

# NAPANEE TS TAYLOR KIDD SOLAR PROJECT

PART OF LOTS 27 AND 28, CONCESSION 1, TOWNSHIP OF LOYALIST, ON

SOLAR ELECTRIC SYSTEM PROJECT - 10.0 MW AC

## VICINITY MAP:



## PROJECT SCOPE:

**SOLAR ELECTRIC SYSTEM**

THE PROPOSED PROJECT IS A RENEWABLE ENERGY GENERATION FACILITY WHICH WILL USE SOLAR PHOTOVOLTAIC TECHNOLOGY TO GENERATE ELECTRICITY. ELECTRICITY GENERATED BY SOLAR PHOTOVOLTAIC PANELS WILL BE CONVERTED FROM DIRECT CURRENT (DC) TO ALTERNATING CURRENT (AC) BY INVERTERS, WHICH WILL ALSO STEP-UP THE VOLTAGE TO 44 KV PRIOR TO BEING CONNECTED TO THE EXISTING LOCAL DISTRIBUTION LINE. TO MEET ONTARIO POWER AUTHORITY'S (OPA) FEED-IN-TARIFF (FIT) PROGRAM REQUIREMENTS, A SPECIFIC PERCENTAGE OF EQUIPMENT WILL BE MANUFACTURED IN ONTARIO. THIS PROJECT IS CLASSIFIED AS A CLASS 3 SOLAR FACILITY AND THEREFORE REQUIRES A RENEWABLE ENERGY APPROVAL (REA).

THE SYSTEM WILL BE INTERCONNECTED AND WILL BE OPERATED IN PARALLEL WITH THE ENERGY PROVIDER'S ELECTRIC GRID AS PER THE REQUIREMENTS OF THE ONTARIO ELECTRICAL SAFETY CODE (OESC).

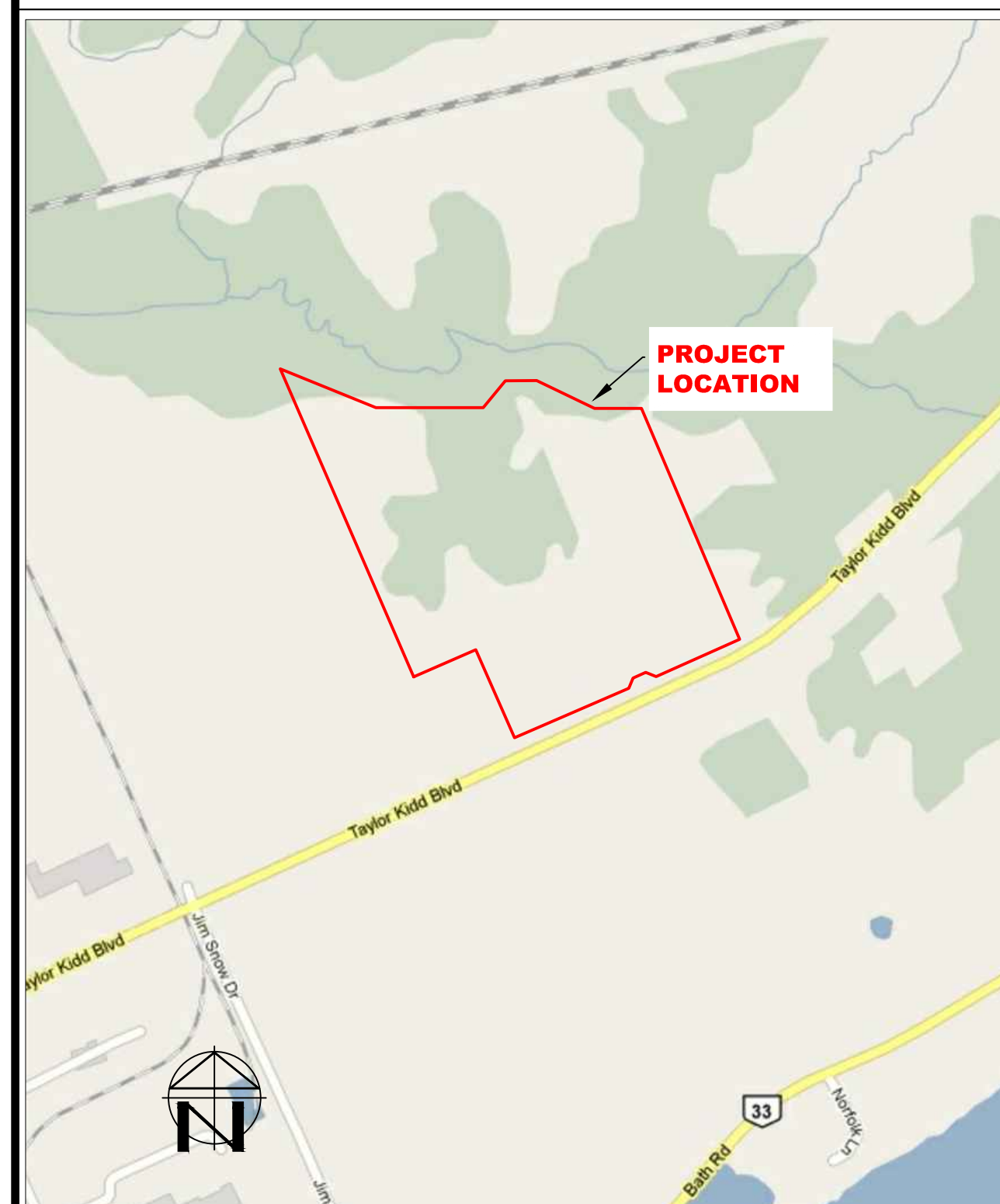
## DRAWING INDEX:

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| G-001  | TITLE SHEET                |
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| EP-801 | SINGLE LINE DIAGRAM        |
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| S-102  | RACKING AND ANCHOR OPTIONS |

