

Ref No. INKEL/RED/2022-23/NIQ-MMS-11MWp KSEB\_3.5MWp/01  
Date: 08.02.2024

**Notice for Inviting Quotations**

INKEL Ltd. Invites sealed quotations from financially and technically sound reputed suppliers for the Supply of Hot Dip Galvanised Solar PV Module Mounting Structure at Mylatty, in Kasaragode district, Kerala.

Name of Work	Quotations invited for the Supply of Hot dip Galvanised Solar PV Module Mounting Structure for 3.5MWp Solar Project at Mylatty
Earnest Money Deposit	Rs. 50,000.00 in the form of Demand Draft in favour of INKEL Limited payable at Ernakulam.
Tender Fee	Rs. 5,600.00 in the form of Demand Draft in favour of INKEL Limited payable at Ernakulam.
Date of publishing bid documents	08.02.2024
Last Date & Time of Submission of Quotation document	19.02.2024,3:00PM
Opening of Quotation Cover	19.02.2024,4:00PM
Nature of Contract	Supply

**Eligibility Criteria**

The bidder must fulfil the following eligibility criteria.

- a) The bidder must be registered under GST.
- b) The Bids shall be submitted only by a Module Mounting Structure Manufacturer or its authorised dealer. The bidder who are not OEM Authorised dealer should submit a manufacturer authorization letter/certificate along with the Bid.
- c) Bidder should have supplied module mounting structures for solar projects of more than 5000kWp solar power plant capacity to reputed customers in the last 3 financial years.
- d) Bidder shall have facility for carrying out routine in process and finished product testing/verification.
- e) Bidders shall not be blacklisted or banned by INKEL/KSEBL or any other Govt. agencies.
- f) The bidder shall have an average annual turnover equal to or more than Rupees One crores in the last five financial years immediately preceding the bid opening date.

**The Scope of Supply & Technical Specifications to be followed is scheduled in Appendix - 1**

The Quotation documents should be submitted by online only and in the designated covers on the below address by mentioning name of work:

**“Supply of Solar PV Module Mounting Structure for 3.5MWp Solar Power Plant Project Mylatty Kerala”**

**To,**  
**Managing Director**  
**INKEL Limited, Door No. 7/473ZA – 5 & 6,**  
**1st Floor, Ajiyal Complex, Kakkanad, Cochin, Pin: 682030**

***Note: Please sign and seal all the pages in the Notice Inviting Quotation and return the same.***

The quotation shall be valid for 04 months reckoned from the date of opening of quotation. Bidder shall extend the bid validity by another 2 months, if so desired by the Purchaser. The decision taken in the INKEL Evaluation Committee will be final. INKEL Ltd reserves the right to modify/cancel the NIQ and to reject any or all quotations without assigning any reasons.

For bids submitted online, the hardcopies of Demand Draft (DD) for the remittance of Tender fee and EM shall be submitted offline to INKEL office.

The EMD of unsuccessful bidders shall be returned within 30 days from the date of issue of Letter of allocation to the successful bidder on bidders request.

Any queries on the issued document may be addressed to the following addresses at least 3 days before the last date for submission of quotation:  
tenders.re@inkel.in

**Bidding Process**

The bid in response to this NIQ shall be submitted in PDF as follows:

**Cover-1: Technical Bid**

1. Copy of GST registration certificate.
2. The entire NIQ document signed and sealed by the bidder as a token of acceptance of all the terms and conditions of this tender.
3. Documents to prove Eligibility Criteria stated above

**Cover-II: Financial Bid**

1. Price Bid as per Appendix 4 (**Password Protected PDF**).

All pages of the Bidder's submission shall be signed and stamped by the duly authorized of the Bidder.

