0"			3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1211	2.42	YES									
448	61-70		0'-6"	2'-0"			3'-6"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1397	2.79	YES									
449					0-10	9'-0"	3'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	776	232	0.47	YES						
450					11-20			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	776	380	0.78	YES						
451					21-30			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	550	1.1	YES						
452					31-40			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	703	1.41	YES						
453					41-50			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	862	1.72	YES						
454					51-60			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1020	2.04	YES						
455					61-70			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1179	2.34	YES						
456				0-10	9'-0"	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	776	227	0.45	YES							
457				11-20			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	776	381	0.76	YES							
458				21-30			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	536	1.07	YES							
459				31-40			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	685	1.37	YES							
460				41-50			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	840	1.68	YES							
461				51-60			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	994	1.99	YES							
462				61-70			0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	776	1147	2.29	YES							



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Exposure C, ASCE 7-10, SCH 40- GM Chart for 5 Modules 90-160 Mph



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column								
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)
1				0-10	15'-6"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	762	1265	2.53	YES				
2				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	590	1642	3.29	YES				
3				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	467	1828	3.65	YES				
4				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1855	3.71	YES				
5			5	41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	295	1819	3.63	YES				
6				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	245	1791	3.58	YES				
7				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	222	1859	3.72	YES				
8				0-10	15'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1256	2.51	YES				
9				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	644	1628	3.26	YES				
10				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	508	1810	3.62	YES				
11				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1841	3.68	YES				
12				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1800	3.6	YES				
13				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	268	1773	3.55	YES				
14				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	240	1841	3.69	YES				
15				0-10	13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1084	2.17	YES				
16				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	644	1628	3.26	YES				
17				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	599	1796	3.59	YES				
18				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	472	1823	3.65	YES				
19				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1787	3.57	YES				
20				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	313	1760	3.52	YES				
21				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	281	1828	3.66	YES				
22				0-10	12'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	988.7	1.97	YES				
23				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	1587	3.17	YES				
24				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	630	1764	3.53	YES				
25				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	499	1791	3.59	YES				
26				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	399	1755	3.51	YES				
27				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	331	1728	3.46	YES				
28				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	299	1796	3.59	YES				
29				0-10	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	895	1.79	YES				
30				11-20	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1497	2.99	YES				
31				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	689	1732	3.47	YES				
32				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	544	1764	3.52	YES				
33				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1723	3.45	YES				
34				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1701	3.4	YES				
35				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	327	1764	3.53	YES				
36				0-10	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	871	1.74	YES				
37				11-20	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1456	2.92	YES				
38				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	689	1687	3.38	YES				
39				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	544	1714	3.43	YES				
40				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1678	3.36	YES				
41				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	363	1655	3.31	YES				
42				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	327	1719	3.44	YES				

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krrinner Ground Screws G114x1600.								
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)				
								[S1] (ft-in)	[S2] (ft-in)		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)
43				0-10	15'-0"	0'-6"	2'-0"	2'-0"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1224	2.45	YES
44				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	676	1642	3.29	YES
45				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1828	3.65	YES
46				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	422	1855	3.71	YES
47				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1819	3.63	YES
48				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	281	1791	3.58	YES
49				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	254	1859	3.72	YES
50				0-10	13'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1093	2.19	YES
51				11-20	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	735	1628	3.26	YES
52				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1810	3.62	YES
53				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	458	1841	3.68	YES
54				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	367	1800	3.6	YES
55				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	308	1773	3.55	YES
56				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	277	1841	3.69	YES
57				0-10	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	925	1.85	YES
58				11-20	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	1546	3.1	YES
59				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	680	1796	3.59	YES
60				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1823	3.65	YES
61				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	431	1787	3.57	YES
62				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	358	1760	3.52	YES
63				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1828	3.66	YES
64				0-10	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	871	1.74	YES
65				11-20	11'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1456	2.91	YES
66				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	721	1764	3.53	YES
67				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	567	1791	3.59	YES
68				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	454	1755	3.51	YES
69				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	376	1728	3.46	YES
70				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	340	1796	3.59	YES
71				0-10	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	775.5	1.56	YES
72				11-20	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	1302	2.6	YES
73				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	780	1732	3.47	YES
74				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1764	3.52	YES
75				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	494	1723	3.45	YES
76				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1701	3.4	YES
77				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1764	3.53	YES
78				0-10	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	757.4	1.51	YES
79				11-20	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	1265	2.54	YES
80				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	785	1687	3.38	YES
81				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	617	1714	3.43	YES
82				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	494	1678	3.36	YES
83				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	413	1655	3.31	YES
84				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	372	1719	3.44	YES