ELECTRICAL ENGINEER:  
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## STREET MAP:



## AERIAL VIEW:



## PROJECT TEAM:

**PROJECT CONTACT:**  
 PROJECT: NAPANEE TS TAYLOR KIDD SOLAR PROJECT  
 AXIO POWER CANADA INC.  
 945 PRINCESS STREET, SUITE 252  
 KINGSTON, ON, K7L 3N6  
 CONTACT: ROBERT BARKLEY  
 TEL: (613) 545-0215  
 FAX: (613) 545-0692  
 EMAIL: rbarkley@axiopower.com

**DESIGN ENGINEERING FIRM:**  
 BLUE OAK ENERGY CANADA CORP.  
 200 VINYL COURT, UNIT D  
 VAUGHAN, ON L4L 4A3  
 CONTACT: VINCE GREEN, PE  
 TEL: (905) 850-3200  
 EMAIL: vince@blueoakenergy.com



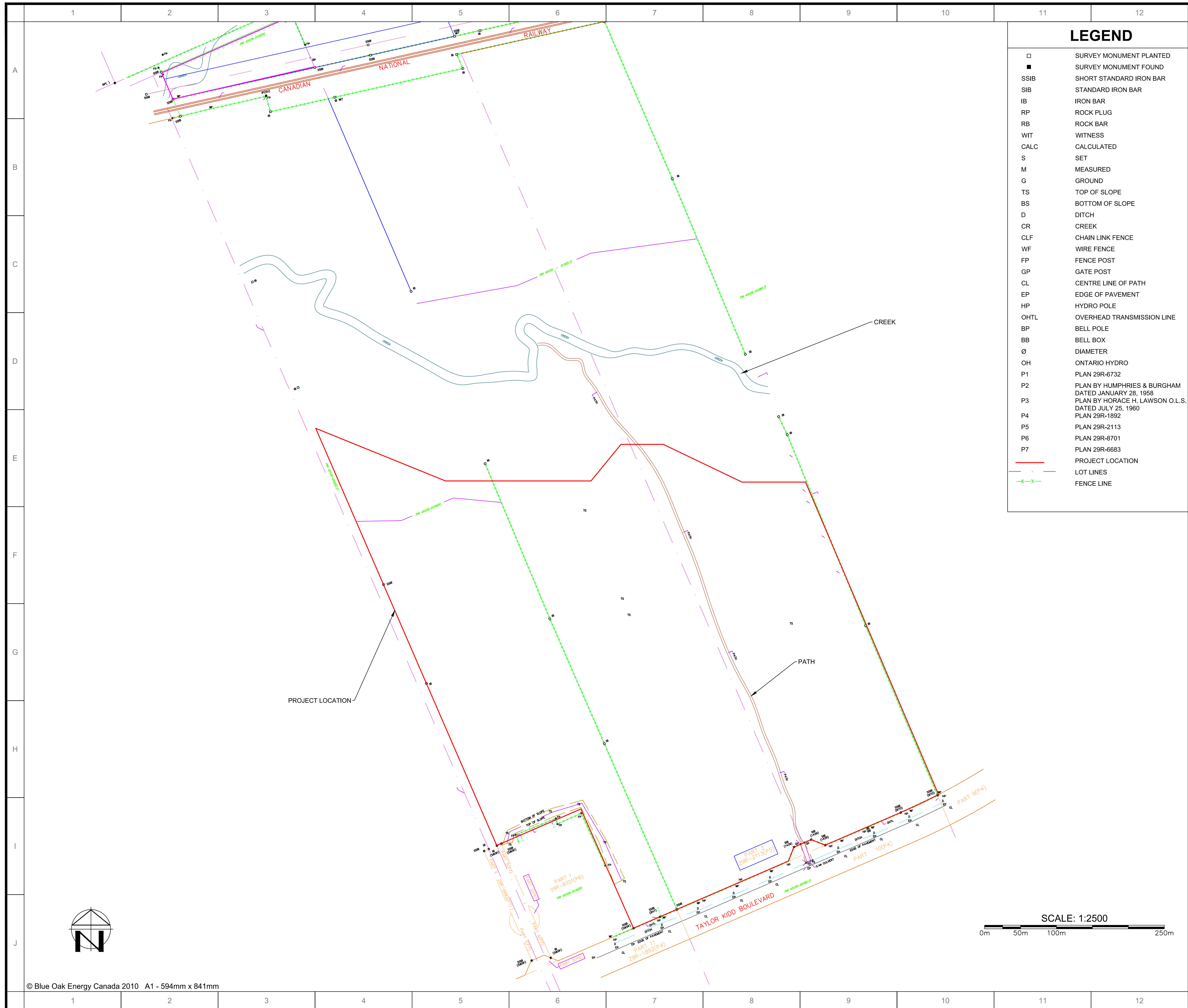
**AXIO POWER CANADA INC**

945 PRINCESS STREET, SUITE 252  
 KINGSTON, ON K7L 3N6

PROJECT SITE:  
**NAPANEE TS TAYLOR KIDD SOLAR PROJECT**  
 PART OF LOTS 27 AND 28, CONCESSION 1,  
 TOWNSHIP OF LOYALIST, ON

