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CIN : U74140DL2014PTC272484

File No. : VIS (2021-22)-PL779-679-1038 Dated: 22/02/2022

LENDER'S INDEPENDENT ENGINEER REPORT

OF

SOLAR QUEST PROJECTS THREE PRIVATE LIMITED

SET UP AT

MUMBAI PORT TRUST, CHENNAI METRO RAIL LIMITED AND IMSC, CHENNAI

COMPANY/PROMOTER

SOLAR QUEST PROJECTS THREE PRIVATE LIMITED

REPORT PREPARED FOR

STATE BANK OF INDIA, SME, ASAF ALI ROAD, DELHI

- Corporate Valuers
- Business/ Enterprise/ Equity Valuations
- Lender's Independent Engineers (LE)
- Techno Economic Viability Consultants (TEV)
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PART A — REPORT SUMMARY

1.	**Name of Project:**	**Project 1-** Installation and commissioning of Rooftop Solar power plant of capacity 288 kWp at Chennai Metro Rail Limited , CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, Tamil Nadu- 600019 **Project 2-** Installation and commissioning of Rooftop Solar power plant of capacity 375 kWp at Chennai Metro Rail Limited, Wimco Nagar metro Station., Chennai, Tamil Nadu – 600019 **Project 3:** Installation and commissioning of Rooftop Solar power plant of capacity 45 kWp at The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA NodalCenter, Ambedkar Road, Pallavaram, Chennai, Tamil Nadu – 600043 **Project 4:** Installation and commissioning of Rooftop Solar power plant of capacity 292 kWp at The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai ,Chennai, Tamil Nadu – 600113 **Project 5:** Installation and commissioning of Rooftop Solar power plant of capacity 499 kWp at Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001 **Project 6:** Installation and commissioning of Rooftop Solar power plant of capacity 500 kWp at Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001
2.	**Project Location:**	**Project 1:** Chennai Metro Rail Limited , CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, Tamil Nadu- 600019 **Project 2:** Chennai Metro Rail Limited, Wimco Nagar metro Station., Chennai, Tamil Nadu – 600019 **Project 3:** The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA Nodal Center, Ambedkar Road, Pallavaram, Chennai, Tamil Nadu – 600043 **Project 4:** The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai ,Chennai, Tamil Nadu – 600113 **Project 5:** Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001

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		Project 6: Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001
3.	**Name of the Proposed Borrower:**	M/s. Solar Quest Project Three Private Limited
4.	**Director's**	Mr. Pranjal Dhariwal Mr. Dipak Kumar (Solanki)
5.	**Prepared for Bank:**	State Bank of India
6.	**LIE Consultant Firm:**	M/s. R.K. Associates Valuers & Techno Engineering Consultants (P) Ltd.
7.	**Date of Survey:**	25th January 2022 and 16th February 2022
8.	**Date of Report:**	22nd February 2022
9.	**Purpose of the Report:**	Review, evaluate & comment on project implementation & present status details to facilitate bankers to take credit decision on the Project.
10.	**Scope of the work provided by the Lender:**	To verify and examine the installation, commissioning status of the Project.
11.	**Documents perused for Proposal:**	a. Project Report b. Copies of Invoices
12.	**Annexure with the report:**	1. Copies of Invoices

PART B INTRODUCTION

1. **NAME OF THE PROJECT:** 6 Solar Power Plants having cumulative 1.99 MW of capacity being set up under the SECI Scheme in Tamil Nadu and Maharashtra.

2. **PROJECT OVERVIEW:**

The company proposed to set up 6 Nos. of solar rooftop Power Plant Projects at various locations of varying capacities. List of locations is as below:

Project 1: Installation and commissioning of Rooftop Solar power plant of planned capacity 288 kWp at Chennai Metro Rail Limited, CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, Tamil Nadu- 600019

Project 2: Installation and commissioning of Rooftop Solar power plant of planned capacity of 375 kWp at Chennai Metro Rail Limited, Wimco Nagar metro Station. Chennai, Tamil Nadu – 600019.

Project 3: Installation and commissioning of Rooftop Solar power plant of capacity planned capacity of 45 kWp at The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA Nodal Center, Ambedkar Road, Pallavaram, Chennai, Tamil Nadu – 600043.

Project 4: Installation and commissioning of Rooftop Solar power plant of planned capacity of 292 kWp at The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai, Tamil Nadu – 600113.

Project 5: Installation and commissioning of Rooftop Solar power plant of planned capacity of 499 kWp at Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra-400001.

Project 6: Installation and commissioning of Rooftop Solar power plant of planned capacity of 500 kWp at Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra-400001.

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Solar Quest LLP bagged allocation of 3500 kWp from Solar Energy Corporation of India vide sanction Letter Ref. No.: SECI/C&P/RfS/MNRE/975MW GCRT/R1/IND/082019/LOA/35438 Dated 15/0/2020. According to this sanction 500 kWp is allotted to Zone 1 CAPEX Model and 3000 kWp was allotted to Zone 1 RESCO Model. However vide Letter Ref. No.: SECI/Solar/112/2020-21/43608, 999 kWp has been transferred from Zone -1 RESCO to Zone 2 RESCO and 1000 kWp has been transferred from Part B (RESCO) Zone 1 to Part A (CAPEX) Zone 1. Thus as on Date 1500 kWp is associated to CAPEX Model and 2000 kWp is associated to RESCO Model against which the company has installed 2,153 kWp. However they are only eligible to claim subsidy on 1999 kWp sanctioned by SECI. Under this report only 2000 kWp under RESCO Model is considered. 1500 kWp under CAPEX Model is out of scope of this report.

Following are the three off takers and their details:

Sr. No.	Project Name	Client Category	Tariff	Cost of Project	Sanctioned Capacity	Installed Capacity
1.	Mumbai Port Trust	Govt.- Dockyard	3.25	4,49,51,198/-	999 kWp	1045 kWp
2.	Chennai Metro Rail Ltd.	Govt.-Railways	3.25	3,28,10,816/-	663 kWp	848 kWp
3.	IMSC, Chennai	Govt.- Research	3.25	1,13,28,746/-	3367 kWp	260 kWp
	Total			**8,90,90,760/-**	**1,999 kWp**	**2,153 kWp**

Total Project cost envisaged in this project is Rs.8.90 crore as per the company's Project report. Till date this Project is funded completely from promoter's only. However, as per invoices the company has incurred Rs.8.95 Crore on the project till 18th February 2022. Thus there is minor Cost overrun in the project which may be attributed to increase in input cost of the industry.

Also, In regard to the installed capacity of 260 kWp at IMSC Chennai, the company has provided invoices for setting up of 330 kWp. Clarification was sought from the borrower. Accordingly, the borrower has informed that the actual installed capacity at site is only 260 kWp and for remaining 70 kWp material is lying at site. Therefore as per invoice No. SQTN/2021-22/019 the amount for installing 330 kWp amounts to Rs.1,47,48,904/-. Thus as per pro rata basis the cost for installing 70 kWp amounts to Rs.31,28,555.40 which is not considered in our assessment as the same is associated to uninstalled physical progress.

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2.1 DETAILS OF PROJECTS COMMISIONED

i. PROJECT COMMISIONED AT IMSC, CIT CAMPUS, THARAMANI AND PALLAVARAM, CHENNAI AND (267.95 kWp)

Project Location	**4th Cross street, IMSC, CIT Campus, Tharamani and Pallavaram, Chennai, Tamil Nadu 600113**						
Particulars	**Approved Capacity for Commissioning**						**Total**
Project Name	120 kWp	17.8 kWp	33 kWp	20 kWp	27.145 kWp	50 kWp	**267.945**
Location	IMSC, New Building	IMSC Substation	IMSC Auditorium	IMSC Hostel	IMSC Guest House	IMSC Pallavaram	**IMSC Pallavaram and Tahramani**
PPA Agreement Date	29/12/2020	29/12/2020	29/12/2020	29/12/2020	29/12/2020	29/12/2020	**29/12/2020**
Date of Commissioning	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	**15/09/2021**
Module Make	Waaree	Waaree	Waaree	Waaree	Waaree	Waaree	**Waaree**
Power of each module	445 Wp	445 Wp	445 Wp	445 Wp	445 Wp	445 Wp	**445 Wp**
Total No. of Modules	**254**	**40**	**74**	**45**	**61**	**112**	**586**

Note: The Company has purchased material for installation of approximately 330 kWp of solar panels and other allied equipment's. However as per our discussion with the company, they have only installed approximately 260 kWp of Solar panels. Remaining materials for approximately 70 kWp is lying as material at site.

ii. PROJECT COMMISIONED AT CMRL, WIMCO NAGAR METRO STATION (448 kWp) AND CMRL, TIRUVYATTUR METRO STATION (400 kWp)

Project Location	**CMRL Wimco Nagar Metro Station**
Project Name	448 kWp
PPA Agreement Date	14/08/2021
Date of Commissioning	18/10/2021
Module Make	Topsun
Power of each module	400 Wp
Total No. of Modules	1120

Project Location	**Tiruvyottiur Metro station**
Project Name	400 kWp
PPA Agreement Date	14/08/2021
Date of Commissioning	18/10/2021
Module Make	Topsun
Power of each module	400 Wp
Total No. of Modules	1000

iii. PROJECT COMMISIONED AT MUMBAI PORT, SHED NO. 13 (B1) [499 kWp] and MUMBAI PORT, SHED NO. 13 (B2 (500 kWp) OF THE INDIRA DOCK

Project Location	**Shed No. 13 (B1) of the Indira Dock , Mumbai Port trust**
Project Name	499 kWp
PPA Agreement Date	11/02/2021
Date of Commissioning	16/09/2021
Module Make	Topsun
Power of each module	335 Wp
Total No. of Modules	1558

Project Location	**Shed No. 13 (B2) of the Indira Dock , Mumbai Port trust**
Project Name	500 kWp
PPA Agreement Date	11/02/2021
Date of Commissioning	16/09/2021
Module Make	Topsun
Power of each module	335 Wp
Total No. of Modules	1562

2.2 EXCERPTS OF POWER PURCHASE AGREEMENTS

➔ **Major Terms of the Power Purchase Agreement between Chennai Metro Rail Limited and Solar Quest Projects three Private Limited:**

a. **Scope of Work and concessionaire responsibility:** Site survey, Planning, Design, Engineering, Manufacture, Supply, Civil work, Erection, Testing and Commissioning including operation and maintenance of Solar PV Power System of 663kWp (288kWp + 375kWp)

b. **Term Period:** 25 years from Commercial Operation Date.

c. **Project Tariff:** Rs.3.25/kwh (Tariff Stream throughout the PPA tenure i.e. 25 Years).

d. **Estimated Annual Production:**

Annexure-4

Project:	288 kWp Solar On-Grid Power Project		
Location:	CMRL, Tiruvottiyur Metro Station		
Design Criteria			
Expected Yearly Energy Generation Sheet			
End of Year	Yearly Degradation 'MWh' (Modules & System)	Global incident in coll. Plane (Glob. Inc) 'kWh/Sq. mtr Yearly	Energy injected into grid (E. Grid) 'MWh' Yearly 'A'
	Degradation consider in PV system generation data		
1.	1.0%	1946	417.60
2.	1.0%	1946	413.42
3.	1.0%	1946	409.29
4.	1.0%	1946	405.20
5.	1.0%	1946	401.14
6.	1.0%	1946	397.13
7.	1.0%	1946	393.16
8.	1.0%	1946	389.23
9.	1.0%	1946	385.34
10.	1.0%	1946	381.48
11.	1.0%	1946	377.66
12.	1.0%	1946	373.89
13.	1.0%	1946	370.15
14.	1.0%	1946	366.45
15.	1.0%	1946	362.79
16	1.0%	1946	359.16
17	1.0%	1946	355.56
18	1.0%	1946	352.00
19	1.0%	1946	348.49
20	1.0%	1946	345.00
21	1.0%	1946	341.55
22	1.0%	1946	338.14
23	1.0%	1946	334.75
24	1.0%	1946	331.41
25	1.0%	1946	328.10

Customer

CHENNAI METRO RAIL CHENNAI

For Solar Quest Projects Three Pvt. Ltd

Service Provider Representative

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

e. **Maintenance and Cleaning:** The service provider shall at all times during the term of the agreement maintain the system except raised structure/shelter in the efficient condition which would include proper cleaning of PV Modules. The customer agrees to, at his expense to provide adequate raw/potable/ government supply water at the site itself, for cleaning of PV modules on a monthly or as required basis during the Term of this agreement. The amount of water required shall be two litres per module per cleaning which is approximately 6000L twice a month.

➔ **Major Terms of the Power Purchase Agreement between The Institute of Mathematical Sciences, IV cross road, CIT Campus, taramani, Chennai 600 113, Tamil Nadu, India and M/s Solar Quest Projects three Private Limited:**

a. **Scope of Work and concessionaire responsibility:** Design, Manufacture, Supply, Erection, Testing and Commissioning including Warranty, Operation and maintenance if 337 Kwp Rooftop Solar PV Systems at the institute of Mathematical Sciences and DAE Nodal Center.

b. **Term Period:** 25 years from Commercial Operation Date.

c. **Project Tariff:** Rs.3.25/kwh (Tariff Stream throughout the PPA tenure i.e. 25 Years).

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d. **Estimated Annual Production:** Expected annual generation as per PPA is as below:

SCHEDULE IV

Project:	292 kWp Solar On-Grid Power Project
Location:	The Institute of Mathematical Sciences, CIT Campus
Design Criteria	

Expected Yearly Energy Generation Sheet			
End of Year	Yearly Degradation 'MWh' (Modules & System)	Global incident in coll. Plane (GlobInc) 'kWh/Sq. mtr Yearly	Energy injected into grid (E_Grid) 'MWh' Yearly 'A'
Degradation consider in PV system generation data			
1.	1.0%	1946	408.80
2.	1.0%	1946	404.71
3.	1.0%	1946	400.66
4.	1.0%	1946	396.65
5.	1.0%	1946	392.69
6.	1.0%	1946	388.76
7.	1.0%	1946	384.87
8.	1.0%	1946	381.02
9.	1.0%	1946	377.21
10.	1.0%	1946	373.44
11.	1.0%	1946	369.71
12.	1.0%	1946	366.01
13.	1.0%	1946	362.35
14.	1.0%	1946	358.73
15.	1.0%	1946	355.14
16	1.0%	1946	351.59
17	1.0%	1946	348.07
18	1.0%	1946	344.59
19	1.0%	1946	341.14
20	1.0%	1946	337.73
21	1.0%	1946	334.36
22	1.0%	1946	331.01
23	1.0%	1946	327.7
24	1.0%	1946	324.42
25	1.0%	1946	321.18

e. **Maintenance and Cleaning:** The Power producer shall maintain general cleanliness of area around the project during construction and operation period of the project. Case any damages is caused to the equipment/facilities owned by the purchaser doe to the power producer, the same shall be made good rectified by the Power producer at their cost.

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➔ **Major Terms of the Power Purchase Agreement between The board of trustees of the port of Mumbai and M/s Solar Quest Projects three Private Limited:**

a. **Scope of Work and concessionaire responsibility:** Design, Manufacture, Supply, Erection, Testing and Commissioning including Warranty, Operation and maintenance if 499 Kwp Rooftop Solar PV Systems at Shed No. 13B (2) of Indira Dock, Mumbai Port Trust, Mumbai.

b. **Term Period:** 25 years from Commercial Operation Date.

c. **Project Tariff:** Rs.3.25/kwh (Tariff Stream throughout the PPA tenure i.e. 25 Years).

d. **Estimated Annual Production:** Expected annual generation as per PPA is as below:

SCHEDULE IV

Project	499 kWp Solar On-Grid Power Project
Location	Shed No 13 B(2) of Indira Dock, Mumbai Port Trust
Design Criteria	

Expected Yearly Energy Generation Sheet			
Year	Yearly Degradation 'MWh' (Modules & System)	Global incident in coll Plane (GlobInc) 'kWh/Sq. mtr Yearly	Energy injected into grid (E_Grid) 'MWh' Yearly 'A'
	Degradation consider in PV system generation data		
1	1.0%	1954.8	675.00
2	1.0%	1954.8	668.25
3	1.0%	1954.8	661.57
4	1.0%	1954.8	654.95
5	1.0%	1954.8	648.40
6	1.0%	1954.8	641.92
7	1.0%	1954.8	635.50
8	1.0%	1954.8	629.14
9	1.0%	1954.8	622.85
10	1.0%	1954.8	616.62
11	1.0%	1954.8	610.46
12	1.0%	1954.8	604.35
13	1.0%	1954.8	598.31
14	1.0%	1954.8	592.33
15	1.0%	1954.8	586.40
16	1.0%	1954.8	580.54
17	1.0%	1954.8	574.73
18	1.0%	1954.8	568.99
19	1.0%	1954.8	563.30
20	1.0%	1954.8	557.66
21	1.0%	1954.8	552.09
22	1.0%	1954.8	546.57
23	1.0%	1954.8	541.10
24	1.0%	1954.8	535.69
25	1.0%	1954.8	530.33

SOLAR QUEST PROJECTS THREE PVT. LTD.
DIRECTOR

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

e. **Maintenance and Cleaning:** The Power producer shall maintain general cleanliness of area around the project during construction and operation period of the project. Case any damages is caused to the equipment/facilities owned by the purchaser doe to the power producer, the same shall be made good rectified by the Power producer at their cost.

2.3 Excerpts of SECI Sanction Letters

Sanction Letter No.	Bidder Name	Location	Date	Capacity Sanctioned	Capacity Installed
SECI/PS/97.5MW /45471	Solar Quest Project Three Private Limited	Chennai Metro Rail Limited, CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, TAMIL NADU- 600019	20/10/2021	288 kWp	400 kWp
SECI/PS/97.5MW /45472	Solar Quest Project Three Private Limited	Chennai Metro Rail Limited, Wimco Nagar metro Station., Chennai, TAMIL NADU - 600019	20/10/2021	375 kWp	448 kWp
SECI/PS/97.5MW /44715	Solar Quest Project Three Private Limited	The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA Nodal Center, Ambedkar Road, Pallavaram, Chennai, TAMIL NADU - 600043	18/09/2021	45 kWp	260 kWp
SECI/PS/97.5MW /44727	Solar Quest Project Three Private Limited	The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai ,Chennai, TAMIL NADU - 600113	19/09/2021	291.92 kWp	
SECI/PS/97.5MW /44726	Solar Quest Project Three Private Limited	Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA -400001	19/09/2021	499 kWp	1045 kWp
SECI/PS/97.5MW /44716	Solar Quest Project Three Private Limited	Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA -400001	18/09/2021	500 kWp	
Grand Total				**1999 kWp**	**2153 kWp**

Note: The Company has installed Solar Panels for Rating capacity of 2153 kWp as against sanctioned capacity of 1999 kWp. Clarification was sought from the company who has informed that they will claim subsidy on sanctioned capacity only. However they will claim reimbursement form the bank for amount against installation of 2153 kWp only.

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3. **SCOPE OF THE REPORT:** Review, evaluate & comment on project implementation & present status details to take further business decision on the Project.

4. **PURPOSE OF THE REPORT:** To verify and examine the installation, commissioning status of the Project.

5. **METHADOLOGY ADOPTED:**

   a. Study of Project Planning documents/ reports to know about the Project.
   b. Additional information, data, documents collection the company.
   c. Study and analysis of the documents and information obtained from the company.
   d. Research about the Project/ sector from the sources in the public domain.
   e. Correlation of the provided information against Industry/ sector benchmarks/ trend.
   f. Information compilation, analysis and reporting.

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PART C PROJECT LOCATION & SITE APPROPRIATENESS

1. **LOCATION:** The Project is set up at various location:

Location	Date	Capacity Sanctioned	Capacity Installed
Chennai Metro Rail Limited, CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, Tamil Nadu- 600019	20/10/2021	288 kWp	400 kWp
Chennai Metro Rail Limited, Wimco Nagar metro Station., Chennai, Tamil nadu - 600019	20/10/2021	375 kWp	448 kWp
The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA Nodal Center, Ambedkar Road, Pallavaram, Chennai, Tamil nadu - 600043	18/09/2021	45 kWp	260 kWp
The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai ,Chennai, Tamil Nadu - 600113	19/09/2021	291.92 kWp	
Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001	19/09/2021	499 kWp	1045 kWp
Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001	18/09/2021	500 kWp	
		1999 kWp	**2153 kWp**

2. **SITE APPROPRIATENESS:**

2.1 Site Appropriateness for Location:

- Chennai Metro Rail Limited, CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, Tamil Nadu- 600019,
- Chennai Metro Rail Limited, Wimco Nagar metro Station., Chennai, Tamil Nadu – 600019,
- The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA Nodal Center, Ambedkar Road, Pallavaram, Chennai, Tamil Nadu – 600043

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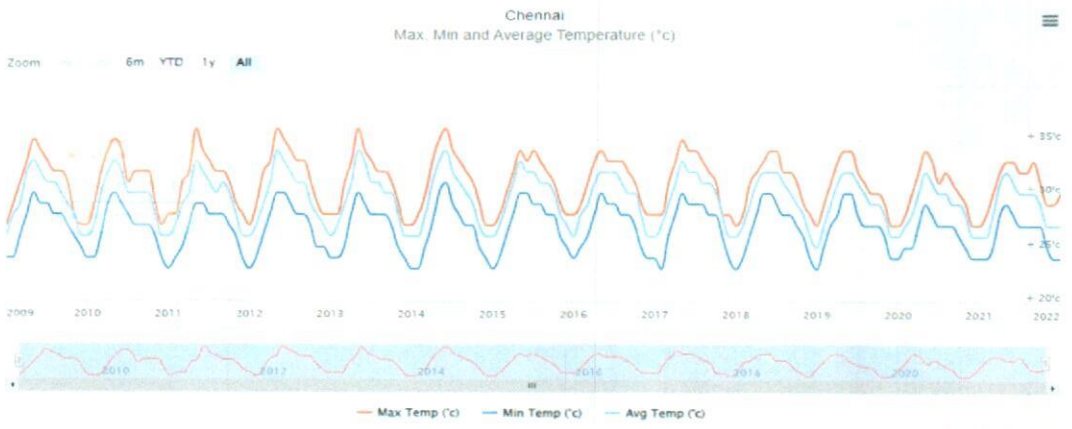
- The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai ,Chennai, Tamil Nadu - 600113

The site appropriateness for a roof top solar power unit is basically based on the weather and solar radiation parameters since annual energy yield of a PV plant is solely dependent on the solar resource of the site. In this regard for doing the site appropriateness following site parameters are being evaluated:

a. Temperature: The average temperature is measured as per the Metrological Station statistic available at Chennai in which both the sites are located. At an average temperature of 35^0 C, May is the hottest month of the year and at an average temperature of 27^0 C January is the coldest month.

