

TRACKER SYSTEM

007140 - GREENSKIES CLEAN ENERGY LLC

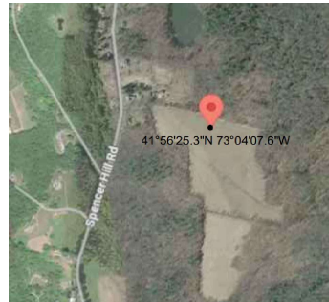
15866 WINCHESTER, CT (SPENCER HILL), US



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SITE LOCATION MAP



PROJECT DRAWING PACKAGE			
SHEET #	DRAWING #	DRAWING NAMES	REV #
1		COVER PAGE	
2	G-01	GENERAL NOTES	B
3	L-01	RACKING LAYOUT & DETAILS	09
4	S-01	RACKING ASSEMBLY DETAILS, SOLX20 - 12 MODULES RED TABLE	B
5	S-02	RACKING ASSEMBLY DETAILS, SOLX25 - 24 MODULE GREEN TABLE	B
6	S-03	CONNECTION SECTIONS & DETAILS - 1	B
7	S-04	CONNECTION SECTIONS & DETAILS - 2	B
8	S-05	PONY PANEL CONNECTION SECTIONS & DETAILS - 3	A
9	S-06	PONY PANEL CONNECTION SECTIONS & DETAILS - 4	A
10	S-07	MASTER BOM	B

A. DESIGN CRITERIA:

BUILDING CODE: CONNECTICUT STATE BUILDING CODE, ASCE 7-16

LOADS:

DEAD LOAD = SELF WEIGHT

SNOW:

GROUND SNOW LOAD, $P_g = 40$ PSF (DENSITY: 19.20 (lb/ft³))
PANEL SNOW LOAD, $P_f = 33.6$ PSF (BASED ON 3in SNOW DEPTH)
SNOW EXPOSURE FACTOR, $C_e = 1.0$
SNOW IMPORTANCE FACTOR, $I_s = 1.0$
SNOW RISK CATEGORY, I
SNOW THERMAL FACTOR, $C_t = 1.2$
SNOW SLOPE FACTOR, $C_s = 0.18$ AT 60° TILT
TRACKER STOWS AT 60° WHEN THE GROUND SNOW EXCEEDS 3 INCHES, EXCEPT WHILE WIND SPEED EXCEEDS 30 MPH THEN IT STOW AT 0° GOVERNS

ICE:

NOMINAL MAPPED ICE THICKNESS, $I = 1$ inch (density: 56.2pcf)
ICE IMPORTANCE FACTOR, $I = 0.8$
WIND ICE SPEED, $V_i = 50$ MPH

WIND:

ULTIMATE DESIGN WIND SPEED (STOW), $V = 105$ MPH
MAX DESIGN WIND SPEED AT 60° TILT, $V_{1.60} = 20$ MPH
TRACKER STOWS TO 0° (HORIZONTAL) WHEN WIND SPEED REACHES 30 MPH
STOW TILT ANGLE = 0°
RISK CATEGORY, I
EXPOSURE C

SEISMIC:

RISK CATEGORY, R.C. - I
SEISMIC IMPORTANCE FACTOR, $I_e = 1.0$
MAPPED SHORT PERIOD SPECTRAL ACCELERATION, $S_s = 0.167g$
MAPPED ONE SECOND SPECTRAL ACCELERATION, $S_1 = 0.054g$
SITE CLASSIFICATION, D
DESIGN SHORT PERIOD SPECTRAL ACCELERATION, $S_{ds} = 0.178g$
DESIGN ONE SECOND SPECTRAL ACCELERATION, $S_{d1} = 0.086g$
SEISMIC DESIGN CATEGORY, S.D.C. - B
BASIC SEISMIC-FORCE-RESISTING SYSTEM = STEEL ORDINARY CANTILEVERED COLUMN RESPONSE MODIFICATION FACTOR (R) = 1.25
SEISMIC RESPONSE COEFFICIENT, $C_s = 0.11$
ANALYSIS PROCEDURE USED = EQUIVALENT LATERAL FORCE PROCEDURE
PANEL PRESSURE: MAXIMUM ASD FACTORED PANEL PRESSURE UPWARD = 14.1 PSF
MAXIMUM ASD FACTORED PANEL PRESSURE DOWNWARD = -14.7 PSF

B. MANUFACTURER NOTES:

- ALL DIMENSIONS IN mm.
- PV MODULE GAP IS DESIGNED TO 16mm (0.64INCHES) AND SHALL NOT EXCEED 24mm (0.95INCHES) IN EITHER THE HORIZONTAL OR VERTICAL DIRECTION AT INSTALLATION. TABLE SHALL NOT EXCEED MAXIMUM LENGTH AND WIDTH DEFINED ON S-01 TO S-02.
- PV MODULE: 144HC M10 SL / 540W
- PV MODULE DIMENSIONS: 2279x1134x35mm
- ROW SPACING: SEE LAYOUT.
- TRACKER IS DESIGNED TO TYPICALLY OPERATE BETWEEN +/-60° TILT ANGLES WHEN THE WIND SPEED IS LESS THAN 20MPH. IF WIND SPEED IS BETWEEN 20-30MPH OPERATIONAL TILT ANGLES ARE REDUCED TO +/-45° IF WIND SPEEDS ARE EQUAL TO OR GREATER THAN 30MPH THE SYSTEM IS DESIGNED TO STOW AT 0°.
- TRACKER IS DESIGNED TO SUPPORT ICE LOADS AT 0° TILT. IF THERE IS AN ICE STORM EVENT, THE OPERATOR IS RESPONSIBLE TO MANUALLY SET THE TRACKER TO 0° OPERATOR TO VERIFY PANELS ARE CLEAR OF ICE BEFORE RESUMING OPERATION.
- SNOW LOAD ON PANEL IS LIMITED TO 3 INCHES MAXIMUM OF ACCUMULATED SNOW. TRACKER IS DESIGNED TO STOW AT 60° WHERE SNOW EXCEEDS 3 INCHES.
- ELECTRICAL CONTRACTOR RESPONSIBLE FOR WINDING INSULATION PROTECTION AND SUPPORT FOR ALL ELECTRICAL COMPONENTS PER REQUIRED SPECIFICATIONS AND APPLICABLE CODES. ANY MODIFICATION TO RACKING ASSEMBLY MUST BE APPROVED BY POLAR RACKING.
- GROUNDING CLAMPS TO BE INSTALLED PER LATEST SITE-SPECIFIC POLAR RACKING INSTALLATION MANUAL.
- THIS DOCUMENT IS TO BE READ IN CONJUNCTION WITH THE INSTALLATION MANUAL PROVIDED WITH THE PRODUCT.

C. STRUCTURAL STEEL:

GENERAL:

REFER TO CONNECTION DETAIL SHEET FOR BOLTED CONNECTION TORQUES.
ANY FASTENER WITH LOCITE IS FOR SINGLE USE ONLY

COLD FORMED STRUCTURAL STEEL FRAMING:

GENERAL:

COMPONENTS SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND IN ACCORDANCE WITH THE REFERENCED EDITION OF "SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS" BY THE AISI. STEEL FOR COLD FORMED MEMBERS SHALL HAVE A MINIMUM YIELD STRENGTH AS SPECIFIED IN TABLE 1. MINIMUM DELIVERED THICKNESS SHALL BE 95% THE DESIGN THICKNESS SHOWN ON DRAWINGS. STEEL COATING SHALL BE PER TABLE 1.

D. PILE INSTALLATION TOLERANCES:

- TOLERANCES PROVIDED AT TOP OF PILE
- POSITION:
 - EAST/WEST 25mm (0.984INCHES)
 - NORTH/SOUTH 25mm (0.984INCHES)
- VERTICAL POSITION +325mm (12.79INCHES) / -25mm (0.98INCHES) OF NOMINAL HEIGHT
- INSTALLATION ANGLE 1° FROM PLUMB
- GRADE REQUIREMENT PER TABLE: MAXIMUM ALLOWABLE GRADE IS 10% IN NORTH-SOUTH DIRECTION. NOTE THAT A SOLX25 TABLE HAS THREE POSTS AND THE SOLX20 HAS 2 POSTS
- GRADE CHANGE REQUIREMENTS LESS THAN 8% ALLOWABLE GRADE CHANGE IN NORTH-SOUTH DIRECTION BETWEEN TABLES

E. FOUNDATIONS:

DESIGN BY OTHERS, SHOP DRAWINGS SHALL BE SUBMITTED AS A DEFERRED SUBMITTAL. CALCULATIONS SHALL BE SEALED BY A REGISTERED ENGINEER OTHER THAN THE ENGINEER OF RECORD, AND SHALL BE SUBMITTED TO THE ENGINEER OF RECORD AND DETERMINED TO BE IN GENERAL CONFORMANCE WITH THE TRACKER DESIGN, AND SHALL THEN BE SUBMITTED TO THE JURISDICTION FOR REVIEW. FOUNDATIONS SHALL NOT BE INSTALLED UNTIL THEIR DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL.

