

Corrigendum-1

Note: Please refer the updated ATC as below:

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	1 of 51
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Buyer Added Bid Specific ATC

1.0 The Minimum Qualifying Requirements are as under:

1.1 Experience:

Successfully completed/ carried out similar works during last 7 years ending on 31.07.2026 should be either of following:

- a) Three similar works of capacity not less than 0.1 MW each; or
- b) Two similar works of capacity not less than 0.2 MW each; or
- c) One similar work of capacity not less than 0.5 MW each.

Definition of "Similar Work"

Supply, erection, testing, and commissioning of inverter(s) for grid-connected solar power plants;

"OR"

EPC/ Comprehensive O&M (for min. 1 year) of grid connected solar power plants

The bidder shall submit the work completion certificate(s) for each work mentioned at a/b/c above, as applicable.

Note: In support of above, the Bidder shall furnish documentary evidence like copies of LoA/PO, completion certificate & successful performance certificate/ successful operation certificate (s).

1.2 Financial Criteria:

The bidder should have an Average Annual Turnover of Rs. 22,27,275/- or more in the past three financial years.

For the purpose of arriving at Average Annual Turnover, total income except non-recurring income e.g. sale of fixed assets shall be considered.

General Notes for Financial Situation:-

- (i) Audited Balance Sheets, Profit & Loss Accounts, the schedules and other Financial Statements of the immediately preceding 3 (three) Financial years of the Bidder should be furnished by the Bidder.

- (ii) In case where Audited financial results for the immediately preceding financial year are not available, then a certificate from chartered accountant certifying turnover and bearing UDIN number shall be submitted.
- (iii) For the purpose of arriving at Average Annual Turnover, total income except non-recurring income e.g. sale of fixed assets shall be considered.
- (iv) MSEs and Start-ups are exempted from the Financial Criteria as mentioned as Clause 1.2 above.

2.0 **SJVN's Rights & Disclaimers**

- 2.1 The SJVN (referred as Buyer) reserves its right to accept or reject any or all Bids, abandon/ cancel the Bidding process, and issue another tender for the same or similar works at any time before the award of the contract. It would have no liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for such action(s).
- 2.2 SJVN Ltd. reserves the right to assess the bidder's capability and capacity to perform the contract satisfactorily, should the circumstances warrant such assessment in the overall interest of SJVN Ltd.
- 2.3 The Bid Document is neither an agreement nor an offer to prospective Bidder(s)/Seller(s) or any other party hereunder. The purpose of the Bid Document is to provide the Bidder(s) with information to assist them in participation in this Bidding Process. The Bid Document does not purport to contain all the information Bidder(s) may require. It may not address the needs of all Bidders. They should conduct due diligence, investigation, and analysis, check the information's accuracy, reliability, and completeness, and obtain independent advice from appropriate sources. Information provided in the Bid Document to the Bidder(s) is on a wide range of matters, some of which may depend upon interpreting the law. The information given is not intended to be an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The SJVN, its employees and other associated agencies accept no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein. The SJVN, its employees and other associated agencies make no representation or warranty for the accuracy, adequacy, correctness, completeness or reliability, assessment, assumption, statement, or information in the Bid Document. They have no legal liability, whether resulting from negligence or otherwise, for any loss, damages, cost, or

expense that may arise from/ incurred/ suffered howsoever caused to any person, including any Bidder, on such account.

3.0 **Cost of Bid**

3.1 The Bidder shall bear all costs associated with the preparation and submission of the Bids. In no case, SJVN shall be responsible for these costs regardless of the conduct or outcome of the tendering process.

4.0 **Pre-Bid Meeting**

4.1 Sellers may submit their Pre-Bid queries/clarifications by email to elect.contracts@sjvn.nic.in, and the same must be received to SJVN (buyer) one (01) day before the scheduled pre-bid meeting date.

4.2 **Scheduled date of Pre-Bid Meeting is 26.08.2026 (11:00AM)**, the Pre-bid Meeting will be held through video conferencing.

4.3 Pre-bid meeting link is :
Join: https://teams.microsoft.com/meet/481450180766714?p=9MwrU2g3JL_O4ycRKOD

Meeting ID: 481 450 180 766 714

Passcode: at2CT2cm

Contact details of concerned persons:

Project Site:

Sh. Atul Harkut (Sr. Manager, Charanka SPS)-9736037717

Sh. Lavkush Kumar (JE, Charanka SPS)-8077381587- For Site Visit

Electrical Contracts Department, CHQ, Shimla

Sh. Dheeraj Kumar Singh (Manager, ECD)-9418403138/8219082238

5.0 **Pre-Bid Clarifications**

5.1 Bidder shall disclose/submit their queries, if any, on or before date specified in the Bid Document, enabling SJVN to clarify/resolve those queries in order to avoid taking of unscrupulous deviations by the Bidders while submitting/uploading their Bids.

5.2 The Bidders may submit their queries/clarification or modification to the Bid Document, if any, in writing at following email address by one day prior to date of Pre-Bid Meeting specified in the Bid Document:
elect.contracts@sjvn.nic.in

5.3 The Buyer will respond to any request for clarification or modification of the Bid Document in the Pre-Bid Meeting that it receives not later than the date of

Pre-Bid Meeting, Further, response of the Buyer will be published through modification in ATC by issuance of Corrigendum on GeM Portal, if required.

6.0 Amendments to Bid Document

6.1 At any time prior to the deadline for submission of Bid, SJVN may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder(s), modify the Bid Document, such amendment will be issued by modifying the “Buyer Added Bid Specific ATC”.

No press note will be released in this regard.

6.2 All such Amendments shall be integral part of Bid Document. SJVN shall bear no responsibility or liability arising out of non-receipt of the above in time by the Bidders.

6.3 In order to allow prospective Bidders reasonable time in which to take the amendment into account in preparing their Bids, SJVN, at its discretion, may extend the deadline for the submission and opening of the Bids.

7.0 Language of Bids

7.1 The Bid prepared by the Bidder and all correspondence & documents related to the Bid exchanged between Bidder and the buyer shall be written in English language. For cases where any documents/certificates are not in English Language, exact translation in English will have to be made & submitted duly certified by Notary public with one copy of Original. For purposes of interpretation, the English language copy of the documents shall govern.

8.0 Signing of Bid

8.1 Unless otherwise specified elsewhere in the Bid Document, each & every page of documents to be submitted along with the bid required to be signed by the official(s) who submits the bid on behalf of the bidder.

8.2 The bid/offer submitted by the bidder shall contain no overwriting, alterations, omissions, or additions, unless such corrections are initiated by the person or persons signing the Bid. Corrections if any shall only be made by scoring out the cancelled portion, writing the correction, initiating and dating it by the person or persons signing the Bid.

9.0 Prices

9.1 Unless otherwise specified in the Technical Specifications, bidders shall quote for the entire facilities on a “single responsibility” basis such that the

total bid price covers all the Contractor's obligations mentioned in or to be reasonably inferred from the Bid Document in respect of the design, manufacture, including procurement and subcontracting (if any), delivery and transportation, installation, commissioning, synchronisation with grid.

9.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bid Document.

9.3 The bidder has to submit Financial document wherein, prices for Supply and Installation part has to be quoted separately and their grand total including GST.

10.0 **Bid Offer Validity**

10.1 Bids shall remain valid for the period as specified in the Bid Document. A bid valid for a shorter period shall be rejected by the buyer being nonresponsive.

10.2 In exceptional circumstances, prior to expiry of the original bid validity period, SJVN may request the bidders to extend the period of bid validity for a specified additional period. The request and the responses thereto shall be made through GeM Portal. A bidder agreeing to the request will not be required or permitted to modify its bid. If bidder refuse to extend the period of bid validity, the bid of such bidder shall not be considered for further evaluation.

11.0 **Submission of Documents in Hard Copy / Physical Form**

(i) In addition to uploading of scanned copy in online bid, only following Document(s) is/are required to be submitted in the hard copy also:

(a) Earnest Money Deposit (EMD)/ Bid Security

(i) Hard copy should be reached in o/o HoD (Electrical Contracts) SJVN, Corporate Headquarter, Shakti Sadan, Shanan, P.O. Malyana, Shimla –171006 (H.P.) within one week of last date of bid submission. The sealed envelope shall be super-scribed with GeM tender no. and tender name.

12.0 **Taking Over Certificate**

Upon successful completion of entire Scope of Work by the contractor covered under the contract of this package, the Engineer-in-charge shall issue to the Contractor a Work Completion Certificate as a proof of the acceptance of the whole work. Such certificate shall not relieve the contractor of any of his obligations which otherwise survive, by the terms and conditions of the contract after issuance of such certificate.

13.0 **Bid Opening**

13.1 Bid Opening procedure shall be followed as per GeM Portal.

14.0 No Deviation Certificate

Bidder may note that Bid shall be submitted on the basis of “NO DEVIATION” and shall be in full compliance to the requirements of the Tender Document. The bids with deviations shall be considered as non-responsive and may be liable for rejection.

15.0 Evaluation of Bids

15.1 Preliminary Examination of Bids

- (i) The Buyer will examine the Bids to determine whether the same are complete, whether required documents have been furnished, whether the documents have been properly signed and whether the Bids are generally in order.
- (ii) Prior to the detailed evaluation, the Buyer will determine whether each bid is of acceptable quality, is complete, and is substantially responsive to the Bid Document.

A substantially responsive bid is one that conforms to all the terms, conditions and specifications of the Bid Document.

- (iii) The Buyer’s determination of a bid’s responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

15.2 Techno-commercial Evaluation

- i. The bids shall be determined to meet the minimum qualifying requirement. The determination will consider the Bidder’s financial, technical and past performance. It will be based upon the examination of the documentary evidence submitted by the bidder, in compliance to requirements specified in ATC Clause 1.0, as well as such other information as the Buyer deems necessary and appropriate.
- ii. In order to determine whether the technical aspects are in accordance with the requirements set forth in the Bid Document, the Buyer will carry out a detailed evaluation of the bids previously determined to be substantially responsive. In order to reach such a determination, the Buyer will examine and compare the technical aspects of the bids on the basis of the information supplied by the bidders.
- iii. Bidders may note that deviations, variations and additional conditions etc. found anywhere in the bid shall not be given effect to in evaluation & treated as deemed to be withdrawn and it shall also be assumed that the bidder complies to all the provisions & conditions of Bid Document, otherwise the bid Security/EMD of the bidder may be forfeited, and its bid shall liable to be rejected.

15.3 Price Bid Evaluation

Price Bids will be opened of all techno-commercial qualified bidders through GEM Portal. The buyer's price evaluation of a bid will take into account the Price quoted on GeM portal.

16.0 Award Criteria

16.1 The Buyer shall award the Contract to the L1 bidder whose offer has been determined to be the lowest as per GeM Portal and is substantially responsive to the Bid Document, provided further that the bidder is determined to be qualified to perform the Contract satisfactorily. The Letter of Award (LOA) shall constitute a contract agreement and no separate contract agreement shall be signed.

17.0 Clarification on Bids

17.1 During evaluation and comparison of bids, the Buyer may, at his discretion ask the bidder for clarification on its bid. The request for clarification shall be in writing and no change in prices or substance of the bid shall be sought, offered or permitted. No post bid clarification at the initiative of the bidder shall be entertained as all such clarifications would have been obtained prior to the submission of the bid.

17.2 If bidder fails to provide clarifications on the information requested by the Buyer within the stipulated time period as specified in the Bid Document, its bid may be evaluated based on the available data.

18.0 Submission of Documents with the bid

18.1 Each seller shall upload the following documents along with its Techno-Commercial bid:

- (i) Letter of Bid (Format-1 Provided in ATC)
- (ii) Valid supporting document for Financial Criteria Relaxations (ref. Clause 1.2 of ATC) and EMD Exemption to MSEs or Start ups (as applicable), as per GTC/ATC. In case the bidder is not seeking EMD exemptions, the scan copy of the EMD Forms as per ATC/GTC (Ref. Attachment-1).
- (iii) Integrity Pact (Ref. Attachment-2).
- (iv) OEM Certificate regarding the percentage of the local content and the details of locations at which the local value addition (Ref. Attachment-3).

- (v) Undertaking in Compliance to MoF, GOI order no. F. No. 6/18/2019-PPD, Dated 23.07.2020 and its subsequent amendments thereof (Ref. Attachment-4).
 - (vi) Documents to substantiate “Experience” under Minimum Qualifying Requirements specified above at ATC Clause 1.1 (Ref. Attachment-5).
 - (vii) Documents to substantiate “Financial Capacity” under Minimum Qualifying Requirements specified above at ATC Clause 1.2 (Ref. Attachment-6).
 - (viii) No Deviation Certificate (Ref. Attachment-7).
 - (ix) Quality Assurance Plan (Ref. Attachment-8).
 - (x) Form of Declaration Regarding Conflict of Interest (Ref. Attachment-9).
 - (xi) Related Party Declaration (Ref. Attachment-10)
 - (xii) Indemnity Bond (Ref. Attachment-11 (A&B))
 - (xiii) Determination of Idling time cost claim (Ref. Attachment-12)
 - (xiv) Undertaking i.r.o. Inverter as per clause 2.4.5.4 of Technical Specification along with documentary proof (Ref. Attachment-13)
- # (Any other additional information/Document(s) pertaining to this tender except price content, if any)

19.0 Integrity Pact

- 19.1 To improve transparency and fairness in the tendering process, the Buyer is implementing Integrity Pact. Integrity Pact is deemed as part of the contract so that the prospective bidders are bound by its provisions.
- 19.2 The Integrity Pact, signed by all the prospective Bidders and the Buyer, shall commit the persons/officials of both the parties, not to exercise any corrupt /fraudulent/collusive/coercive practices in the Tendering process and also during implementation of the Contract. Only those Bidders who have entered into Integrity Pact with the Buyer shall be eligible to participate in the bidding process. Bidders signing Integrity Pact shall not approach the Courts while representing the matters to IEMs and he/she will await their decision in the matter.
- 19.3 Entering into Integrity Pact as per Performa (enclosed) is a basic qualifying requirement. In case of JV, each partner of JV shall sign Integrity Pact with the Buyer. In case of sub-contracting, the principal contractor shall be responsible for adoption of Integrity Pact by the sub-contractor.