Max, Min and Average Temperature



Source: ***https://www.worldweatheronline.com/chennai-weather-averages/tamil-nadu/in.aspx***

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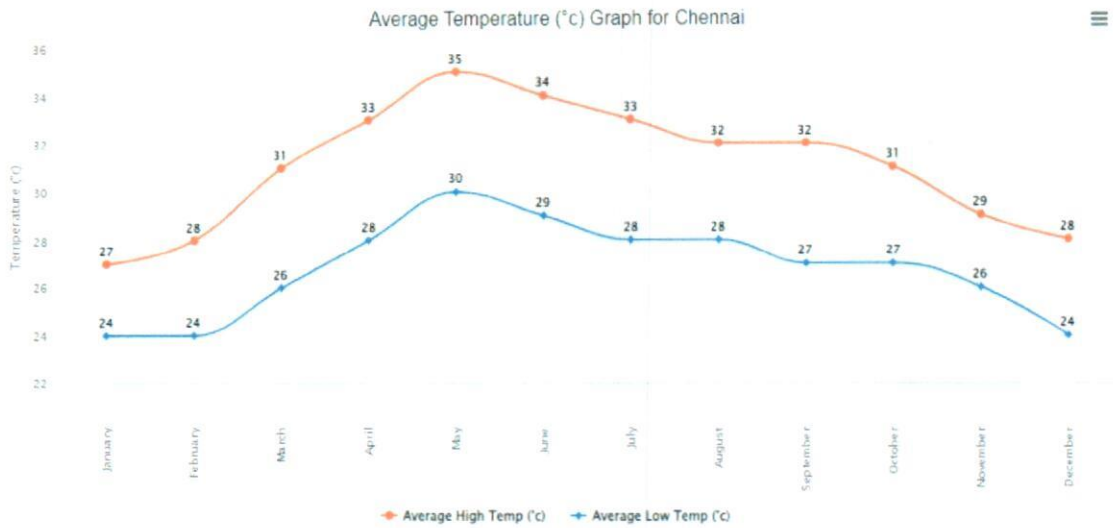
Monthly Average Temperature



Source: ***https://www.worldweatheronline.com/chennai-weather-averages/tamil-nadu/in.aspx***

Note: Although the temperature doesn't affect the amount of solar energy a solar panel receives, it does affect how much power you will get out of it. Thus, as the solar panels get hotter, they will produce less power from the same amount of sunlight. In this area the average Maximum temperature is about 35^0 C and average minimum temperature is about 27^0 C. As per information available in public domain solar panels are tested at 25 °C (77 °F) and thus solar panel temperature will generally range between 15 °C and 35 °C during which solar cells will produce at maximum efficiency. However, solar panels can get as hot as 65 °C (149 °F) at which point solar cell efficiency will be hindered.

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b. Wind Speed: The macro-level wind speed zones of India have been formulated and published in IS: 875 (Part 3) - 1987 titled "Indian Standard Code of Practice for Design Loads (other than earthquakes) for Buildings and Structures, Part 3, Wind Loads". There are six basic wind speeds `V_b' considered for zoning, namely 55, 50, 47, 44, 39 and 33 m/s. From wind damage view point, these could be described as follows:

- 55 m/s (198 km/h) - Very High Damage Risk Zone – A
- 50 m/s (180 km/h) - Very High Damage Risk Zone – B
- 47 m/s (169.2 km/h) - High Damage Risk Zone
- 44 m/s (158.4 km/h) - Moderate Damage Risk Zone – A
- 39 m/s (140.4 km/h) - Moderate Damage Risk Zone – B
- 33 m/s (118.8 km/h) - Low Damage Risk Zone

The cyclone affected coastal areas of the country are classified in 50 and 55 m/s zones. The basic wind speeds are applicable to 10 m height above mean ground level in an open terrain with a return period of 50 years. Chennai lies on 50m/s band of wind speed. **Therefore Chennai lies in Very High damage risk zone B.**

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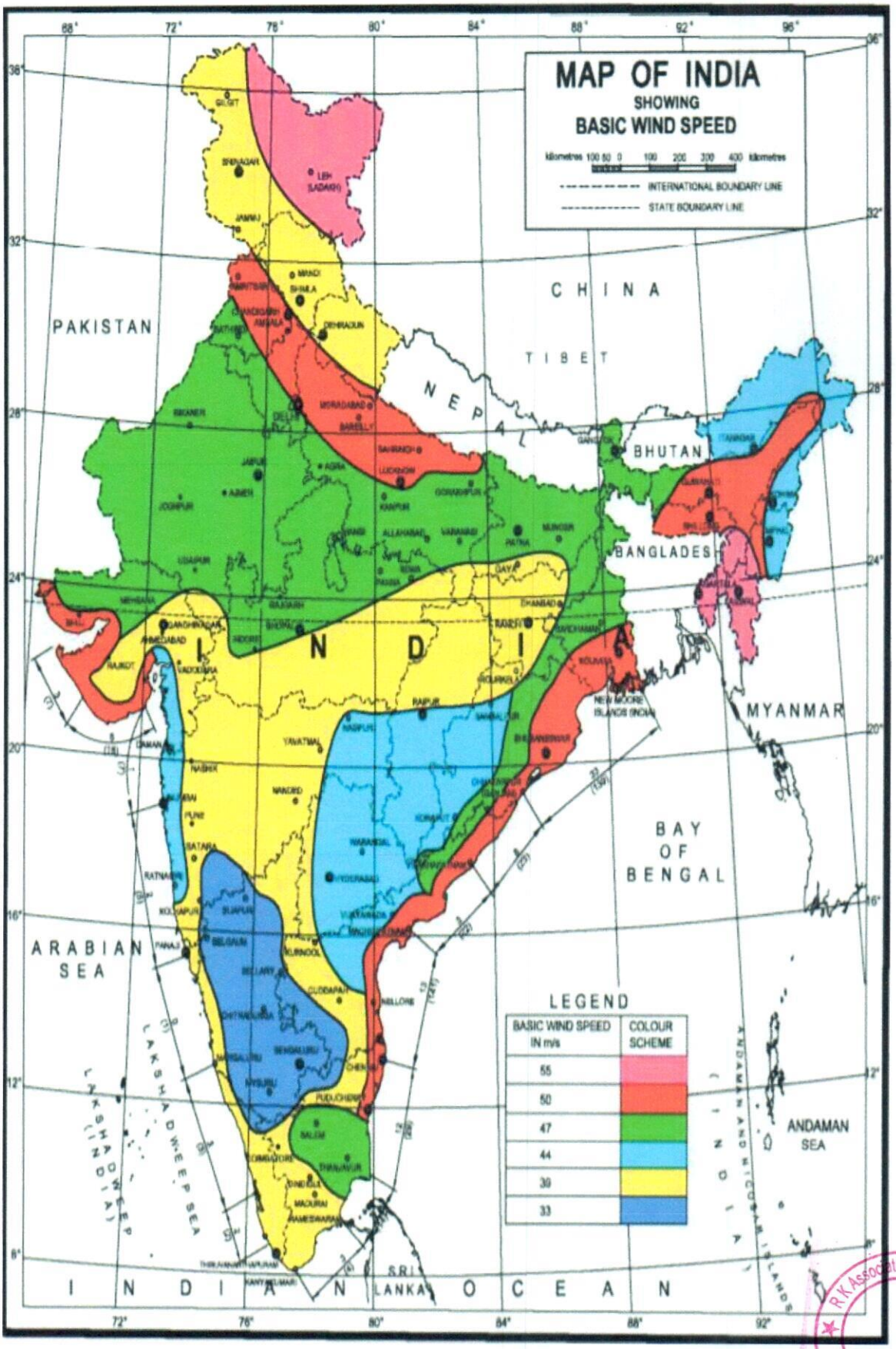

MAP OF INDIA
SHOWING
BASIC WIND SPEED
INTERNATIONAL BOUNDARY LINE
STATE BOUNDARY LINE
PAKISTAN
CHINA
TIBET
NEPAL
BHUTAN
BANGLADES
MYANMAR
INDIA
BAY OF BENGAL
ARABIAN SEA
ANDAMAN SEA
INDIAN OCEAN
SRI LANKA
LEGEND
BASIC WIND SPEED IN m/s
COLOUR SCHEME
55
50
47
44
39
33

Design Wind Speed (V_z) - The basic wind speed (V_b) for any site shall be modified to include the following effects to get design wind velocity at any height (V_z) for the chosen structure:

a) Risk level;

b) Terrain roughness, height and size of structure; and

c) Local topography. It can be mathematically expressed as follows: where

$$V_z = V_b\, k_1 k_2 k_3$$

V_z = Design wind speed at any height z in m/s;

V_b = Basic Wind Speed

k_1 = Probability factor (risk coefficient)

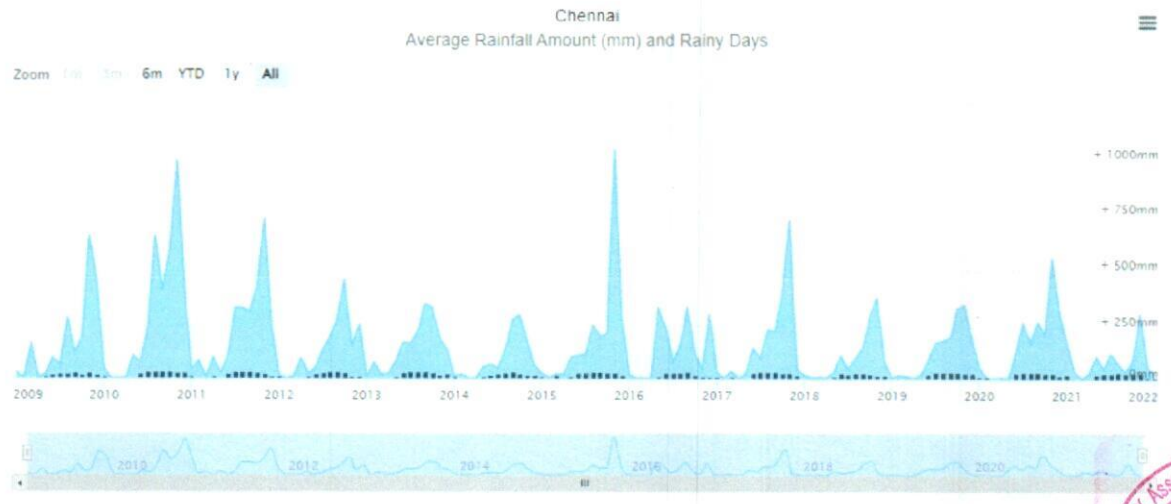
k_2 = Terrain, height and structure size factor

k_3 = Topography factor

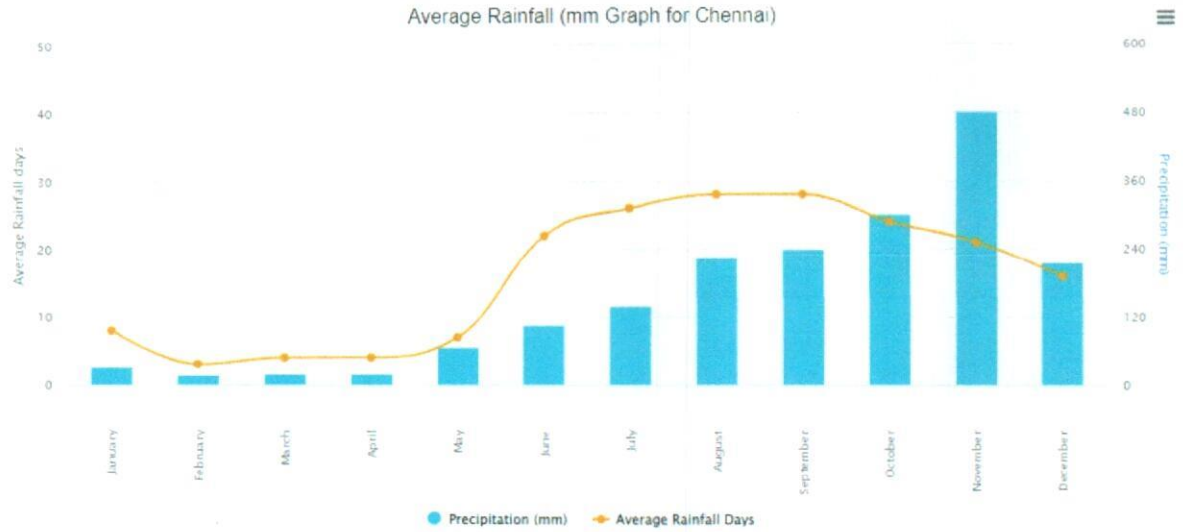
Note: From the production point of view, since wind velocity can reduce the thermal losses, therefore moderate wind speeds outside high risk zones are favorable for PV Solar Projects. These projects lies in Very high damage risk zone thus there are chances for damage to solar panels during high wind velocity in the area.

c. **Rainfall:** To show variation within the months and not just the monthly totals, we show the average rainfall for Year 2009 to Year 2022 (as on date)

Rainfall and Rain Days



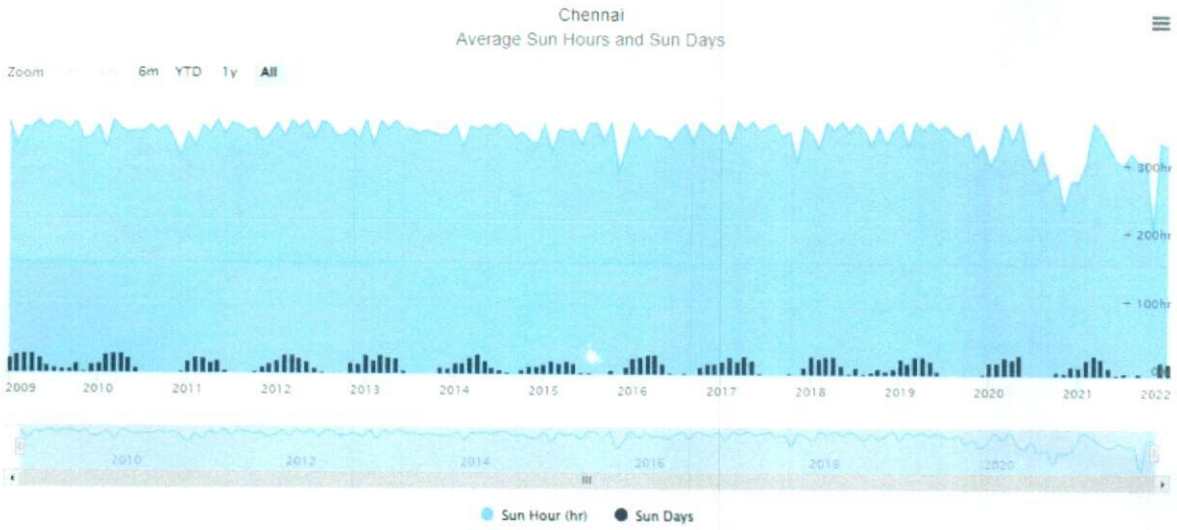
Monthly Average Rainfall



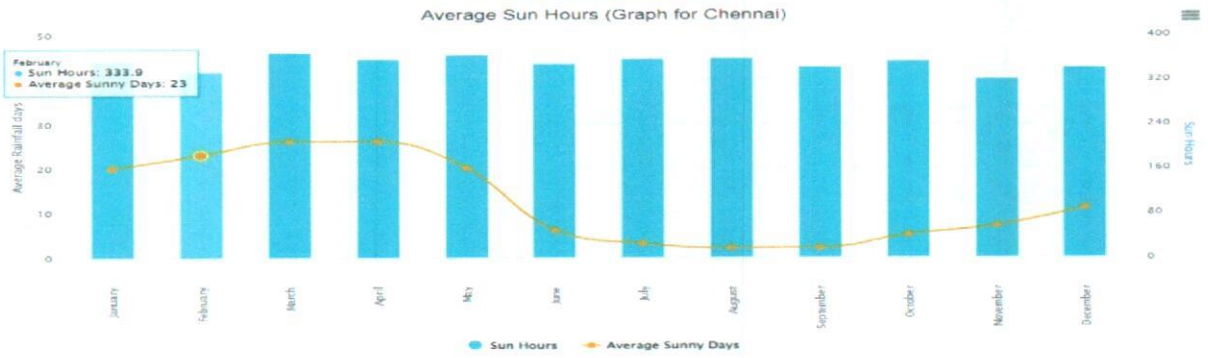
Source: ***https://www.worldweatheronline.com/chennai-weather-averages/tamil-nadu/in.aspx***

d. Average Sun Hours and Sun Days:

Average Sun Days



Average Sun Hours



Source: https://www.worldweatheronline.com/chennai-weather-averages/tamil-nadu/in.aspx

{Table: 2}

CHENNAI						
Year	**2019**		**2020**		**2021**	
Days/Year	**Sun Day**	**Sun Hour**	**Sun Day**	**Sun Hour**	**Sun Day**	**Sun Hour**
January	24	372	20	308	13	286
February	18	336	20	329	24	314
March	27	372	28	370	31	372
April	28	360	25	342	26	357
May	21	372	31	372	13	338
June	7	360	2	324	3	316
July	1	367	0	302	5	310
August	1	355	2	330	0	327
September	0	348	1	285	5	313
October	1	359	6	297	0	315
November	2	322	5	243	1	212
December	3	339	15	286	21	342
Total	**133**	**4262**	**155**	**3788**	**142**	**3802**

AVERAGE SUN DAYS	AVERAGE SUN HOURS
143	**3951**

As per last 3 year data, average sun days are 143 and average sun hours in a year is 3951 recorded at Chennai Zone.

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Note: Anything that stands between the panels and the sun, be it clouds in the sky, fog on the surface, or shade from a nearby tree, reduces the amount of solar energy your system produces. However, the panels could still be producing electricity, depending on how thick the cloud coverage is.

On a partly cloudy day, the production can drop by 10% to 25%, depending on how frequently the clouds pass over your system. But the effect of phenomenon of "edge of cloud" can actually intensify the sunbeam and can lead to a brief increase in electricity production. If fluffy cumulus clouds pass in front of the sun, the wispy edges act as a magnifying glass, causing a stronger beam of sunlight to hit the panels! All in all, estimates available in public domain are that the panels will produce about 10 - 30% of the electricity on cloudy days as they would on sunny days.

e. Irradiation map of Chennai

Definitions:

Solar irradiance *is the power per unit area (watt per square metre, W/m2), received from the Sun in the form of electromagnetic radiation as reported in the wavelength range of the measuring instrument.*

Global Horizontal Irradiance (GHI) *is the total amount of shortwave radiation received from above by a surface horizontal to the ground. This value is of particular interest to photovoltaic installations and includes both Direct Normal Irradiance (DNI) and Diffuse Horizontal Irradiance (DIF).*

Diffuse Horizontal Irradiance *is the amount of radiation received per unit area by a surface that does not arrive on a direct path from the sun, but has been scattered by molecules and particles in the atmosphere. Basically, it is the illumination that comes from clouds and the blue sky.*

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Chennai

13.083694°,080.270186°
Chennai, Tamil Nadu, India
Time zone: UTC+05:30, Asia/Kolkata [IST]

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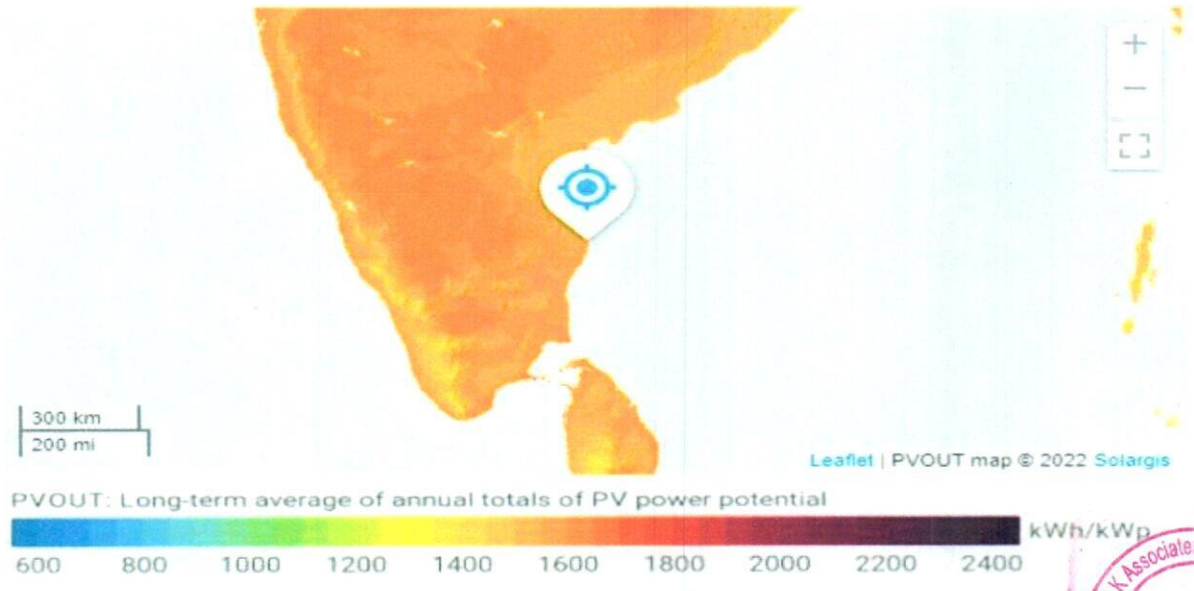
SITE INFO

Map data Per year

Specific photovoltaic power output	PVOUT specific	**1568.8**	kWh/kWp
Direct normal irradiation	DNI	**1374.1**	kWh/m²
Global horizontal irradiation	GHI	**1957.1**	kWh/m²
Diffuse horizontal irradiation	DIF	**933.6**	kWh/m²
Global tilted irradiation at optimum angle	GTI opta	**2007.9**	kWh/m²
Optimum tilt of PV modules	OPTA	**14 / 180**	
Air temperature	TEMP	**28.3**	°C
Terrain elevation	ELE	**33**	ft

Source: *https://globalsolaratlas.info/detail?c=13.083826,80.270233,11&s=13.083694,80.270186&m=site*

PVOUT map



f. **Water Availability**: Plant will require module cleaning during dry spells. Cleaning may require substantial quantities of water approx. 2.0 Liter per module depending upon the manpower available and degree of soiling.

g. **Site accessibility:** All roofs are accessible.

2.2 Site Appropriateness For Location

- Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001
- Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, Mahrashtra -400001

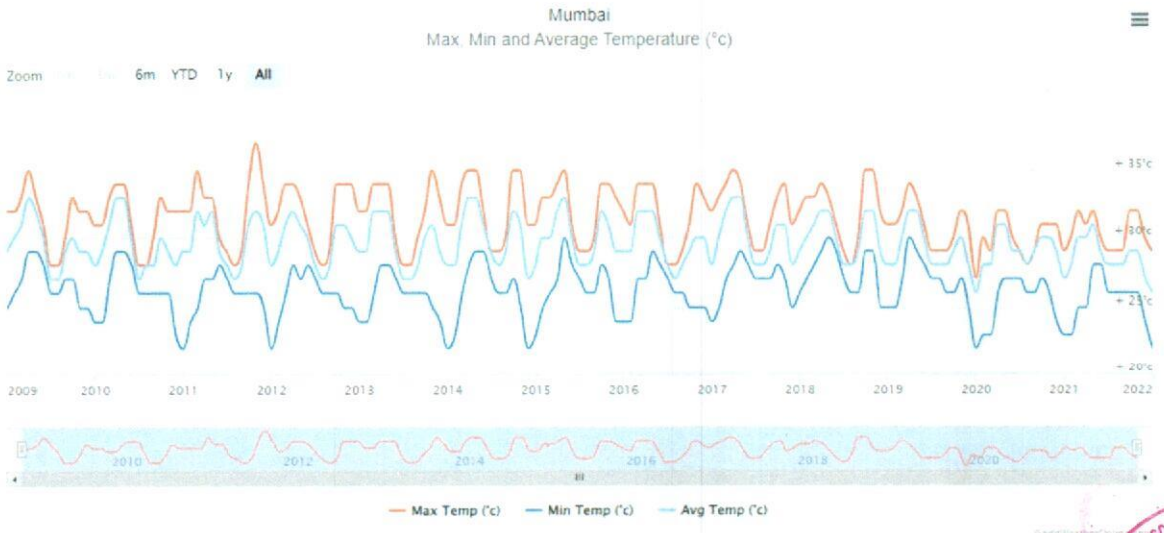
The site appropriateness for a roof top solar power unit is basically based on the weather and solar radiation parameters since annual energy yield of a PV plant is solely dependent on the solar resource of the site.