F. General Notes

- THE STRUCTURAL CONSTRUCTION DOCUMENTS REPRESENT THE FINISHED STRUCTURE, EXCEPT WHERE NOTED, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. THE STRUCTURAL ENGINEER OF RECORD SHALL NOT BE RESPONSIBLE FOR THE CONSTRUCTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES FOR PROCEDURE OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND THE PROGRAMS INCIDENT THERE TO (NOR SHALL OBSERVATION VISITS TO THE SITE INCLUDE INSPECTION OF THESE ITEMS).
- WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE REFERENCED EDITION AND/OR ADDENDA. ANY ENGINEERING DESIGN PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW, SHALL BEAR THE SEAL OF A REGISTERED ENGINEER RECOGNIZED BY THE BUILDING CODE JURISDICTION OF THIS PROJECT.
- NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL STRUCTURAL NOTES AND SPECIFICATIONS, THE GREATER REQUIREMENTS SHALL GOVERN.
- VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE MANUFACTURER DRAWINGS AND FIELD CONDITIONS. IT IS THE MANUFACTURER'S RESPONSIBILITY TO VERIFY AND COORDINATE ALL DIMENSIONS PRIOR TO PROCEEDING WITH THE ANY DISCREPANCIES SHALL BE RESOLVED THROUGH THE MANUFACTURER.
- CONTRACTOR TO CONFIRM WITH PV MODULE INSTALLATION MANUAL FOR DIRECT BOLTING ZONES TO ENSURE THEY ARE FASTENED PER MODULE REQUIREMENTS.
- NO PERSONNEL SHALL STEP OR STAND, KNEEL, SIT, LAY, OR CRAWL ON PV MODULES (SOLAR PANELS) AT ANY TIME. RACKING STRUCTURE AND PV MODULES ARE NOT DESIGNED FOR LIVE LOADS AND MAY VOID WARRANTY.

144HC M10 SL Bifacial Module

HELIONE

144HC M10 SL Bifacial Module
144 Half-Cut Monocrystalline 520W - 540W

21%
Utilizes the latest M10 size super high efficiency Monocrystalline PERC cells, half cut design, further reduces cell to module (CTM) losses.

Hail Resistance
Proven glassback construction is ideal for hail resistance up to 50mm.

Anti-Reflective
Premium solar glass with anti-reflective coating delivers more energy throughout the day.

High Reliability
Proven technology for high temperature and humidity environments.

No Compromise Guarantee
10 Year Product Warranty
25 Year Linear Performance Guarantee

World-class Quality
Established in 2011, Helione is recognized and ISO 9001 certified. The manufacturing of our solar modules and solar power systems is carried out in our own facilities in China, ensuring quality control and consistency.

Local Sales, Service, and Support
Helione has a strong presence in the US and Canada, with a dedicated sales and support team. Helione's commitment to customer service is reflected in our 24-hour technical support and 10-year product warranty.

25% First Year Degradation & 0.5% Annual Power Degradation

Global Expansion
Established in 2011, Helione is recognized and ISO 9001 certified. The manufacturing of our solar modules and solar power systems is carried out in our own facilities in China, ensuring quality control and consistency.

Helione

144HC M10 SL Bifacial Module

Electrical Data (STC)

Parameter	Value
Maximum Power	540W
Maximum Power Voltage	42.1V
Maximum Power Current	12.83A
Open Circuit Voltage	54.7V
Short Circuit Current	13.4A
Module Efficiency	21.2%
Temperature Coefficient of P _{max}	-0.45%/°C
Temperature Coefficient of V _{oc}	-0.33%/°C
Temperature Coefficient of I _{sc}	0.05%/°C

Electrical Data (NMOT)

Parameter	Value
Maximum Power	540W
Maximum Power Voltage	42.1V
Maximum Power Current	12.83A
Open Circuit Voltage	54.7V
Short Circuit Current	13.4A
Module Efficiency	21.2%
Temperature Coefficient of P _{max}	-0.45%/°C
Temperature Coefficient of V _{oc}	-0.33%/°C
Temperature Coefficient of I _{sc}	0.05%/°C

Mechanical Data

Parameter	Value
Module Dimensions	2279 x 1134 x 35mm
Weight	18.5kg
Frame	Aluminum
Backsheet	ETFE
Front Glass	3.2mm
Interconnectors	MC4

Temperature Ratings

Parameter	Value
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +125°C
Maximum Ambient Temperature	55°C

Warranty

Parameter	Value
Product Warranty	10 Years
Performance Warranty	25 Years



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SHEET 1 OF 1

REV: B

ARRAY INFORMATION

RACK TYPE	TRACKER
TILT ANGLE	-60° to +60°
MODULE TYPE	144HC M10 SL / 540W
MODULE DIMS.	2279 x 1134 x 35mm
MODULE QTY.	6960
SYSTEM SIZE (DC)	3.7584 MW DC
PAPER SIZE	D

8	ISSUED FOR REVIEW	15/JAN/2025
A	ISSUED FOR REVIEW	06/JAN/2025
REV#	DESCRIPTION	DATE

REVISIONS		
ENGINEERING SEAL		

PROJECT NAME:
Greenskies Clean Energy LLC
15866 Winchester, CT (Spencer Hill)

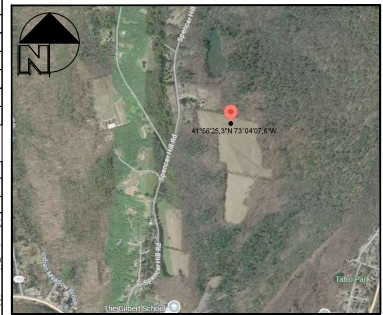
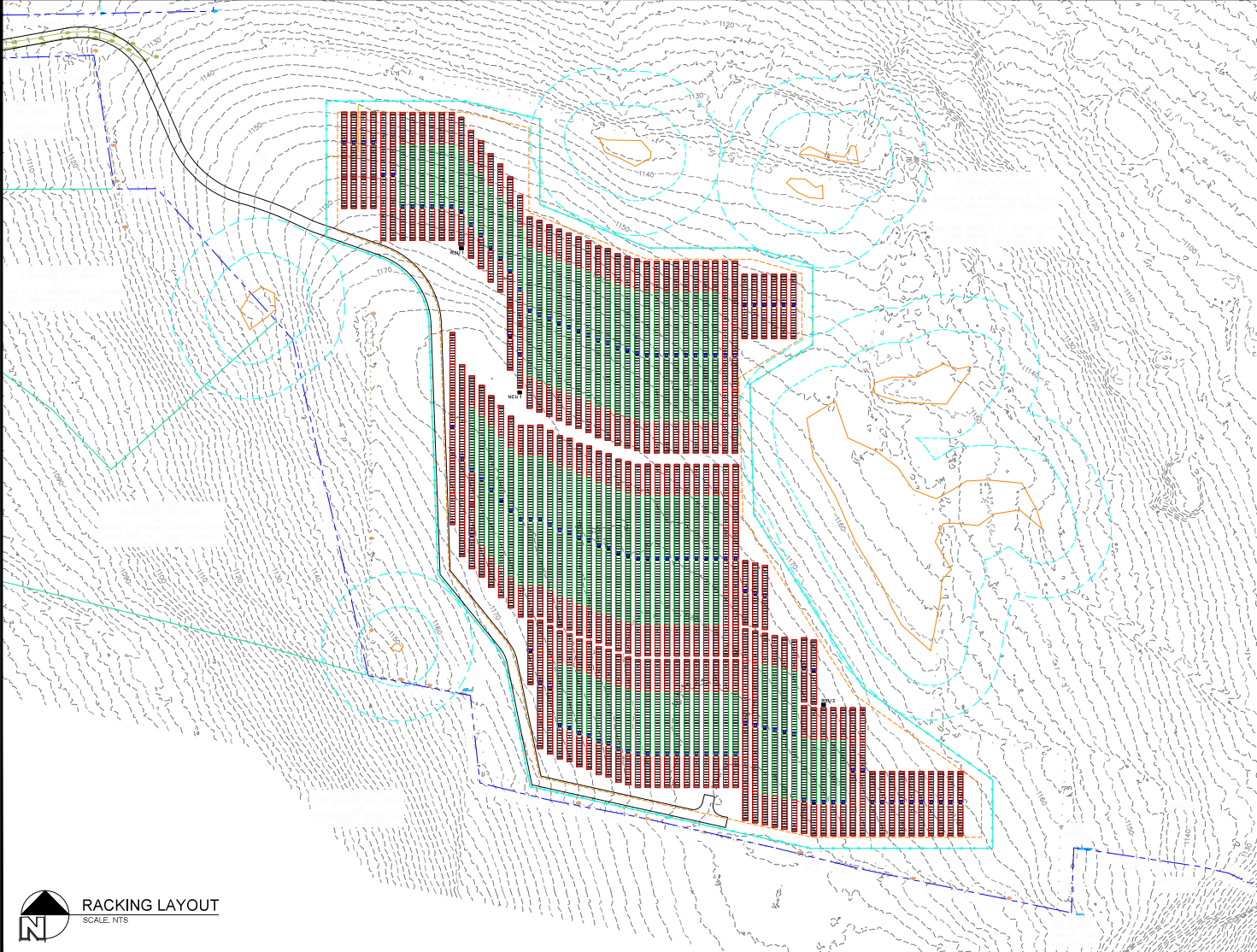
TITLE:
GENERAL NOTES

PROJ. NO.:	DWG. BY:	CHECKED BY:	SCALE:
007140	AK	MG	1:12
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ASSEMBLY NUMBER:	-		