Sd/-  
Managing Director

**NIQ Annexures:**

1. Appendix-1 - Scope of Supply and Technical Specifications
2. Appendix-2 – Guaranteed Technical Particulars
3. Appendix-3 - Confirmations By Bidder
4. Appendix-4 – Price Details
5. Appendix-5 – Covering Letter
6. Appendix-6 – Drawings

## Appendix-1

### SCOPE OF SUPPLY AND TECHNICAL SPECIFICATION

#### 1. SCOPE OF SUPPLY

- 1.1. Fabrication, machining, hot dipping, testing and delivery of Ground Mount Solar PV Module Mounting Structure as per approved drawing and technical specification to Mylatty in Kerala. Delivery schedule will be shared along with PO which shall be adhered by bidder. The actual quantity to be supplied and the delivery schedule will be as stated in the Purchase Order which shall be adhered to by the supplier/successful bidder.
- 1.2. Sufficient Fasteners of SS304 grade for assembly of the MMS table and installation of PV Module onto the table shall be provided.
- 1.3. The Quantity required is 3.5MWp (Break up of Table requirement is available in the technical specification and drawing).

#### 2. TECHNICAL REQUIREMENTS

##### 2.1. Standards applicable for Structures shall be:-

- 2.1.1. The mounting steel structure : BIS 2062 (amended up to date)
- 2.1.2. Galvanization of mounting structure : BIS 4759 (amended up to date).

3. The structure shall be a stable and durable structure that can support the array and withstand wind, rain, and other adverse conditions. The module mounting structures shall have adequate strength and appropriate design suitable to the locations which can withstand the load and high wind velocities.
4. The mechanical structure shall be made up of hot-dip galvanised steel and designed to withstand gusts of wind / cyclonic wind up to 150 km/hr from the back side of the panel. Stationary structures shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly.

##### 1. Summary of Requirements

Wind velocity withstanding capacity	150 km/hr
Structure material	Hot dip Galvanised Steel as per specifications BIS 2062 or shall be cold formed light gauge structural steel sections with IS 811: 1987/IS 801: 1975 having galvanization thickness as per BIS 4759 -amended up to date.
Bolts, Nuts, fasteners, panel mounting clamps	Stainless Steel SS 304
Mounting arrangement for ground mounted structure.	Using appropriate foundation confirming with applicable IS specification for Ground mounted system.

Panel Tilt angle	North South Orientation with a fixed tilt angle of 10-13 degrees (depending on location) facing true South
Minimum distance between ground level and lower edge of PV panel	600 mm
Minimum Section (Lipped C Channel) Sizes	<ul style="list-style-type: none"> <li>• Coloumn-120*50*15*2.5mm</li> <li>• Rafter-120*50*15*2.0mm</li> <li>• Purlin-100*40*15*2.5mm</li> <li>• Side Bracing-80*40*15*2.0mm</li> </ul>
Access for panel cleaning and maintenance	Panel top and bottom shall be accessible for cleaning and from the bottom for access to the module junction box
Table Arrangement	15*2 in portrait

Array support structure shall be fabricated using corrosion resistant GI metal sections electrically compatible with the structural material.

## 5. Mechanical Specifications

- 5.1.** The tilt angle of the SPV panels shall be 10–13-degree latitude to the horizontal surface facing true south direction. Site wise tilt angle requirement will be furnished during the Purchase Order.
- 5.2.** The minimum clearance between the lower edge of the PV panel and ground level shall be 600mm. (to allow ventilation for cooling, also ease of cleaning and maintenance of panels, interconnection of panels, verification of connecting contacts and panels cleaning). The minimum height should be increased according to the site conditions.
- 5.3.** The PV array structure design shall be appropriate with a factor of safety of min 1.5.
- 5.4.** Array support structure shall be fabricated using corrosion resistant GI metal sections.
- 5.5.** Array support structure welded joints and fasteners shall be adequately treated to resist corrosion.
- 5.6.** The support structure shall be free from corrosion when installed.
- 5.7.** PV modules shall be secured to support structure using Stainless Steel (304 grade) screw fasteners and/or metal clamps. Screw fasteners shall use existing mounting holes provided by the module manufacturer. Proposed Module that will be used: 335Wp polycrystalline modules.

Module make and Data sheets will be shared during detailed engineering after issuance of Purchase Order

- 5.8.** The support structure shall withstand wind loading of up to 150 km/hr. Photovoltaic arrays must be mounted on a stable, durable structure that can support the array and withstand wind, rain, hail and other adverse

conditions. Adequate spacing shall be provided between any two modules secured on the PV panel for improved wind resistance.

