ऑयल इंडिया लिमिटेड
(भारत सरकार का उद्यम)
Oil India Limited
(A Government of India Enterprise)

Materials Department
(Rajasthan Project)
02-A, District Shopping Centre,
Saraswati Nagar,Basni
Jodhpur – 342 005
Rajasthan, India.
Phone -0291-2729472
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TENDER NO. SJI8084P19 **Date: 22.05.2018**

INVITATION TO e-BID UNDER SINGLE STAGE TWO BID SYSTEM

Dear Sirs,

OIL invites Bids for the supply, installation and commissioning of **Rooftop Solar Power Plant (15 KW capacity)** through its e-Procurement site under **Local Competitive Bidding (LCB) - Single Stage Composite Bid System**. The bidding documents and other terms and conditions are available at Booklet No. MM-RP-LOCAL-E-01-2005. The prescribed Bid Forms for submission of bids are available in the tender document folder.

The general details of tender can be viewed by opening the RFx [Tender no.] under RFx and Auctions page. The details of items tendered can be found under Item tab and details can be found under Technical RFX.

The tender is invited with firm price for the specified quantity. Further details of tender are given in Rfx Parameters → Technical Attachments as **ANNEXURE IA.**

THE TENDER WILL BE GOVERNED BY:

a) "General Terms & Conditions" for e-Procurement as per Booklet No. MM-RP-LOCAL-E-01-2005 for E-procurement (LCB Tenders).

b) Technical specifications, Quantity and Notes for the **Rooftop Solar Power Plant (15 KW capacity)** as per **Annexure – IA**.

c) The prescribed Bid Forms for submission of bids are available in the Technical Attachments. Technical Checklist, Commercial Checklist & SRP checklist must be filled-up and submitted along with the technical bid.

d) A certificate issued by a practicing Chartered/Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual turnover & Net worth as per format prescribed in *"Annexure-CA certificate"*. The same must be submitted along with the bid.

SPECIAL NOTE:

1.0 Please note that all tender forms and supporting documents are to be submitted through OIL's e-Procurement site only except following documents which are to be submitted manually in sealed envelope super scribed with Tender no. and due date to **CGM (Services), Oil India Limited, Rajasthan Project, 2A, Saraswati Nagar, District Shopping Centre, Basni, Jodhpur-342005, Rajasthan** on or before the Bid Closing Date mentioned in the Tender.

a) Original Bid Security.
b) Detailed Catalogue.
c) Any other document required to be submitted in original as per tender requirement.

All documents submitted in physical form should be signed on all pages by the authorised signatory of the bidder and to be submitted in triplicate.

2.0 Bidders are requested to examine all instructions, forms, terms and specifications in the bid. Failure to furnish all information required as per the NIT or submission of offers not substantially responsive to the bid in every respect will be at the bidders risk and may result in rejection of its offer without seeking any clarifications.

3.0 OIL INDIA LIMITED (OIL) has upgraded its E-tender Portal. As part of the new system, the intending bidder must have Encryption Certificate along with Digital Signature Certificate (DSC) of Class III [Organization]. The date for implementation of new system is 12th April 2017 and the requirement of the new DSC will be applicable for the tenders floated on 12th April 2017 onwards. All our current and prospective esteemed bidders are therefore requested to acquire Class III DSC [Organization] along with Encryption Certificate issued by any of the Licensed Certifying Authorities (CA) operating under Controller of Certifying Authorities (CCA) of India as per Indian IT Act 2000. Guideline for getting Digital Signature and other related information are available on the e-tender website www.oil-india.com. The bid signed using any other digital certificate or digital certificate without organization name of the bidder, will be liable for rejection.

4.0 Encryption certificate is mandatorily required for submission of bid. In case bidder created response using one certificate (using encryption key) and bidder subsequently changes the digital signature certificate then the old certificate (used for encryption) is required in order to decrypt his encrypted response for getting the edit mode of his response. Once decryption is done, the bidder may use his new DSC certificate for uploading and submission of his offer. It is the sole responsibility of the bidder to keep their DSC certificate properly. In case of loss of DSC certificate, Oil India Limited is not responsible.

5.0 Please ensure that Technical Bid / all technical related documents related to the tender are uploaded in the Technical Attachments under Rfx Information tab. The "TECHNO-COMMERCIAL UNPRICED BID" shall contain all techno-commercial details except the prices. The price bid is to be uploaded under "Notes and Attachments" tab as per the Price bid format furnished vide Annexure-F.

6.0 Please refer Annexure-B and Annexure-F for BEC/BRC applicable against this tender. Please ensure compliance to BEC/BRC and submit requisite documentation, failing which offer may be liable for rejection.

7.0 Bidder are advised to fill up the Technical bid check list and Response sheet & Bidder's declaration as per Annexure-C along with the tender documents.

8.0 Please refer "**E-Tender User Manual**" document for help on system settings and procedure to upload technical and price bids.

9.0 Amendments to the NIT after its issue will be published on OIL's website only. Revision, clarification, addendum, corrigendum, time extension etc. to the tender will be hosted on OIL website only. No separate notification shall be issued in the press. Prospective bidders are requested to visit website regularly to keep themselves updated.

10.0 Bid must be submitted electronically only through OIL's e-procurement portal. Bid submitted in any other form will be rejected.

11.0 Bidders to take special note of the following conditions:

11.1 Against Tender Fee – Payment should be made only through online mode and no other instrument (Cash/DD/Cheques/Cashier Cheque, etc) will be acceptable.

11.2 Against Bid Security/EMD/Performance Bank Guarantee – Only payments through online mode or Submission of Bank Guarantee/LC will be acceptable. No DD/Cheques/Cashier Cheque or any other mode will be acceptable.

12.0 Attention about GST: Please ignore the details given about the taxes, duties & levies in anywhere in Tender documents which is not applicable now after implementation of GST with effect from 01.07.2017. Others all terms and condition remains same. Referred annexure for GST uploaded under Technical bid.

13.0 Pre-Bid Conference: A pre-bid conference to explain Company's exact requirements and to reply queries of Bidders, if any, on the tender stipulations will be held on 12.06.2018 at 11:00 hrs (IST) in OIL's Project Office at 2A, District Shopping Centre, Saraswati Nagar, Basni, Jodhpur -342005, Rajasthan. Maximum of two representatives of each Bidder will be allowed to attend the pre-bid conference on producing authorization letter as per the proforma attached. Bidders interested to attend the Pre-Bid Conference should intimate MANAGER (M&C), Oil India Limited, Jodhpur latest by 09.06.2018.

Yours faithfully,

OIL INDIA LIMITED
Sd/-

(Bhavik Mody)
Manager (M&C)
Rajasthan Project
Jodhpur, Rajasthan

Tender No. & Date : SJI8084P19 22.05.2018

Tender Fee : INR 1,000.00
Bid Security Amount : INR 29,300.00

Bidding Type : Single Bid (Composite Bid)

Bid Closing On : 24.07.2018 at 11:00 hrs. (IST)
Bid Opening On : 24.07.2018 at 15:00 hrs. (IST)

Performance Guarantee : Applicable

OIL INDIA LIMITED invites Press tenders for items detailed below:

Item No./ Mat. Code	Material Description	Quantity	UOM
10 0C000434	ROOFTOP SOLAR POWER PLANT. Specs. Attached as Annexure-A	1	NO
	Installation & Commissioning		
10	Installation&Commissioning of 15 KWp SPP Attached as Annexure- D	1	AU
	Comprehensive AMC		
10	Comprehensive AMC for 1st year Attached as Annexure-E	1	AU
20	Comprehensive AMC for 2nd year Attached as Annexure-E	1	AU
30	Comprehensive AMC for 3rd year Attached as Annexure-E	1	AU
40	Comprehensive AMC for 4th year Attached as Annexure-E	1	AU
50	Comprehensive AMC for 5th year Attached as Annexure-E	1	AU

Standard Notes: BIDDERS ARE ADVISED TO VISIT THE SITE BEFORE BID SUBMISSION. BIDDERS ARE ALSO ADVISED TO ATTEND THE PRE-BID CONFERENCE WITH THEIR QUERIES AS PER THE PRE-BID CONFERENCE CLAUSE.

1) The tender is invited under SINGLE STAGE-COMPOSITE BID SYSTEM. The bidder has to submit both the "TECHNO-COMMERCIAL UNPRICED BID" and "PRICED BID" bid through electronic form in the OIL's e- Tender portal within the Bid Closing Date and Time stipulated in the e-Tender. The "TECHNO-COMMERCIAL UNPRICED BID" is to be submitted as per Scope of Work & Technical Specification of the tender and "PRICED BID" as per the Price Bid format uploaded under "Notes and Attachments" tab.

2) Please go through the help documents in details before uploading the document and ensure

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uploading of technical bid as per the instructions.

3) Bid should be valid for **minimum 90 days** from bid closing date, failing which offer shall be rejected.

4) The original bid security (Amount is mentioned above and also in Rfx Parameters of the tender in OIL's e-portal) should reach us before bid closing date and time of the technical bid. Bid without original Bid Security will be rejected. The bidders who are exempted from submitting the Bid Bond should attach documentary evidence in the TECHNO-COMMERCIAL BID as per clause 9.8 of Section A General Terms and conditions(MM-RP-LOCAL-E-01-2005). The bid security shall be valid up to **03.01.2019**. **Only payments through online mode or Submission of Bank Guarantee/LC will be acceptable. No DD/Cheques/Cashier Cheque or any other mode will be acceptable. Please refer special notes for Bid security through SFMS system.**

5) Successful bidder shall be required to furnish a Performance Security equivalent to 10% of total order value. **Performance security in form of Bank Guarantee/LC will be acceptable. No DD/Cheques/Cashier Cheque or any other mode will be acceptable. Please refer Special notes for Performance security through SFMS system.**

6) Pre-Bid Conference: A pre-bid conference to explain Company's exact requirements and to reply queries of Bidders, if any, on the tender stipulations will be held on **12.06.2018 at 11:00** hrs (IST) in OIL's Project Office at 2A, District Shopping Centre, Saraswati Nagar, Basni, Jodhpur -342005, Rajasthan. Maximum of two representatives of each Bidder will be allowed to attend the pre-bid conference on producing authorization letter as per the proforma attached. Bidders interested to attend the Pre-Bid Conference should intimate MANAGER(M&C), Oil India Limited, Jodhpur latest by **09.06.2018**.

7) Bidders to note that Govt. of India under Micro, Small and Medium Enterprises Development (MSMED) Act 2006, has proclaimed the Public Procurement Policy, 2012 with effect from 1st April, 2012 in respect of procurement of goods and services, produced and provided by micro and small enterprises, by its Ministries, Departments and Public Sector Undertakings for promotion and development of Micro and Small Enterprises. A new Clause on applicability of Public Procurement Policy for procurement of goods from Micro and Small Enterprises(MSE) in the tender is furnished vide Amendment to General Terms and Conditions for Local Tender (MM-RP-LOCAL-E-01-2005). Bidders are requested to take note of the same and to submit their offers accordingly.

8) To ascertain the substantial responsiveness of the bid OIL reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarifications fulfilling the BRC clauses in toto must be received on or before the deadline given by the company, failing which the offer will be summarily rejected.

9) General terms and conditions (document MM-RP-LOCAL-E-01-2005) is enclosed.

10) GST (Goods & Service Tax) will be cost loaded as quoted and in line with provisions of the bidding document. Any claim subsequently by the bidders for additional payment/liability shall not be admitted and has to be borne by the bidders. For GST clause please refer Annexure-GST.

11) Tender fee Payment should be made only through online mode and no other instrument(Cash/DD/Cheques/Cashier Cheque, etc.) will be acceptable.

12) Purchase Preference on Local Content is applicable against this tender. Please refer the Special Notes in this document for the applicable clause.