DRAWING:  
 TITLE SHEET

DRAWING NO.  
**G-001**



**LEGEND**

□	SURVEY MONUMENT PLANTED
■	SURVEY MONUMENT FOUND
SSIB	SHORT STANDARD IRON BAR
SIB	STANDARD IRON BAR
IB	IRON BAR
RP	ROCK PLUG
RB	ROCK BAR
WIT	WITNESS
CALC	CALCULATED
S	SET
M	MEASURED
G	GROUND
TS	TOP OF SLOPE
BS	BOTTOM OF SLOPE
D	DITCH
CR	CREEK
CLF	CHAIN LINK FENCE
WF	WIRE FENCE
FP	FENCE POST
GP	GATE POST
CL	CENTRE LINE OF PATH
EP	EDGE OF PAVEMENT
HP	HYDRO POLE
OHTL	OVERHEAD TRANSMISSION LINE
BP	BELL POLE
BB	BELL BOX
Ø	DIAMETER
OH	ONTARIO HYDRO
P1	PLAN 29R-6732
P2	PLAN BY HUMPHRIES & BURGHAM DATED JANUARY 28, 1958
P3	PLAN BY HORACE H. LAWSON O.L.S. DATED JULY 25, 1960
P4	PLAN 29R-1892
P5	PLAN 29R-2113
P6	PLAN 29R-8701
P7	PLAN 29R-6683
—	PROJECT LOCATION
- - -	LOT LINES
-X-X-	FENCE LINE

**NOTES:**  
 1. SEE PROJECT CIVIL DRAWINGS FOR OFFICIAL LANDMARKS, SITE INFORMATION AND SURVEYING. SHOWN HERE AS REFERENCE ONLY.

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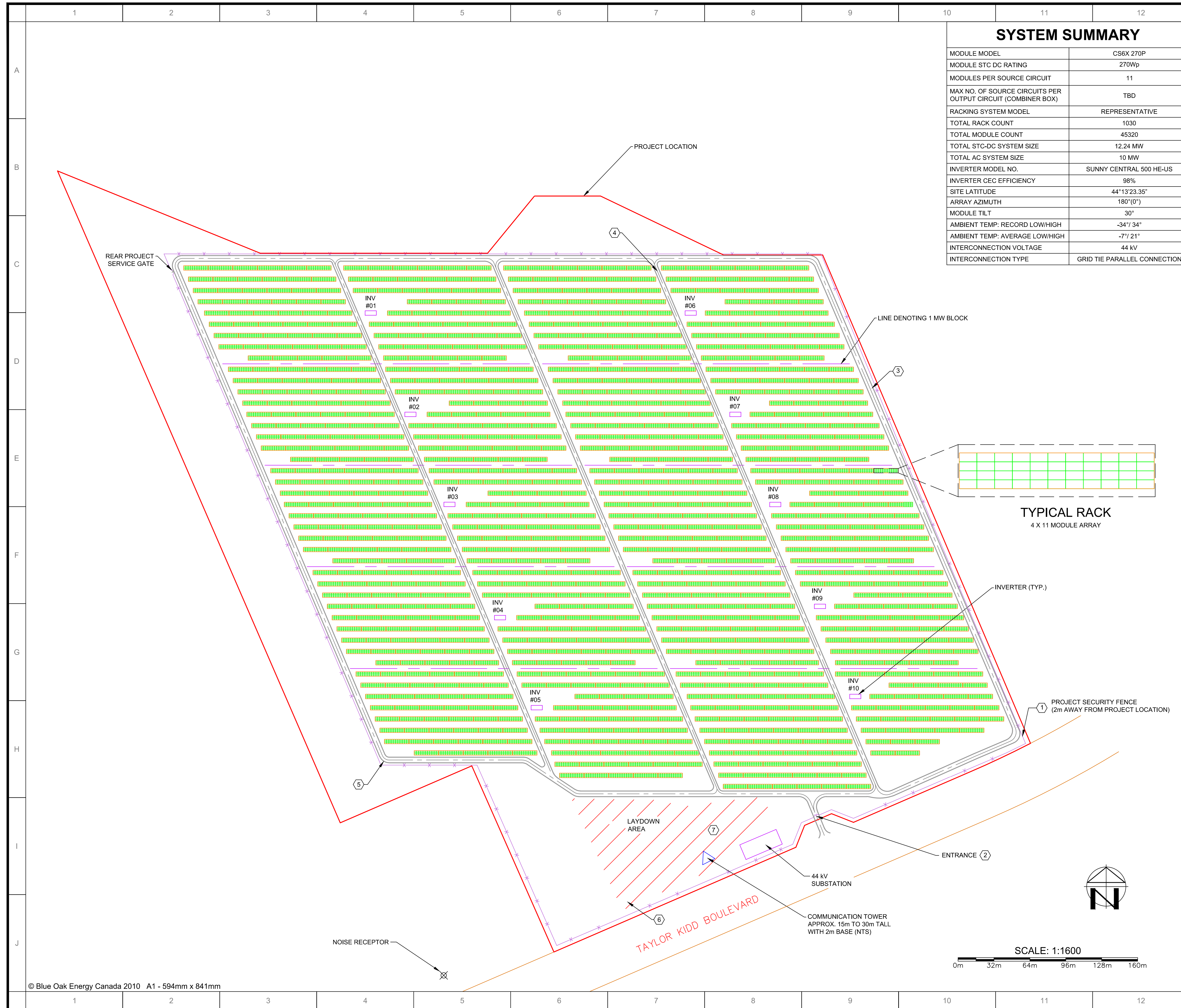
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**AXIO POWER CANADA INC**  
 945 PRINCESS STREET, SUITE 252  
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DRAWING:  
 EXISTING SITE PLAN  
 DRAWING NO.  
**ES-101**



SYSTEM SUMMARY	
MODULE MODEL	CS6X 270P
MODULE STC DC RATING	270Wp
MODULES PER SOURCE CIRCUIT	11
MAX NO. OF SOURCE CIRCUITS PER OUTPUT CIRCUIT (COMBINER BOX)	TBD
RACKING SYSTEM MODEL	REPRESENTATIVE
TOTAL RACK COUNT	1030
TOTAL MODULE COUNT	45320
TOTAL STC-DC SYSTEM SIZE	12.24 MW
TOTAL AC SYSTEM SIZE	10 MW
INVERTER MODEL NO.	SUNNY CENTRAL 500 HE-US
INVERTER CEC EFFICIENCY	98%
SITE LATITUDE	44°13'23.35"
ARRAY AZIMUTH	180°(0°)
MODULE TILT	30°
AMBIENT TEMP: RECORD LOW/HIGH	-34°/ 34°
AMBIENT TEMP: AVERAGE LOW/HIGH	-7°/ 21°
INTERCONNECTION VOLTAGE	44 kV
INTERCONNECTION TYPE	GRID TIE PARALLEL CONNECTION