- 19.4 To oversee the compliance of obligation under the Integrity Pact, a panel of Independent External Monitor(s) (IEMs) have been appointed by concerned authority. The Contact address of IEMs are as under:

S.no	Name of IEMs	Address of IEMs
1	Sh. Manoj Pant, IFoS (Retd.)	House no. 70, Usha Colony, Sahastradhara Road, Dehradun-248013 (Uttarakhand), Email- mpant2007@gmail.com
2	Dr. Davendra Verma, ISS (Retd.)	604, Tower-14, Purvanchal Royal City, Chi V, Greater Noida, G. B. Nagar-201310, Uttar Pradesh Email- verma.davendra@gmail.com
3	Sh. Prashanta Kumar Agrawal, IPS (Retd.)	House no. 762, Sector-17, Faridabad (HR) 121002 Email- agrawal.prashanta@gmail.com

20.0 Scope

The scope of the work is provided under Section-II-Scope of Work/ Specification Document.

21.0 Contract(s)/ Contract Document(s)

Besides the Documents specified at Clause No. 5. of GeM GTC, the 'Specification Document' shall also be integral part of the Contract.

22.0 Contract/Purchase order

Contract shall mean the purchase order created / issued by the Buyer on GeM portal for the works incorporating supply and commissioning of Goods / Services in electronic form which includes scope of supply, delivery instructions and specifications etc. as ordered by Buyer against such Contract besides the subject GTC, STC/ATC as the case may be.

23.0 Applicable Laws & Jurisdiction

The Contract shall be interpreted and governed in all respects in accordance with the laws of Republic of India. All disputes in connection with or arising out of the Contract, shall be subject to the exclusive jurisdiction of the Courts of Shimla.

24.0 Order of Precedence

In case of any contradiction in any of the terms & conditions to the extent that the two provisions cannot co-exist, the order of precedence, unless otherwise agreed by both of the party (i.e. Buyer & Seller), shall be taken in the order set out below:

- (i) Contract generated through GeM Portal.
- (ii) Bid specific Additional Terms and conditions (ATC).
- (iii) Specification Document.
- (iv) Bid submitted by the seller.
- (v) GeM General Terms & Conditions (GTC)

25.0 Notices

25.1 Any notice given by one party to the other pursuant to the Contract shall be in writing. The term “in writing” means communicated in written form with proof of receipt.

25.2 A notice shall be effective when delivered or on the notice’s effective date, whichever is later.

26.0 Settlement of Disputes

Refer GeM GTC Clause 16.0 [Dispute resolution between the buyer and the seller / service provider]. However, in the event of any dispute or difference relating to the interpretation and application of the of the provision of commercial contract (s) between Central Public sector Enterprise (s)/Port Trusts inter se and also between CPSEs and Governmental Departments/Organizations (Excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through Administrative Mechanism for Resolution of CPSEs Disputes (AMRCD).

27.0 Contractor’s Responsibilities

27.1 The Contractor shall design, manufacture, tests, supply, transport, installation, commissioning, synchronization with grid, etc., the goods (including associated purchases and/or subcontracting), with due care and diligence in accordance with the Contract.

27.2 The Contractor shall acquire in its name all permits, approvals and / or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located that are necessary for the performance of the Contract, including, without limitation,

visas for the Contractor's and Sub Contractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Buyer and that are necessary for the performance of the Contract. However, if law requires the Buyer to obtain any permit/license in the Buyer's name and are necessary for the execution of the Contract, the same shall be acquired by the Buyer.

- 27.3 The contractor shall comply with the provisions of GST Act 2017 regarding declaration of goods in e-way bill when the consignment is transported by road in a motorized conveyance and the consignment value is more than Rs. 50,000/-.

28.0 **Buyer's Responsibilities**

- 28.1 The Buyer shall ensure the accuracy of all information and/or data to be supplied by the Buyer, except when otherwise expressly stated in the Contract.
- 28.2 The buyer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way.
- 28.3 If requested by the Contractor, the Buyer shall use its best endeavours to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals and/or licenses necessary for the execution of the Contract from all local, state or national government authorities or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.

29.0 **Contract Price**

The Contract Price shall mean the total price mentioned in the purchase order/contract created / issued by the Buyer on GeM in electronic form.

30.0 **Contract Performance Guarantee**

- 30.1 The Contractor shall, within twenty-eight (28) days of the notification of contract award, provide a Performance Security for the due performance of the Contract for an amount equivalent to 5% (Five percent) of Contract price with a validity up to 60 days beyond the end of warranty period (warranty period mentioned in Specification period).

In case the Seller fails to submit the Performance Security and/or any additional Performance Security within the stipulated period as per provision(s) of the Contract, the Buyer, without prejudice to its other

remedies under the contract, interest shall be chargeable on per day basis on the amount of CPG/PSD @ SBI MCLR as on date of bid submission +200 basis point for delayed period on the amount of such Performance Security.

- 30.2 The proceeds of the Performance Security shall be payable to the Buyer as compensation for any loss resulting from the Contractor's failure to complete its obligations under the Contract.
- 30.3 The security shall be denominated in the currency of the Contract and shall be in the forms of an irrevocable bank guarantee as per Format-2 provided in the ATC or in any other form acceptable to the Buyer. The BG should be issued by Reputed Bank/Public Sector Bank/ Nationalized Bank/Scheduled Bank located in India.
- 30.4 All the Bank Guarantees shall also be transmitted through SFMS Gateway by the issuing Bank to the designated Bank of SJVN as detailed out below:

(i)	Name of the Beneficiary and his Details	SJVN Limited Corporate Head Office, Shakti Sadan, Shanan Shimla Himachal Pradesh-171006
(ii)	Beneficiary IFSC	SBIN0063985
(iii)	Beneficiary Branch Name and Address	State Bank of India, Shimla (H.P.)
(iv)	Account Number	10835926299

31.0 Taxes and Duties

Refer GTC Clause 8 [Duties & Taxes] of GeM 4.0 (Version1.14) dt. 31.01.2024

32.0 Effective Date

The effective date shall be from the date of issuance of GeM contract. Effective date shall constitute the beginning of Contractor's contractual obligation and will be considered for all purposes and intents.

33.0 Copyright

The copyright in all drawings, documents and other materials containing data and information furnished to the Buyer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Buyer directly or through the Contractor by any third party, including contractors of materials, the copyright in such materials shall remain vested in such third party.

The buyer shall however be free to reproduce all drawings, documents and other material furnished to buyer for the purpose of contract including, if required, for operation and maintenance.

34.0 Confidential Information

34.1 The Buyer and the Contractor shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party, any documents, data or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Sub Contractor(s) such documents, data and other information it receives from the Buyer to the extent required for the Sub Contractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Sub Contractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this Clause.

34.2 The Buyer shall not use such documents, data and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data and other information received from the Buyer for any purpose other than the design, procurement of goods as are required for the performance of the Contract.

35.0 Engineer-in- Charge/EIC

Sh. Atul Harkut (Sr. Manager, Charanka Solar Power Station) shall be EIC for this work. The Buyer may from time to time appoint some other person as the EIC in place of the person previously so appointed, and shall give a notice of the name of such other person to the Contractor without delay. The EIC shall represent and act for the Buyer at all times during the currency of the Contract. All notices, instructions, orders, certificates, approvals and all other communications under the Contract shall be given by the EIC, except as herein otherwise provided. All notices, instructions, information and other communications given by the Contractor to the Buyer under the Contract shall be given to the EIC, except as herein otherwise provided.

36.0 Defect Liability

Refer Clause 2.20 of Section-II-Scope of Work/ Technical Specification Document.

37.0 Insurance

Refer Clause 2.23 of Section-II-Scope of Work/ Technical Specification Document.

38.0 Force Majeure

38.1 “Force Majeure” shall mean any event beyond the reasonable control of the Buyer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:

- (i) war, hostilities or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy and civil war,
- (ii) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion and terrorist acts,
- (iii) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority,
- (iv) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague,
- (v) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster,
- (vi) shortage of labour, materials or utilities where caused by circumstances that are themselves Force Majeure

38.2 If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.

38.3 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GeM GTC clause no. 15.

- 38.4 The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfil its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under ATC Sub-Clauses 39.0 [Termination].
- 38.5 No delay or non-performance by either party hereto caused by the occurrence of any event of Force Majeure shall constitute a default or breach of the Contract give rise to any claim for damages or additional cost or expense occasioned thereby if and to the extent that such delay or non-performance is caused by the occurrence of an event of Force Majeure.
- 38.6 If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of one or more events of Force Majeure during the currency of the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which the dispute will be resolved in accordance with ATC Clause 26.0 [Settlement of Disputes].
- 38.7 Notwithstanding ATC Sub-Clause 38.5, Force Majeure shall not apply to any obligation of the Buyer to make payments to the Contractor herein.

39.0 Termination

39.1 Termination for Contractor's Default

The Buyer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefor to the Contractor, referring to this ATC Sub-Clause 39.1 [Termination for Contractor's Default]:

- (i) if the Buyer determines that the Contractor has engaged in corrupt, fraudulent, collusive coercive, or obstructive practices, in competing for or in executing the Contract, then the Buyer may, after giving 14 days' notice to the Contractor, terminate the Contractor's employment under the Contract.
- (ii) if the Contractor has abandoned or repudiated the Contract
- (iii) if the Contractor persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause
- (iv) if the Contractor refuses or unable to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Buyer pursuant to GeM GTC Clause no. 15.

In the event the Buyer terminates the Contract in whole or in part, pursuant to ATC Clause 39.1, the Buyer may procure, upon such terms and in such manner as it deems appropriate, goods similar to those undelivered or not performed, and the Contractor shall be liable to the Buyer for any additional costs for such similar Goods. However, the Contractor shall continue performance of the Contract to the extent not terminated.

39.2 In pursuant to Clause 39.1 [Termination for Contractor's Default], the Buyer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Buyer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this ATC Sub-Clause 39.2

39.3 Upon receipt of the notice of termination under ATC Sub-Clauses 39.1 or 39.3, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

- (i) cease all further work, except for such work as the Buyer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed,
- (ii) deliver to the Buyer the Goods manufactured by the Contractor up to the date of termination,
- (iii) to the extent legally possible, assign to the Buyer all right, title and benefit of the Contractor to the Goods as of the date of termination, and, as may be required by the Buyer,
- (iv) deliver to the Buyer all drawings, specifications and other documents prepared by the Contractor or its Sub Contractors as of the date of termination in connection with the Facilities.

39.4 Termination for Convenience.

- (i) The Buyer, by notice sent to the Contractor, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Buyer's convenience, the extent to which performance of the Contractor under the Contract is terminated, and the date upon which such termination becomes effective.
- (ii) The Goods that are complete and ready for shipment within twenty-eight (28) days after the Contractor's receipt of notice of termination

shall be accepted by the Buyer at the Contract terms and prices. For the remaining Goods, the Buyer may elect:

- (a) to have any portion completed and delivered at the Contract terms and prices; and/or
- (b) to cancel the remainder and pay to the Contractor an agreed amount for partially completed Goods and for materials.

The Contractor shall also deliver to the Buyer all drawings, specifications and other documents prepared by the Contractor or its Sub Contractors as of the date of termination in connection with the Facilities.

No Cognizance will be given to the early delivery and installation.

40.0 Completion Period

- 40.1 The entire scope of supply and works under this contract shall be completed within 90 days from date of issuance of Letter of Award

41.0 Liquidated Damages

- 41.1 The time period for completion of entire scope of work as stipulated above shall be deemed to be the essence of the contract. If the Contractor fails to complete any or all of the work within the period(s) specified in the Contract, the Buyer, without prejudice to its other remedies under the Contract, shall be entitled to recover from the Seller agreed Liquidated Damages, and not by way of penalty a sum equivalent to 0.50% per week of the delay or part thereof on the Contract price. Once the maximum is reached, the Buyer may consider termination of the Contract pursuant to ATC Clause 39.1 [Termination for Contractor's Default].
- 41.2 The total amount of Liquidated Damages for delay under the Contract shall be subject to a maximum of ten percent (10%) of the Contract Price.
- 41.3 The amount of Liquidated Damage shall be payable by the Contractor whenever demanded by the Buyer and/or Buyer can recover the amount of Liquidated Damages (to the extent leviable at any time) from the amount payable to the Contractor/bank guarantees available with Buyer under this Contract.

42.0 Price Adjustment

Not applicable being "FIRM" Price Contract. A bid submitted with an adjustable price offer / proposal will be treated as non- responsive and rejected.

43.0 Payment Terms

The payment shall be released within 30 days in the following manner on submission of requisite documents as detailed below:

43.1 40% (Forty percent) of Gross total Price of work mentioned at No. 3 of the Price Schedule along with 100% GST for price of item mentioned at No. 1 shall be paid after quality inspection of manufactured item by the Employer before dispatch of material from manufacturer's work on production of the following:

- (i) Application of payment along with three (3) copies of GST Invoice.
- (ii) Material Dispatch Clearance Certificate (MDCC) issued by the Employer, wherever applicable as per relevant clause(s) of this Bid Document.
- (iii) Submission of Packing list identifying contents of each package as per Clause No. 2.8 of specification document.
- (iv) Indemnity Bond as per Clause No. 2.11.6 of specification document.
- (v) Insurance certificate(s) as per Clause No. 2.23 of specification document.
- (vi) Submission of Guarantee/ Warranty Certificate issued by the Contractor/ OEM.
- (vii) Submission of Certificate that all applicable laws and regulations have been adhered to, payments have been released timely to the sub-contractors/ supplies/ workers and supporting records shall be maintained and can be produced during audit.

The above documents shall be submitted by the Contractor to the Employer within six (06) days from the issue of MDCC to the contractor. The Contractor will be responsible for any consequent expenses due to delay in furnishing the above documentation.

43.2 40% (Forty percent) of Gross total Price of work mentioned at No. 3 of the Price Schedule shall be paid on receipt of supply of inverter and allied components by the Employer at project site on production of following:

- (i) Application of payment along with three (3) copies of GST Invoice.
- (ii) Proof of Dispatch: Railway receipt/Consignment note /original goods receipt etc.
- (iii) Insurance certificate(s) as per Clause No. 2.23 of specification document.
- (iv) Physical Verification & discrepancy report by SJVN Limited for

the equipment/material received and stored at site. Payment shall be released after making adjustment of discrepancies only.