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Special Notes : AA. Purchase preference policy (linked with Local Content)(PP-LC)

a) Ministry of Petroleum & Natural Gas, Government of India implemented PP-LC Policy to provide Purchase Preference (linked with local content) by notification no. Ref. O-27011/44/2016-ONG-II/FP dtd. 25.04.2017.

b) As per the PP-LC policy, 50% of the tendered quantity would be awarded to the lowest techno-commercially qualified LC (Local Content) manufacturer / supplier which are within the price band of 10% of the L1, subject to matching the L1 price. Bidders seeking Purchase preference (linked with Local Content)(PP-LC) shall be required to meet / exceed the target of Local Content (LC) as per values furnished vide MOPNG notification no. O-27011/44/2015-ONG-II/FP dated 25.04.2017 as on the bid closing date. The remaining quantity will be awarded to L1 (i.e. Non Local Content (NLC) manufacturer / supplier not meeting prescribed LC criteria).

c) In case a bidder is eligible to seek benefits under PP-LC policy as well as Public Procurement Policy for MSEs-Order 2012, then the bidders should categorically seek benefits against only one of the two policies i.e. either PP-LC or MSE policy. If a bidder seeks free of cost tender document under the MSE policy, then it shall be considered that the bidder has sought benefit against the MSE policy and this option once exercised cannot be modified subsequently.

d) Price Break-up: The bidder shall provide break up of "Local component" and "Imported Component" along with their price bid.

e) Such bidders shall furnish following undertaking from the manufacturer on Manufacturer's letter head along with their techno-commercial bid. The undertaking shall become a part of the contract:

"We _____ (Name of Manufacturer) undertake that we meet the mandatory minimum Local Content (LC) requirement i.e. _____ (to be filled as notified at Enclosure I of the policy) for claiming purchase preference linked with Local Contents under the Govt. policy against under tender no. _____."

f) Above undertaking shall be supported by the following certificate from Statutory Auditor engaged by the bidder, on the letter head of such Statutory Auditor (as per the provisions of the aforesaid policy):

"We _____ the statutory auditor of M/s _____ (name of the bidder) hereby certify that M/s_____ (name of manufacturer) meet the mandatory Local Content requirements of the Goods and/or Services i.e. _____ (to be filled as notified at Enclosure I of the policy) quoted vide offer No._____ dated _____ against OIL's tender No._____ by M/s _____ (Name of the bidder).

g) Failure to submission of documents as mentioned in a), b) & c) above will be treated as "Calculation of LC is not verifiable, the value of LC of the said component shall be treated as NIL" and hence will not be eligible for PP-LC.

h) At the time of bidding, the bidder has to confirm in their bid for submission/complying the following in the event of order:

1) In case of procurement of goods under PP-LC, the LC content may be calculated by the supplier and the verification of the procurement of goods, service shall be carried out by a Statutory Auditor engaged by the bidder.

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2) The supplier shall provide the necessary local content documentation to the statutory auditor, which shall review and determine the local content requirements have been met, issue a local content certificate to that effect on behalf of procuring company, stating the percentage of local content in the good or service measured.

3) The local content certificate shall be submitted along with each invoice raised. However, the % of local content may vary with invoice while maintaining the overall % of local content for the total purchase of the pro-rata local content requirement. In case, it is not satisfied cumulatively in the invoices raised up to that stage, the supplier shall indicate how the local content requirement would be met in the subsequent stages.

i) A bidder who has been awarded the contract after availing Purchase Preference is found to have violated the LC provision, in the execution of the procurement contract of goods and/or services shall be subject to financial penalty over and above the PBG value prescribed in the contract and shall not be more than an amount equal to 10% of the Contract Price. View this, the supplier shall confirm in their bid for submission of PBG (PBG-PPLC) of 10% of the contract value which shall be valid throughout the execution of the contract(format as provided vide the notification). This PBG-PPLC is in addition to the PBG, which is required to be submitted by the successful bidder as per OIL's general terms & condition. Bidders to provide an undertaking complying to the submission of additional PBG along with their bid, in case of availing PPLC benefit.

j) Bidders should note that PP - LC shall not be available in case of procurement of goods / services falling under the list of items reserved for exclusive purchase from Micro and Small Enterprise (MSEs) or Domestically Manufactured Electronic Products (DMEP).

BB. CONFIRMATION OF BID SECURITY / PERFORMANCE SECURITY:

The following clause is applicable for bid security / performance security submitted in the form of bid bond/LC. Bidders are requested to strictly comply to this clause:

Bidders are requested to advise the Bank Guarantee issuing bank to comply with the following and ensure to submit, the receipt of the copy of SFMS message as sent by the issuing bank branch, along with the original Performance Bank Guarantee to OIL's order/contract issuing office.

The bank guarantee issued by the bank must be routed through SFMS platform as per following details:

(i) "MT 760 / MT 760 COV for issuance of bank guarantee
(ii) "MT 760 / MT 767 COV for amendment of bank guarantee
The above message / intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Jodhpur Branch, IFS Code - UTIB0000057; Swift Code: AXISINBB057. Branch Address - AXIS Bank Ltd, Prince Tower, Near Jaljog Circle, Residency Road, Jodhpur - 342003"

ANNEXURE – A

TECHNICAL SPECIFICATIONS FOR GRID INTERACTIVE ROOFTOP MOUNTED SOLAR PHOTO-VOLTAIC SYSTEM

1.0 INTRODUCTION:

It has been proposed to setup a 15 KWp (estimated) grid interactive solar photovoltaic power plant (without battery back-up) at the Rooftop of OIL House building, Oil India Limited (OIL), Jodhpur, Rajasthan, India.

The Grid Interactive Rooftop Mounted Solar Photovoltaic (PV) plant shall consist mainly of the following components

A) Solar PV Modules-

Specification-

SPV Poly crystalline modules to be supplied shall be of reputed make, (cells / modules may be manufactured in India or abroad) conforming to Tier -1 (e.g. Tata Solar, Waree, Vikram Solar, HT SAEE etc.). SPV modules shall contain high power poly crystalline silicon solar cells.

Stabilized output of the Solar Power Plant shall not be less than 15 KW under Standard Test Condition after one year of operation from date of Commissioning of solar plant.

Stabilized output of the Solar Power Plant shall not be less than 15 KW under Standard Test Condition after one year of operation from date of Commissioning of solar plant.

Peak power point voltage and the peak power point current of any supplied module and / or any module string (series connected module) shall not be more than 3% from the respective arithmetic means for all modules and / or for all module strings, as the case may be.

The solar cell shall have surface anti-reflective coating to help in absorbing more light in all weather conditions.

Each module shall have low iron tempered glass front for strength & superior light transmission. It shall also have tough multi-layered polymer back sheet for environmental protection against moisture with high electrical insulation.

The module frame shall be made of aluminium or corrosion resistant material that shall be electrically & mechanically compatible with the structural material to be used for mounting the modules.

The solar modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from the environment. The arrangement and the material of encapsulation shall be compatible with the thermal expansion properties of the Silicon cells and the module framing arrangement / material. The encapsulation arrangement shall ensure complete moisture proofing during life of the solar modules.

Solar module shall be laminated using lamination technology using established polymer (EVA) and Pedlar / Polyester laminate.

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The PV modules used must qualify to the latest edition of IEC 61215 & IEC 61730 (Edition I and II) for safety qualification testing, Salt Mist Corrosion Resistant (IEC 61701, IEC 62716), Sand Storm Test (IEC 60068-2), Fire Resistance (EN 13501-1 class E, IEC 61730 class C) & Ammonia Corrosion Resistant: IEC 62716. 2.1.16 Modules shall be PID-free

Photo conversion efficiency of SPV Module shall not be less than 15%. Module shall be made of high transmittance glass front surface giving high encapsulation gain.

The PV modules should have lowest temperature coefficient and positive power tolerance. Negative power tolerance shall not be accepted.

Module rating is considered under standard test conditions; however Solar Modules shall be designed to operate and perform under site conditions.

All materials to be used shall have a proven history of reliability, light weight and stable operation in external outdoor applications and shall have service life of more than 25 years

Solar PV Module design shall conform to following requirement:

a. Weather proof DC rated MC connector and a lead cable coming out as a part of the module, making connections easier and secure, not allowing any loose connections.

b. Resistant to water in grace, abrasion, hail impact, humidity & other harsh environmental factors for the worst situation at site.

PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 12 years and 80% at the end of 25 years.

The fill factor of module shall not be less than 0.70 (typical).

The V-I curve of each PV module with Sl. Nos. shall be submitted along with Modules meeting the required specifications.

Identification and Traceability:
Each PV module shall have RF identification tag. The following information must be mentioned in the RFID used on each module. This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.

i) Name of the manufacturer of PV module

ii) Name of the manufacturer of Solar cells

iii) Month and year of the manufacturer (Separately for Solar cell and module)

iv) Country of origin (Separately for Solar cell and module)

v) I-V curve for the module

vi) Wattage, Im, Vm and FF for the module

vii) Unique Serial No and Model No of the module

viii) Date and year of obtaining IEC PV module qualification certificate

ix) Name of the test lab issuing IEC certificate

x) Other relevant information on traceability of Solar cell and module as per ISO 9000 series.

Bidder shall provide data sheet for Solar PV Module (Under Standard Testing Condition) along with their offer as per Guaranteed Technical Particular

Marking:

Each PV module used in any solar power project must use a RF identification tag. The following information must be mentioned in the RF ID used on each module

(This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions.) and also in clear and indelible markings:

- Name, monogram or symbol of manufacturer of PV module;

- Name, monogram or symbol of manufacturer of Solar cells;

- Unique Serial number and model number of the module;

- Polarity of terminals or leads (colour coding is permissible)

- Maximum system voltage for which the module is suitable;

- Date & place (country of origin) of manufacture (separately for PV module and solar cell)

- I-V Curve for the module;

- Wattage, Im, Vm &FF for the module;

- Name of the test lab issuing IEC certificate;

- Other relevant information on traceability of solar cells and module as per ISO 9000;

The 15 KW Solar PV power plants shall continuously measure solar radiation, ambient temperature, wind speed and other weather parameters, generation of DC power as well as AC power generated from the plant.

Bidder shall provide data sheet for Solar PV Module (Under Standard Testing Condition) along with their offer as per Guarantee Technical Particular (Table-2).

PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 12 years and 80% at the end of 25 years.

B) Module Mounting Structures

PV Array / String Configurations: The Solar array/string shall be configured in multiple numbers of sub-arrays / string, providing optimum DC power to auditable number of sub arrays / string. The bidder shall submit their own design indicating configuration of Inverters respective sub arrays/string and bill of material.

ANNEXURE – A

The Module structure design shall be appropriate and innovative with a factor of safety of not less than 1.5. The bidder may choose to offer module mounting structure as per their design / economics.

The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement
The mounting structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the base properly.

The mounting steel structure shall be as per latest BIS 2062 (amended up to date) and galvanisation of mounting structure shall be in compliance of BIS 4759 (amended up to date).
The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.

Nut & bolts, supporting structures including Module Mounting Structures shall have to be adequately protected from atmosphere and weather prevailing in the area.

All fasteners shall be of stainless steel of grade SS 304.

The Mounting structure shall be grounded properly using maintenance free earthing kit.

The support structure & foundation shall be so designed to withstand speed for wind zone of the location as given in relevant Indian wind load codes/ standards.

IS 800-2007 shall be followed for structural design. Contractor shall submit the DBR and STADD calculations along with the structural design within 10 days for approval of Oil India Ltd.

SPV module mounting structure

a. Type: Fixed

b. Azimuth: 0 degree True south

c. Tilt Angle: At altitude or as per site requirement.

Hot dipped Galvanized 80 Microns Steel Structure must be considered for all type of structural steel proposed for the power plant. Minimum thickness of galvanization should be at least 80 microns.

Design drawings with material selected shall be submitted for prior approval of OIL India within 10 days of detailed order. The bidder/manufacturer 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 in four sets to Oil India Ltd for approval before starting the execution work. The work will be carried out as per design approved by Oil India Ltd.

C) INVERTER(S):

Inverter, grid interactive in nature, shall consist of MPPT controller, inverter of aggregate rating 15 KW in array design/suitable rating in case of string design, associated control and protection devices etc all integrated into inverter. It shall provide necessary protections for Grid Synchronization and Data Logging/Monitoring. The Inverters should convert DC power produced by SPV modules in to AC power and must synchronize automatically its AC output to the exact AC Voltage and frequency of Grid. The bidder may choose the inverter as string/Central as per their Design/ Project Philosophy.

