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Dated: 24/04/2023

# LENDER'S INDEPENDENT ENGINEER'S REPORT OF ~5 MWp ROOFTOP SOLAR POWER PLANT

TO BE SET-UP AT  
7 LOCATIONS IN KOTA AND JODHPUR

DEVELOPER:  
M/S OPPL SPV GUJ PRIVATE LIMITED

- Corporate Valuers
- Business/ Enterprise/ Equity Valuations
- Lender's Independent Engineers (LIE)
- Techno Economic Viability Consultants (TEV)
- Agency for Specialized Account Monitoring (ASM)
- Project Techno-Financial Advisors
- Chartered Engineers
- Industry/ Trade Rehabilitation Consultants
- NPA Management
- Panel Valuer & Techno Economic Consultants for PSU Banks

TO BE SUBMITTED AT  
STATE BANK OF INDIA, SME BRANCH, SOUTH EXTENSION, DELHI

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## PART A

## REPORT SUMMARY

1.	Name of the Project	~5 MWp Grid Tied Rooftop Solar Power Plant				
2.	Project Location	S. No.	City	Buyer Name & Address	Capacity (kWp) as per PPA-AC	
					DC	
		1	Jodhpur	Mahatma Gandhi Hospital, Jodhpur, Rajasthan-342001	500	676.70
		2		Mathura Das Hospital, Shastri Nagar, Jodhpur, Rajasthan-342003	1000	1,355.74
		3		Umaid Hospital, Pratap Nagar, Jodhpur, Rajasthan-342003	500	670.00
		4	Kota	Government Medical College, Rangbari, Sector-4, Rangbari, Kota, Rajasthan-342005	500	676.70
		5		J.K. Lone Hospital Kota, Nayapura, Kota, Rajasthan-324001	180	268.00
		6		Maharao Bhim Singh Hospital, Kota, Nayapura, Kota, Rajasthan-324001	500	676.70
		7		New Medical College Hospital Kota, Rangbari Road, Kota, Rajasthan-324005	500	676.70
		Total Capacity				3,680
3.	Seller Company	M/s OPPL SPV GUJ Private Limited				
4.	Prepared for Organization	State Bank of India, SME Branch, South Extension, Delhi				
5.	LIE Consultant Firm	M/s. R.K. Associates Valuers & Techno Engineering Consultants (P) Ltd.				
6.	Date of Survey	As per the mail dated 24-03-2023, the management of the subject company has confirmed that there is no work done at any of the 7 subject sites, therefore, site survey has not been done.				
7.	Date of Report	24-04-2023				
8.	Details & documents provided by	Mr. Mohit Jangra Assistance Manager Finance and Accounts M/s Oriana Power Pvt. Ltd.				
9.	Report Type	Lender's Independent Engineering Report				
10.	Purpose of the Report	Review, evaluate & comment on project implementation & present status details to facilitate bankers to take business decision on the Project.				
11.	Scope of the Report	To review Project cost and examine the current status of installation/Commissioning of the Project.				
12.	Documents produced for Perusal	a. Copy of Power Purchase Agreements (PPA) along with Novation Agreements b. Copy of Techno-Commercial offer from OPPL to OPPL SPV GUJ Pvt. Ltd. c. Copy of Plants' Layout d. Copy of SLD e. Copy of PV Syst reports				
13.	Annexure with the Report	<ul style="list-style-type: none"><li>• Benchmark Cost by MNRE</li><li>• Market Comparables</li><li>• Global Solar Atlas by World Bank Group</li><li>• Layout Plans</li></ul>				






## PART B

## INTRODUCTION

- 1. NAME OF THE PROJECT:** ~5 MWp rooftop solar power plant to be installed at 7 locations which are described in Part-A.2 above by M/s OPPL SPV GUJ Pvt. Ltd., an SPV of M/s Oriana Power Private Limited.
- 2. PROJECT OVERVIEW:** M/s Oriana Power Private Limited which is the parent company of M/s OPPL SPV GUJ Pvt. Ltd. is an associate company of Trinix Impex & BCS Switchgear Industries. It is a MNRE approved channel partner and into the industry of Solar EPC / Design & Supply of BoS (Balance of System – Module Mounting Structure, LT/ ACCB/ ACDB/ DCCB Panel, Weather Monitoring Sensors, LA, Earthing, Cable Tray, etc.) for PV Solar Plants in India. The subject company is developing 7 rooftop solar power plants in Kota & Jodhpur having a total DC capacity of 5,000 kWp.

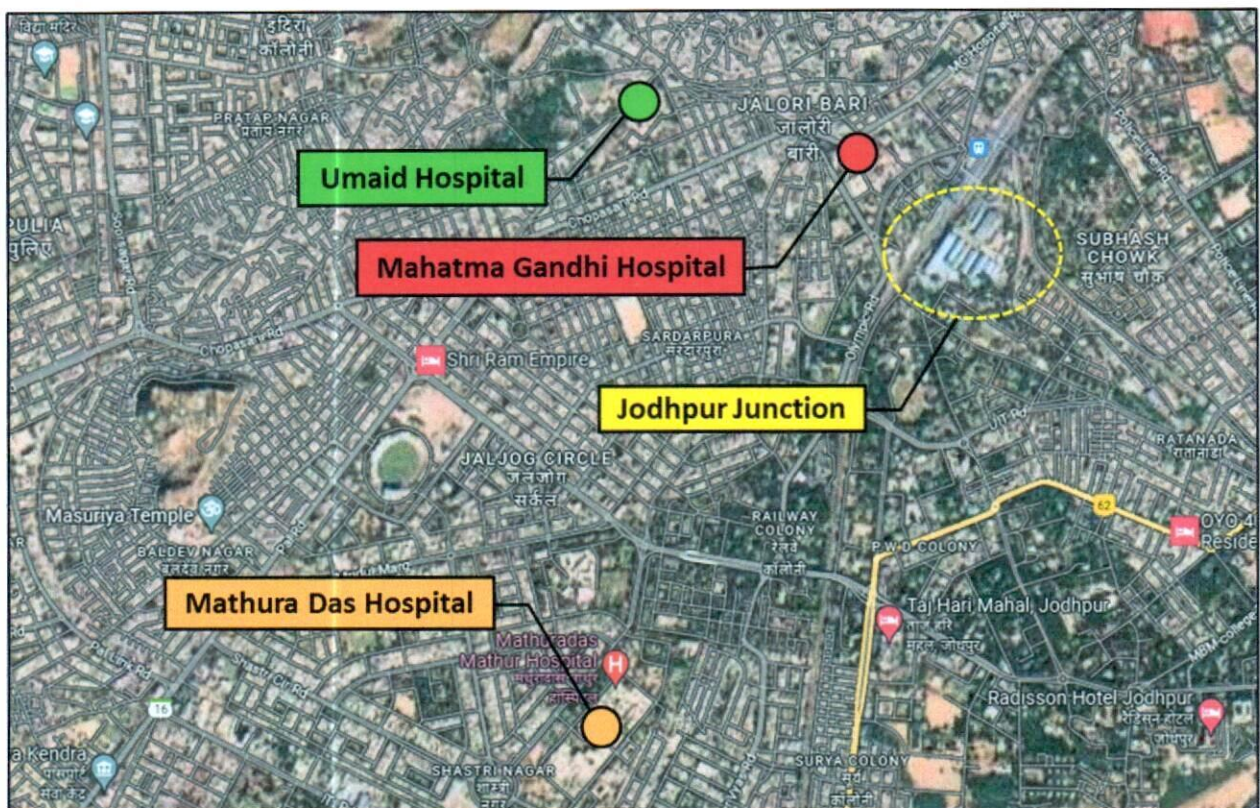
In this respect, 7 Power Purchase Agreements (PPA) dated between 3<sup>rd</sup> March 2023 to 10<sup>th</sup> March 2023 were signed between M/s OPWR DEL SPV Private Limited (hereinafter referred to as "Seller" which is engaged in the business of design, supply, erection, testing, commissioning, operating and maintenance of power plants, including grid connected Solar power projects. Whereas, Mahatma Gandhi Hospital-Jodhpur, Mathura Das Hospital- Jodhpur, Umaid Hospital-Jodhpur, Government Medical College-Kota, J.K. Lone Hospital-Kota, Maharao Bhim Singh Hospital-Kota and New Medical College Hospital-Kota (hereinafter referred to as "The Purchasers") are the owners of the respective properties where solar plant is being setup. As per the PPA, rooftop solar power plants were to be setup for a total capacity (AC) of 3,680 KWp at basic / Floor Tariff: Rs. 4.05/KWh fixed for 25 years of plant operation / PPA tenure.

On the same dates of PPAs, a Novation Agreement which are supplemental to each PPA was signed between all 7 Purchasers, M/s OPWR DEL SPV Private Limited (Transferor) and M/s OPPL SPV GUJ Pvt. Ltd. (Transferee) where the Transferor has transferred all its rights, liabilities, duties, and obligations mentioned in the novation agreements and the principal PPA to the transferee. Therefore, M/s OPPL SPV GUJ Pvt. Ltd. became obligatory to construct, operate and maintain the plants at the sites and supply the entire Electricity generated from the Plant to the Buyer on the terms and conditions contained in PPAs and Novation Agreements.

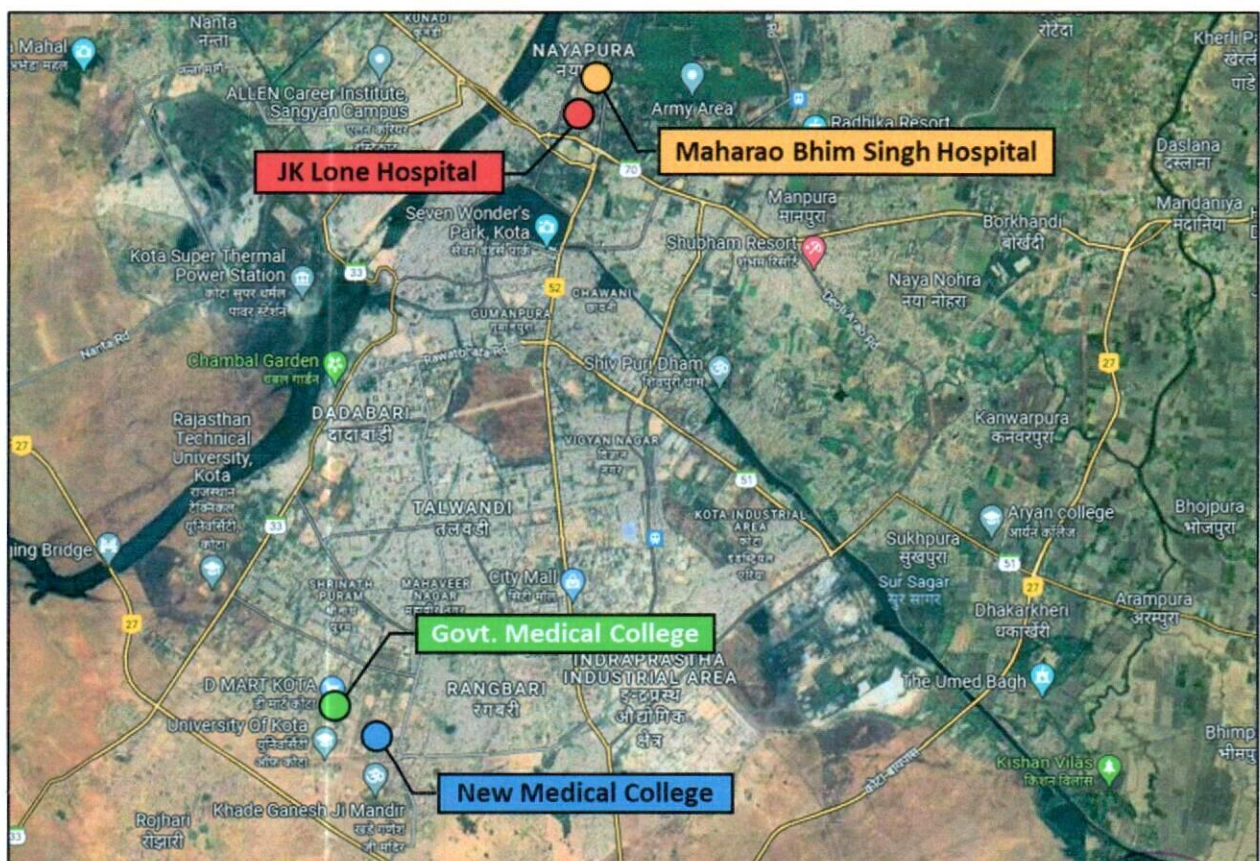




## Jodhpur Location Map



## Kota Location Map





For the implementation of the subject project, M/s OPPL has shared a Techno-Commercial offer to the subject company and as per the verbal information shared by the management of the subject company, the same has been accepted and no written document has been signed between them. As per the same, the total project cost is estimated at a price of Rs. 24.62 Cr. including duties and taxes.