- NOTES:**
- PV RACKS SUPPORTING FIXED TILTED PV MODULES WITH DC WIRING AND COMBINER BOXES ABOVE GROUND. DC CABLING FROM COMBINER BOXES TO ROUTE UNDERGROUND TO INVERTER / POWER ENCLOSURES.
  - INVERTER / POWER ENCLOSURES TO BE LOCATED WITHIN ARRAY AREA TO COLLECT DC POWER, CONVERT AND OUTPUT MEDIUM VOLTAGE AC POWER.
  - DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
  - SEE RACK DETAIL DRAWINGS IN S-101 FOR RACK ELEVATION AND TOLERANCES.
  - CONTACT, COORDINATE AND ATTAIN APPROVAL FROM AGENCIES HAVING EASEMENTS AND ROW SPACING IN PROJECT AREA.
  - PV MODULES TO BE CANADIAN SOLAR MODEL CS6X 270P OR EQUIVALENT.
- KEYED NOTES:**
- PROJECT SECURITY FENCE. 2.7m (9 FT) TALL, SET APPROXIMATELY 2m INSIDE PROJECT LOCATION LINE.
  - DOUBLE SWING GATES, 2.5m EACH SECTION.
  - PERIMETER SERVICE ROAD, 5m WIDTH . SEE SECTION DETAILS IN S-101.
  - INTERIOR SERVICE ROADS, 3.7m WIDTH SEE SECTION DETAILS IN S-101.
  - 9m TURNING RADII AT ROAD CENTER LINES ON PERIMETER SERVICE ROAD AND ON TRANSITIONS TO INTERIOR SERVICE ROADS TO MEET TYPICAL SAFETY AGENCY REQUIREMENTS.
  - AREA AROUND GATES AND SWITCH HOUSE COMPACTED, SLOPED FOR DRAINAGE AND TOPPED WITH 'ROAD BASE' ROCK AND SAND MIXTURE. PROVIDES PARKING FOR APPROX. 10 VEHICLES.
  - LAYDOWN AREA TO BE COMPACTED NATIVE SOIL ALLOWING TEMPORARY PARKING, STORAGE, ETC. DURING CONSTRUCTION. TO BE FINISH GRADED AND SEEDED AT END OF CONSTRUCTION.

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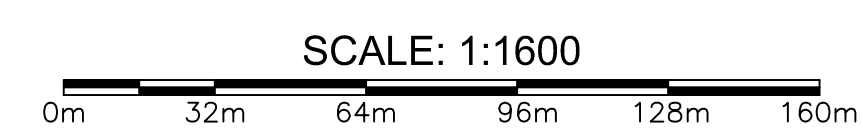
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DRAWING: ARRAY PLAN  
 DRAWING NO. **ES-102**