The DC energy produced has to be utilized to maximum and supplied to the bus for inverting to AC voltage to extract maximum energy from solar array and provides 3-ph, 433V AC/ (+15% to – 10%), 50+/-1.5 Hz with total harmonic voltage distortion less than3% to synchronize with local grid. DC voltage ripple content shall be not more than 3%.

Each inverter shall be compliant with IEEE standard 929-200 or equivalent and IEC 60068-2 standards for Environmental Testing.

The Inverters shall be of very high quality having efficiency not less than 98% and shall be capable of running in integrated mode.

Degree of protection of the indoor Inverters shall be at least IP-31and that of outdoor at least IP-65.

Built in with data logging to remotely monitor plant performance through external PC.

The Inverters shall be designed for continuous, reliable power supply as per specification.

The Inverters should be designed to be completely compatible with the SPV array voltage and Grid supply voltage.

The dimension, weight, foundation details etc. of the Inverter shall be clearly indicated in the detailed technical specification.

The system should be capable of providing all the data including that of meter and Inverter to the central software on IEC-104 protocol. All the equipment's /hardware /software for complying to the same will be in the bidder's scope.

The Inverter shall be capable of complete automatic operation, including wake-up, synchronization & shut down independently& automatically.

Both AC & DC lines shall have suitable fuses, Metal Oxide Arrestors/surge arrestors and contactors to allow safe start up and shut down of the system. Fuses used in the DC circuit should be DC rated.

Inverters shall operate in sleeping mode when there will no power connected.

Protections:

- Over voltage both at input & output.
- Over current both at input & output.
- Over / under grid frequency.

- Heat sink over temperature.

- Short circuit.

- Protection against lightening.

- Surge arrestors to protect against Surge voltage induced at output due to external source.

- Any other protection.

- Anti- Islanding Protection

It should have user friendly 4X40 LED/LCD display for programming and view on line parameters such as:

- Inverter per phase Voltage, current, kW, kVA and frequency,

- Grid Voltage and frequency,

- Inverter (Grid) on Line status,

- PV panel voltage,

- Solar charge current and ambient temperature,

- Individual power stage heat sink and cabinet temperature,

- Solar Radiation (with external pyronometer with in scope)

- Inverter Import export kWh summation

- Solar kWh summation

- Inverter on

- Grid on

- Inverter under voltage/over voltage

-Inverter over load

- Inverter over temperature.

The Inverters shall have arrangement for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.

The 3 phase Inverters shall be from internationally reputed firms, which will incorporate latest Technological advance to provide highly reliable and efficient energy conversion from DC to AC.

ANNEXURE – A

Inverter shall be capable to synchronize independently & automatically with OIL's System grid power line frequency to attain synchronization and export power generated by solar plant to the internal electrical system.

The Inverter shall be capable of complete automatic operation, including wake-up, synchronization & shut down.

Typical failure analysis report of Inverters and recommended list of critical components shall be provided by the bidder while submitting their offer.

The Inverter shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line fault currents and line to ground fault currents.

The Inverter shall be able to withstand an unbalanced load conforming to IEC standard and relevant Indian electricity condition. The Inverter shall include appropriate self- protective and self-diagnostic features to protect itself and the PV array from damage in the event of Inverter component failure or from parameters – beyond the Inverter's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the Inverter front panel to cause the inverter to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the Inverter, including commutation feature, shall be cleared by the Inverter protective devices and not by the existing site utility grid service circuit breaker.

The Inverter shall go to shut down/standby mode, with its contacts open, under the following conditions before attempting an automatic restart after an appropriate time delay.

- When the power available from the PV array is insufficient to supply the losses of the Inverter, the Inverter shall go to standby/shutdown mode.

- The Inverter control shall prevent excessive cycling of shut down during insufficient solar radiance.

Operation outside the limits of power quality as described in the technical data sheet should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are

i. Neutral voltage displacement
ii. Over current
iii. Earth fault and
iv. Reverse power

In each of the above cases, tripping time should be very less.

Detailed technical description of the complete unit of offered Inverter should be furnished with bid document Following Technical documents of Inverter shall be supplied for approval after placement of order.

- Detailed technical description of the complete unit
- Instructions for installation and operation

- Electrical diagrams of all internal cabling, necessary for installation, maintenance and fault finding.
- Description of electrical and mechanical characteristics of units.
- Maintenance and fault-finding procedures.
- Safety precautions.
- Software for data monitoring with detailed description.
- Details of data acquisition
- Details of Telemetry linking
- Factory test reports in details on various parameters.
- Trouble shooting procedures.
- All maintenance requirements and their schedules, including detailed instructions on how to perform each task.
- Detailed schematics of all power instrumentation and control equipment and subsystems along with their interconnection diagrams. Schematics shall indicate wiring diagrams, their numbers and quantities, type and ratings of alt components and subsystems.
- A detailed bill of materials which shall list components model numbers, quantities and manufacturer of each supplied item.
- All documents and write ups shall be in English. They shall be clean and legible, and must be checked, signed, approved and dated by a competent representative of the contractor.

The Bidder shall provide data sheet for Inverter along with their offer as per Guaranteed Technical Particular.

D) PV Cable

Specification: Single-pole, double insulated EBXL, XLPO (Strings) solar cable of adequate rating with fine-wire copper strand. The robust, flexible and space-saving design ensures constant electrical and mechanical properties during the whole life of the PV installation. TÜV certified according to the latest regulations. -40°C to +120°C (permanent) UV, ozone and hydrolysis resistant 1.1KV, Copper Armoured XLPE insulated.

E) MC4 Connector (Pair Male-Female)

Specification: With safety clip that requires a tool to unlock (NEC2008 compliant) Certified for applications with modules according to IEC61730, Safety class II, Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment -with Minimal voltage drop, High current-carrying capacity, Minimal power loss, Minimal contact resistance, High durability contacts withstand up to 1 million mating cycles, Operating temperatures up to 350°C.

F) Junction Boxes

Specification: Dust, vermin and water proof made from FRP

G) AC Cable

Specification: Adequate rating Power Cable shall be 1.1 kV, multi-core, stranded Copper conductor, XLPE insulated galvanized steel wire/strip armoured, flame retardant low smoke (FRLS) with PVC outer sheath made on PVC compound, conformity to IS:7098& other relevant standards.

H) Distribution Boxes, cables and accessories
Specification: An ACDB shall be provided in between PCU and Load/grid interface of suitable rating of connection and disconnection of PCU from load Class 1 Energy Meter for solar power monitoring.
All the cables shall be supplied conforming to IS standard as per requirement.

I)LT Panel
Specification: LT Panel with MCCBs at incomers and outgoing with proper rating Auto synchronization facility having reverse power and other protection relays. The Components shall be from the Make as specified. Having 2 Separate Compartments for Protective items and Power Distribution/ Collection.

J) Monitoring System
Specification: This Monitoring System should be able to show and log all the major parameters from the Inverters and AC system and should be able to generate reports (generation, other operation parameters etc.) with errors and faults. This system should be accessible through web portal for remote monitoring. It can store historical data. It must be industrial grade.

K) Earthing System
Specification: As per relevant IS

L) Lightening Arrester
Specification: As per relevant IS, ESE Type

M) MEASUREMENT OF ENERGY AND METERING

ABT Metering Set with CT- PT Set having accuracy of 0.2s class (Metering Cubicle) in the connection point.
Connection point is the place where the DISCOM supply and the Solar Plant supply integrates.

MEASUREMENT OF ENERGY AND METERING

Metering Systems:
The Operator shall maintain the Metering System (which shall include ABT / TOD IEGC compliant meter, current and potential transformers and metering equipment). The Metering System will be designed and installed conforming to prudent practice so as to measure outgoing energy and power delivered by the Solar plant to the OIL's domestic station at the delivery point, i.e. point of inter connection and also for the import of energy

for any purpose. Metering equipment shall comply with the requirements of Grid Code but shall not be inferior to 0.2 accuracy Class.

The Owner shall have the right to carry out inspections of the Metering Systems from time to time to check their accuracy.

Sealing and Maintenance of Meters
The Metering System shall be sealed in the presence of both parties
When the Metering System and/or any component thereof is found to be outside the acceptable limits of accuracy or otherwise not functioning properly, it shall be repaired, re-calibrated or replaced by the Operator on priority.
Breaking of meter seals shall not be done except in case of any requirement by testing / calibration. Even in such case the Operator shall immediately inform the Owner of such requirement to enable Owner for deputing its representative. All testing / calibration of metering system shall be done by accredited agency.

All testing and metering equipment shall conform to the relevant IS
ABT Meter means meter for measurement power and energy as per **IEGC**

Approval from State DISCOM and payment of fees, if any, for integration of supply from the proposed Solar Power plant including testing/certification of ABT meter etc, if needed, shall be under the scope of the Bidder. No payment shall be paid by OIL in this regard.

N) Surge protection devices in both DC power side and AC power side

O) Any other item not mentioned but required for proper installation and commissioning of the plant shall have to be provided by the supplier as per standard.

2.0 LOCATION:

Location Details
Name of State: Rajasthan
District: Jodhpur
Location: OIL House of Oil India Limited (rooftop)
Latitude: 26°14'5.10"N
Longitude: 73° 1'2.10"E
Roof top area of installation: 1500 sq. feet

3.0 OPERATING CONDITIONS:

a. Operating Environment: 10 to 50 Deg. C
b. Operating Relative Humidity: 0 to 80%
c. Storage temp.: 15 to 45 Deg. C
d. Elevation: 221 m above MSL

ANNEXURE – A

4.0 SCOPE OF SPECIFICATION:

a) The scope of these specifications shall cover design, engineering, manufacture, quality surveillance, testing at manufacturer's works, packing and supply, erection, testing and commissioning and performance testing of 15KWp (estimated) grid interactive Rooftop mounted solar photovoltaic system with associated components for installation at Oil India Limited, Jodhpur

b) The systems shall be complete with PV modules, inverter, metering, junction boxes, AC, DC distribution boards and cables, communication interface, and any other equipment necessary for safe and efficient operation of the system.

c) The work shall also include interconnection of PV system with the existing OIL grid supplying power to the building.

d) The civil works for installation of complete system shall also be in scope of supplier.

e) The equipment offered shall conform in all respects to high standards of engineering, design and workmanship and be capable of performing in commercial operation up to Bidder's guarantee in a manner acceptable to OIL, who will interpret the meaning of drawings and specifications and shall have the power to reject any work or materials, which in his judgment are not in full accordance therewith.

f) It shall be the responsibility of the Bidder to ensure that all the works as per scope of the specification are completed for safe and efficient working of the system.

g) All the necessary co-ordination with regard to sub-contracted items shall be carried out by the Bidder. The customer (OIL) will communicate only with the Bidder for all matters pertaining to this contract.

h) Considering the reliability of the grid, no electrical storage batteries are envisaged as excess electricity generated by the solar panels which is not required by the equipment/devices in the building premises shall be exported to the grid.

5.0 CODES AND STANDARDS

a) All Equipment and accessories shall comply with requirement of standards published by Bureau of Indian Standards (BIS). In-case no BIS codes exist the equipment shall meet the requirement of international standard including IEEE for design and installation of grid connected PV system. The list of standards adopted shall be indicated in the bid.

b) The SPV Module must be provided with acceptable Test& Certified documents.

c) The quality of equipment supplied shall be generally controlled to meet the guidelines for engineering design included in the standards and codes listed in the relevant ISI and other standards, such as:

- IEEE 928: Recommended Criteria for terrestrial PV power systems.