NOTE:

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- 6 Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- 7 Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- 8 Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing	Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
							Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.				Actual Force (kg)			Average Uplift force= 1950 kg (1625 kg w/ FOS)					
							Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Uplift Force	Downward	Horiz.						
							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)			
							[S1] (ft-in)	[S2] (ft-in)																							
85				0-10	13'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1061	2.12	YES			
86			5	11-20	11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	735	1574	3.15	YES			
87		21-30		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	608	1828	3.65	YES				
88		31-40		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	481	1855	3.71	YES				
89		41-50		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	385	1819	3.63	YES				
90		51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	322	1791	3.58	YES				
91		61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	290	1859	3.72	YES				
92				10	0-10	12'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	971	1.94	YES		
93		11-20	11'-6"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	1560	3.12	YES				
94		21-30	9'-6"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	662	1810	3.62	YES				
95		31-40	7'-6"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	522	1841	3.68	YES				
96		41-50	6'-0"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1800	3.6	YES				
97		51-60	5'-0"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	349	1773	3.55	YES				
98		61-70	4'-6"		0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	313	1841	3.69	YES				
99			15	0-10	10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	844	1.69	YES			
100		11-20		10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1415	2.83	YES				
101		21-30		9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	771	1796	3.59	YES				
102		31-40		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	608	1823	3.65	YES				
103		41-50		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	485	1787	3.57	YES				
104		51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	404	1760	3.52	YES				
105		61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	363	1828	3.66	YES				
106	100	C	20	0-10	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	790	1.58	YES			
107				11-20	10'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	853	1324	2.65	YES			
108				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	812	1764	3.53	YES			
109				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	639	1791	3.59	YES			
110				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	512	1755	3.51	YES			
111				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	426	1728	3.46	YES			
112				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	385	1796	3.59	YES			
113					25	0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	698.4	1.4	YES	
114				11-20		9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1170	2.34	YES		
115				21-30		9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1642	3.29	YES		
116				31-40		7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	694	1764	3.52	YES		
117				41-50		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	553	1723	3.45	YES		
118				51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1701	3.4	YES		
119				61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1764	3.53	YES		
120			30	0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	680.3	1.37	YES			
121		11-20		9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1143	2.28	YES				
122		21-30		9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1601	3.2	YES				
123		31-40		7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	698	1714	3.43	YES				
124		41-50		6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	558	1678	3.36	YES				
125		51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	463	1655	3.31	YES				
126		61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	417	1719	3.44	YES				

NOTE:

- Top Cap design to be provided by "



Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→	DATE	→
JOB NO.	→	CHECKER	→
A220170		July 5, 2024 SAM	

