Solar Feasibility Site Survey

The Solar contractor must present the full Solar Feasibility Site Survey (SFSS) document for the solar feasibility survey. All informations recorded in this document must be factually accurate. Note: Solar contractor will be fully liable for non-performance of the solar solution because all data captured on this SFSS documents will be use as key inputs to produce the final solar solution design, thus contractors is fully responsible for the solution. Ensure no property or live equipments is affected during the survey and all completed forms must be legible.

Contractor must present the following tools for the survey:

- Compass
- Surveyor's Tape measure
- Pen and Book
- Digital Camera
- ATC Site Acsys key
- Clamp meter (optional)

Site ID	601707	Site Name	NEW DROBO 3		
Date	9th Dec, 2019	Time	4:50 pm	Region	BA

Site Coordinate	Latitude	longitude
	7.60408	-2.78808

Contractor: PARK INFRATEL GHANA LIMITED

Names of Contractor Rep: SAMUEL BULLEY

Contact of Contractor Rep: 0577746777

Rev.02 02/04/19
Prepare by Fred Darko

Site ID	601707	Site Name	NEW DROBO 3		
Date	9th Dec, 2019	Time	4:50 pm	Region	BA

1. Site Information

1.1	DC System on site?	Yes ☐ No ☑
1.2	DC System brand and size	Emerson ☐ Single ☐ Delta ☐ Dual ☐ If Other Specify: Yet to be installed
1.3	Is space available inside the DC Cabinet for Solar MPPT Controller to be installed at the power compartment section	Yes ☐ No ☐
1.4	Measure and record the available space for the MPPT controller in the DC cabinet	Length: m Height: m
1.5	Is there any tall structure, tree or building higher than the site fence that can cause possible shading?	Yes ☑ No ☐
1.6	If Yes indicate or name the structure type(s)	Four Trees
1.7	If yes, specify the height and the distance of the structure from the site fence	Height of structure AGL: 8m,8m,1Om,10m Distance from fence: 9m,5m,4m,6m
1.8	Record distance from Shed leg on which DB will be fixed to the DC Cabinet in meters	
	Any comment: No DC cabinet installed in the site	

2. DC Supply parameter

2.1	System Voltage	DC System yet to be installed	**V**	*Measured between +ve and -ve*
2.2	Load Current_1	DC System yet to be installed	**A**	*Measured on -ve cable*
2.3	Load Current_2		**A**	*Measured on -ve cable*
2.4	Load Current_3		**A**	*Measured on -ve cable*
2.5	Load Current_4		**A**	*Measured on -ve cable*

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3. Site Dimension Detail

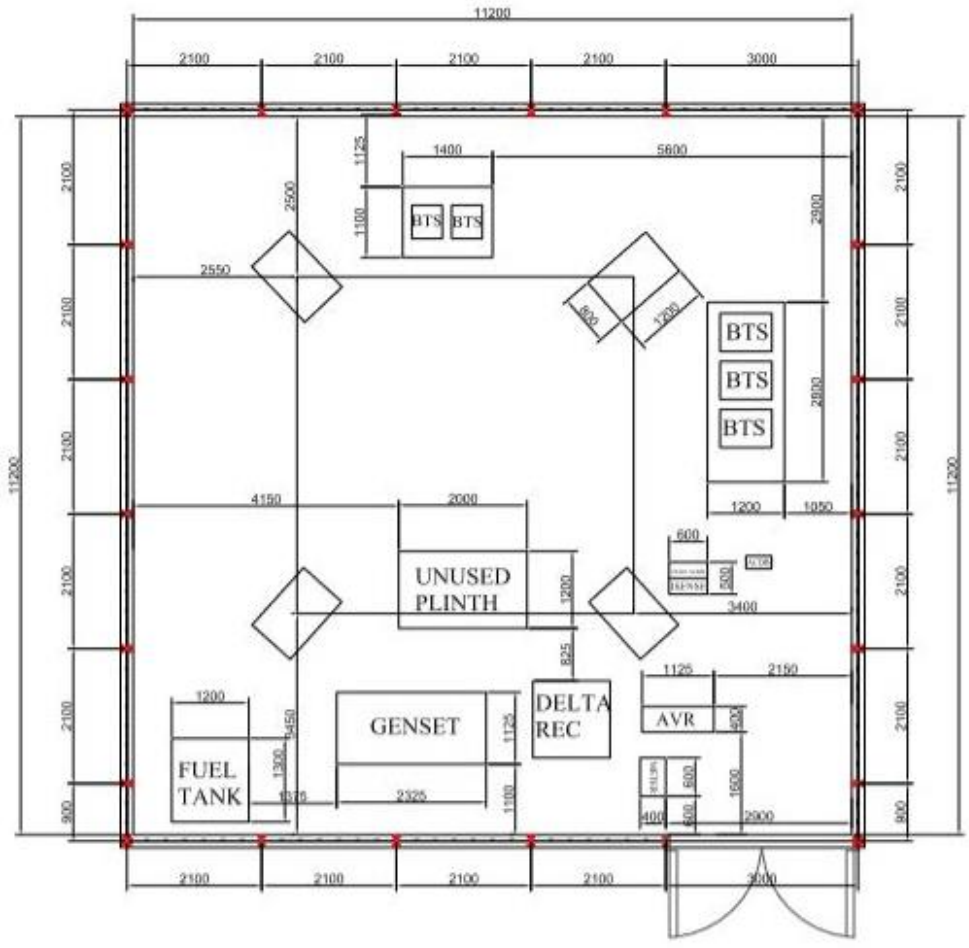
Site Dimension		
Front side (Gate side)	11.2	meters
Right Side (When facing the gate from outside the site)	11.2	meters
Back Side (opposite the gate side)	11.2	meters
Left Side (When facing the gate from outside the site)	11.2	meters
Available space around the tower		
Distance from tower Leg/face or monopole to front side of fence	3.45	meters
Distance from tower Leg/face or monopole to Right side of fence	2.55	meters
Distance from tower Leg/face or monopole to Back side of fence	2.55	Meters
Distance from tower Leg/face or monopole to Left side of fence	3.4	Meters
Propose location for Solar shed (Option_1) *(It's recommended this field must be completed only after sketching and plotting the shades for sketch_3)*		
Length of Side_A	2	Meters
Length of Side_B	7	Meters
Length of Side_C	2	Meters
Length of Side_D	7	Meters
Propose location for Solar shed (Option_2) *(It's recommended this field must be completed only after sketching and plotting the shades for sketch_3)*		
Length of Side_A	2	Meters
Length of Side_B	7	Meters
Length of Side_C	2	Meters
Length of Side_D	7	Meters

Site ID	601707	Site Name	NEW DROBO 3		
Date	9th Dec, 2019	Time	4:50 pm	Region	BA

4. Geographical information

Sketch block diagram of site layout show the following;

- Tower and site entrance
- All available equipments plinth
- All equipments (Genset, DC Cabinet, AVR, etc)
- Indicate dimensions between adjoining equipments and fence and
- Provide the True North & South in relation to the site orientation