- IEEE 929: Recommended practice for utility interface of residential and intermediate PV systems.
- IEEE519: Guide for harmonic control and reactive compensation of Static Power Controllers.
- National Electrical NFPA 70-1990 (USA) or Equipment National standard.
- National Electrical Safety Code ANSIC2 (USA) or equipment national standard.
- IEC: 61215 (2005) - Crystalline silicon terrestrial photovoltaic (PV)modules– Design qualification and type approval
- IEC 61683 / IS 61683 - Efficiency Measurements of Power Conditioners/Inverters including MPPT and Protections
- IEC: 61730 -1, -2 Photovoltaic (PV) module safety qualification Part 2: Requirements for testing
- IEC: 60904-1(2006) Photovoltaic Devices-Part-I: Measurement of Photovoltaic current- Voltage Characteristic
- IEC: 62446 (2009)- Grid-Connected Photovoltaic Systems— Minimum Requirements for System Documentation, Commissioning Tests and Inspection:
- IS 9000: Basic environmental testing procedure for Electronic and electrical items.

6.0 SPECIFIC TECHNICAL REQUIREMENTS:

a) The Solar PV power system shall be rooftop mounted, grid connected without battery back-up.

b) The PV Array shall consist of a number of individual PV modules or panels that have been wired together in a series and/ or parallel combination and shall meet the generation power capacity of 15KWpeak (estimated).

c) The DC power generated from SPV array shall be converted to AC power with Power Conditioning Unit /Inverter, consisting of grid-tied Inverter and the associated control and protection devices. The voltage level shall match the grid voltage.

d) Output from Power Conditioning Unit shall be connected to an existing LT power distribution panel, wherein continuous synchronization with grid power shall be automatically active through static circuitry mechanism & devices.

e) Maximum available power of Solar PV Plant will be drawn during the daytime and during any shortfall in power generated by Solar PV Plant during time then extra power required shall be drawn from the Utility Source/without interruption to serve the load requirement. In case of any failure of grid power supply, PV Solar power supply will also automatically get disconnected immediately and the same will be restored automatically at restoration of grid power.

f) DUTY CYCLE: Average Hours of Operation/day: 8-11 hours per day, as per the solar insolation levels of the site.

7.0 SUPPLY & INSTALLATION OF DC COMBINER BOX /ARRAY JUNCTION BOX:

a) Enclosure: The array junction boxes shall be made of PC-GFS Polycarbonate-Glass fibre substance) thermoplastic having minimum IP65/66 protection in accordance with IEC 60 529 with the help of internally embedded polyurethane gasket.

b) The enclosure should be double insulated with protection class II. In view of the same, IEC60439/IEC61439 (new revision) comes as an important standard as it fulfils this requirement of enclosure to be double insulated. (Test certification is required for IP65/ IP 66 degree of protection.) The lid shall be of transparent poly-carbonate.

c) Fuse Protection on Strings: DC fuses rated from 2A to 25A from leading manufacturers to be used in the combiner box to provide over-current protection.

d) Surge Protection Device: Surge Protection devices or SPD to be provided to protect the combiner/junction box from any power surge and voltage spike. SPD to be used should meet Type 2 regulations, and to be typically rated between 600 to 1000V.

e) Input Glands/Connectors: The combiner/array junction box offered is to be provided with IP67rated Cable Glands or MC 4 connectors at the input side to lead the array strings into the box. Suitable markings should be provided for easy identification and cable ferrules shall be fitted at the cable termination points for identification.

f) Degree of protection against mechanical load: IK 08 (5 Joule)

g) Toxic behaviour: Halogen/Silicon free, conform to RoHS directive 2002/95/EC

h) Temperature Tolerance range: -40 deg C to +120 deg C

i) Chemical Resistance: Acid, Lye, Petrol, Mineral Oil & partially resistant from Benzene.

j) UV behaviour: UV stabilized, even after many years there should be no sign of brittleness.

8.0 METERING SCHEME

a) Metering is required to measure the Solar Gross Generation on continuous basis and register cumulative energy based on 15-minute interval basis, daily, monthly and yearly energy generation.

b) The average voltage and power factor based on 15-minute interval must also be recorded.

c) Meter must also display on demand, instantaneous, AC system voltages and currents, frequency, reactive power with sign, total harmonics current and voltage distortion etc.

d) Meters shall comply with the requirements of CEA Regulations on "Installation and Operation of Meters" and in conformity with IS 13779 or IS 14679.

e) An integrating pyranometer (class II or better) is to be provided with the sensor mounted in the plane of the array. Readout shall be integrated with data logging.

9.0 POWER QUALITY REQUIREMENTS:

a) DC Injection in to the grid: The injection of DC power into the grid shall be avoided by using an isolation transformer at the output of the inverter. It is proposed to limit DC injection within 1% of the rated current of the inverter as per IEC 61727.

b) The limits for harmonics shall be as stipulated in the CEA Regulations on grid connectivity which are as follows:

- Total Voltage Harmonic Distortion= 5%
- Individual Voltage Harmonic Distortion=3%
- Total Current Harmonic Distortion=8%

c) Voltage Unbalance-The Voltage Unbalance in the grid shall not exceed 3.0%.

d) Voltage Fluctuations: The permissible limit of voltage fluctuation for step changes which may occur repetitively is 1.5%. For occasional fluctuations other than step changes the maximum permissible limits is 3%.

10.0 COMMUNICATION INTERFACE:

a) The project envisages a communication interface which shall be able to support

- Real time data logging
- Event logging
- Supervisory control
- Operational modes
- Set point editing

b) The following parameters shall also be measured and displayed continuously.

- Solar system temperature
- Ambient temperature
- Solar irradiation/insolation
- DC current and Voltages
- DC injection into the grid (one-time measurement at
- Efficiency of the inverter
- Solar system efficiency
- Display of I-V curve of the solar system
- Any other parameter considered necessary by supplier of the solar PV system based on prudent practice.

c) Data logger/PC based monitoring system must record these parameters for study of effect of various environmental & grid parameters on energy generated by the solar system and various analysis would be required to be provided through bar charts, curves, tables, which shall be finalized during approval of drawings.

d) The communication interface shall be an integral part of inverter and shall be suitable to be connected to local computer and also remotely via the Web using either a standard modem or a GSM/WIFI modem.

11.0 WEATHER MONITORING STATION:

a) An integrating PYRANOMETER for measuring the Solar Irradiance is to be provided, with the sensor mounted in the plane of the array. Readout is to be integrated with the data logging system.

b) In addition, temperature probes for recording the Solar panel temperature and ambient temperature are to be provided.

12.0 LIGHTNING PROTECTION AND EARTHING:

a) Required numbers of suitable lightning arrestors should be installed in the array area. Lightning protection shall be provided by the use of suitable earthing conductors and electrodes so that any lightning strike may find an alternate route to earth. Protection shall meet requirements of Central Electricity Regulations, 2010, and IS 2309:1969 (Protection of Buildings and allied structures from lighting).

b) Each array structure of the PV system should be grounded properly as per IS: 3043-1987.Provision should be kept for shorting and grounding of the PV array at the time of maintenance work. All metal casing/shielding of the plant should be thoroughly grounded in accordance with CEA Regulation-2010. Earth resistance should be tested in a dry weather in presence of the representative of customer, after earthing work is complete, with a calibrated earth tester and should have a value not more than the value specified in the relevant Code/Rules.

c) In case the SPV Array cannot be installed close to the equipment to be powered & a separate earth has been provided for SPV System, it shall be ensured that all the earth connections are bonded together to prevent the development of potential difference between any two earths.

13.0 CIVIL WORKS:

a) Embedment of structures suitable for mounting PV modules.

b) All the machinery such as hydra, JCBs, fork-lifts, for unloading of materials at site, movement of materials, foundation, erection of structures, module mounting, etc. shall be in the scope of Vendor.

14.0 SYSTEM DOCUMENTATION:

Complete documentation on the system must be provided to OIL. System documentation should include an owner's manual and copies of relevant drawings for whatever system maintenance might be required in the future.

15.0 TESTS AND TEST REPORTS:

Final acceptance tests for the PV plant shall include, but not limited to, the following:

a) Visual inspection
b) Verification that all required system and equipment labels, markings and placards are correct and in the proper locations. This includes ensuring that all equipment is properly listed, identified and labelled, suitable for the conditions of use, and installed according to the listed product instructions.
c) Wiring & cabling
d) Earthing connections
e) Mounting and support structures
f) Modules
g) Lightning protection including surge protection
h) Insulation Resistance Measurement
i) Importance of PV system wire insulation for safety and performance
j) Measurement methods for AC and DC circuits
k) Interpretation of insulation test data and application of the results
l) Test equipment selection
m) Array Performance Measurement
    - Electrical measurement, including calculating circuit voltages and currents to verify that the PV array and system operating parameters are within specifications.
    - I-V Curve Tracing and discrete voltage and current measurement
    - PV system performance verification, correction and measurement using capacity test
    - Interpreting I-V curves for performance troubleshooting
    - Power performance Index and Energy performance index
    - Calculations of energy yield
    - Power rating, inverter efficiency, module temperature, array yield, system losses, etc.

16.0 DOCUMENTS TO BE SUBMITTED ALONG WITH THE BID:

a) Type test certificates for all the tests specified for the factory built Solar PV modules: Approved by MNRE Authorized test centre or equivalent International Labs (certificate to be submitted along with the offer).

b) Module mounting structure- Certificate from MNRE approved test centre.

c) Inverter: Certificate from MNRE approved test centre.

d) DC Cable- TUV Certification

e) Bill of materials.

f) Annexure – C: Bidder's declaration

g) Documents as specified in BEC/BRC criteria.

17.0 MAINTENANCE REQUIREMENT:

a) Easy access shall be provided for all components in the SPV plant and grid connecting equipment. Maintenance platform shall be provided for easy inspection of all the equipment.

b) If special tools are required for installation and maintenance, the bidder shall indicate the same and to be supplied free of cost.

c) The Bidder shall furnish operating and maintenance instruction manual to enable the purchaser to carry out maintenance of equipment effectively and safely.

d) Washing / cleaning of SPV panels would be carried out as per the prudent practice of the supplier.

18.0 LAYOUT REQUIREMENT:

The overall dimensions of the SPV Plant shall suit the Rooftop space provided for the layout requirements. The arrangement to suit this space shall be intimated at the time of approving the general arrangement drawing of the equipment.

19.0 INSTRUCTIONS, O&M MANUALS & DOCUMENTS TO BE SUBMITTED ALONG WITH SUPPLY:

a) Four copies of Instruction and Operation and Maintenance Manual in English should be provided with the system.

b) The manual shall be furnished at the time of dispatch of the equipment and shall include the following aspects:

- Erection drawings with written assembly instructions.
- Detailed instructions and procedures for the installation operation and maintenance.
- About solar PV system– its components and expected performance.
- Clear instructions about mounting of PV module (s)
- About the electronics
- DO's and DONT's
- Principle of Operation of various equipment

- Safety and reliability aspects
- Metering scheme
- About power conditioning unit's software and controls
- Clear instructions on regular maintenance and troubleshooting of solar power plant
- Name and address of the person or service centre to be contacted in case of failure or complaint.
- Rated voltages, current and all other technical information which may be necessary for correct operation of the SPV plant.
- Catalogue numbers of all the components which are liable to be replaced during life of the SV plant and all the component parts.
- Trouble shooting and diagnostic procedure

20.0 **AC DISTRIBUTION BOARD (ACDB)**

Inverter installed in a control room converts DC energy produced by the solar array to AC energy. The AC power output of the inverter shall be fed to the ACDB (metering panel & isolation panel) which also houses energy meter. The 433V AC output from isolation transformer shall be exported by cable of required capacity to OIL domestic station.

All the power cables shall be taken through top/ Bottom of the panel as per site requirement.

The ACDB shall fitted with suitable rating & size copper bus, MCCB, HRC fuses/circuit breaker/isolator, indicators for all incomer and outgoing terminals, LED voltmeter & Ammeter with suitable selector switches to monitor & measure the power to be evacuated.

Nut & bolts including metallic shall have to be adequately protected against atmosphere and weather prevailing in the area.

The overall dimension, weight, sheet thickness, painting etc. should be indicated by the Contractor.