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																								US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.														
								Front Column			Rear Column			Front Column				Rear Column				Fornt Column		Rear Column		Actual Force (kg)										
								[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)				
127				0-10			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	938.8	1.88	YES						
128				11-20			11'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1574	3.15	YES						
129				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	685	1828	3.65	YES						
130				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	540	1855	3.71	YES						
131				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	431	1819	3.63	YES						
132				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	358	1791	3.58	YES						
133				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	322	1859	3.72	YES						
134				0-10			10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	848	1.7	YES						
135				11-20			10'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	1424	2.85	YES						
136				21-30			9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	739	1810	3.62	YES						
137				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1841	3.68	YES						
138				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	467	1800	3.6	YES						
139				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	390	1773	3.55	YES						
140				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	349	1841	3.69	YES						
141				0-10			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	721.1	1.45	YES						
142				11-20			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	816	1211	2.42	YES						
143				21-30			9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	816	1701	3.4	YES						
144				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	680	1823	3.65	YES						
145				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	544	1787	3.57	YES						
146				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	454	1760	3.52	YES						
147				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	408	1828	3.66	YES						
148				0-10			8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	812	671.2	1.34	YES						
149				11-20			8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	812	1125	2.25	YES						
150				21-30			8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	812	1578	3.16	YES						
151				31-40			7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	717	1791	3.59	YES						
152				41-50			6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1755	3.51	YES						
153				51-60			5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	476	1728	3.46	YES						
154				61-70			4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	431	1796	3.59	YES						
155				0-10			8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	621.3	1.24	YES						
156				11-20			8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	1043	2.08	YES						
157				21-30			8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1460	2.92	YES						
158				31-40			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	1764	3.52	YES						
159				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	621	1723	3.45	YES						
160				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	517	1701	3.4	YES						
161				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	467	1764	3.53	YES						
162				0-10			8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	607.7	1.21	YES						
163				11-20			8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	830	1016	2.03	YES						
164				21-30			8'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	830	1424	2.84	YES						
165				31-40			7'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	1714	3.43	YES						
166				41-50			6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	621	1678	3.36	YES						
167				51-60			5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	517	1655	3.31	YES						
168				61-70			4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	467	1719	3.44	YES						

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Stress of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Stress of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

→

AZ20170

DATE

CHECKER

→

→

July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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								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)	Actual Force (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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[S1] (ft-in)	[S2] (ft-in)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg,



5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krriner Ground Screws G114x1600.								
								Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column		Actual Force (kg)				
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.
																									1950 1625			
211				0-10	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	778	1.55	YES
212				11-20	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	848	1302	2.6	YES
213				21-30	9'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	848	1828	3.65	YES
214				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	671	1855	3.71	YES
215				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	535	1819	3.63	YES
216				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	444	1791	3.58	YES
217				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	404	1859	3.72	YES
218				0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	689	1.37	YES
219				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	1152	2.31	YES
220				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1619	3.24	YES
221				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	721	1841	3.68	YES
222				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	580	1800	3.6	YES
223				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	481	1773	3.55	YES
224				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	435	1841	3.69	YES
225				0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	603	1.21	YES
226				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	1011	2.02	YES
227				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1415	2.83	YES
228				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1823	3.65	YES
229				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	667	1787	3.57	YES
230				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	558	1760	3.52	YES
231				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	503	1828	3.66	YES
232				0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	553	1.11	YES
233				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	821	926	1.85	YES
234				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1302	2.6	YES
235				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	821	1673	3.35	YES
236				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	703	1755	3.51	YES
237				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	585	1728	3.46	YES
238				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	526	1796	3.59	YES
239				0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	503	1.01	YES
240				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	850	1.69	YES
241				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1188	2.37	YES
242				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1528	3.06	YES
243				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	632	1723	3.45	YES
244				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	675	1701	3.4	YES
245				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1764	3.53	YES
246				0-10	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	495	0.98	YES
247				11-20	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	825	825	1.77	YES
248				21-30	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1156	2.31	YES
249				31-40	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	825	1488	2.98	YES
250				41-50	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	762	1678	3.36	YES
251				51-60	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	635	1655	3.31	YES
252				61-70	9'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	571	1719	3.44	YES