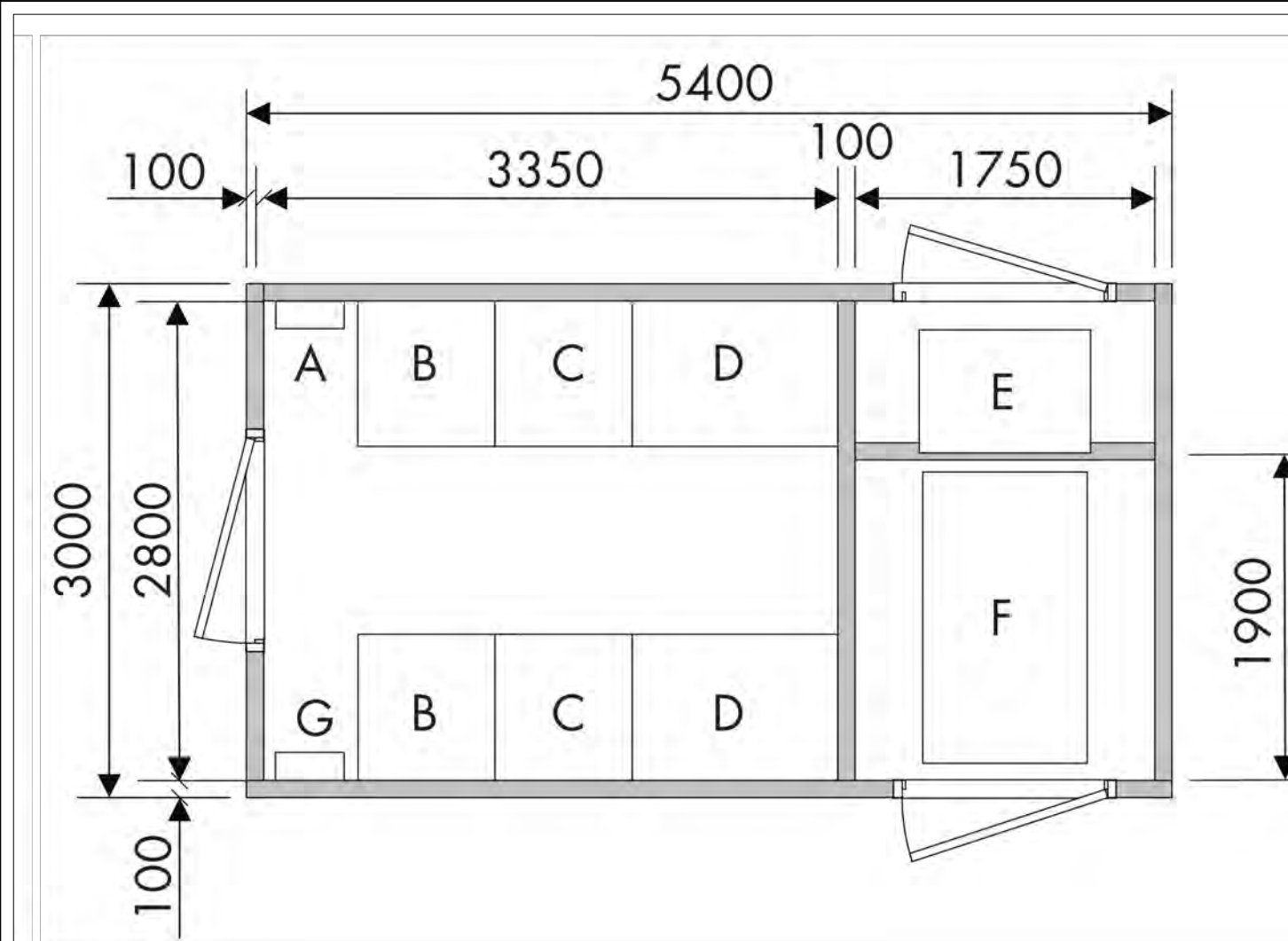
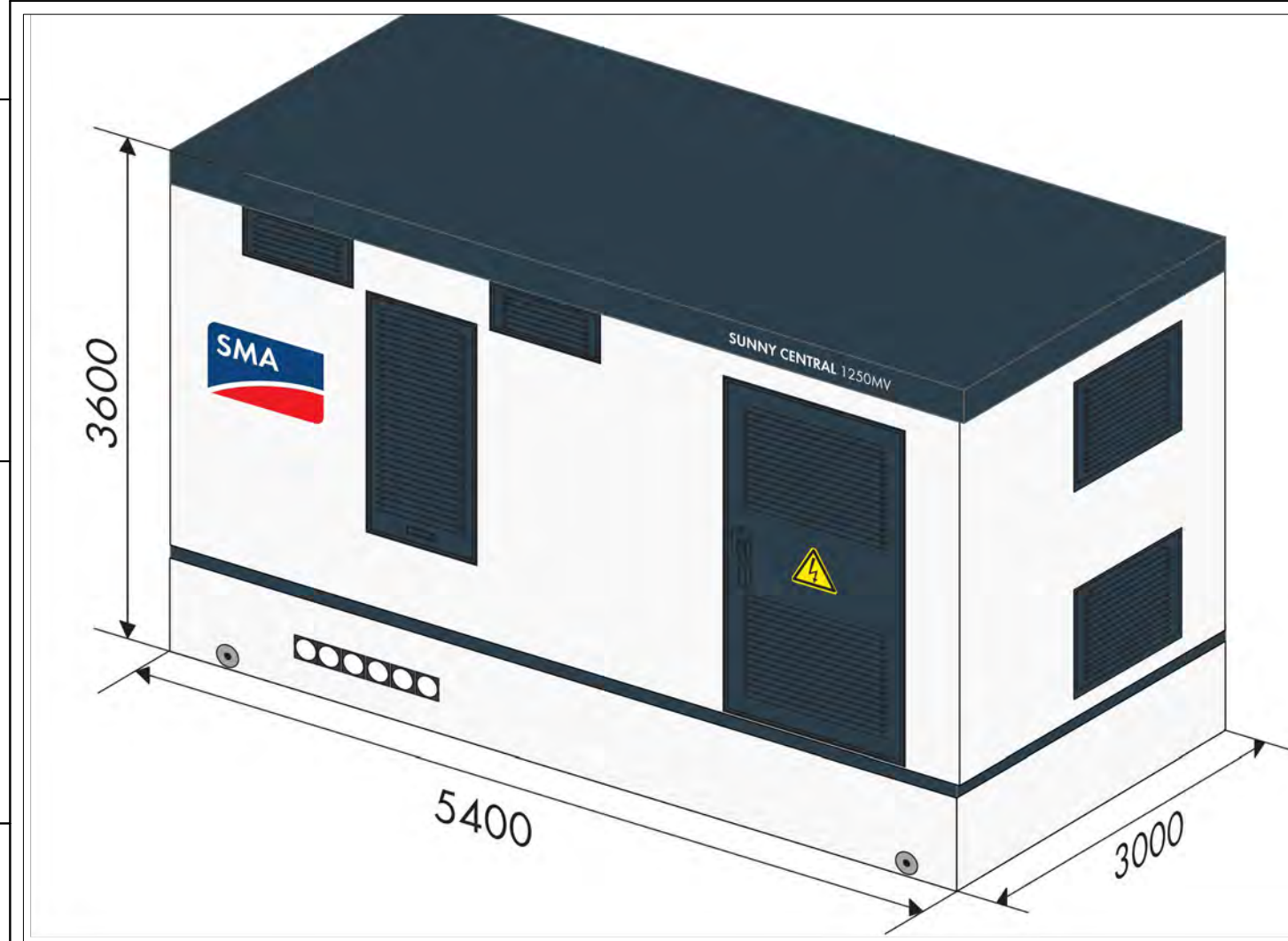




SUNNY CENTRAL 500HE-US INVERTER



- |   |  |   |  |
|---|--|---|--|
| <p><b>High Yields</b></p> <ul style="list-style-type: none"> <li>• 98% CEC efficiency</li> <li>• Suitable for ambient temperatures of up to 60 °C (140 °F)</li> <li>• OptiCool™ intelligent temperature management</li> </ul> | <p><b>Low System Costs</b></p> <ul style="list-style-type: none"> <li>• Outdoor-rated enclosure</li> <li>• Couples to medium-voltage external transformer</li> <li>• Available as integrated solution</li> </ul> | <p><b>Strong Peripherals</b></p> <ul style="list-style-type: none"> <li>• Optional DC &amp; AC disconnects</li> <li>• Optional combiner boxes with string monitoring</li> <li>• Sunny WebBox, Modbus® &amp; OPC compatible</li> </ul> | <p><b>UL Certified</b></p> <ul style="list-style-type: none"> <li>• UL 1741 / IEEE-1547 compliant</li> </ul> |
|---|--|---|--|