21.0 MINIMUM TECHNICAL REQUIREMENT / STANDARD FOR SOLAR PHOTOVOLTAIC (PV) PLANT

PV MODULES:

The PV modules must conform to the latest edition of any of the following IEC/equivalent BIS Standards for PV module design qualification and type approval:
Crystalline Silicon Terrestrial PV Modules IEC 61215 / IS14286
Thin film PV modules IEC
Concentrator PV Modules & Assemblies IEC 62108

In addition, the modules must conform to IEC 61730 Part 1- requirements for construction & Part 2 - requirements for testing, for safety qualification.

PV modules to be used in a highly corrosive atmosphere (coastal areas, etc.) Must qualify Salt Mist Corrosion Testing as per IEC 61701.

ANNEXURE – A

BALANCE OF Plant (BoP) ITEMS/ COMPONENTS:
The BoP items / components of the SPV power plants/ systems deployed Under the Mission must conform to the latest edition of IEC/ equivalent BIS Standards as specified below:

BoP item / component		Applicable IEC / equivalent BIS Standard
	Standard Description	Standard Number
Inverter(s)*	Efficiency Measurements	IEC 61683
	Environmental Testing	IEC 60068 2
Charge controller/ MPPT units*	Design Qualification Environmental Testing	IEC 62093 IEC 60068 2 (6,21,27,30,75,78)
Storage Batteries	General Requirements & Methods of Test Tubular Lead Acid	IEC 61427 IS 1651/IS 133369
Cables	General Test and	IEC 60189
Measuring Methods PVC insulated cables for working Voltages up to and including 1100 V-Do-, UV resistant for outdoor installation		IS 694/ IS 1554 IS/IEC 69947
Junction Boxes / Enclosures	General	Requirements IP 65 (for outdoor) / IP 21 (for indoor) IEC 62208
SPV System	Design PV Stand-alone System design verification	IEC 62124
Installation Practices	Electrical installation of buildings Requirements for SPV power supply systems	IEC 60364-7-712

* Must additionally conform to the relevant national/international Electrical Safety Standards.

22.0 WARRANTY

The mechanical structures, electrical works including power conditioners / inverters / charge controllers/ maximum power point tracker units/Transformer, ACDB, LT DB, distribution boards / digital meters / switchgear / storage batteries, all equipment etc. and overall workmanship of the SPV power plants/ systems must be warranted against any manufacturing/ design/ installation defects for a minimum period of 5 years or as per OEM.

PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 12 years and 80% at the end of 25 years.

System warranty certificate for the entire system for 12 months from the date of commissioning.

23.0 NOTE:

a) Bidders must visit the installation site and carry out all required assessments prior to submission of bid.

b) General arrangement drawing of the plant to be approved by OIL prior to supply and installation.

	Compliance by Bidder	
CC. BID REJECTION CRITERIA (BRC)	**Indicate 'Confirmed' / 'Not Confirmed' / Not applicable**	**Indicate Corresponding page ref. of unpriced bid**
In addition to the General Terms and Conditions for Local Tender, the following BEC / BRC criteria will be applicable against this tender: The bids shall conform to the specifications, terms and conditions given in the tender. Bids shall be rejected in case the item(s) offered do not conform to technical specifications and to the respective international / national standards wherever stipulated. Notwithstanding the general conformity of the bids to the stipulated specifications, and terms & conditions, the following requirements shall have to be particularly met by the bidders, without which the offer will be considered as non-responsive and rejected. All the documents related to BEC / BRC must be submitted along with the technical bid.		
A) TECHNICAL BRC		
1.0 The SPV modules / SPV systems must be tested and approved from MNRE's Solar Energy Centre/ MNRE authorised testing laboratories/centres, for assessing this manufacturer shall furnish latest type test reports. (copies of approval and test reports be attached).		
2.0 The bidder should have installed at least one Grid connected Solar PV Power Plant having capacity of not less than 15 kW which should have been commissioned during the last five (05) years as on original bid closing date of the tender.		
3.0 The details of projects executed in the past five (05) years shall be submitted along with tender documents. A certificate issued by the Govt. Organization/MNRE Authorized Agency/Project owner towards the satisfactory installation and functioning of the power plants to be furnished by the bidder.		
4.0 Bidder must agree to carry out comprehensive annual maintenance contract for a period of 5 years from the date of commissioning. Undertaking in this regard must be submitted along with the bid.		
5.0 Bidder shall have to quote for all the items mentioned in the NIT otherwise, their offer shall not be considered for evaluation. Note: Documentary evidence (self-attested) for all the above must be furnished along with the bid, failing which offer would be rejected.		
6.0 Bidder to unconditionally confirm their acceptance to carry out Performance Ratio Guarantee Test as per section – B of Bid Evaluation Criteria (BEC).		
B) FINANCIAL CRITERIA:		
1.0 The bidder shall have an annual financial turnover of minimum INR 14,40,300/- during any of the preceding 03 (Three) financial/accounting years reckoned from the original bid closing date, irrespective of whether their bid is for all the tendered items or not.		
2.0 "Net Worth" of the bidder should be positive for the financial/accounting year just preceding to the original Bid Closing Date of the Tender.		
3.0 Considering the time required for preparation of Financial Statements, if the last date of preceding financial/accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial/accounting year are not available with the bidder, then the financial turnover of the previous three financial/accounting years excluding the preceding financial/accounting year will be considered. In such cases, the Net worth of the previous financial/accounting year excluding the preceding financial/accounting year will be considered. However, the bidder has to submit an affidavit/ undertaking certifying that 'the balance sheet/Financial Statements for the financial year …….. has actually not been audited so far'.		
Notes: a) For proof of Annual Turnover & Net worth any one of the following document must be submitted along with the bid:- i) A certificate issued by a practicing Chartered/Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual turnover & Net worth as per format prescribed as in CA certificate document. OR ii) Audited Balance Sheet along with Profit & Loss account. In case of foreign bidders, self-attested/digitally signed printed published accounts are also acceptable. b) In case the bidder is a Central Govt. Organization/PSU/State Govt. Organization/Semi-State Govt. Organization or any other Central/State Govt. Undertaking, where the auditor is appointed only after the approval of Comptroller and Auditor General of India and the Central Government, their certificates may be accepted even though FRN is not available. However, bidder to provide documentary evidence for the same.		

	Compliance by Bidder	
C) COMMERCIAL CRITERIA:		
1.0 Bids are invited under Single Stage Composite Bid System. Bidders shall quote accordingly.		
2.0 Bidders must confirm that Goods/materials to be supplied shall be brand new (of recent make) and of the best quality and workmanship and shall be guaranteed for a period of 18 months from the date of supply OR 12 months from date of commissioning, whichever is earlier, against any defects arising from faulty materials, workmanship or design. Defective goods/materials or parts rejected by OIL shall be replaced by the supplier at the supplier's expenses without any extra cost to OIL.		
3.0 The prices offered shall have to be firm through delivery and not subject to variation on any account. A bid submitted with an adjustable price will be treated as non-responsive and rejected.		
4.0 Bids received in physical form against online invitation through e-portal shall be rejected (except the documents specifically called for in hard copies, if any). Similarly, Bids received after the bid closing date and time shall be rejected. Also, modifications to bids received after the bid closing date & time shall not be considered.		
5.0 Bids containing incorrect statement shall be rejected.		
6.0 Validity of the bid shall be minimum 90 days from the date of Bid closing. Bids with lesser validity shall be rejected.		
7.0 Bid Security in ORIGINAL shall be furnished by the Bidder as a part of their TECHNICAL BID. The amount of Bid Security and its validity shall be as specified in the Bid Document. Any bid not accompanied by a proper bid security in ORIGINAL shall be rejected without any further consideration. A bid shall be rejected straightway if Original Bid Security is not received within the stipulated date & time mentioned in the Tender and/or if the Bid Security validity is shorter than the validity indicated in Tender and/or if the Bid Security amount is lesser than the amount indicated in the Tender.		
8.0 Successful bidder shall be required to furnish a Performance Security equivalent to ten percent (10%) of total evaluated value of the Purchase Order for Supply and Installation and Commissioning Price and validity as advised by OIL in the Purchase order. Bidder to submit a separate Performance Security for O&M contract equivalent to 10% of the O&M contract value which shall be valid for 90 days beyond contract period/duration. Bidders should undertake in their bids to submit Performance Security as stated above.		
9.0 A bid shall be rejected straightway if it does not conform to any one of the following clauses: (a) Validity of bid shorter than the validity called for in the Tender. (b) Original Bid Security not received within the stipulated date & time mentioned in the Tender. (c) Bid Security with (i) validity shorter than the validity called for in Tender and/or (ii) Bid Security amount lesser than the amount indicated in the Tender.		
10.0 Bidder must accept and comply with the following clauses as given in the Bid Document, failing which bid shall be liable for rejection: i) Liquidated Damages ii) Guarantee of material iii) Arbitration / Resolution of Dispute iv) Force Majeure v) Applicable Laws vi) Performance Security		

ANNEXURE – C

BIDDER'S DECLARATION

The following check list must be completed and submitted with the offer. Please ensure that all these points are covered in your offer. These will ensure proper evaluation at our end.
Please mark Yes or No to the following question, in the right hand column

Sl. No.	ITEM	YES / NO
1	Whether all items to be provided as per technical specifications?	
2	The SPV modules / SPV systems must be tested and approved from MNRE's Solar Energy Centre/ MNRE authorised testing laboratories/centres, for assessing this manufacturer shall furnish latest type test reports. Copies of approval and test reports be attached. Have you submitted?	
3	The bidder should have installed at least one Grid connected Solar PV Power Plant having capacity of not less than 15 kW which should have been commissioned during the last five (05) years {2013-14,2014-15,2015-16 ,2016-17 and 2017-18}. Proof of certificates to be attached. Have you attached ?	
4	The details of projects executed in past five (05) years shall be submitted along with tender documents. A certificate issued by the Govt. Organisation/MNRE Authorised Agency/Project owner towards the satisfactory installation and functioning of the power plants to be furnished by the bidder. Documentary evidence is to be submitted. Have you submitted?	
5	Bidder must agree to carry out comprehensive annual maintenance contract for a period of 25 years from the date of commissioning. Undertaking must be submitted along with the bid. Have you submitted the undertaking?	
6	Inverter: Certificate from MNRE approved test centre. Have you submitted?	
7	DC Cable- TUV Certification. Have you submitted?	
8	Bill of materials of entire PV system. Have you submitted?	

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ANNEXURE –D

INSTRUCTIONS FOR INSTALLATION AND COMMISSIONING:

1.0 The supplier shall execute the jobs as per specifications and OEM guidelines

1.1 Supplier shall issue his/her work persons with all the safety gadgets.

1.2 Quality of jobs carried out by the Supplier shall be of high standard and should be as per the norms of Central Electricity Authority Regulations, 2010, NEC and other electrical standards recognized by the company.

1.3 Installation & commissioning shall be considered as complete only if it meets the full satisfaction of OIL's engineer in charge.

1.4 OIL shall reserve the right to ask the supplier to re-do poor quality job at no extra cost to OIL.

2.0 MANPOWER

2.1 All personnel deputed by the Supplier shall be competent for the job.

2.2 All workers shall be medically fit and able to carry out the various jobs assigned to them.

2.3 Job shall have to be carried out in consultation with OIL's engineer in charge.

2.4 The boarding/lodging, transportation to site, including transportation of materials at site and related costs shall be under the scope of the supplier.

2.5 Loading and unloading of materials/ machines shall be the scope of the Supplier.

3.0 General HSE points to be adopted by the Supplier:

a) It will be solely the Supplier's responsibility to fulfil all the legal formalities with respect to the Health, Safety and Environmental aspects of the entire job (namely, the persons employed by him, the equipment used, the environment etc.) under the jurisdiction of the district of that state where it is operating. The Supplier has to ensure that all sub-Suppliers hired by him/her comply with the same requirement as the Supplier himself/herself and shall be liable for ensuring compliance all HSE laws by the sub-Suppliers.

b) The number of work persons hired/engaged by the Supplier shall depend on the quantum and/or exigency of jobs. Company engineer/ company supervisor may direct the Supplier/Supplier's supervisor to hire more persons if considered essential.

c) It will be entirely the responsibility of the Supplier or his/her Supervisor/representative to ensure strict adherence to all HSE measures and statutory rules during operation in OIL's installation and safety of workers engaged by him/her. The crew members will not refuse to follow any instruction given by company's Safety Officer / Engineer / Official / Supervisor/Junior Engineer for safe working/ operation.

d) Any issues regarding compensation arising out of the job carried out by the Supplier whether related to pollution, Safety or Health will be solely under the scope of the supplier and supplier cannot make OIL liable for the same.

e) Any compensation arising due to accident of the Supplier's personnel while carrying out the job will be solely the responsibility of the Supplier and supplier cannot make OIL liable for the same.