Basically, there are three standard test conditions which are the industry standard for the conditions under which a solar panel are tested and give its efficiency rating.

In this regard for doing the site appropriateness following site parameters are being evaluated:

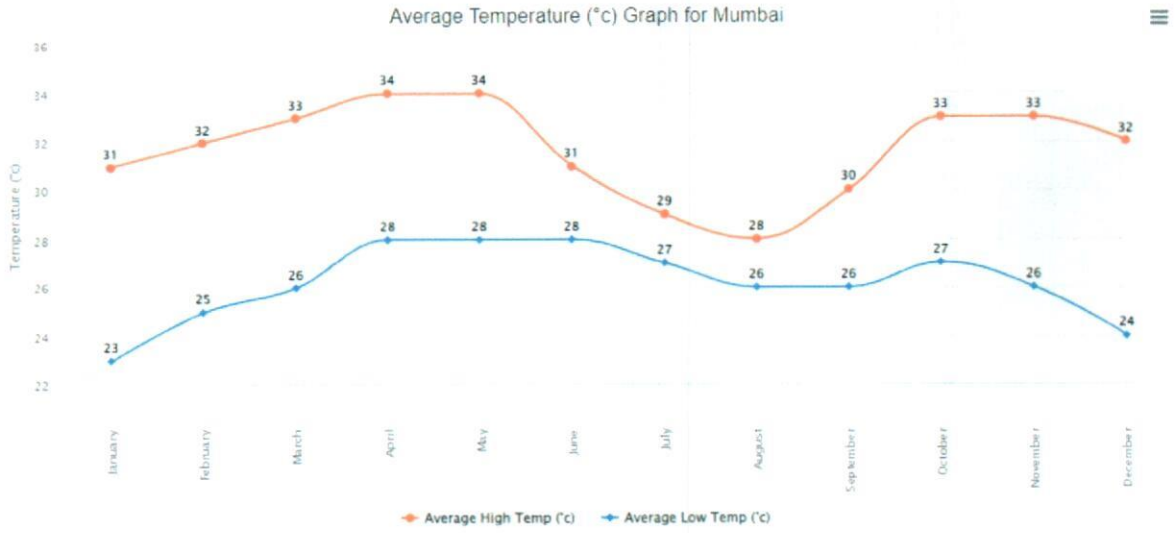
a. Temperature: The average temperature is measured as per the Metrological Station statistic available at Mumbai in which both the sites are located. At an average day temperature of 34^0 C, April and May are the hottest month of the year and at an average day temperature of 28^0 C August is the coldest month.

Max, Min and Average Temperature



Source: https://www.worldweatheronline.com/mumbai-weather-averages/maharashtra/in.aspx

Monthly Average Temperature



Source: https://www.worldweatheronline.com/mumbai-weather-averages/maharashtra/in.aspx

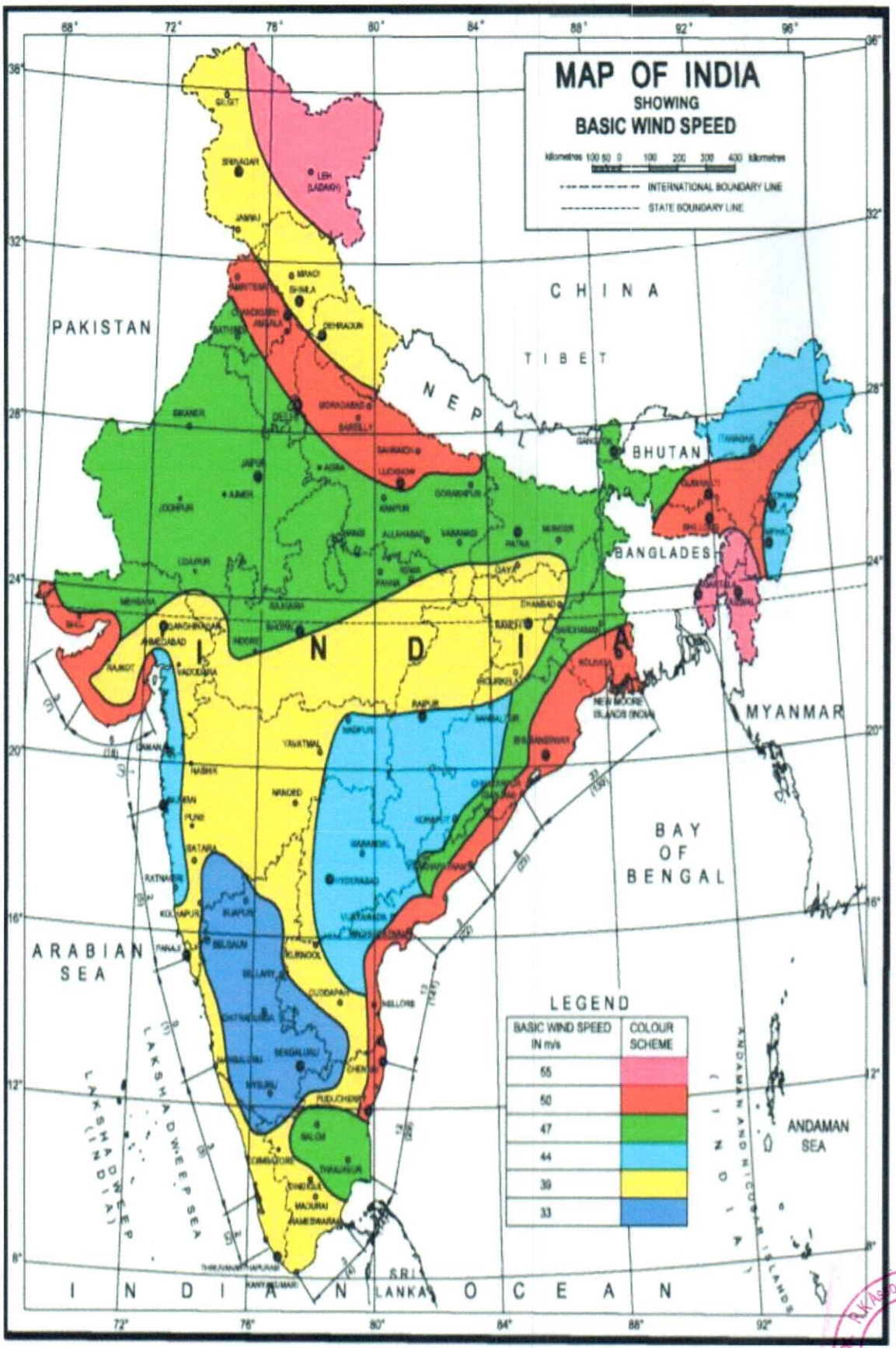
Note: Although the temperature doesn't affect the amount of solar energy a solar panel receives, it does affect how much power you will get out of it. Thus, as the solar panels get hotter, they will produce less power from the same amount of sunlight. In this area the average Maximum temperature is about 34^0 C and average minimum temperature is about 28^0 C. As per information available in public domain solar panels are tested at 25°C (77 °F) and thus solar panel temperature will generally range between 15 °C and 35 °C during which solar cells will produce at maximum efficiency. However, solar panels can get as hot as 65 °C (149 °F) at which point solar cell efficiency will be hindered.

b. Wind Speed: The macro-level wind speed zones of India have been formulated and published in IS: 875 (Part 3) - 1987 titled "Indian Standard Code of Practice for Design Loads (other than earthquakes) for Buildings and Structures, Part 3, Wind Loads". There are six basic wind speeds `V_b' considered for zoning, namely 55, 50, 47, 44, 39 and 33 m/s. From wind damage view point, these could be described as follows:

- 55 m/s (198 km/h) - Very High Damage Risk Zone – A
- 50 m/s (180 km/h) - Very High Damage Risk Zone – B
- 47 m/s (169.2 km/h) - High Damage Risk Zone
- 44 m/s (158.4 km/h) - Moderate Damage Risk Zone – A
- 39 m/s (140.4 km/h) - Moderate Damage Risk Zone – B

- 33 m/s (118.8 km/h) - Low Damage Risk Zone

The cyclone affected coastal areas of the country are classified in 50 and 55 m/s zones. The basic wind speeds are applicable to 10 m height above mean ground level in an open terrain with a return period of 50 years. Mumbai lies on 44m/s band of wind speed. Therefore Mumbai lies in Moderate damage risk zone.


MAP OF INDIA
SHOWING
BASIC WIND SPEED
INTERNATIONAL BOUNDARY LINE
STATE BOUNDARY LINE
PAKISTAN
CHINA
TIBET
NEPAL
BHUTAN
BANGLADES
MYANMAR
I N D I A
BAY OF BENGAL
ARABIAN SEA
ANDAMAN SEA
I N D I A N O C E A N
SRI LANKA
LEGEND
BASIC WIND SPEED IN m/s
COLOUR SCHEME
55
50
47
44
39
33

Design Wind Speed (V_z) - The basic wind speed (V_b) for any site shall be modified to include the following effects to get design wind velocity at any height (V_z) for the chosen structure:

a) Risk level;

b) Terrain roughness, height and size of structure; and

c) Local topography. It can be mathematically expressed as follows: where

$$V_z = V_b\, k_1 k_2 k_3$$

V_z = Design wind speed at any height z in m/s;

V_b = Basic Wind Speed

k_1 = Probability factor (risk coefficient)

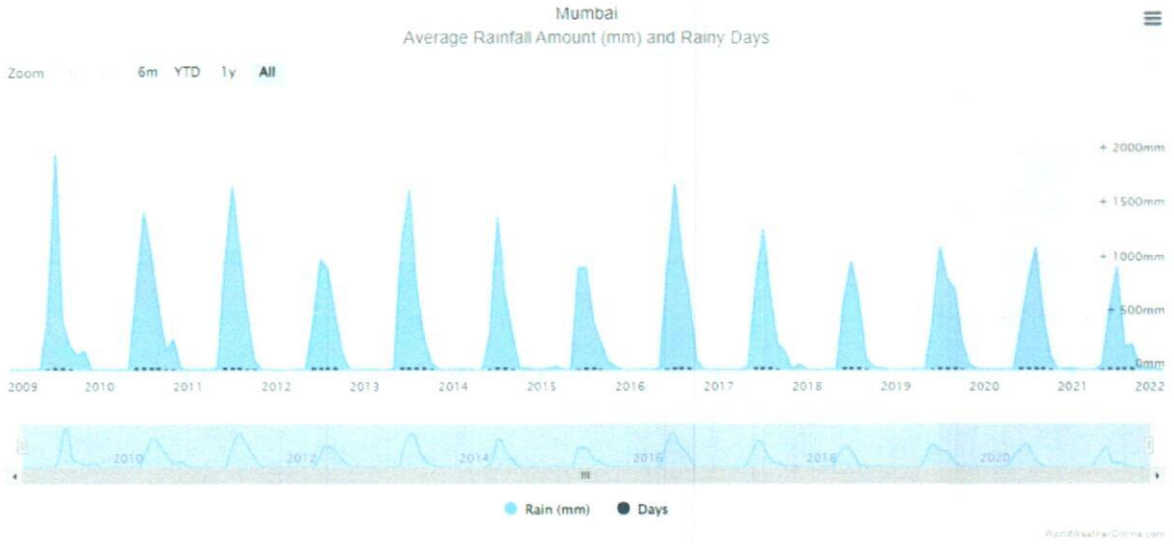
k_2 = Terrain, height and structure size factor

k_3 = Topography factor

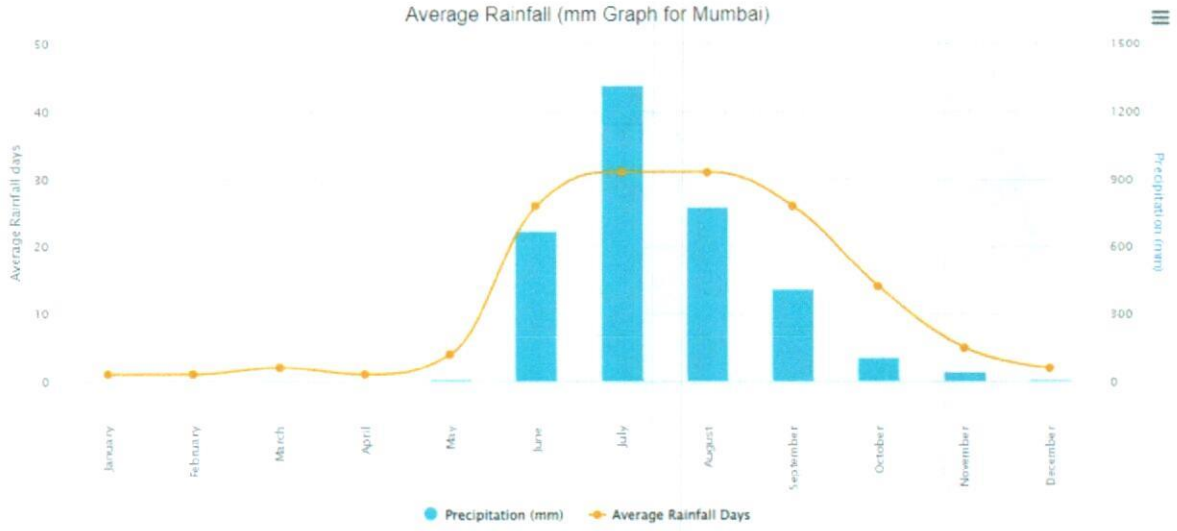
Note: From the production point of view, since wind velocity can reduce the thermal losses, therefore moderate wind speeds outside high risk zones are favorable for PV Solar Projects. These projects lies in Moderate damage risk zone thus there are less chances for damage to solar panels during high wind velocity in the area.

c. **Rainfall:** To show variation within the months and not just the monthly totals, we show the average rainfall for Year 2009 to Year 2022 (as on date)

Rainfall and Rain Days



Monthly Average Rainfall

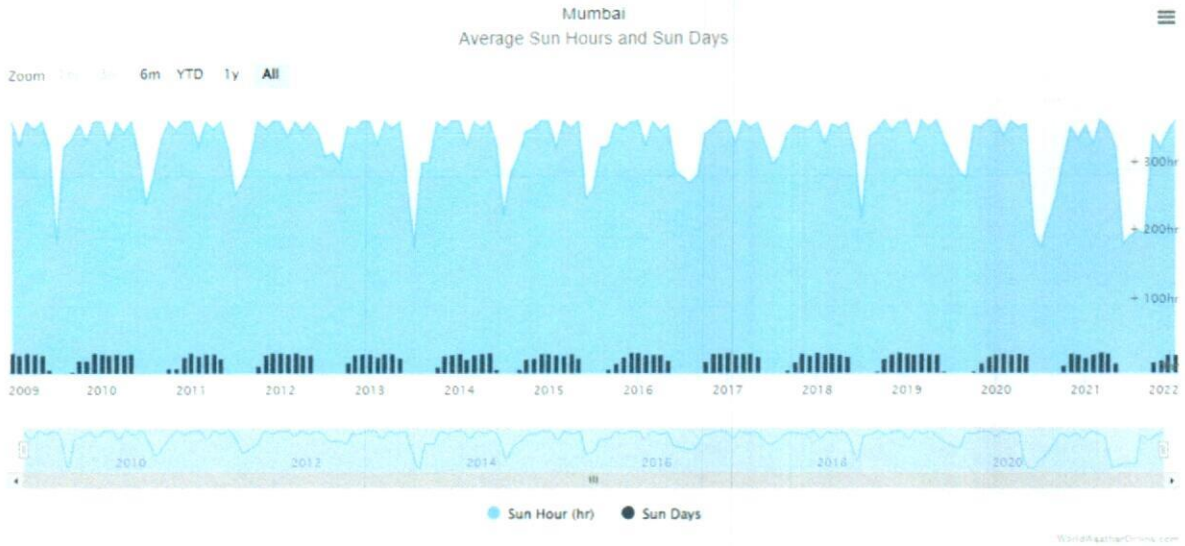


Source: https://www.worldweatheronline.com/mumbai-weather-averages/maharashtra/in.aspx

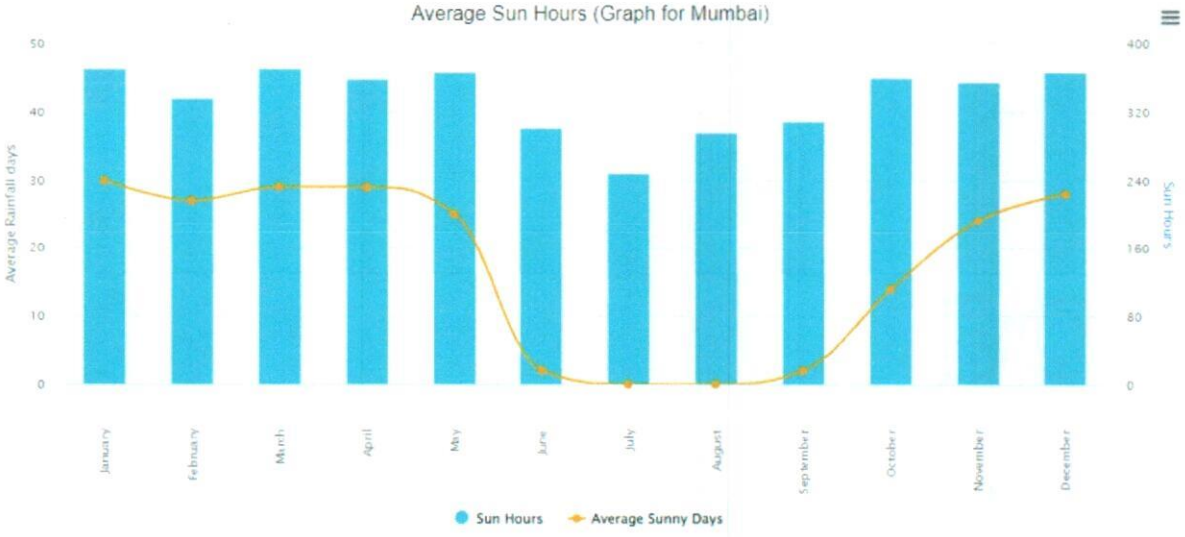
d. Average Sun Hours and Sun Days:

Average Sun Days and Sun Hours

Sun Hours and Sun Days



Average Sun Hours



Source: https://www.worldweatheronline.com/mumbai-weather-averages/maharashtra/in.aspx

{Table: 2}

MUMBAI						
Year	2019		2020		2021	
Days/Year	Sun Day	Sun Hour	Sun Day	Sun Hour	Sun Day	Sun Hour
January	30	372	27	371	22	363
Februay	28	336	29	348	28	336
March	29	372	27	371	31	372
April	28	360	30	360	30	360
May	27	372	26	366	14	332
June	3	344	0	207	0	188
July	0	318	0	184	0	200
August	0	297	0	223	0	207
September	0	285	0	256	0	204
October	4	363	11	311	16	350
November	15	360	29	360	20	329
December	24	372	27	343	28	354
Total	**188**	**4151**	**206**	**3700**	**189**	**3595**

AVERAGE SUN DAYS	AVERAGE SUN HOURS
194	**3815**

As per last 3 year data, average sun days are 194 and average sun hours in and year is 3815 recorded at Mumbai Zone.

Note: Anything that stands between the panels and the sun, be it clouds in the sky, fog on the surface, or shade from a nearby tree, reduces the amount of solar energy your system produces. However, the panels could still be producing electricity, depending on how thick the cloud coverage is.

On a partly cloudy day, the production can drop by 10% to 25%, depending on how frequently the clouds pass over your system. But the effect of phenomenon of "edge of cloud" can actually intensify the sunbeam and can lead to a brief increase in electricity production. If fluffy cumulus clouds pass in front of the sun, the wispy edges act as a magnifying glass, causing a stronger beam of sunlight to hit the panels! All in all, estimates available in public domain are that the panels will produce about 10 - 30% of the electricity on cloudy days as they would on sunny days.

e. Irradiation map of Mumbai

Definitions:

Solar irradiance *is the power per unit area (watt per square metre, W/m2), received from the Sun in the form of electromagnetic radiation as reported in the wavelength range of the measuring instrument.*

Global Horizontal Irradiance (GHI) *is the total amount of shortwave radiation received from above by a surface horizontal to the ground. This value is of particular interest to photovoltaic installations and includes both Direct Normal Irradiance (DNI) and Diffuse Horizontal Irradiance (DIF).*

Diffuse Horizontal Irradiance *is the amount of radiation received per unit area by a surface that does not arrive on a direct path from the sun, but has been scattered by molecules and particles in the atmosphere. Basically, it is the illumination that comes from clouds and the blue sky.*

Mumbai

19.07599°,072.877393°
Mumbai, Maharashtra, India
Time zone: UTC+05:30, Asia/Kolkata [IST]

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SITE INFO

Map data Per year

Specific photovoltaic power output	PVOUT specific	1615.1	kWh/kWp
Direct normal irradiation	DNI	1437.2	kWh/m²
Global horizontal irradiation	GHI	1921.6	kWh/m²
Diffuse horizontal irradiation	DIF	913.5	kWh/m²
Global tilted irradiation at optimum angle	GTI opta	2045.0	kWh/m²
Optimum tilt of PV modules	OPTA	22 / 180	
Air temperature	TEMP	26.8	°C
Terrain elevation	ELE	16	ft

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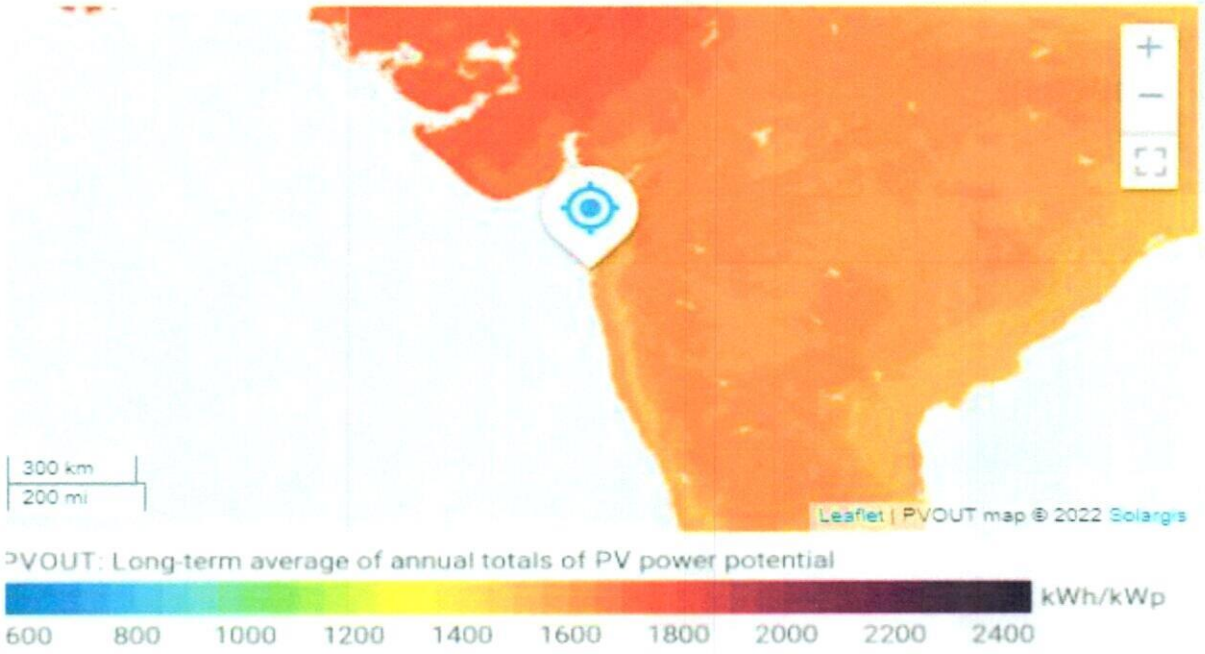
PVOUT map



PVOUT: Long-term average of annual totals of PV power potential

Source: *https://globalsolaratlas.info/detail?c=19.075746,72.877121,11&s=19.07599,72.877393&m=site*

f. **Water Availability**: Plant will require module cleaning during dry spells. Cleaning may require substantial quantities of water approx 2.0 litre per module depending upon the manpower available and degree of soiling.

g. **Site accessibility:** All roofs are accessible.

