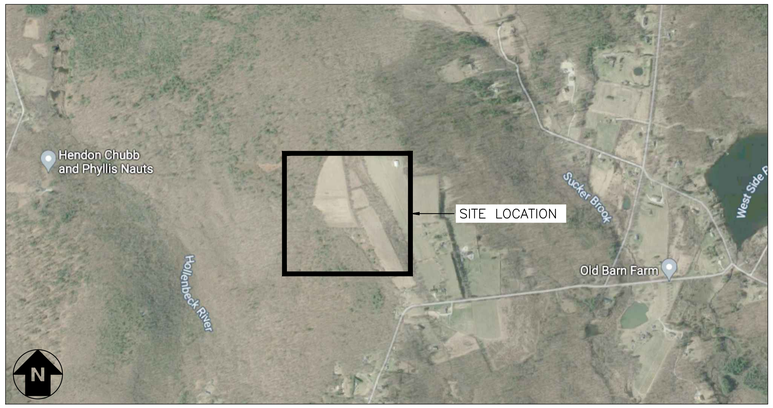
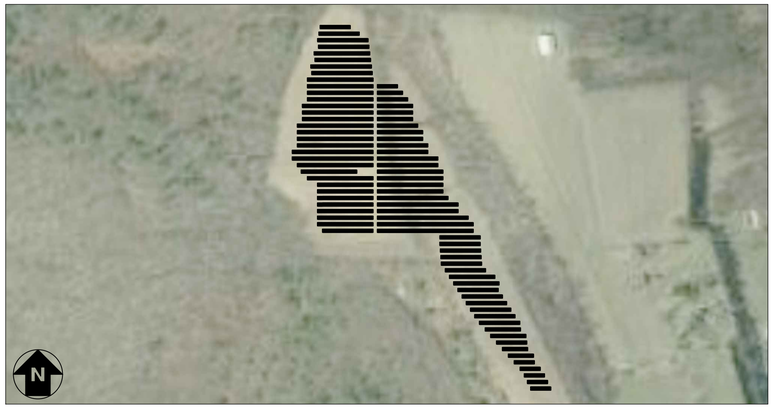
GROUND MOUNT SYSTEM AT

GOSHEN FARM

129 BARTHOLOMEW HILL RD, GOSHEN CT, 06756



LOCATION MAP
SCALE: 1" = 1000'



SYSTEM PLAN
SCALE: 1" = 300'-0"

TOTAL SYSTEM SUMMARY:

TOTAL DC SYSTEM SIZE:	4651.200 kWDC
AC SYSTEM SIZE:	4000.000 kWAC
MODULE MANUFACTURER:	CANADIAN SOLAR
MODULE MODEL:	CS3Y-475MB-AG
MODULES PER STRING:	24
MODULE QUANTITY:	9,792
STRING QUANTITY:	408
MODULE TILT:	25°
MODULE AZIMUTH:	0°
INVERTER MANUFACTURER:	CANADIAN SOLAR
INVERTER MODEL:	CSI-125KTL-GS-E
INVERTER QUANTITY:	32

SCOPE OF WORK SUMMARY

GROUND MOUNT PV ARRAY:

- INSTALL SOLAR MODULES AND RACKING SYSTEM ON GROUND LEVEL.
- INSTALL INVERTERS AND ELECTRICAL DISTRIBUTION EQUIPMENT.
- INTERCONNECT AT NEW UTILITY SERVICE

DEVELOPER:

Greenskies
a Clean Focus company

127 WASHINGTON AVENUE,
WEST BUILDING, GARDEN LEVEL
NORTH HAVEN, CT 06473

ENGINEERED BY:

PUREPOWER ENGINEERING

111 RIVER STREET, SUITE 1110
HOBOKEN, NEW JERSEY, 07030

DRAWING INDEX

		CONCEPTUAL DESIGN 05/05/2021
GENERAL		
G001	TITLE SHEET	●
ELECTRICAL		
E001	ELECTRICAL NOTES & SYMBOL LIST	
E100	AC ELECTRICAL PLAN	●
E101	PARTIAL ELECTRICAL PLAN – SYSTEM 1	
E102	PARTIAL ELECTRICAL PLAN – SYSTEM 2	
E103	TYPICAL INVERTER & EQUIPMENT PLAN	
E104	EQUIPMENT MOUNTING DETAILS IN ARRAY	
E105	MEDIUM VOLTAGE EQUIPMENT PLAN	
E300	ONE LINE DIAGRAM – SYSTEM 1	●
E301	ONE LINE DIAGRAM – SYSTEM 2	●
E310	SCHEDULES & CALCULATIONS	
E401	GROUNDING DETAILS	
E402	ELECTRICAL DETAILS	
E500	LABELS & SIGNAGE	
E600	EQUIPMENT DATA SHEETS	

LEGEND:

UPDATED DRAWING ISSUED	●
UNCHANGED, PREVIOUSLY ISSUED DRAWING STILL CURRENT	○
DRAWING REMOVED FROM SET	×

DATE	REVISION DESCRIPTION	PM	ENG	CHK
05/05/2021	CONCEPTUAL DESIGN	SK	PM	RI

PUREPOWER ENGINEERING
111 RIVER STREET, HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. WINS
CT LICENSE No. 0029462

GREENSKIES
127 WASHINGTON AVENUE
NORTH HAVEN, CT 06473
WWW.GREENSKIES.COM

DEVELOPER: Greenskies a Clean Focus company

PAGE SIZE: 36" x 24"
PROJECT #: 01590.01

DC SYSTEM SIZE: 4,651.200 kW
AC SYSTEM SIZE: 4,000.000 kW
MODULE TYPE: CS3Y-475MB-AG
MODULE QUANTITY: 9,792
STRING QUANTITY: 408
ORIENTATION: 25° TILT, 0° AZIMUTH