4.0 TOOLS AND TACKLES:

a) All tools and tackles shall be of standard make and must conform to IS or relevant standard.

b) Whenever OIL inspector/ Engineer wishes to inspect, Supplier shall produce the tools and tackles for inspection. Items must be replaced suitably whenever found defective.

c) All tools & tackles required for carrying out the job shall have to be arranged by the supplier.

5.0 CUSTOMER'S ON SITE INSTRUCTION:

a) Bidder shall provide necessary onsite instruction and demonstration on the system related today to day operation & maintenance of the system including basic troubleshooting.

b) On-site instruction shall be considered by the Vendors and costs towards this, if any, shall be deemed to have been included in the overall quoted costs of the system. No additional costs towards to & fro travel, boarding & lodging shall be made on this account.

ANNEXURE – E

COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC)

Comprehensive Annual Maintenance Contract:

Bidder/supplier of the solar PV plant has to take over the annual maintenance of the plant for 5 years once the plant is successfully handed over to OIL after installation & commissioning.

1. BRIEF POINTS REGARDING THECOMPREHENSIVE ANNUAL MAINTENANCE CONTRACT

a) The contractor shall ensure trouble free operation of the complete solar PV plant system.

b) The contractor shall carry out maintenance of the installation as per the guidelines of the scope of work of CAMC given below during the entire contract period. During the inspection/maintenance schedule, the equipment in the solar PV plant will be thoroughly checked for proper operation, cleaned and serviced. However, contractor shall submit a detailed PM schedule once PO is placed. PM schedule shall be approved by OIL before signing of contract.

c) The contractor shall also make any additional visits during the contract period, if required, in case of breakdown or if called by OIL's personnel. The same will be intimated by OIL. During any visit in the contract period, boarding/lodging, transportation of the contractor's personnel and materials required shall have to be arranged by the contractor.

d) The contractor shall also undertake replacement/repair of any defective part of the solar PV plant system free of cost during the contract period.

e) The contractor should frame a mutually agreed bridging document between OIL & the contractor with roles and responsibilities clearly defined.

f) The price quoted shall be firm and binding, for entire 5 years. Contractor shall have to provide an undertaking to this effect along with supply of materials.

g) At the end of the contractual period, the solar PV plant system shall be handed over to OIL in excellent working condition. If any equipment/part/component of the solar PV system is found to be defective due to improper maintenance, it shall be replaced by the contractor free of cost.

2. CONTRACT GUIDELINES: It is the responsibility of the contractor to ensure maximum output from the plant by cleaning/maintaining the equipment on a regular basis during the whole contract period (O&M) as per OEM recommendation. The contractor shall maintain the plant along with spares for 5 years.

The Comprehensive AMC, therefore, shall be of duration of 5 years as follows:

- Comprehensive annual maintenance contract for 5 years after handing over the plant to OIL.

Once the PO is awarded to the successful bidder for SITC (supply, installation, testing & commissioning), the bidder is to immediately enter into an agreement with OIL for the AMC for a period of 5 years.

ANNEXURE – E

The CAMC shall include overall supervision of maintenance activities that are required to ensure optimum performance of the Solar PV system as per the performance guarantee parameters submitted and established by the contractor at site and accepted by OIL.
The contractor shall submit a Detailed Annual Maintenance schedule to OIL within 15 days of the placement of the purchase order and award of contract for comprehensive AMC.

2.1 The scope of maintenance of the plant shall cover two parts:

a) Scheduled/ Preventive/ predictive maintenance including cleaning/washing of solar panels

b) Unscheduled/ Breakdown maintenance

a) Scheduled/ Preventive maintenance
The contractor shall have to carry out scheduled and preventive maintenance of the solar PV plant for 5 years (to be carried out after successful commissioning of the completed plant to satisfaction of OIL), which includes maintenance of the plant including regular maintenance.

The contractor shall also submit a detailed report every month to OIL about the maintenance carried out in the concerned period.

For ongoing cleaning and maintenance, the contractor shall provide sufficient manpower to carry out routine maintenance in line with OEM's recommendation. All tools/tackles and consumable materials shall be to contractor's account. However, water for cleaning can be provided from OIL's source.

b) Unscheduled/ Breakdown maintenance
In case of malfunction/breakdown in the plant, the contractor shall have to troubleshoot and rectify the failure/breakdown themselves. Any spares/replacement parts required to put the plant back into service shall have to be supplied by the contractor without any cost to OIL.

2.2 Spares required during AMC
The contractor shall supply all spares required during the AMC period. This includes spares/consumables for scheduled as well as unscheduled/breakdown maintenance.

2.3 Warranty

The Contractor shall be liable to replace any parts/components that have failed, may fail or show signs of defects during operation or due to poor workmanship of contractor’s personnel or from any act or omission by the vendors/contractor for a period of 5 years from the date of handing over and acceptance by OIL of the complete Plant, free of cost during the currency of the contract period.

The contractor will have to hand over the plant to OIL in excellent working condition. After completion of AMC period, the final certificate shall be given by OIL's engineer. If there is any defect found in the component/equipment, the same shall have to be replaced by the contractor within one month, if contractor fails to do so, the same will be repaired/replaced by OIL and the cost shall have to be borne by the contractor.

The above includes, but not limited to, replacement/repair of any defective part (all components including PV modules, arrays, power supply unit, converter, inverter, all electronic cards, modules, fuses, fans, switches, wires and cables, lamps, transformers, cables etc.), civil structurers for supporting the panels, metallic structures, cable mounting system etc. of the solar PV plant.

2.4 **Compensation Calculation:**

Agreed Performance Ratio in Percentage (As per Table-1): A

Achieved Performance Ratio in Percentage: B

B= Achieved Annual Energy Production / Nominal Annual Energy Production in kWh*

*Nominal Annual Energy Production in kWh = Annual Cumulative Solar Irradiation intensity ($KWHr/m^2$) for the that year X Generator area of the PV plant (m^2) X Efficiency of the PV modules

Difference = A-B

Compensation = *Calculated AEP for the Year X (A-B) X 8.35 X 25

*Calculated AEP for the Year = Nominal AEP for the Year X Guaranteed PR

Unit rate = 8.35 (Tariff @ LT Commercial rate of corresponding year)

Calculation:

First Year:

At the end of the first year, if the plant failed to achieve the PR (A above) than

a) The bidder shall compensate as follows:

Guaranteed PR: A

Achieved PR: B1

Difference: A-B1

Compensation: (Calculated AEP with the Guaranteed PR) X (A-B1) X 25 Years

Second Year onwards:

b) If the PR quoted in the Table-1 for the second year is equal or more than the achieved PR of first year then no compensation will be levied.

If the achieved PR for the second Year is less than the achieved PR of the first Year but equal to the Guaranteed PR for second year as quoted in Table-1, then no compensation will be levied.

If the achieved PR is less than the Guaranteed PR for the second year as quoted in Table-1 and less than the achieved PR of first Year then compensation will be calculated as follows:

Achieved PR of First Year: B1

Second Year Guaranteed PR (Table-1): A2

Second Year achieved PR: B2

Difference: (B1/A2 whichever is less)-B2

Compensation: (Calculated AEP with the Guaranteed PR for the second Year) X Difference X 24 Years.

This will continue for the remaining years of O&M.

Note: Compensation at the end of year, if arises, may be deducted from the last quarter against O & M charges and the balance, if applicable, can be deducted from the first quarter of the next year.

2.5 PERFORMANCE RATIO GUARANTEE TEST

2.5.1 The test to prove the Performance Guarantee shall be conducted at site by the contractor in presence of Owner's/Consultant representative. The PG test procedure shall be submitted by successful vendor after the award of the contract for review and approval by OIL/Consultant. This test shall be binding on both the parties of the Contract. Any special equipment, instrumentation tools and tackles required for successful completion of the Performance Guarantee Test shall be provided by the Contractor free of cost.

2.5.2 The procedure for PG demonstration test shall be as follows:

i) A calibrated pyranometer shall be installed by the contractor at the location mutually agreed by the Contractor and Owner/Consultant. The test report for the calibration shall be submitted by the contractor for approval by the Owner/Consultant. The output of this pyranometer for three months of the PG test shall be made available at SCADA.

ii) "Achieve d energy production" exported from the plant shall be noted for three months. For this purpose, the energy recorded in the incoming feeder meter from the solar plant shall be taken into account.

iii) This recorded energy shall be compared with the "Nominal Energy Production" as mentioned in 5.26 above for 3 months.

2.5.3 Following factors shall be considered for computing the "Nominal Energy Production"

i) Generation loss due to grid outage: The measured global solar radiation of the period of the power evacuation system shall be excluded to calculate average global solar radiation for the period of the PG test

2.5.4 In case of non- achievement of the desired performance of the plant, the contractor, in its own interest, take adequate measures, such as providing additional modules etc., to improve the performance of the plant at no additional cost to OIL. Otherwise compensation as per clause no 2.4 will be applicable at the end of the year.

2.6 Payment against Comprehensive AMC

Against the AMC, the contractor shall raise the bills quarterly and shall be paid against the quarterly bills. If intimated by OIL, the contractor has to visit the site or visit themselves if they want, with their own cost.

Contractor shall submit a monthly certificate/health report/maintenance report to Electrical Engineering department stating the health/condition of the solar PV plant and/or any repair/maintenance job done during their periodic visits to the installation. Bills should be submitted along with the monthly reports. Bills without the accompanying health report/maintenance report will not be entertained.

ANNEXURE – E

3. SCOPE OF WORK OFCOMPREHENSIVE ANNUAL MAINTENANCE CONTRACT

3.1 Scheduled/ Preventive maintenance

3.1.1 The contractor shall ensure trouble free operation of the solar PV plant system by undertaking scheduled maintenance of the plant as per the recommendations of the respective OEMs/vendors of component items. The components of the solar PV plant shall be checked for loose connection/heating and the same shall be rectified. Troubleshooting and repair of the solar PV plant shall be done by the contractor.

The contractor shall submit a detailed PM schedule of the plant within 15 days of placement of PO. The schedule shall be approved by OIL before signing the contract.

3.1.2 During the inspection/maintenance schedule, the equipment in the solar PV plant will be thoroughly checked for proper operation, cleaned and serviced.

3.1.3 Scope of regular maintenance work:

a) Periodicity of maintenance: Every month

b) Maintenance work to be carried out

i) Cleaning of solar PV modules/arrays monthly with water*

ii) Checking and tightening all wiring connections in PV arrays and electrical cables in PCU, earthing and lightning protection system

iii) Checking of proper functioning of PCU and recording all parameters, including any Fault/incipient fault

iv) Measurement of solar irradiation

v) Troubleshoot faults, if any, and rectify the same- if the fault cannot be rectified, the maintenance team will inform OIL and contractor. Contractor will arrange for rectification of the fault with the help of OEM/expert. Spares for regular/breakdown maintenance will be in contractor's scope.

*** Note:**

A) If the weather is dusty, cleaning of PV arrays more than twice every month is to be carried out as per instruction of engineer-in-charge of OIL. No extra charge can be claimed for this.

B) Water will be available free of cost from the installation. Any equipment viz. hose pipe, mops, pressure washer etc. will be in contractor's scope.

3.1.4 In case of any faults/ other problems not directly connected to the solar PV plant, (for example, non-functioning of a light fitting in a room supplied with solar power), the same shall be reported to concerned electrical engineer/Junior Engineer/supervisor.