- All figures in mm.
- A COM-B, optional
  - C Sunny Central, inverter cabinet
  - E Medium-voltage switchgear
  - G Station sub-distribution

- B Sunny Central, DC cabinet
- D Sunny Central, AC cabinet
- F Transformer

Technical data	Sunny Central 500HE-US
<b>Input data</b>	
Max. DC power	565 kWp <sup>1)</sup>
MPP voltage range	330 V - 600 V
Max. DC voltage	600 V
Feed starting at [U] / [P]	380 V / 5000 W
Max. DC current	1600 A
Number of DC inputs	6 - 9
<b>Output data</b>	
Nominal AC power	500 kVA @ 45 °C (113 °F)
Max. AC current	1470 A @ 200 V
AC grid frequency	60 Hz
AC voltage range	180 V - 220 V
AC voltage range, full active power	196 V - 210 V
Power factor (cos φ)	> 0.99
Max. THD	< 5%
<b>Efficiency <sup>2)</sup></b>	
Max. efficiency	98.6%
CEC efficiency	98.0%
Euro-eta	97.9%
<b>Ambient conditions</b>	
Operating temperature range	-25 °C ... +60 °C (-13 °F ... +140 °F)
Max. temperature for nominal conditions	+45 °C (+113 °F)
Protection rating	NEMA 3R
Installation indoors / outdoors	●/●
Rel. humidity	15% ... 95%
Fresh air consumption	3000 m <sup>3</sup> /h
Internal consumption at nominal power	< 1600 W
Standby consumption (P <sub>night</sub> )	< 110 W
<b>Dimensions and weight</b>	
Height	2277 mm (90 in)
Width	2562 mm (101 in)
Depth	956 mm (38 in)
Weight	< 1800 kg (3970 lb)
<b>Certificates / listings</b>	
Certificates	UL 1741, UL 1998, IEEE 1547
EMC conformity	FCC, Part 15, Class A
<b>Interfaces</b>	
RS485 / Ethernet / analog	o/o/o
Display: text line / graphic	-/●
Communication protocols	Modbus / TCP
SSM-US connection	RS485
Plant monitoring	Sunny Portal

EQUIPMENT SPECIFICATIONS  
SCALE: NTS

NOTES:  
1. NONE.  
  
KEYED NOTES:  
①. NONE.

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DRAWING:  
EQUIPMENT SPECIFICATIONS  
DRAWING NO.  
**EP-701**

# PV SYSTEM GENERATOR CALCULATIONS

MODULE	CANADIAN SOLAR CS6X-270 (TYPICAL)	
MODULE STC POWER	270Wp	
MODULE TILT	30°	
ARRAY AZIMUTH	180°	
	GENERATOR, TYPICAL OF 10	SITE TOTAL
GENERATOR MANUFACTURER	SMA	SMA
GENERATOR MODEL	SUNNY CENTRAL 500HE	SUNNY CENTRAL 500HE
NUMBER OF MODULES PER GENERATOR	4,532	45,320
DC RATING	1,2236 MW	12,236 MW
AC NAMEPLATE RATING	1.0 MW	10 MW
NUMBER OF SOURCE CIRCUITS	412	4,160
SOURCE CIRCUIT COMBINERS	26	260

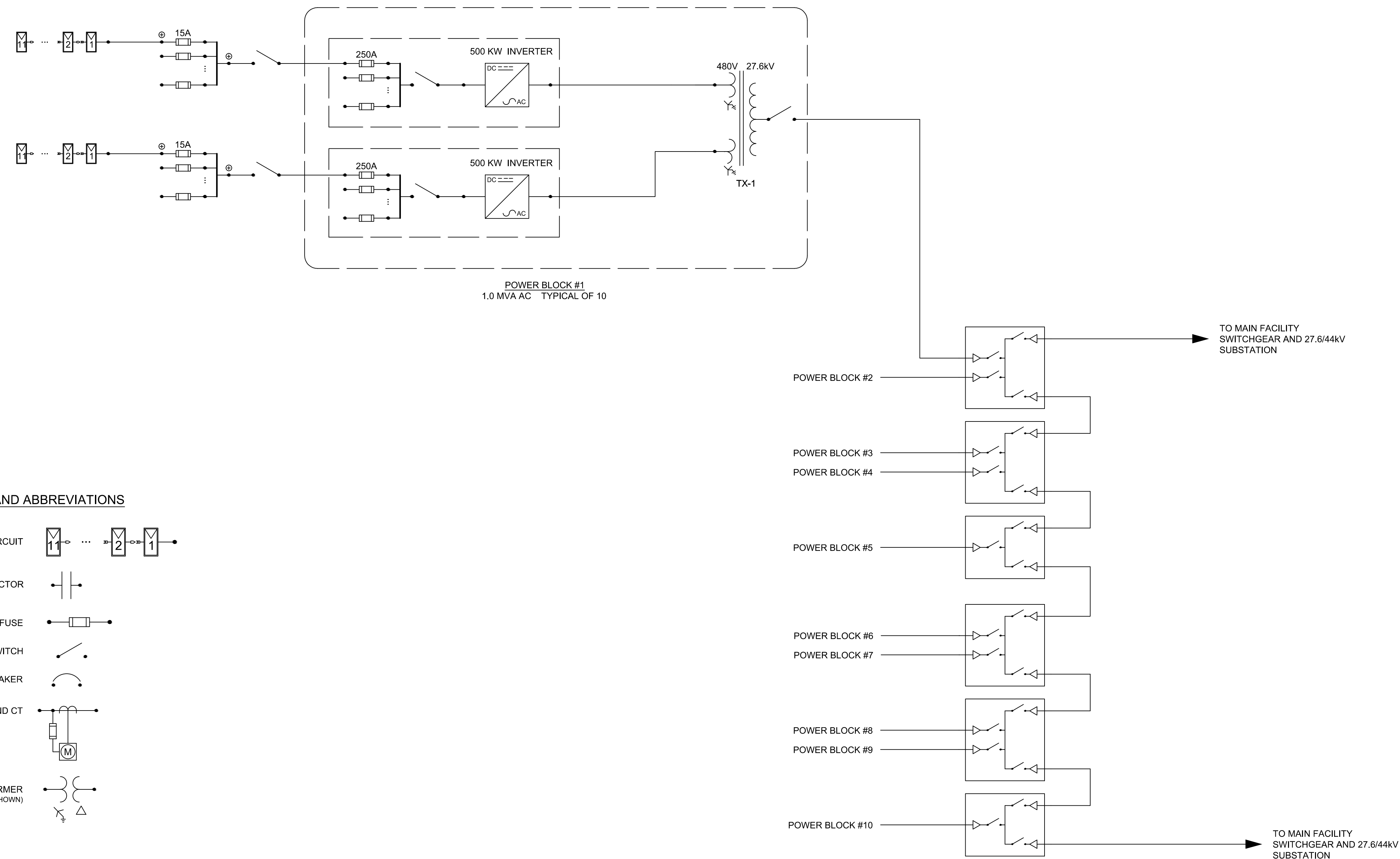
SOURCE CIRCUIT  
CANADIAN SOLAR MODULES  
CONFORMS TO IEC 61215  
600VDC MAX  
11 MODULES WIRED IN SERIES