M/s OPPL SPV GUJ Pvt. Ltd. has approached SBI for credit facility to construct these plants who have in turned appointed M/s R.K Associates Valuers & Techno Engineering Consultants Pvt. Ltd. as Lenders Independent Engineer for knowing the status of these plants.

As per the mail dated 24-03-2023, the management of the subject company has confirmed that there is no work done at any of the 7 subject sites, therefore, site survey has not been done.

**3. SCOPE OF THE REPORT:** To verify the Project cost, expenditures and examine the commissioning, installation status of Solar Power Plants set-up/ being set-up by M/s. OPPL SPV GUJ Pvt. Ltd.

- *Industry/ sector research and demand & supply trend is out of scope of the report.*
- *Financial feasibility study of the Project is out of scope of the report.*
- *Providing any kind of design report or map is out-of-scope of the report.*
- *Scrutiny of contracts, Agreements and arrangement between the parties from legal perspective is out-of-scope of this report.*
- *Energy yield calculation is out-of-scope of this report.*
- *Location feasibility is ascertained based on the PVSyst Report provided by the client.*

*All the assessment carried out for the Project is done based on the documents and information provided to us and its correlation by the Engineering team through physical and virtual site inspection and various other discussions with the Project proponents and thus forming an opinion out of it.*

*Component wise verification is not carried out but Project installation & commissioning has been verified as a whole.*

*Any kind of technical & economic feasibility of the Project is out-of-scope of this Report. This report is only limited & related to the verification and examination of what has already been setup.*

**4. PURPOSE OF THE REPORT:** To provide fair detailed analysis report to the Bank based on the "in-scope points" mentioned above for facilitating them to take appropriate business decision on the Project.



### 5. METHADODOLOGY ADOPTED:

- a. To gather relevant data/ information/ documents related to Project planning, execution, current status.
- b. Study of copy of Project Planning documents/ Agreements to know the scope of work of the company.
- c. To procure, study and analysis of any additional information, data, and documents required/ provided by the company.
- d. Physical site inspection for ascertaining the status of work and shadow analysis.
- e. Research about the Project/ sector from the sources in the public domain.
- f. Correlation of the provided information against Industry/ sector benchmarks/ trend.
- g. Information compilation, analysis and reporting.

*Adina*





**PART C****PROJECT LOCATION AND CAPACITY**

As per the e-mail dated 27-01-2023 and copy of documents provided, details of 7 location has been tabulated below:

S. No.	City	Buyer Name & Address	Capacity-DC (kWp)	Capacity-AC as per PPA (kWp)
1	Jodhpur	Mahatma Gandhi Hospital, Jodhpur, Rajasthan-342001	676.70	500.00
2		Mathura Das Hospital, Shastri Nagar, Jodhpur, Rajasthan-342003	1,355.74	1000.00
3		Umaid Hospital, Pratap Nagar, Jodhpur, Rajasthan-342003	670.00	500.00
4	Kota	Government Medical College, Rangbari, Sector-4, Rangbari, Kota, Rajasthan-342005	676.70	500.00
5		J.K. Lone Hospital Kota, Nayapura, Kota, Rajasthan-324001	268.00	180.00
6		Maharao Bhim Singh Hospital, Kota, Nayapura, Kota, Rajasthan-324001	676.70	500.00
7		New Medical College Hospital Kota, Rangbari Road, Kota, Rajasthan-324005	676.70	500.00
Total Capacity			5,000.54	3,680.00

Source: Via e-mail from company dated 27-01-2023

As per the copy of module layout plans of all the sites, Key Technical Parameters & Configuration of the projects like Modules, Inverter, tilt angle, capacity, etc. are tabulated below:

**1. Mahatma Gandhi Hospital, Jodhpur**

S. No.	Particular	Figure	UOM
1	Proposed Capacity	676.70	kWp
2	Total No. of PV Modules	2020	No.
3	PV Modules Capacity (Multi-Crystalline)	335	Wp
4	PV Module Dimension	1961 x 991 x 35	Mm
5	PV Module Mounting Orientation	Portrait	
6	Module Mounting Structure Angle	~20°	

**2. Mathura Das Hospital, Jodhpur**

S. No.	Particular	Location		Total	UOM
		General	MCH		
1	Proposed Capacity	700.15	655.59	1,355.74	kWp
2	Total No. of PV Modules	2,090	1,957	4,047	No.
3	PV Modules Capacity (Multi-Crystalline)	335	335	670	Wp
4	PV Module Dimension	1976 x 992 x 35			Mm
5	PV Module Mounting Orientation	Portrait			
6	Module Mounting Structure Angle	~20°			

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**3. Umaid Hospital, Jodhpur**

S. No.	Particular	Figure	UOM
1	Proposed Capacity	676	kWp
2	Total No. of PV Modules	2,000	No.
3	PV Modules Capacity (Multi-Crystalline)	335	Wp
4	PV Module Dimension	1961 x 991 x 35	Mm
5	PV Module Mounting Orientation	Portrait	
6	Module Mounting Structure Angle	~20°	

**4. Government Medical College, Kota**

S. No.	Particular	Figure	UOM
1	Proposed Capacity	676.70	kWp
2	Total No. of PV Modules	2,020	No.
3	PV Modules Capacity (Multi-Crystalline)	335	Wp
4	PV Module Dimension	1961 x 991 x 35	Mm
5	PV Module Mounting Orientation	Portrait	
6	Module Mounting Structure Angle	~20°	

**5. J. K. Lone Hospital, Kota**

S. No.	Particular	Figure	UOM
1	Proposed Capacity	268.00	kWp
2	Total No. of PV Modules	800	No.
3	PV Modules Capacity (Multi-Crystalline)	335	Wp
4	PV Module Dimension	1961 x 991 x 35	Mm
5	PV Module Mounting Orientation	Portrait	
6	Module Mounting Structure Angle	~20°	

**6. Maharao Bhim Singh Hospital, Kota**

S. No.	Particular	Figure	UOM
1	Proposed Capacity	676.70	kWp
2	Total No. of PV Modules	2,020	No.
3	PV Modules Capacity (Multi-Crystalline)	335	Wp
4	PV Module Dimension	1961 x 991 x 35	Mm
5	PV Module Mounting Orientation	Portrait	
6	Module Mounting Structure Angle	~20°	

**7. New Medical College Hospital, Kota**

S. No.	Particular	Figure	UOM
1	Proposed Capacity	676.70	kWp
2	Total No. of PV Modules	2,020	No.
3	PV Modules Capacity (Multi-Crystalline)	335	Wp
4	PV Module Dimension	1961 x 991 x 35	Mm
5	PV Module Mounting Orientation	Portrait	
6	Module Mounting Structure Angle	~20°	



## Technical details as per Techno-Commercial offer from OPPL

S. No.	Item Description	Technical Specifications	Quantity	Unit	Make
<b>A PV Section</b>					
1	Solar PV module	230Wp-550Wp Mono-PERC/Multi-Si 25yrs. Linear warranty Certifications: IEC 61215, IEC 61730 & UL 1703; IEC 62804 (PID) IEC 62716 (Ammonia Resistance), IEC 60068-2-68 (Blowing Sand) IEC 61701 (Salt Mist level 6), , ISO 11925-2 (Class E) ISO 9001: 2015, ISO 14001: 2004, OHSAS 18001: 2007	5	MWp.	ALMM Approved/As per Policy
2	Connectors (male & female) pair MC4	Connectors (male & female) pair, MC4 Connector Pin Copper with tin coating Insulation Voltage: 1000V	As per requirement	Nos.	Multi Contact
3	Solar String Inverter – 50/100/250kVA, 415V	50/100/250kVA, 415V output, Outdoor type-IP65, Eff. >98%	As per Design	Nos.	Sungrow/ Growatt /Equivalent
<b>B Structures</b>					
1	Design & Supply of Module Mounting structure supply.	Roof Mounted Ballasted Solar Module Mounting Structure. <b>Material: MS HDG Grade: E 250</b> Galvanization: 80micron Structure designed at 170kmph wind speed as per IS- 875 Ground Clearance 1 mtr.	As per requirement		Oriana Power
2	Structure & Module Mounting Accessories.	<b>Material: SS Grade: SS 304</b> Structure designed at 170kmph wind speed as per IS- 875	As per requirement		Oriana Power
<b>C Remote Monitoring System</b>					
1	Ambient Temperature sensor	PT1000 sensor element	1	Set	IMT
2	Module Back Surface Temperature sensor	PT1000 sensor element	1	Set	IMT
3	Solar Irradiation sensor for radiation measurement	Cell Based sensor with calibration certificate	1	Set	IMT
4	2 Pair Twisted Un - armored communication cable, Cu		As per Design	Mtr	K-flex/parasheild
5	HDPE DWC Conduit, Size of 32/26mm & Accessories (PVC bends & couplers etc.)	Double Wall Corrugated HDPE Conduit for communication cable laying over shed. Conduit will be fixed with shed using GI Saddles and Aluminium pop rivets.	As per Design	Mtrs	Duraline/ equivalent
6	3C 1.5Sq. mm Armored Copper Cable - Data Logger Power cable		As per Design	Mtr	Polycab
7	CAT 6 cable		As per Design	Mtr	Dlink
8	Data logger Installation and IP 65 Box	For Remote monitoring	As per Design	Nos	Webdyn





S. No.	Item Description	Technical Specifications	Quantity	Unit	Make
9	SCADA for Solar Plant monitoring and Grid monitoring	Visual inter-facing for plant monitoring and data analysis	As per Design	Lot	Webdyn
<b>D</b>	<b>DC side - Cables &amp; Accessories</b>				
1	1 Core 4 Sqmm Cu Solar Cable	Solar DC cable, Tin-coated copper cable as per EN standard. UV protected double sheathed XLPO, Halogen free cable.	As per Design	Mtrs	Apar/Siechem/Equivalent
2	1C 2.5 Sq mm Green Cable (for Earthing), with accessories	2.5sqmm. Single core flexible PVC insulated cable for module to module earthing with SS-304 fasteners, teeth washer and copper thimbles.	As per Design	Mtrs	Polycab/KEI
3	DC Electrical accessories	(Consumables like Lugs, Glands, Ferrules, Cable Ties, uPVC tape, uPVC saddle, Cable clips etc.)	As per Design	Set	As per Design RFQ
4	HDPE DWC Conduit, Size of 32/26mm & Accessories (PVC bends & couplers, T Joints etc.)	Double Wall Corrugated HDPE Conduit for DC cable laying over shed. Conduit will be fixed with shed using GI Saddles and Aluminium pop rivets.	As per Design	Mtrs	Apollo/ Duraline/ equivalent
<b>E</b>	<b>AC side - Cables &amp; Accessories</b>				
1	4 C, 25 Sq.mm Cu PVC Flexible Cable.	1.1kV insulated, Copper conductor, PVC insulated, PVC outer sheathed cable	As per Design	Mtrs	Polycab/KEI/Havells
2	3.5 C, 150 Sq.mm AL XLPE Arm Cable.	1.1kV insulated, Aluminium conductor, XLPE insulated, GI strip armoured, PVC outer sheathed cable as per IS-7098 Part-1	As per Design	Mtrs	Polycab/KEI/Havells
3	Cable for earthing- 1C 10 sq.mm Cu flexible (for Inverter earthing)		As per Design	Mtrs	As per Design RFQ
4	Field ACDB for inverters output	3 phase, 415 V, 50 Hz ACCB Panel with - Enclosure material made of CRCA with Powder coated paint - 4P, MCCB's - as per requirement - 4P, Isolator - 3 phase, 4 W, AL, bus bar. - IP 65 with canopy - Panel with double door & lock - SPD Type 2 - with mounting arrangement	As per Design	Nos	Breakers Make: L&T
5	Isolator Panel near Metering Panel	3 phase, 415 V, 50 Hz ACCB Panel with - Enclosure material made of CRCA with Powder coated paint - 4P, 700A MCCB's - 3 phase, 4 W, AL, bus bar. - IP 54 with canopy - Panel with single door & lock with mounting arrangement	As per Design	Nos	Breakers Make: L&T
6	Cable tray for AC cable laying after inverter	50mmX50mmX2mm Hot dip galvanized cable tray with cover and other accessories i.e. cable tray stand, cable tray cover clamp, cable tray coupler, M8 MS HDG Fasteners, anchor bolts etc.	As per Design	Nos	Oriana Power
<b>F</b>	<b>Civil Works</b>				
1	As per site requirement	Civil work for Structure, electrical panel foundations, Structure Foundation, earthing	1	Set	As per RFQ