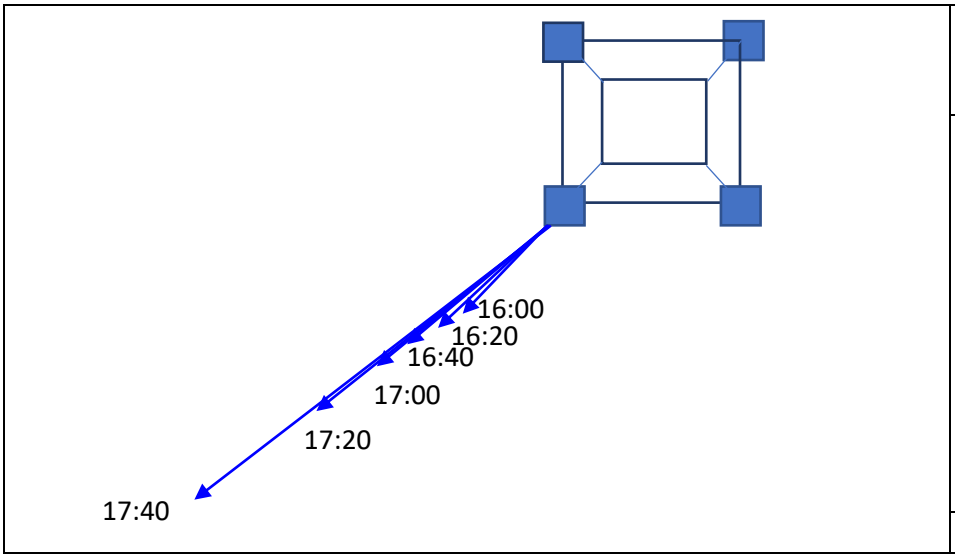


Compass True North

SKETCH-1

Site ID	601707	Site Name	NEW DROBO 3		
Date	9th Dec, 2019	Time	4:50 pm	Region	BA

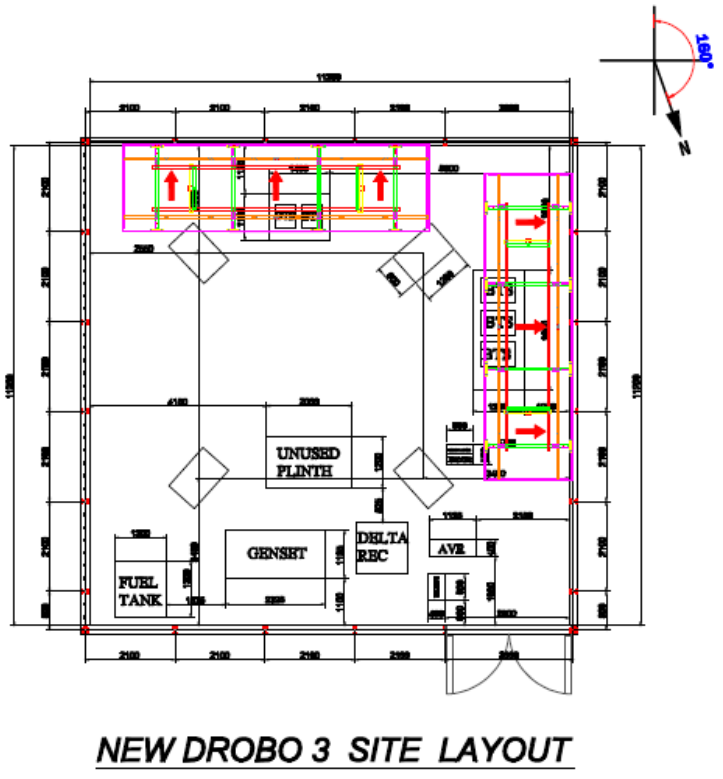
Site Tower and its Shade at Every 20 Minutes for 2 Hours and Sun Path