(v) Submission of Certificate to the effect that Payment(s) claimed conform the Terms and Conditions of the Contract Agreement and that said payment(s) had not been claimed earlier.

(vi) Submission of Certificate that all applicable laws and regulations have been adhered to, payments have been released timely to the sub-contractors/ supplies/ workers and supporting records shall be maintained and can be produced during audit.

43.3 Remaining 20% (Twenty percent) of Gross total Price of work mentioned at No. 3 of the Price Schedule along with 100% GST for item mentioned at No. 2 shall be paid on successful installation, testing, commissioning, synchronization with grid and final acceptance of the entire inverter system at site and on production of the following:

- (i) Application of payment along with three (3) copies of GST Invoice.
- (ii) Submission of Completion and other Reports.
- (iii) Physical Verification & discrepancy report by SJVN Limited for the equipment/material received and stored at site. Payment shall be released after making adjustment of discrepancies only.
- (iv) Submission of Certificate that all applicable laws and regulations have been adhered to, payments have been released timely to the sub-contractors/ supplies/ workers and supporting records shall be maintained and can be produced during audit.
- (v) Issuance of Work Completion Certificate by the Employer.

45.0 Structural Finance Messaging System (SFMS)

45.1 In case the seller submits the EMD in the form of Bank Guarantee, the same shall be transmitted through SFMS Gateway by the issuing Bank to the designated Bank of SJVN, details of which is as below:

- (i) Name of Bank : State Bank of India
- (ii) Account Name : SJVN Limited
- (iii) Account Number : 10835926299 (current account)
- (iv) IFSC Code : SBIN0063985

45.2 The Performance Bank Guarantee (PBG) shall also be transmitted through SFMS Gateway by the issuing Bank to the designated Bank of BUYER as detailed out above at ATC Clause 30.1.

45.0 Extension of Time for Completion

The Completion period specified pursuant to ATC Clause 40.1 shall be extended if the Contractor delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

- (a) any Variation/Change in the scope as provided in ATC Clause 47, or
- (b) any occurrence of Force Majeure, or
- (c) any changes in laws and regulations by Govt. that affects completion time, or
- (d) any default or breach of the Contract by the Buyer, or any activity, act or omission of the Buyer, or the EIC, or any other contractors employed by the Buyer, or
- e) delays attributable to the Buyer on account of any authority, or
- f) any other matter specifically mentioned in the Contract by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

Except where otherwise specifically provided in the Contract, the Contractor shall submit to the EIC a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Buyer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Buyer's estimate of a fair and reasonable time extension, the Contractor shall be entitled to refer the matter under "Settlement of Disputes" (clause no. 26 of ATC).

The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract. In all cases where the Contractor has given a notice of a claim for an extension of time, the Contractor shall consult with the EIC in order to determine the steps (if any) which can be taken to overcome or minimize the actual or anticipated delay. The Contractor shall there after comply with all reasonable instructions which the EIC shall give in order to minimize such delay. If compliance with such instructions shall cause the Contractor to incur extra costs and the Contractor is entitled to an extension of time, the amount of such extra costs shall be added to the Contract Price. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delays due to such failures shall not be considered in assessing the time extension.

In the event of extension of Time for Completion granted pursuant to ATC 45 (d) under the Contract, the Contractor shall be entitled of cost towards idling of Contractor's resources as per the Attachment-12: Valuation of Idling Time cost claims.

46.0 Transportation

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	21 of 51
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- 46.1 The Contractor shall at its own risk and expense transport all the materials/goods to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.
- 46.2 Upon dispatch of each shipment of materials/goods and Contractor shall notify the Buyer by telex, cable, facsimile or electronic means, of the description of the materials at the Site.
- 46.3 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the materials to the Site. The Buyer shall use its best endeavours in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Buyer from and against any claim for damage to roads, bridges or any other traffic facilities that may be caused by the transport of the materials/goods.

After unpacking of Goods the packing material shall become the property of Buyer.

The contractor shall transport the contracted plant and equipment/ supplies through registered common carriers only and shall follow Road Act 2007.

- 46.4 The contractor shall also refer clause 2.9 of Specification document.

47.0 Variation/ Change

- 47.1 The Buyer shall have the right to propose, and subsequently require, that the EIC order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the original scope hereinafter called "Change", provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.
- 47.2 The Contractor may from time to time during its performance of the Contract propose to the Buyer with a copy to the EIC, any Change that the Contractor considers necessary or desirable to improve the quality, efficiency or safety of the system. The Buyer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Buyer shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.
- 47.3 If the Buyer proposes a Change, it shall send to the Contractor a "Request for Change Proposal," requiring the Contractor to prepare and furnish to the EIC as soon as reasonably practicable a "Change Proposal," which shall include the following:
- (a) brief description of the Change
 - (b) effect on the Time for Completion
 - (c) estimated cost of the Change

- 47.4 Prior to preparing and submitting the “Change Proposal,” the Contractor shall submit to the EIC an “Estimate for Change Proposal,” which shall be an estimate of the cost of preparing and submitting the Change Proposal.

Upon receipt of the Contractor’s Estimate for Change Proposal, the BUYER shall do one of the following:

- (a) accept the Contractor’s estimate with instructions to the Contractor to proceed with the preparation of the Change Proposal
 - (b) advise the Contractor of any part of its Estimate for Change Proposal that is unacceptable and request the Contractor to review its estimate
 - (c) advise the Contractor that the Buyer does not intend to proceed with the Change.
- 47.5 Upon receipt of the Buyer’s instruction to proceed, the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal.
- 47.6 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the Parties thereto shall agree on specific rates for the valuation of the Change.
- 47.7 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor would be to increase or decrease the Contract Price as originally set forth in GeM contract by more than fifteen percent (15%), the Contractor may give a written notice of objection thereto prior to furnishing the Change Proposal as aforesaid. If the Buyer accepts the Contractor’s objection, the Buyer shall withdraw the proposed Change and shall notify the Contractor in writing thereof.
- 47.8 Upon receipt of the Change Proposal, the Buyer and the Contractor shall mutually agree upon all matters therein contained. Within fourteen (14) days after such agreement, the Buyer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.
If the Buyer is unable to reach a decision within fourteen (14) days, it shall notify the Contractor with details of when the Contractor can expect a decision.
If the Buyer decides not to proceed with the Change for whatever reason, it shall, within the said period of fourteen (14) days, notify the Contractor accordingly. Under such circumstances, the Contractor shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the Change Proposal, provided that these do not exceed the amount given by the Contractor in its Estimate for Change Proposal submitted.
- 47.9 If the Buyer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters identified in the Change Proposal, the Buyer may nevertheless instruct the Contractor to proceed with the Change by issue of a “Pending Agreement Change Order.”
Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The

Parties shall thereafter attempt to reach agreement on the outstanding issues under the Change Proposal.

If the Parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred under “Settlement of Disputes” (clause no. 26 of ATC).

Attachments & Formats

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN’s Charanka Solar Power Station (5.6 MWp)	24 of 51
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Format-1

Letter of Bid

**Ref No. [*Insert your Reference No.*]
xx.xx.2026**

Dated:

To,

SJVN Limited,

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	25 of 51
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Electrical Contracts Department,
Corporate Head Quarter, Shakti Sadan,
SJVN Ltd., Shanan, Shimla

Subject: Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp) (Bid Number: GEM/2026/B/xxxxxx)

Sir,

- 1.0 I have carefully read and understood all the terms and conditions of the Bid Document issued by BUYER Limited ("the Buyer") vide **Bid Number: GEM/2026/B/xxxxxx** in conjunction with its subsequent Amendment(s)/ Clarification(s)/ Addenda/Errata/ Corrigendum(s), if any, and undertake to abide by them;
- 2.0 The information/documents furnished by undersigned along with the above Bid are true and authentic to the best of my knowledge and belief. I / we, am / are well aware of the fact that furnishing of any false information/fabricated document would lead to rejection of my tender at a
- 3.0 ny stage besides liabilities towards prosecution under appropriate law.
- 4.0 We [*Insert name of the Firm/Agency/Bidder*] undertake, if our bid is accepted, to commence the work/services immediately after issuance of the Contract through GeM in electronic form as per provisions mentioned therein, and to achieve Completion of Works/services within the time stated in the Bid Document.
- 5.0 We [*Insert name of the Firm/Agency/Bidder*] undertake that we have not submitted more than one bids against the subject cited invitation. We also undertake that we have not joined hands with related parties such as associated firms/partners for submitting the bid in different names.
- 6.0 We, [*Insert name of the Firm/Agency/Bidder*], undertake that we are not blacklisted by any PSUs/Central/State Govt./Govt. local bodies as on date and also have not been banned /de-listed/black listed/debarred from business by Ministry of Power, Government of India/any PSU/any Government Department during last 03 (three) years on grounds of corrupt/fraudulent practices and/or by Ministry of Power, Government of India/BUYER on any grounds.
- 7.0 We, [*Insert name of the Firm/Agency/Bidder*], undertake that our offer/bid is in total compliance with the terms and conditions of Bid Document, without any deviation.

- 8.0 We *[Insert name of the Firm/Agency/Bidder]* understand that if we fail to furnish documentary evidence establishing the Qualifying Criteria and also understand that failure to furnish all information required as per Bid Document or submission of bid not substantially responsive to the Bid Document in every respect will be at our risk and may be liable for rejection.
- 9.0 We understand that you are not bound to accept the lowest or any bid you may receive. We acknowledge the right of the Buyer to reject our Bid without assigning any reason or otherwise and hereby waive our right to challenge the same on any account whatsoever.
- 10.0 We understand that you may annul the bidding process and reject all bids or accept or reject any of the bids at any time and that you are neither bound to accept any bid that you may receive nor to invite the Bidders to bid for Works, without incurring any liability to all or any of the Bidders.
- 11.0 We agree and understand that the Bid is subject to the provisions of the Bid Document. In no case, we shall have any claim or right of whatsoever nature if the Works is not awarded to us or our Bid is not opened.

Date.....

Place.....

(Name & Signature of Authorised
Representative with Seal/Stamp of
Company)

Attachment-1

Note: The Bidder may note that no prescribed proforma have been provided for this attachment.

The Bidder is required to upload scan Copy of EMD of requisite value as per ATC/GTC or In case, the bidder seeks EMD Exemption under GTC Clause 4(xiii)(m), a valid supporting document for EMD Exemption

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	27 of 51
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Integrity Pact

The Bidder is required to submit duly signed copy of the Integrity Pact

The Integrity pact comprises following:

- Integrity Pact duly signed between Buyer and the Bidder.
- Guidelines on banning of Business Dealing
- Undertaking (Form of Declaration of Eligibility)

Note: The Bidder may note that the proforma for Integrity Pact is provided with ATC separately.

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	28 of 51
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Self-Certification under Preference to “MAKE IN INDIA” Policy

(On the letter head of the Equipment Manufacturer)

In line with Government Public Procurement Order No. P-45021/2/2017-PP(BE-II) dated 04.06.2020 and its amendments along with clarifications/amendments and other references as issued from time to time applicable as on the date of submission of tender/bid, we hereby certify that we, ...[Insert name of the Firm/Agency/Bidder].....are local contractor meeting the requirement of minimum Local Content as per below declaration as defined in above orders/circulars/clarifications/amendments for the material/item(s)/service offered against Tender No.[Insert Bid/Tender Number along with date]..... .

- (i) The total value of local content addition/manufacturing is%
- (ii) Details of location(s) at which local value addition will be made is as follows:
.....
- (iii) Details of cost of locally sourced imported items (inclusive of taxes) along with break-up on license/royalties paid/technical expertise cost etc. sourced from outside India.

We also understand, false declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rule for which for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

Date.....

Place.....

(Name & Signature of Authorized
Representative with Seal/Stamp of
Company)

Note:

In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020.

Attachment-4

**Undertaking in Compliance of Ministry of Finance, Government of India Order
No F. No. 6/18/2019-PPD, Dated 23.07.2020 and its subsequent amendments
thereof**

(On the letter head of the Seller/Bidder)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries.

I certify that [*Insert name of the Firm/Agency/Bidder*]....., is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that [*Insert name of the Firm/Agency/Bidder*].....fulfils all requirements in this regard and is eligible to be considered.

Note: - Evidence of valid registration by the Competent Authority shall be attached (if applicable)

Date.....

Place.....

(Name & Signature of Authorised
Representative with Seal/Stamp of
Company)

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	30 of 51
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Attachment-5**Schedule for Minimum Qualifying Requirements**

(For the bidders who are seeking qualification under ATC Clause 1.1(a) and 1.1 (b)

To,

SJVN Limited,
Electrical Contracts Department,
SJVN Corporate Office Complex, Shakti-Sadan, Shanan, Shimla

Sir,

We[Insert name of the Firm/Agency/Bidder]..... hereby submit our particulars in compliance to ATC Clause 1.1(a), 1.1 (b) and 1.1(c) of ... [Insert GeM Bid No.].... along with supporting Documents:

Sl. No.	Subject of awarded LOA/WO/PO	Name of Firm Issuing LOA/WO/PO	Reference no. and Date of LOA/WO/PO	Value of LOA/WO/PO in Rs.	Reference no. and Date of Completion Certificate	Reference no. and Date of Certificate for Successful Operation
1.						
2.						
3.						
4.						

Date.....

Place.....

(Name & Signature of Authorised
Representative with Seal/Stamp of
Company)

Remarks:

- Additional Rows may be added for seeking qualification under ATC Clause 1.1(a), 1.1(b) and 1.1(c).

Notes:

- (i) Copies of Letter of award/Work Order/Purchase Order along with Completion Certificate and Certificate of Successful Operation shall have to be provided against ATC Clause 1.1(a), 1.1(b) and 1.1(c) and details should be provided in this Attachment-5.

Attachment-6**Schedule for Minimum Qualifying Requirements**

(For the bidders who are seeking qualification under ATC Clause 1.2)

To,

SJVN Limited,
Corporate Head Quarter, Shakti Sadan,
SJVN Ltd., Shanan, Shimla

Sir,

We[Insert name of the Firm/Agency/Bidder]..... hereby submit following particulars in compliance to ATC Clause 1.2 of ... [Insert GeM Bid No.].... along with documentary evidences:

Sl. No.	Description	FY 2022-23	FY 2023-24	FY 2024-25
1.	Annual Turnover (in INR)			
2.	Average Annual Turnover during the last 3 years, ending 31st March, 2025 (in INR)			

Date.....