3.1.5 The contractor shall check the solar PV plant for any damage and ingress of water.

3.1.6 Following reports shall be submitted by the contractor in hard copy during the periodic visits:

a) Healthiness/problems of solar PV plant (as per solar PV plant OEM(s)' guidelines)

b) Operation checked status (of all components of the solar PV plant, changeover system etc.)

c) Report attended and action taken (in details) for malfunctioning solar PV plant

d) Any other relevant point

3.1.7 The starting date for annual maintenance service shall be the date on which the plant shall be handed over to OIL to their full satisfaction.

3.1.8 Any other points specifically not mentioned in the supply, installation and commissioning and annual maintenance services, but required for successful operation shall be in the scope of the contractor.

Any spares/serviceable parts/replacement parts required to put the defective plant back into service shall have to be supplied by the contractor without any cost to OIL.

4. STATUTORY REQUIREMENT FOR WORK

4.1 The contractor shall execute the jobs as per specifications in the Annual Maintenance contract.

4.2 Contractor shall issue his/her work persons with all the safety gadgets.

4.3 Quality of jobs carried out by the Contractor shall be of high standard and should be as per the norms of Central Electricity Authority Regulations, 2010, NEC and other electrical standards recognized by the company.

5. MANPOWER

5.1 All personnel deputed by the contractor shall be competent for the job.

5.2 All workers shall be medically fit and able to carry out the various jobs assigned to them.

5.3 Personnel deployed by the contractor shall be changed/replaced by the contractor if it is desired by OIL to do so. OIL shall not be required to give any reason for such request/instruction.

5.4 Job shall have to be carried out in consultation with OIL's engineer in charge.

6.0 General HSE points to be adopted by the Contractor:

a) It will be solely the Contractor's responsibility to fulfil all the legal formalities with respect to the Health, Safety and Environmental aspects of the entire job (namely, the persons employed by him, the equipment used, the environment etc.) under the jurisdiction of the district of that state where it is operating. The contractor has to ensure that all sub-contractors hired by him/her comply with the same requirement as the contractor himself/herself and shall be liable for ensuring compliance all HSE laws by the sub- contractors.

b) The number of work persons hired/engaged by the contractor shall depend on the quantum and/or exigency of jobs. Company engineer/ company supervisor may direct the contractor/contractor's supervisor to hire more persons if considered essential.

c) It will be entirely the responsibility of the Contractor or his/her Supervisor/representative to ensure strict adherence to all HSE measures and statutory rules during operation in OIL's installation and safety of workers engaged by him/her. The crew members will not refuse to follow any instruction given by company's Safety Officer / Engineer / Official / Supervisor/Junior Engineer for safe working/ operation.

h) Any issues regarding compensation arising out of the job carried out by the Contractor whether related to pollution, Safety or Health will be settled and payable by the contractor only.

i) Any compensation arising due to accident of the Contractor's personnel while carrying out the job, will be payable by the contractor only.

j) A contractor employee must, while at work, cooperate with his employer or other persons so far as is necessary to enable compliance with any requirement under the act or the regulations that is imposed in the interest of health, safety and welfare of the employee or any other person.

7.0 FORCE MAJEURE:

a) In the event of either party being rendered unable by force majeure to perform any obligation under the contract, the relative obligation of the party affected by such force majeure shall stand suspended till such time that normal conditions are restored. The term force majeure shall mean act of God, strikes, lockouts or other industrial disturbances, wars (whether declared or not), riots, earth quake, storms, fire etc.

8.0 **MEASUREMENT OF ENERGY AND METERING: Refer to clause no 1 (M) of Annexure-A**

ANNEXURE- F

BID EVALUATION CRITERIA (BEC) & PRICE BID FORMAT

BID EVALUATION CRITERIA:

The bids conforming to the specifications, terms and conditions stipulated in the tender and considered to be responsive after subjecting to the Bid Rejection Criteria shall be considered for further evaluation as per General Terms and Conditions for Local Tender and the Bid Evaluation Criteria given below:

Evaluation of techno-commercial bids and priced bids shall be done separately.

1. Evaluation of Techno-commercial bids shall be carried out first. This will be done on the basis of Bid Rejection Criteria, documents furnished by the bidder and completeness & conformity of the bids with respect to the ITB requirements.

2. Price bids of techno-commercially acceptable bidders shall be evaluated and compared. Price evaluation of the bids shall be carried out by Cost per KWh basis with the following consideration.

a. Total EPC (X+Y) contract price quoted by bidder as per Price Bid format in Table-A.

b. Total O&M charges (Z) as per Price Bid format in Table-A for 5 years including statutory charges if any quoted by the bidder.

c. The bidder shall furnish Annual Estimated Production (AEP) for 25 years based on the Performance Ratio (PR) offered by the bidder for the plant.

d. Bidder shall submit AEP and the Performance Ratio (PR) in TABLE-1.

e. AEP shall be calculated as follows

AEP = Nominal Annual Energy Production in kWh X PR

Nominal Annual Energy Production in kWh = Annual Cumulative Solar Irradiation intensity (KWHr/m^2) X Generator area of the PV plant (m^2) X Efficiency factor of the PV modules

Note:

To calculate Nominal Annual Energy Production (NAEP), Annual Solar Irradiation may be considered as **1500 KWh/m^2** (Jodhpur, Rajasthan). The AEP data provided in Table-1 will be used for evaluation purpose only.

f. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between sub totals and the total price, (even in case of carry forward of prices) the unit or subtotal price shall prevail and the total price shall be corrected accordingly. If there is a discrepancy between words and figures, the amount in words will prevail. This evaluation criterion is binding on the bidder.

3. Order shall be placed on the bidder whose Cost per KWH is found to be the Lowest (L1) for the whole project i.e. 15 KW. For this purpose, cost

will be total of Capex and Opex for 5 Years as quoted in price bid format **(W under Table-A)**. Annual Energy Production (AEP) as given in **TABLE-1** for the first five years shall be considered for calculation cost per KWH. Although, bidder has to quote AEP and PR for 25 years.

PR "Performance Ratio" (PR) means the ratio of actual plant output versus Calculated, nominal plant output in kWh annual.

PR= Annual Actual Energy output in kWh / Nominal Annual Energy Production in kWh.

Nominal Annual Energy Production (in KWh) means Annual incident solar irradiation at the generator surface of the PV plant x relative efficiency of the PV plant modules.

PGT means Performance Ratio Guarantee Test.

A. AEP and Performance ratio

1.0 Bidder are expected to make their own study of solar profile and other related parameters of the area & make sound commercial judgment about Performance Ratio (PR) to determine the Annual power output i.e. Annual Energy Production of the plant. It shall be the responsibility of the bidder to access the corresponding solar insolation values and related factors of solar plant.

2.0 The bidder shall be required to install energy meters to record the Net Annual Energy Production (AEP) from the Solar Plant (Energy generated and exported from solar plant – Energy Import from OIL system)

3.0 Necessary corrections may be carried out by OIL in the AEP furnished by bidders.

4.0 The corrected figure for AEP shall be considered for evaluation of bids. The same has to be ratified by the bidder.

5.0 The quoted PR for 25 years shall be adopted for entire O&M period.

6.0 The Successful bidder shall be responsible for achieving the Performance Ratio. For any shortfall in achieving the Performance Ratio (PR), the compensation shall be recovered from the successful bidder on annual basis. The successful bidder has to maintain the Solar Plant equipment(s) including its repair, replacement, overhauling, etc., so as to give the agreed Performance Ratio per year, for which OIL shall pay the agreed O&M charges only and no other charge / cost is payable by OIL.

7.0 The performance of 15 KW Solar Power Project shall be evaluated on annual basis. In case of shortfall in quoted Performance Ratio compensation shall be recovered as per compensation clause no 2.4 of Annexure-E.

8.0 **Compensation Calculation:**

Agreed Performance Ratio in Percentage (As per Table-1): A

Achieved Performance Ratio in Percentage: B

B = Achieved Annual Energy Production / Nominal Annual Energy Production in kWh*

*Nominal Annual Energy Production in kWh = Annual Cumulative Solar Irradiation intensity (KWHr/m^2) for the that year X Generator

area of the PV plant (m^2) X Efficiency of the PV modules
Difference = A-B
Compensation = *Calculated AEP for the Year X (A-B) X 8.35 X 25
*Calculated AEP for the Year = Nominal AEP for the Year X Guaranteed PR
Unit rate = INR 8.35 (Tariff @ LT Commercial rate of corresponding year)

Calculation:

First Year:

At the end of the first year, if the plant failed to achieve the PR (A above) than
a) The bidder shall compensate as follows:

Guaranteed PR: A
Achieved PR: B1
Difference: A-B1
Compensation: (Calculated AEP with the Guaranteed PR) X (A-B1) X 25 Years

Second Year onwards:

b) If the PR quoted in the Table-1 for the second year is equal or more than the achieved PR of first year then no compensation will be levied.

If the achieved PR for the second Year is less than the achieved PR of the first Year but equal to the Guaranteed PR for second year as quoted in TABLE-1, then no compensation will be levied.
If the achieved PR is less than the Guaranteed PR for the second year as quoted in TABLE-1 and less than the achieved PR of first year, then compensation will be calculated as follows:
Achieved PR of First Year: B1
Second Year Guaranteed PR (TABLE-1): A2
Second Year achieved PR: B2
Difference: (B1/A2 whichever is less)-B2
Compensation: (Calculated AEP with the Guaranteed PR for the second Year) X Difference X 24 Years.
This will continue for the remaining years of O&M.

Note: Compensation at the end of year, if arises, may be deducted from the last quarter against O & M charges and the balance, if applicable, can be deducted from the first quarter of the next year.

B. PERFORMANCE RATIO GUARANTEE TEST

1.0 The test to prove the Performance Guarantee shall be conducted at site by the contractor in presence of OIL's representative. The PG test procedure shall be submitted by successful vendor after the award of the contract for review and approval by OIL. This test shall be binding on both the parties of the Contract. Any special equipment, instrumentation

tools and tackles required for successful completion of the Performance Guarantee Test shall be provided by the Contractor free of cost.

2.0 The procedure for PG demonstration test shall be as follows:

i) A calibrated pyranometer shall be installed by the contractor at the location mutually agreed by the Contractor and OIL. The test report for the calibration shall be submitted by the contractor for approval by the OIL. The output of this pyranometer for three months of the PG test shall be made available at SCADA.

ii) "Achieve d energy production" exported from the plant shall be noted for three months. For this purpose, the energy recorded in the incoming feeder meter from the solar plant shall be taken into account.

iii) This recorded energy shall be compared with the "Nominal Energy Production" as mentioned in 8.0 above for 3 months.

3.0 Following factors shall be considered for computing the "Nominal Energy Production"

i) Generation loss due to grid outage: The measured global solar radiation of the period of the power evacuation system shall be excluded to calculate average global solar radiation for the period of the PG test

4.0 In case of non- achievement of the desired performance of the plant, the contractor, in its own interest, take adequate measures, such as providing additional modules etc., to improve the performance of the plant at no additional cost to OIL. Otherwise compensation as per clause no 2.4 of Annexure-E will be applicable at the end of the year.

Other Bid Evaluation Criteria:

1.0 Other terms and conditions of the enquiry shall be as per General Terms and Conditions for Local Tender. However, if any of the Clauses of the Bid Rejection Criteria / Bid Evaluation Criteria (BEC / BRC) mentioned here contradict the Clauses in the General Terms & Conditions of Local Tender of the tender and/or elsewhere, those mentioned in this BEC / BRC shall prevail.