Compass True North

SKETCH-2

Preferred PV Shed Location on the Site Sketch-1

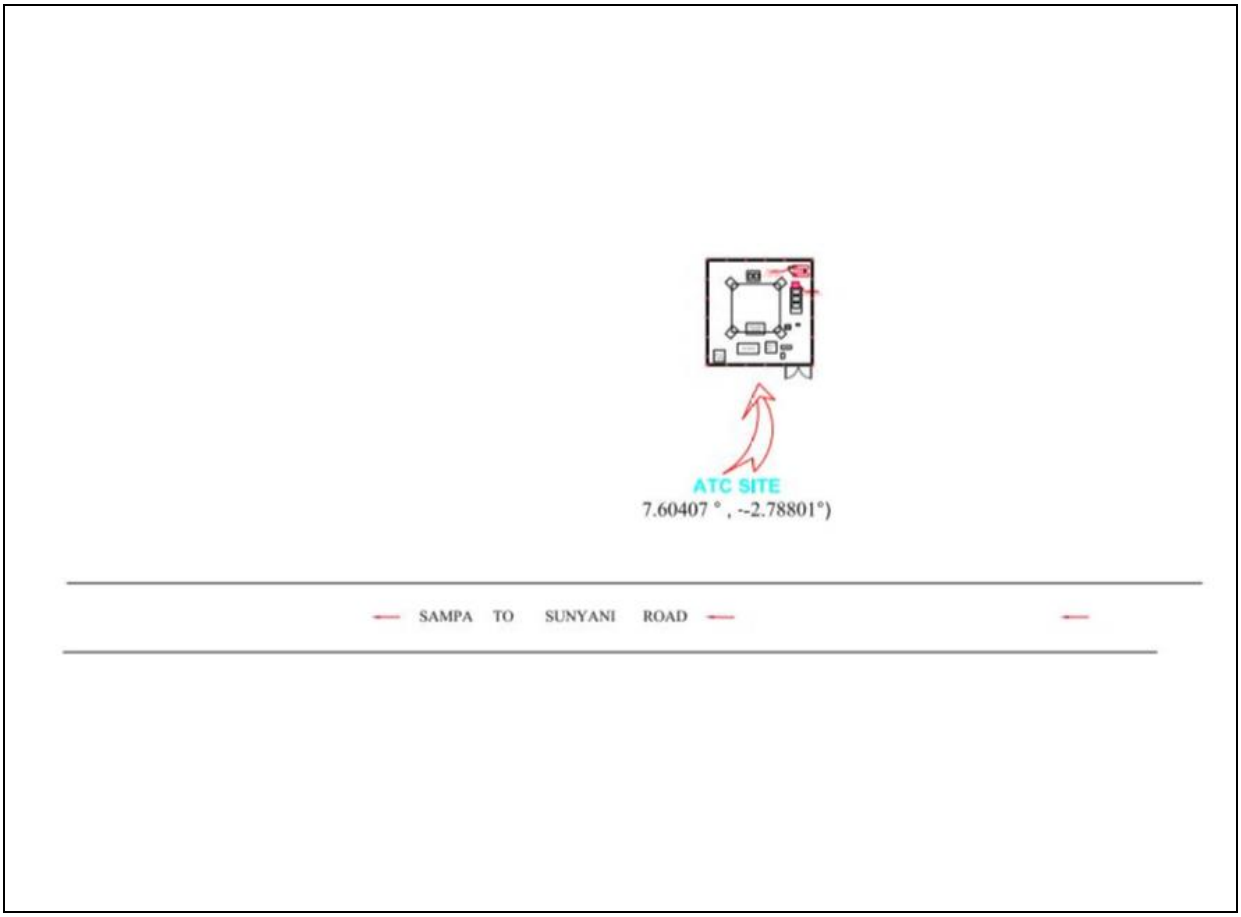


Compass True North

SKETCH-3

Site ID	601707	Site Name	NEW DROBO 3		
Date	9th Dec, 2019	Time	4:50 pm	Region	BA

Locality Map Indicating Available Roads and Any Major Land Marks



5. Supporting images

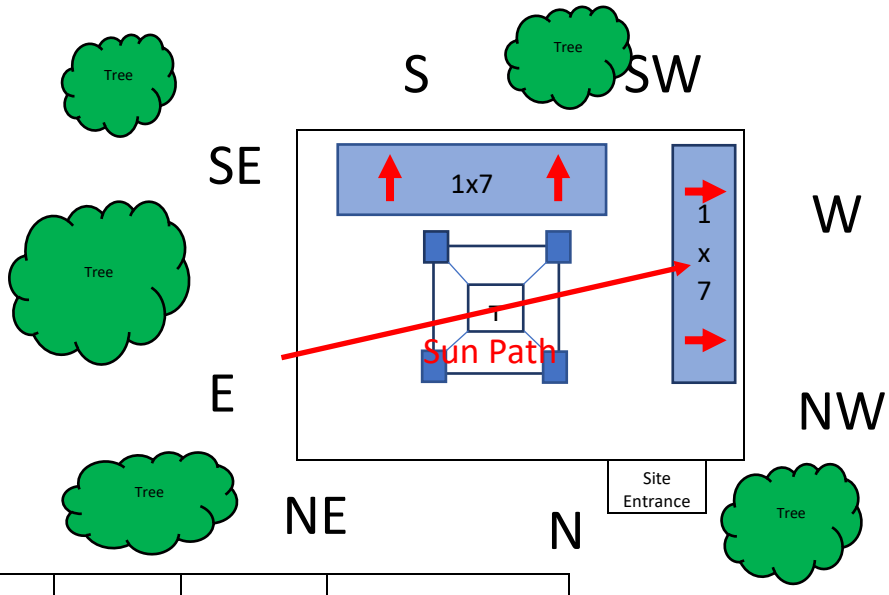
Submit softcopies of site pictures of the following;

1. Site Signage
2. Image of all 4 sides around the tower which were recorded as Option_1 and or 2
3. Image of power compartment of DC system where Solar MPPT will be fix
4. Complete site view from a distance to capture the full tower on site
5. Google map view of the site and indicate the position of the site gate on the map and compass direction

	Solar Contractor Representative	ATC Ghana Representative
Name	Samuel Bulley	
Sign		
Date	9th December, 2019	

Design Summary Sheet (DSS)

Contractor	PARK INFRATEL GHANA LIMITED	Site ID	601707
Site Name	NEW DROBO 3	TSS Date	9th Dec, 2019



Site Load	V	I	kW
Total Design Peak Power (kW_p)			5.32 kW

DC System Not Yet Installed

Design Parameters	Solar Structure_1		Solar Structure_2		Solar Structure_3	
Size of structure	1x7		1x7		NA	
Quantity of PV modules	7		7		NA	
Rating of PV module	380		380		NA	
No of MPPT required	1		1		NA	
Battery type on site	INCELL		INCELL		NA	
Structure facing towards (Azimuth)	W		S		NA	
Structure Angle Tilt (°)	10°		10°		NA	
Potential Shading (Solid object > 3m) include image	Height (m)	Distance (m)	Height (m)	Distance (m)	Height (m)	Distance (m)
	10 , 8	6 , 5	8 , 8	3 , 9	NA	NA

	Vetted
Name	
Sign/Date	

Note: This document is in no way guaranteeing the energy yield of the solar plant to be built by the solar vendor but verifying minimal design input consideration and inventory requirement.

Solar Feasibility Site Survey

SITE NAME: NEW DROBO 3 **SITE ID: 601707**

SITE SIGNAGE

SITE FRONT VIEW

FRONT (GATE VIEW)

BACK VIEW

Solar Feasibility Site Survey

SITE NAME: NEW DROBO 3 **SITE ID: 601707**

	
LEFT VIEW	**RIGHT VIEW**
	
COMPLETE SITE/TOWER VIEW	**COMPASS**

Solar Feasibility Site Survey

SITE NAME: NEW DROBO 3 **SITE ID: 601707**

NO DC CABINET ON SITE	**POSITION FOR MPPT CONTROLLER (NA)**
	
PROPOSED SOLAR PV LOCATION-1 (1X7)	**PROPOSED SOLAR PV LOCATION-2 (1X7)**

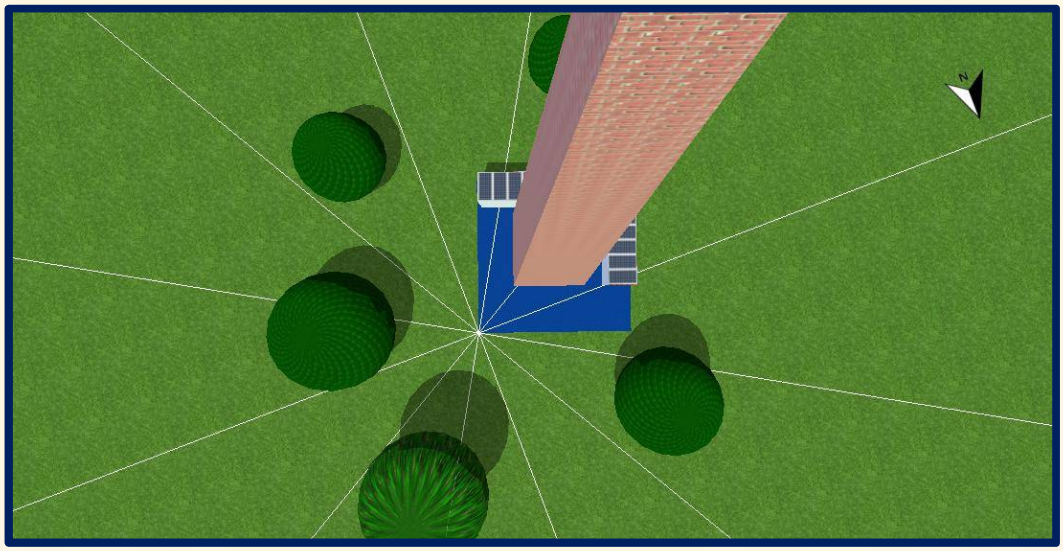
Solar Feasibility Site Survey

SITE NAME: NEW DROBO 3 **SITE ID: 601707**

SATELITE VIEW

SIMULATION REPORT

SOLAR POWER GENERATION
WITH
SHADING ANALYSIS



NEW DROBO 3

(Site ID: 601707)

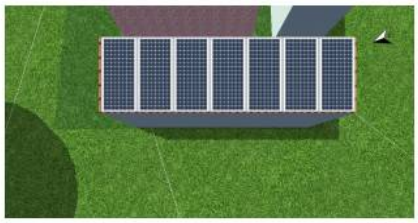
Simulation done using PV SOL

PROJECT OVER VIEW

A grid connected SPV plant is proposed at the Site. The proposed location is provided below. The site has a mobile tower of 54m height. So, the Shadow of the tower will fall on the SPV panels which are mounted at an elevation of 3.5m. As all other buildings inside the fence are below the SPV panel level, their shadow will not fall on the Panels. However, if there is any other adjacent building, structure or tree of more than 3m outside the fence, shadow of the same has been considered. Solar simulation has been carried out in this report keeping these parameters in view.