PROJECT: GROUNDMOUNT SYSTEM AT GOSHEN FARM
129 BARTHOLOMEW HILL ROAD
GOSHEN CT, 06756

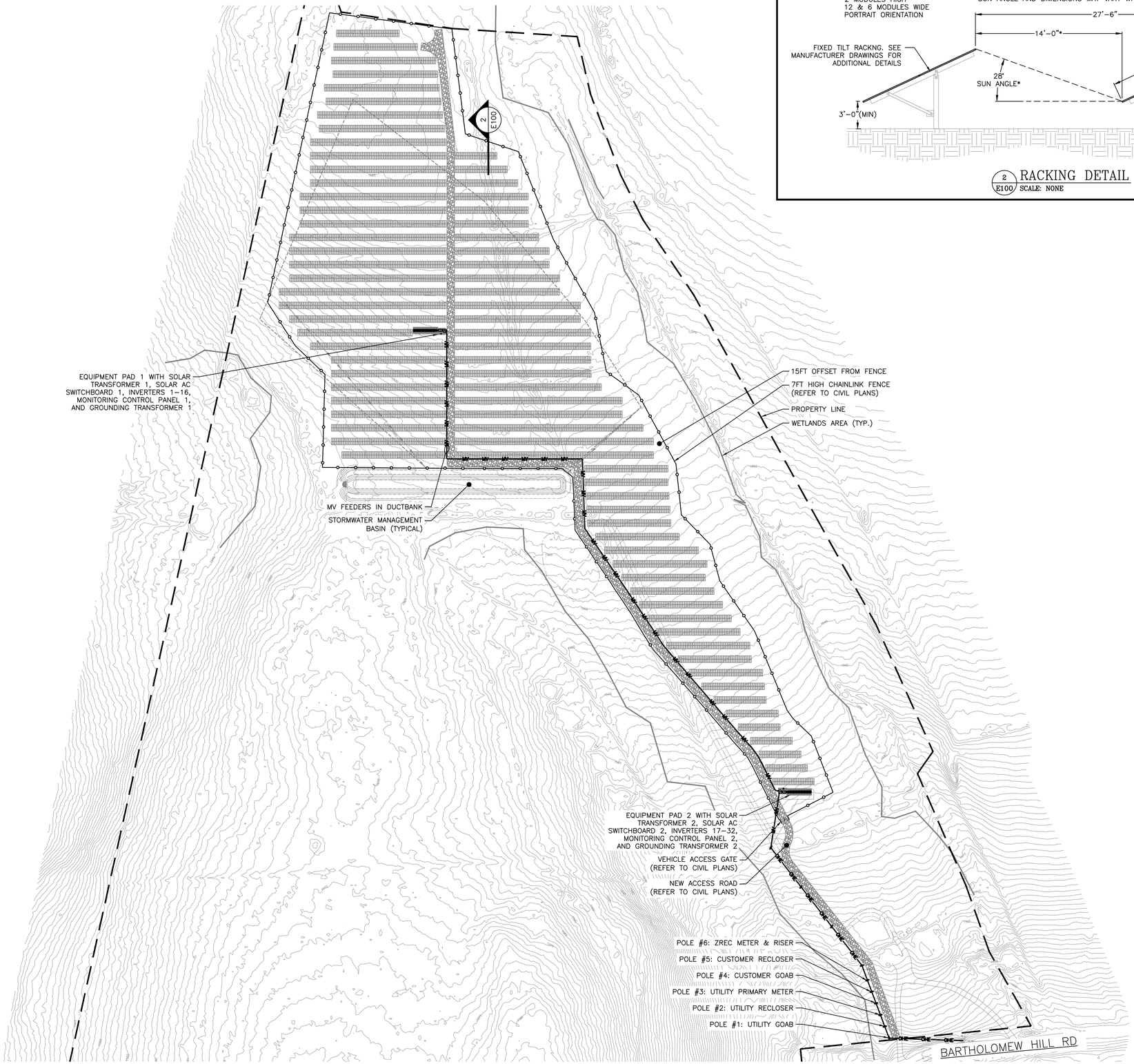
DRAWING TITLE: TITLE SHEET

DRAWING #: G001

PLOT DATE: 5/5/2021 5:04 PM

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PLOT DATE: 5/7/2021 10:01 AM



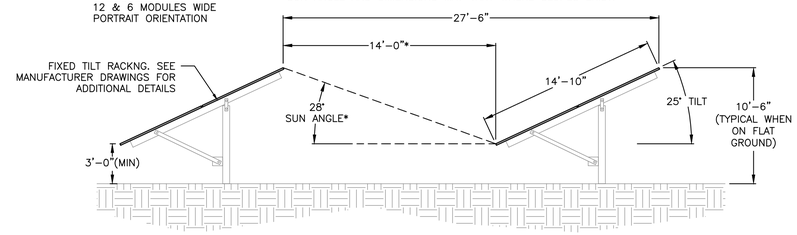
1 E100 AC ELECTRICAL PLAN
SCALE: 1" = 100'-0"

N

LINETYPE LEGEND
—MV— MV CIRCUIT IN CONDUIT
—OHE— OVERHEAD FEEDER

TYPICAL TABLE SIZE
2 MODULES HIGH
12 & 6 MODULES WIDE
PORTRAIT ORIENTATION

* RACKING DIMENSIONS SHOWN ARE TYPICAL FOR FLAT GRADE. SUN ANGLE AND DIMENSIONS MAY VARY WHERE SLOPES EXIST.