- 5.9. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.
- 5.10. Stationary structures shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly.
- 5.11. Adequate spacing shall be provided between any two modules secured on the PV panel for improved wind resistance.
- 5.12. Any modification in the design of structures that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost.
- 5.13. The bidder shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings. The drawings along with detailed structure design and material selected and their standards shall be submitted to INKEL LTD for approval before starting the execution work. The material selected and their standards shall be submitted to INKEL LTD for approval before starting the execution of work. The work will be carried out as per design approved by INKEL LTD.
- 5.14. The height of each PV panel structure shall not exceed 3m above the ground level.
- 5.15. The bidder/manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings. The detailed structure design drawings should be submitted along with the bid. The array design shall be submitted with the STAAD structural design report for the materials used with relevant IS during drawing approval.
- 5.16. **Array Details**
  - 5.16.1. Single array/table shall have 30 nos. of PV Modules in 15X2 arrangement (drawing enclosed).
  - 5.16.2. Polycrystalline PV Modules of 335Wp rating will be used.
  - 5.16.3. Approximate weight of one PV module of 22Kg shall be considered.

## **1. QUALITY ASSURANCE**

- 1.1. Quality Plan and Datasheet shall be subject to INKEL's approval. MMS shall be subject to pre-dispatch inspection by INKEL, customer or any third party designated by INKEL.
- 1.2. Pre-shipment inspection by INKEL/Customer at vendor works will include: -
  - 1.2.1. Dimensional and Visual Check.
  - 1.2.2. Verification of materials used.
  - 1.2.3. Measurement of coating thickness.
  - 1.2.4. Any other test as desired by INKEL to verify the compliance to technical requirements.
- 1.3. Successful bidder has to prepare and submit the Quality assurance plan to INKEL/ Customer approval.

## **2. PACKING AND IDENTIFICATION**

The MMS shall be packed properly in the truck in road worthy packing.

### **3. GENERAL CONDITIONS**

Any additional tests / Type tests / Certification required by INKEL / INKEL's customer shall be compiled.

### **4. MANUFACTURING CLEARANCE APPROVAL PROCEDURE**

- 4.1. The successful vendor shall submit the Guaranteed technical Particular (GTP), Datasheet, Bill of Materials (BOM), General Arrangement Drawing and Quality assurance plan of the module for approval immediately after receipt of P.O.
- 4.2. Vendors shall provide test certificates corresponding to standards mentioned above along with complete test reports for proposed materials.
- 4.3. The vendor shall submit a detailed manufacturing quality plan with a list of checks / tests performed during incoming material inspection, production, pre- dispatch and package.

### **5. MANUFACTURING AND INSPECTION**

- 5.1. The manufacturing shall start only after clearance by INKEL.
- 5.2. The vendor shall inform the inspection date to INKEL at least 10 working days before the start of the proposed schedule of inspection. FAT for each 1MWp Quantity.

Following tests as part of FAT

- Dimensional check on all sectional members
- Coating thickness check

### **6. DELIVERY**

- 6.1. The materials shall be ready for inspection within 14 days from the date of issue of manufacturing clearance.
- 6.2. Dispatch clearance will be issued after successful inspection.

### **7. TERMS OF PAYMENT**

- 7.1. 5% as advance against the submission of BG.
- 7.2. 50% against delivery of materials at site
- 7.3. 45% against site acceptance test / GRN.
- 7.4. GST portion will be released after the reflection of the same on GST2RB.