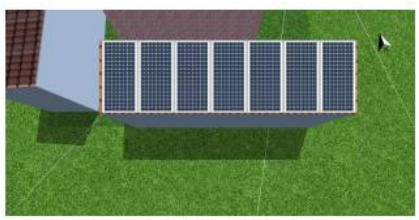
Module Data	Manufacturer: Jinko Solar Model: Swan JKM380M-72H Nominal output: 380 W	
Number of PV Modules	7	Power 2.66 kWp
Orientation	290°	Azimuth 110 °
Inclination	10°	
Installation Type	Roof parallel	
Diffuse Shading	27.21%	

Latitude(S):**7.60408**
Longitude (E); **-2.78808**

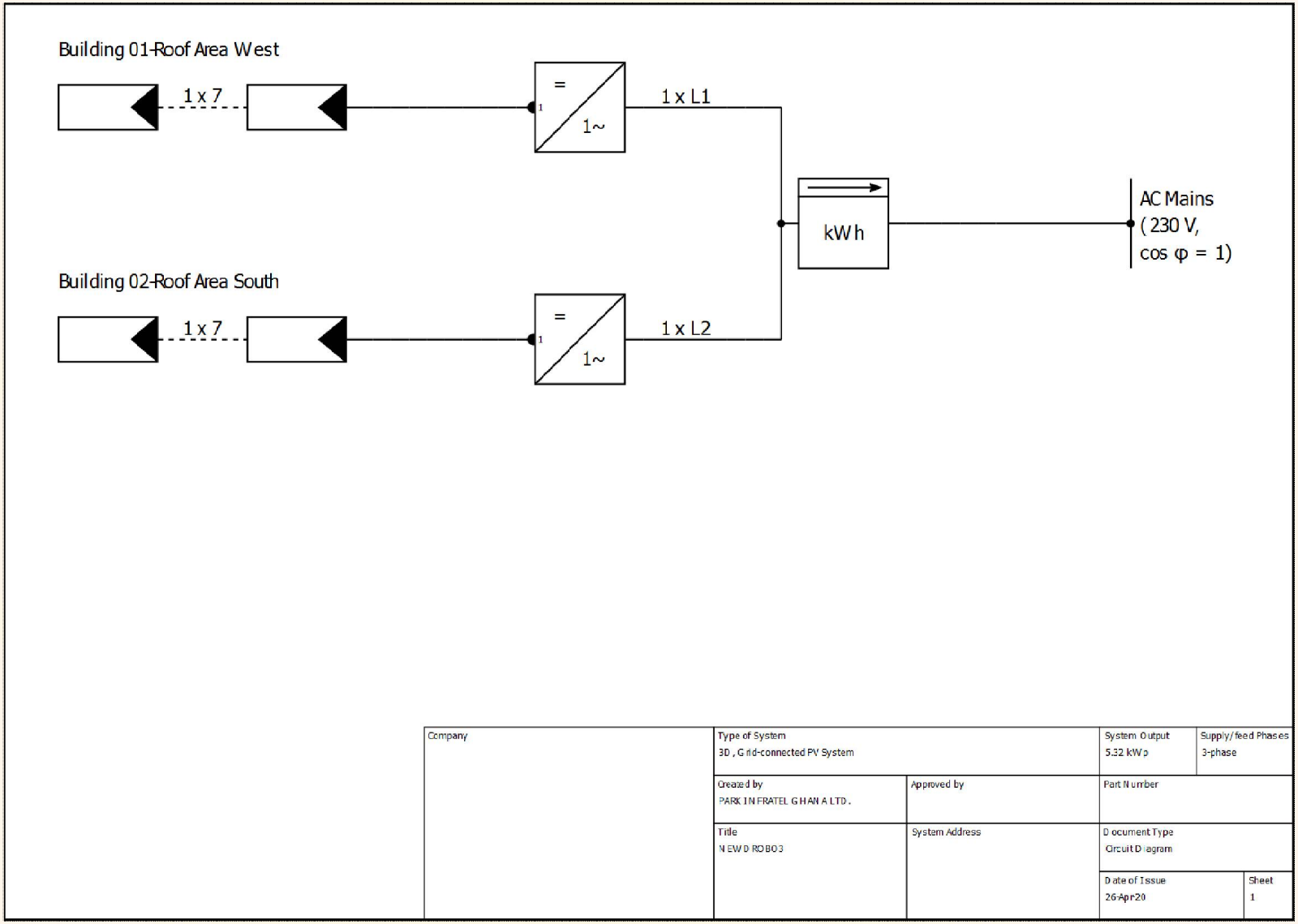


Module Data	Manufacturer: Jinko Solar Model: Swan JKM380M-72H Nominal output: 380 W	
Number of PV Modules	7	Power 2.66 kWp
Orientation	200°	Azimuth 20 °
Inclination	10°	
Installation Type	Roof parallel	
Diffuse Shading	28.94%	

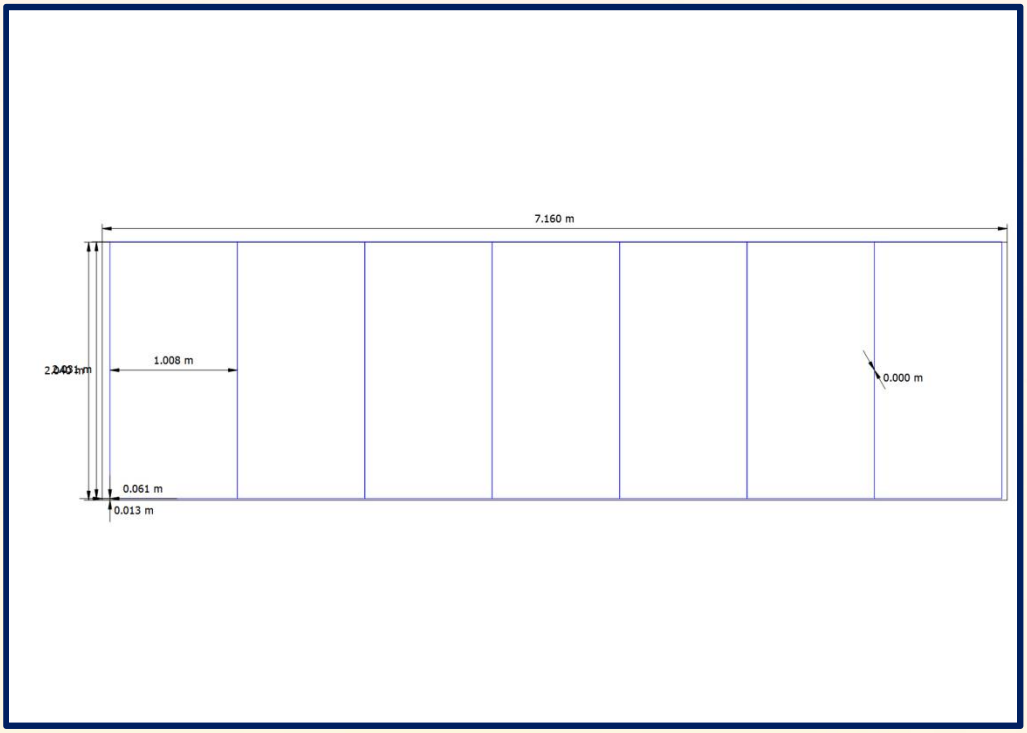
Latitude(S):**7.60408**
Longitude (E); **-2.78808**