2 E100 RACKING DETAIL
SCALE: NONE

DATE	REVISION DESCRIPTION	PM	ENG	CHK
05/05/2021	CONCEPTUAL DESIGN	SK	PM	RI

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CT LICENSE No. 0029462

DEVELOPER
Greenskies a Clean Focus company

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NORTH HAVEN, CT 06473
WWW.GREENSKIES.COM

PAGE SIZE: 36" x 24"
PROJECT #: 01590.01

DC SYSTEM SIZE: 4,651.200 kW
AC SYSTEM SIZE: 4,000.000 kW
MODULE TYPE: CS3Y-475MB-AG
MODULE QUANTITY: 9,792
STRING QUANTITY: 408
ORIENTATION: 25° TILT, 0° AZIMUTH

PROJECT
GROUNDMOUNT SYSTEM AT
GOSHEN FARM
129 BARTHOLOMEW HILL ROAD
GOSHEN CT, 06756

DRAWING TITLE
AC ELECTRICAL PLAN

DRAWING #
E100

RULER IN INCHES: 0 ½ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

SYSTEM SUMMARY	
DC SYSTEM SIZE	4,651.200 KW
AC SYSTEM SIZE	4,000.000 KW
MODULE	CANADIAN CS3Y-475MB-AG
MODULE QTY	9,792
INVERTER	CANADIAN CSI-125KTL-GS-E
INVERTER QTY	32

1 E300 ONE LINE DIAGRAM
SCALE: NONE

SHEET NOTES:
1. PROVIDE TORQUE MARKS INSIDE INVERTERS.
2. SET ELECTRONIC-TRIP BREAKERS TO THE SETTINGS BELOW, UNLESS OTHERWISE NOTED IN POWER STUDY. "NOMINAL TRIP" REFERS TO BREAKER TRIP RATING INDICATED ON ONELINE. SETTINGS BELOW ARE NOT FOR COORDINATION PURPOSES.
   - L = 100% OF NOMINAL TRIP (EXACT) MINIMUM TIME DELAY
   - S = 125% OF NOMINAL TRIP (OR NEXT HIGHER) MINIMUM TIME DELAY
   - I = 150% OF NOMINAL TRIP (OR NEXT HIGHER)
   - G = 20% OF NOMINAL TRIP (OR NEXT HIGHER) 0.5 SEC TIME DELAY

DATE	REVISION DESCRIPTION	PM	ENG	CHK
05/05/2021	CONCEPTUAL DESIGN	SK	PM	SK

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111 RIVER STREET, HOBOKEN, NJ
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CT LICENSE No. 0029262

DEVELOPER

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Greenskies a Clean Focus company

PAGE SIZE 36" x 24"
PROJECT # 01590.01

DC SYSTEM SIZE: 4,651.200 kW
AC SYSTEM SIZE: 4,000.000 kW
MODULE TYPE: CS3Y-475MB-AG
MODULE QUANTITY: 9,792
STRING QUANTITY: 408
ORIENTATION: 25° TILT, 0° AZIMUTH

PROJECT
GROUNDMOUNT SYSTEM AT
GOSHEN FARM
129 BARTHOLOMEW HILL ROAD
GOSHEN CT, 06756

DRAWING TITLE
ONE LINE DIAGRAM - SYSTEM 1

DRAWING #
E300

PLOT DATE: 5/5/2021 5:04 PM
RULER IN INCHES:

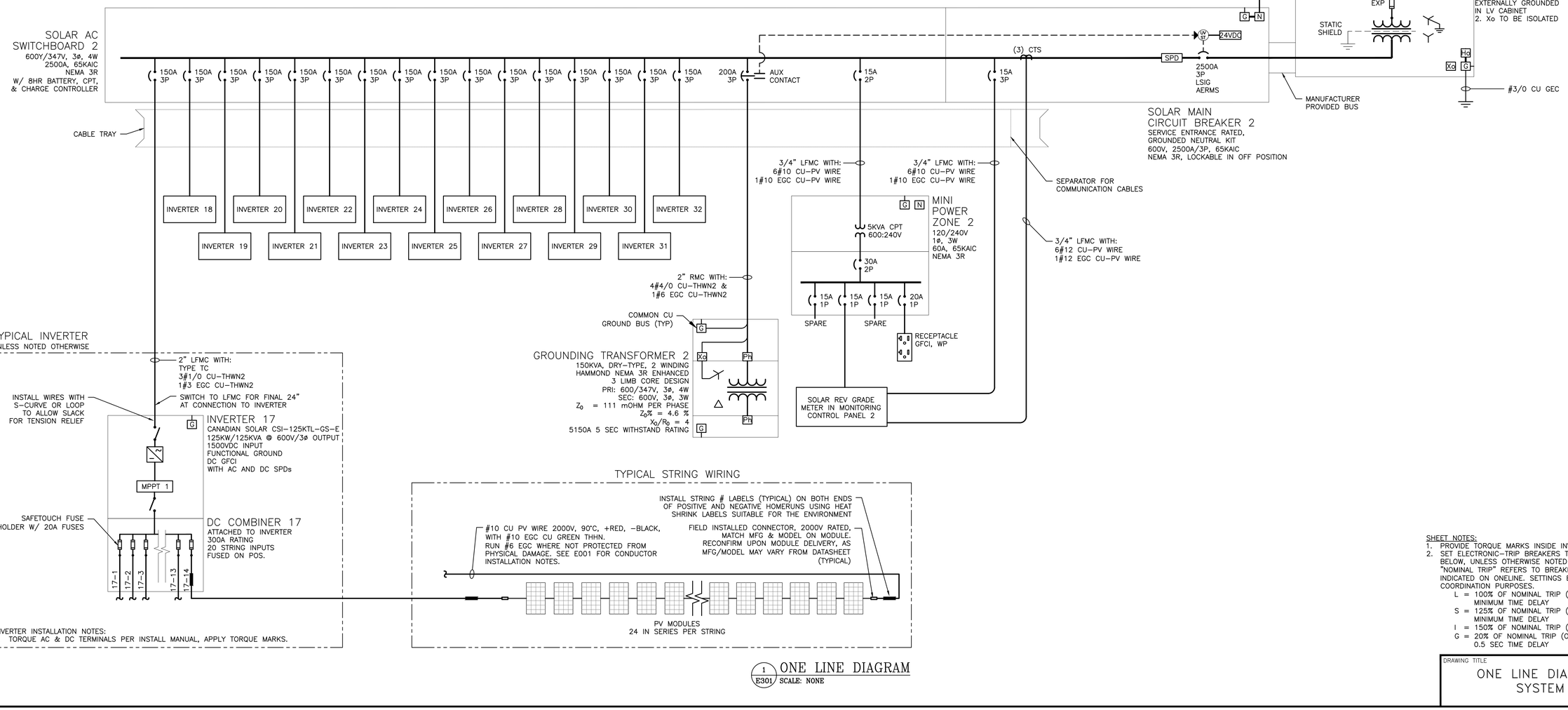
PLOT DATE: 5/5/2021 5:04 PM

EXTERNAL RELAY SETTINGS								
ANSI ELEMENT #	Pickup	Real	Units	Level	Delay (sec)	Total Clear Time (sec)*	Curve	Description
27	2.33	11650	V	88%	1.95	2.00		Slow UV
27	1.32	6600	V	50%	1.05	1.10		Fast UV
59	2.92	14600	V	110%	1.95	2.00		Slow OV
59	3.18	15900	V	120%	0.11	0.16		Fast OV
59N	0.34	1700	V	13%	1.95	2.00		Neutral Shift
81U-1	56.50	56.50	Hz	94%	0.11	0.16		Fast UF
81U-2	58.50	58.50	Hz	98%	299.95	300.00		Slow UF
81O-1	62.00	62.00	Hz	103%	0.11	0.16		Fast OF
81O-2	61.20	61.20	Hz	102%	299.95	300.00		Slow OF
51N	0.25	25	A	25%	1.95	2.00	U4	Timed Neutral OC
50P	15.06	1506	A	1500%	0.00	0.05		Instant. Phase OC
51P	1.50	150	A	150%	1.95	2.00	U4	Timed Phase OC
79	2.52	12600	V	95%	299.95	300.00		Min Reclosing Voltage Value
79	2.78	13900	V	105%	299.95	300.00		Max Reclosing Voltage Value
79	59.50	59.50	Hz	99%	299.95	300.00		Min Reclosing Frequency Value
79	60.50	60.50	Hz	101%	299.95	300.00		Max Reclosing Frequency Value
100.4A USED FOR 50/51 ELEMENTS				13279V USED FOR 27/59 ELEMENTS				
CT RATIO FACTOR = 100				LEA RATIO FACTOR = 5000				
				* total clear time includes 0.05 sec breaker opening time				