- 1 Top Cap design to be verified by "K2 Systems". Average Force of Top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average Force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of Top cap = 1950 kg, uplift force of top cap with factor of safety = $1950 \text{ kg}/1.2 = 1625 \text{ kg}$.
- 6 Yield Stress of 3" dia pipe - $F_y = 35 \text{ ksi}$ and $F_u = 58 \text{ ksi}$
- 7 Yield Stress of 2-7/8" dia US Helical pipe - $F_y = 60 \text{ ksi}$ (refer US Helical Chart)
- 8 Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																				US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Actual Force (kg)						
					[S1] (ft-in)	[S2] (ft-in)		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)	Uplift Force	Downward	Horiz.				
					Average Uplift force= 1950 kg (1625 kg w/ FOS)																											
1950 1625																																
253				0-10	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	694	1.39	YES				
254				11-20	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	1166	2.33	YES				
255				21-30	8'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1633	3.27	YES				
256				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	739	1855	3.71	YES				
257				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	590	1819	3.63	YES				
258				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	490	1791	3.58	YES				
259				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	444	1859	3.72	YES				
260				0-10	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	649	1.3	YES				
261				11-20	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	848	1084	2.17	YES				
262				21-30	8'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	848	1524	3.05	YES				
263				31-40	7'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1841	3.68	YES				
264				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	635	1800	3.6	YES				
265				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1773	3.55	YES				
266				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	476	1841	3.69	YES				
267				0-10	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	521.5	1.04	YES				
268				11-20	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	876	1.75	YES				
269				21-30	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1229	2.46	YES				
270				31-40	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1583	3.16	YES				
271				41-50	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	735	1787	3.57	YES				
272				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	612	1760	3.52	YES				
273				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	553	1828	3.66	YES				
274				0-10	6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	512.5	1.02	YES				
275				11-20	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	839	862	1.72	YES				
276				21-30	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1206	2.41	YES				
277				31-40	6'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	839	1556	3.11	YES				
278				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	771	1755	3.51	YES				
279				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	644	1728	3.46	YES				
280				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	580	1796	3.59	YES				
281				0-10	6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	468	0.93	YES				
282				11-20	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	780	1.56	YES				
283				21-30	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1098	2.19	YES				
284				31-40	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1410	2.82	YES				
285				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1723	3.45	YES				
286				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	694	1701	3.4	YES				
287				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1764	3.53	YES				
288				0-10	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	454	0.91	YES				
289				11-20	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	762	1.52	YES				
290				21-30	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1066	2.13	YES				
291				31-40	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1374	2.74	YES				
292				41-50	6'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1678	3.36	YES				
293				51-60	5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	698	1655	3.31	YES				
294				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	626	1719	3.44	YES				

NOTE:

- Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- Top Cap is reviewed only for the uplift value provided in Report.
- Factor of Safety (FOS) = 1.2
- Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- Yield Strss of 3" dia pipe - Fy = 35 ksi & Fu = 58 ksi
- Yield Strss of 2-7/8" dia US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- Bracing not required.



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.								
								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)	Actual Force (kg)							
																							Uplift Force	Downward	Horiz.					
																							Average Uplift force= 1950 kg (1625 kg w/ FOS)							
																							1950 1625							
295				0-10		7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	572	1.14		YES
296				11-20		7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	957	1.92		YES
297				21-30		7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1347	2.69		YES
298				31-40		7'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1732	3.46		YES
299				41-50		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	707	1819	3.63		YES
300				51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	590	1791	3.58		YES
301				61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	531	1859	3.72		YES
302				0-10		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	527	1.05		YES
303				11-20		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	825	885	1.76		YES
304				21-30		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1238	2.48		YES
305				31-40		6'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	825	1596	3.19		YES
306				41-50		6'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	762	1800	3.6		YES
307				51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	635	1773	3.55		YES
308				61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	571	1841	3.69		YES
309				0-10		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	440	0.88		YES
310				11-20		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	803	740	1.48		YES
311				21-30		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1039	2.08		YES
312				31-40		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1338	2.68		YES
313				41-50		5'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	803	1637	3.27		YES
314				51-60		5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	730	1760	3.52		YES
315				61-70		4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	658	1828	3.66		YES
316				0-10		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	436	0.87		YES
317				11-20		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	844	726	1.46		YES
318				21-30		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1020	2.04		YES
319				31-40		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1315	2.63		YES
320				41-50		5'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	844	1610	3.22		YES
321				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	766	1728	3.46		YES
322				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	689	1796	3.59		YES
323				0-10		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	390	0.78		YES
324				11-20		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	650	1.3		YES
325				21-30		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	912	1.83		YES
326				31-40		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1175	2.35		YES
327				41-50		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1438	2.88		YES
328				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1701	3.4		YES
329				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	744	1764	3.53		YES
330				0-10		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	377	0.76		YES
331				11-20		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	830	635	1.27		YES
332				21-30		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	890	1.78		YES
333				31-40		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1143	2.29		YES
334				41-50		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1397	2.8		YES
335				51-60		5'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	830	1655	3.31		YES
336				61-70		4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	748	1719	3.44		YES

NOTE:

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top cap = 1950 kg, uplift force of top cap 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 US Helical pipe - Fy = 60 ksi (refer US Helical Chart)
- 8 Bracing not required.



Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME

JOB NO.

→

→

AZ20170

DATE

CHECKER

→

→

July 5, 2024

SAM

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																								US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
								Pole Footing Size						US Helical Size								Krinner Ground Screws G114x1600.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
								Front Column			Rear Column			Front Column				Rear Column				Front Column		Rear Column		Actual Force (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
								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)	Uplift Force	Downward	Horiz.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
					[S1] (ft-in)	[S2] (ft-in)																					Average Uplift force= 1950 kg (1625 kg w/ FOS)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							



STRUCTURAL ENGINEERS

Ground Mount Structure Spans (ASCE 7-10)

5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

JOB NAME	→		DATE	→	
JOB NO.	→	AZ20170	CHECKER	→	July 5, 2024 SAM

SR- No's	Wind Speed (mph)	Expo-sure Catego-ry	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hang (ft-in)	Foundation																US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)				
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.											
								Front Column			Rear Column			Front Column			Rear Column			Front Column		Rear Column		Actual Force (kg)							
								[S1] (ft-in)	[S2] (ft-in)		Dia. (D) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Dia. (D) (ft)	Depth (d) (ft)	#5 Reinf. Spacing	Reinf. 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)	Uplift Force	Downward	Horiz.
								Average Uplift force= 1950 kg (1625 kg w/ FOS)																							
																								1950 1625							
379				0-10	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	2'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	408	0.82	YES			
380				11-20	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	807	685	1.37	YES			
381				21-30	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	962	1.92	YES			
382				31-40	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1238	2.48	YES			
383				41-50	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1515	3.03	YES			
384				51-60	5'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	807	1791	3.58	YES			
385				61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	726	1859	3.72	YES			
386				0-10	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	780	363	0.73	YES			
387				11-20	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	780	612	1.76	YES			
388				21-30	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	858	1.71	YES			
389				31-40	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1102	2.21	YES			
390				41-50	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1351	2.7	YES			
391				51-60	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1596	3.19	YES			
392				61-70	4'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	780	1841	3.69	YES			
393				0-10	4'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	322	0.64	YES			
394				11-20	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	798	540	1.08	YES			
395				21-30	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	758	1.7	YES			
396				31-40	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	976	1.95	YES			
397				41-50	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1188	2.38	YES			
398				51-60	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1406	2.82	YES			
399				61-70	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	798	1624	3.25	YES			
400				0-10	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	318	0.63	YES			
401				11-20	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	834	530	1.06	YES			
402				21-30	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	745	1.49	YES			
403				31-40	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	957	1.91	YES			
404				41-50	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1170	2.34	YES			
405				51-60	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1383	2.77	YES			
406				61-70	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	834	1596	3.19	YES			
407				0-10	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	273	0.54	YES			
408				11-20	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	454	0.91	YES			
409				21-30	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	640	1.28	YES			
410				31-40	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	821	1.65	YES			
411				41-50	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1007	2.01	YES			
412				51-60	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1188	2.31	YES			
413				61-70	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1374	2.75	YES			
414				0-10	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	263	0.53	YES			
415				11-20	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	5'-0"	8"	2-7/8"	1	10	9'	2-7/8"	1	10	9'	4.5	63	4.5	63	789	445	0.89	YES			
416				21-30	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	622	1.24	YES			
417				31-40	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	803	1.6	YES			
418				41-50	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	980	1.96	YES			
419				51-60	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1156	2.32	YES			
420				61-70	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2-7/8"	2	8	7'	2-7/8"	2	8	7'	4.5	63	4.5	63	789	1338	2.67	YES			



5- modules with max. area 28.125 sq-ft (90"x45") w/panel & 3" dia. SCH 40 Pipe or Mechanical Tube.