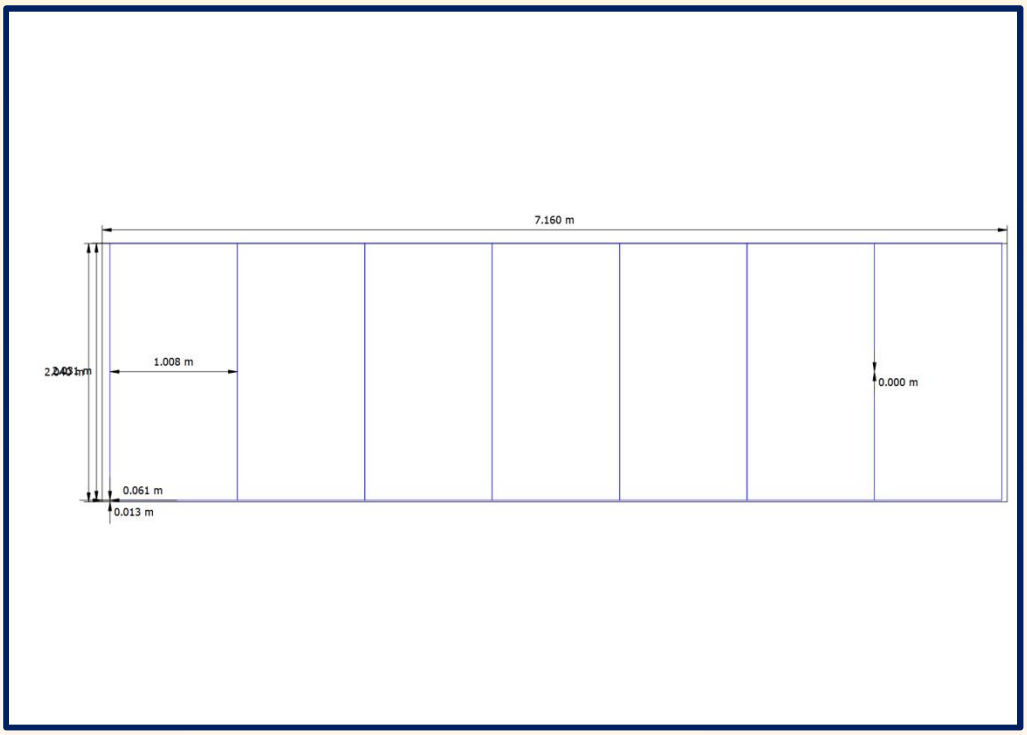
SYSTEM SLD


Building 01-Roof Area West
1 x 7
=
1~
1 x L1
Building 02-Roof Area South
1 x 7
=
1~
1 x L2
kWh
AC Mains
(230 V,
cos φ = 1)
Company
Type of System
3D , Grid-connected PV System
System Output
5.32 kWp
Supply/feed Phases
3-phase
Created by
PARKINFRATEL GHANA LTD.
Approved by
Part Number
Title
NEW D ROBO3
System Address
Document Type
Circuit Diagram
Date of Issue
26-Apr20
Sheet
1