PRICE BID FORMAT (Table-A)

Line item	Description	HSN Code	Qty.	Unit	Quoted Price inclusive of Design, Manufacture, Packing & Forwarding (A)	Applicable GST (B)	Total price C= (A+B)	Freight, insurance inclusive of applicable GST (D)	Net price X = (C+D)
10	15 KWp roof top solar PV plant (grid connected)		1	NO					

i) Supply Part

Total cost of supply (X) =

ii) Installation & Commissioning part (All inclusive- Installation, hooking up with grid, laying of cables, testing and commissioning)

Line item	Description	SAC Code	Qty.	Unit	Install. & comm. Cost (F)	GST (G)	Total price Y = (F+G)
20	Installation & commissioning of 15 KWp roof top solar PV plant (grid connected)		1	AU			

Total cost of Installation & Commissioning (Y) =

iii) Comprehensive Annual Maintenance Contract (all inclusive)
(Note: Bidder has to fill up the figure for cost of comprehensive AMC for 5 years as detailed below, otherwise his bid shall be rejected outright)

Line item	Description	SAC Code	Qty.	Unit	Comprehensive AMC cost (H)	Applicable GST etc. (I)	Total price Z = (H+I)
30	Comprehensive AMC for 1st Year		1	AU			
	Comprehensive AMC for 2nd Year		1	AU			
	Comprehensive AMC for 3rd Year		1	AU			

	Comprehensive AMC for 4th Year		1	AU			
	Comprehensive AMC for 5th Year		1	AU			

Total cost of Comprehensive AMC (Z) =

Grand total cost (W) = (X) + (Y) + (Z) =

Table-1

Annual Energy Production (AEP) for 25 Years Period

1. The Bidder shall provide Performance Ratio (PR) considering offered design configuration and all local conditions, solar insolation, wind speed and direction, air temperature & relative humidity, barometric pressure, rainfall, sunshine duration, grid availability and grid related all other factors and losses due to near shading, incidence angle modifier, irradiance level, temperature loss array loss, Module quality loss, Module array mismatch loss, and various inverter losses, etc.

2. Bidder shall furnish detailed calculations for Nominal Annual Estimated Energy Production (NAEP) FOR 25 YEARS PERIOD of the 15KW solar power plant based on solar irradiation of 1500 KWHr/m^2.

3. Generator Area: _____m2

Year	Nominal Annual Energy Production (KWh)	PR Ratio (%)	Annual Energy Production (KWh)	Module Efficiency
	(A)	(B)	C=AXB	D
1st				
2nd				
3rd				
4th				
5th				
6th				
7th				
8th				
9th				
10th				
11th				
12th				
13th				
14th				
15th				
16th				
17th				
18th				
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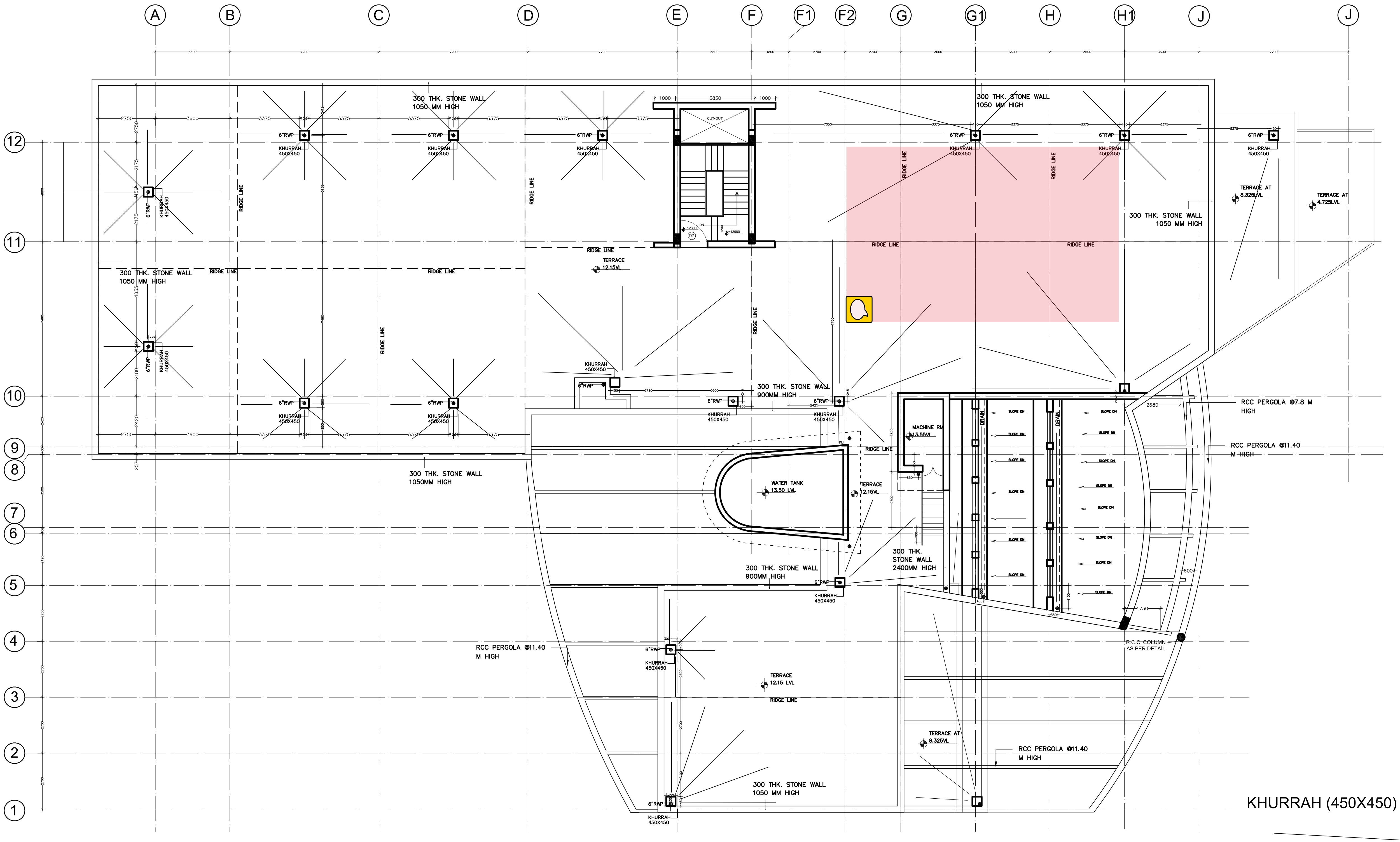
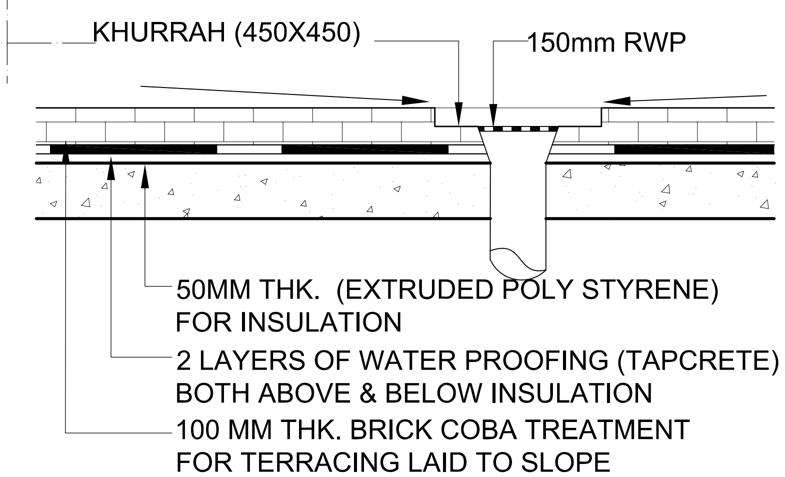


TERRACE PLAN



KHURRAH DETAIL

WORKING DRAWING

PROPOSED CONSTRUCTION OF OIL HOUSE AT PLOT NO - 2A, SARASWATI NAGAR, JODHPUR, RAJASTHAN

OWNERS SIGN	ARCHITECTS– SIGN

no	date	description	no	date	description
revision			revision		

JOB NO	DATE	ISSUED BY	SHEET TITLE
810	09/12/09	–	TERRACE FLOOR PLAN
DEALT	CHECKED	SCALE	
SWATI	GURPREET	NTS	

DRG. NO
R1/W-106

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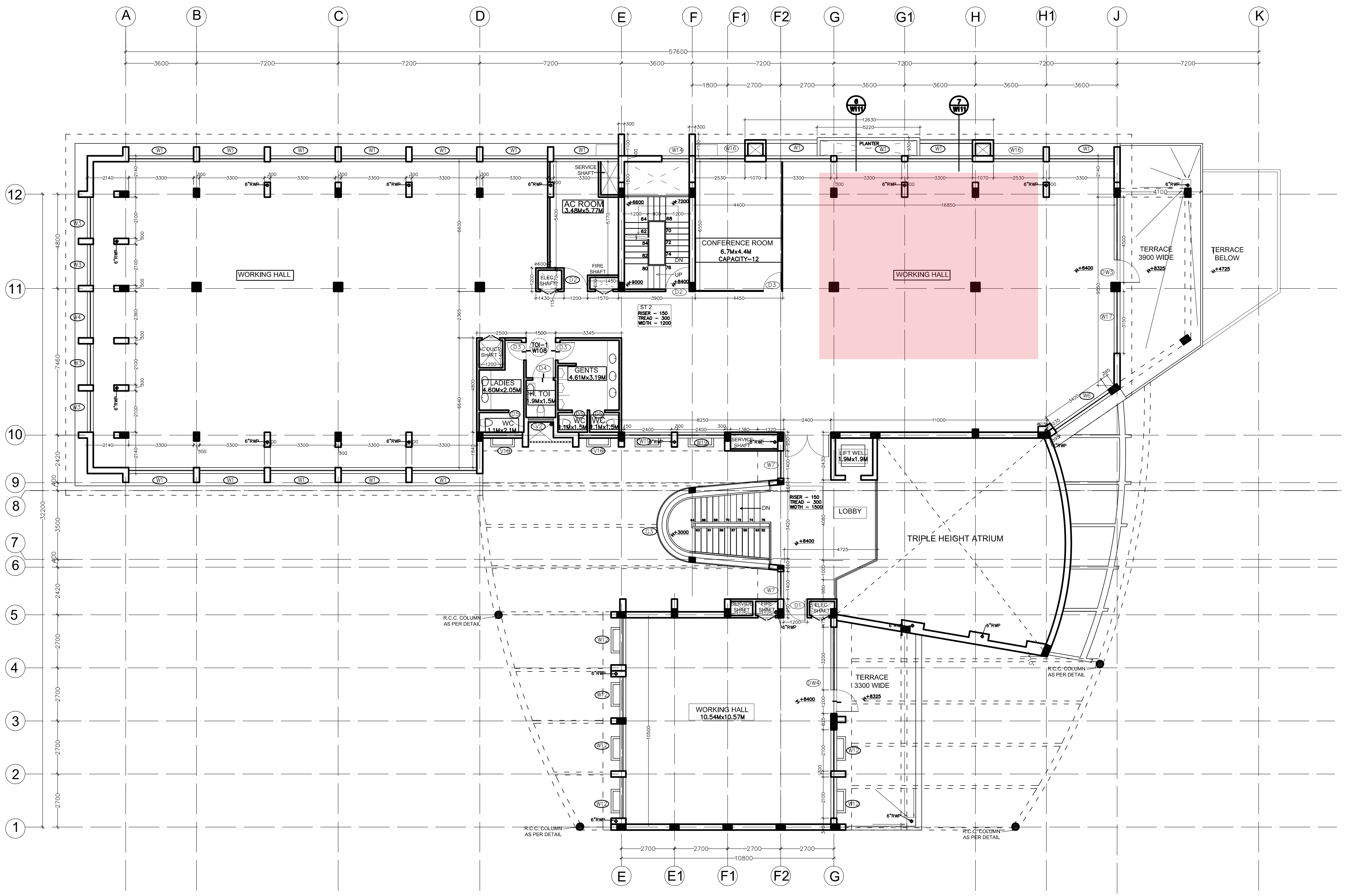

WORKING DRAWING

PROPOSED CONSTRUCTION OF OIL HOUSE AT PLOT NO - 2A, SARASWATI NAGAR, JODHPUR, RAJASTHAN	OWNERS SIGN	ARCHITECTS– SIGN	

no	date	description
01	9/12	RW Pipes

revision

JOB NO	DATE	ISSUED BY	SHEET TITLE
810	09/12/09	–	SECOND FLOOR PLAN
DEALT SWATI	CHECKED GURPREET	SCALE NTS	

DRG. NO R1/W-104

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