S. No.	Item Description	Technical Specifications	Quantity	Unit	Make
		pit chamber construction.			
<b>G Safety &amp; Protections</b>					
1	Fire extinguisher With sand bucket ( 4 Kg ABC type )	4 Kg ABC type fire extinguishers with stand	As per design	Set	As per Design RFQ
2	Earthing Kit for plant AC and DC earthing	Copper Bonded rods 3m, 17.2 mm, chemical bags and other required accessories. Earthing pit chamber will be constructed and Cast iron cover will be installed	1	Set	VNT/JMV/GS Electrode
3	Lightning Arrester for protection of solar power plant	ESE Type, GI mast, 2 Earthing pit, 1 C 70 mm <sup>2</sup> Cu PVC cable, 2 set of earthing for one lightning arrester, R-109 Meter , Stay Set support.	As per design	Nos.	VNT/JMV/Allied Power
4	GI Strip 25X3 mm for DC side	Hot dip galvanized earthing strip with minimum 80 micron. Material grade E-250	As per Site Req	Meter	As per Design RFQ
<b>H Services</b>					
1	Installation, testing and Commissioning	Complete plant service work	5	MWp	As per Design RFQ
2	Module cleaning system with uPVC pipe line system and pump.	1 HP, 230V Centrifugal pump, CPVC Pipe (1/2 inch) line over roof with shut-off valves, CPVC pipe will be fixed over roof with SS saddles gitti-pench. Flexible Hosepipe (1 inch) of 40 Meter length, Wiper 1.5 Meter length, Extendable Pole Piping for Each Roof, Piping as per detail drawing	1	Set	Ashirwad/Astral/Equivalent

*The above-mentioned installations/parts are provided as per best industrial practice and can be verified after commissioning of the project. The specification for the items mentioned in the above Techno Commercial Offer to be inline and with as per government guidelines.*

#### Client's Scope of work

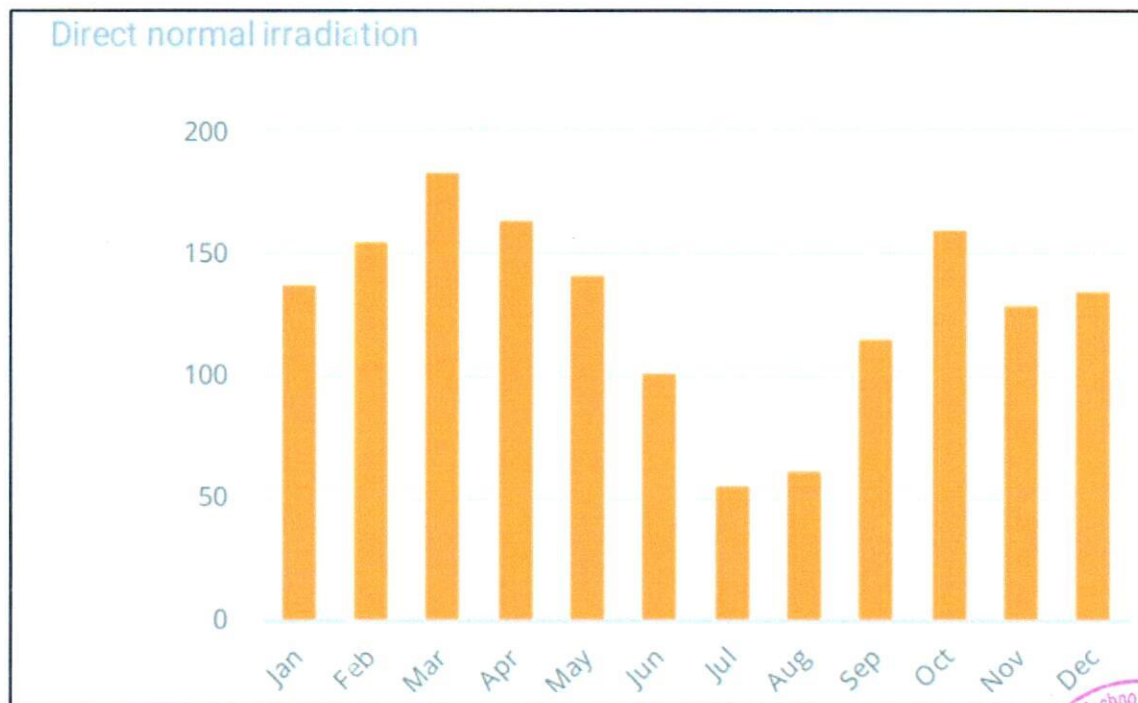
- Provision of permission to work on site
- Clear shadow free area / Tin shed for the installation of PV modules & equipment's.
- Entrance/working permission for local labor for loading/un-loading work.
- Electrical power point nearby to site for electricity requirement during construction.
- Water tap points (minimum 1 inch ) at PV plant site for module cleanings system
- Internet / SIM card with data packs shall be provided at site for remote monitoring of inverters and other devices.
- Documents required for CEIG approval/DISCOM NOC/Bi-directional Meters.



**PART D****IRRADIATION & ENERGY YIELD ASSESSMENT**

Company has used PVSyst V7.3.2 to assess energy yield calculation which is the standard Industry practice. The yearly average of main results of irradiation and energy yield are as follows:-

S. No.	City	Plant Location	Annual Production Probability (MWh)		Specific Production (kWh/kWp/year)		Per. Ratio (%)
			P50	P90	As per PPA	As per PVsyst	
1	Jodhpur	Mahatma Gandhi Hospital	1130.6	1100.7	1500	1671	82.86
2		Mathura Das Hospital	2286.0	2225.0	1500	1686	83.39
3		Umaid Hospital	1130.5	1100.6	1500	1671	82.62
4	Kota	Government Medical College	1109.5	1080.1	1500	1640	85.02
5		J.K. Lone Hospital	440.6	428.9	1500	1644	85.28
6		Maharao Bhim Singh Hospital	1113.1	1083.6	1500	1645	85.26
7		New Medical College Hospital	1103.0	1073.9	1500	1630	84.52

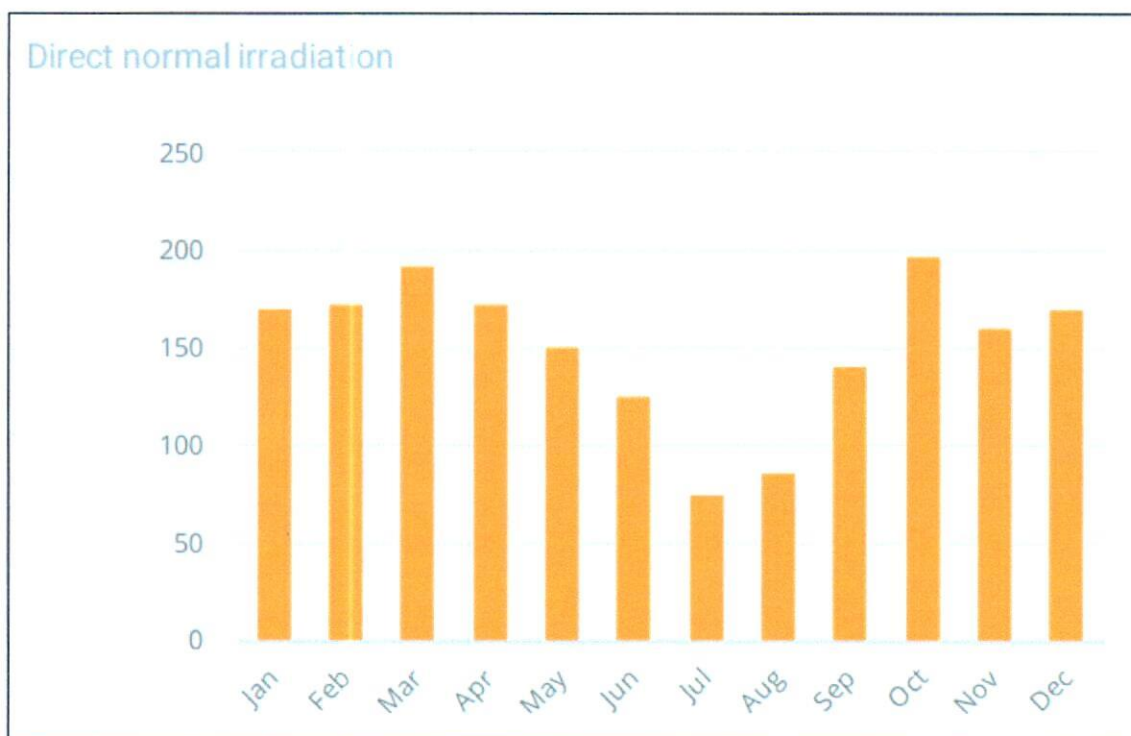
**Monthly averages- Direct normal irradiation (kWh/m<sup>2</sup>)****1. Kota:**

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## 2. Jodhpur:



### Observations and Remarks:

1. As per the PVsyst - Simulation reports dated 16<sup>th</sup> March 2023, the estimated energy that can be produced by the subject plants and their respective performance ratio is more than as agreed in the PPA.
2. As per Global Solar Atlas by World Bank Group, the location wise Annual Averages- Direct Normal Irradiation are:
  - a. Jodhpur: 1819.70 kWh/m<sup>2</sup>
  - b. Kota: 1,533.1 kWh/m<sup>2</sup>
3. As per the information provided by the management of the company, Plant Load Factor (CUF at P90) is about 18.27%.

*Shai*



**PART E****POWER PURCHASE AGREEMENT**

As per the information provided by the company, the total proposed capacity of the subject rooftop solar power plant is ~5 MW. As on date, TEIPL has signed 7 no. of PPAs to supply power to these 7 locations. Details of the same are tabulated below:

S. No.	City	Plant Location	kWp (AC)	Tariff (Rs./kWh)	PPA and Novation Date
1	Jodhpur	Mahatma Gandhi Hospital	500	4.05	03-03-2023
2		Mathura Das Hospital	1,000	4.05	03-03-2023
3		Umaid Hospital	500	4.05	03-03-2023
4	Kota	Government Medical College	500	4.05	03-03-2023
5		J.K. Lone Hospital	180	4.05	09-03-2023
6		Maharao Bhim Singh Hospital	500	4.05	03-03-2023
7		New Medical College Hospital	500	4.05	03-03-2023
Total			3,680		

*Source: Details provided by the company*

**Important Clauses:** All PPA's are agreed for 25 years with fixed tariff of Rs. 4.05/- per kWh.

Some of the important clauses as per 7 nos. of signed PPA's are as follows:-

**Clause-3: Terms & Termination****3.1. Term**

- The term of this agreement will be for a period of 25 years from COD, pursuant to the provisions of the Agreement. i.e., if COD is any date between 01-04-2023 and 31-03-2024, then the 25-year term shall continue till 31-03-2048.
- After the Term, the ownership of the System shall be transferred to the Purchaser free of cost at the discretion of Power Purchaser.