2 RELAY SETTINGS
E301 SCALE: NONE

INVERTER INTERNAL PROTECTIVE SETTINGS: UL1741-SA COMPLIANT					
ANSI ELEMENT #	Pickup	Units*	Level	Total Clear Time (sec)	Description
27	304.8	V	88%	2.00	Slow UV
27	173.2	V	50%	1.10	Fast UV
59	381.1	V	110%	2.00	Slow OV
59	415.7	V	120%	0.16	Fast OV
81U-1	56.50	Hz	94%	0.16	Fast UF
81U-2	58.50	Hz	98%	300.00	Slow UF
81O-1	62.00	Hz	103%	0.16	Fast OF
81O-2	61.20	Hz	102%	300.00	Slow OF
79	329.1	V	95%	300.00	Min Reclosing Voltage Value
79	363.7	V	105%	300.00	Max Reclosing Voltage Value
79	59.6	Hz	99%	300.00	Min Reclosing Frequency Value
79	60.5	Hz	101%	300.00	Max Reclosing Frequency Value
INVERTER INTERNAL OPERATION SETTINGS					
PF Set Point	1.00				Power Factor Control
Var Control	OFF				Reactive Power Control
Ramp Rate	10%/1 sec				dkw / dt
Freq Control	OFF				Speed Control
* voltages based off 346.4V Line to Neutral					

3 INVERTER SETTINGS
E301 SCALE: NONE



1 ONE LINE DIAGRAM
E301 SCALE: NONE

SHEET NOTES:
1. PROVIDE TORQUE MARKS INSIDE INVERTERS.
2. SET ELECTRONIC-TRIP BREAKERS TO THE SETTINGS BELOW, UNLESS OTHERWISE NOTED IN POWER STUDY. "NOMINAL TRIP" REFERS TO BREAKER TRIP RATING INDICATED ON ONELINE. SETTINGS BELOW ARE NOT FOR COORDINATION PURPOSES.
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   - I = 150% OF NOMINAL TRIP (OR NEXT HIGHER)
   - G = 20% OF NOMINAL TRIP (OR NEXT HIGHER) 0.5 SEC TIME DELAY

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05/05/2021	CONCEPTUAL DESIGN	SK	PM	SK

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RICHARD A. WINS
CT LICENSE No. 0029462

GREENSKIES
127 WASHINGTON AVENUE
NORTH HAVEN, CT 06473
WWW.GREENSKIES.COM

DEVELOPER: Greenskies, a Clean Focus company

PAGE SIZE: 36" x 24"
PROJECT #: 01590.01

DC SYSTEM SIZE: 4,651,200 kW
AC SYSTEM SIZE: 4,000,000 kW
MODULE TYPE: CS3Y-475MB-AG
MODULE QUANTITY: 9,792
STRING QUANTITY: 408
ORIENTATION: 25° TILT, 0° AZIMUTH

PROJECT: GROUNDMOUNT SYSTEM AT GOSHEN FARM
129 BARTHOLOMEW HILL ROAD
GOSHEN CT, 06756

DRAWING TITLE: ONE LINE DIAGRAM - SYSTEM 2

DRAWING #: E301

RULER IN INCHES: 0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

THREE-PHASE STRING INVERTER 125 KW

CSI-125KTL-GI-E

Canadian Solar's grid-tied, transformer-less string inverters help accelerate the use of three-phase string architecture for commercial rooftop and small ground-mount applications. An NRTL approved, cost-effective alternative to central inverters, these inverters are modular design building blocks that provide high yield and enable significant BoS cost savings. They provide up to 98.8 % conversion efficiency, and a wide operating range for maximum energy harvest.