PART D — PROJECT TECHNICAL DETAILS

1. PLANT CONFIGURATION (Source: Inspection Reports by SECI Inspector)

Project 1: Installation and commissioning of Rooftop Solar power plant of planned capacity 288 kWp at Chennai Metro Rail Limited, CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, Tamil Nadu- 600019

Planned Project Capacity:	288 kWp
Installed Project Capacity:	400 kWp
Panels Manufacturing Country:	India
Type of Panels:	Mono PERC Crystalline
Make of Panels	Topsun make
Model of Panels	TS72MP400F
Year of Manufacturing:	2021
Wattage of each module:	400 Wp
No. of panels installed:	1000 Nos.
Material of Structure:	Anodized Aluminum
Inverter Company (Model):	Sungrow (TS72MP400F)
No. of inverters installed:	4 X 100 Kw= 400 Kw
Year of manufacturing of Inverters	2021

Project 2: Installation and commissioning of Rooftop Solar power plant of planned capacity of 375 kWp at Chennai Metro Rail Limited, Wimco Nagar metro Station. Chennai, Tamil Nadu – 600019.

Planned Project Capacity:	375 kWp
Installed Project Capacity:	448 kWp
Panels Manufacturing Country:	India
Type of Panels:	Mono PERC Crystalline
Make of Panels	Topsun
Model of Panels	TS72MP400F
Year of Manufacturing:	2021
Wattage of each module:	400 Wp
No. of panels installed:	1120
Material of Structure:	Anodized Aluminum

Inverter Company (Model):	Sun grow (Model-SG110CX)
No. of inverters installed:	4 x 100 kW=400 Kw
Year of manufacturing of Inverters	2021

Project 3: Installation and commissioning of Rooftop Solar power plant of capacity planned capacity of 45 kWp at The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA Nodal Center, Ambedkar Road, Pallavaram, Chennai, Tamil Nadu – 600043.

Planned Project Capacity:	45 kWp
Installed Project Capacity:	50.73 kWp
Panels Manufacturing Country:	India
Type of Panels:	Poly Crystalline
Make of Panels	Waaree
Model of Panels	WSMD-445
Year of Manufacturing:	2021
Wattage of each module:	445 Wp
No. of panels installed:	114
Material of Structure:	Galvanised Iron
Inverter Company (Model):	Growatt (MAC50KTL3-XLV)
No. of inverters installed:	1 x 50 kW=50 kW
Year of manufacturing of Inverters	2021

Project 4: Installation and commissioning of Rooftop Solar power plant of planned capacity of 292 kWp at The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai, Tamil Nadu – 600113.

Planned Project Capacity:	292 kWp
Installed Project Capacity:	207.37 kWp
Panels Manufacturing Country:	India
Type of Panels:	Poly Crystalline
Make of Panels	Waaree
Model of Panels	WSMD-445
Year of Manufacturing:	2021
Wattage of each module:	445 Wp

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No. of panels installed:	466
Material of Structure:	Galvanised Iron
Inverter Company (Model):	New Library Block: Sungrow (SG110CX) and Growatt (MID25KTL3-X) Auditorium Block: Growatt (MID33KTL3-X) Sub-station: Growatt (MID25KTL3-X) New Guest House: Growatt (MID25KTL3-X) Hostel Block: Growatt (MID33KTL3-X)
No. of inverters installed:	New Library Block: 1 X 100 kW and 1 X 25 kW Auditorium Block: 1 X 33 kW Sub-station: 1 X 25 kW New Guest House: 1 X 25 kW Hostel Block: 1 X 33 kW
Year of manufacturing of Inverters	2021

Project 5: Installation and commissioning of Rooftop Solar power plant of planned capacity of 499 kWp at Mumbai Port Trust, Shed No. 13 B(2) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra-400001.

Project 6: Installation and commissioning of Rooftop Solar power plant of planned capacity of 500 kWp at Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra-400001.

The approval for energisation of electrical installation of M/s Mumbai Port trust, Shed No. 13B of Indira Dock, Mumbai Port trust, Mumbai, MH, 400001 **(Project 5 and Project 6)** is received by Chief electrical inspector (CEI) of Government of India vide Document No. RIO (W)/MPT/MH/MAZGAON/A-09296/DD/2021/3793-94 Dated 25th February 2022. However detailed inspection report is awaited. Bank to obtain the same from the company.

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2. COMPONENTS AND ITS TECHNICAL SPECIFICATIONS:

a. **Plant Type:** Basically there are three types of Solar Power Plants:

- **Off Grid Solar Power Plant:** Off grid is a battery based solar power system. In the first priority this system will run your home appliances or connect load (as per solar inverter capacity) and surplus power feed in to the solar battery bank, provided with the solar power system. This type of solar power are recommended where power cut are the major problem.

- **On Grid Solar Power Plant:** On grid solar system is grid (Government electricity supply) connected system. In the first priority this system will run your home appliances or connect load (without any limit). If the connected load will exceed the capacity of installed solar power plant it will automatically use the power from main grid and if the connected load is less, it will supply surplus power to the grid. This type of system is recommended to reduce electricity bills only.

- **Hybrid Solar Power Plant:** Hybrid is a combination of on grid solar system as well as off grid solar system. One side hybrid solar system connects with the main electricity grid and simultaneously it will also provide battery backup to you.

Solar Quest Project Three Private Limited will set-up On Grid PV Module Solar Power Plant which is the most recommended type for such kind of Projects.

b. **PV Module Type and Configuration:** Solar panels can be categorized on the basis of various parameters like the number of junctions they have or the generation they belong to. On the basis of the number of junctions, there are single-junction and multi-junction solar panels that differ in terms of the number of layers in the solar panel. Then there is another way of classifying solar panels i.e. with regards to the generation they belong to, which focuses on the material and efficiency of different types of solar panels.

1ST GENERATION SOLAR PANELS

These are basic solar panels that are made up of Mono-crystalline silicon or polycrystalline silicon and are used in conventional surroundings.

- **Mono-Crystalline solar panels (Mono-SI):** These are made up of mono-crystalline silicon. They have a dark look throughout the panel and rounded edges. These panels have the highest efficiency rate due to the high purity of the silicon used. They are most expensive because of their quality of occupying less space, high power output and long durability.

  In India, Mono-Crystalline solar panels are available in a panel efficiency range of 17%, 18% and 19%.

- **Polycrystalline solar panels (Poly-SI):** Their production technology is based on melting raw silicon. Their outer structure has square cells, angles that are uncut and they are blue in colour. They are cheaper than Mono-SI because they occupy more space to generate the same amount of energy as compared to Mono-SI. Polycrystalline solar panel technology is the more prevalent technology in the world. These solar panels are made out of polycrystalline silicon which can be as much as 99.99% pure. These panels have an efficiency of between 13%-17%. Polycrystalline solar cells have lower efficiency and costs than Mono Crystalline solar cells. But that is changing over time and today few brands of polycrystalline solar panels are offering efficiency levels of 20%+. These are blue in Color

2ND GENERATION SOLAR PANELS

These panels comprise different types of thin film solar cells that are primarily used to build solar power systems with low power output.

- **Thin film solar panels (TFSC):** These are a less expensive option. They are made by placing one or more films of photovoltaic material onto a substrate. These are cheaper as less material is used in its manufacturing. They are not suitable for residential purpose because they require large spaces to generate sufficient energy. They have shorter warranties in comparison to their 1st generation counterparts. They are best suited for the areas that have ample open space for installation.

- **Amorphous silicon solar panels (A-Si):** These types of solar panels use a triple layer technology which is considered to be the best in the thin film variety. They are available at very low costs but provide efficiency of only 7%.

3RD GENERATION SOLAR PANELS

Solar panels belonging to this generation use organic as well as inorganic materials. These include a variety of thin film panels and some of them, such as 'bio hybrid solar cells', are still in the development phase.

- **Cadmium Telluride solar panels (CdTe):** These solar panels are manufactured using Cadmium Telluride. They are efficient as their manufacturing cost is very low and require very less amount of water to be produced. The primary advantage of these panels is that they can reduce carbon footprints significantly while their only disadvantage is that they can lead to fatalities if ingested or inhaled.

- **Concentrated PV panels (CVP or HCVP):** These panels are the most efficient type of solar panels with an efficiency of 41%. They use curved mirror surfaces and lenses and cooling systems are also integrated to make them more efficient. These are multi-junction solar panels which can be best efficient when they receive sun rays at a perfect angle.

4TH GENERATION SOLAR PANELS

The fourth-generation solar cell technology is also referred to as the 4G solar cell technology. This technology makes use of the combination of inorganic and organic materials, as a means to boost the efficiency and cost-effectiveness of solar cells. The 4G solar cells are engineered at solar scale and are characterized by the flexibility of conducting polymer films (the organic materials), and the stable nanostructures (inorganic materials).

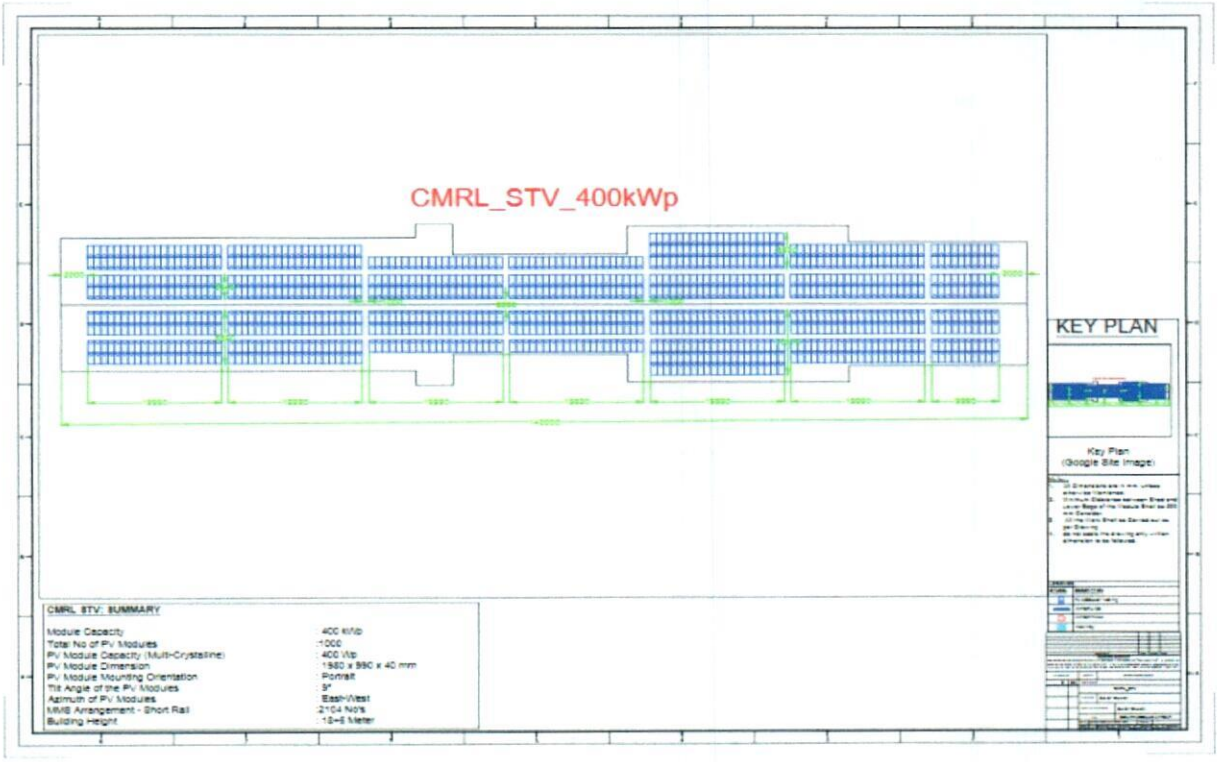
Solar Quest Private Limited has used both Mono-Crystalline PERC technology and Polycrystalline Solar Panels. These PV panels are readily available in Indian markets at lower unit prices with proven lifelong performance.

2.1 Technical Specification of Rooftop Project located at

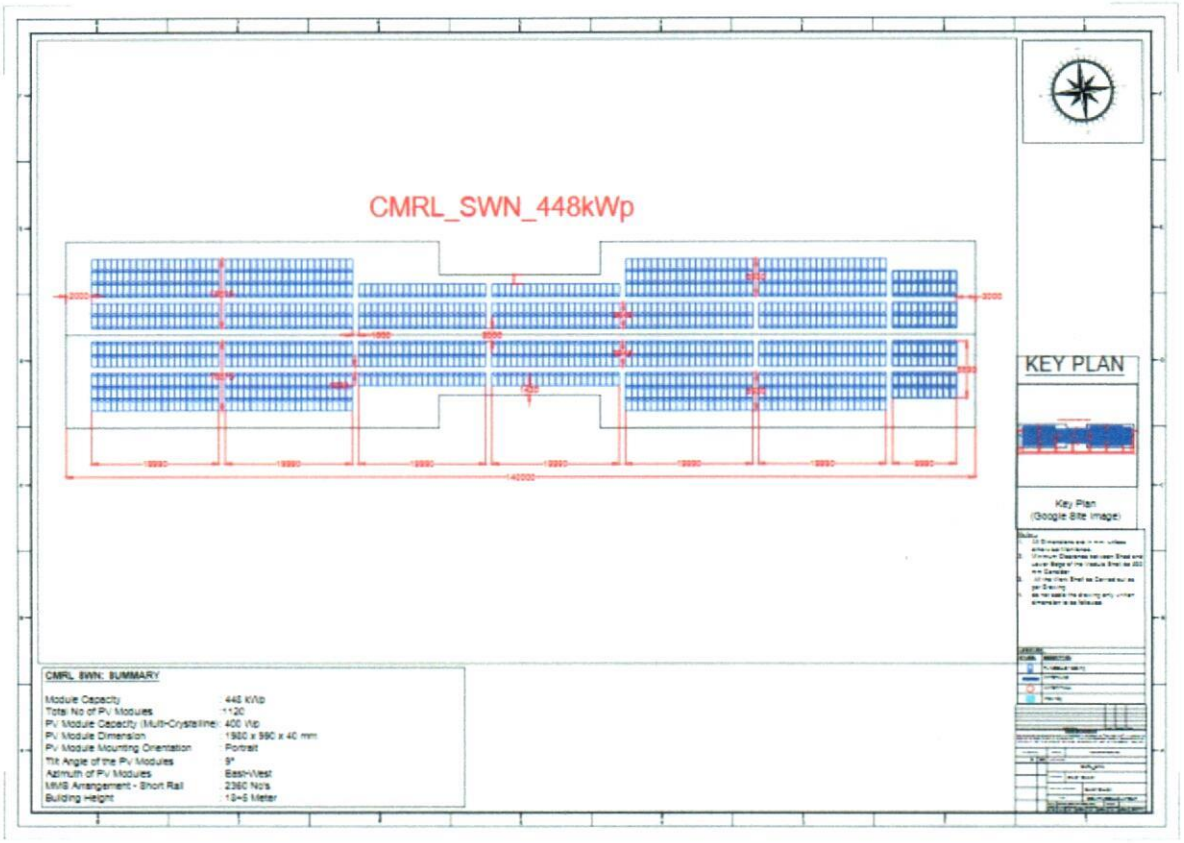
- ***Chennai Metro Rail Limited, Wimco Nagar metro Station, Chennai, TAMIL NADU – 600019 (375 kWp)***
- ***Chennai Metro Rail Limited, CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, TAMIL NADU- 600019 (288 kWp)***

Basic Information

Sanctioned Capacity of Plant	288 kWp
Installed Capacity of Plant	400 kWp
Site Address	Chennai Metro Rail Limited, Wimco Nagar metro Station., Chennai, TAMIL NADU - 600019
Latitude and Longitude	13.1718833,80.3049771



Sanctioned Capacity of Plant	375 kWp
Installed Capacity of Plant	448 kWp
Site Address	Chennai Metro Rail Limited , CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, TAMIL NADU- 600019
Latitude and Longitude	13.1803112,80.3053671



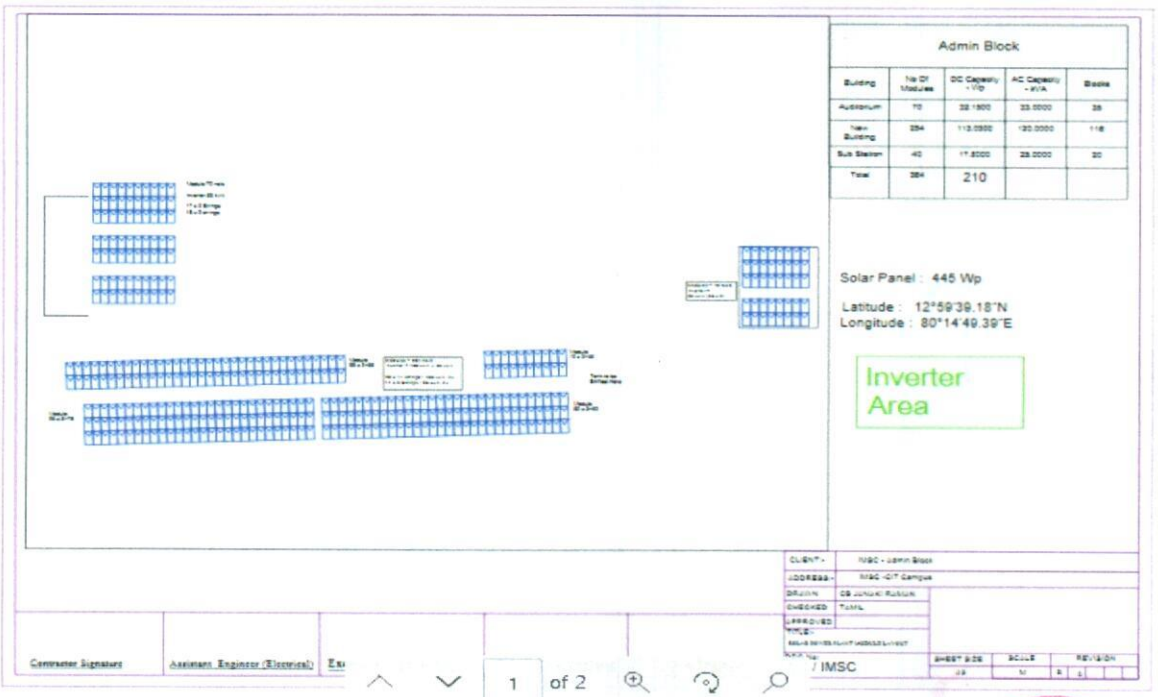
2.2 Technical Specification of Rooftop Project located at:

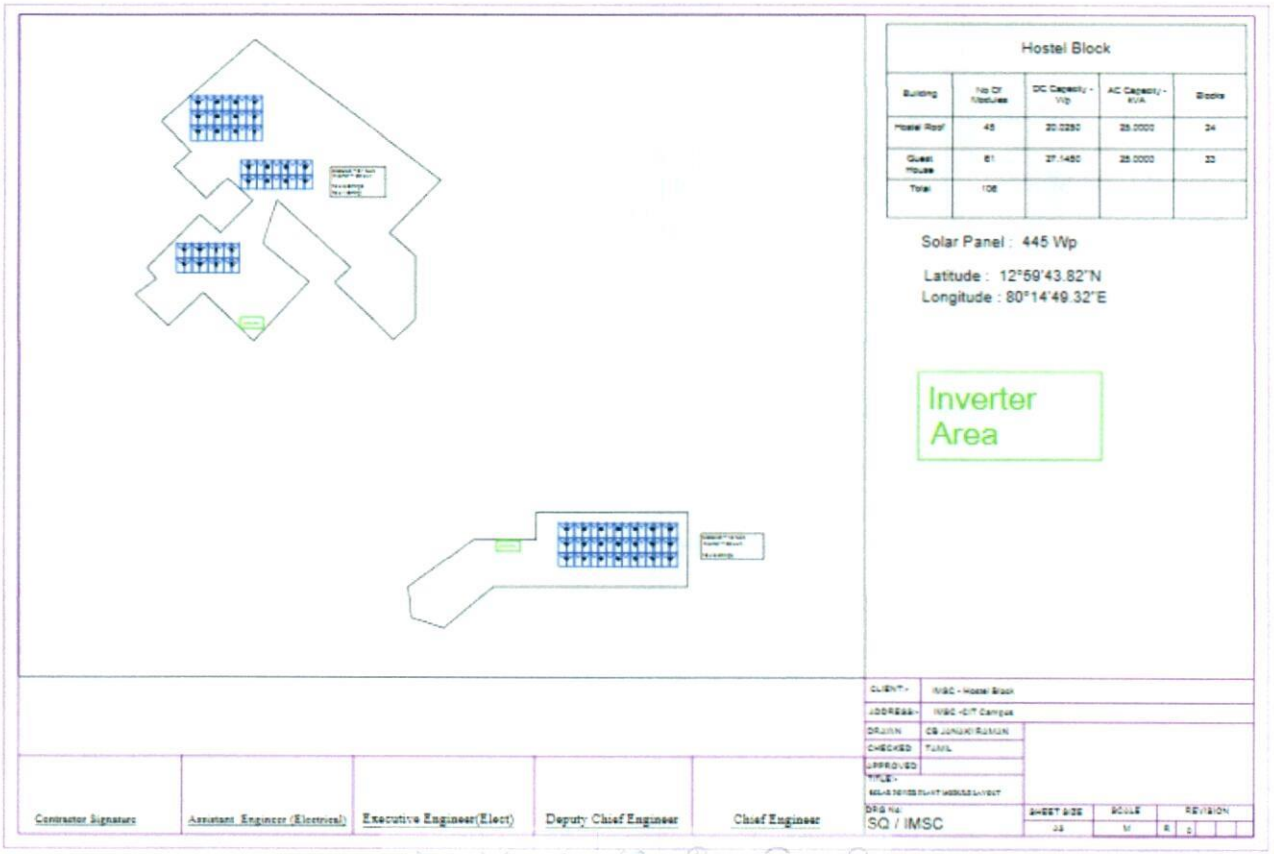
- ***The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA Nodal Center, Ambedkar Road, Pallavaram, Chennai, TAMIL NADU – 600043***
- ***The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai ,Chennai, TAMIL NADU – 600113***