**3.2. Purchase Option/ purchase Obligation**

So long as a Purchaser default shall not have occurred and be continuing. Purchaser has the option to purchase the System by paying the Power Producer the Purchase price as per Schedule III to the Agreement.

**Clause-4: Construction, Testing and Commission of the System:****4.1. Installation Work**

**h)** If the Power Producer is unable to commence supply of Solar Power to the Purchaser by the Scheduled Completion Date, other than for the reasons specified in Article 11 and 12.2 (Force Majeure or Purchaser Default), the Power Producer or its contractor shall pay genuine pre-estimated liquidated damages for the delay in such commencement of supply of Solar Power as per the clause of the REIL RFS REIL/BID/RTS(C)/2019-20/001 dated 04-10-2019 appended as Schedule VI format as per respective RFS document to this Agreement.





i) The Purchaser shall ensure that all arrangements and infrastructure for receiving Solar Power beyond the Delivery Point are ready on or prior to the Commercial Operation Date and is maintained in such state in accordance with applicable laws through the Term of the Agreement.

**Clause-5: System Operations****a. The Power Producer as Owner and Operator**

The System will be legally and beneficially owned by the Power Producer and will be operated and maintained and, as necessary, repaired by the Power Producer at its sole cost and expense.

Power Producer shall not be responsible for any work done by others on any part of the System/Project authorized by the Purchaser and not authorized in advance by the Power Producer in writing.

Power Producer shall not be responsible for any loss, damage, cost or expense arising out of or resulting from the improper operation or 'maintenance of the System by Purchaser or anyone instructed to do such work by Purchaser.

**Caluse-6: Delivery of Solar Power****6.1 Purchaser Requirement:**

Purchaser agrees to purchase one hundred per cent (100%) of the Solar Power generated by the System and made available by the Power Producer to Purchaser at the Delivery Point during each relevant month of the Term.

**Caluse-7: Tariff and Payments**

7.1.(ii) whether any Solar Power has been injected, whether inadvertently or otherwise, into the grid of the Distribution Utility. The Power Producer will bill the Purchaser for each KWh metered as above at the Delivery Point, at the Tariff prevailing at that point of time as detailed in Schedule - II, the Tariff will be equal to **Rs. 4.05/kWh**. The 'year' considered shall be the financial year which April 1<sup>st</sup> to 31<sup>st</sup> March of every year. Schedule II provides a detailed year on year tariff schedule.

**Clause-8: General Covenants****8.1 Power Producer's Covenants**

(c) The system shall meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the daily





normalized irradiance levels of the location during the O&M period. PR shall be minimum of 75% at the time of inspection for initial Project acceptance.

(d) Governmental Approvals: While providing the Installation work, solar Power and System Operations, the Power Producer shall obtain and maintain and secure all Governmental Approval required to be obtained and maintained and secured by the Power Producer and to enable the Power Producer to perform such obligations.

**Clause-12: Default:****12.1 Power Producer Defaults and Power Purchaser Remedies****(b) Purchaser's Remedies**

(iii.) Following the issue of Purchaser Preliminary Default Notice, it shall be the responsibility of the Parties to discuss as to what steps shall be taken with a view to mitigate the consequences of the relevant Power Producer's Default having regard to all the circumstances. If the Power Producer Default is not cured within a period of sixty (60) days of the issue of Purchaser Preliminary Default Notice or any other such period mutually agreed upon by the Parties, the Purchaser shall have the right to terminate this Agreement by issuing a Purchaser Termination Notice.

**Clause-14: Assignment & Novation****14.1 Assignment**

Notwithstanding anything contained herein, the Power Producer has the right to assign all or any of its rights under this Agreement (including rights over any assets hereunder), to any third party including, though not restricted to any lender, equipment lessor or other party("Assignment"), without the consent of the Power Purchaser. In the event of such assignment, the Purchaser will be able to hold the Power Producer as well as the party to whom the benefits under this contract are assigned, to be jointly and severally responsible for performing the obligations under this contract.

**14.2 Novation**

The Parties agree and acknowledge that the Power Producer may intend to novate the Agreement to a party and has the right to transfer any or all of its rights and obligations under this Agreement to a party or any other third party ("New Party"), with the consent of the Power Purchaser. The Power Purchaser shall not unreasonably withhold such consent. Upon Novation, the New Party shall automatically and without any further action be entitled to all the same rights and assume the same obligations, under this Agreement, as if it were originally a party to this Agreement. Further, the Purchaser hereby agrees





and undertakes that, promptly upon receiving a request from the Power Producer, the Purchaser shall execute such further writings, deeds and/or agreements and take all such further actions as may be necessary for effecting or implementing the transfer of any or all of the Power Producer's rights and/or obligations under this Agreement to the New Party. If the parties agree to do Novation, then separate Novation agreement shall be executed.

**Clause-17: Miscellaneous****17.14 Insurance**

The Power Producer shall maintain at its own costs, throughout the tenure of this Agreement and any extensions thereof all mandatory insurance coverage for adequate amount including but not restricted to comprehensive general liability insurance including theft and vandalism, covering the System and accidental losses, bodily harm, injury, death of all individuals employed/ assigned by the Power Producer to perform the services required under this Agreement.

**Other important facts of PPA**

- Description of the Site and Premises shall be as per SCHEDULE 1 of PPA.
- Yearly degradation of Module & PV System considered in generation data is 1% per annum.
- Deemed Generation and/or expected yearly energy generation shall be as per Schedule IV of PPA.
- Monthly Electricity Purchase Rate • Basic / Floor Tariff: Rs. 4.05 per unit levelised for 25 years of plant operation / PPA tenure to be as described in SCHEDULE II.
- In case the Buyer provides the termination notice to the Seller, the Buyer shall pay the Termination Compensation as per Schedule 11.

*Please note that the above main clauses of PPA are mentioned only for illustration purpose of the convenience of the lenders to analyze the Project in terms of technicality. However, this shall not be construed as professional opinion on the contract legality which is out of scope of this report.*





**PART F****CURRENT STATUS OF WORK**

As per information and documents shared by the company's representative, following are our observations and remarks on the current status of the project:

- a. The work related to installation of modules is yet to start.
- b. The materials and panels are yet to be purchased.
- c. As per the information shared by the management, the expected COD of the entire project shall be in the month of April 2024.





## PART G

## PROJECT COST &amp; EXPENDITURE

**Project Cost:** As per copy of Techno-Commercial Offer dated 06-03-2023 from Oriana Power shared by the company, project cost break-up are as follows:-

S. No.	Description	Amount (Including duties and taxes)
1	Solar Panel: multi/Mono-Si, IEC certification, BIS certification and other relevant standard as per Government	Rs. 13,61,64,800
2	Solar Inverter: String inverter with multiple MPPT provision, Outdoor Mounted, IP65 Protection and all relevant standards as per Government	Rs. 1,90,00,000
3	BOS: Module Mounting Structure, DC Cable, AC Cable, LT Panel, Civil material, Conduit, MCS, RMS, Earthing and Protection Systems, Lightning Arrester, Weather Sensor and monitoring system, Metering Unit, Discom approvals etc.	Rs. 7,47,00,000
4	I&C: Supply of civil material, Installation, testing and commissioning of Solar Power plant as per site requirement	Rs. 1,63,00,000
<b>Total</b>		<b>Rs. 24,61,64,800</b>

- Freight & Transit Insurance: Inclusive
- Taxes GST- as per government norms
- Net-metering fee will be paid by consumer
- Any changes in Tax/Duties shall be borne by the Purchase
- Excludes-  
Any approval  
Anything out of BOQ

- **Expenditure:** As per information/details shared by the company, the installation work related to power plant is yet to start. Thus, the expenditure incurred till date on the project is Nil.

**Observations and Remarks:**

1. Project cost calculated on the basis of market comparable.

S. No.	Particulars	Excluding GST	Including GST	Remark
		Per KW Cost (In Rs.)	Per KW Cost (In Rs.)	
1	Subject project installation cost as per Techno-Commercial Offer	-	49,233	As per EPC Agreement
<b>Market Research Details</b>				
2	NMRE Benchmark Cost	39,080		Refer Annexure-1
3	Market Research	48,700	55,400	Refer Annexure-2
4	Market Quotation	37,740	42,500	Refer Annexure-3
5	As per Solar Square	45,000	51,200	Refer Annexure-3
6	Market Quotation (Tata Solar)	60,000	68,300	Refer Annexure-4



2. As per our analysis and market research, the installation cost of Rooftop Mounted Solar Power Plant varies from Rs. 45,500/- per KW to Rs. 68,300/- per KW. For the smaller setups the higher range is feasible. Whereas for large set-up, the smaller range is feasible.
3. The project cost is solely dependent upon project location, contractors profit, type of module and its supporting structures, etc.
4. Based upon the above mentioned details, the project cost amounting to Rs.24.62 Cr. inclusive of GST for the installation of subject rooftop solar power plant seems to be reasonable.
5. As per the mail dated 24-03-2023, the management of the subject company has confirmed that there is no work done at any of the 7 subject sites, therefore, site survey has not been done.
6. As per Clause 17.14 of the PPA, the subject company has to take an Insurance Policy. However, it is yet to be executed

**Note:**

- *Project cost is analyzed based on lump sum cost only and not item wise.*
- *Project cost is assessed for the date of this report only and due to price fluctuations it may vary from time to time.*





## PART H

## PHOTOGRAPHS

***Since the installation work related to solar panels is not started yet and this is just DESKTOP LIE based upon documents provided. Thus, Photographs are not available.***



## PART I

## OTHER DOCUMENTS &amp; REFERENCES

**Annexure-1: Benchmark Cost by MNRE:**

No. 318/38/2018-GCRT  
Government of India  
Ministry of New & Renewable Energy  
\*\*\*

Block No. 14, CGO Complex,  
Lodi Road, New Delhi  
Date: 18<sup>th</sup> August 2021

**ORDER**

**Subject: Benchmark costs for Grid-connected Rooftop Solar Photo-voltaic systems for the financial year 2021-22 -reg.**

I am directed to convey the approval of competent authority for issuing of the benchmark costs for Grid-connected Rooftop Solar Photo-voltaic Systems for the financial year 2021-22 as under:

**For General Category States/UTs:**

System Capacity range	Upto 1 kW	>1kW upto 2 kW	>2kW upto 3 kW	> 3kW upto 10 kW	>10 kW upto 100 kW	> 100kW upto 500 kW
Benchmark cost (Rs./kW)	51100	46980	45760	44640	41640	39080

**For Special Category States/UTs** (i.e. North-Eastern States including Sikkim, Himachal Pradesh, Uttarakhand, Jammu and Kashmir, Ladakh, Andaman and Nicobar and Lakshadweep islands):

System Capacity range	Upto 1 kW	>1kW upto 2 kW	>2kW upto 3 kW	> 3kW upto 10 kW	>10 kW upto 100 kW	> 100kW upto 500 kW
Benchmark cost (Rs./kW)	56210	51670	50330	49100	45800	42980

2. The above benchmark cost includes cost of Solar PV panels (with domestic cell and modules), inverter (single/3 phase wherever applicable), balance of system e.g. cable, switches/ circuit breaker/ connectors/ junction box, mounting structure, earthing, lightening arrester, and civil works, installation & commissioning, CMC for 5 years, transportation, insurance, applicable taxes, etc. The above benchmark costs are excluding of net metering cost and battery back-up costs.

3. The benchmark cost for year 2021-22 will be applicable for all LoAs to be issued/empanelment of vendors to be done by the state implementing agencies, under Ph-II of rooftop solar programme of MNRE, after 10 days from the date of issuance of this benchmark cost notification.