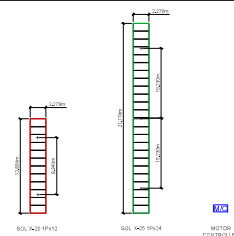
USER: ASHOK KUMAR
PRINT DATE: January 28, 2025
FILENAME: 007140 - GREENSKIES CLEAN ENERGY - 15866 WINCHESTER, CT SPENCER HILL - REV 09 - JFC.DWG

PICTURE		STRUCTURE TYPE	DIMENSION	MODULE/STRUCTURE	QUANTITY	DRIVESHAFTS /BLOCK	COUPLERS /BLOCK	FILES/STRUCTURE	TOTAL FILES	CONTROLS-MOTOR	TOTAL CONTROLS-MOTOR	TABLE BREAKDOWN
		EXTERIOR 12 (Hill)	(13804xmm) x (2279mm)	12	4	3	2	2	8	0	0	12E
		EXTERIOR 24	(28283xmm) x (2279mm)	24	29	5	4	4	116	1	29	12E-12E
		EXTERIOR 48	(56376xmm) x (2279mm)	48	6	9	8	8	48	1	6	12E-12-12-12E
		EXTERIOR 72	(84471xmm) x (2279mm)	72	8	13	12	12	96	1	8	12E-12-12-12-12-12E
		INTERIOR 48	(56311xmm) x (2279mm)	48	38	9	8	7	266	1	38	12E-24-12E
		INTERIOR 72	(84347xmm) x (2279mm)	72	49	13	12	10	490	1	49	12E-24-24-12E
TABLE TYPE		# OF TABLE	TOTAL OF MODULES	# OF FILES								
SOL X-20 1Px12		308	3696	616								
SOL X-25 1Px24		136	3264	408								
TOTAL		444	6960	1024								
MOTOR/CONTROLLER		130										

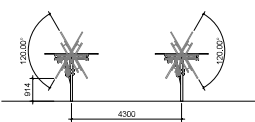
DESCRIPTION	QTY.
NCU (NETWORK CONTROL UNIT)	1
RSU (REMOTE SENSING UNIT)	2



SITE LOCATION



DETAIL - TABLES TOP VIEW
SCALE NTS



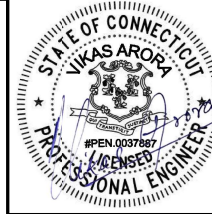
DETAIL 2 - ROW SPACING (Preliminary)
SCALE 1:100



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ARRAY INFORMATION

PROPOSED DC SIZE	3,7584 MW DC
RACKING MANUFACTURER	SOLIX SINGLE AXIS TRACKER
TILT ANGLE	-90° TO +90°
MODULE CONFIGURATION	1 PORT/TRAJ
PANEL TYPE	144HC M10 SL 540W
PANEL DIMS.	2279x1134x35 mm
PANEL QTY.	6960
STRING SIZE	24
ROW SPACING (Post to Post)	4.30m

9	ISSUED FOR CONSTRUCTION	28/JAN/25
8	ISSUED FOR CONSTRUCTION	27/JAN/25
7	ISSUED FOR REVIEW	24/JAN/25
6	ISSUED FOR REVIEW	20/JAN/25
5	ISSUED FOR REVIEW	09/JAN/25
4	ISSUED FOR REVIEW	07/JAN/25
3	ISSUED FOR REVIEW	07/JAN/25
2	ISSUED FOR REVIEW	30/DEC/24
1	ISSUED FOR REVIEW	27/DEC/24
0	ISSUED FOR REVIEW	24/DEC/24

REV NO.	ISSUANCE	DATE
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PROJECT NAME:

Greenskies Clean Energy LLC
15866 Winchester, CT (Spencer Hill)

DRAWING NAME:

RACKING LAYOUT & DETAILS

PROJ. NO:	DWG. BY:	CHKD. BY:	APPR. BY:
007140	AV	M3	
DRAWING NUMBER:			L-01

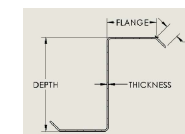
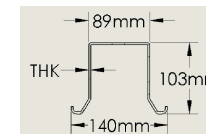




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PART	PROFILE (mm) Depth x Flange x Lip	MIN. THICKNESS (mm)	MATERIAL Fy (ksi)
PURLIN	140 x 75 x 20	1.95	70
PIVOT ARM	88.5 x 102.64	3.1	70

* FOR POST SPECIFICATIONS, REFER TO FOUNDATION DRAWINGS AND DETAILS. PILE DESIGN IS DONE BY OTHERS

MAIN COMPONENTS BILL OF MATERIALS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	900595001	Actuator, Assembly, X20/X25	2
2	900593001	Spherical Eye Bearing, Assembly, 38.1 mm Bearing Dia, 12.75 mm ID	2
3	40002600X	144HC M10 SL / 540W, 22729/1134x35mm (NOT A POLAR SUPPLY)	12
4	400036001	Grounding Strap, AK Stamping, 6 AWG, 5/16" Terminal, 24", A225-124	1
5	X301268001	Beam, U-Channel, 1440 mm, 1.5 mm THK, G90, 1400 mm PV Pitch	2
6	X30128400X	Ground Screw, 3.5" OD, XX mm L, XX mm L Helix, XX mm Vail, 50ksi YS, HDG	2
7	X301218001	L Angle, 1300 mm, 1.5 mm THK, G90, 1400 mm PV Pitch	5
8	X301129001	Beam, Omega, 1440 mm, 1.5 mm THK, G90, 1400 mm PV Pitch	2
9	X300744001	Purlin, 2140x75x20, 1380 mm, 1.95 mm THK, 70 ksi, G90, X242, 1134 mm PV Width	2
10	300610007	Pivot Arm, 1177 mm, 1.1 mm THK, 70 ksi, G90	2
11	301613000	Pin, Actuator, Hex Head w/ Relief, 9.73mm OD, 44.45mm L, 5/16"-18 x 1/2", CL 10.9, Zn-III, 3M 3353	4
12	300678001	Pin, Pivot Arm, Hex Head, 12.63mm OD, 95.25mm L, M10-1.5 x 16mm, CL 12.9, Zn-III, 3M 3353	2
13	300676001	Ranged Bushing, Actuator Side, 12.75mm ID, 21.5mm OD, 11.5mm L, 30mm FLG OD, 3mm FLG THK, Zn-Fe	4
14	300675001	Ranged Bushing, Pivot Bracket, 12.75mm ID, 19.5mm OD, 28.23mm L, 30mm FLG OD, 3mm FLG THK, Zn-Fe	4
15	300674001	Bracket, Pivot, Tall, 4 mm THK, HDG	2
16	300670001	Bracket, Actuator, 4.77 mm THK, HDG	2
17	300669001	Bracket, Lower Pile, 3.1 mm THK, HDG	2
18	300668002	Bracket, U-Clamp, 3.5" OD Post, 4 mm THK, HDG	2
19	300667001	Housing Flange, Spherical Eye Bearing, 38.1 mm Bearing Dia, 3.1 mm THK, HDG	4
20	300632001	Bushing, Actuator Bracket, 9.75 mm ID, 22.4 mm OD, 15.75 mm Minor Dia, 25.5 mm L, Bronze	2
21	200320100	Spacer, 8.875 mm QS Driveshaft, 16 mm ID, 19.05 mm OD, 10 mm L, 6063-T6	2
22	200319100	Retainer, 8.875 mm QS Driveshaft, 25.4 mm L, 6063-T6	2

HARDWARE BILL OF MATERIALS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
23	100115001	Bolt, Carriage, Short Neck, M6*-1.25 x 25 mm, Class 8.8, Magni 565	42
24	100113001	U-Bolt, M10-1.5 x 3-5/8"-1-3/4" Thread Length, Class 8.8, Magni 565	4
25	100104001	Washer, Split Lock, M8, Magni 565	12
26	100103001	Washer, External Tooth Lock, M8, 18-8 SS	48
27	100110010	Nut, Hex Flange w/ Nylon Insert, Serrated, M8*-1.25, Class 8, Magni 565	90
28	100100008	Bolt, Hex Flange, Serrated, M8*-1.25 x 22 mm, Class 8.8, Magni 565	48
29	100100006	Bolt, Hex Flange, Serrated, M6*-1.0 x 35 mm, Class 8.8, Magni 565	2
30	100100004	Bolt, Hex Flange, Serrated, M6*-1.0 x 16 mm, Class 8.8, Magni 565	2
31	100100001	Bolt, Hex Flange, Serrated, M6*-1.5 x 30 mm, Class 8.8, Magni 565	28
32	100099002	Nut, Hex Flange, Serrated, M6*-1.0, Class 8, Magni 565	40
33	100099001	Nut, Hex Flange, Serrated, M10*-1.5, Class 8, Magni 565	4

		UNFACTORED LOADS							FACTORED	
LOCATION	LOAD	DEAD LOAD	SNOW LOAD	ICE LOAD	WIND LOAD	SEISMIC LOAD	WIND ON ICE	WIND W/ SNOW	MAX ASD LOAD	LOAD COMBO
X20 - 12 MODULE TABLE	VERTICAL DOWN, P (kips)	0.65	0.81	1.02	3.44	0.03	0.37	1.62	2.72	D + 0.6W
	VERTICAL UP, T (kips)	0	0	0	-3.75	-0.03	-0.44	-1.92	1.86	0.6D + 0.6W [2]
	HORIZONTAL, V (kips)	0	0	0	0.23	0.09	0.02	0.23	0.14	D + 0.6W 0.6D + 0.6W [2]
	MOMENT, M (kips.ft)	0	0	0	6.68	0.61	1.26	4.15	4.01	D + 0.6W 0.6D + 0.6W [2]