Place.....

(Name & Signature of Authorised
Representative with Seal/Stamp of
Company)

Notes:

- (i) Audited Balance Sheets, Profit & Loss Accounts, the schedules and other Financial Statements of the immediately preceding 3 (three) Financial years of the Bidder should be furnished by the Bidder.
- (ii) In case where Audited financial results for the immediately preceding financial year are not available, then a certificate from chartered accountant certifying turnover shall be submitted.

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	32 of 51
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No Deviation Certificate

To

[Address of Tender Inviting Authority]

Dear Sir,

SUB: NO DEVIATION CERTIFICATE REGARDING NOTICE INVITING TENDER FOR “Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Inverters having capacity of 1 MW (AC) each for SJVN’s Charanka Solar Power Station (5.6 MWp)”

Dear Sir,

We, [Bidder’s name], confirm our acceptance to all terms and conditions mentioned in the Bid Document Ref No _____ dated _____ including all subsequent clarifications/ amendment /addendum/corrigendum(s), in totality and withdraw all deviations raised by us, if any.

.....
(Seal & Signature of the
Bidder)

Place:

Date:

Quality Assurance Plan

To,
 SJVN Limited,
 Corporate Head Quarter, Shakti Sadan,
 SJVN Ltd., Shanan, Shimla

Dear Sirs,

- 1.0 We[*Insert name of the Bidder*]... hereby confirm that, we will follow Quality Assurance Programme as per/ required in Specification Document containing overall Quality Management and Procedures, which we propose to follow during various phases of execution of the Contract.

Date.....

Place.....

(Name & Signature of Authorised
 Representative with Seal/Stamp of
 Company)

(To be executed on plain paper at the time of submission of bid and on Non-judicial stamp paper of appropriate value by successful bidder (Contractor) prior to signing of Contract Agreement)

FORM OF DECLARATION REGARDING CONFLICT OF INTEREST

UNDERTAKING

I / We, M/s(Name of Bidder) hereby declare following information i.r.o. 2.11 of Integrity Pact (ATC Clause No. 19.0) ;

- 1.)
- 2.)
- 3.)

Date.....

Place.....

(Name & Signature of Authorised
Representative with Seal/Stamp of
Company)

Note: Proforma of Integrity Pact is attached with ATC.

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	35 of 51
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Attachment-10

Related Party Declaration by Bidder

(On the letterhead of the Seller/Bidder)

I/We hereby declare that I/We have read and understood the provisions of **Section 2(76) of the Companies Act, 2013**, read with the relevant Rules framed thereunder, and **Indian Accounting Standard (Ind AS)-24 – Related Party Disclosures**.

Accordingly, I/We hereby certify the details of Related Parties, if any, in compliance with participation in the tender invited by SJVN Limited vide..... [Insert GeM Bid No.]
.....

Details of related Party are hereunder:

Sl.	Name of Related Party	Nature of Relationship (Director / KMP / Relative / Entity, etc.)	Brief Description
1.			
2.			
3.			
4.			
5.			

I/We further undertake that:

- The above declaration is true and correct to the best of my/our knowledge.
- Any change in the above particulars during the currency of the tender / contract shall be **promptly intimated in writing** to SJVN Limited.
- I/We understand that **submission of false or misleading information** may lead to rejection of the bid / termination of contract and other action as deemed fit by SJVN Limited.

ATTACHMENT-11 (A)

**FORM OF INDEMINITY BOND TO BE EXECUTED BY THE
CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN
INSTALMENTS BY THE EMPLOYER FOR PERFORMANCE OF ITS
CONTRACT**

(Equipment handed over in installments)

(On non-judicial stamp paper of appropriate value)

INDEMINITY BOND

THIS INDEMINITY BOND is made this..... day of
.....20..... by(Contractor's
Name) a Company registered under the Companies Act, 1956/Partnership
firm/Proprietary concern having its Registered Office at
.....(hereinafter called as 'Contractor' or Obligor"
which expression shall include its successors and permitted assigns) in
favour of SJVN Ltd., a Company incorporated under the Companies Act,
1956 having its Registered Office at SJVN Corporate Head Quarter,
Shanan, Shimla- 171006 (India)and its project at
.....(hereinafter called "SJVNL" which expression shall include
its successors and assigns) :

WHEREAS SJVN Ltd has awarded to the Contractor a Contract for
..... vide its Notification of Award/Contract
No..... dated and its Amendment
No.....and Amendment No.....(applicable
when amendments have been issued)(hereinafter called the Contract") in
terms of which SJVN Ltd is required t handover various Equipments to the
Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No..... of the said Contract,
the Contractor is required to execute an Indemnity Bond in favour of SJVN
Ltd for the Equipments handed over to it by SJVN Ltd for the purpose of
performance of the Contract/Erection portion of the contract(hereinafter
called the 'Equipments")

NOW THEREFORE, This Indemnity Bond witnessed as follows:

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	37 of 51
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1. That in consideration of various Equipments as mentioned in the Contract, valued at (Currency and amount in Figures)(Currency and amount in words)..... handed over to the Contractor in installments from time to time for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep SJVN Ltd indemnified, for the full value of the Equipments. The Contractor hereby knowledge's actual receipt of the initial installment of the Equipment etc. as per details in the Schedule appended hereto. Further, the Contractor agrees to acknowledge actual receipt of the subsequent installments of the Equipments etc. as required by SJVN Ltd in the form of Schedules consecutively numbered which shall be attached to this Indemnity Bond as to form integral parts of this Bond. It is expressly understood by the Contractor that handing over of the dispatch title documents in respect of the said Equipments duly endorsed by SJVN Ltd in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipments etc. in trust as a "Trustee" for and on behalf of SJVN Ltd.

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at SJVN Ltd project site against all Contractor risks whatsoever till the Equipments are duly used/erected in accordance with the terms of the Contract and the plant/package duly erected and commissioned in accordance with the terms of the Contract is taken over by SJVNL. The Contractor undertakes to keep SJVN Ltd harmless against any loss or damage that may be caused to the Equipments.

3. The Contractor undertakes that the Equipments shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilized for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.

4. That SJVN Ltd is and shall remain the exclusive Employer of the equipments free from all encumbrances, charges or liens of any kind, whatsoever. The Equipments shall at all times be open to inspection and checking by the Project Manager or other employees/agents authorized by him in this regard. Further, SJVN Ltd shall always be free at all times to take possession of the Equipments in whatever form the Equipments may be, if

in its opinion, the equipments are likely to be endangered, misutilised or converted to uses other than those specified in the contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of SJVN Ltd to return the Equipments without any demur or reservation.

5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipments or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Project Manager of SJVN Ltd as to assessment of loss or damage to the Equipment shall be final and binding of the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipments at its own cost and/or shall pay the amount of loss to SJVN Ltd without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to SJVN Ltd against the Contractor under the Contract and under this Indemnity bond.
6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of SJVNL, THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day month and year first above mentioned.

SCHEDULE

Particulars of the equipments handed over	Quantity	Particulars of Value Dispatch title Documents		Value of the Equipments	Signatures of Attorney in token of receipt.
		RR/GR/Bill of lading No. & Date	Carrier		

(Please number subsequent schedules)

For and on behalf
of.....
(Contractor's Name)

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	39 of 51
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(Signature).....

(Name).....

Designation of Authorized representative

(Common Seal)

(In case of Company)

WITNESS:

1. 1. Signatures.....

2. Name.....

3. Address.....

2. 1. Signatures.....

2. Name.....

3. Address.....

Indemnity Bond are to be executed by the authorized person and (i) In case of contracting Company under common seal of the Company or (ii) having the Power of Attorney issued under common seal of the company with authority to execute Indemnity Bond, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond

**FORM OF INDEMINITY BOND TO BE EXECUTED BY THE CONTRACTOR
FOR THE EQUIPMENT HANDED OVER IN ONE LOT BY THE
EMPLOYER FOR PERFORMANCE OF ITS CONTRACT**

(Equipment handed over in one lot)

(On non-judicial stamp paper of appropriate value)

INDEMINITY BOND

THIS INDEMINITY BOND is made this..... day of
.....20..... by(Contractor's
Name) a Company registered under the Companies Act, 1956/Partnership
firm/Proprietary concern having its Registered Office at
.....(hereinafter called as 'Contractor' or Obligor"
which expression shall include its successors and permitted assigns) in
favour of SJVN Ltd , a Company incorporated under the Companies Act,
1956 having its Registered Office at SJVN Corporate Head Quarter,
Shanan, Shimla- 171006 (India) and its project at
.....(hereinafter called "SJVN Ltd" which expression shall
include its successors and assigns) :

WHEREAS SJVN Ltd has awarded to the Contractor a Contract for
..... vide its Notification of Award/Contract
No..... dated and its Amendment
No.....and Amendment No.....(applicable
when amendments have been issued)(hereinafter called the Contract") in
terms of which@ is required to handover various
Equipments to the Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No..... of the said Contract,
the Contractor is required to execute an Indemnity Bond in favour of
..... @..... for the Equipments handed over to it by SJVN
Ltd for the purpose of performance of the Contract/Erection portion of the
contract(hereinafter called the 'Equipments")

AND THEREFORE, This Indemnity Bond witnessed as follows:

- 1 That in consideration of various Equipments as mentioned in the
Contract, valued at (Currency and amount in Figures)
.....(Currency and
amount in words)..... handed over

to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep SJVN Ltd

indemnified, for the full value of the entire Equipment. The Contractor hereby acknowledges actual receipt of the Equipment etc. as per dispatch title documents handed over to the Contractor duly endorsed in their favour as detailed in the Schedule appended hereto. It is expressly understood by the contractor that handing over of the dispatch title documents in respect of the said Equipments duly endorsed by SJVN Ltd in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipment etc. in trust as a "Trustee" for and on behalf of SJVNL.

- 2 That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at SJVN Ltd project site against all contractors risks whatsoever till the Equipments are duly used/erected in accordance with the terms of the Contract and the plant/package duly erected and commissioned in accordance with the terms of the Contract is taken over by SJVNL. The Contractor undertakes to keep SJVN harmless against any loss or damage that may be caused to the Equipments.
3. The Contractor undertakes that the Equipments shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilized for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.
4. That SJVN LTDs and shall remain the exclusive Employer of the equipments free from all encumbrances, charges or liens of any kind, whatsoever. The Equipments shall at all times be open to inspection and checking by the Project Manager or other employees/agents authorized by him in this regard. Further, SJVN Ltd shall always be free at all times to take possession of the Equipments in whatever form the Equipments may be, if in its opinion, the equipments are likely to be endangered, misutilised or converted to uses other than those specified in the contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of SJVN Ltd to return the Equipments without any demur or reservation.

5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipments or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Project Manager of SJVN Ltd as to assessment of loss or damage to the Equipment shall be final and binding of the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipments at its own cost and/or shall pay the amount of loss to SJVN LTD without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to SJVN LTD against the Contractor under the Contract and under this Indemnity bond.
6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of SJVN, THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day month and year first above mentioned.

SCHEDULE

Particulars of the Equipments handed over	Quantity	Particulars of Dispatch title		Value of the Equipments	Signatures of Attorney in token of receipt.
		RR/GR/Bill of lading No. & Date	Carrier		

For and on behalf of

.....

(Contractor's Name)

(Signature).....

(Name).....

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	43 of 51
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Designation of Authorized representative

(Common Seal)

(In case of Company)

WITNESS:

1. 1. Signatures.....

2. Name.....

3. Address.....

2. 1. Signatures.....

2. Name.....

3. Address.....

Indemnity Bond are to be executed by the authorized person and (i) In case of contracting Company under common seal of the Company or (ii) having the Power of Attorney issued under common seal of the company with authority to execute Indemnity Bond, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond

Date.....

Place.....

(Name & Signature of Authorised
Representative with Seal/Stamp of
Company)

Note: Non-submission of declaration shall render the bid liable for rejection.

Attachment-12

Determination of Idling Time cost Claims

The idling time cost claims resulting from extension of Time for Completion under ATC clause 45 shall be determined as under:-

1. Cost of Labour

The labour directly engaged for the works at Site by the Contractor or through sub-contractor, will be reimbursed for idle period in case contractor produces proof that idle labour has been paid wages during the period of idling. Cost of equipment related labour, will be worked out as per CWC norms limited to actual whichever is lower.

The above cost will be considered for payment based on the supporting details such as attendance sheet, receipt of deposit of Employees provident fund duly certified by the Contractor.

In addition to actual cost of labour, indirect charges shall be considered. The indirect charges (other than salary) shall be 55% for skilled and unskilled labour. Indirect charges shall be applicable on the basic wages. Basic wages means component of wages on which statutory deductions like Employee Provident Fund is deposited to the statutory authority.

3. Bank Guarantees and Insurance charges

These charges shall be paid beyond Scheduled completion period on authorized extension of completion period upon production of documentary evidence.

4. Charges on account of extension of Warranty

The Charges towards extensions of warranty are to be considered for only those equipments which have been supplied till the scheduled completion period/ extended completion period. Charges towards extended warranty shall be calculated upto 2.25% of composite contract price per annum on prorata basis.

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	45 of 51
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5. Expenses on additional storage / preservation / transportation / double handling

Against submission of documentary evidence as per actual.

6. Overhead

Overhead costs include but not limited to Office and share of head office expenses, Legal charges, General establishment, Watch and Ward, Local conveyance, Travelling expenses, Social welfare, salaries of Managerial and clerical staff etc. and Publicity etc.

Overhead Charges	=	2% of Contract price × authorized Time Extension entitling cost claim
		Contractual Construction Period

7. The taxes applicable on cost claims

Attachment-13

Undertaking i.r.o Inverter as per clause 2.4.5.4 of Technical Specification

Subject: Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)

We, M/s _____, hereby undertake that the inverter(s)/inverter model(s) proposed to be supplied against subject cited tender are already supplied and installed in Solar PV projects in India with a cumulative capacity not less **than 50 MW**, as on the last date of submission of the Bid.

We also confirm that relevant details/ documents in support of the above have been submitted to the Employer along with bid submission.

We further certify that the information provided is true and correct.