**Appendix - 2**  
**GUARANTEED TECHNICAL PARTICULARS**

<b>Guaranteed Technical Particular Data Sheet</b>			
<b>Sl.</b>	<b>Particulars</b>	<b>Required</b>	<b>Offered</b>
1	Supplier Name		
2	Wind velocity withstanding capacity	150 km/hr	
3	Structure material	Hot dip Galvanised Steel (as per BIS specifications 2062 &4759	
4	Galvanization thickness	As per IS4759	
5	Bolts, Nuts, fasteners,	Stainless Steel SS 304	
6	Panel Tilt angle	12 degrees	
7	Minimum distance between ground level and lower edge of PV panel	600mm	
9	Column Size	120*50*15*2.5mm	
10	Rafter Size	120*50*15*2.0mm	
11	Purlin Size	100*40*15*2.5mm	
12	Side Bracing Size	80*40*15*2.0mm	
13	Approx. weight per Table	kg	

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**Signature of Bidder with Stamp**

**Appendix - 3**  
**CONFIRMATIONS BY BIDDER**

<b>Sl No.</b>	<b>Item</b>	<b>Acceptance by Vendor ( Yes / No )</b>
1	Wind velocity withstanding capacity of 150km/hr	
2	Hot dip Galvanized Steel (as per BIS specifications 2062 & 4759)	
3	Facility to conduct Factory acceptance tests	

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**Signature of Bidder with Stamp**



**Appendix – 4**  
(To be filled by bidder)

**Price Details:**

<b>Estimated Quantity: 3.5MWp</b>							
<b>Options</b>	<b>Item</b>	<b>Unit</b>	<b>Rate / Kg</b>	<b>Total Weight in Kg</b>	<b>Total Price</b>	<b>GST</b>	<b>Total price (All inclusive)</b>
<b>1</b>	PV Module: 335Wp Polycrystalline module Supply of MMS as per approved drawings and technical specification including all required bolts, nuts, fasteners, panel mounting clamps	<b>Kg</b>					
<b>Total price (in Words)</b>							

**Terms and Conditions:**

1. The above price is deemed inclusive of all costs such as packing in road worthy manner, loading, transportation to site, GST, transit insurance, all taxes and duties.
2. Delivery schedule shall be as stated in the NIQ and Purchase Order. Any faulty/damaged material delivered shall be replaced free of cost by the Bidder upon notification by INKEL Ltd.
3. Validity of the Quotation is 120 days from the date of opening of quotation. Bidder shall extend the bid validity by another 2 months, if so desired by the Purchaser.
4. The quoted price shall be deemed inclusive of expenses for conducting factory acceptance tests.

Bidder Name:

Signature .....

Official Seal

Date:

## **Appendix – 5**

(To be submitted by the bidder in Company letter head)

From,  
(Insert address of the bidder)  
To,  
Managing Director,  
INKEL Limited  
Kakkanad, Kochi, Kerala-682030

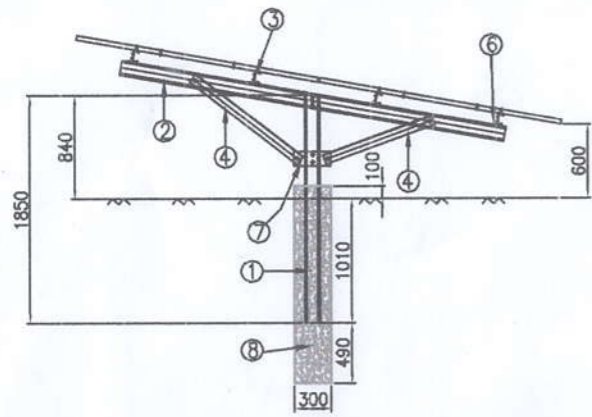
Sub: Supply of Hot Dip Galvanised Solar PV Module Mounting Structure for 3.5MWp Project.

Dear Sir,

We, the undersigned.....[insert name of the 'Bidder'] having read, examined and understood in detail the NIQ document for Supply of Hot Dip Galvanised Solar PV Module Mounting Structure for 3.5MWp Project, hereby submit our quotation comprising of technical and commercial Bid.