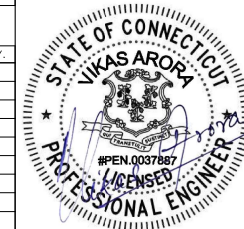
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ARRAY INFORMATION

RACK TYPE	TRACKER
ARRAY SIZE	X12
TILT ANGLE	+60° TO -60°
MODULE TYPE	144HC M10 SL / 540W
MODULE DIMS.	2279x1134x35mm
SYSTEM SIZE (DC)	3.7584 MW
SYSTEM SIZE (AC)	- KW AC
MODULE QTY.	6960

PAPER SIZE	D
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Customer's Approval and Signature:



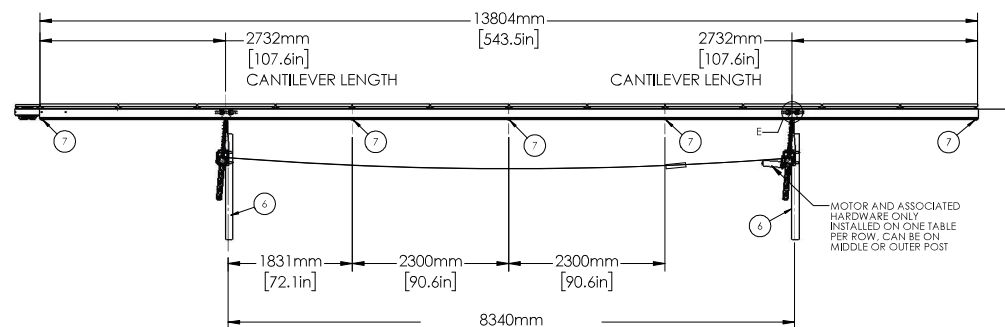
PROJECT NAME:

TITLE: RACKING ASSEMBLY DETAILS,
SOLY20 - 12 MODULES RED TABLE

PROJ. NO.:	DWG. BY:	CHECKED. BY:	SCA
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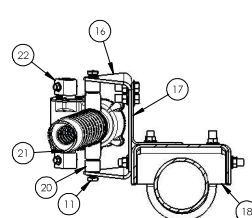
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DRAWING NUMBER:	S-01
ASSEMBLY NUMBER:	X901033001



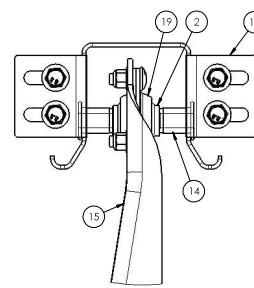
POST TO POST SPACING

EAST ELEVATION

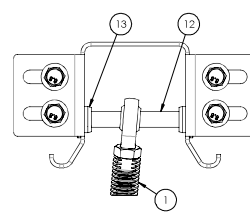


SECTION D-

SCALE 1:4



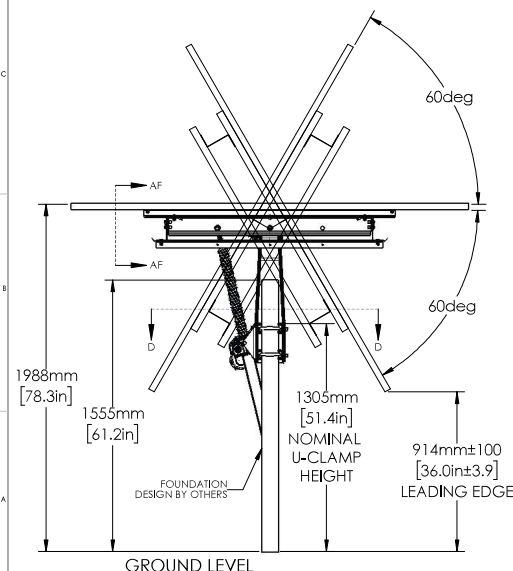
DETAIL E
SCALE 1 : 2



SECTION AF-AF

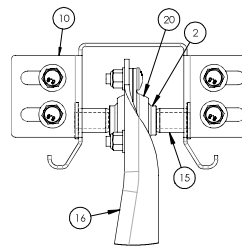
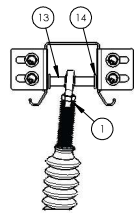
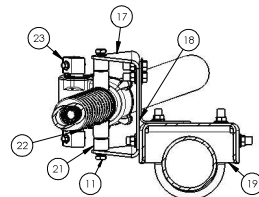
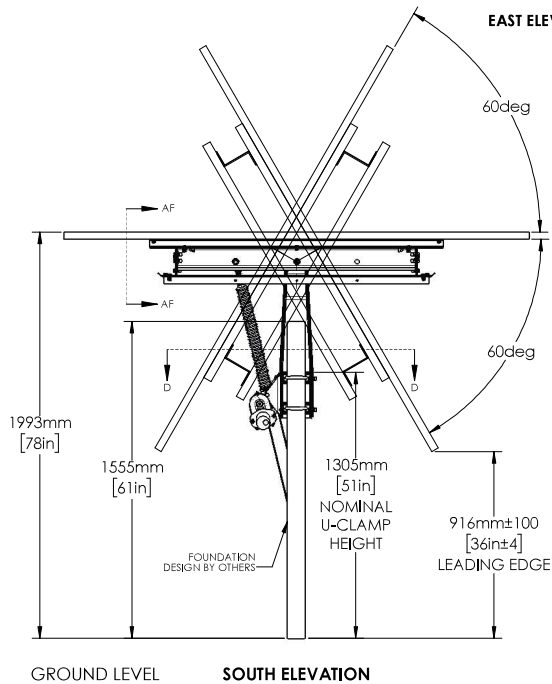
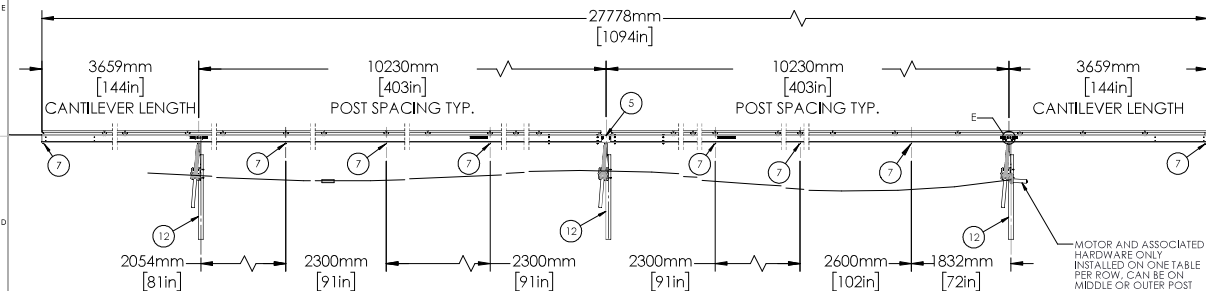
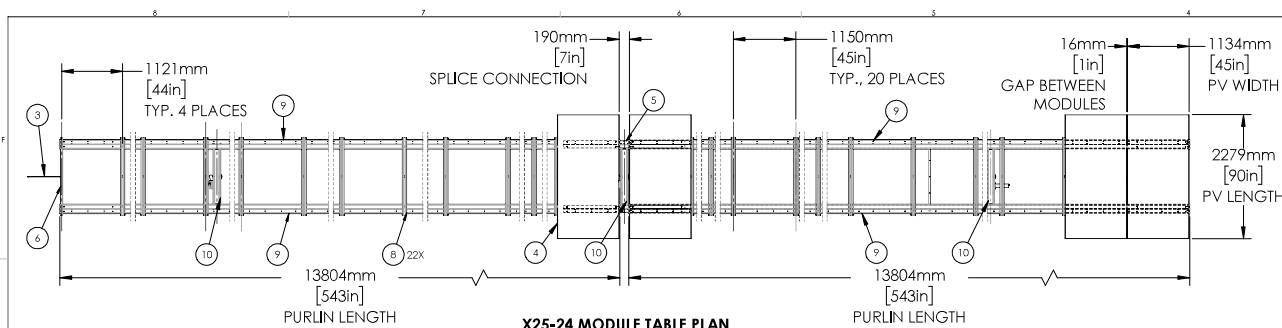
SCALE 1:2

FOR DIRECT BOLTING REQUIREMENTS
REFER TO GENERAL NOTES 5
(DRAWING NUMBER G-01)



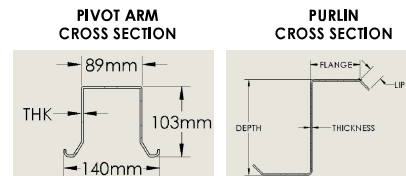
SOUTH ELEVATION

FOR DIRECT BOLTING REQUIREMENTS
REFER TO GENERAL NOTES 5
(DRAWING NUMBER G-01)



FOR DIRECT BOLTING REQUIREMENTS,
REFER TO GENERAL NOTES 5
(DRAWING NUMBER G-01)

REV.	DATE	DESCRIPTION	ECO	SIGNATURE
A	06/JAN/2023	INITIAL RELEASE	N/A	MM
B	13/JAN/2023	TOLERANCE AND FASTENER COMBOS UPDATED	N/A	MG



PART	PROFILE (mm) Depth x Flange x Lip	MIN. THICKNESS (mm)	MATERIAL Fy (ksi)
PURLIN	140 x 75 x 20	2.15	70
PIVOT ARM	88.5 x 102.64	2.7	70
SPLICE	142.2X66/72	4.2	70

* FOR POST SPECIFICATIONS, REFER TO FOUNDATION DRAWINGS AND DETAILS. PILE DESIGN IS DONE BY OTHERS.