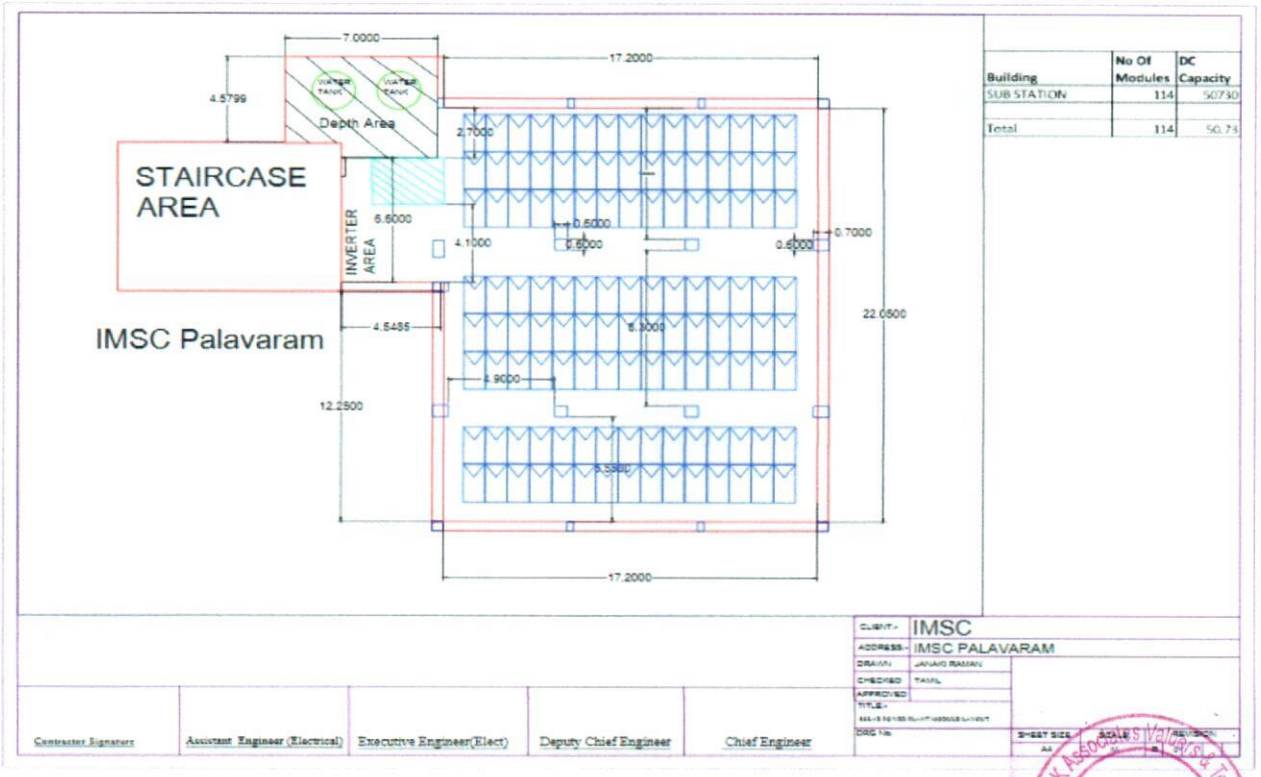
Sanctioned Capacity of Plant	45 kWp
Installed Capacity of Plant	50.73 kWp
Site Address	The Institute of Mathematical Sciences, DEA Nodal Center, Ambedkar Road, Pallavaram, Chennai, TAMIL NADU - 600043

Latitude and Longitude	12.9941453,80.2469537

Sanctioned Capacity of Plant	291.92 kWp
Installed Capacity of Plant	207.37 kWp
Site Address	The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai, Chennai, TAMIL NADU - 600113
Latitude and Longitude	12.9941453,80.2469537



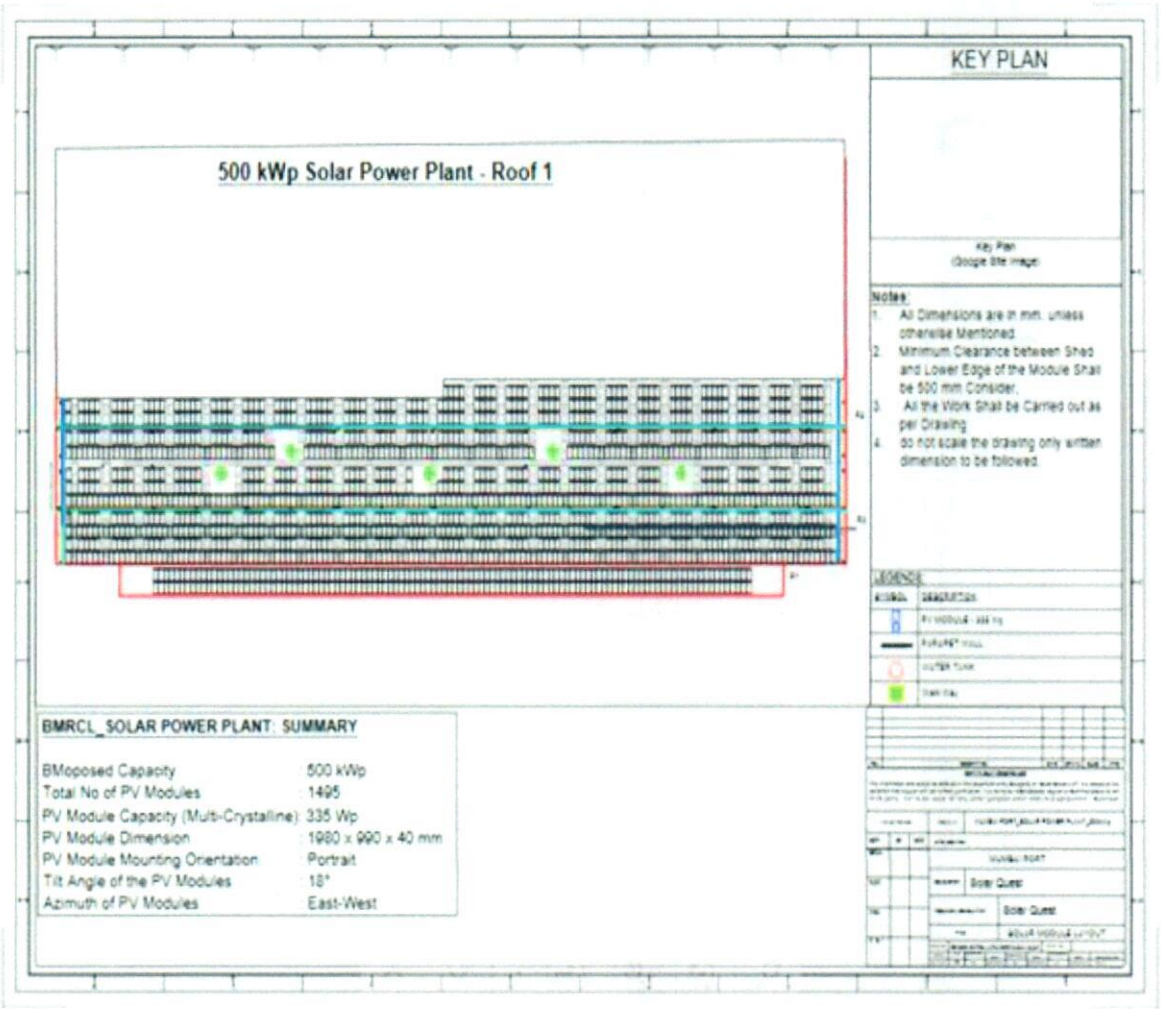

Hostel Block
Building | No Of Modules | DC Capacity - Wp | AC Capacity - KVA | Blocks
Hostel Roof | 48 | 20.2260 | 25.0000 | 24
Guest House | 61 | 27.1450 | 25.0000 | 33
Total | 108
Solar Panel : 445 Wp
Latitude : 12°59'43.82"N
Longitude : 80°14'49.32"E
Inverter Area
Contractor Signature
Assistant Engineer (Electrical)
Executive Engineer(Elect)
Deputy Chief Engineer
Chief Engineer
SQ / IMSC

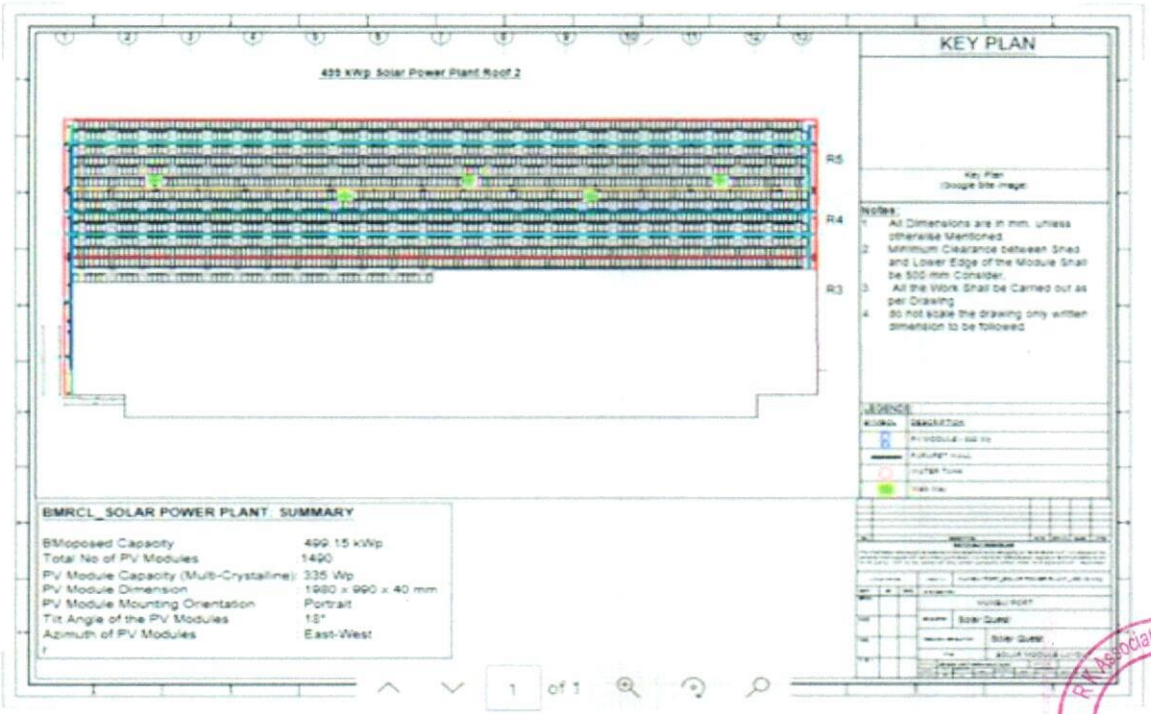

7.0000
17.2000
4.5799
Depth Area
STAIRCASE AREA
INVERTER AREA
6.6000
2.7000
0.6000
4.1000
0.6000
0.6000
0.7000
22.0500
IMSC Palavaram
4.5485
6.3000
4.9000
12.2500
17.2000
Building | No Of Modules | DC Capacity
SUB STATION | 114 | 50.730
Total | 114 | 50.73
CLIENT - IMSC
ADDRESS - IMSC PALAVARAM
Contractor Signature
Assistant Engineer (Electrical)
Executive Engineer(Elect)
Deputy Chief Engineer
Chief Engineer

2.3 Technical Specification of Rooftop Project located at

- ***Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA -400001***
- ***Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra-400001***

Sanctioned Capacity of Plant	999 kWp
Installed Capacity of Plant	1045 kWp
Site Address	***Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA -400001 and Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA - 400001***
Latitude and Longitude	18.949273,72.8383673


KEY PLAN
500 kWp Solar Power Plant - Roof 1
Notes:
1. All Dimensions are in mm. unless otherwise Mentioned.
2. Minimum Clearance between Shed and Lower Edge of the Module Shall be 500 mm Consider.
3. All the Work Shall be Carried out as per Drawing.
4. do not scale the drawing only written dimension to be followed.
BMRCL_SOLAR POWER PLANT: SUMMARY
BMoposed Capacity 500 kWp
Total No of PV Modules 1495
PV Module Capacity (Multi-Crystalline): 335 Wp
PV Module Dimension 1980 x 990 x 40 mm
PV Module Mounting Orientation Portrait
Tilt Angle of the PV Modules 18°
Azimuth of PV Modules East-West


KEY PLAN
499.15 kWp Solar Power Plant Roof 2
Notes:
1. All Dimensions are in mm. unless otherwise Mentioned.
2. Minimum Clearance between Shed and Lower Edge of the Module Shall be 500 mm Consider.
3. All the Work Shall be Carried out as per Drawing.
4. do not scale the drawing only written dimension to be followed.
BMRCL_SOLAR POWER PLANT: SUMMARY
BMoposed Capacity 499.15 kWp
Total No of PV Modules 1490
PV Module Capacity (Multi-Crystalline): 335 Wp
PV Module Dimension 1980 x 990 x 40 mm
PV Module Mounting Orientation Portrait
Tilt Angle of the PV Modules 18°
Azimuth of PV Modules East-West
1 of 1

3. SITE INSPECTION DETAILS:

Site Inspection for Project 5 and Project 6 was conducted on 25th January 2022. As per our observation made during site visit approximately sufficient amount of solar panels were found to be installed at site and power generation has started in the project. The precise quantification of solar panels was not possible due to practical challenges due bulky quantity of solar panels. Therefore we have relied on site inspection reports and other information provided by the company for the number of solar panels installed on site.

Site Inspection for Project 1, Project 2, Project 3 and Project 4 was conducted on 16th February 2022. Survey engineer was not allowed to physically inspect the number of solar panels installed at Wimco Nagar metro station, Chennai and Tiruvyottir Metro station, Chennai. Also, the rough quantification of solar panels was not possible due to practical challenges because of bulky quantity of solar panels and their elevation level. Therefore we have relied on information provided by the company and the site inspection reports approved by Department of atomic energy for rooftop solar power plants at Project 1, Project 2, Project 3 and Project 4.

PART E PLANT INFRASTRUCTURE SECTIONS & FACILITY DETAILS

1. LAND DETAILS

This is a Roof top Project hence Land is not required for this Project. Moreover, for setting up this Power Plant, Solar Quest Project Three has used roof tops of Tituvotriyur Metro station Wimco Nagar Metro station in Chennai, Rooftop of Institute of mathematical sciences and Roof of Shed No. 13 B (1 & 2) of Mumbai Port and hence no cost has been incurred on Land & Building. Structures on which the plant is to be installed are:

Sr. No.	Location
1.	Chennai Metro Rail Limited , CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, Tamil Nadu- 600019
2.	Chennai Metro Rail Limited, Wimco Nagar metro Station., Chennai, Tamil Nadu - 600019
3.	The Institute of Mathematical Sciences, The Institute of Mathematical Sciences, DEA Noda Center, Ambedkar Road, Pallavaram, Chennai, Tamil Nadu - 600043
4.	The Institute of Mathematical Sciences, 4th Cross road, CIT Campus, Tharamani, Chennai ,Chennai, TAMIL NADU - 600113
5.	Mumbai Port Trust, Shed No. 13B(2) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001
6.	Mumbai Port Trust, Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, Maharashtra -400001

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2. BUILDING AND STRUCTURAL DETAILS:

The Solar panel Modules have been installed on Module Mounting Structure (MMS). Generally MMS are classified under Building works only. However the company has informed that they have received a complete invoice which contains all the Components related to solar power plant. The copy of those invoices is attached as annexure with this report.

During site visit we have verified that the modules have been installed on Module mounting structure (MMS) only.

TABLE 8

PARTICULARS	DETAILS
Total Estimated Cost allocated in Plant Machinery & Equipment	8.90 Crore
Total Money outlaid till completion for the project as per Invoices	8.95 Crore
Total Approved by LIE based on site visit and Invoices	8.64 Crore

Observations & Remarks:

In regard to the installed capacity of 260 kWp at IMSC Chennai, the company has provided invoices for setting up of 330 kWp. Clarification was sought from the borrower. Accordingly, the borrower has informed that the actual installed capacity at site is only 260 kWp and for remaining 70 kWp material is lying at site. Therefore as per invoice No. SQTN/2021-22/019 the amount for installing 330 kWp amounts to Rs.1,47,48,904/-. Thus as per pro rata basis the cost for installing 70 kWp amounts to Rs.31,28,555.40 which is not considered in our assessment as the same is associated to uninstalled physical progress. Therefore we have only approved Rs. 8.64 Crore as against envisaged expenditure of Rs.8.95 Crore.

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PART F MAJOR SUPPLIERS

Solar Quest LLP, incorporated Solar Quest Three Pvt. Ltd. as a project company to execute projects under SECI Tender, for the purpose of selling power. Total DC capacity installed against this 1.9 MW is 2.15 MW and the power generation will be based on this 2.15 MW Capacity.

The company has signed Purchase orders with Topsun and Waaree for supply of solar panels. Details of the same is as below:

Sr. No.	Company	PO No.	PO Amount	Material
1.	Topsun Energy limited	SQ/BLR/PO/010	2.08	335 Wp Solar PV Module
2.	Topsun energy limited	SQ/NGR/2021-22/020	2.14	400 Wp Solar PV Module
3.	Waaree Energies Limited	SQ/NGR/2021-22/ 013R1	0.75	445 Wp Solar PV Module
Grand Total			**4.97**	

The company has also raised purchase orders with Sungrow for supply of solar inverters. However the copy of the same is not provided to us.

PART G PROJECT COST & MEANS OF FINANCE

1. **TOTAL PROJECT COST:** The project envisages construction of Rooftop Solar power plant, therefore Land cost is not estimated at our end. As per the project report provided by the company, the have estimated Rs.8.90 Crore as project cost for installation of 1999 kWp of Solar Rooftop power plant. However as per the invoices provided by the company, they have incurred Rs.8.95 Crore till 18th February 2022 for installation and commissioning works of solar panels, Inverter and other Balance of system equipment's. Break up of Rs.8.95 Crore is as below:

{Table: 9}

Sr. No.	Particulars	Amount (In Crore)
1.	Installation of 330 kW Solar Power Plant (Less 70 kWp) at Tharamani, Chennai	1.17
2.	Installation of 1045 kW Solar Power Plant at Mumbai Port	4.50
3.	Installation of 448 kW Solar Power Plant at CMRL Wimco Nagar Metro station	1.55
4.	Installation of 400 kW Solar Power Plant at Tiruvyottur Metro station	1.73
	Total Project cost as on 18th February 2022 as per Invoices	**8.95**
	Total Project Cost as per Project Report	**8.90**

Source: Copies of Invoices Provided by Solar Quest LLP and Project report

Observations & Comments:

1. *The basis of the above estimated cost is as per the copies of invoices provided by the company.*
2. *In regard to the installed capacity of 260 kWp at IMSC Chennai, the company has provided invoices for setting up of 330 kWp. Clarification was sought from the borrower. Accordingly, the borrower has informed that actual installed capacity at site is only 260 kWp and for remaining 70 kWp material is lying at site. On Clarification the company has informed that material at site amounts to approximately Rs.0.31 Crore. Therefore Net amount of Invoice No. SQTN/2021-22/019 stands at Rs.1.17 Crore.*
3. *As per MNRE guidelines, the approved benchmark cost for Grid-connected Rooftop Solar Photo-voltaic systems for the financial year 2020-2021 for the capacity range > 100 to 500 kW is Rs.45,000 per kilowatt peak (kWp). Thus the project cost amounting to Rs.8.90 Crore for installation of 1999 kWp of rooftop solar power plant seems reasonable.*
4. *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.

5. *As per expenditure details provided by the company in the form of invoices, the company has made an expenditure amounting to Rs.8.95 Crore in the project till 18th February 2021. However we have only approved Rs.8.64 Crore. Although, we haven't verified the tax paid by the company on the invoices. Bank to verify the same from their end.*
6. *The company has not provided us the individual cost of Inverters and solar panels. Therefore we will not be able to comment on the reasonableness of purchase cost for inverters and solar panels.*
7. *Therefore, in terms of benchmark cost the estimated Project cost appears to be reasonable.*

2. **CURRENT STATUS & TOTAL EXPENDITURE INCURRED TILL DATE:** Details of the expenditure shown to us by the company is enumerated in the Table below is up to 18th February 2022.

{Table: 10}

SR. NO.	PARTICULARS	TOTAL ALLOCATED AMOUNT	INCURRED UP TO 18th FEBRUARY 2022	CURRENT STATUS OF WORK AND REMARKS
		(All figures in cr.)		
1.	**Land & Site Development**	Total allocated amount	0.00	This is a Rooftop Project hence land was not required for this Project.
		Expenses shown by the company	0.00	
		Approved by LIE up to 18th February 2022	**0.00**	
2.	**Civil & Structure Works**	Total allocated amount	0.00	Generally the cost incurred towards Module mounting structure (MMS) is considered under Civil and structure works. However we do not have dedicated expenditure details made towards purchase and installation of MMS. As per our discussion with the company, the cost of the same is considered under Plant and machineries only. Therefore based on invoices we have also considered the same under expenditure towards Plant and machinery only. However we have physically verified that all the Solar modules were installed on MMS only.
		Expenses shown by the company	0.00	
		Approved by LIE up to 18th February 2022	**0.00**	
3.	**Plant & Machinery**	Total allocated amount	8.90	Rs.8.95 Crore has been incurred under this head as against envisaged amount of Rs.8.90 Crore.
		Expenses shown by the company	0.00	

		Approved by LIE up to 18th February 2022	**8.95**	Thus there is minor cost overrun in the project which may be attributed to increase in Input cost in the industry.
4.	**Prelim and Preoperative Expense and Taxes & Duties**	Total allocated amount	0.00	No Cost incurred in this head till date.
		Expenses shown by the company	0.00	
		Approved by LIE up to 18th February 2022	**0.00**	
5.	**Total**	Total allocated amount	**8.90**	As per copies of invoices provided to us The company has made an expenditure on the project amounting to Rs.8.95 Crore as against envisaged amount of Rs.8.90 Crore. In regard to the installed capacity of 260 kWp at IMSC Chennai, the company has provided invoices for setting up of 330 kWp. Clarification was sought from the borrower. Accordingly, the borrower has informed that the actual installed capacity at site is only 260 kWp and for remaining 70 kWp material is lying at site. Therefore as per invoice No. SQTN/2021-22/019 the amount for installing 330 kWp amounts to Rs.1,47,48,904/-. Thus as per pro rata basis the cost for installing 70 kWp amounts to Rs.31,28,555.40 which is not considered in our assessment as the same is associated to uninstalled physical
		Expenses shown by the company	**0.00**	
		Approved by LIE up to 18th February 2022	**8.64**	

				progress. Therefore we have only approved Rs. 8.64 Crore as against envisaged expenditure of Rs.8.95 Crore.

3. **SOURCES OF FINANCE & UTILIZATION OF FUNDS:** The Total Project Cost as per copies of invoices provided by the company amounts to Rs.8.95 Crore. As on date the company has funded the cost from their own sources. Details of sources is not provided by the company. However they have shown their interest of reimbursement for the project cost incurred till 18th February 2022 which is on discretion of the Bank.