(Hiren Chandra Borah)  
Scientist D  
E Mail: hiren.borah@nic.in

To  
All Concerned



**Annexure-2**

Installation Cost of 1MW Power Plant	
For better understanding of investment in 1 megawatt solar power system, we have break down the overall cost in fragments. You can now compare and analyse the cost of solar panels, solar inverters and other accessories individually.	
Particulars	Estimated Cost
Solar Panels	3 Cr.
Solar Inverter	1 Cr.
Combiners + Junction Boxes	20 Lakh
Protective Gears Arrangement	10 Lakh
SCADA & Data Logger System	7 Lakh
Land Bank	*5 Acre
Erection of Project	50 Lakh
<b>Total Project Cost</b>	<b>4.87 Cr. (Approx.)</b>
<ul style="list-style-type: none"> <li>*Land value of 5 acre is not included in this table.</li> <li>All the figures in above table are just to provide a rough idea. Don't consider it as an exact and final cost of 1MW solar power plant.</li> </ul>	

**Annexure-3**

Project Cost (Mono-Crystalline) included GST		
S. No.	Description	On Tin Roof
1.	Turnkey EPC prices for Design, Supply, Erection, Testing & Commissioning of 250 KW Solar Power Generating System	94,35,000
2.	GST	11,90,000
<b>Total (GST Included)</b>		<b>1,06,25,000 /-</b>
➤ Discom Legal & Liasoning Fees included above.		
<p style="text-align: right;"><b>Shubham Agarwal &amp; Praveen Mehta</b>  <b>SOLAR NATION</b>  M- +91 9461846401,9829227948 Email – <a href="mailto:solarnationbusiness@gmail.com">solarnationbusiness@gmail.com</a></p>		



**Annexure-4**

**solar square** Homes Housing Society Commercial About Us B

You can later on also buy this plant from the vendor.

### Cost of 1 MW solar plant

Now, let us discuss the cost of 1 MW solar plant. There is no fixed number for the final 1 MW solar plant cost. However, we have a tentative figure – between 4 to 5 crore.

This price range is subject to increase or decrease depending on various factors. Here are some factors affecting the overall 1 megawatt solar power plant cost.

- Type of solar panels selected - **monocrystalline or polycrystalline panels**
- Manufacturing technology and efficiency of the solar inverter selected
- Solar brand opted
- Type of solar power plant - on-Grid, off-grid, or hybrid

Concerning the 1 MW solar power plant subsidy 2020, the **government provides subsidies** on solar plants for residential setups and housing societies. No subsidy is offered for solar systems being installed for commercial purposes.

**Annexure-5**



### Tata Solar Power Plants

**₹ 60,000/ KW** [Get Latest Price](#)

Country of Origin Made in India

Minimum Order Quantity 10 KW

We Design, Supply and Erect Tata Solar Power Plants

[View Complete Details](#)

**Get Latest Price**  
Request a quote

[View Similar Products](#)

*Aditya*





**Data by Global Solar Atlas by World Bank Group****1. Jodhpur****GLOBAL SOLAR ATLAS**  
BY WORLD BANK GROUP**Jodhpur**

26.296772°, 073.035143°

unnamed road, Jodhpur, Rajasthan, India

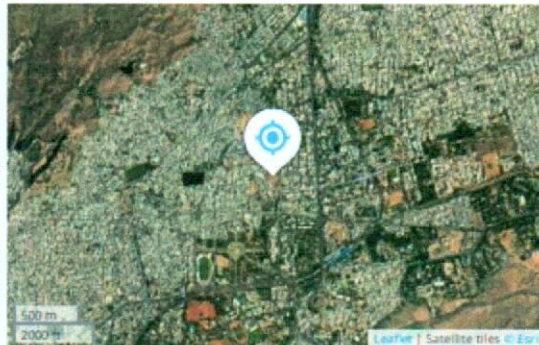
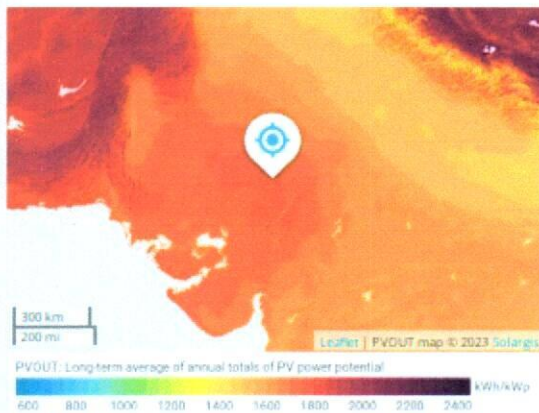
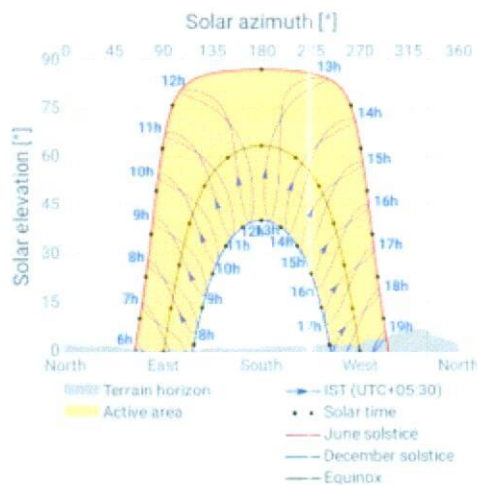
Time zone: UTC+05:30, Asia/Kolkata [IST]

Report generated: 29 Mar 2023

**SITE INFO****Map data**

Per year

Specific photovoltaic power output	PVOUT specific	1745.7	kWh/kWp
Direct normal irradiation	DNI	1819.7	kWh/m <sup>2</sup>
Global horizontal irradiation	GHI	2021.9	kWh/m <sup>2</sup>
Diffuse horizontal irradiation	DIF	823.7	kWh/m <sup>2</sup>
Global tilted irradiation at optimum angle	GHI opta	2249.2	kWh/m <sup>2</sup>
Optimum tilt of PV modules	OPTA	29 / 180	°
Air temperature	TEMP	26.9	°C
Terrain elevation	ELE	240	m

**Map****PVOUT map****Horizon and sunpath**

## GLOBAL SOLAR ATLAS

BY WORLD BANK GROUP

### PV ELECTRICITY AND SOLAR RADIATION

#### Annual averages

Direct normal irradiation

**1820.5**

kWh/m<sup>2</sup> per year

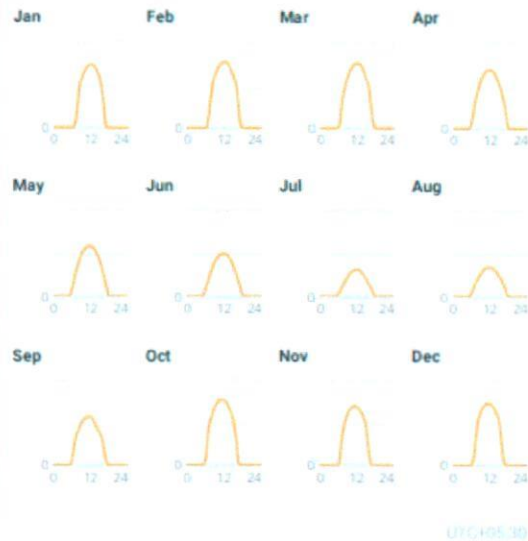
#### Monthly averages

Direct normal irradiation



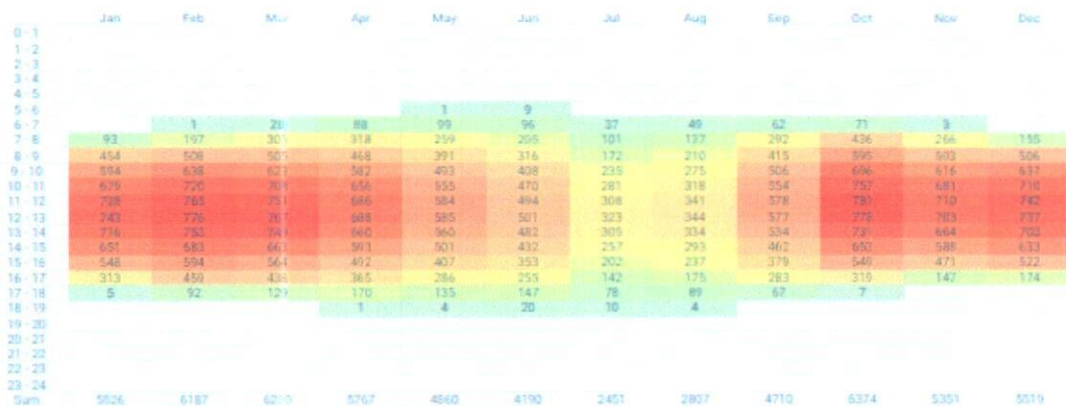
#### Average hourly profiles

Direct normal irradiation [Wh/m²]



#### Average hourly profiles

Direct normal irradiation [Wh/m²]





## 2. Kota

### Kota

25.173702°, 075.857419°

unnamed road, Kota, Rajasthan, India

Time zone: UTC+05:30, Asia/Kolkata (IST)

Report generated: 29 Mar 2023

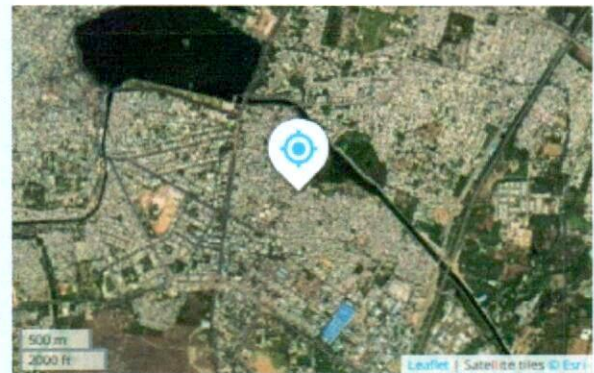
#### SITE INFO

##### Map data

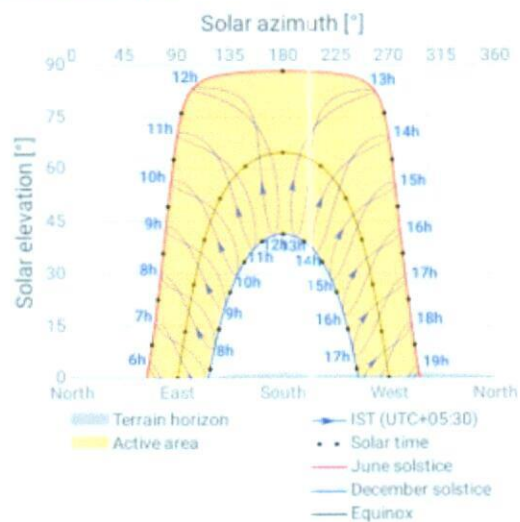
Per year

Specific photovoltaic power output	PVOUT specific	1624.4 kWh/kWp
Direct normal irradiation	DNI	1533.1 kWh/m <sup>2</sup>
Global horizontal irradiation	GHI	1911.2 kWh/m <sup>2</sup>
Diffuse horizontal irradiation	DIF	877.5 kWh/m <sup>2</sup>
Global tilted irradiation at optimum angle	GHI opta	2088.5 kWh/m <sup>2</sup>
Optimum tilt of PV modules	OPTA	26 / 180
Air temperature	TEMP	26.6 °C
Terrain elevation	ELE	266 m