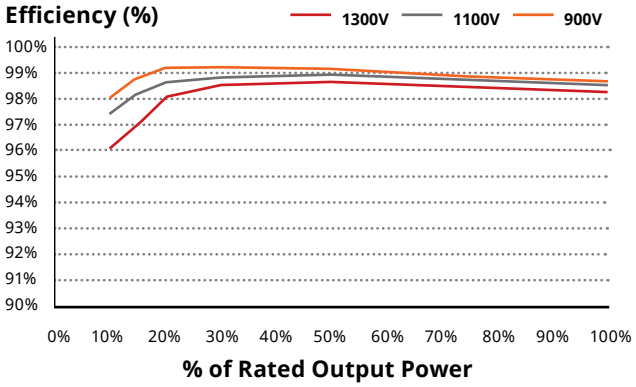
5 years **Standard warranty, extension up to 20 years**

KEY FEATURES

- Maximum efficiency of 99.1%, CEC efficiency of 98.6%
- Single MPPT for higher conversion efficiency
- Transformerless design
- PID mitigation capability

EFFICIENCY CURVE

CSI-125KTL-GI-E @ 900 V



HIGH RELIABILITY

- Advanced thermal design with variable speed fans
- Ground-fault detection and interruption circuit

BROAD ADAPTIBILITY

- NEMA 4X (IP65), outdoor application
- Utility interactive controls: active power derating, reactive power control and over frequency derating
- Integrated wiring box design
- Integrated DC and AC load rated disconnects
- Wide MPPT range for flexible string sizing
- AC terminals compatible with copper and aluminum conductors
- Supports up to 20 DC string inputs

CANADIAN SOLAR INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. As a leading PV project developer and manufacturer of solar modules with over 33 GW deployed around the world since 2001, Canadian Solar Inc. is one of the most bankable solar companies worldwide.

*For detailed information, please refer to the Installation Manual.

CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada | www.canadiansolar.com

SYSTEM/TECHNICAL DATA	
MODEL NAME	**CSI-125KTL-GI-E**
DC INPUT	
Max. PV Power	187.5kW
Max. DC Input Voltage	1500 V_{DC}
Operating DC Input Voltage Range	860-1450 V_{DC}
Start-up DC Input Voltage	900 V_{DC}
Number of MPP Trackers	1
MPPT Full Power Voltage Range	860-1450 V_{DC}
Operating Current (Imp)	150 A
Max. Input Current (Isc)	300 A
Number of DC Imputs	20
DC Disconnection Type	Load rated DC switch
AC OUTPUT	
Rated AC Output Power	125 kW
Max. AC Output Power	125 kW
Rated Output Voltage	600 V_{AC}
Output Voltage Range*	528-660 V_{AC}
Grid Connection Type	3/N/PE
Nominal AC Output Current	120 A
Rated Output Frequency	50/60 Hz
Output Frequency Range*	47-62 Hz
Power Factor	1 default (±0.8 adjustable)
Current THD	< 3 %
AC Disconnection Type	Load rated AC switch
SYSTEM	
Topology	Transformerless
Max. Efficiency	99.1 %
EU Efficiency	98.6 %
Night Consumption	< 2 W
ENVIRONMENT	
Protection Degree	NEMA 4X (IP65)
Cooling	Intelligent Redundant Cooling
Operating Temperature Range	-25 ° C to +60 ° C
Storage Temperature Range	-40 ° C to +70 ° C
Operating Humidity	0 - 100 %
Operating Altitude	4000 m
Audible Noise	<55 dBA @ 1 m
DISPLAY AND COMMUNICATION	
Display	LED
Communication	Standard: RS485 (Modbus RTU), AND either MODBUS or ETHERNET
MECHANICAL DATA	
Dimensions (W / H / D)	1176 x 713.5 x 315 mm
Weight	84 kg
Installation Angle	Back title up to 15 degrees
DC Inputs	MC4/ T4
DC Fuse Rating	20A
SAFETY	
Safety and EMC Standard	IEC62109-1/-2, IEC/EN 61000-2/-4
Grid Standard	VDE0126-1-1, IEC61683 or EN50530
Smart-Grid Features	Voltage-Ride Thru, Frequency-Ride Thru, Soft-Start, Volt-Var, Frequency-Watt, Volt-Watt

*The “Output Voltage Range” and “Output Frequency Range” may differ according to specific grid standard.