MAIN COMPONENTS BILL OF MATERIALS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	900595001	Actuator, Assembly, X20/X25	3
2	900593001	Spherical Eye Bearing, Assembly, 38.1 mm Bearing DIA, 12.75 mm ID	3
3	400039001	Grounding Strap, AK Stamping, 6 AWG, 5/16" Terminals, 24", A2251-24	1
4	400026XXXX	144HC M10 SL / 540W, 2279x1134x35mm (NOT A POLAR SUPPLY)	24
5	X301558001	Splice, Purlin, 2142.2x66/72, 2322 mm, 4.2 mm THK, 70 ksi, HDG, X25	2
6	X301268001	Beam, U-Channel, 1440 mm, 1.5 mm THK, G90, 1400 mm PV Pitch	4
7	X301218001	L Angle, 1300 mm, 1.5 mm THK, G90, 1400 mm PV Pitch	8
8	X301129001	Beam, Omega, 1440 mm, 1.5 mm THK, G90, 1400 mm PV Pitch	22
9	X300662001	Purlin, 2140x75x20, 13804 mm, 2.15 mm THK, 70 ksi, G90, X25-24, 1134 mm PV Width	4
10	X300661009	Pivot Arm, 1177 mm, 2.7 mm THK, 70 ksi, G90	3
11	301613001	Pin, Actuator, Hex Head w/ Relief, 9.73mm OD, 44.45mm L, 5/16"-18 x 1/2", CL 10.9, Zn-Ni, 3M 2353	6
12	30128400X	Ground Screw, 3.5" OD, XX mm L, XX mm L Helix, XX mm Wall, 50ksi YS, HDG	3
13	300678001	Pin, Pivot Arm, Hex Head, 12.63mm OD, 95.25mm L, M10-1.5 x 1.6mm, CL 12.9, Zn-Ni, 3M 2353	6
14	300676001	Flanged Bushing, Actuator Side, 12.75mm ID, 21.5mm OD, 11.5mm L, 30mm FLG OD, 3mm FLG THK, Zn-Fe	6
15	300675001	Flanged Bushing, Pivot Bracket, 12.75mm ID, 19.5mm OD, 28.23mm L, 30mm FLG OD, 3mm FLG THK, Zn-Fe	6
16	300674001	Bracket, Pivot, Tall, 4 mm THK, HDG	3
17	300670001	Bracket, Actuator, 4.77 mm THK, HDG	3
18	300669001	Bracket, Lower Pile, 3.1 mm THK, HDG	3
19	300668002	Bracket, U-Clamp, 3.5" OD Post, 4 mm THK, HDG	6
20	300667001	Housing Flange, Spherical Eye Bearing, 38.1 mm Bearing DIA, 3.1 mm THK, HDG	6
21	200322001	Bushing, Actuator Bracket, 9.75 mm ID, 22.4 mm OD, 15.75 mm Minor DIA, 25.5 mm L, Bronze	6
22	200321001	Spacer, 8.875 mm SQ Driveshaft, 16 mm ID, 19.05 mm OD, 10 mm L, 6063-T6	2
23	200319001	Retainer, 8.875 mm SQ Driveshaft, 25.4 mm L, 6063-T6	2

HARDWARE BILL OF MATERIALS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
24	100115001	Bolt, Carriage, Short Neck, M8-1.25 x 25 mm, Class 8.8, Magni 565	77
25	100113001	U-Bolt, M10-1.5 x 3-5/8" x 5-3/8", 1-3/4" Thread Length, Class 8.8, Magni 565	6
26	100104001	Washer, Split Lock, M8, Magni 565	96
27	100103001	Washer, External Tooth Lock, M8, 18-8 SS	24
28	100101001	Nut, Hex Flange w/ Nylon Insert, Serrated, M8-1.25, Class 8, Magni 565	173
29	100100008	Bolt, Hex Flange, Serrated, M8-1.25 x 22 mm, Class 8.8, Magni 565	96
30	100100006	Bolt, Hex Flange, Serrated, M6-1.0 x 35 mm, Class 8.8, Magni 565	2
31	100100004	Bolt, Hex Flange, Serrated, M6-1.0 x 16 mm, Class 8.8, Magni 565	2
32	100100001	Bolt, Hex Flange, Serrated, M10-1.5 x 30 mm, Class 8.8, Magni 565	74
33	100099002	Nut, Hex Flange, Serrated, M6-1.0, Class 8, Magni 565	4
34	100099001	Nut, Hex Flange, Serrated, M10-1.5, Class 8, Magni 565	92

LOCATION	LOAD	UNFACTORED LOADS					FACTORED		
		DEAD LOAD	SNOW LOAD	ICE LOAD	WIND LOAD	SEISMIC LOAD	WIND ON ICE	WIND W/ SNOW	MAX ASD LOAD
X25 - 24 MODULE TABLE	VERTICAL DOWN, P (kips)	0.88	1.20	1.52	2.55	0.04	0.56	1.22	2.41
	VERTICAL UP, T (kips)	0	0	0	-2.98	-0.04	-0.66	-1.64	1.26
	HORIZONTAL, V (kips)	0	0	0	0.16	0.11	0.03	0.12	0.09
	MOMENT, M (kips-ft)	0	0	0	5.46	0.68	1.21	3.68	3.28



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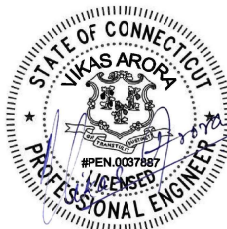
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ARRAY INFORMATION

RACK TYPE	TRACKER
ARRAY SIZE	X24
TILT ANGLE	+60° TO -60°
MODULE TYPE	144HC M10 SL / 540W
MODULE DIMS.	2279x1134x35mm
SYSTEM SIZE (DC)	3.7584 MW
SYSTEM SIZE (AC)	- KW AC
MODULE QTY.	6960

PAPER SIZE D

Customer's Approval and Signature:



PROJECT NAME:
Greenskies Clean Energy LLC
15866 Winchester, CT (Spencer Hill)

TITLE:
RACKING ASSEMBLY DETAILS,
SOLX25 - 24 MODULES GREEN TABLE

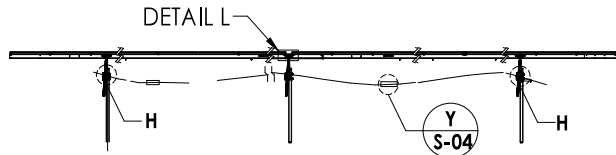
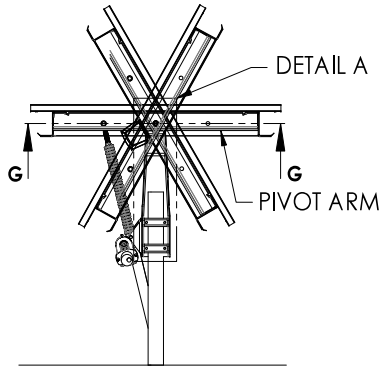
PROJ NO.: 007140 DWG BY: Kalyan Gali CHECKED BY: MG SCALE: NTS

DRAWING NUMBER: S-02

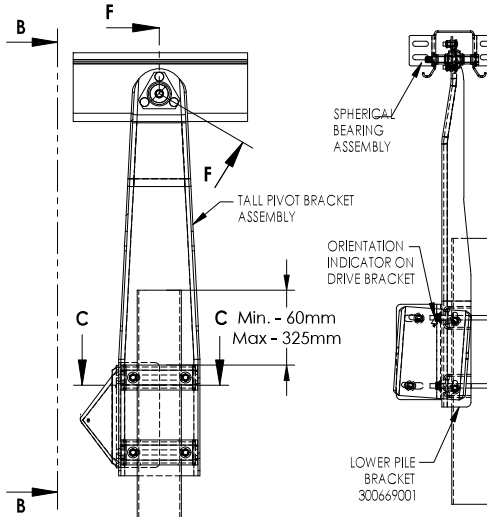
ASSEMBLY NUMBER: X901034001

FASTENERS TORQUE

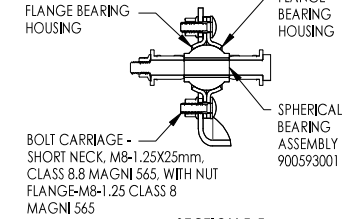
FASTENER SIZE	TIGHTENING TORQUE	
	N-m	ft-lb
M10x1.5, Class 8	51 +/- 4	37.6 +/- 3
M8x1.5, Class 8	26 +/- 2	19.2 +/- 2
M6x1.0, Class 8	11 +/- 1	8.1 +/- 1
3 / 8 Actuator Pin	28 +/- 3	21 +/- 3



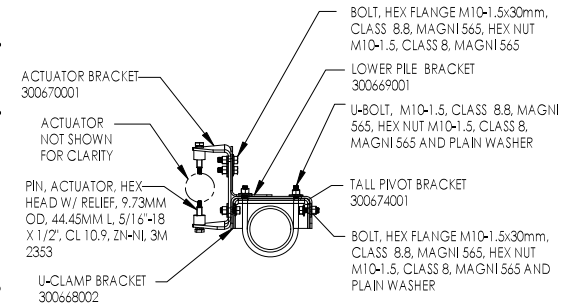
DETAIL A: U-CLAMP TO PILE ADAPTER CONNECTION