ARRANGEMENT OF SPV MODULES

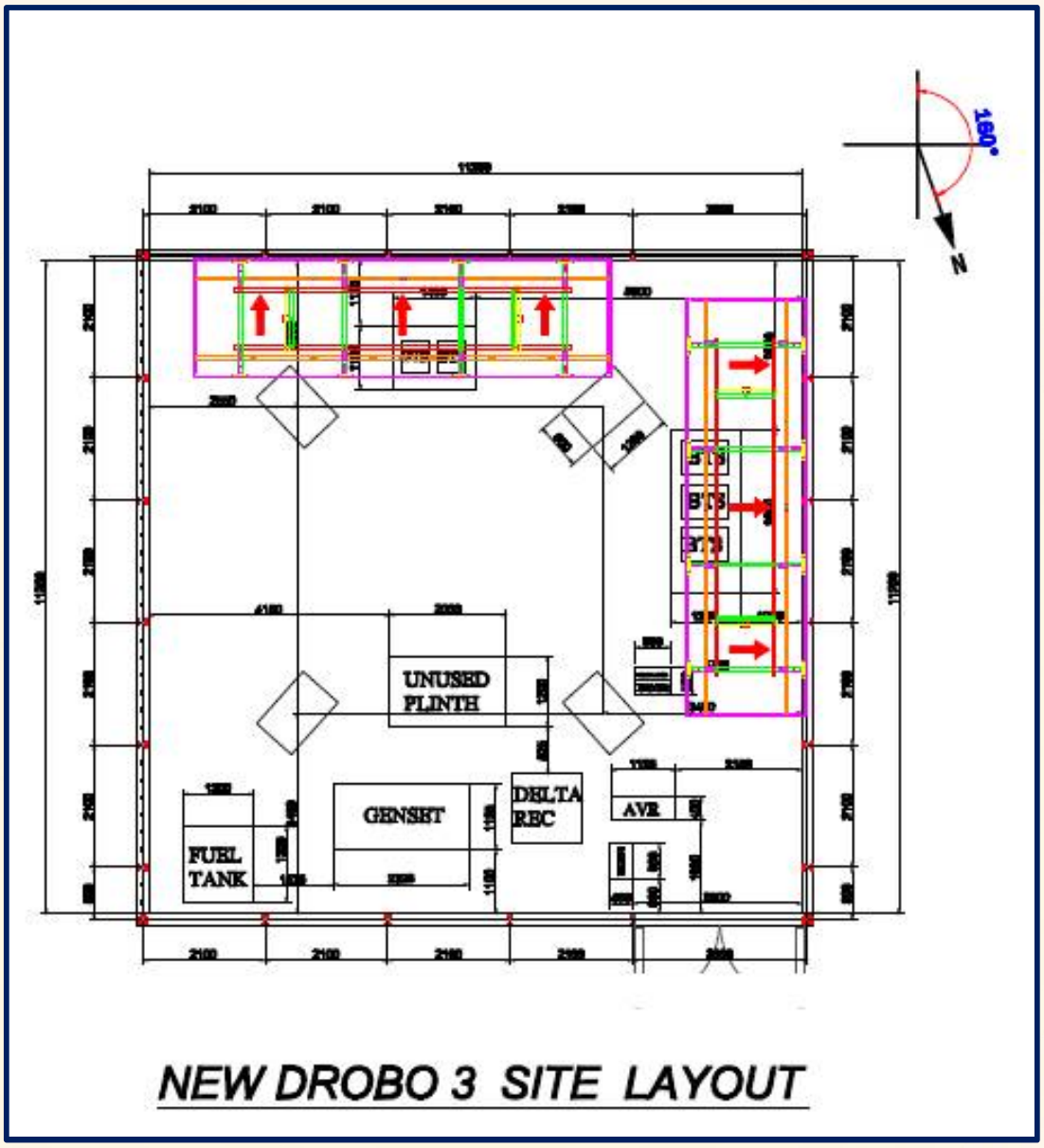


BUILDING-1 PANEL DIMENSION PLAN



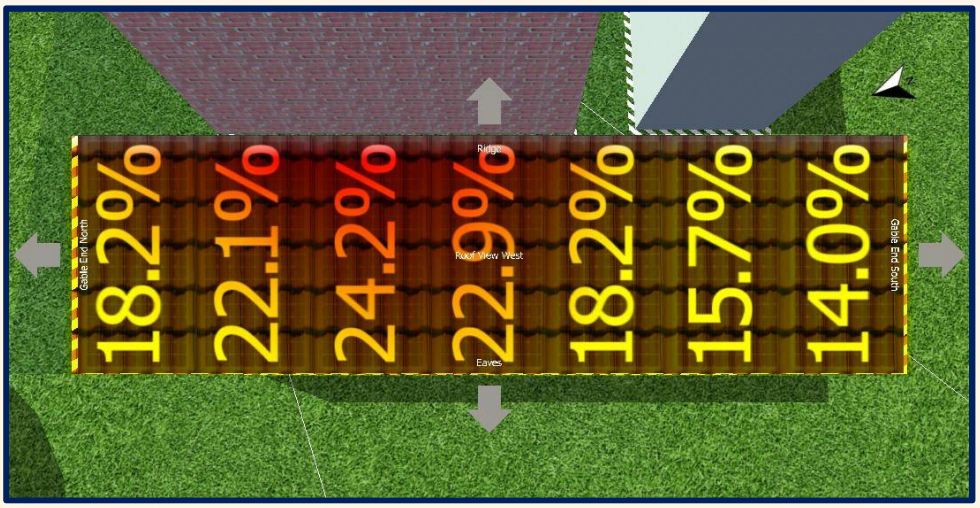
BUILDING-2 PANEL DIMENSION PLAN

GENERAL ARRANGEMENT

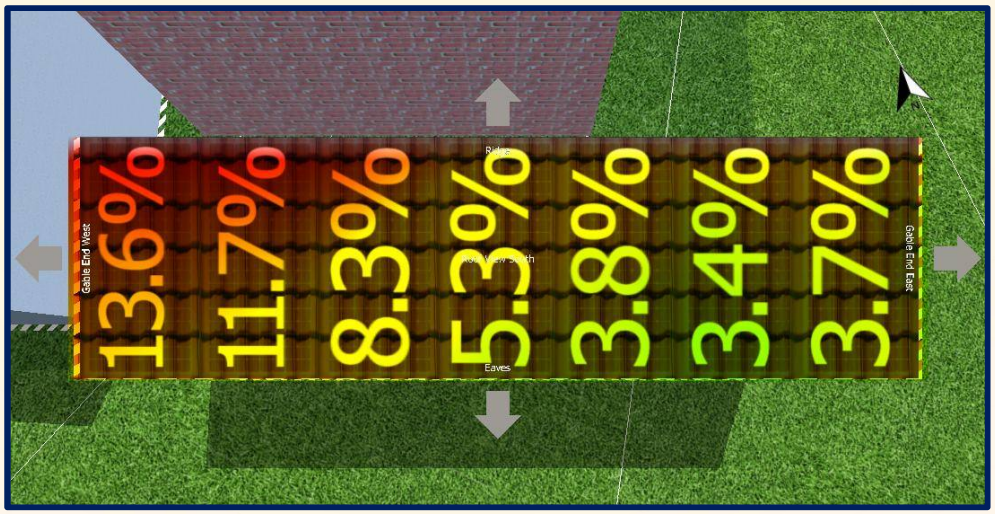


NEW DROBO 3 SITE LAYOUT

SHADING ANALYSIS

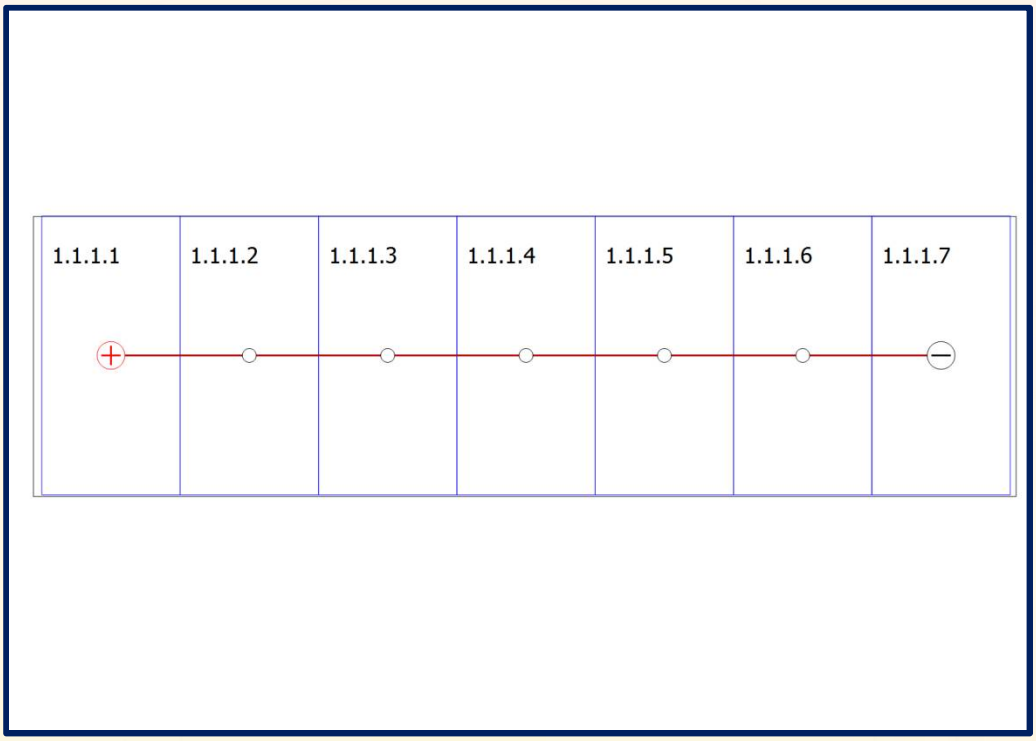


BUILDING-1 PANELS SHADING LOSS

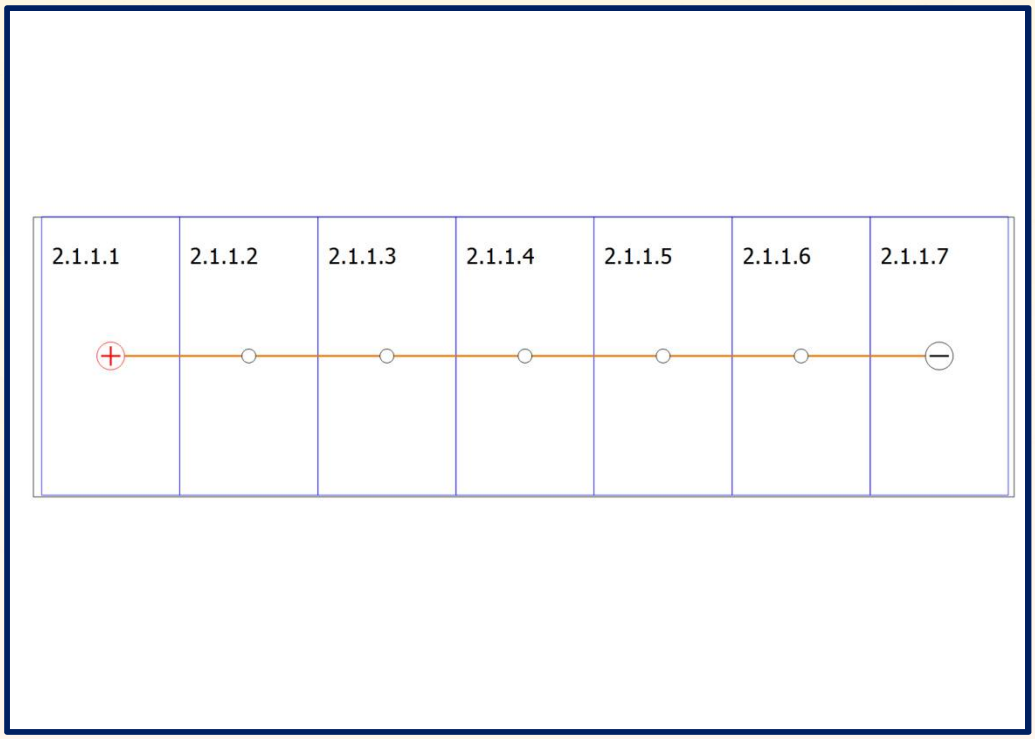


BUILDING-2 PANELS SHADING LOSS

CABLE PLAN

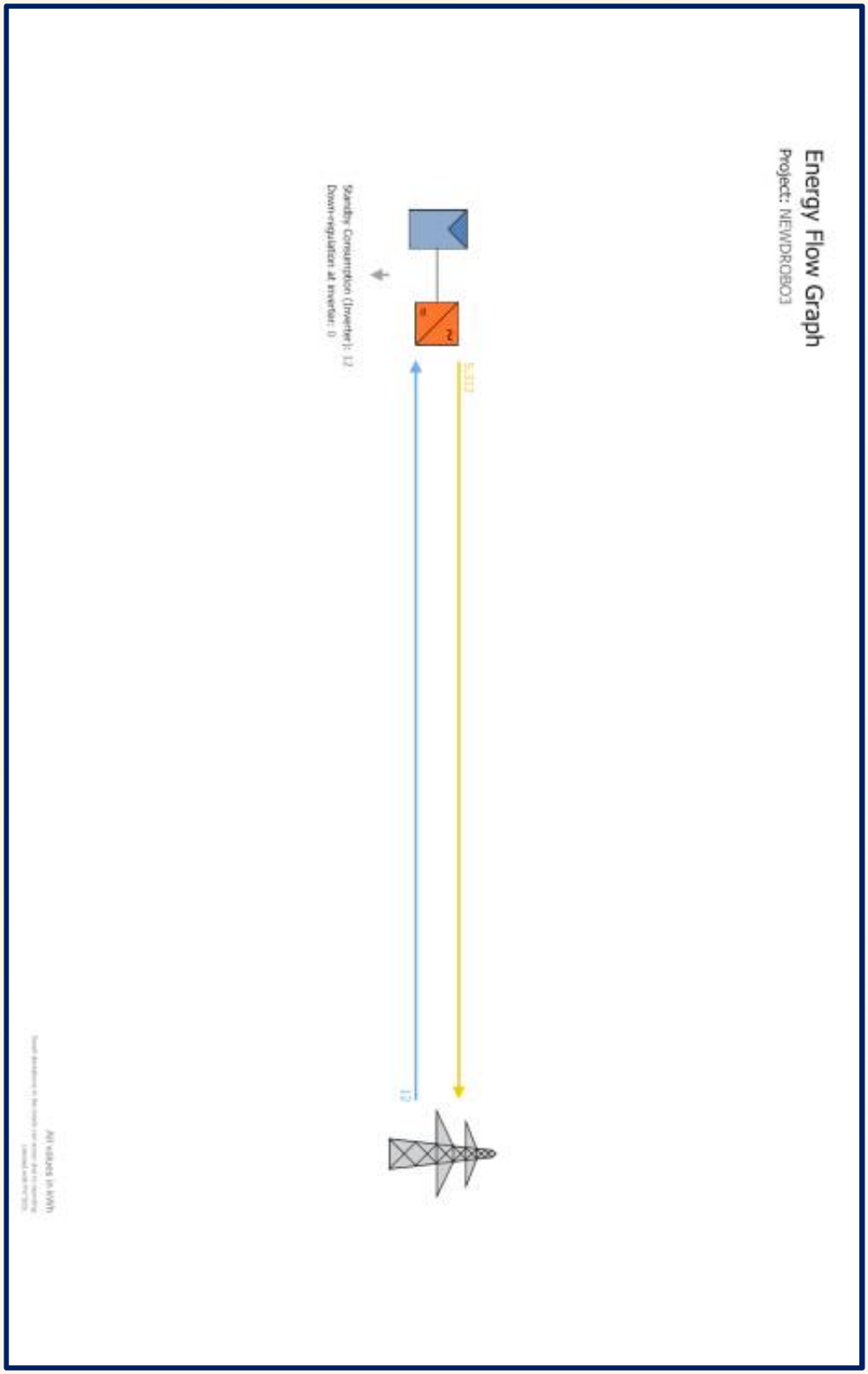


BUILDING-1 PANEL CABLE PLAN

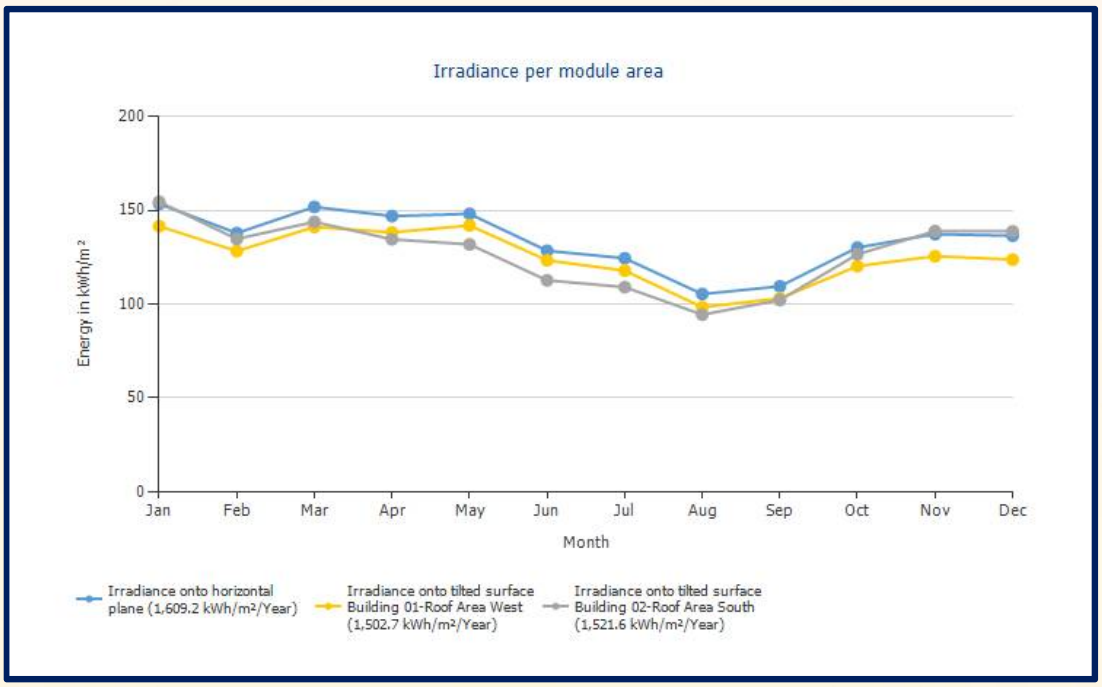


BUILDING-2 PANEL CABLE PLAN

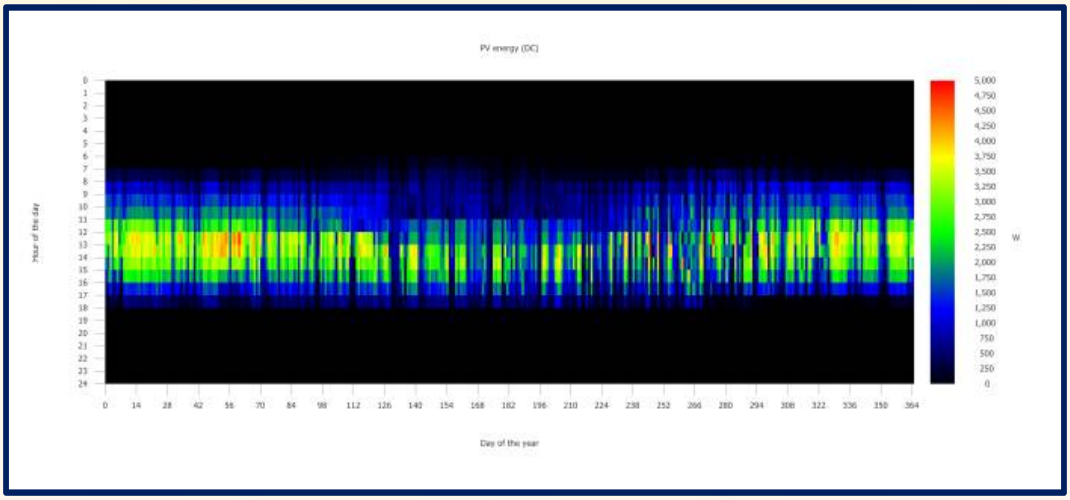
ENERGY FLOW DIAGRAM



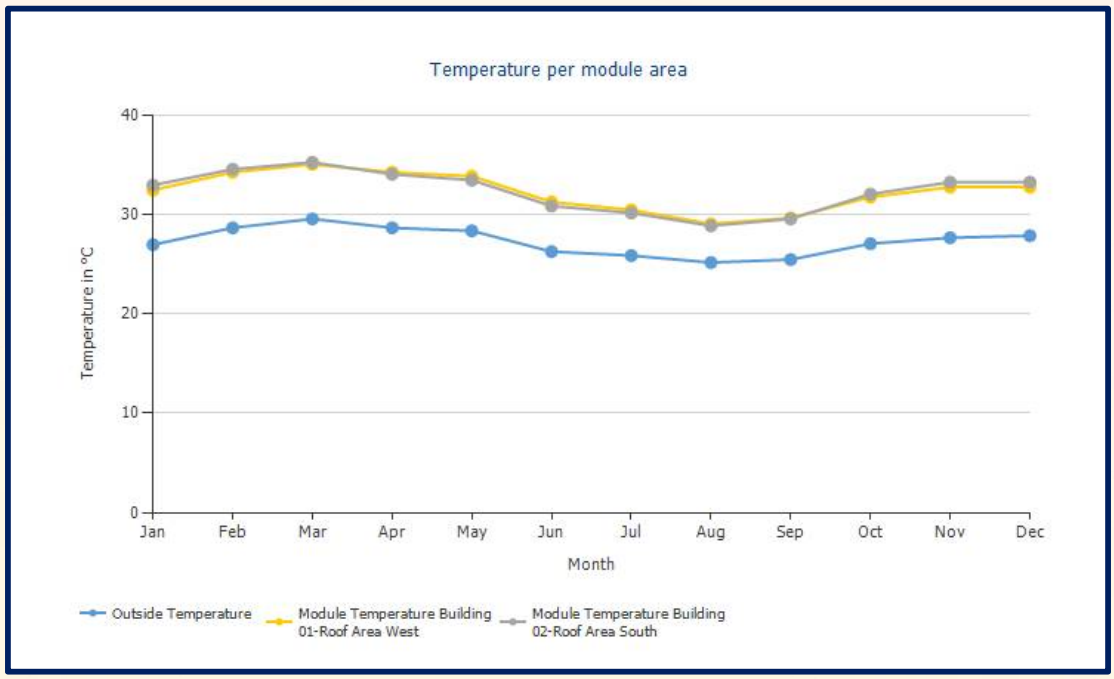
SOLAR RESOURCE ANALYSIS



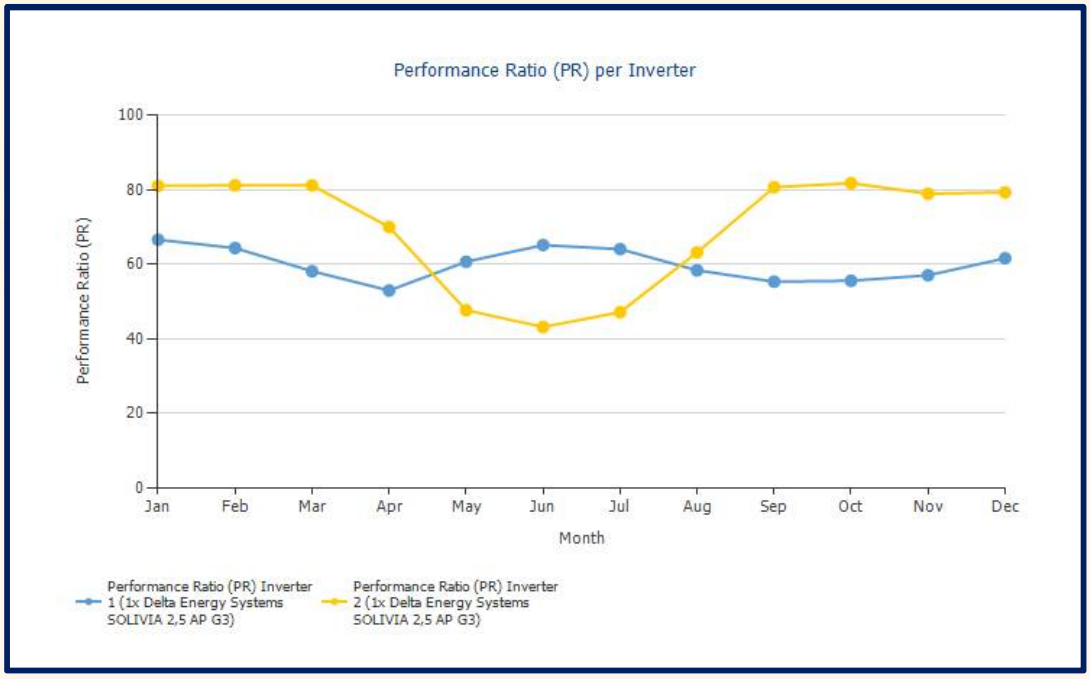