{Table: 11}

PARTICULARS	PLANNED AMOUNT	CURRENT STATE OF INVESTMENT *(As per SQLLP)*
	(Amount in Crore)	
Own Sources	8.90	8.95
TOTAL	**8.90**	**8.95**

Source: As per verbal information provided by the company supported by Copies of Invoices.

PART H STATUTORY & REGULATORY APPROVALS, CLEARANCES & NOC

{Table: 12}

SR. NO.	NAME OF LICENSE/ REGISTRATION ISSUING AUTHORITY	DATE OF ISSUE LICENCE NO.	Current Status
1.	Approval for Installing Rooftop Solar Power Plant SECI	---	Obtained
2.	Commissioning Certificate CMRL, IMS and Mumbai Port Trust	NA NA	Obtained
3.	Net Metering Document Chief Electrical Officer	NA	Not Yet Obtained

PART I — OBSERVATIONS & COMMENTS

1. Solar Quest LLP bagged allocation of 3500 kWp from Solar Energy Corporation of India vide sanction Letter Ref. No.: SECI/C&P/RfS/MNRE/975MW GCRT/R1/IND/082019/LOA/35438 Dated 15/0/2020. According to this sanction 500 kWp is alloted to Zone 1 CAPEX Model and 3000 kWp was allotted to Zone 1 RESCO Model. However vide Letter Ref. No.: SECI/Solar/112/2020-21/43608, 999 kWp has been transferred from Zone -1 RESCO to Zone 2 RESCO and 1000 kWp has been transferred from Part B (RESCO) Zone 1 to Part A (CAPEX) Zone 1. Thus as on Date 1500 kWp is associated to CAPEX Model and 2000 kWp is associated to RESCO Model against which the company has installed 2,153 kWp. However they are only eligible to claim subsidy on 1999 kWp sanctioned by SECI.

2. Promoter Solar Quest LLP has invested in the entire CAPEX for the project as a creditor for the construction of power plants, i.e. Rs.8.90 Crore. However, as per invoices the company has incurred Rs.8.95 Crore on the project till 18th February 2022. Thus there is a minor cost overrun the project which may be attributed to increase in input cost for the industry.

3. In regard to the installed capacity of 260 kWp at IMSC Chennai, the company has provided invoices for setting up of 330 kWp. Clarification was sought from the borrower. Accordingly, the borrower has informed that actual installed capacity at site is only 260 kWp only and for remaining 70 kWp material is lying a site. In regard to the installed capacity of 260 kWp at IMSC Chennai, the company has provided invoices for setting up of 330 kWp. Clarification was sought from the borrower. Accordingly, the borrower has informed that the actual installed capacity at site is only 260 kWp and for remaining 70 kWp material is lying at site. Therefore as per invoice No. SQTN/2021-22/019 the amount for installing 330 kWp amounts to Rs.1,47,48,904/-. Thus as per pro rata basis the cost for installing 70 kWp amounts to Rs.31,28,555.40 which is not considered in our assessment as the same is associated to uninstalled physical progress. Therefore we have only approved Rs. 8.64 Crore as against envisaged expenditure of Rs.8.95 Crore.

4. The Company has installed Solar Panels for Rating capacity of 2153 kWp as against sanctioned capacity of 1999 kWp. Clarification was sought from the company regarding subsidy grant from the government. Accordingly the company has informed that they will claim subsidy on sanctioned capacity only. However they will claim reimbursement form the bank for amount against installation of 2153 kWp only.

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5. As per last 3 year data, average sun days are 143 and average sun hours in a year is 3951 recorded at Chennai Zone.

6. As per last 3 year data, average sun days are 194 and average sun hours in and year is 3815 recorded at Mumbai Zone.

7. As per MNRE guidelines, the approved benchmark cost for Grid-connected Rooftop Solar Photo-voltaic systems for the financial year 2020-2021 for the capacity range > 100 to 500 kW is Rs.45,000 per kilowatt peak (kWp).Thus the project cost amounting to Rs.8.90 Crore for installation of 1999 kWp of rooftop solar power plant seems reasonable. However as per latest MNRE guidelines the approved benchmark cost for Grid-connected Rooftop Solar Photo-voltaic systems for the financial year 2021-2022 for the capacity range > 100 kW to 500 kW is Rs.39,080 per kW. According to which project cost amounting to Rs.8.90 Crore seems to be on higher side.

8. The Total Project Cost as per copies of invoices provided by the company amounts to Rs.8.95 Crore. As on date the company has funded the cost from their own sources. Details of sources is not provided by the company. However they have shown their interest of reimbursement for the project cost incurred till 18th February 2022 which is on discretion of the Bank.

9. The company has obtained completion certificates for all the 6 Projects. Completion certificates are attached with this report.

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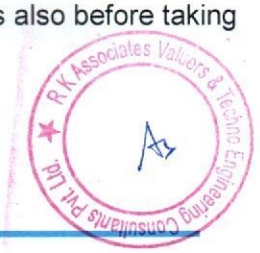
PART J DISCLAIMER

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 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	**FOR INTERNAL USE**
DATE: 02/03/2022	***SURVEYED BY:*** Mr. Abhisehk Shanbhag and Mr. Senthil Kumaran
NOTE: This report contains 92 Pages	***PREPARED BY:*** PE TEAM For R.K. Associates Valuers and Techno Engineering Consultants private limited

1. ***DEFECT LIABILITY PERIOD*** *- In case of any query/ issue or escalation you may please contact Incident Manager by writing at valuers@rkassociates.org. We ensure 100% accuracy in the Calculations done, Rates adopted and various other data points & information mentioned in the report but still can't rule out typing, human errors or any other mistakes. In case you find any mistake, variation, discrepancy or inaccuracy in any data point of the report, please help us by bringing all such points into our notice in writing at valuers@rkassociates.orgwithin 30 days of the report delivery, to get these rectified timely, failing which R.K Associates Valuers Techno Engineering Consultants (P) Ltd. won't be held responsible for any inaccuracy in any manner. Also if we will not hear back anything from you within 30 days, we will assume that report is correct in all respect and no further claim of any sort will be entertained thereafter. We would welcome and appreciate your feedback & suggestions in order to improve our services.*

COMPLETION CERTIFICATE OF THE PROJECTS

Work Completion Certificate

Scheme Details	**SECI -97.5 MW**
Project Name:	400 kWp Solar Power Plant
Customer:	CMRL -Tiruvyottiur Metro Station
PPA Agreement Signed Date	14 Aug 2021
Project Location	Tiruvyottiur, Chennai, Tamil Nadu 600019
Date of Test Commissioning	18-Oct-2021

We hereby certify to M/s. Solar Quest Projects Three Private limited has completed the supply, installation, testing and Commissioning of Grid Connected SPV Power Plant of 400 kWp capacity at Tiruvyottiur Metro Station (STV), Tiruvyottiur, Chennai, Tamil Nadu 600019, which has been Test Commissioned on 18 Oct 2021, and we are waiting for Electrical Safety approval.

FOR CHENNAI METRO RAIL LIMITED

K. RAVI KUMAR
JGM (MEP)
CHENNAI METRO RAIL LIMITED
Poonamallee High Road,
Koyambedu, Chennai - 600 107.

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Work Completion Certificate

Scheme Details	**SECI -97.5 MW**
Project Name:	448 kWp Solar Power Plant
Customer:	CMRL - Wimco Nager Metro Station
PPA Agreement Signed Date	14 Aug 2021
Project Location	Wimco Nagar, Tiruvyottiur, Chennai, Tamil Nadu 600019
Date of Test Commissioning	18-Oct-2021

We hereby certify to M/s. Solar Quest Projects Three Private limited has completed the supply, installation, testing and Commissioning of Grid Connected SPV Power Plant of 448 kWp capacity at Wimco Nagar Metro Station (SWN) Wimco Nagar, Tiruvyottiur, Chennai, Tamil Nadu 600019, which has been Test Commissioned on 18 Oct 2021, and we are waiting for Electrical Safety approval.

FOR CHENNAI METRO RAIL LIMITED

K. RAVI KUMAR
JGM (MEP)
CHENNAI METRO RAIL LIMITED
Poonamallee High Road,
Koyambedu, Chennai – 600 107

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Work Completion Certificate

Scheme Details	**SECI -97.5 MW**
Project Name:	120 kWp Solar Power Plant
Customer:	IMSC NEW BUILDING
PPA Agreement Signed Date	29-DEC-2020
Project Location	4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113
Date of Test Commissioning	15-SEPT-2021

We hereby certify to M/s. Solar Quest Projects Three Private limited has completed the supply, installation, testing and Commissioning of Grid Connected SPV Power Plant of 120 kWp capacity at New Building Roof of Institute of Mathematics and Sciences, 4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113, ministry of Atomic Energy, which has been Test Commissioned on 15 Sep 2021, and we are awaiting for Electrical Safety and DISCOM approvals.

Test Commissioning has been Completed.

FOR SOLAR QUEST PROJECTS
THREE PRIVATE LIMITED.,

For Solar Quest Projects Three Pvt. Ltd
Authorised Representative

Signature of the Developer

FOR INSTITUTE OF MATHEMATICS
AND SCIENCES

The Institute of Mathematical Sciences
Dept. of Atomic Energy

Signature of the beneficiary

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Work Completion Certificate

Scheme Details	SECI -97.5 MW
Project Name:	17.8 kWp Solar Power Plant
Customer:	IMSC SUBSTATION
PPA Agreement Signed Date	29-DEC-2020
Project Location	4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113
Date of Test Commissioning	15-SEPT-2021

We hereby certify to M/s. Solar Quest Projects Three Private limited has completed the supply, installation, testing and Commissioning of Grid Connected SPV Power Plant of 17.8 kWp capacity at Substation Roof of Institute of Mathematics and Sciences, 4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113, ministry of Atomic Energy, which has been Test Commissioned on 15 Sep 2021, and we are awaiting for Electrical Safety and DISCOM approvals.

Test Commissioning has been Completed.

FOR SOLAR QUEST PROJECTS THREE PRIVATE LIMITED.,

For Solar Quest Projects Three Pvt Ltd

Authorised Representative

Signature of the Developer

FOR INSTITUTE OF MATHEMATICS AND SCIENCES

S. MOHAN
Scientific Officer D(E)
The Institute of Mathematical Sciences
Dept. of Atomic Energy

Signature of the beneficiary

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Work Completion Certificate

Scheme Details	**SECI -97.5 MW**
Project Name:	33 kWp Solar Power Plant
Customer:	IMSC AUDITORIUM
PPA Agreement Signed Date	29-DEC-2020
Project Location	4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113
Date of Test Commissioning	15-SEPT-2021

We hereby certify to M/s. Solar Quest Projects Three Private limited has completed the supply, installation, testing and Commissioning of Grid Connected SPV Power Plant of 33 kWp capacity at Auditorium Roof of Institute of Mathematics and Sciences, 4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113, ministry of Atomic Energy, which has been Test Commissioned on 15 Sep 2021, and we are awaiting for Electrical Safety and DISCOM approvals.

Test Commissioning has been Completed.

FOR SOLAR QUEST PROJECTS
THREE PRIVATE LIMITED.,

For Solar Quest Projects Three Pvt. Ltd

Authorised Representative

Signature of the Developer

FOR INSTITUTE OF MATHEMATICS
AND SCIENCES

The Institute of Mathematical Sciences
Dept. of Atomic Energy

Signature of the beneficiary

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Work Completion Certificate

Scheme Details	**SECI -97.5 MW**
Project Name:	20 kWp Solar Power Plant
Customer:	IMSC HOSTEL
PPA Agreement Signed Date	29-DEC-2020
Project Location	4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113
Date of Test Commissioning	15-SEPT-2021

We hereby certify to M/s. Solar Quest Projects Three Private limited has completed the supply, installation, testing and Commissioning of Grid Connected SPV Power Plant of 20 kWp capacity at Hostel Roof of Institute of Mathematics and Sciences, 4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113, ministry of Atomic Energy, which has been Test Commissioned on 15 Sep 2021, and we are awaiting for Electrical Safety and DISCOM approvals.

FOR SOLAR QUEST PROJECTS
THREE PRIVATE LIMITED.,

For Solar Quest Projects Three Pvt. Ltd
Authorised Representative

Signature of the Developer

FOR INSTITUTE OF MATHEMATICS
AND SCIENCES

Test Commissioning Completed

The Institute of Mathematical Sciences
Dept. of Atomic Energy

Signature of the beneficiary

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Work Completion Certificate

Scheme Details	SECI -97.5 MW
Project Name:	27.145 kWp Solar Power Plant
Customer:	IMSC GUEST HOUSE
PPA Agreement Signed Date	29-DEC-2020
Project Location	4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113
Date of Test Commissioning	15-SEPT-2021

We hereby certify to M/s. Solar Quest Projects Three Private limited has completed the supply, installation, testing and Commissioning of Grid Connected SPV Power Plant of 27.145 kWp capacity at Guest House Roof of Institute of Mathematics and Sciences, 4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113, ministry of Atomic Energy, which has been Test Commissioned on 15 Sep 2021, and we are awaiting for Electrical Safety and DISCOM approvals.

FOR SOLAR QUEST PROJECTS THREE PRIVATE LIMITED.,

For Solar Quest Projects Three Pvt. Ltd

Authorised Representative

Signature of the Developer

FOR INSTITUTE OF MATHEMATICS AND SCIENCES

Test Commissioning has been completed.

S. MOHAN
Scientific Officer D(E)
The Institute of Mathematical Sciences
Dept. of Atomic Energy

Signature of the beneficiary

R.K Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Work Completion Certificate

Scheme Details	**SECI -97.5 MW**
Project Name:	50 kWp Solar Power Plant
Customer:	IMSC PALLAVARAM
PPA Agreement Signed Date	29-DEC-2020
Project Location	4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113
Date of Test Commissioning	15-SEPT-2021

We hereby certify to M/s. Solar Quest Projects Three Private limited has completed the supply, installation, testing and Commissioning of Grid Connected SPV Power Plant of 50 kWp capacity at Pallavaram Roof of Institute of Mathematics and Sciences, 4th Cross Street, CIT Campus, Tharamani, Chennai, Tamil Nadu 600113, ministry of Atomic Energy, which has been Test Commissioned on 15 Sep 2021, and we are awaiting for Electrical Safety and DISCOM approvals.

Test Commissioning has been Completed.

FOR SOLAR QUEST PROJECTS
THREE PRIVATE LIMITED.,

For Solar Quest Projects Three Pvt. Ltd
Authorised Representative

Signature of the Developer

FOR INSTITUTE OF MATHEMATICS
AND SCIENCES

S. MOHAN
Scientific Officer (E)
The Institute of Mathematical Sciences
Dept. of Atomic Energy.

Signature of the beneficiary

R.K.Associates Valuers & Techno Engineering Consultants Pvt Ltd

REINFORCING YOUR BUSINESS RK ASSOCIATES

MAZAGAON, MUMBAI - 400 010
INDIA

No: MEED/E/2-G/1564

Date: 21/09/2021

Commissioning Report

Project Name:	499 kWp Solar Power Plant
Customer:	Mumbai Port Trust
PPA Agreement Signed Date	11.02.2021
Project Location	Shed No. 13 B of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA - 400001
Date of Test Commissioning	16.09.2021

Certified that a Grid Connected SPV Power Plant of 499 kWp capacity has been installed at the site Mumbai Port Trust /Shed No. 13 B of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA - 400001 by M/s. Solar Quest Projects Three Private limited. The Plant has been Tested and Commissioned and clearance for Electrical Safety and DISCOM approvals is awaited.

Signature of the beneficiary

Asstt. Executive Engineer (M/E)
MEED, Mumbai Port Trust

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

MAZAGAON, MUMBAI - 400 010.
INDIA.

No: MEED/E/2-G/1564

Date: 21/09/2021

Commissioning Report

Project Name:	500 kWp Solar Power Plant
Customer:	Mumbai Port Trust
PPA Agreement Signed Date	11.02.2021
Project Location	Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA - 400001
Date of Test Commissioning	16.09.2021

Certified that a Grid Connected SPV Power Plant of 500 kWp capacity has been installed at the site Mumbai Port Trust /Shed No. 13 B(1) of Indira Dock, Mumbai Port Trust, Mumbai, MAHARASHTRA - 400001, by M/s. Solar Quest Projects Three Private limited. The plant has been Tested Commissioned and clearance for Electrical Safety and DISCOM approvals is awaited.

Signature of the beneficiary
Asstt. Executive Engineer (M/E)
MEED, Mumbai Port Trust

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

COPIES OF INVOICES

Solar Quest LLP

AE 178, 11th Main Road, Anna Nagar, Chennai –600 040
Email: info@solarquest.in Website: www.solarquest.in

INVOICE

Solar Quest LLP AE 178, 11th Main Road, Anna Nagar, Chennai –600 040 Tamilnadu, INDIA **GST NO : 33ACJFS2440R1ZP**	Invoice No. **SQTN/2021-22/049**	Dated **18-Feb-2022**
	Delivery Note	Mode/Terms of Payment
	Supplier's Ref.	Other Reference(s)
Buyer **SOLAR QUEST PROJECTS THREE PRIVATE LIMITED** 23, behind Mahalakshmi Temple, Govind Rao Street 2nd cross street, Karnataka, 560020 **GST No : 29ABDCS9950J1ZN**	Buyer's Order No.	Dated
	Despatch Document N	Dated
	Despatched through :	
	Terms of Delivery / Transport Detail	

Sl	Description of Goods	Quantity	Rate	per	Amount
1	**400kW Solar Power Plant** Solar Grid Tie Inverters - 4 Nos Alumium Sheet Metal Structure 445w Topsun Solar Panel - 1000 Nos AC Distribution Box & AC/DC Cables BOS Of Solar Power Plant				1,50,00,000.00
					1,50,00,000.00
	IGST				20,70,000.00
	TCS				17,070.00
	Round Off				
	Amount Receivable				**1,70,87,070.00**

Delivery Locaion
CMRL Thiruvettriyur, Chennai

For Solar Quest LLP

Company's GST No: **33ACJFS2440R1ZP**

Declaration

Authorised Signatory

SUBJECT TO BANGALORE JURISDICTION

We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

This is a Computer Generated Invoice

Solar Quest LLP

AE 178, 11th Main Road, Anna Nagar, Chennai –600 040
Email: info@solarquest.in Website: www.solarquest.in

INVOICE

Solar Quest LLP AE 178, 11th Main Road, Anna Nagar, Chennai –600 040 Tamilnadu, INDIA **GST NO : 33ACJFS2440R1ZP**	**Invoice No.** SQTN/2021-22/051 — **Dated** 21-Feb-2022 Delivery Note — Mode/Terms of Payment Supplier's Ref. — Other Reference(s) Buyer's Order No. — Dated Despatch Document N — Dated Despatched through : Terms of Delivery / Transport Detail
Buyer **SOLAR QUEST PROJECTS THREE PRIVATE LIMITED** 23, behind Mahalakshmi Temple, Govind Rao Street 2nd cross street, Karnataka, 560020 **GST No : 29ABDCS9950J1ZN**	

Sl	Description of Goods	Quantity	Rate	per	Amount
1	**448kW Solar Power Plant** Solar Grid Tie Inverters - 4 Nos Alumium Sheet Metal Structure 445w Topsun Solar Panel - 1120 Nos AC Distribution Box & AC/DC Cables BOS Of Solar Power Plant				1,68,00,000.00
					1,68,00,000.00
	IGST				23,18,400.00
	TCS				19,118.00
	Round Off				
	Amount Receivable				1,91,37,518.00

Delivery Locaion
CMRL Thiruvettriyur, Chennai

For Solar Quest LLP

Company's GST No: 33ACJFS2440R1ZP

Declaration

Authorised Signatory

SUBJECT TO BANGALORE JURISDICTION

We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

This is a Computer Generated Invoice

Solar Quest LLP

SOLARQUEST

AE 178, 11th Main Road, Anna Nagar, Chennai –600 040
Email: info@solarquest.in Website: www.solarquest.in

INVOICE

Solar Quest LLP AE 178, 11th Main Road, Anna Nagar, Chennai –600 040 Tamilnadu, INDIA **GST NO : 33ACJFS2440R1ZP**	**Invoice No.** **SQTN/2021-22/019**	**Dated** **27-Sep-2021**
	Delivery Note	Mode/Terms of Payment
	Supplier's Ref.	Other Reference(s)
Buyer **SOLAR QUEST PROJECTS THREE PRIVATE LIMITED** 23, behind Mahalakshmi Temple, Govind Rao Street 2nd cross street, Karnataka, 560020 **GST No : 29ABDCS9950J1ZN**	Buyer's Order No.	Dated
	Despatch Document N	Dated
	Despatched through :	
	Terms of Delivery / Transport Detail	

Sl	Description of Goods	Quantity	Rate	per	Amount
1	**330kW Solar Power Plant** Solar Grid Tie Inverters - 7 Nos Alumium Sheet Metal Structure 445w Topsun Solar Panel - 740 Nos AC Distribution Box & AC/DC Cables BOS Of Solar Power Plant				1,35,30,000.00
					1,35,30,000.00
	IGST				12,04,170.00
	TCS				14,734.00
	Round Off				
	Amount Receivable				1,47,48,904.00

Delivery Locaion
IMSC Proj - Chennai

For Solar Quest LLP

Company's GST No: **33ACJFS2440R1ZP**

Declaration

Authorised Signatory

SUBJECT TO BANGALORE JURISDICTION

We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

This is a Computer Generated Invoice

Solar Quest LLP

SOLARQUEST

NO.23 KUMARA PARK WEST , BANGALORE-560020
Email: info@solarquest.in Website: www.solarquest.in

INVOICE

Solar Quest LLP NO.23 GOVIND RAO STREET KUMARAPARK-WEST BANGALORE-560020 E-Mail: Deepak@solarquest.in 09880273667	Invoice No.: SQBLR/2021-22/I Dated: 30-Sep-2021 Delivery Note Mode/Terms of Payment Supplier's Ref. Other Reference(s)
Buyer **SOLAR QUEST PROJECTS THREE PRIVATE LIMITED** 23, behind Mahalakshmi Temple, Govind Rao Street 2nd cross street, Karnataka, 560020 **GST No : 29ABDCS9950J1ZN**	Buyer's Order No. Dated Despatch Docume Dated Despatched through : Terms of Delivery / Transport Detail

Sl	Description of Goods	Quantity	Rate	per	Amount
1	**1045kW Solar Power Plant** 110kW Solar Grid Tie Inverters - 10 Nos Alumium Sheet Metal Structure 335w Topsun Solar Panel - 3120 Nos AC Distribution Box & AC/DC Cables BOS Of Solar Power Plant				4,12,77,500.00
					4,12,77,500.00
	CGST				18,36,848.75
	SGST				18,36,848.75
	TCS				44,952.00
	Round Off				0.50
	Amount Receivable				4,49,96,150.00

Bank Details : **Solar quest LLP** **A/c No: 0784201003850** **IFSC code : CNRB0000784** Canara Bank , Seshadripuram Branch , Bangalore	**Delivery Location** **Mumbai Port**

For Solar Quest LLP

Company's GST No: **29ACJFS2440R1ZE**

Declaration

Authorised Signatory

SUBJECT TO BANGALORE JURISDICTION

We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

This is a Computer Generated Invoice

COPIES OF INSPECTION REPORTS

IMSC, PALLAVARAM

Inspection Report of 45 kWp Rooftop Solar Plant Installed at IMS, Pallavaram, Chennai

Project Inspection Report under RfS No: SECI/C&P/RfS/MNRE/97.5MW GCRT/R1/IND/082019
Dated: 29/08/2019 (Achievement Linked IncentiveScheme)

Date of Inspection: 24.12.2021

A	Name of the Successful Bidder: **M/s. Solar Quest Projects Three Pvt. Ltd**
B	Name of the Building Department / Organisation: **The Institute of Mathematical Sciences, NPCIL Campus, Pallavaram, Chennai , TAMIL NADU**
C	Name of the Ministry: **Department of Atomic Energy**
D	Address of SPV power plant installed: **The Institute of Mathematical Sciences, NPCIL Campus, Pallavaram, Chennai , TAMIL NADU**
E	Meter Consumer Number: **Pending Submission** .(Electricity bill copy to be attached)

S. No	Component	Details	Page No.
1	Installed Project capacity in (kWp)	50.73 kWp	
2	Whether the system is installed in shadow free area or not? If not mention the details.	YES	
3	PV modules are made in India	WAAREE make provided. Model – WSMD-445- Solar Doublet Module 445 1- Manufacturer's undertaking with Invoice reference and Manufacturer's Flasher test report containing Sl nos. of modules with Invoice reference are attached. 2- Undertaking from bidders with Serial No. – **pending submission** 3- Invoice copy of modules attached 4- Delivery challan of modules attached	
4	Whether all major components (except inverters) are made in India	YES	
5	Type, Make and year of manufacturing of Modules	2021	

(Signature – Bidder's Representative)
For Solar Quest Projects Three Pvt. Ltd
Authorised Representative

(Signature – CPSU's Inspector)
C R SREENIVASAN
SECI INSPECTOR
EXECUTIVE ENGINEER (E)
BSNL COIMBATORE

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

78	Itemized bill of material for complete SPV plant covering all the components and associated accessories. The country of manufacturing needs to be mentioned for all major components like modules, inverters, cables, mounting structure, switchgear, SCADA system etc.	Yes	
79	Soft copy in CD of final drawing	**Pending**	
80	Photo Graphs of sites	**Pending**	
81	Any specific problem(s)		
82	Recommendations	The Plant may be re-offered after attending to the low PR and other issues.	