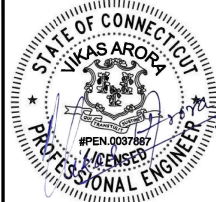
SECTION B-B



SECTION F-F



SECTION C-C



ARRAY INFORMATION

BACK TYPE	TRACKER
TLT ANGLE	-60° to +60°
MODULE TYPE	144HC M10 SL / 540W
MODULE DIMS.	2279x1343mm
MODULE QTY./TABLE	6980
SYSTEM SIZE (DC)	5,7584 MW
PAPER SIZE	D

REV NO.	ISSUANCE	DATE
B	ISSUED FOR REVIEW	15-JAN-25
A	ISSUED FOR REVIEW	06-JAN-25

PROJECT NAME:
Greenskies Clean Energy LLC
15866 Winchester, CT (Spencer Hill)

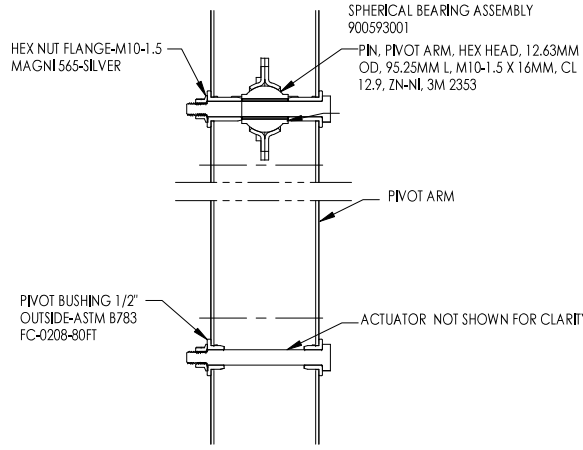
TITLE:
CONNECTION SECTIONS
& DETAILS - I

PROJ. NO.:	DWG. BY:	CHECKED BY:	SCALE:
007140	GK	MG	NTS

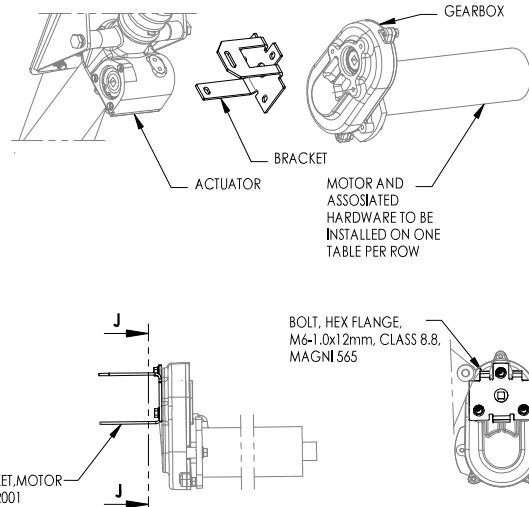
DRAWING NUMBER:
S-03

ASSEMBLY NUMBER:
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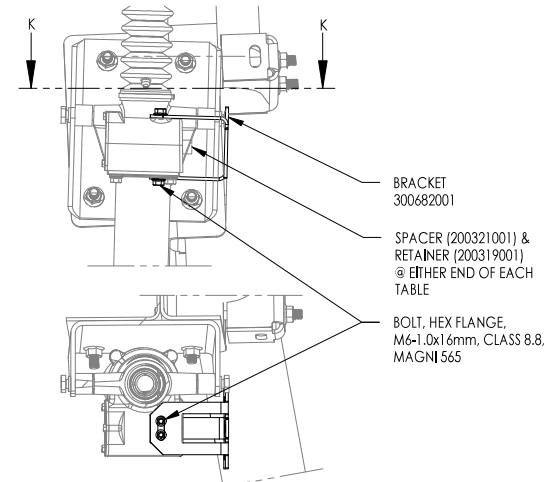
DETAIL G: SHOULDER BOLT TO PIVOT ARM CONNECTION



DETAIL H: ACTUATOR TO GEARBOX FIXING CONNECTION DETAIL

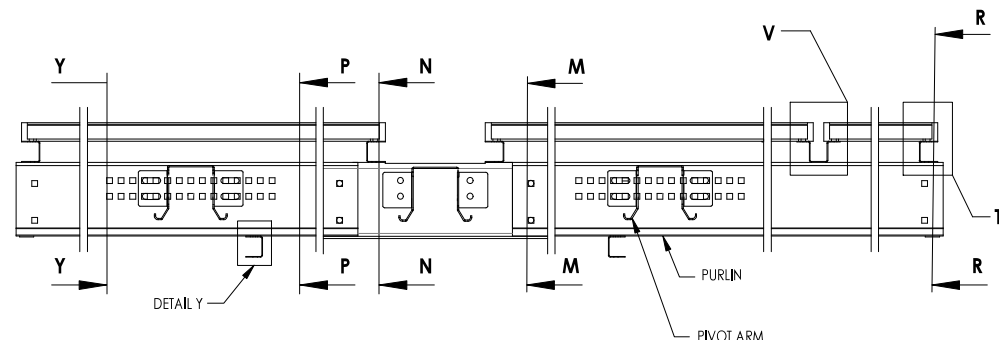


SECTION J-J

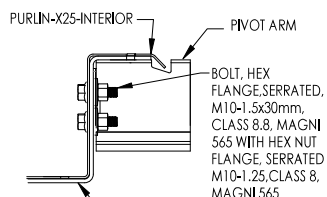


SECTION K-K

DETAIL L: PURLIN AND SPLICE BRACKET TO PIVOT ARM (FOR VIEW PURPOSE SHOWN SOLX25)

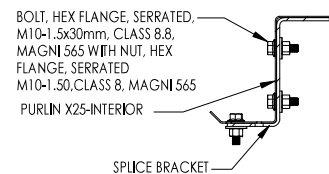


SECTION M: PIVOT ARM TO SPLICE



SECTION M-M (ONLY FOR SOLX25)

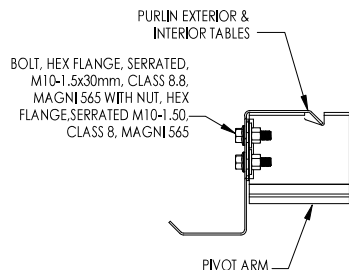
SECTION N: SPLICE TO PURLIN



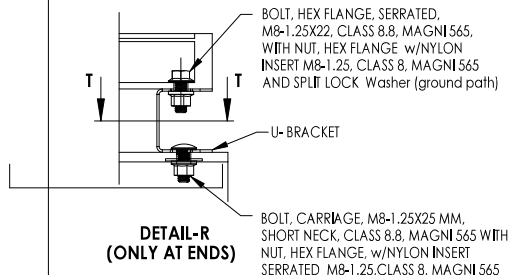
NOTE: ONLY FOR SOLX25 TABLE

SECTION N-N (ONLY FOR SOLX25)

SECTION P: PURLINS TO PIVOT ARM

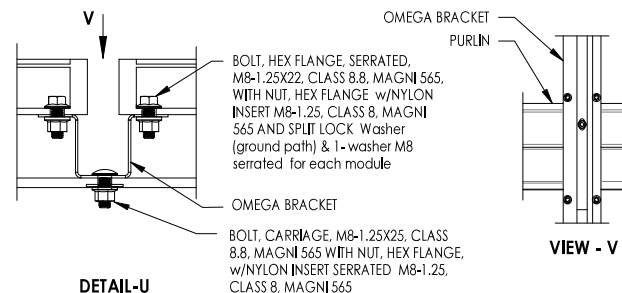


DETAIL R: MODULE TO PURLIN CONNECTION (THRU U-BRACKET)

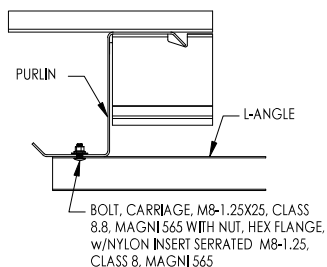


SECTION T-T

DETAIL U: MODULE TO PURLIN CONNECTION (THRU OMEGA BRACKET)

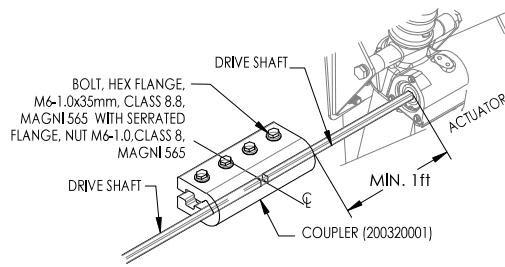


SECTION W: PURLINS BRACE CONNECTION



SECTION W-W

DETAIL Y: DRIVE SHAFT AND COUPLER CONNECTION



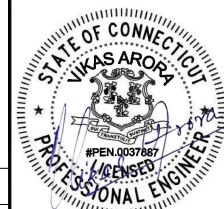
NOTE:
COUPLER CAN BE AT ANY DISTANCE AWAY FROM ACTUATOR
(MIN. 1FT AWAY FROM ACTUATOR)



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ARRAY INFORMATION

PACK TYPE	TRACKER
TILT ANGLE	-90° to +90°
MODULE TYPE	144HC M10 SL / 540W
MODULE DIMS.	2279x1134x35mm
MODULE QTY./TABLE	6060
SYSTEM SIZE (DC)	3.7584 MW
PAPER SIZE	D