Authorized Signatory

ATC	Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Central Inverters having capacity of 1 MW (AC) each for SJVN's Charanka Solar Power Station (5.6 MWp)	47 of 51
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PROFORMA FOR
BANK GUARANTEE TOWARDS CONTRACT PERFORMANCE GUARANTEE

(To be stamped in accordance with Stamp Act)

To

[Buyer's Name & Address]

Dear Sirs,

In consideration of the [Buyer's Name]..... having its registered office at Corporate Office Complex, Shanan, Shimla Himachal Pradesh-171006 (Hereinafter referred to as the Buyer,' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) having awarded to M/s. [Contractor's Name] with its Registered/Head Office at (Hereinafter referred to as the 'Contractor', which expression shall unless repugnant to the context or meaning thereof, include its successors administrators, executors and assigns).

The Contractor has entered into Contract bearing No. dated..... and amounting of **INR.....[Insert Total Contract Value (in words)]**..... with the Buyer for **“Supply, Installation, Testing, Commissioning and Synchronisation of Two (2) Inverters having capacity of 1 MW (AC) each for SJVN’s Charanka Solar Power Station (5.6 MWp)”**. As per provisions of the Contract, a Performance Security for sum of **INR.....[Insert the amount of Performance Security (in words)]**..... is required to be furnished by the Contractor to the Buyer for due performance of the contract.

We [Name & Address of the Bank] Having its Head Office at (hereinafter referred to as the 'Bank', which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Buyer, on demand any and all monies payable by the contractor to the extent of **INR.....[Insert the amount of Performance Security (in words)]**..... as aforesaid at any time upto (@) [days/month/year] without any demur, reservation, context, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Buyer on the Bank shall

be conclusive and binding notwithstanding any difference between the Buyer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes that the guarantee shall be irrevocable and valid till the completion of faithful performance of the Contract to the satisfaction of the Buyer and/ or the Buyer in writing discharges the Guarantee.

The Buyer shall have the fullest liberty, without affecting in any way the liability of the Bank under this guarantee, from time to time to extend the time for performance of the Contract by the Contractor. The Buyer shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Buyer and the Contractor or any other course or remedy or security available to the Buyer. The Bank shall not be released of its obligations under these presents by any exercise by the Buyer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Buyer or any other indulgence shown by the Buyer or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving the Bank.

The Bank also agrees that the Buyer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Buyer may have in relation to the Contractor's liabilities.

Notwithstanding anything contained hereinabove our liability under this guarantee is restricted to **INR.....***[Insert the amount of Performance Security (in words)]*.....and it shall remain in force upto and including (@) and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s..... *[Contractor's Name]* on whose behalf this guarantee has been given.

Dated this day of 2024..... at
.....

WITNESS

.....
(Signature)
(Name)
.....

.....
(Signature)
(Name)
.....

(Official Address)
Stamp)

(Designation with Bank

Attorney as per Power of
Attorney No.....
Dated

- Notes: 1. (@) This date will be Sixty (60) days after expiry of defect liability period as per Clause 36.0 of ATC.
2. The bank guarantee shall be issued by any Scheduled Bank /Nationalized Bank.
3. The Bank Guarantee shall be transmitted through SFMS Gateway by the issuing Bank to the designated Bank of BUYER, details of which is as below:

(i)	Name of Bank	:	State Bank of India
(ii)	Account Name	:	SJVN Limited
(iii)	Account Number	:	10835926299 (current account)
(iv)	IFSC Code	:	SBIN0063985

**Financial Document
(TO BE FILLIED IN FINANCIAL BID ONLY)**

Sr. No.	Service Text	Qty	Amount (excluding GST)	GST	Amount (including GST)
1.	Supply of Inverter(s) along with allied components complete in all respect	1 Job			
2.	Installation, testing, commissioning and synchronisation of the inverter(s) along with allied components complete in all respect	1 Job			
3.	Gross Total (1+2)				

**Supply, Installation, Testing, Commissioning and Synchronisation
of Two (2) Inverters having capacity of 1 MW (AC) each for SJVN's
Charanka Solar Power Station (5.6 MWp)**

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4.1 PLANT INFORMATION

4.1.1 SJVN has installed and commissioned a 5 MW (AC) Grid connected PV based Solar Power Plant at Gujarat Solar Park, Charanka, Tehsil – Santalpur, District – Patan, Gujarat. 5.25 MWp was commissioned on 31.03.2017 and 0.344 MWp was commissioned on 28.08.2018.

4.1.2 Location and Approach:

Sl. No.	Item	Particulars
1.	Nearest Village/ Town	Charanka
2.	Taluka/ Tehsil	Santalpur
3.	District	Patan
4.	State	Gujarat
5.	Nearest Railway station	Radhanpur
6.	Nearest Airport	Ahmedabad

4.1.3 Overall outline of 5 MW (AC) solar photovoltaic power plant:

The solar PV plant having capacity of 5.6 MWp is divided into 5 blocks (~1.1 MWp). Solar PV modules installed at the plant generates DC electricity that in turn is inverted to 3-phase, 400V AC power using solar Central inverters. Output of each inverter is stepped up to 11kV using inverter transformers. The power is combined in at 11kV level and stepped up through 66kV 6.25 MVA transformer. Power from the transformer is evacuated to GETCO 66kV/400kV Charanka Substation through underground 66kV power cables and terminated to single 66kV bay in GETCO substation. There is one Main Control Room (MCR) housing Inverters, Batteries, UPS, FCBC, conference room, SCADA panels, SCADA room, etc.

The DC SLD of the plant, AC SLD of the plant, existing 1 MW (AC) each ABB Inverter data sheet and 3.3 MVA inverter transformer data sheet are enclosed as Annexure I, II, III, and IV.

4.2 SCOPE OF WORK IN BRIEF

The Contractor shall undertake replacement of two (2) damaged Inverter of 1 MW (AC) each of ABB make with new inverter(s) of reputed make of same total AC power capacity including associated works for successful completion of job in all respect and serve the intended purpose. This shall inter-alia include and not limited to provisions of manpower, spares, special tools, crane, hydra, and all such material/equipment that may be required for successful completion of job in all respect, as per the detailed scope of works/ services mentioned in this section and elsewhere in this bid document.

4.3 SCOPE OF WORK

- 4.3.1 Supply, testing, Packing, Forwarding, Delivery, Safe Storage, Installation, Testing and Commissioning of new inverters and associated components covered in this package are included in the scope of the contractor.
- 4.3.2 Site visit, design, detail engineering, factory tests, supply of all materials, preservation at site/ storage at site, fabrication, assembly, all mechanical works for installation, erection, installation, testing, commissioning, guarantee, performance evaluation/ test at site with all safety & Personnel protective equipment (PPEs) with trained personnel for installation, supervision & commissioning of inverters, training to the client personnel, submission of commissioning reports, other documents enclosed with the tender document and as per direction of Engineer-in-charge.
- 4.3.3 The entire scope of supply and works under this contract shall be completed within 90 days from date of acceptance of Letter of Award.
- 4.3.4 The inverter shall have a warranty of minimum 5 years. All warranties shall be in the name of SJVN Limited.
- 4.3.5 **Engineering, Design and Documentation:**
 - 4.3.5.1 The contractor shall study the existing inverter(s) installation and accordingly design/ engineer new inverter in such a way that the new supplied inverter is replaced one-to-one with existing one, accommodating existing set up with or without major modification(s). Any major modification, if required, shall be part of scope of work.
 - 4.3.5.2 The contractor shall study the existing system interfacing details and accordingly design the interfacing architecture & submit for review.
 - 4.3.5.3 Submission of detail technical specification, data sheet, general arrangement drawings, layout plan, circuit diagram, Detailed Supply, erection & commissioning Schedule, Technical Manuals, O&M Manuals for review and approval within 15 days of award of contract.
 - 4.3.5.4 Contractor shall submit erection, installation, testing and commissioning procedures and various procedures for Inverter system installations including schemes, drawings & documents for Inverter system.
 - 4.3.5.5 The drawings and documents to be submitted by the Contractor to EIC after award of the work as per the requirements enlisted in the bidding document shall be for Owner's review, information and record. The Contractor shall ensure that drawings and documents submitted to EIC are accompanied by relevant calculations, data as required and essential for review of the document/ drawings. SJVN Limited will review the drawings/documents within two weeks from the date of submission provided the same are accompanied by relevant calculations, data as required and essential for review.

- 4.3.5.6 All documents and drawings including those of contractors/sub-vendors/manufacturers etc. shall be submitted to EIC after having been fully vetted in detail, approved and co-opted by the Contractor & shall bear Contractor seal/ certifications to this effect. All documents/drawings & submissions made to Owner without compliance to this requirement will not be acceptable and the delay & liability owing to this shall be to the Contractor's account.
- 4.3.5.7 The review of documents and drawings by Owner shall not absolve Contractor from his responsibility to meet the requirements of specifications, drawings etc. and liabilities for mistakes and deviations. Upon receiving the comments on the drawing/documents reviewed by EIC, Contractor shall incorporate the comments as required and ensure their compliance.
- 4.3.5.8 Copies of all detailed working drawing relating to the works shall be kept at the contractors' office at the site and shall be made available to the Engineer-in-charge/EIC at any time during execution of the contract. However, no extra claim what so ever shall be entertained for any variation in the "reviewed/issued for construction drawings" regarding any changes.
- 4.3.5.9 The Contractor shall rectify any inaccuracies, errors and non-compliance to contractual requirements. Any delay occurring on this shall not construe a reason for delay/ extension.

4.3.6 Software, Hardware and Interfacing:

- 4.3.6.1 Supply and installation of all necessary software and hardware in inverter for smooth operation, trouble shooting, alarming and catering the protection of inverter, is in the scope of vendor. Software should be designed user friendly and easily accessible and support effective integration.
- 4.3.6.2 The Contractor shall also supply and install all necessary software and hardware required for operation, monitoring, control of inverter, setting of operational parameters of the inverter in a laptop/ desktop with suitable hardware configuration for all the software's and interfacing purposes.
- 4.3.6.3 Synchronization of new inverter(s) with existing grid, Interfacing of new inverter with existing SCADA system for their remote monitoring from control room, laying and termination of necessary control cables if required for the above said job, including interfacing of signals (hard-wired & serial) with the existing SCADA system.
- 4.3.7 The procurement and supply in sequence and at the appropriate time of all materials and consumables covered under Contractor's scope of supply shall be entirely the Contractor's responsibility.

4.3.8 Dismantling, Replacement and Installation:

- 4.3.8.1 The contractor shall use the space of the damaged inverter for installation of new inverter. However, in case repair of existing space is required, the

same shall also be done by the contractor without any additional financial implication to SJVN Limited. All the necessary arrangements required in this regard shall be in the scope of the contractor.

4.3.8.2 All the installation/erection shall be carried out by suitable capacity equipment & machines with all applicable safety measures. The contractor shall arrange for all equipment & machines of suitable capacity required for installation/erection, testing & commissioning and PG test of Inverter system and contract price deemed to be included for the same in respective items without any liability on the part of Owner. Contractor shall be responsible for organizing the lifting & dismantling of the existing Inverter in the proper sequence, that orderly progress of the work is ensured and access routes for working of the other equipment are kept open. Contractor shall note all the details, wiring, ferruling, automations & interlocks prior to the dismantling of the existing Inverter system.

4.3.8.3 Disconnection of all AC/DC cable, termination from existing inverter side, cutting of AC/DC cable lugs, removing of gland plate from AC/DC side of the existing inverter disconnection of all control cables, auxiliary wiring and ground cables from inverter, SCADA panel, UPS, etc. Installation of new inverter in existing space with or without modification of existing space. Replacement of damaged power cables and lugs. Reconnecting of SCADA unit and UPS unit including necessary modification if required. Sealing of opening made in the walls/floors for cables trays, cables, bus ducts, etc. using acceptable practice and standards. Reconnection of all disconnected power cables to new inverter and complete commissioning of new inverter with grid synchronization. Shifting of damaged inverter to any designated place within premises as per instructions of SJVN Limited. The damaged inverter will not be the property of the contractor.

4.3.8.4 Any damage to any existing equipment, unit, structure during the course of dismantling or re-assembling of new inverter shall be repaired or replaced by contractor free of cost.

4.3.9 Temporary and Ancillary works:

4.3.9.1 All Temporary and ancillary works, enabling works connected with the work, including all works which are required for the safety of the existing installation of Owner such as barricading of existing facilities etc. and as detailed in bid document shall be responsibility of the Contractor and the price quoted by them shall be deemed to have included the cost of such works which shall be removed by the contractor at his cost, immediately after completion of his work.

4.3.9.2 Preparing approaches and working area for the movement and operation of the cranes, hydra shall also be the responsibility of the Contractor. The Contractor shall acquaint himself with access availability, facilities, local

labour, etc.

- 4.3.9.3 Complete civil work for installation and setting up of new inverter, including employment of crane, hydra, if required, and removal of existing damaged inverter is in the scope of the contractor. The job includes repairing of all civil works damaged during installation of electrical facilities.
- 4.3.9.4 The Contractor shall without prejudice to his overall responsibility to execute and complete the work as per specifications and time schedule, progressively deploy construction equipments and tools & tackles and shall augment the same as decided by the Engineer-in-Charge depending on the exigencies of the work so as to complete all works within the contracted time schedule and without any additional cost to EIC. No construction equipment/ manpower shall be supplied by the Owner.
- 4.3.10 Any commissioning & start up spare consumed during the startup & commissioning is included in the supply of this package, for which no extra payment shall be made.
- 4.3.11 Any work not conforming to execution drawings, specifications or codes and approved methodology/scheme shall be rejected forthwith and the Contractor shall carryout the rectifications at his own cost.
- 4.3.12 **Personnel deployment, Supervision and Safety:**
 - 4.3.12.1 Subject to the provisions in the contract document and without prejudice to Contractor's liabilities and responsibilities to provide adequate qualified skilled, semi skilled and unskilled personnel on the work, contractor shall deploy supervisory personnel and augment the same as decided by the Engineer-in-Charge depending upon the site requirement & the exigencies of work so as to complete all works within the contracted time schedule and without any additional cost to Owner.
 - 4.3.12.2 The contractor shall have to depute at least one experienced supervisor who does have sufficient experience in the field of electrical system & installation of such Inverter system. He/she should be able to manage site activities while executing the job at site and guide their personnel to carry out the work as and when required as per the specifications of contract and instructions of the Engineer In charge. No extra payment will be made for providing supervisor in order to achieve desired workmanship and quality; the contractor shall also deploy other suitably experienced persons for the execution of work.
 - 4.3.12.3 The Contractor shall at their own expense arrange for safety provisions as required in such works and as directed by the Engineer-in-charge, in respect of all facilities in connection therewith.
 - 4.3.12.4 The contractor shall provide all personnel with proper protective equipment as per job requirement.