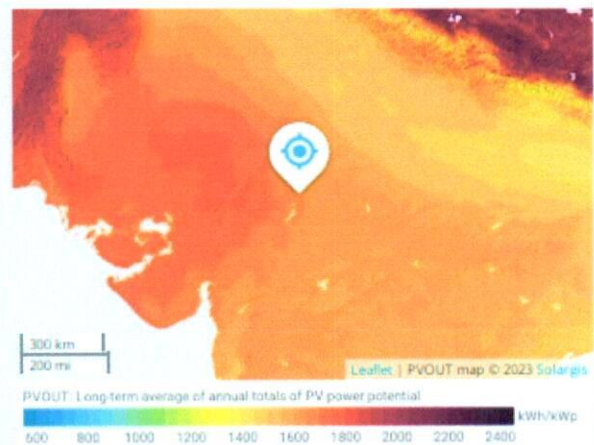
##### Map



#### Horizon and sunpath



##### PVOUT map



## GLOBAL SOLAR ATLAS

BY WORLD BANK GROUP

## PV ELECTRICITY AND SOLAR RADIATION

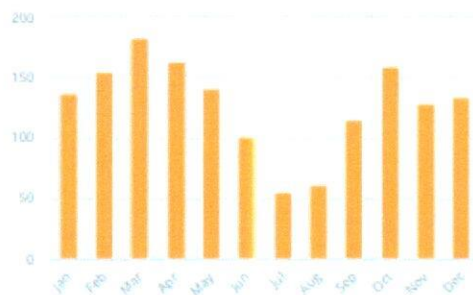
## Annual averages

Direct normal irradiation

**1538.4**kWh/m<sup>2</sup> per year

## Monthly averages

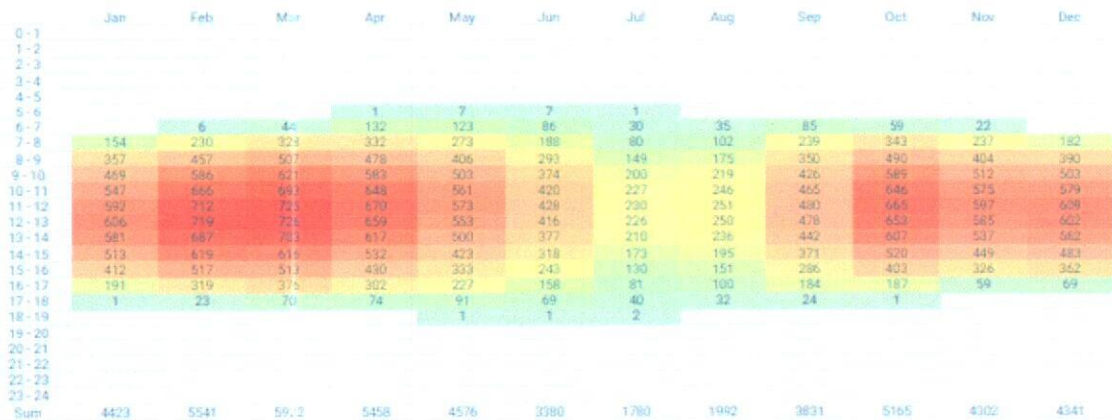
Direct normal irradiation



## Average hourly profiles

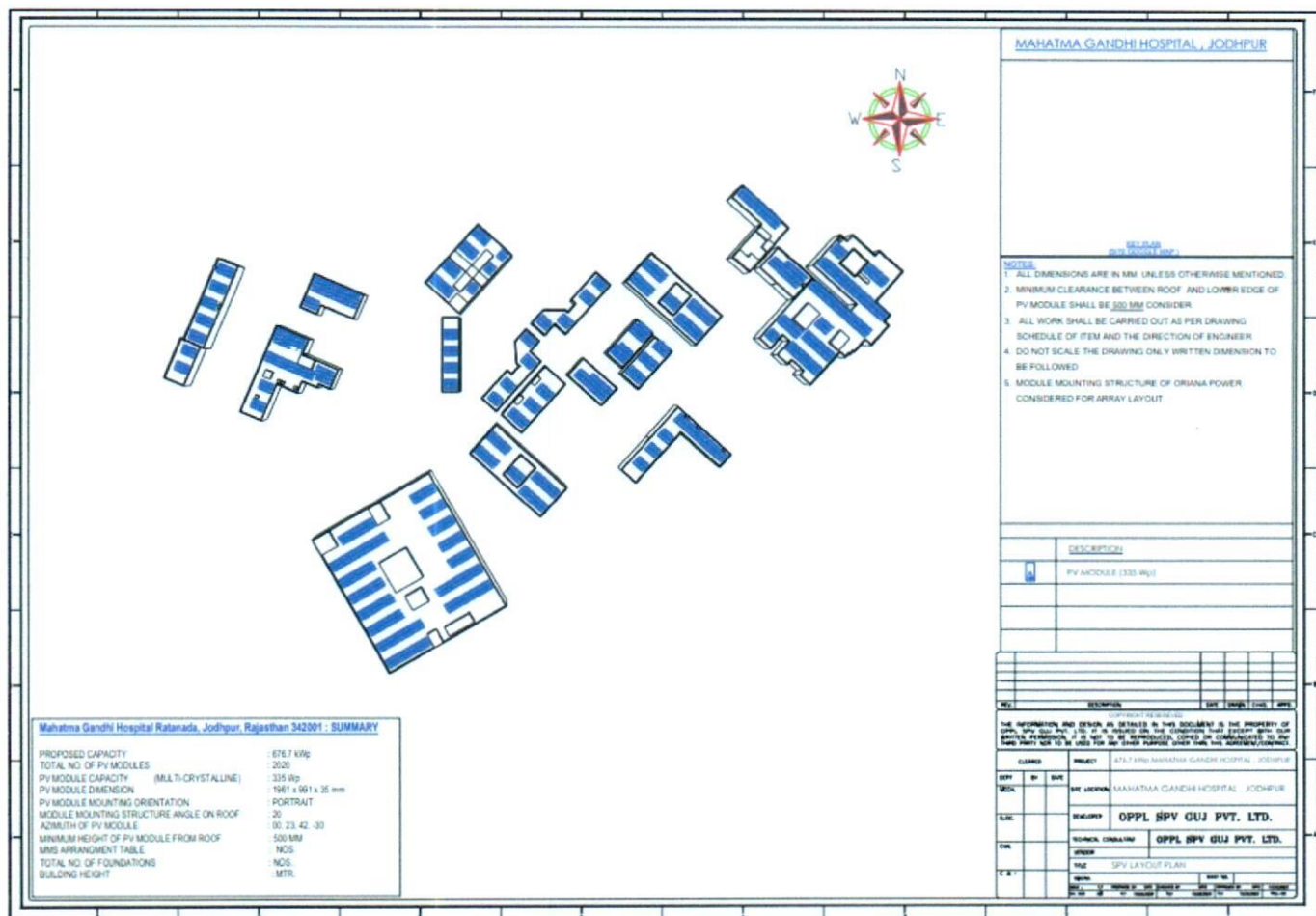
Direct normal irradiation [Wh/m<sup>2</sup>]

## Average hourly profiles

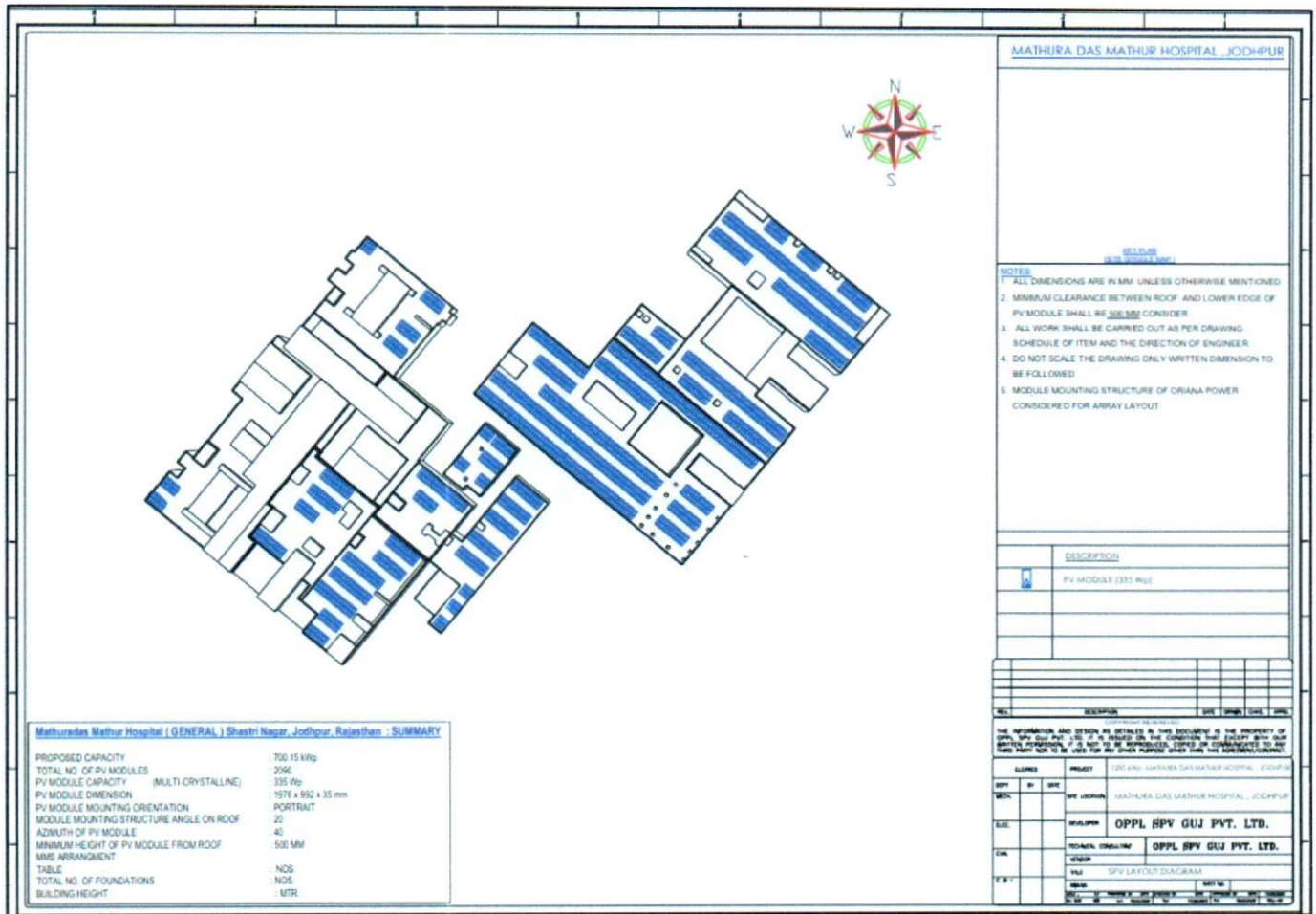
Direct normal irradiation [Wh/m<sup>2</sup>]