REV NO.	REVISION	DATE
B	ISSUED FOR REVIEW	15-JAN-25
A	ISSUED FOR REVIEW	08-JAN-25

PROJECT NAME:
Greenskies Clean Energy LLC
15866 Winchester, CT (Spencer Hill)

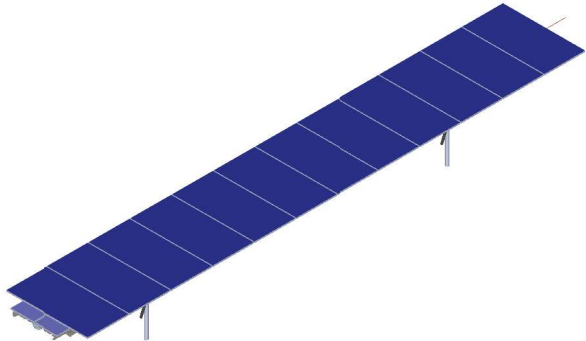
TITLE:
CONNECTION SECTIONS &
DETAILS - 2

PROJ. NO.:	DWG. BY:	CHECKED BY:	SCALE:
007140	GL	MG	NTS

DRAWING NUMBER:
S-04

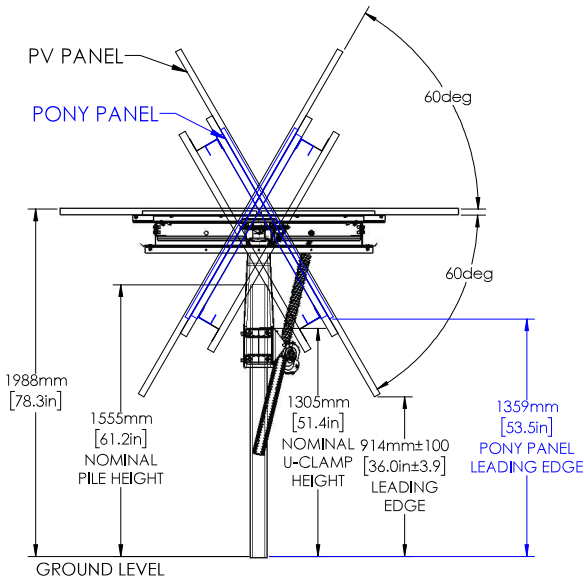
ASSEMBLY NUMBER:
-

PONY PANEL CONNECTION DETAIL:



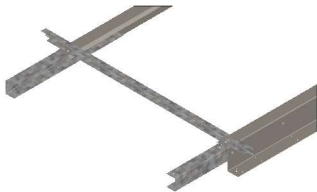
ISOMETRIC VIEW
SCALE 1:48

- GENERAL NOTES:**
1. REFER TO LAYOUT FOR PONY PANEL INSTALLATION LOCATION.
 2. FIELD DRILL TO BE DONE ON Z-PURLIN WEB(TO ALIGN WITH C-CHANNEL)



SOUTH ELEVATION

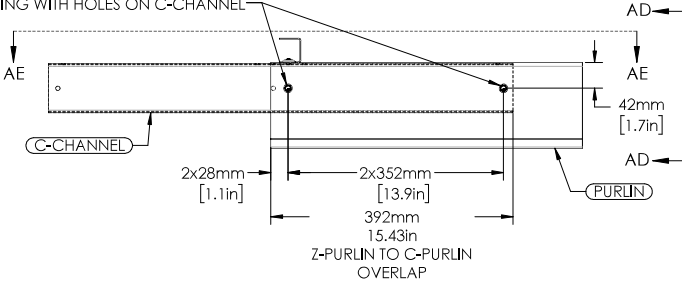
C-CHANNEL TO Z-PURLIN & U-CHANNEL



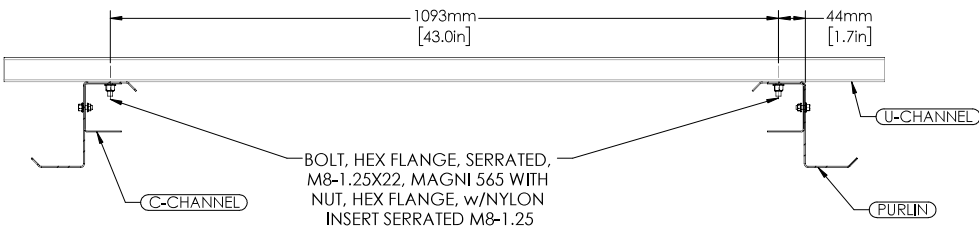
ISOMETRIC VIEW
SCALE 1:12

BOLT, HEX FLANGE, SERRATED, M6-1.0x16mm
WITH NUT, HEX FLANGE, w/NYLON INSERT
SERRATED, M6-1.0, CLASS 8.8, MAGNI 565

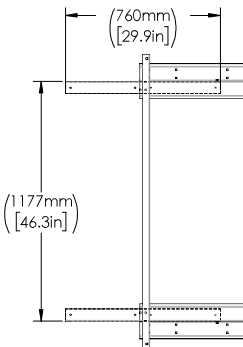
FIELD DRILL HOLES ON BOTH PURLINS
MATCHING WITH HOLES ON C-CHANNEL



FRONT VIEW
SCALE 1:4



SECTION AD-AD
SCALE 1 : 4



SECTION AE-AE
SCALE 1 : 12

REV.	DATE	DESCRIPTION	CHECKED BY
A	16/JAN/2025	INITIAL RELEASE	MG



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REV: **A**

ARRAY INFORMATION

RACK TYPE	TRACKER
MODULE QTY.	6960
TILT ANGLE	+60° TO -60°
MODULE TYPE	144HC M10 SL / 540W
MODULE DIMS.	2279x1134x35mm
SYSTEM SIZE (DC)	3.7584 MW
SYSTEM SIZE (AC)	
PAPER SIZE	D

Customer's Approval and
Signature:



PROJECT NAME:
GREENSKIES CLEAN ENERGY - LLC
15866 WINCHESTER CT - SPENCER HILL

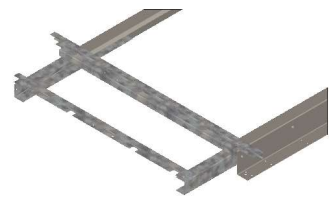
TITLE: PONY PANEL CONNECTION
SECTIONS & DETAILS - 3

PROJ. NO.	DWG. BY	CHECKED BY	SCALE
007140	Kalyan Gali	MG	NTS

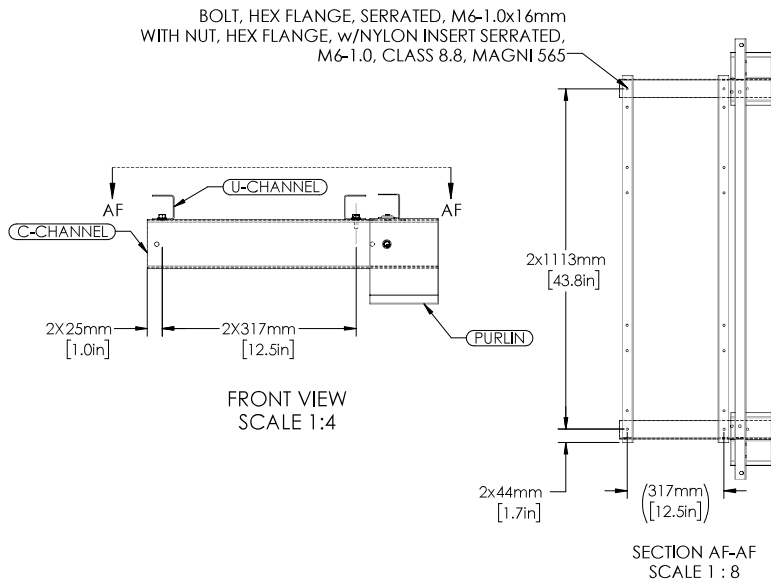
DRAWING NUMBER: S-05

ASSEMBLY NUMBER:

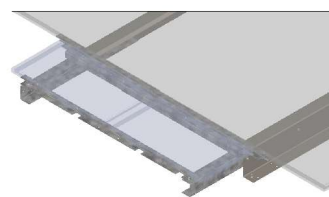
U-CHANNEL TO C-CHANNEL



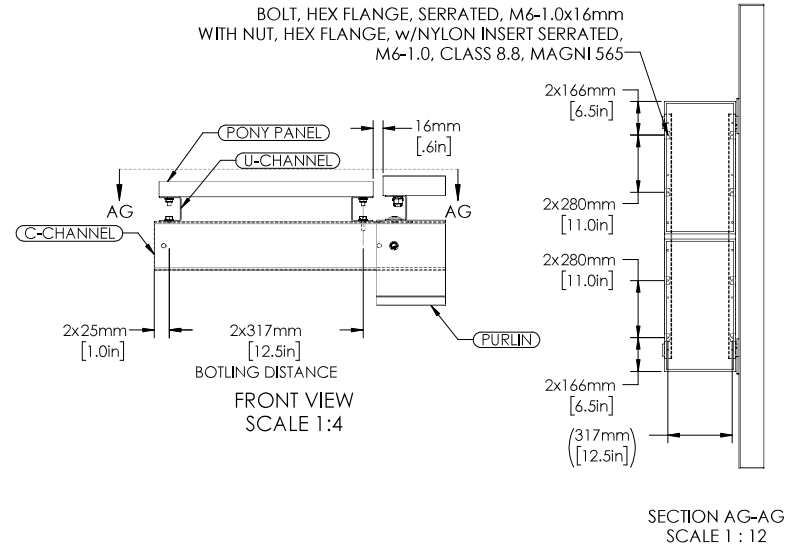
ISOMETRIC VIEW
SCALE 1:12



U-CHANNEL TO PONY PANEL

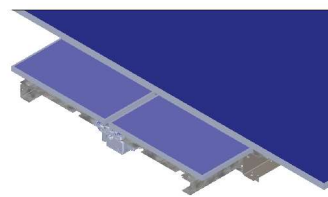


ISOMETRIC VIEW
SCALE 1:12

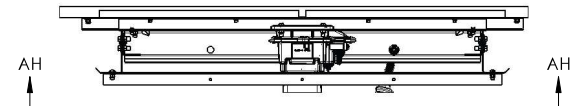


CONTROLLER TO PONY PANEL'S
U-CHANNEL

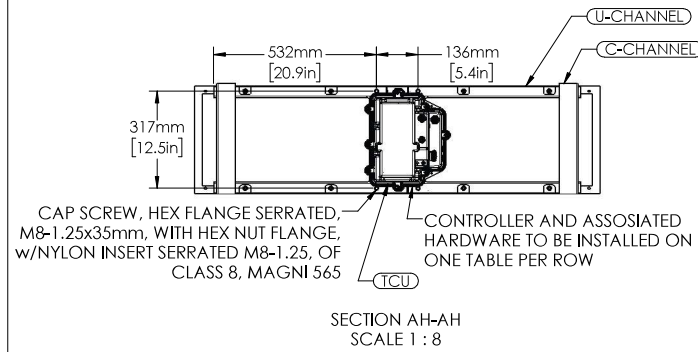
REV.	DATE	DESCRIPTION	CHECKED BY
A	16/JAN/2025	INITIAL RELEASE	MG



ISOMETRIC VIEW
SCALE 1:12



SIDE VIEW
SCALE 1:8



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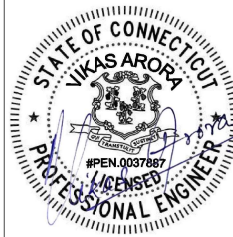
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REV: **A**

ARRAY INFORMATION	
RACK TYPE	TRACKER
MODULE QTY.	6960
TILT ANGLE	+60° TO -60°
MODULE TYPE	144HC M10 SL / 540W
MODULE DIMS.	2279x1134x35mm
SYSTEM SIZE (DC)	3.7584 MW
SYSTEM SIZE (AC)	
PAPER SIZE	D

Customer's Approval and Signature:



PROJECT NAME:			
GREENSKIES CLEAN ENERGY - LLC 15866 WINCHESTER CT - SPENCER HILL			
TITLE: PONY PANEL CONNECTION SECTIONS & DETAILS - 4			
PROJ. NO.: 007140	DWG. BY: Kalyan Gali	CHECKED BY: MG	SCALE: NTS
DRAWING NUMBER:		S-06	
ASSEMBLY NUMBER:			

MASTER BILL OF MATERAILS

REVISIONS				
REV.	DATE	DESCRIPTION	ECO	SIGNATURE
A	15/JAN/2025	INITIAL RELEASE	N/A	MG
B	30/JAN/2025	Ext Row-17 Added	N/A	MG



6889 Beechwood Road, Unit 5, Middletown, OH 44130
TEL: (414) 860-6722 FAX: 414-860-6719
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127 Washington Avenue, West Building, Lower Level,
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TEL: +1 860-396-5408
info@greenskies.com

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REV: **B**

ARRAY INFORMATION

RACK TYPE	TRACKER
ARRAY SIZE	-
TILT ANGLE	+60° TO -60°
MODULE TYPE	144HC M10 SL / 540W
MODULE DIMS.	2279x1134x35mm
SYSTEM SIZE (DC)	3.7584 MW
SYSTEM SIZE (AC)	- KW AC
MODULE QTY.	6960
PAPER SIZE	D

Customer's Approval and Signature:



PROJECT NAME:
Greenskies Clean Energy LLC
15866 Winchester, CT (Spencer Hill)

TITLE: MASTER BOM

PROJ. NO.: 007140	DWG. BY: Ashok Kumar	CHECKED BY: MG	SCALE: NTS
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DRAWING NUMBER: S-07

ASSEMBLY NUMBER: -

	POLAR PART NUMBER	POLAR DESCRIPTION	X900856001	X900857001	X900858001	X900859001	X900860001	X900861001	Layout Specific Quantity
			Ext Row - 12(Half)	Ext Row - 24	Ext Row - 48	Ext Row - 72	Int Row - 48	Int Row - 72	
ROWS QTY			4	29	6	8	38	49	
TABLE	X9008550C1	Tracker table, X20, 1x12, Red, Portrait, Round Post, Bifacial, 2279x1134x35mm	1	2	4	6	2	2	
	X9008560C1	Tracker table, X25, 1x24, Green, Portrait, Round Post, Bifacial, 2279x1134x35mm					1	2	
DRIVE SHAFT	300683001	Driveshaft, 8.875mm SQ, 6652 mm, ASTM A227, 1100 MPa Min. Tensile, Zn-Fe	3	5	9	13	9	13	
	200320001	Coupler, 8.875mm SQ Driveshaft, 80 mm L, 6063-T6	2	4	8	12	8	12	
	100100006	Bolt, Hex Flange, Serrated, M6-1.0 x 35 mm, Class 8.8, Magni 565	8	16	32	48	32	48	
	100099002	Nut, Hex Flange, Serrated, M6-1.0, Class 8, Magni 565	8	16	32	48	32	48	
DC Controller	400044001	Tracker Control Unit, SPB, 300 W, 6 Ah, Low Temp., T1A-SPB-300-DC2-Z3-U-L (2020 Platform) (-30°C-40°C)	0	1	1	1	1	1	
	100018011	Cap Screw, Hex, Flange, Serrated, M8-1.25x35mm, Steel, Class 8.8, Magni 565	0	4	4	4	4	4	
	100101001	Nut, Hex Flange w/ Nylon Insert, Serrated, M8-1.25, Class 8, Magni 565	0	4	4	4	4	4	
	400049001	PV Cable Extension, SPB, Y-Branch, TCU, F-M-M connection, 700mm, MEC101-1208-1	0	1	1	1	1	1	
	400047001	Fuse, Fast Blow, SPB, TCU, 15 A, FN15A0M0250	0	1	1	1	1	1	
	500088001	Cable Clip, Heyco, S6405	0	1	1	1	1	1	
	400040001	Antenna Cable Extension, TCU/RSU, 3.1 m, ZCBEXTANT 12	0	1	1	1	1	1	
	400041001	Antenna, TCU/RSU, MEC101_1121	0	1	1	1	1	1	
	400042001	Motor Cable Extension, TCU, 6 m, C20002#06	0	1	1	1	1	1	
	400050001	PV Cable Extension, SPB, Y-Branch, TCU, M-F-F connection, 700mm, MEC101-1208-2	0	1	1	1	1	1	
PONY PANEL	400045001	PV Panel, SPB TCU, 76 W, 36 V, ZPS2X36C016	0	2	2	2	2	2	
	301463001	Beam, U-Channel, SPB TCU PV Panel, 1200 mm, 1.5 mm THK, G90, 600 mm PV Pitch	0	2	2	2	2	2	
	301464001	Bracket, SPB TCU PV Panel, 1.5 mm THK, G90	0	2	2	2	2	2	
	100100004	Bolt, Hex Flange, Serrated, M6-1.0 x 16 mm, Class 8.8, Magni 565	0	16	16	16	16	16	
	100099002	Nut, Hex Flange, Serrated, M6-1.0, Class 8, Magni 565	0	16	16	16	16	16	
	100103002	Washer, External Tooth Lock, M6, 18-8 SS	0	2	2	2	2	2	
MOTOR	900594001	Motor/Gearbox, Assembly, 24 VDC, 125 W, Brushed	0	1	1	1	1	1	
	300682001	Bracket, Motor Mount, 3.1mm THK, HDG	0	1	1	1	1	1	
	100100007	Bolt, Hex Flange, Serrated, M6-1.0 x 12 mm, Class 8.8, Magni 565	0	3	3	3	3	3	
	100100004	Bolt, Hex Flange, Serrated, M6-1.0 x 16 mm, Class 8.8, Magni 565	0	3	3	3	3	3	
N-PLATE	500085001	Label, X20/X25 Information & Warnings	0	1	1	1	1	1	
	500086001	Label, UL Certification	0	1	1	1	1	1	
NCU	400033002	Network Control Unit, NCU-AC3-FP1-ZB-GW2-U-L							1
RSU	400034002	Remote Sensing Unit, R1A-AC2-ZB-U-L							2
	400043001	Box, RSU, w/ Anemometer & Snow Sensors, X20022#09							2
	400036001	Power Cable, AC Tracker Control Unit, C16003#72							2
	400040001	Antenna Cable Extension, TCU/RSU, 3.1 m, ZCBEXTANT 12							2
	400041001	Antenna, TCU/RSU, MEC101_1121							2
PC	400035002	Industrial PC, w/ Datalogger, H17014#03, ARK-1220L-S6A2							1
	400038001	Communication Adapter, RS485-USB, X18017#06							1