4.3.12.5 The contractor should report all accident/incident (if any) to EIC without fail whether minor or major.

4.3.13 Statutory approvals and Liaison:

4.3.13.1 All approval of installation and drawings, tests, clearances and certificates required by CEA, Chief Electrical Inspector of Gujarat or any other state/ central govt authority, applicable for energizing/commissioning the electrical system commissioned by the contractor shall be obtained by the Contractor at their own costs, for which the Contractor shall perform such tests and undertake such rectification and/ or changes as may be required.

4.3.13.2 All tests and works relating to obtaining clearances and certificates for energizing the complete electrical facilities covered under this scope of work and approval of installation and drawings from the Chief Electrical Inspector and other statutory authority, as applicable, shall be in the scope of the contractor.

4.3.13.3 The Contractor shall arrange the inspection of the works by the authorities and necessary coordination and liaison work in this respect shall be the responsibility of the contractor. Any change/addition required to be made to meet the requirements of the statutory authorities shall be carried out by the contractor without any extra cost to owner. The inspection and acceptance of the work by statutory authorities shall however, not absolve the contractor from any of his responsibilities under this contract.

4.3.14 The Contractor will be responsible to complete the entire job in all respects, including any other material or work necessary to complete the job satisfactorily, though specifically not covered in the Scope of Work.

4.3.15 Bidders are requested to carefully examine and understand the scope of work and seek clarifications, if required, to ensure that they have understood the specifications. Such clarifications should be sought within the time period as stipulated in section ITB. Bidder's offer should not carry any sections like clarifications, interpretations and/ or assumptions.

4.3.16 Before submitting his bid, the Bidder should inspect and examine the site and its surroundings and should satisfy himself as to the quantities and nature of work, materials necessary for completion of the work and their availability, means of access to site and in general shall himself obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect his offer. No consequent extra claims on any misunderstanding or otherwise shall be allowed by the Employer.

4.4 TECHNICAL REQUIREMENTS FOR INVERTER

4.4.1 The new inverters should have cumulative AC power rating of 2 MW only but cumulative DC power rating should be minimum 2400 kWp.

- 4.4.2 The inverter system shall include electronic inverter along with associated control, protection and data logging devices. The system shall incorporate a uni-directional inverter designed to supply the AC power to the grid at load without any disturbance. The power-conditioning unit shall automatically adjust the voltage & frequency levels to suit the Grid. All three phases shall be supervised with respect to rise/fall in programmable threshold values of frequency. The model offered should have operating capability to operate under the existing environmental conditions in India. Only Indoor/Outdoor type Central inverter shall be accepted.
- 4.4.3 Vendor shall ensure proper design of inverter after considering input, output transformer, existing electrical system, and interface/interlocks of existing system with SCADA.
- 4.4.4 If any modification is required in SCADA, it should also be carried out by the Contractor at his own cost.
- 4.4.5 **General Requirements:**
- 4.4.5.1 The inverter shall confirm to IEC 61000 or equivalent international standard for compliance to requirements for Electromagnetic compatibility and to IEC60068-2 or equivalent international standard for requirement of environmental testing. Block wise installation should have to be adopted.
- 4.4.5.2 Maximum inverter DC overloading shall be limited to its design PV Array power to inverter nominal AC power ratio. Bidder needs to submit all the relevant technical documents/test report from inverter manufacturer (OEM) during detailed engineering stage in support of declared inverter design DC overloading capacity. Contractor shall also submit maximum overloading capacity of the inverter at ambient temperature of 50°C along with the inverter data sheet. In case, the rated capacity is mentioned in KVA, the certificate of OEM declaring the power factor of the Inverter/inverter at 50°C has to be submitted and the power factor shall be multiplied by the KVA rating to achieve the rated capacity of the Inverter in KW. Inverter nameplate rating (at 50 Deg C) shall be selected in such a way that Generating station shall be capable of supplying dynamically varying reactive power support so as to maintain power factor within limits of 0.95 lagging to 0.95 leading without compromising the rated output (at POI) complying with the CEA Guidelines
- 4.4.5.3 IGBT: The IGBT used in inverter should be of reputed make and would have end to end manufacturing i.e from fabrication to manufacturing. Further, a declaration/certificate for end to end manufacturing shall be provided to employer during detailed engineering inverter shall also confirm to IEC 62109 or IEC 62103 or equivalent international standard for compliance to requirement for the design and manufacture of inverter for protection against electric shock, energy, fire, mechanical and other hazards.

- 4.4.5.4 Only those inverter's/Inverters models/capacity which are supplied and installed (as on the original date of submission of Bid) for more than 50 MW capacity Solar PV projects in India shall be considered for this project. The Contractor must provide all the relevant data sufficing the above requirement to the Employer.
- 4.4.5.5 The items, notified as having sufficient local capacity and competition, shall mandatory be sourced from Class-I local suppliers in SI/EPC/Turnkey Contracts/ Services tenders. This provision will be applicable only for those items which have been notified by the Nodal Ministry as Class I i.e. having sufficient local capacity and competition, with specific HSN codes."
- 4.4.5.6 All the inverters shall consist of associated control, protection and data logging devices and remote monitoring hardware and compatible with software used for string level monitoring.
- 4.4.5.7 The rated power /name plate capacity of Inverter shall be AC Output of the Inverter at 50°C ambient temperature. Hence, the maximum AC Power Output at 50°C ambient temperature should not be less than the rated capacity of the Inverter.
- 4.4.5.8 Grid Connectivity: Relevant CERC regulations and grid code as amended and revised from time to time shall be complied. The system shall incorporate a uni-directional inverter and should be designed to supply the AC power to the grid at load end. The power conditioning unit shall adjust the voltage & frequency levels to suit the grid. The inverter output shall always follow the grid in terms of voltage and frequency. This shall be achieved by sensing the grid voltage and phase by the feedback control loop of the inverter and the inverter shall always remain synchronized with the grid.
- 4.4.5.9 The inverter must have provision to be isolated from grid through Circuit Breakers, which shall be inbuilt with the inverter or located in separate standalone panel. In case of grid failure, the inverter shall be re-synchronized with grid after revival of power supply. Vendor to furnish the time taken by inverter to be re-synchronized after restoration of grid supply during detailed engineering. inverter and its components shall be designed accordingly and parallel operation equipped with advanced/dynamic grid support & monitoring features. Suitable synchronizing methodology shall be provided for synchronizing the AC output from the inverters.
- 4.4.5.10 The inverter must have the feature to work in tandem with other similar inverter's and be able to be successively switched "ON" and "OFF" automatically based on solar radiation variations during the day. The inverter shall be capable of controlling the power factor dynamically.
- 4.4.5.11 The minimum euro efficiency of the inverter as per IEC 61683 shall be 98% at 100 % load. The Contractor shall specify the conversion efficiency at

following load conditions i.e. 25%, 50%, 75% and 100% during detail engineering, which shall be confirmed by type test reports.

- 4.4.5.12 The inverter shall have protection against any sustained fault in the feeder line and against lightning discharge in the feeder line. inverter should be equipped with space heater in each cabinet to control through hygostat and thermostat.
- 4.4.5.13 The inverter shall also have the adequate protection against earth leakage faults. The incoming DC feeder of inverter shall have suitably rated isolators to allow safe start up and shut down of the system and its terminals should be shrouded. The DC feeder shall terminate in the fuse box through a suitable fuse rating. The inverter fuse box shall have one spare terminal with fuse and holder for the future use. The connection between the fuse box and inverter shall be through copper bus bars or copper cable.
- 4.4.5.14 Internal Surge Protection Device (SPD) shall be provided in the inverter on DC and AC side. It shall consist of Metal Oxide Varistor (MOV) type arrestors. The discharge capability of the SPD shall be as per IEC 61643-12. During earth fault and failure of MOV, the SPD shall safely disconnect the healthy system. SPD shall have thermal disconnecter to interrupt the surge current arising from internal and external faults. In order to avoid the fire hazard due to possible DC arcing in the SPD due to operation of thermal disconnecter, the SPD shall extinguish the arc.
- 4.4.5.15 Adequate grounding for the DC side shall be provided.
- 4.4.5.16 Each solid-state electronic device shall have to be protected to ensure long life as well as smooth functioning of the inverter.
- 4.4.5.17 The inverter shall have anti-islanding protection as per IEC 62116 or equivalent international standard.
- 4.4.5.18 The inverter shall have required protection arrangements against reverse polarity of DC connection and remains in standby mode.
- 4.4.5.19 The inverter shall have arrangement for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.
- 4.4.5.20 The inverter shall be tropicalized and design shall be compatible with conditions prevailing at site. Provision of exhaust fan with proper ducting for cooling of inverter's should be incorporated in the inverter's, keeping in mind the extreme climatic condition of the site.
- 4.4.5.21 It should have local display with keypad for system control including start & stop, monitoring instantaneous system data, event logs, data logs with date & time and configuration settings. Control and readout should be provided on an indicating panel integral to the inverter.

- 4.4.5.22 Display: The inverter shall have local LCD (Liquid crystal display) and keypad for system control, monitoring instantaneous system data, event logs, data logs and changing set points. inverter front panel shall be provided with display (LCD or equivalent) to monitor the following Instantaneous DC power input:
- (i) DC input voltage
 - (ii) DC Current
 - (iii) Instantaneous active AC power output
 - (iv) Instantaneous reactive AC power output
 - (v) AC voltage (all the 3 phases and line)
 - (vi) AC current (all the 3 phases and line)
 - (vii) Power Factor
 - (viii) KWh produced during entire day
 - (ix) Total kWh produced during its life time
 - (x) Thermal loading (percentage)
- 4.4.5.23 The inverter shall include appropriate self-protective and self-diagnostic feature 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 failure, shall be cleared by the inverter protective devices.
- 4.4.5.24 All the cables from the array strings to the solar grid inverters shall be connected/terminated in the DC Distribution Box with suitable rated GPV type fuse conforming to IEC 60269-6 or UL- 2579 Standards.
- 4.4.5.25 In case external auxiliary power supply is required, Standalone UPS shall be used to meet auxiliary power requirement of inverter, it shall have a backup storage capacity of at least 120 minutes.
- 4.4.5.26 To prevent the maximum permissible temperature in the inverter room from being exceeded because of internal heat emission of inverters and other auxiliaries in the inverter room, the inverter room in the PV station shall be adequately ventilated. The ventilation capacity and air quality of inverter room shall be as per inverter and other auxiliaries manufacturer's recommendations. Filter banks at the air inlet of the inverter room shall be provided to prevent dust ingress.
- 4.4.5.27 The Contractor shall ensure by carrying out all necessary studies that the inverter will not excite any resonant conditions in the system that may result

in the islander operation of PV plant and loss of generation. In case there is excitation of any resonant condition in the system during PV plant operation that may result in the is landing/tripping of the PV plant and affect the power transfer, it shall be the responsibility of contractor to rectify the design and carryout required modification in the equipment of his supply.

4.4.6 **Maximum Power Point Tracker (MPPT):**

Maximum power point tracker (MPPT) shall be integrated in the power conditioner unit to maximize energy drawn from the Solar PV array. The MPPT should be microprocessor based to minimize power losses. The contractor shall submit the details of working mechanism of MPPT during detail engineering. The operating range of inverter and the MPPT shall be large enough such that it satisfactorily operates for PV Modules exposed to the maximum ambient temperature of 50°C. The MPPT Unit shall conform to IEC 62093 for design qualification.

- (i) Low Power Mode (Auto): The system shall automatically 'wake up' in the morning and begin to export power provided there is sufficient solar irradiation and the grid voltage and frequency are in range.
- (ii) Standby Mode: The control system shall continuously monitor the output of the solar power plant until pre-set value is exceeded & that value to be indicated in data sheet.
- (iii) Basic System Operation (Full Auto Mode): When solar radiation increases further, the inverter shall adjust the voltage of SPV array to maximize solar energy fed into the grid. When the solar radiation falls below threshold level, the inverter shall enter in low power mode/standby mode.
- (iv) The inverter control shall prevent excessive cycling of shut down during insufficient solar radiance
- (v) Sleep Mode: Automatic 'sleep' mode shall be provided so that unnecessary losses are minimized at night. The inverter must also automatically re-enter standby mode when threshold of standby mode reached.

4.4.7 **Other Technical Features:**

Inverter Mounting	As per Design
Wave Form	Pure Sine wave
MPPT Voltage (Max. & Min.)	As per standard manufacturing norms
Minimum Efficiency at 100% load	> 98%, measured as per IEC 61683
No load loss	<1% of rated power maximum loss in sleep mode shall be less than 0.05%

Output frequency	50 Hz
Power Factor Control Range	≥ 0.95 lead or lag
Maximum Input voltage	1000 V or 1500V as per application
THD	Less than 3 % of rated power
Ambient temperature	0 to (+) 55°C
Humidity	95 % non- condensing or more
Enclosure (type)	Minimum IP 21 (Indoor rated) & Minimum IP 55 (Outdoor rated)
DC injection	Less than 0.5% of nominal load current
Maximum Noise Level	75 dB
Flicker	As per IEC 61000

4.4.7.1 The inverter shall meet the following requirements.

- (i) Inverter shall be equipped with Voltage Ride-Through (VRT) capabilities to stay online during grid disturbance as per IEC 61727 or equivalent standard. Inverter shall be able to support low and high frequency ride through and reactive power compensation as response to abnormally low or high grid voltage.
- (ii) Sinusoidal current modulation with excellent dynamic response.
- (iii) Unit wise & integrated Data logging.
- (iv) Dedicated open protocol modbus / RS 485 or any other compatible networking.
- (v) The inverter shall have protection against various faults including but not limited to following:
 - (a) AC/DC Over current
 - (b) Sync loss
 - (c) Over temp.
 - (d) Line to ground fault
 - (e) Short circuit
 - (f) Surge voltage induced at output due to external source
 - (g) AC/ DC bus over/under voltage
 - (h) Cooling System failure
 - (i) Anti-islanding
 - (j) Unbalance Protection

- (k) A under & over frequency
- (l) AC &DC Short Circuit
- (m) Over load Protection
- (n) AC &DC Lightening/surge Protection
- (vi) Power regulation in the event of thermal overloading.
- (vii) Set point pre-selection for VAR control.
- (viii) Remote control via telephone modem or mini web server & SCADA.
- (ix) Insulation monitoring of the PV array with sequential fault location.
- (x) Ground fault detector to sense discharge current with respect to ground.
- (xi) Inverters shall offer the possibility to set a constant reactive power mode to absorb or inject reactive power during night time.
- (xii) Overvoltage voltage against atmospheric lighting discharge to the PV Array.
- (xiii) Inverter shall offer provision for both local and remote emergency stop.
- (xiv) Earthing of Inverter: DC side of each inverter shall be earthed to distinct earth pit through adequate size conductor as per IS 3043-1987. The size of conductor shall be as per the maximum fault current of DC.
- (xv) The contractor shall submit to the Employer the Drawings, design calculations, 'the temperature versus output characteristics' of the Inverter Operation & Maintenance manual and other information as per Engineering Information schedule during detailed engineering.
- (xvi) The Inverter/inverters installed in the solar power plant must have a warranty for 5 years.