16 STRING COMBINER BOX WITH  
INTEGRATED DISCONNECT  
TYPE 3R MIN.  
600 VDC MAX FUSES

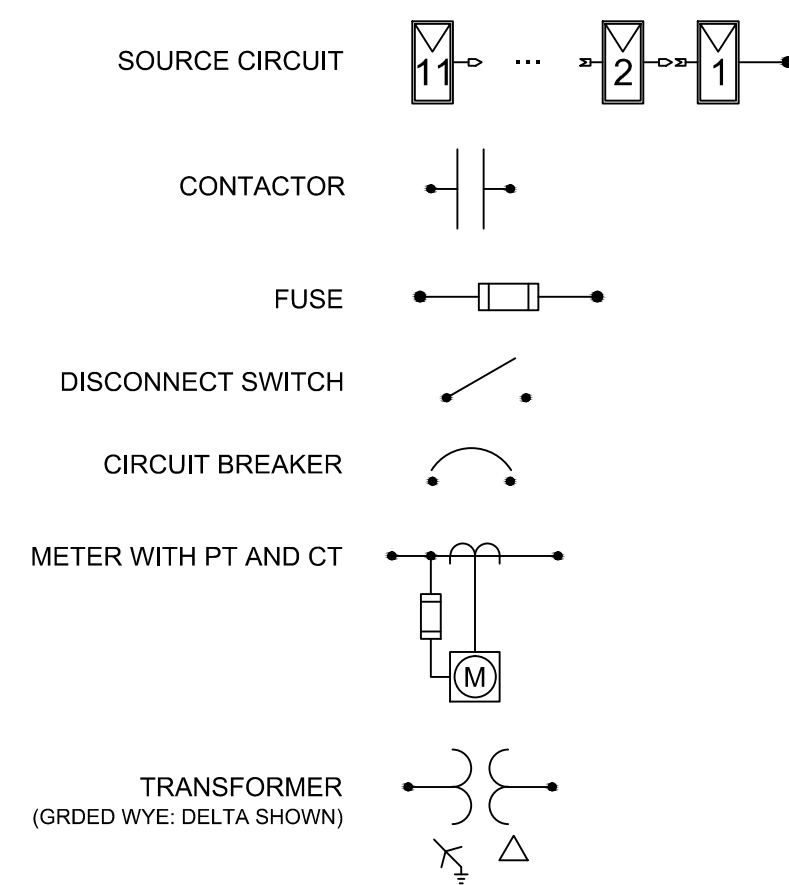
PV POWER CONDITIONING SYSTEM  
IEEE 929 AND IEEE 1547 COMPLIANT  
600 VDC MAX INPUT VOLTAGE  
PRODUCTION METERING OCCURS AT INVERTER OUTPUT WITH  
GROUND-FAULT DETECTION