SR- No's	Wind Speed (mph)	Expo-sure Catag-ory	Tilt Angle (Deg.)	Roof Snow Load (psf)	3" Pipe SCH 40 or Mechanical Tube Column Spacing		Beam Pipe over- hange (ft-in)	Foundation																		US Helicals Adapter (See note 1,2,3,4,5)			Systems Top Cap (See note 1,2,3,4,5)	
								Pole Footing Size						US Helical Size						Krinner Ground Screws G114x1600.										
								Front Column			Rear Column			Front Column			Rear Column			Fornt Column		Rear Column		Actual Force (kg)						
					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)	Uplift Force	Downward	Horiz.	Average Uplift force= 1950 kg (1625 kg w/ FOS)				
					[S1] (ft-in)	[S2] (ft-in)																					1950 1625			
421	160	C	5	0-10	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	368	0.73	YES		
422				11-20	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	834	617	1.23	YES		
423				21-30	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	866	1.73	YES		
424				31-40	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1116	2.23	YES		
425				41-50	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1361	2.73	YES		
426				51-60	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1610	3.22	YES		
427			61-70	4'-6"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	834	1859	3.72	YES			
428			10	0-10	4'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	322	0.65	YES		
429				11-20	4'-0"	0'-6"	2'-0"	2'-6"	8"	2'-0"	3'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	545	1.08	YES		
430				21-30	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	762	1.52	YES		
431				31-40	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	980	1.96	YES		
432				41-50	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1202	2.4	YES		
433				51-60	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1420	2.84	YES		
434			61-70	4'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	3'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1637	3.27	YES			
435			15	0-10	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	282	0.56	YES		
436				11-20	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	798	472	0.94	YES		
437				21-30	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	663	1.32	YES		
438				31-40	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	853	1.7	YES		
439				41-50	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1043	2.08	YES		
440				51-60	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1234	2.46	YES		
441			61-70	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	798	1420	2.84	YES			
442			20	0-10	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	277	0.55	YES		
443				11-20	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	839	436	0.93	YES		
444				21-30	3'-6"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	650	1.3	YES		
445	31-40	3'-6"		0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	835	1.67	YES				
446	41-50	3'-6"		0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1025	2.05	YES				
447	51-60	3'-6"		0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1211	2.42	YES				
448	61-70	3'-6"	0'-6"	2'-0"	3'-6"	8"	2'-0"	4'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	839	1397	2.79	YES					
449	25	0-10	3'-0"	0'-6"	2'-0"	3'-0"	8"	2'-0"	4'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	776	232	0.47	YES				
450		11-20	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	776	380	0.78	YES				
451		21-30	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	550	1.1	YES				
452		31-40	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	703	1.41	YES				
453		41-50	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	862	1.72	YES				
454		51-60	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	1020	2.04	YES				
455	61-70	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-0"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	1179	2.34	YES					
456	30	0-10	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	776	227	0.45	YES				
457		11-20	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	1	10	9'	2'-7/8"	1	10	9'	4.5	63	4.5	63	776	381	0.76	YES				
458		21-30	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	536	1.07	YES				
459		31-40	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	685	1.37	YES				
460		41-50	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	840	1.68	YES				
461		51-60	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	994	1.99	YES				
462	61-70	3'-0"	0'-6"	2'-0"	3'-6"	8"	2'-0"	5'-6"	8"	2'-7/8"	2	8	7'	2'-7/8"	2	8	7'	4.5	63	4.5	63	776	1147	2.29	YES					

- 1 Top Cap design to be provided by "K2 Systems". Average Force of top Cap = 1950 kg (4299 lbs).
- 2 If Actual force is greater than Average Force, Please contact "K2 Systems" For special engineering design of Top Cap.
- 3 Top Cap is reviewed only for the uplift value provided in Report.
- 4 Factor of Safety (FOS) = 1.2
- 5 Uplift force of top cap = 1950 kg, uplift force of top cap with factor of safety = 1950 kg/1.2 = 1625 kg.
- 6 Yield Stress of 3" dia pipe - $F_y = 35$ ksi & $F_u = 58$ ksi
- 7 Yield Stress of 2-7/8" dia US Helical pipe - $F_y = 60$ ksi (refer US Helical Chart)
- 8 Bracing not required.