1. We give our unconditional acceptance to the NIQ terms and conditions, dated ..... issued by INKEL Limited, and as amended. We shall ensure that we execute the works as per the provisions of the NIQ and all provisions of such NIQ shall be binding on us.
2. We have submitted our Price Bid strictly as per terms of this NIQ without any deviations, conditions and without mentioning any assumptions or notes for the Price Bid in the said format(s).
3. **Acceptance**  
We hereby unconditionally and irrevocably agree and accept that the decision made by INKEL LTD. in respect of any matter regarding or arising out of the NIQ shall be binding on us. We confirm that there are no litigations or disputes against us, which materially affect our ability to fulfil our obligations with regard to execution of projects of capacity offered by us.
4. We are enclosing herewith the Cover-I (Technical bid) and Cover II (Price Bid) containing duly signed formats, each one duly sealed separately as desired by you in the NIQ for your consideration.
5. It is confirmed that our Bid is consistent with all the requirements of submissions stated in the NIQ and subsequent communications from INKEL Limited. The information submitted in our quotation is complete, strictly as per the requirements stipulated in the NIQ and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our quotation. We confirm that all the terms and conditions of our quotation are valid for acceptance for a period as stated in the NIQ document. We confirm that we have not taken any deviation so as to be deemed non responsive.

Thanking you,  
Yours faithfully,  
(Authorised Signatory of the Bidder)



Module Mounting Structure Side View

Details of Structure Materials		
Sl. No.	Item	Section Sizes
1	Column	Lipped C Channel 120x50x15x2.5mm
2	Rafter	Lipped C Channel 120x50x15x2mm
3	Purlin	Lipped C Channel 100x40x15x2.5mm
4	Side bracing	Lipped C Channel 80x40x15x2.0mm
5	Splice purlin	Lipped C Channel 90x30x15x2.0mm
6	Connecting Angle	L Angle 90x60x2.0mm
7	Bracing con. plate	300x120x6mm
8	Foundation Grade	M20

- NOTES:
- All dimensions are in mm unless otherwise specified.
  - Structure material - Hot dip Galvanized Steel as per BIS 2062 specifications having galvanization thickness as per BIS 4759 - amended up to date.
  - Material for the steel members - mild steel with yield strength of 250Mpa.
  - Minimum distance between ground level and lower edge of PV Module : 0.6 m.
  - Design wind speed - 150km/h.
  - PV Module Tilt angle : 12 degrees.
  - Tolerance on module mounting structure dimensions : +/- 5%.
  - Foundation depth will be modified according to site conditions.
  - No. of PV Modules per Table - 30 Nos. (15X2)

PLACE FOR APPROVAL STAMP - KSEBL

*Provisionally approved*

**CHIEF ENGINEER**  
Renewable Energy and Energy Savings  
KSEB Ltd. Vydyuthi Bhavanam  
Pattom, Thiruvananthapuram

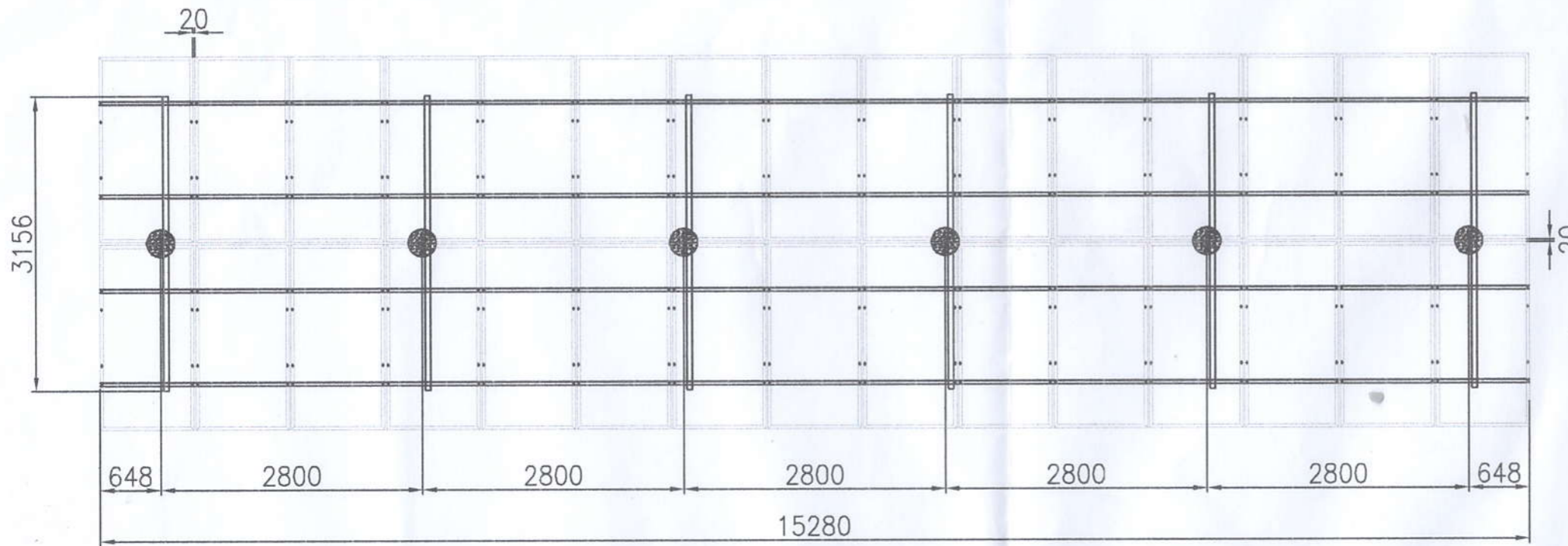
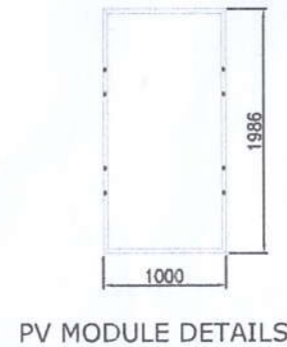
PLACE FOR SEAL & SIGNATURE - INKEL LIMITED