4.4.8 **Standards and Codes:**

The system and equipment shall be designed, built, tested and installed to the latest revisions of the following applicable standards. In the event of other standards being applicable they will be compared for specific requirement and specifically approved during detailed engineering for the purpose:

Standard	Description
IEC 61727 or Equivalent Standard.	Photovoltaic (PV) System – Characteristics of utility interface
IEC 61683	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency

Standard	Description
EN 50530	MPPT efficiency of grid connected photovoltaic inverters
IEC 60068-2/IEC 62093	Environmental testing
IEC 61000-6-2, IEC 61000-6-4	Electromagnetic compatibility (EMC)
IEC62109-1&2/IEC 62103 or equivalent standard.	Electrical Safety of power converters for use in photovoltaic power systems – Particular requirements for inverters
IEEE Standard 929-2000 or equivalent	Recommended practice for PV Utility Interconnections
IEEE 1547/UL1741/IEC 62116 or equivalent EN/BIS Standards	Protection against islanding of Grid
Grid Connectivity	Relevant CERC/CEA regulations (including LVRT Compliance) and grid code as amended from time to time
BDEW 2008 or Latest	Technical guidelines for generating plant connected to medium voltage network
IEEE 519	Recommended practices and requirements for harmonic control in electrical power system.
IEC 62093	Reliability test standards
As per the Solar Photovoltaics, Systems, Devices and Components Goods (Requirements for Compulsory Registration) Order, 2017, Inverters used in the grid connected solar power projects shall be registered with BIS and bear the Standard Mark as notified by the Bureau of Indian Standards.	

4.4.9 Routine Testing & Inspection at Work

All the Routine Tests, inspection at manufacturer's works as well as at site shall be carried out strictly as per the mutually agreed Manufacturing Quality Assurance Plan and reports shall be submitted to Employer. All the acceptance tests and Routine Tests, inspection at manufacturer's works as well as at site shall be carried out strictly as per specifications, relevant standards and in accordance with the Final Quality Assurance Plan and reports shall be submitted to Employer. The Employer reserves the right to inspect the modules at the manufacturer's site prior to dispatch.

4.4.10 Type Test:

The inverter supplied must be of type tested design and certified by any of the accredited certifying agencies in accordance with relevant standards /codes and the type test reports shall be submitted to Employer for approval. If the type tests are not done previously, then they shall be conducted without any additional cost to the Employer and the type test report shall be submitted before supply of inverters.

4.5 QUALITY ASSURANCE PLAN

- 4.5.1 For all major/critical items, the contractor shall submit Manufacturing and Site/Field Quality Assurance Plans, considering the latest practices being followed in Solar Power Industry/Standard requirements/technical specifications requirements, in the format widely accepted in the Solar Power Industry. The final Quality Assurance Plans shall be mutually agreed upon with the successful bidder during the detailed engineering stage progressively. This Quality Plan will detail out various tests / inspection to be carried out as per the requirements of the Technical Specifications and standards mentioned therein and Quality Practices and procedures to be followed by Supplier/Contractor's Quality Assurance Department., the relevant reference documents and standards and acceptance norms etc. during all stages of material procurement, manufacture, assembly and final testing/performance testing and shall be reviewed in-line with SJVN Limited standard quality plans.
- 4.5.2 During inspection, the Supplier/Contractor shall provide reference documents/plant standards/acceptance norms/test and inspection procedure etc. as referred in Quality Plan. The approved Quality plan shall form a part of the contract. During approval of Quality Plan, SJVN Limited jointly with the contractor will identify Customer Hold Points (CHPs) for the major/critical items i.e. testing checks which shall be carried out in the presence of SJVN Limited authorized representative.
- 4.5.3 The site/field quality assurance plans shall detail out the established quality assurance practices, tests and procedures etc. to be followed by the Supplier/Contractor's Site Quality Assurance Dept. during various stages of site activities from receipt of material/equipment at site till final commissioning/acceptance/handover.
- 4.5.4 The inspection calls shall be placed at least one month in advance for overseas inspections and 10 days for inspections within India.
- 4.5.5 Only calibrated testing and measuring instruments would be used during manufacturing, testing and commissioning by the Supplier/contractor. Copy of the valid calibration certificates would be provided during inspection to SJVN Limited by the Supplier/contractor.
- 4.5.6 For all spares and replacement items, the quality requirements as agreed for the main equipment supply shall be applicable.

- 4.5.7 The contractor will provide a compliance certificate regarding confirmation that repair/rectification has been carried out as per the standard procedure to make the job acceptable.
- 4.5.8 Approval of the results of the tests and inspection will not, however, prejudice the right of SJVN Limited to reject the equipment if it does not comply with the specification in service and the above shall in no way limit the liabilities and responsibilities of the contractor in ensuring complete conformance of the materials/equipment supplied to relevant specification, standard, data sheets, drawings etc.
- 4.5.9 For item/material/assembly covered in QAP, the Supplier/contractor shall be required to submit copies of the following Quality Assurance documents in original along with the request letter for issuance of MDCC (Material Dispatch Clearance Certificate).
- (i) Factory test result for testing required as per applicable codes and standards referred in the Specifications and approved Quality Assurance Plan.
 - (ii) Inspection reports duly signed by authorized representative of SJVN Limited and Supplier.
- 4.5.10 For item/material/assembly not covered in QAP, the Supplier/contractor shall be required to submit copies of the following Quality Assurance documents in original along with the request letter for issuance of MDCC:
- (i) Internal inspection reports/compliance certificate duly signed by authorized representative of Supplier/contractor's Quality Assurance Department.
 - (ii) Undertaking from the Supplier/contractor that the components requested for MDCC meets the requirements of applicable standards and other relevant requirements of the contract.
- 4.5.11 Any test which is the part of the contract document but not mentioned in the Quality Plan will also be carried out by the Supplier/contractor without any additional cost to SJVN Limited.
- 4.5.12 The Contractor shall have to submit the Quality Assurance Plans for the Inverter system.

4.6 SPECIFICATIONS AND DRAWINGS

- 4.6.1 The Contractor shall execute the basic and detailed design and engineering work in compliance with the provisions of the Contract, or where not so specified, in accordance with good and sound engineering practice. The Contractor shall be responsible and shall pay for any alterations of the work for any discrepancies, errors or omissions in the specifications, drawings and other technical documents that it has prepared, whether such specifications,

drawings and other documents have been approved/reviewed by the Engineer-in-Charge or not.

- 4.6.2 The materials, design and workmanship shall satisfy the applicable standards, specifications contained herein and codes referred to. Where the Contract Document stipulates requirements in addition to those contained in the standard codes and specifications, those additional requirements shall also be satisfied.
- 4.6.3 3 (Three) prints of all relevant drawings along with soft copies of drawings in pdf in DVD/CD/USB drive as defined in the technical specifications, shall be submitted by the contractor. No extension in Contract completion time shall be allowed on account of the time consumed in submission and examination of defective drawings and re-submission of corrected drawings.
- 4.6.4 In addition to the drawings defined in the technical specification, the Contractor will furnish any other drawing, which, in his opinion, is necessarily required to describe the equipment in full details and interconnection thereof and any drawings which EIC may request.
- 4.6.5 These drawings, shall become the property of the Employer and shall not be departed from it in anyway, whatsoever, except with the written permission of the Engineer-in-Charge hereinafter provided.
- 4.6.6 The Contractor shall also furnish 5 (Five) bound sets of “as built” drawings and the list of all “as built” drawings bearing drawing numbers after commissioning, incorporating all site modifications/changes etc.
- 4.6.7 The Employer/EIC shall have the right to serve notice in writing to the Contractor on any grounds of objections, which he may have in respect of any drawings, equipment and workmanship which is in his opinion not in accordance with the contract. The Contractor shall give due consideration to such objections and shall either make modifications that may be necessary to meet the said objections or shall inform in writing to the EIC giving reasons therein, that no modifications are necessary to comply with the contract. The Contractor has to satisfy the objection, otherwise, The Employer/EIC at its liberty may reject all or any component of equipment or workmanship connected with such work.

4.7 APPROVAL / REVIEW OF DRAWINGS & DOCUMENTS

The Contractor shall prepare and furnish to the EIC the documents as per Contract Agreement for its approval or review. EIC shall review the documents furnished by the contractor and give the feedback or approval within two weeks from the date of submission of documents by the contractor. Any part of the Facilities covered by or related to the documents to be approved by the EIC shall be executed only after the EIC's approval thereof. Document furnished by the Contractor, shall not relieve the Contractor of any responsibility or

liability imposed upon it by any provisions of the Contract.

4.8 PACKING, FORWARDING

- 4.8.1 The Contractor shall be responsible for securely protecting and packing the equipment, taking special care for protruding parts and such other vulnerable parts as per prescribed standards enforced to withstand the journey and ensuring the safety of materials and also arrival of materials at destination in good and original condition for contemplated use, so as to avoid damage under normal conditions of transport, loading & unloading, handling and storage at site till the time of erection and such conditions as specified in the Contract. The Contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing. Each bundle or package shall have the following marking on it:
- (i) The name and address of the consignee.
 - (ii) The relevant marks, reference numbers etc., for identification.
 - (iii) Directions for handling the materials.
- 4.8.2 Each package shall also be accompanied with detailed packing list to facilitate checking of the contents at the destination
- 4.8.3 The Contractor shall also give all dispatch information concerning the weight, size and content of each package, including any other information which the Employer may require.
- 4.8.4 The Proof of dispatch three copies shall be mailed to the Engineer-in-Charge within three (03) days from the date of dispatch to enable the Employer to make progressive payment to the Contractor, if any.
- 4.8.5 In case of imported equipment, the Contractor shall make shipping arrangements as per Government of India Guidelines. The Contractor shall, wherever applicable, pack all equipment, crate, preserve, make it seaworthy and fit for long storage in tropical climate in accordance with internationally accepted export practices and in such manner so as to protect it from damage and deterioration in transit by sea, rail and road, and during storage at the site till the time of erection. The Contractor shall be responsible for all damage due to improper packing. Customs clearance shall be the responsibility of the Contractor. The Contractor shall notify the Employer of the date of each shipment from the port of such shipment at the designated point of arrival. The Contractor shall give complete shipping information concerning the weight, size, content of each package including any information the Employer may require.
- 4.8.6 All demurrage, wharfage and other expenses incurred due to delayed clearance of the material and which are attributable to the Contractor and Sub-Contractor during transportation shall be to the account of the Contractor.

4.9 TRANSPORTATION

- 4.9.1 The Contractor shall at its own risk and expense transport all the Equipment and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.
- 4.9.2 The Contractor shall notify the Employer/EIC the details of dispatch for every month from his works and the expected date of arrival at the site for the information of the Employer. The Contractor shall furnish the Employer/EIC with relevant shipping documents to be agreed upon between the parties.
- 4.9.3 The Contractor shall prepare detailed challan / packing list of all packages dispatched to site. The Contractor shall further be responsible for making all necessary arrangement for loading, unloading and other handling right from his work to and at the site.
- 4.9.4 In case the contractor decides to transport the goods by road within the Employer country, then such goods necessarily be transported through a registered common carrier as per "The Carriage by Road Rules 2011".

4.10 DELIVERY OF EQUIPMENT

- 4.10.1 The Contractor shall deliver the equipment / materials at the place(s) and in the manner as specified in the Contract. The Contractor shall comply with all instructions that may be given by the Employer from time to time regarding transportation of the equipment/materials. The contractor shall, immediately after dispatch, provide delivery information to the Employer.
- 4.10.2 In case of any damage or loss occurred in transit, it shall be the liability of the Contractor to initiate or pursue the claim with the Insurance Company. He shall also take immediate steps to repair the damages or to replace the loss and damages as per the instruction of the Engineer-in- charge.
- 4.10.3 Property or title of the equipment / goods shall not pass to the Employer unless these are actually delivered at the designated Project without any damage.
- 4.10.4 The Employer shall not be responsible to the Contractor to secure/ arrange/ provide means of transport. Similarly, any road license and or permit, if necessary, shall be arranged by the Contractor. However, if any documentary assistance is necessary to facilitate transportation, these will be supplied to the Contractor to the extent possible.
- 4.10.5 No material shall be dispatched from the manufacturer's works before the same is accepted, subsequent to pre-dispatch final inspection including verification of records of all previous tests/inspections by the EIC/Authorized representative of Employer.

4.11 MATERIALS HANDLING AND STORAGE

- 4.11.1 All the equipment supplied under the contract and arriving at site shall be

promptly received against indemnity bond, unloaded, transported and stored in the designated storage facilities arranged/constructed by the contractor. All the equipment shall be stored as per standard storage and preservation instructions etc. of the suppliers/manufacturers. The equipment stored shall be properly protected to prevent damage either to the equipment or to the floor where they are stored and also from theft, pilferages etc. The storage facilities shall also include enclosed storage space(s) of suitable size(s) and shall be weatherproof, with good ventilation and solid floors.