PV ENERGY (DC)



SPV THERMAL ANALYSIS



PERFORMANCE RATIO PER INVERTER



SYSTEM CONFIGURATION

Project Data

Project Name	NEWDROBO3
Project Number	601707
Project Designer	PARK INFRATEL GHANA LTD.
Start of Operation	25-Apr-20

System Type, Climate and Grid

Type of System	3D, Grid-connected PV System
Climate Data	NEWDERBO3, GHA
Resolution of the data	1 h
AC Mains	230 V, 3-phase, cos φ = 1
Maximum Feed-in Power...	No

3D Design

Module Area	Building 01-Roof Area West
Module Data	Swan JKM380M-72H
Manufacturer	Jinko Solar
Number of PV Modules	7
PV Generator Output	2.66 kWp
Inclination	10°
Orientation	290°
Installation Type	Roof parallel
Module Area	Building 02-Roof Area South
Module Data	Swan JKM380M-72H
Manufacturer	Jinko Solar
Number of PV Modules	7
PV Generator Output	2.66 kWp
Inclination	10°
Orientation	200°
Installation Type	Roof parallel

Configuration

Module Area	Building 01-Roof Area West
Inverter 1	SOLIVIA 2,5 AP G3
Quantity	1
Manufacturer	Delta Energy Systems
Configuration	MPP 1: 1 x 7
Module Area	Building 02-Roof Area South
Inverter 2	SOLIVIA 2,5 AP G3
Quantity	1
Manufacturer	Delta Energy Systems
Configuration	MPP 1: 1 x 7

RESULTS

Financial Analysis

Return on Assets	5.43 %
Total Payment from Utility	660.32 $/Year
Accrued Cash Flow (Cash Balance)	4,262.18 $

Tech. Quality of the PV System

PV Generator Energy (AC grid)	5,312 kWh/Year
Spec. Annual Yield	998.56 kWh/kWp
Performance Ratio (PR)	65.5 %

System integration

Energy from Grid	12 kWh/Year	Grid Feed-in	5,312 kWh/Year