*Nevil Jose*

**Nevil Jose**  
Sr. Manager-Solar  
INKEL Limited



BILL OF MATERIALS PER TABLE				
ITEM	DESCRIPTION	LENGTH	QTY	TOTAL LENGTH PER TABLE
COLUMN	C120x50x15x2.5mm	1850	6	11100
RAFTER	C120x50x15x2mm	3156	6	18936
PURLIN	C100x40x15x2.5mm	15280	4	61120
BRACING 1	C80x40x15x2.0mm	1102	6	6612
BRACING 2	C80x40x15x2.0mm	938	6	5628
PURLIN CLEAT	L90x60x2.0mm	150	24	3600
PURLIN SPLICE	90x30x2.0mm	300	8	2400
BRACING PLATE	300x120x6.0mm	300	6	1800



2x15 Module Mounting Structure Top View

0 28.12.2022 SUBMITTED FOR APPROVAL NJ NJ PR NJ

REV.	DATE	DRAWING STATUS	DSGN.	DRWN.	CHKD.	APPRD.
0	28.12.2022	SUBMITTED FOR APPROVAL	NJ	NJ	PR	NJ

CLIENT: THE CHIEF ENGINEER (RENEWABLE ENERGY & ENERGY SAVINGS)  
**KSEB** KERALA STATE ELECTRICITY BOARD  
VYDYUTHI BHAVANAM, PATTOM, THIRUVANANTHAPURAM - 695004  
Phone: 0471-2447404, 2514385, E-mail: cerees@ksebl.in

PROJECT: Design as per site conditions, erection, testing & commissioning of Grid tied Solar Photo Voltaic (SPV) Projects in the land owned by KSEBL with a total installed capacity of 11MWp in total 21 locations including Operation & Maintenance of the plant for the first 5 years from the date of commissioning as part of the feeder level solarization of PMKUSUM scheme

SITE/LOCATION:

DRAWING TITLE:  
MODULE MOUNTING STRUCTURE - GA DRAWINGS



**INKEL LIMITED**  
Door No. 7/473ZA - 5 & 6, 2nd Floor Ajiyal Complex,  
Kakkanad, Cochin PIN: 682030  
Phone: 0471-2978101, 0471-2978103  
E-mail: inkelservice@inkel.com

APPROVED	NJ	DRAWING NO:			
CHECKED	PR	IL-KSB11MW-CIV-001			
DRAWN	NJ	DATE	SHEET NO	SCALE	REVISION
DESIGNED	NJ	28.12.2022	01 OF 01	N.A	0