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustment to the information described herein at any time without further notice.

Caution: For professional use only. The installation and handling of PV equipment requires professional skills and should only be performed by qualified professionals. Please read the safety and installation instructions before using the product.

NEW

CanadianSolar

BiHiKu5 Mono

465 W ~ 490 W

BIFACIAL MONO PERC

UP TO 30% MORE POWER FROM THE BACK SIDE

CS3Y-465|470|475|480|485|490MB-AG

Dimensions: 2260 × 1048 × 32 mm (89.0 × 41.3 × 1.26 in)
Weight: 29.9 kg (65.9 lbs)
Max. System Voltage: 1500 V (IEC/UL) or 1000 V (IEC/UL)

MORE POWER

490 W — Module power up to 490 W
Module efficiency up to 20.7 %

$ — Up to 11.5 % lower LCOE
Up to 3.2 % lower system cost

Comprehensive LID / LeTID mitigation technology, up to 50% lower degradation

Compatible with mainstream trackers, cost effective product for utility power plant

Better shading tolerance

MORE RELIABLE

Minimizes micro-crack impacts

*** — Heavy snow load up to 5400 Pa, wind load up to 2400 Pa*

12 Years — **Enhanced Product Warranty on Materials and Workmanship***

30 Years — **Linear Power Performance Warranty***

1st year power degradation no more than 2%
Subsequent annual power degradation no more than 0.45%

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2015 / Quality management system
ISO 14001:2015 / Standards for environmental management system
OHSAS 18001:2007 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

* As there are different certification requirements in different markets, please contact your local Canadian Solar sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

CANADIAN SOLAR INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. No. 1 module supplier for quality and performance/price ratio in IHS Module Customer Insight Survey. As a leading PV project developer and manufacturer of solar modules with over 43 GW deployed around the world since 2001.

* For detailed information, please refer to the Installation Manual.

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www.canadiansolar.com

6 August 2020 AM2020-013rv0

Gina L. Wolfman
Clean Focus and Greenskies
127 Washington Ave.
West Building, Lower Level
North Haven, CT, 06473

Subject: CS3W-395PB-AG module information

Dear Mrs. Gina Wolfman,

This letter is provide clarification on the CS3W-395PB-AG bifacial PV module and specifically the following items:

1. The CS3W-395PB-AG or any of the other Canadian Solar PV modules do not contain PFAS (polyfluoroalkyl substances) or its derivatives. Such chemical is not used in the manufacture of any Canadian Solar modules.
2. TCLP test was conducted on the CS3W-395PB-AG module and no Selenium was identified in the report.
3. To learn more about the US EPA and its TLCP process please visit https://www.epa.gov/hw-sw846/sw-846-test-method-1311-toxicity-characteristic-leaching-procedure
4. The PV module is a completely sealed construction inside two layers of 2mm solid glass where PV cells are contained. The module is enclosed inside aluminium frame and sealed with a silicon sealant. Such construction assures that modules will not leach any chemicals into the environment. In the event the PV module is damaged it is possible that Lead (heavy metal) can leach out of the PV module as per the TLCP report. When disposing PV modules at the end of their life cycle, it is important to utilize a landfill that can safely contain such possible leaching.

Please do not hesitate to contact me with further questions.

Best Regards,

Andrey Malyshev
Andrey Malyshev, P.Eng.
Technical Applications Engineer
Canadian Solar Solutions Inc
T: 519-837-1881 x2377; C: 226-979-2230
Andrey.Malyshev@canadiansolar.com