Format for Performance Ratio (PR)

"Performance Ratio" (PR) means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.

$$PR = \frac{Measured\ Output\ in\ kW}{Installed\ capacity\ in\ kW \times Measured\ radiation\ intensity\ in\ kW/m2} \times 100$$

Parameters	Input value	Remarks, if any
Date and Time for PR measurement	24.12.2021, 11.00 hrs	
A) Installed Plant Capacity in kW	50.73 kW	
B) Measured output in kW	32 kW	
C) Measured radiation intensity in W/m^2	1170 W/m^2	
Performance Ratio (%) $(\frac{B*1000}{A\times C} \times 100)$	(32*1000*100) = **53.91%** 50.73*1170	**PR is less than the benckmark value of 75%**

Declaration:

1. It is to certify that all the information given above is true and correct to best of our knowledge. ~~The plant is found to be installed as per the technical specifications mentioned in SECI's RfS No.:SECI/C&P/RfS/MNRE/97.5MW-GCRT/R1/IND/082019 dated: 29/08/2019.~~
2. The Bidder declares that they including their Affiliate/Group company will not claim any subsidy/incentive using this project under any other schemes of Central/State Govt./Public sector Undertaking.

Signature of Inspecting Officer, Date & Name

C R SREENIV[illegible]N
SECI INSPECTOR
[illegible]NEER

For Solar Quest Projects Three Pvt. Ltd

Signature of Representative of Bidder, Date & Seal

Authorised Representative

Signature of Government Building Representative, Date& Seal– Conforming installation of rooftop solar plant at their building and its satisfactory operation

(Signature – Bidder's Representative) (Signature – SECI's Inspector)

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

IMSC, TARAMANI

Inspection Report of 207.37 kWp Rooftop Solar Plant Installed at IMS, Tharamani, Chennai

Project Inspection Report under RfS No: SECI/C&P/RfS/MNRE/97.5MW GCRT/R1/IND/082019
Dated: 29/08/2019 (Achievement Linked IncentiveScheme)

Date of Inspection: 24.12.2021

A	Name of the Successful Bidder: **M/s. Solar Quest Projects Three Pvt. Ltd**
B	Name of the Building Department / Organisation: **The Institute of Mathematical Sciences, NPCIL Campus, ~~Pallavaram~~ Tharamani, Chennai , TAMIL NADU**
C	Name of the Ministry: **Department of Atomic Energy**
D	Address of SPV power plant installed: **The Institute of Mathematical Sciences, NPCIL Campus, ~~Pallavaram~~ Tharamani, Chennai , TAMIL NADU**
E	Meter Consumer Number: **Pending Submission** .(Electricity bill copy to be attached)

S. No	Component	Details	Page No.
1	Installed Project capacity in (kWp)	207.37 kWp	
2	Whether the system is installed in shadow free area or not? If not mention the details.	YES	
3	PV modules are made in India	WAAREE make provided. Model – WSMD-445- Solar Doublet Module 445 1- Manufacturer's undertaking with Invoice reference and Manufacturer's Flasher test report containing Sl nos. of modules with Invoice reference are attached. 2- Undertaking from bidders with Serial No. – **pending submission** 3- Invoice copy of modules attached 4- Delivery challan of modules attached	
4	Whether all major components (except inverters) are made in India	YES	

(Signature – Bidder's Representative)
For Solar Quest Projects Three Pvt. Ltd
Authorised Representative

(Signature – CPSU)
C R SREENIVASAN
SECI INSPECTOR
EXECUTIVE ENGINEER (E)
BSNL COIMBATORE

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Inspection Report of 207.37 kWp Rooftop Solar Plant Installed at IMS, Tharamani, Chennai

Checked for New Guest house block (25 kW)

Parameters	Input value	Remarks, if any
Date and Time for PR measurement	24.12.2021, 13.00 hrs	
A) Installed Plant Capacity in kW	25 kW	
B) Measured output in kW	14.40 kW	
C) Measured radiation intensity in W/m^2	1240 W/m^2	
Performance Ratio (%) $(\frac{B*1000}{A\times C} \times 100)$	$\frac{14.40*1000*100}{25*1240}$ = 46.45%	**PR is less than the benchmark value of 75%**

Declaration:

1. It is to certify that all the information given above is true and correct to best of our knowledge. ~~The plant is found to be installed as per the technical specifications mentioned in SECI's RfS No.:SECI/C&P/RfS/MNRE/97.5MW GCRT/R1/IND/082019 dated: 29/08/2019.~~
2. The Bidder declares that they including their Affiliate/Group company will not claim any subsidy/incentive using this project under any other schemes of Central/State Govt./Public sector Undertaking.

Signature of Inspecting Officer, Date & Name

C R SREENIVASAN
SECI INSPECTOR
EXECUTIVE ENGINEER (E)
BSNL COIMBATORE

For Solar Quest Projects Three Pvt. Ltd

Signature of Representative of Bidder, Date & Seal

Authorised Representative

Signature of Government Building Representative, Date& Seal– Conforming installation of rooftop solar plant at their building and its satisfactory operation

(Signature – Bidder's Representative) (Signature – SECI's Inspector)

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

CMRL, TIRUVOTRIYUR

Inspection Report of 400 kWp Rooftop Solar Plant Installed at CMRL, Tiruvotriyur, Chennai

Project Inspection Report under RfS No: SECI/C&P/RfS/MNRE/97.5MW GCRT/R1/IND/082019
Dated: 29/08/2019 (Achievement Linked IncentiveScheme)

Date of Inspection: 27.01.2022 & 28.01.2022

A	Name of the Successful Bidder: **M/s. Solar Quest Projects Three Pvt. Ltd**
B	Name of the Building Department / Organisation: **Chennai Metro Rail Limited, CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, TAMIL NADU - 600019**
C	Name of the Ministry: Ministry of Railways
D	Address of SPV power plant installed: **Chennai Metro Rail Limited, CMRL Tiruvotriyur Metro Station, Tiruvotriyur, Chennai, TAMIL NADU - 600019**
E	Meter Consumer Number: **1843** .(Electricity bill copy to be attached)

S. No	Component	Details	Page No.
1	Installed Project capacity in (kWp)	400 kWp	—
2	Whether the system is installed in shadow free area or not? If not mention the details.	YES	—
3	PV modules are made in India	Topsun make provided. Model – TS72MP400F 1- Manufacturer's undertaking with Invoice reference and Manufacturer's Flasher test report containing Sl nos. of modules with Invoice reference are attached. 2- Undertaking from bidders with Serial No. 3- Invoice copy of modules attached 4- Delivery challan of modules attached	4 5 6-17 18-25
4	Whether all major components (except inverters) are made in India	YES	—
5	Type, Make and year of manufacturing of Modules	Mono PERC Crystalline, Topsun make, Model – TS72MP400F Mfg-2021	

For Solar Quest Projects Three Pvt. Ltd

(Signature – Bidder's Representative)
Authorised Representative

C R SREENIVASAN
SECI INSPECTOR
EXECUTIVE ENGINEER (E
BSNL COIMBATORE

(Signature - SECI's Inspector)

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

		mentioned in SECI's RfS No.:SECI/C&P/RfS/MNRE/ 97.5MW GCRT/R1/IND/082019 dated: 29/08/2019. The Performance Ratio of the System is found to be 83.62%. The system was commissioned on 18.10.2021 as per the Display board available at site.	

Format for Performance Ratio (PR)

"Performance Ratio" (PR) means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.

$$PR = \frac{Measured\ Output\ in\ kW}{Installed\ capacity\ in\ kW \times Measured\ radiation\ intensity\ in\ kW/m2} \times 100$$

Parameters	Input value	Remarks, if any
Date and Time for PR measurement	27.01.2022, 15.00 hrs	
A) Installed Plant Capacity in kW	100 kW x 4 nos.	
B) Measured output in kW	49.2+44.51+48.65+43.2= 185.56 kW	
C) Measured radiation intensity in W/m^2	(629.2+530.25+545.50+514)/4 = 554.74	
Performance Ratio (%) $(\frac{B*1000}{A\times C} \times 100)$	$\frac{185.56*1000*100}{400*554.74}$ = **83.62%**	

Declaration:

1. It is to certify that all the information given above is true and correct to best of our knowledge. The plant is found to be installed as per the technical specifications mentioned in SECI's RfS No.:SECI/C&P/RfS/MNRE/97.5MW GCRT/R1/IND/082019 dated: 29/08/2019.
2. The Bidder declares that they including their Affiliate/Group company will not claim any subsidy/incentive using this project under any other schemes of Central/State Govt./Public sector Undertaking.

28/01/2022
C R SREENIVASAN
SECI INSPECTOR
EXECUTIVE ENGINEER (S)
BSNL COIMBATORE

Signature of Inspecting Officer, Date & Name

For Solar Quest Projects Three Pvt. Ltd
Authorised Representative

Signature of Representative of Bidder, Date & Seal

Signature of Government Building Representative, Date& Seal– Conforming installation of rooftop solar plant at their building and its satisfactory operation

(Signature – Bidder's Representative)

(Signature - SECI's Inspector)

R.K. Associates Valuers & Techno Engineering Consultants (I) Pvt. Ltd.

CMRL, WIMCO NAGAR METRO STATION

Inspection Report of 448 kWp Rooftop Solar Plant Installed at CMRL, WIMCO Nagar, Chennai

Project Inspection Report under RfS No: SECI/C&P/RfS/MNRE/97.5MW GCRT/R1/IND/082019 Dated: 29/08/2019 (Achievement Linked IncentiveScheme)			
Date of Inspection: 27.01.2022 & 28.01.2022			
A	Name of the Successful Bidder: **M/s. Solar Quest Projects Three Pvt. Ltd**		
B	Name of the Building Department / Organisation: Chennai Metro Rail Limited, CMRL Wimco Nagar metro Station, Chennai, TAMIL NADU - 600019		
C	Name of the Ministry: Ministry of Railways		
D	Address of SPV power plant installed: Chennai Metro Rail Limited, CMRL Wimco Nagar metro Station, Chennai, TAMIL NADU - 600019		
E	Meter Consumer Number: 1843 .(Electricity bill copy to be attached)		
S. No	**Component**	**Details**	**Page No.**
1	Installed Project capacity in (kWp)	448 kWp	–
2	Whether the system is installed in shadow free area or not? If not mention the details.	YES	–
3	PV modules are made in India	Topsun make provided. Model – TS72MP400F 1- Manufacturer's undertaking with Invoice reference and Manufacturer's Flasher test report containing Sl nos. of modules with Invoice reference are attached. 2- Undertaking from bidders with Serial No. 3- Invoice copy of modules attached 4- Delivery challan of modules attached	4 5 6-22 23-26
4	Whether all major components (except inverters) are made in India	YES	–
5	Type, Make and year of manufacturing of Modules	Mono PERC Crystalline, Topsun make, Model – TS72MP400F Mfg-2021	

For Solar Quest Projects Three Pvt. Ltd

(Signature – Bidder's Representative)

Authorised Representative

C R SREENIVASAN
SECI INSPECTOR
EXECUTIVE ENGINEER (E)
BSNL COIMBATORE

(Signature - SECI's Inspector)

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

Inspection Report of 448 kWp Rooftop Solar Plant Installed at CMRL, WIMCO Nagar, Chennai

82	Recommendations	The plant is found to be installed as per the technical specifications mentioned in SECI's RfS No.:SECI/C&P/RfS/MNRE/ 97.5MW GCRT/R1/IND/082019 dated: 29/08/2019. The Performance Ratio of the System is found to be **78.88%.** The system was commissioned on 18.10.2021 as per the Display board available at site.	

Format for Performance Ratio (PR)

"Performance Ratio" (PR) means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.

$$PR = \frac{Measured\ Output\ in\ kW}{Installed\ capacity\ in\ kW \times Measured\ radiation\ intensity\ in\ kW/m2} \times 100$$

Parameters	Input value	Remarks, if any
Date and Time for PR measurement	27.01.2022, 12.00 hrs	
A) Installed Plant Capacity in kW	448 kW.	
B) Measured output in kW	70.83+74.5+75.85+76.41= 297.59 kW	
C) Measured radiation intensity in W/m^2	(855.3+832.6+841.5+838.5)/4 = 841.97	
Performance Ratio (%) $(\frac{B*1000}{A\times C} \times 100)$	297.59*1000*100 = **78.88%** 448*841.97	

Declaration:

1. It is to certify that all the information given above is true and correct to best of our knowledge. The plant is found to be installed as per the technical specifications mentioned in SECI's RfS No.:SECI/C&P/RfS/MNRE/97.5MW GCRT/R1/IND/082019 dated: 29/08/2019.
2. The Bidder declares that they including their Affiliate/Group company will not claim any subsidy/incentive using this project under any other schemes of Central/State Govt./Public sector Undertaking.

28/01/2022

C R SREENIVASAN
SECI INSPECTOR
EXECUTIVE ENGINEER (E)
BSNL COIMBATORE

Signature of Inspecting Officer, Date & Name

For Solar Quest Projects Three Pvt. Ltd

Authorised Representative

Signature of Representative of Bidder, Date & Seal

Signature of Government Building Representative, Date& Seal– Conforming installation of rooftop solar plant at their building and its satisfactory operation

(Signature – Bidder's Representative)

(Signature - SECI's Inspector)

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

MUMBAI PORT TRUST

Government of India
Central Electricity Authority
Regional Inspectorial Organisation
Ground Floor, WRPC Building, F-3, MIDC Area
Marol, Andheri (East), Mumbai 400 093

ISO: 9001:2015

Telefax: 022 – 28211003 **riowestcea@ni.in**

No.:RIO(W)/MPT/MH/Mazgaon/A-09296/DD/2021/3793-94 Date: 25 FEB 2022

Approval for Energisation

(under Regulation 43 of CEA (Measures relating to Safety and Electric Supply), Regulations,2010)

Kind attention: Shri Manas Mandal,
M/s. Mumbai Port Trust,
5th Floor Nirman Bhavan,
Mechanical and Electrical Department,
Bombay Port Trust, Mazgaon,
Mumbai 400010

Subject: Approval for Energisation of Electrical Installations of M/s. Mumbai Port Trust, Shed no. 13B of Indira Dock, Mumbai Port Trust, Mumbai, MH, 400001 (1037KWp DC grid connected Roof top solar system) under regulation 32 of Central Electricity Authority (Measures relating to Safety and Electric Supply), Regulations 2010 (as amended till date)

Ref:

1. Your online application no: A/2022/09296 dated 12/02/2022.
2. CEA inspection report letter No.:RIO(W)/MPT/MH/Mazgaon/A-09296/DD/2021/003738-39 Date:18.02.2022
3. M/s. MPT compliance letter no. MEED/E/2-G(Solar)/898 dated: 24.02.2022.

Whereas the inspection of Electrical Installation **of M/s. Mumbai Port Trust, Shed no. 13B of Indira Dock, Mumbai Port Trust, Mumbai, MH, 400001 (1037KWp DC grid connected Roof top solar system)** was inspected on 16th February, 2022 by the undersigned. The non-compliances of certain provisions/stipulations of the regulations were conveyed to you vide our office letter under reference at Sl.No.(2) above (Inspection Report) and the compliance of the same has since been received vide your letter under reference at Sl.No. (3) above.

The Approval for energisation of Electrical Installation of **M/s. Mumbai Port Trust, Shed no. 13B of Indira Dock, Mumbai Port Trust, Mumbai, MH, 400001 (1037KWp DC grid connected Roof top solar system)** is here by accorded subject to consistent compliance of relevant provisions of CEA (Measures relating to Safety and Electric Supply) Regulations, 2010 (as amended till date) by **M/s. MPT.** The above apparatus /Installations shall be due for periodical inspection under regulation 30 after two years from the date of inspection. The periodicity is subject to change by Government Notification.

Installation Equipment: List of Electrical Equipments is furnished at Annexure –I.

B. Venkata Sandeep 25/02/2021

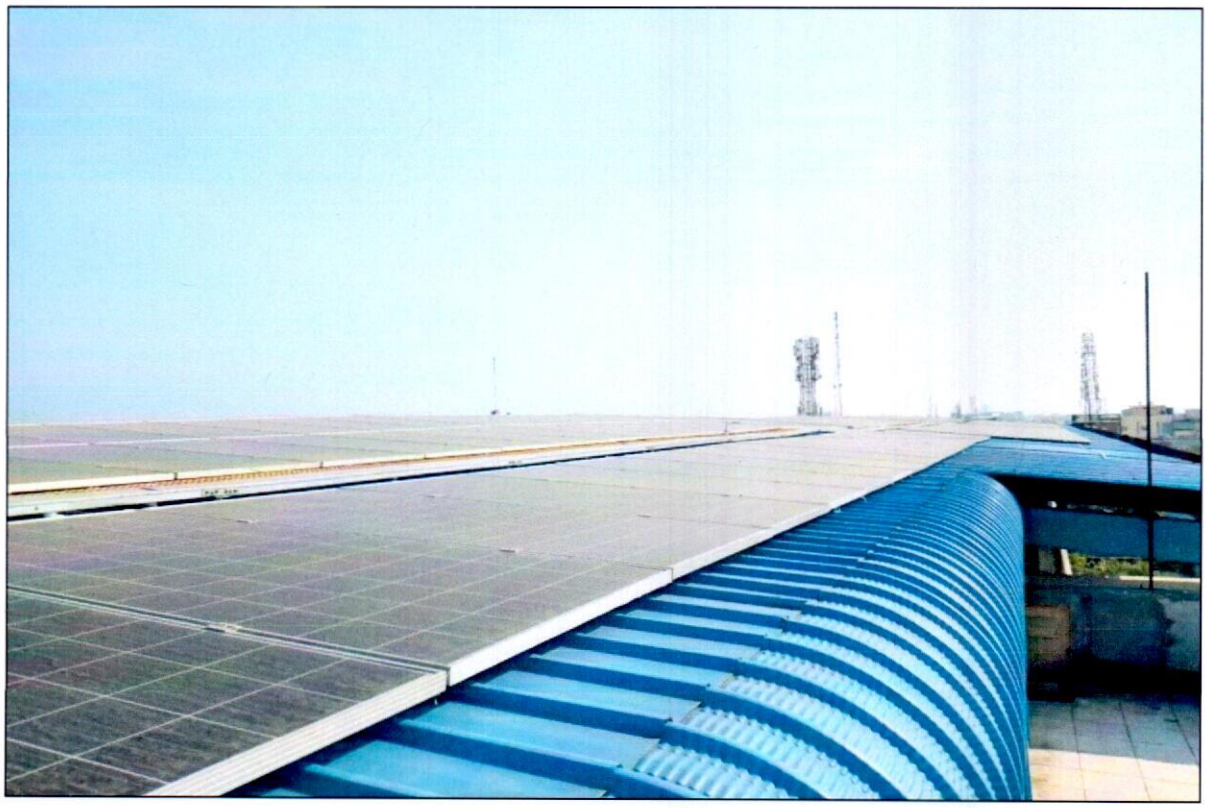
(B.Venkata Sandeep)
Deputy Director
For Chief Electrical Inspector
to the Govt. of India

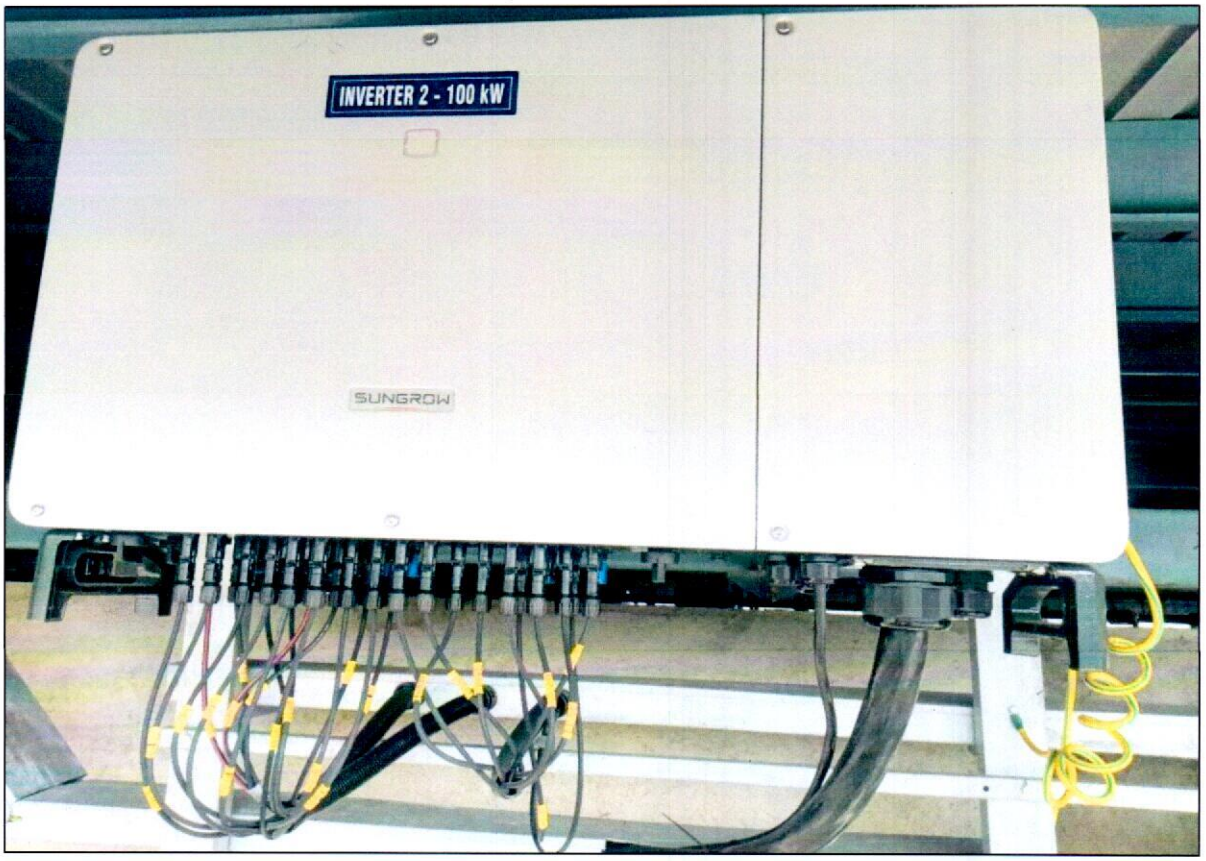
Copy to:

1) Chief Engineer (CEI), CEA, 3rd Floor, NRPC Building, Katwaria Saria, New Delhi
2) SE, RIO(W), CEA, Mumbai

SITE PHOTOGRAPHS

SITE PHOTOGRAPH OF TIRUVYOTTUR METRO STATION, CHENNAI





SITE PHOTOGRAPH OF WIMCO NAGAR METRO STATION, CHENNAI

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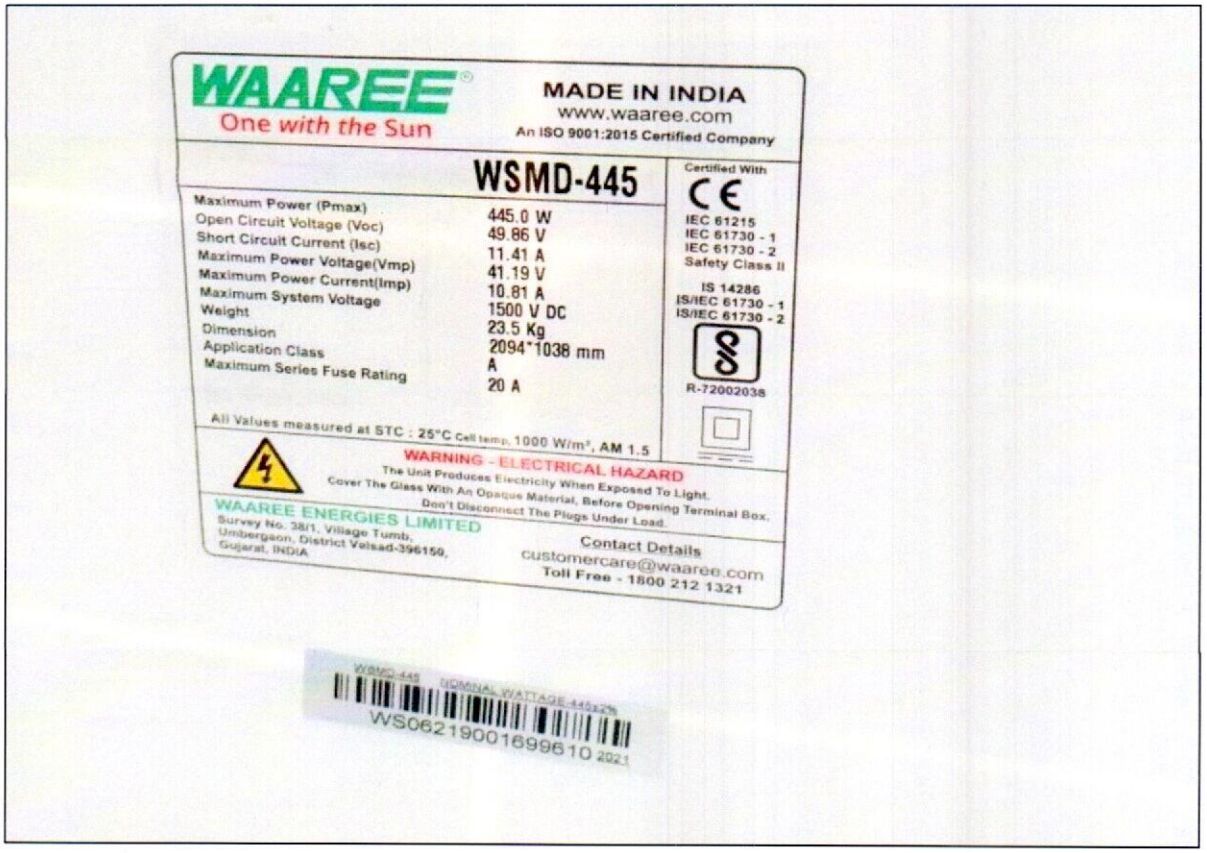
R-72002038
Maximum Power (Pmax) 445.0 W
Open Circuit Voltage (Voc) 49.86 V
Short Circuit Current (Isc) 11.41 A
Maximum Power Voltage(Vmp) 41.19 V
Maximum Power Current(Imp) 10.81 A
Maximum System Voltage 1500 V DC
Weight 23.5 Kg
Dimension 2094*1038 mm
Application Class A
Maximum Series Fuse Rating 20 A
All Values measured at STC : 25°C Cell temp, 1000 W/m², AM 1.5
WARNING - ELECTRICAL HAZARD
The Unit Produces Electricity When Exposed To Light.
Cover The Glass With An Opaque Material, Before Opening Terminal Box.
Don't Disconnect The Plugs Under Load.
WAAREE ENERGIES LIMITED
Survey No. 38/1, Village Tumb,
Umbergaon, District Valsad-396150,
Gujarat, INDIA
Contact Details
customercare@waaree.com
Toll Free - 1800 212 1321
WS06219001698757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Short Circuit Current (Isc) 11.41 A
Maximum Power Voltage(Vmp) 41.19 V
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Dimension 2094*1038 mm
Application Class A
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Certified With
IEC 61215
IEC 61730 - 1
IEC 61730 - 2
Safety Class II
IS 14286
IS/IEC 61730 - 1
IS/IEC 61730 - 2
R-72002038
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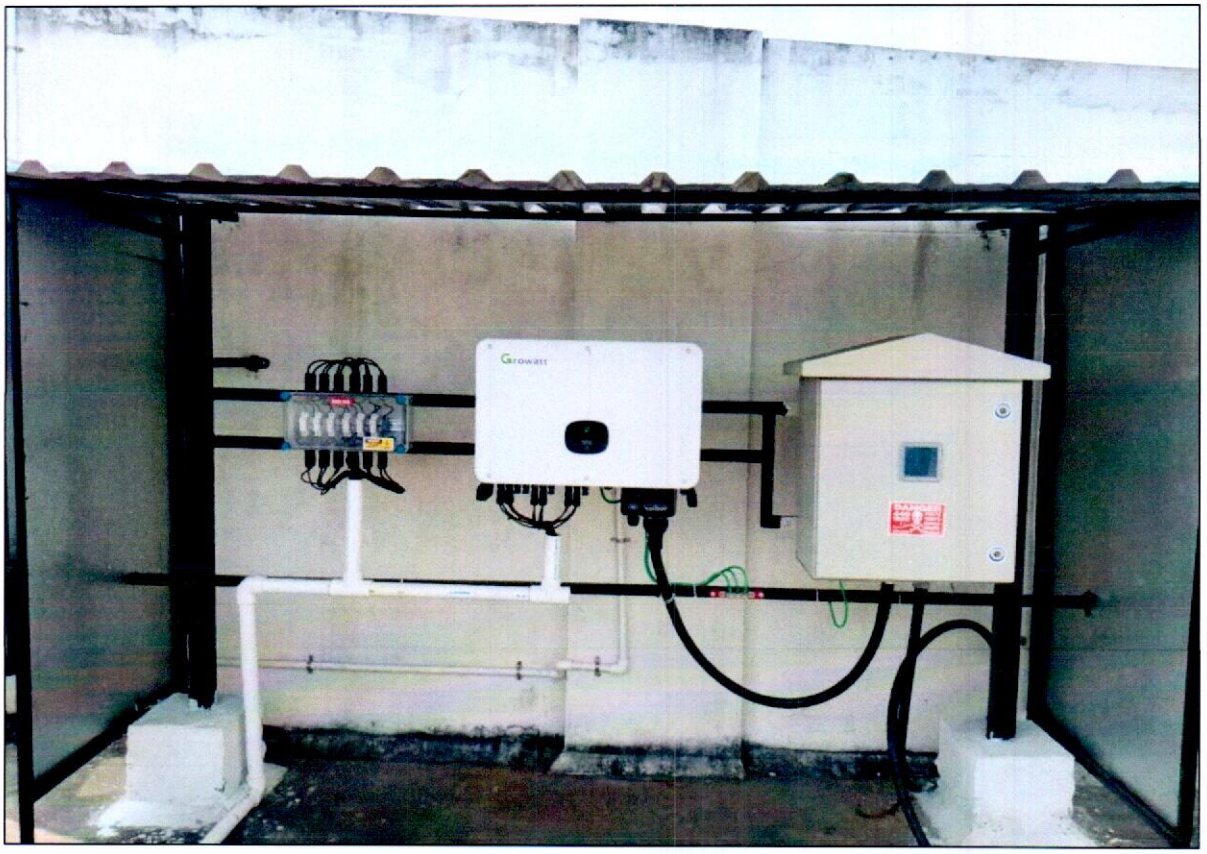
WS06219001699610 2021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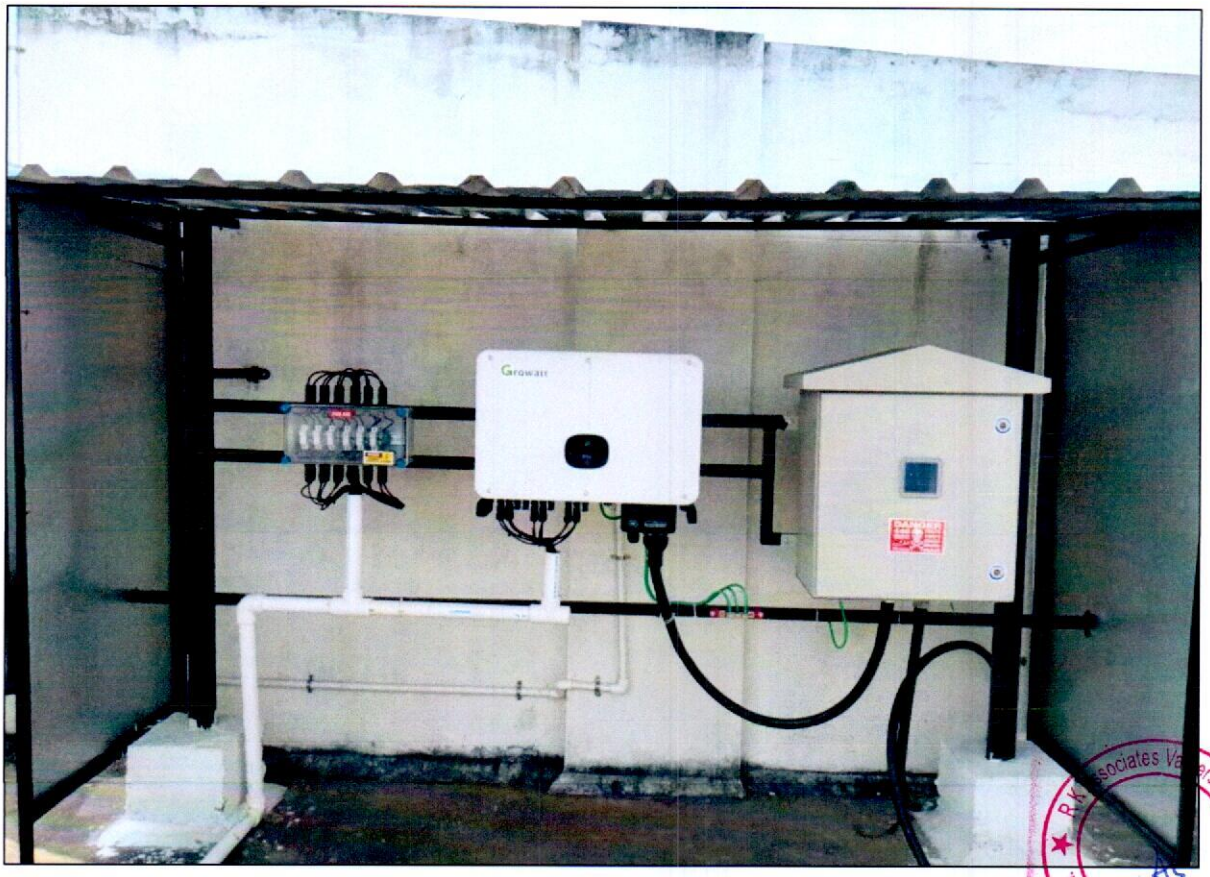
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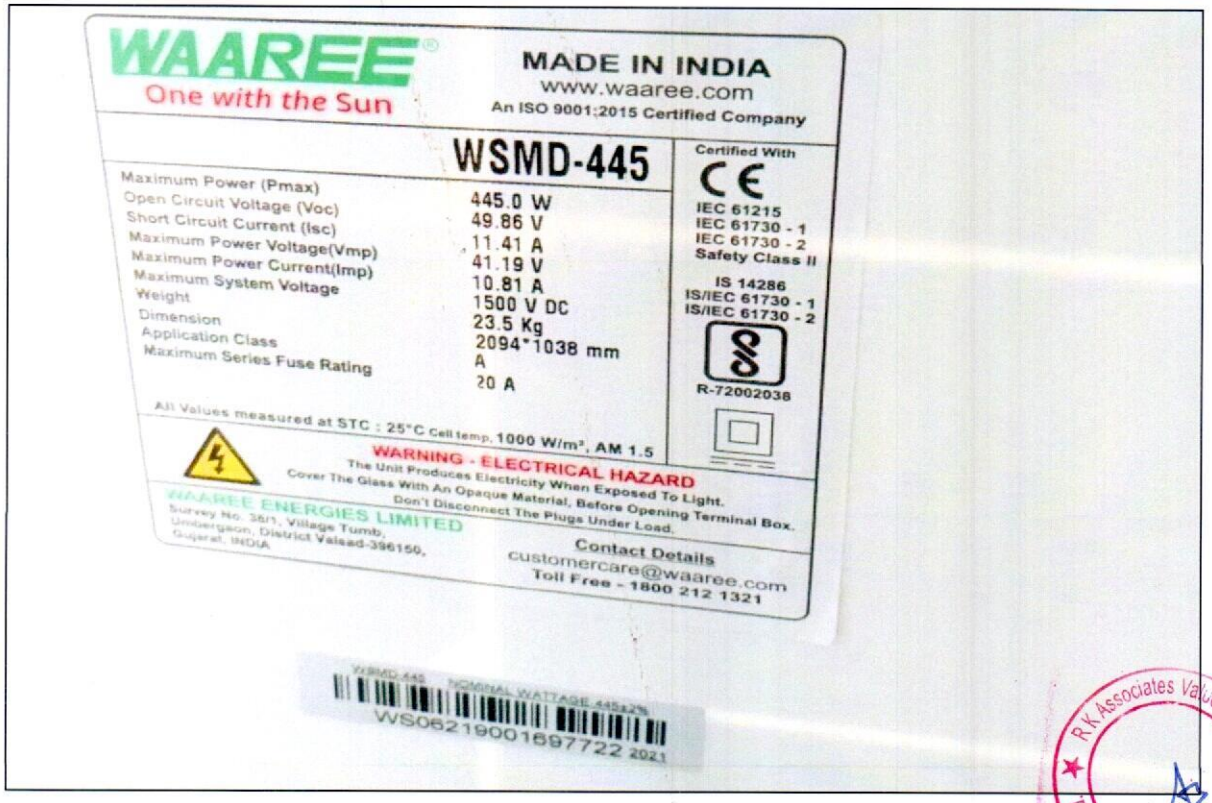
SITE PHOTOGRAPH OF INSITUTUTE OF MATHEMATICAL SCIENCE, THARAMANI, CHENNAI



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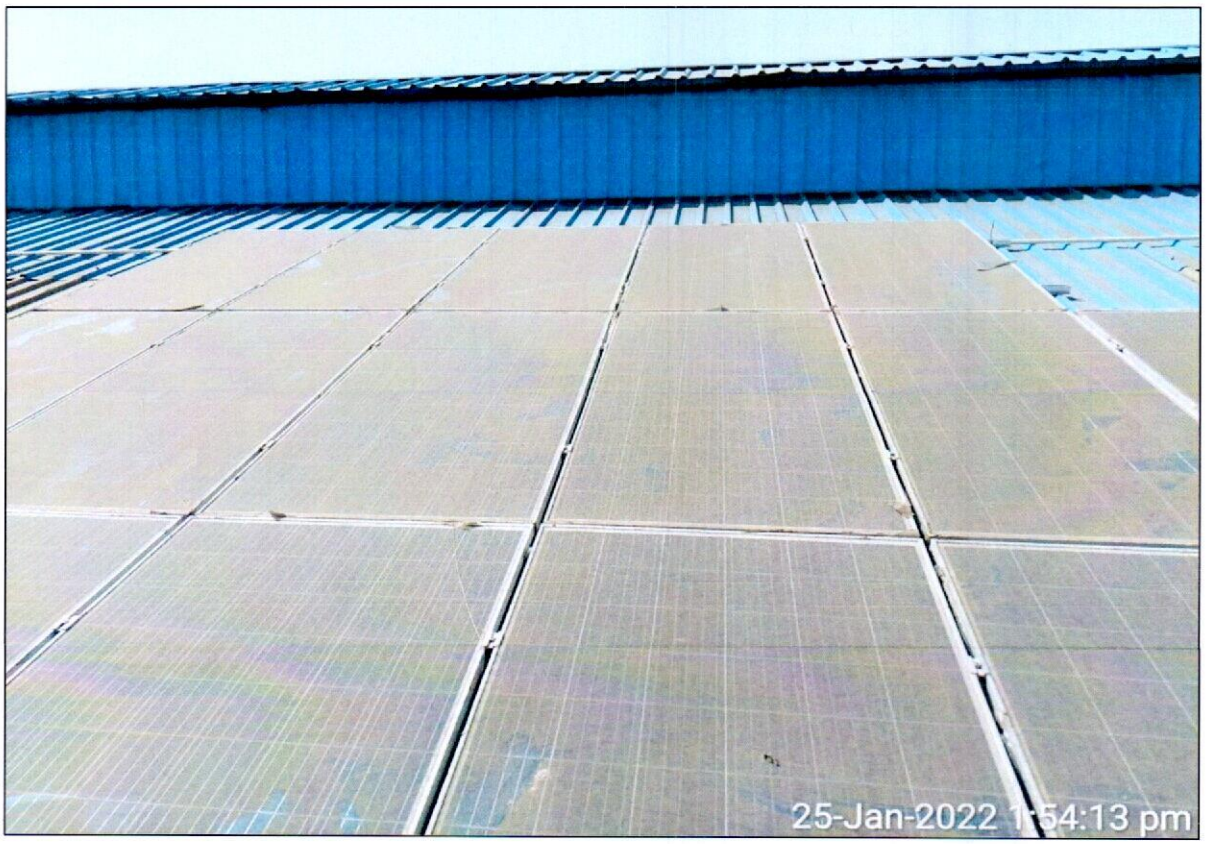
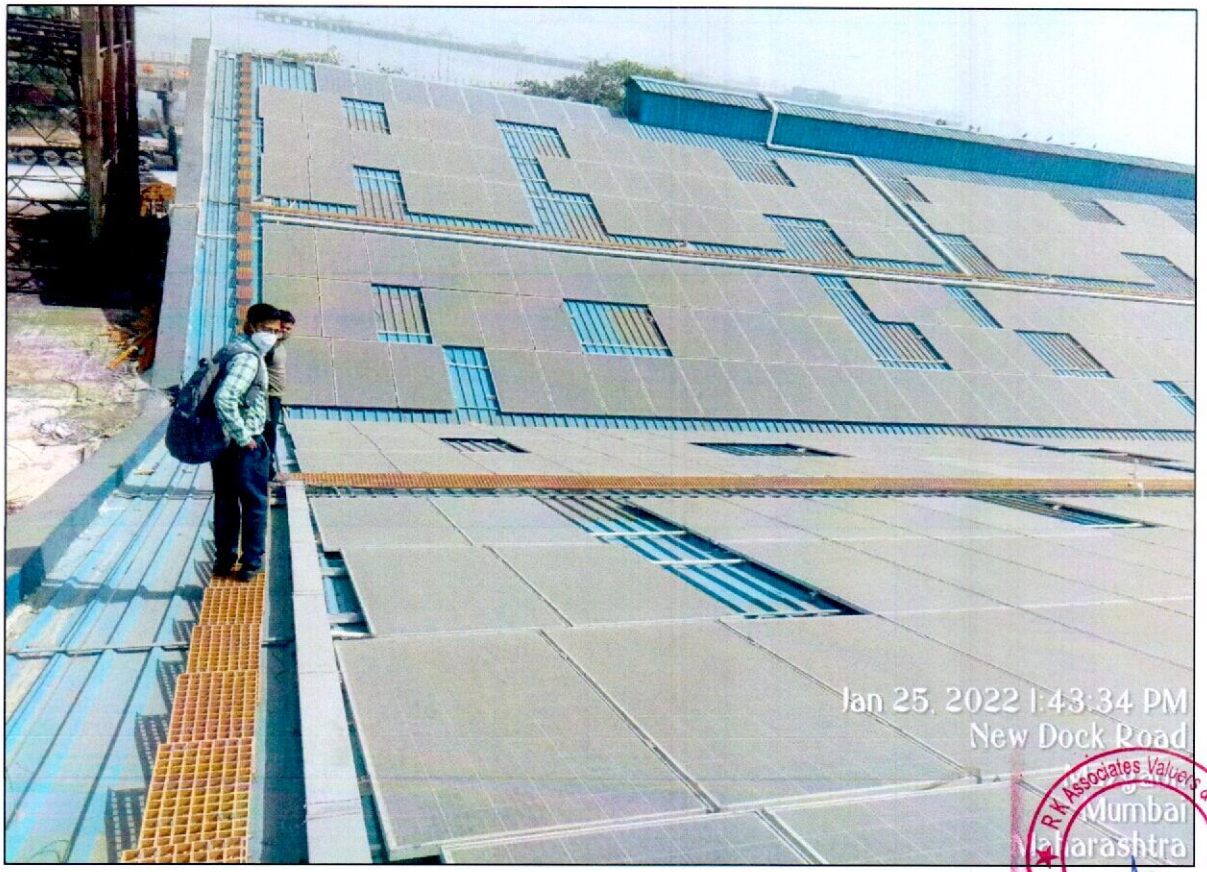
SITE PHOTOGRAPH OF MUMBAI PORT TRUST, SHED NO. 13 B (2) AND 13 B-1 OF INDIRA DOCK, MUMBAI PORT TRUST, MUMBAI, MAHARASHTRA -400001

R.K.Associates Valuers & Techno Engineering Consultants Pvt. Ltd.

R.K. Associates Valuers & Techno Engineering Consultants Pvt. Ltd.





R.K Associates Valuers & Techno Engineering Consultants Pvt. Ltd.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