TRANSFORMER  
1000 kVA, LV:27.6kV

SECTIONALIZING SWITCHES  
600A BUS, 200A LOAD RATINGS  
PAD MOUNTED



## SYMBOLS AND ABBREVIATIONS



## GENERAL NOTES:

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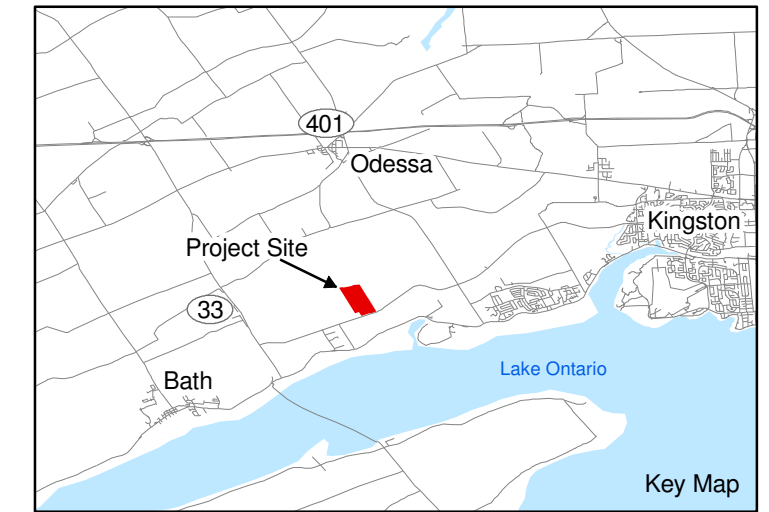
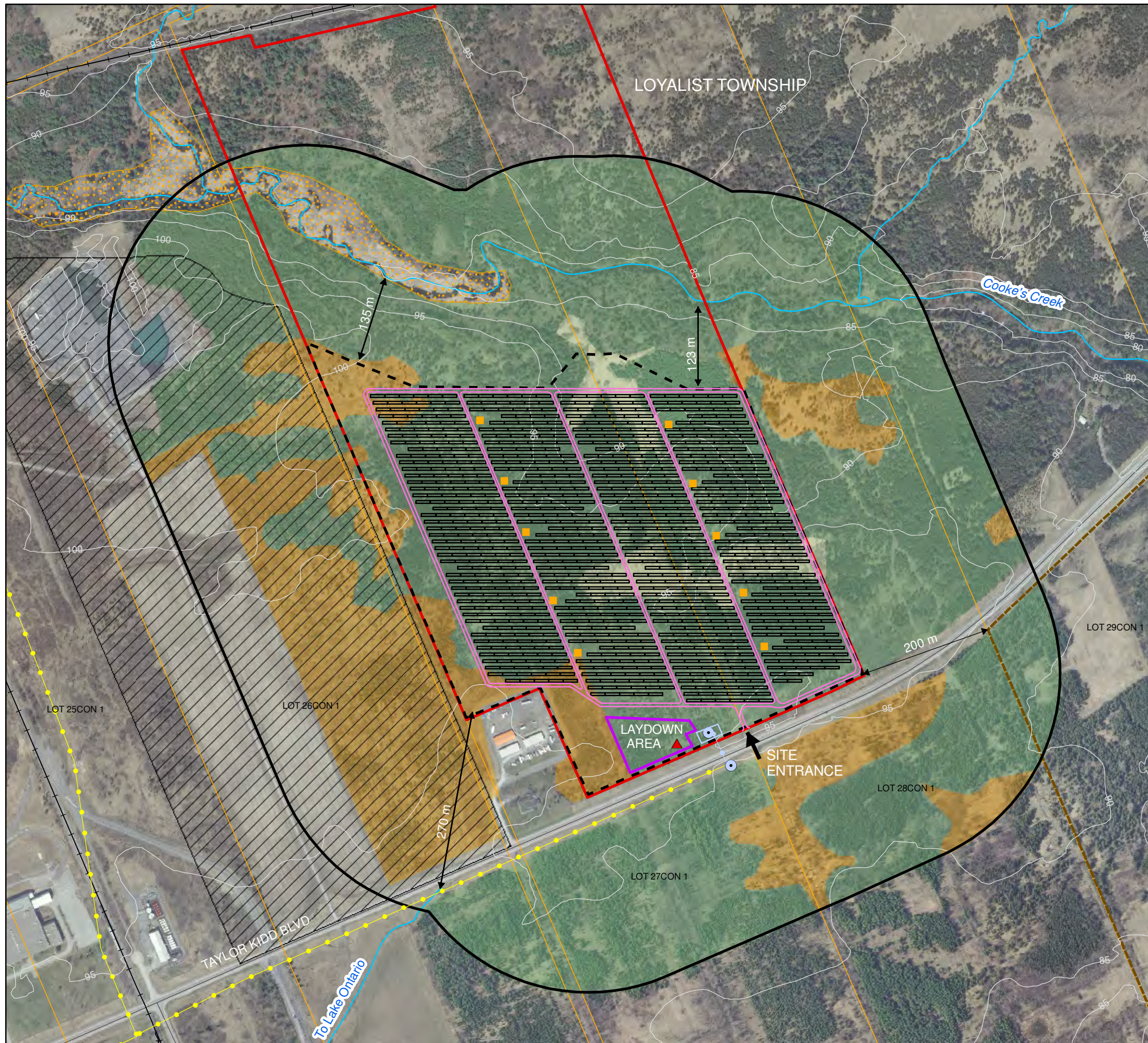
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PART OF LOTS 27 AND 28, CONCESSION 1,  
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DRAWING: SINGLE LINE DIAGRAM

DRAWING NO. **EP-801**







**LEGEND**

**Existing Features**

- Road
- +— Railway
- Transmission Line (new 44 kV by Hydro One)
- Topographic Contour (5 m interval)
- Watercourse
- - - Project Location
- ▭ Project Site
- ▭ 300 m from Project Location
- ▭ Parcel
- ▨ Authorized Aggregate Site
- ▭ Parrott's Bay Conservation Area

**Significant Natural Features / Significant Wildlife Habitat (within 120 m of Project Location)**

- ▭ Cultural Meadow / Significant Wildlife Habitat (Raptor Nesting / Milksnake)
- ▭ Cultural Thicket / Significant Wildlife Habitat (Raptor Nesting / Milksnake)
- ▭ Significant Wildlife Habitat (Amphibian Breeding / Waterfowl Nesting / Marsh Bird Breeding)
- ▭ Significant Woodland / Significant Wildlife Habitat (Area Sensitive Bird Breeding / Raptor Nesting / Milksnake)

**Proposed Project Components**

- Panel Layout
- Access Roads
- - - Fence
- Transmission Line
- Inverter
- ▲ Communication Tower
- ⊙ Substation
- ⊙ Connection Point
- ▭ Laydown Area

**Notes:**

- OBM and NRVIS data downloaded from LIO with permission.
- Spatial referencing UTM NAD 83.
- Air Photos obtained from Cataraqui Region Conservation Authority, flown in 2008, scale 1:2000.
- Significant natural features and wildlife habitat depicted within 120 m of Project Location obtained from Ecological Services (2011c).

0 50 100 200 Metres  
Scale 1:6,000

NORTH

Figure 2.1  
 Axiom Power Canada Inc./SunEdison Canada  
 Napanee TS Taylor Kidd  
 Site Layout Plan **HATCH**