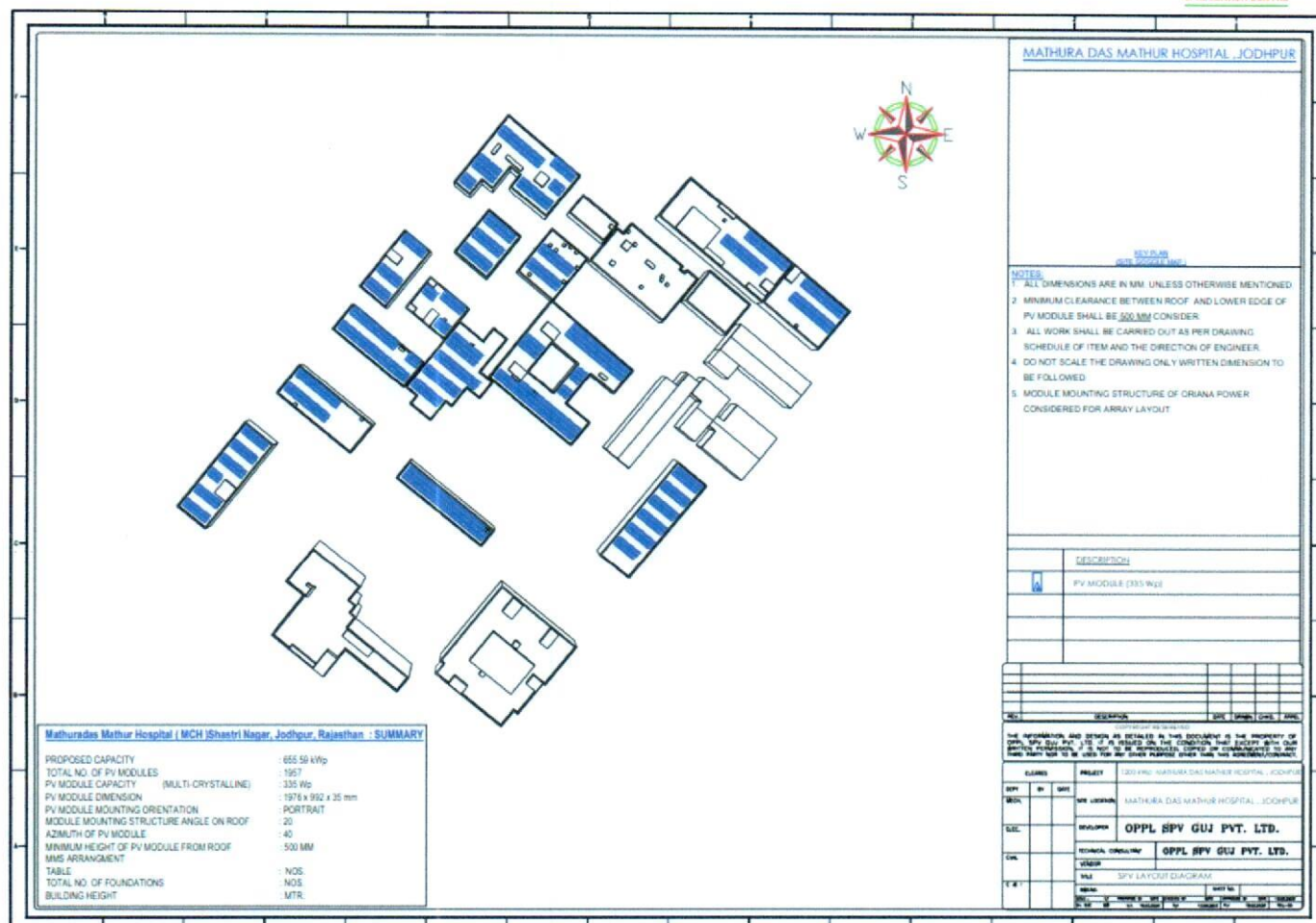
1. Mahatma Gandhi Hospital, Jodhpur



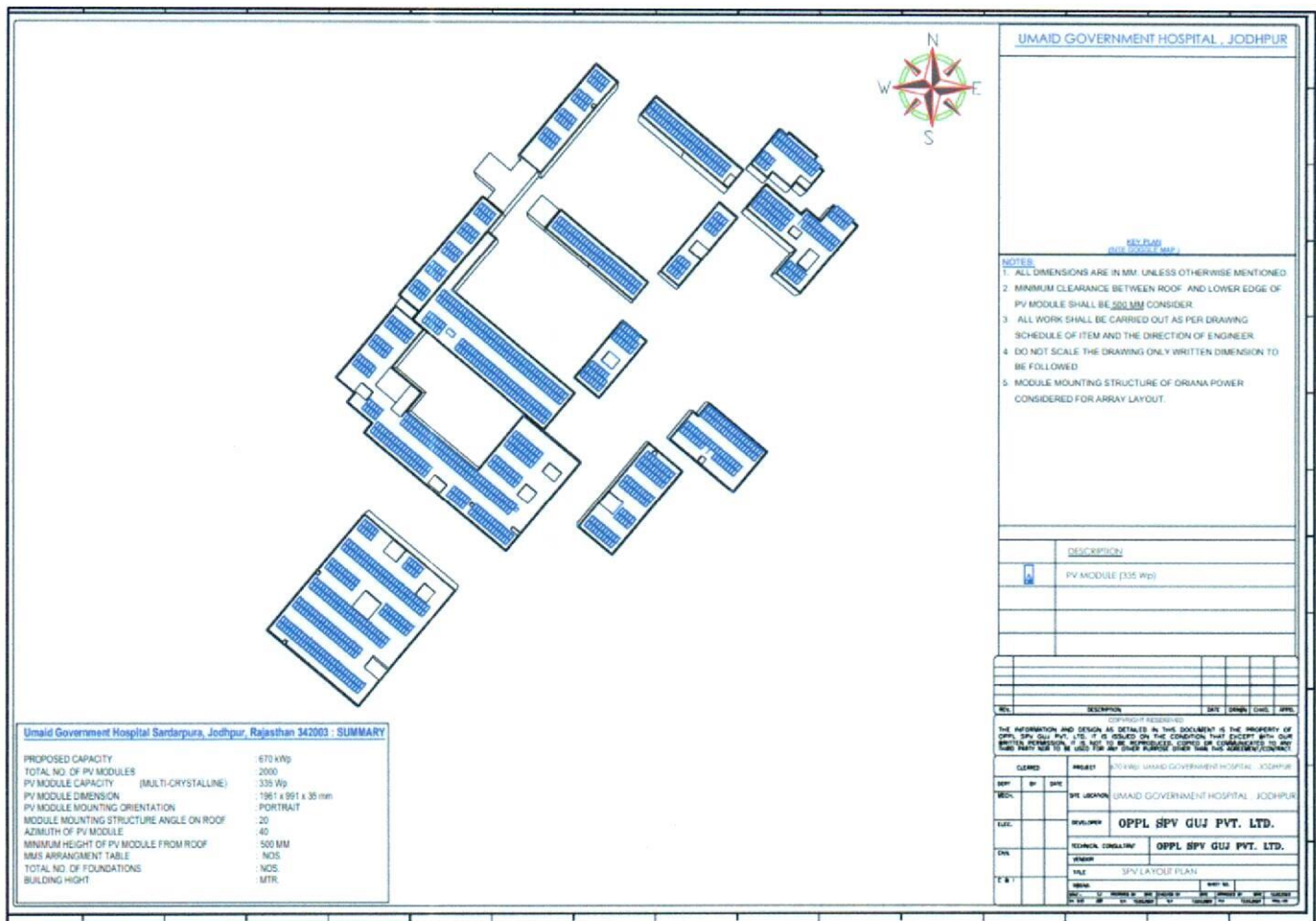
## 2. Mathura Das Hospital, Jodhpur:





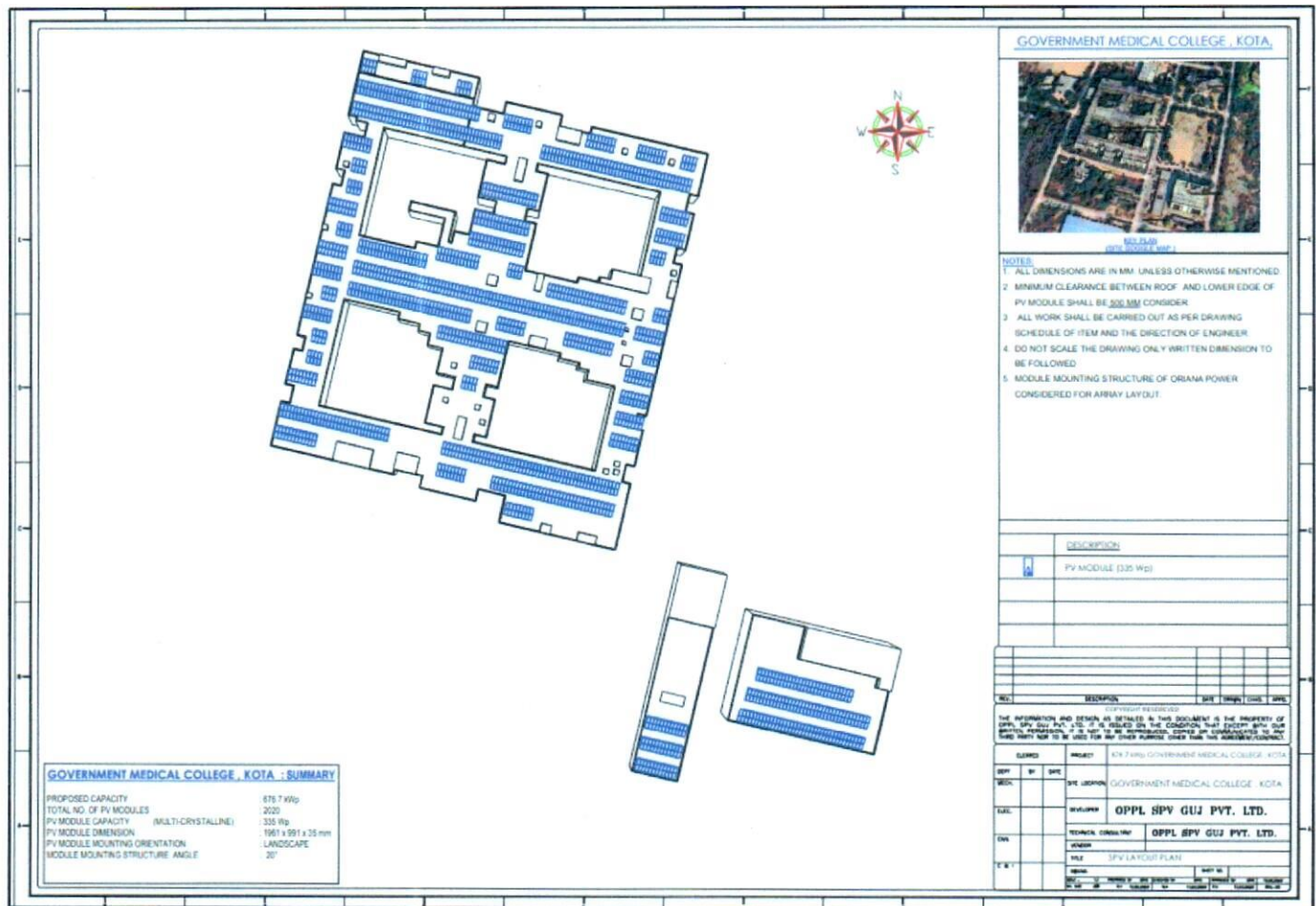


### 3. Umaid Hospital, Jodhpur:

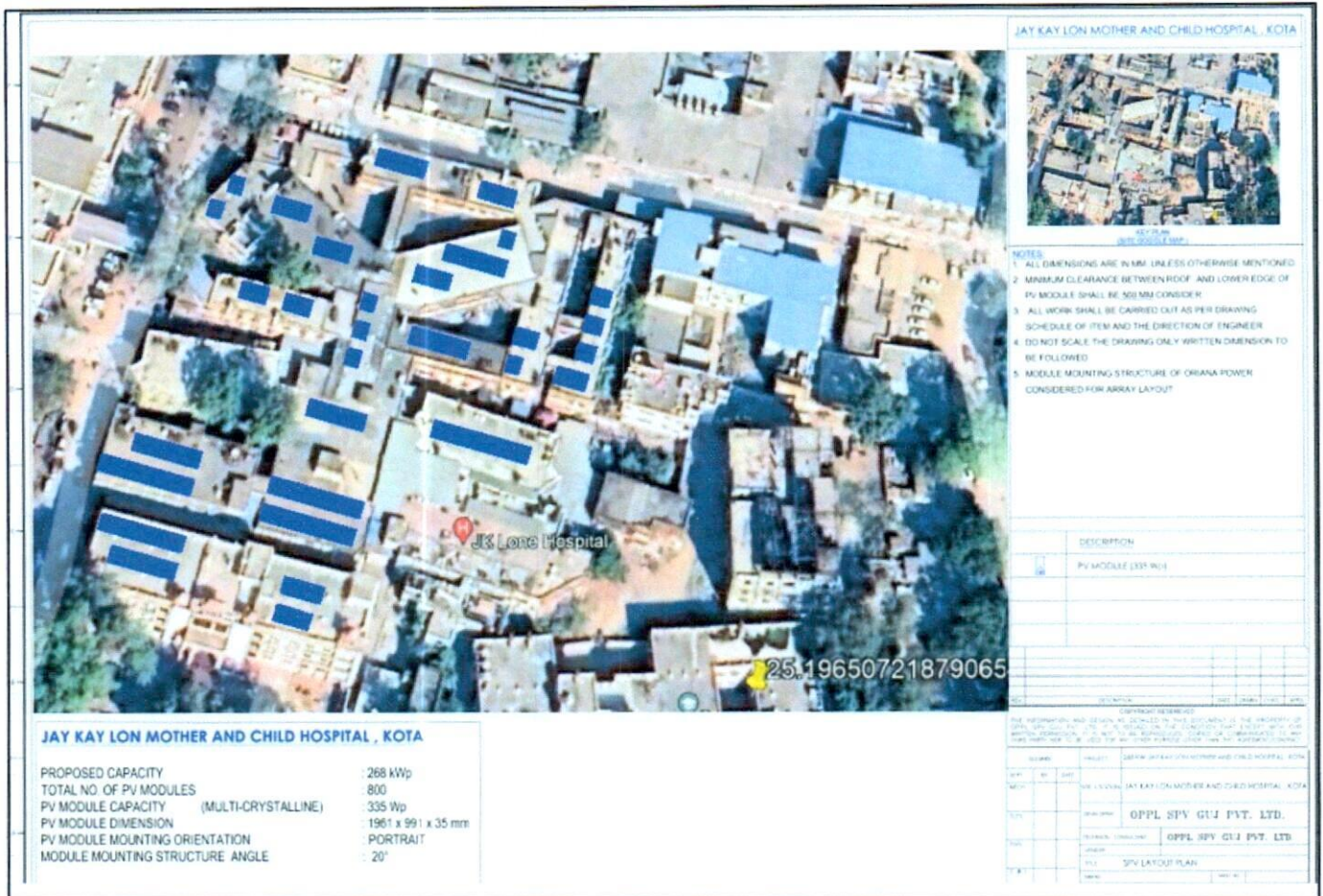




#### 4. Government Medical College, Kota:

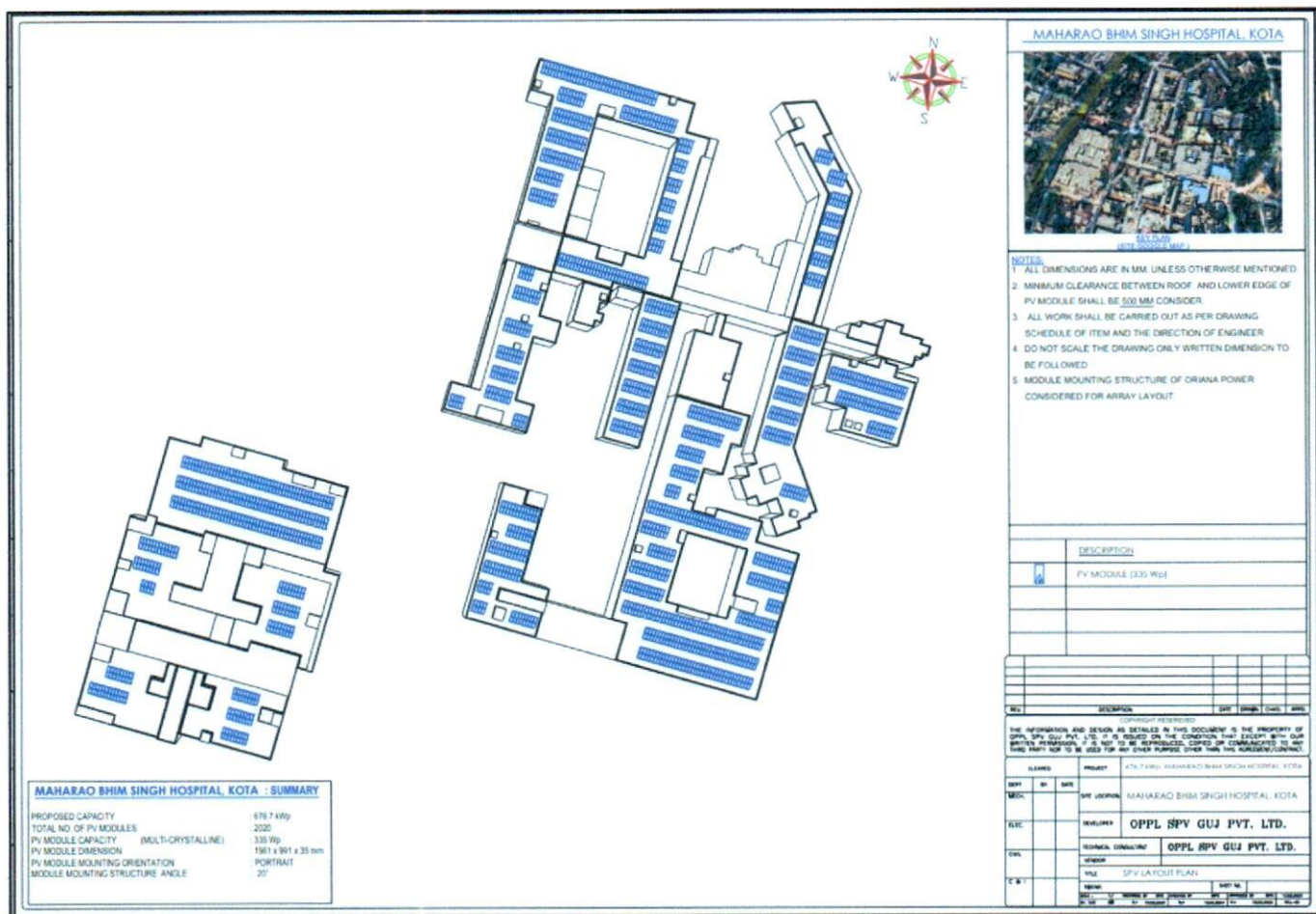


### 5. J K Lone Hospital, Kota:





## 6. Maharao Bhim Singh Hospital, Kota:





NEW MEDICAL COLLEGE, KOTA.



NOTES

- NOTES:**
1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED
  2. MINIMUM CLEARANCE BETWEEN ROOF AND LOWER EDGE OF PV MODULE SHALL BE 500 MM CONSIDER
  3. ALL WORK SHALL BE CARRIED OUT AS PER DRAWING SCHEDULE OF ITEM AND THE DIRECTION OF ENGINEER
  4. DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSION TO BE FOLLOWED
  5. MODULE MOUNTING STRUCTURE OF ORIANA POWER CONSIDERED FOR ARRAY LAYOUT

DESCRIPTION
-------------

4	PV MODULE (335 Wp)

Ref.	DESCRIPTION	DATE	DRIVER	CHECK	AMT.
------	-------------	------	--------	-------	------

Copyright Reserved

CLASSIFIED			PROJECT			67.7 KVP NEW MEDICAL COLLEGE, KOITA		
DEPT	BY	DATE	NEW LOCATION			NEW MEDICAL COLLEGE, KOITA		
DEVELOPER	OPPL SPV GUJ PVT. LTD.							
TECHNICAL CONSULTANT	OPPL SPV GUJ PVT. LTD.							
STUDY	SPV LAYOUT PLAN							
REVISION				SHEET NO.				
APPROVED BY	DATE			APPROVED BY			DATE	

## NEW MEDICAL COLLEGE, KOTA : SUMMARY

PROPOSED CAPACITY	676.7 kWp
TOTAL NO. OF PV MODULES	2020
PV MODULE CAPACITY (MULTI-CRYSTALLINE)	335 Wp
PV MODULE DIMENSION	1961 x 991 x 35 mm
PV MODULE MOUNTING ORIENTATION	LANDSCAPE
MODULE MOUNTING STRUCTURE ANGLE	20°





## PART J

## DISCLAIMER

1. No employee or member of R.K Associates has any direct/ indirect interest in the Project.
2. This report is prepared based on the copies of the documents/ information which the Bank/ Company has provided to us out of the standard checklist of documents sought from them and further based on our assumptions and limiting conditions. All such information provided to us has been relied upon in good faith and we have assumed that it is true and correct in all respect. Verification or cross checking of the documents provided to us has not been done at our end from the originals. If at any time in future, it is found or came to our knowledge that misrepresentation of facts or incomplete or distorted information has been provided to us then this report shall automatically become null & void.
3. This report is a general analysis of the project based on the scope mentioned in the report. This is not an Audit report, Design document, DPR or Techno-financial feasibility study. All the information gathered is based on the facts seen on the site during survey, verbal discussion & documentary evidence provided by the client and is believed that information given by the company is true best of their knowledge.
4. All observations mentioned in the report is only based on the visual observation and the documents/ data/ information provided by the client. No mechanical/ technical tests, measurements or any design review have been performed or carried out from our side during Project assessment.
5. Bank/FII should ONLY take this report as an Advisory document from the Financial/ Chartered Engineering firm and it's specifically advised to the creditor to cross verify the original documents for the facts mentioned in the report which can be availed from the borrowing company directly.
6. In case of any default in loans or the credit facility extended to the borrowing company, R.K Associates shall not be held responsible for whatsoever reason may be and any request for seeking any explanation from the employee/s of R.K Associates will not be entertained at any instance or situation.
7. This Report is prepared by our competent technical team which includes Engineers and financial experts & analysts.
8. This is just an opinion report and doesn't hold any binding on anyone. It is requested from the concerned Financial Institution which is using this report for taking financial decision on the project that they should consider all the different associated relevant & related factors also before taking any business decision based on the content of this report.





9. All Pages of the report including annexures are signed and stamped from our office. In case any paper in the report is without stamp & signature then this should not be considered a valid paper issued from this office.
10. Though adequate care has been taken while preparing this report as per its scope, but still we can't rule out typing, human errors, over sightedness of any information or any other mistakes. Therefore, the concerned organization is advised to satisfy themselves that the report is complete & satisfactory in all respect. Intimation regarding any discrepancy shall be brought into our notice immediately. If no intimation is received within 15 (Fifteen) days in writing from the date of issuance of the report, to rectify these timely, then it shall be considered that the report is complete in all respect and has been accepted by the client upto their satisfaction & use and further to which R.K Associates shall not be held responsible in any manner.
11. Defect Liability Period is **15 DAYS**. We request the concerned authorized reader of this report to check the contents, data and calculations in the report within this period and intimate us in writing if any corrections are required or in case of any other concern with the contents or opinion mentioned in the report. Corrections only related to typographical, calculation, spelling mistakes, incorrect data/ figures/ statement will be entertained within the defect liability period. Any new changes for any additional information in already approved report will be regarded as additional work for which additional fees may be charged. No request for any illegitimate change in regard to any facts & figures will be entertained.
12. R.K Associates encourages its customers to give feedback or inform concerns over its services through proper channel at [le@rkassociates.org](mailto:le@rkassociates.org) in writing within 30 days of report delivery. After this period no concern/ complaint/ proceedings in connection with the Lender's Independent Engineering Services will be entertained due to possible change in situation and condition of the subject Project.
13. Our Data retention policy is of **ONE YEAR**. After this period, we remove all the concerned records related to the assignment from our repository. No clarification or query can be answered after this period due to unavailability of the data.
14. This Lender's Independent Engineering report is governed by our (1) Internal Policies, Processes & Standard Operating Procedures, (2) Information/ Data/ Inputs given to us by the client and (3) Information/ Data/ Facts given to us by our field/ office technical team. Management of R.K Associates never gives acceptance to any unethical or unprofessional practice which may affect fair, correct & impartial assessment and which is against any prevailing law. In case of any indication of any negligence, default, incorrect, misleading, misrepresentation or distortion of facts in the report then it is the responsibility of the user of this report to immediately or at least within the defect liability period bring all such act into notice of R.K Associates management so that corrective measures can be taken instantly.





15. R.K Associates never releases any report doing alterations or modifications from pen. In case any information/ figure of this report is found altered with pen then this report will automatically become null & void.

Place : Noida  
Date : 24.04.2023  
Note : This report contains 40 pages

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