4.11.2 The following parts shall be stored inside enclosed storage space(s):

Bolts, pins, packing, tools, insulation materials, electrical parts with electrical devices attached, electric motors and PCU inverters, instruments, welding material and equipment, all small parts and all parts of the equipment which already have been finally painted.

4.11.3 If large parts are stored in the open air, they shall be provided with weather resistant and fire-resistant covers. Electrical parts, which are not packed suitably and those so packed, but whose packing has been damaged shall be kept in suitable places from the moment of storage to the moment of installation.

4.11.4 Contractor shall be responsible for examining all the dispatches and notify the EIC immediately of any damage, shortage, discrepancy, etc. for the purpose of EIC's information only. The contractor shall also submit to the EIC every week a report detailing receipt of material at site, material issued for installation/erection, balance material at store. However, the contractor shall be solely responsible for any shortage or damage in transit, handling and/or in storage and erection of the equipment at the site. Any demurrage, warfage and other such charges claimed by the transporters shall be to the account of the contractor.

4.11.5 All equipment shall be handled very carefully and shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site.

4.11.6 **Indemnity Bond:** The contractor shall sign and submit Indemnity Bond(s) in the format of the Bid Document and shall be obliged and shall remain absolutely responsible for the safe transit protection and custody of the Equipment of SJVN Limited against all Contractor's risks whatsoever till the Equipment are duly used/erected and commissioned in accordance with the terms of the Contract till the same is taken over by EIC. The Contractor shall keep Employer harmless against any loss or damage that may be caused to the Equipment. The Contractor shall ensure that the Equipment shall be used exclusively for the performance /execution of the Contracts strictly in accordance with its terms and conditions and no part of the equipment shall be utilized for any other work or purpose whatsoever. The non-observance of

the obligations under the Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purposes including legal/penal consequences.

4.12 MATERIALS AND WORKMANSHIP

- 4.12.1 The Contractor shall also guarantee that the equipment and materials shall be new and of best quality workmanship and the materials shall have no defect in design and/or manufacture, and shall meet the requirements of the specification and shall be in all respects suited for purposes intended.
- 4.12.2 The Contractor shall guarantee, inter-alia, the following:
 - (i) Use of best quality and strength of materials.
 - (ii) Satisfactory Performance during the period of operation.
 - (iii) Achievement of Performance figures as specified for all parts under the severest condition of operation.
- 4.12.3 Unless otherwise specified, they shall conform in all respect to the latest edition of the relevant IS codes specification wherever Indian specifications apply or IEC codes or equivalent internationally accepted standard.
- 4.12.4 The Contractor shall remedy, without any cost to the Employer, all defects in design materials and workmanship which may develop under normal use and which have been called to the attention of the Contractor prior to the expiry of the warranty period.

4.13 INSPECTION AND TESTING

- 4.13.1 The Engineer-in-charge or his duly authorized representative and/or an external inspection agency acting on behalf of the Employer shall have access, at all reasonable time to inspect and examine the materials and workmanship of the equipment during its manufacture, erection, shop assembly and testing and if part of the equipment is being manufactured or assembled on another premises or works, the Contractor shall obtain for the Engineer-in-charge and his duly authorized representatives, permission to inspect it as if the works were manufactured or assembled on Contractor's own premises or works.
- 4.13.2 The Contractor shall give the written notice to Employer, for testing of any material being ready for inspection/testing at least 10 (Ten) days in advance from the date of actual inspection/testing at the premises of the Contractor or elsewhere. Such Inspection / testing shall be carried out to the Contractor's account except for the expenses of the representative of the Employer. However, the Employer at its own discretion may waive the inspection / testing in writing under very special circumstance. The Engineer-in-Charge or his representative (s), unless the inspection of the tests is in writing waived, shall attend such tests on the date of which the equipment is notified by the

Contractor as being ready for test / inspection, failing which the Contractor may proceed with the tests which shall be deemed to have been made in the Employer's presence. The Contractor shall forthwith forward to the Engineer-in-charge duly certified copies of test results in quadruplicate, for approval of the Engineer-in-charge. However, waiver accorded by the EIC will not absolve the Contractor towards the execution of the Contract in conformity with the Contract Agreement

- 4.13.3 The Engineer-in-Charge shall, within 15 (Fifteen) days from the date of inspection as defined herein, give notice in writing to the Contractor, of any objection to any drawing, testing procedure and testing facility and all / or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Contractor shall give due consideration to such objection and shall make the modifications that may be necessary to meet the said objection at no extra cost to the Employer.
- 4.13.4 When the factory tests have been completed at the Contractor's or Sub-Contractor's works, the Engineer-in-Charge shall issue a certificate to this effect within 15 (Fifteen) days after completion of tests. However, if the tests are not witnessed by the Engineer-in-Charge, the certificate shall be issued within 15 (Fifteen) days of receipt of the Contractor's test certificate by the Engineer-in-Charge only when the tests have been carried out as per relevant codes / standards. The completion of these tests or the issue of the certificate, shall not bind the Employer to accept the equipment, should it, on further tests after erection, be found not to comply with the Contract
- 4.13.5 In all cases where the Contract provides for inspection/ tests to be carried out, whether at the premises of the Contractor or of any Sub-Contractor, the Contractor/Sub-Contractor shall provide free of charges such items as labour, materials, electricity, fuel, water, stores, apparatus, instruments etc. as may reasonably be demanded by the Engineer-in-Charge or his authorized representative(s) to carry out efficiently such test / inspection of the equipment in accordance with the Contract and shall give facilities to the EIC or to his authorized representative to accomplish testing. Charges for any special test(s), other than those specified in the Contract, if required, will be paid by the Employer. Rate(s) for such special test(s) shall be mutually discussed and agreed.
- 4.13.6 All inspection, measuring and test equipment used by contractor shall be calibrated periodically depending on its use and criticality of the test/measurement to be done. The Contractor shall maintain all the relevant records of periodic calibration and instrument identification, and shall produce the same for inspection by SJVN Limited. Wherever asked specifically, the Contractor shall re- calibrate the measuring/test equipment in the presence of EIC.
- 4.13.7 The Employer or his authorized representative shall have the right to carry out

inward inspection of the items on delivery at Site and if the items have been found to be not in line with the approved specifications, shall have the liberty to reject the same.

- 4.13.8 The Contractor has to provide the necessary testing reports to the Employer as and when required.
- 4.13.9 The Contractor shall submit 3 (three) copies of purchase order for materials purchased / to be purchased for use in the works, which will require inspection/ testing by the Employer's representative at the places other than the Contractor's works before shipment. In such cases, all the above-mentioned clauses will apply. When the inspection/test has been satisfactorily completed, the Employer will issue a certificate to that effect.
- 4.13.10 Neither the waiver of inspection / testing nor acceptance after inspection and or testing by the Employer shall relieve the Contractor in way of the responsibility of supplying the equipment/materials strictly in accordance with the specifications, drawings, etc. In any case, the Contractor shall remain fully responsible for satisfactory performance of the equipment/materials.

4.14 AUTHORIZED TEST CENTRES FOR TEST CERTIFICATES

The inverters/ cables deployed shall have valid test certificates for their qualification as per above specified IEC/ IS Standards by one of the NABL Accredited Test centers in India. In case of the equipment for which such Test facilities may not exist in India, test certificates from reputed ILAC Member body accredited Labs abroad (with proper proof of accreditation) will be acceptable.

4.15 COMMISSIONING

- 4.15.1 As soon as installation of the Facilities, in the opinion of the Contractor, has been completed as specified in the Technical Specifications, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Engineer-in-Charge in writing to witness the pre-commissioning of the Facility.
- 4.15.2 After all the works in respect of Pre-commissioning are completed and in the opinion of the Contractor, the Facilities is ready for Commissioning, the Contractor shall so notify the Engineer-in-charge in writing. The commissioning of the facilities shall be carried out in the presence of the Engineer-in-charge or his representative(s) in line with the commissioning procedure.

4.16 FINAL ACCEPTANCE AND WORK COMPLETION CERTIFICATE:

- 4.16.1 Final acceptance shall occur when the Contractor has completed the supply installation, testing & commissioning of all the components of the inverter

system along with its associated infrastructure & facilities in all respect, successfully completed all outstanding works and completion of all facilities in accordance with scope of works as specified in Technical Specifications as per satisfaction of Engineer-in-Charge and has submitted all technical documentation and acceptance of the same by Engineer-in-Charge.

- 4.16.2 Work Completion Certificate will be issued by Employer/ EIC on occurrence of Final Acceptance.

4.17 COMPLETION DOCUMENTS

- 4.17.1 Notwithstanding the provisions contained in standard specification, upon completion of work, the Contractor shall complete all of the related drawings and documents to the "As Built" stage (including all vendor/sub-vendor drawings for bought out items). Following documents to be submitted:

- 4.17.2 The following documents shall be submitted in both hard and soft copy by the Contractor in 1 (One) set, as a part of completion documents:

- (i) Preliminary survey report, Operation & Design data collected, and Design proposal for the replacement of the existing Inverter systems.
- (ii) Test documents & drawings for bought out items.
- (iii) Guarantee certificates.
- (iv) All approved design & detail engineering documents.
- (v) Pre-commissioning/Commissioning checklist.
- (vi) Installation, testing & commissioning reports of Inverter system.
- (vii) Trial run test reports.
- (viii) Complete operation & maintenance manual for Inverter system.
- (ix) All other requirements as specified in the respective specifications.
- (x) As built drawings.
- (xi) Any other drawing/document/report specified elsewhere in the bidding document.
- (xii) One set of Handing over report.

4.18 REJECTION OF DEFECTIVE EQUIPMENT

- 4.18.1 If, during the progress of works, the Engineer-in-Charge shall decide and inform in writing to the Contractor that the Contractor has assembled any equipment or part of the equipment unsound or imperfect or has furnished any equipment inferior to the quality specified, the Contractor, on receiving details of such defects or deficiencies shall, at his own expense, within 7 (Seven) days of receiving notice or otherwise, and for a period of time as may be

decided by the Engineer-in-Charge for making it good, proceed to alter, reconstruct or remove such work and furnish fresh equipment up to the standard of specifications. In case the Contractor fails to do so, the Engineer-in-charge may, on giving the Contractor minimum 7 (Seven) days' notice in writing of his intentions to do so, proceed to remove the portion of the work so complained of and at the risk and cost of the Contractor, perform all such work or furnish all such equipment, provided that nothing in this Clause shall be deemed to deprive the Employer of or affect any rights under the Contract which the Employer may otherwise have in respect of such defects and deficiencies.

- 4.18.2 In case of such replacement / rectification by the Employer, the Contractor shall be liable to pay to the Employer the extra cost, if any, for such replacement/by delivery and/or erected, as provided for in the original Contract, such extra cost being the ascertained difference between the price by the Employer under the provision above mentioned, for such replacement and the Contract price for the equipment so replaced. If the Employer/EIC does not so replace the rejected equipment, the Contractor shall be liable only to repay to the Employer/EIC all money paid by the Employer to him in respect of such equipment.
- 4.18.3 In the event of such rejection, the Employer shall be entitled to the use of the equipment in responsible and proper manner till a time reasonably sufficient to enable him to obtain other replacement equipment.

4.19 GUARANTEE AND WARRANTY

- 4.19.1 The Contractor must ensure that the goods supplied under the contract are new, unused and of specified models and incorporate all recent improvements in design and materials unless provided otherwise in the contract. The warranty/ guarantee period required for equipment under the projects is specified in Clause No. 4.3.4.
- 4.19.2 Manufacturer's Warranty/Guarantee certificate shall be furnished by the contractor as per Clause No. 4.19.1.
- 4.19.3 In respect of goods not covered by the Sub Clause 4.19.1, the Employer shall be entitled to the benefit of such guarantee given to the Contractor by the original Contractor or manufacturer of such goods.
- 4.19.4 During the Operation & Maintenance and guarantee period, the Contractor shall be responsible for any defects in the work due to faulty workmanship or due to use of sub- standard materials in the work.
- 4.19.5 Any defects in the work during the guarantee period shall therefore, be rectified by the Contractor without any extra cost to the Employer within a reasonable time as may be considered from the date of defect notice failing which the Employer reserves the right to take up rectification work at the risk and cost of

the Contractor.

- 4.19.6 In the event of emergency where, in the judgment of the Engineer-in-charge, delay would cause serious loss or damage, repairs, replacement, rectification, adjustment etc. may be done by the Engineer-in-charge or by any other Agency chosen by the Engineer-in-charge at the risk and cost of the Contractor. However, the Contractor shall assist the Employer/other Agency employed for necessary corrections. This shall not relieve the Contractor from any of his liability under the terms of the Contract. In case of defective parts which are not repairable at site but are essential for the commercial operation of the equipment, the Contractor and the Engineer-in-charge shall mutually agree to prepare rolling program for replacement or renewal, which will minimize interruption to the maximum extent, in the operation of the equipment.
- 4.19.7 In respect of goods supplied and or works done by the Contractor or goods supplied by the Sub-Contractor(s) to the Contractor where a longer guarantee is provided by such sub- Contractors, the Employer shall be entitled to the benefit of such longer guarantee period.
- 4.19.8 In case of defective parts which are not repairable at site but are essential for the operation of the equipment, the Contractor and the Engineer-in-charge shall mutually agree to an improvised arrangement to be made by the Contractor to ensure continued equipment operation and to a programme of replacement or renewal which will minimize interruption/dislocation to the maximum extent in the operation of the equipment. The cost of transportation, including all taxes & duties etc. as applicable, Insurance of defective parts from site and replacement will be borne by the Contractor.
- 4.19.9 It shall be expressly understood that all expenses in respect of replacement/repair during the warranty period or extended warranty period or as latent defects as noted above including, but not limited to, transportation cost, all taxes, duties and levies as applicable, etc. till such spare parts are installed in the main equipment after necessary replacement/repair and the main equipment is put back into operation, shall entirely be to the Contractor's account.

4.20 DEFECT LIABILITY

- 4.20.1 The contractor shall warrant that the equipment will be new & in accordance with the contract documents, relevant standards and free from defects arising due to deficiencies in design & engineering and from defects in material and workmanship for a period of 45 days from the date of commissioning and synchronisation of the inverter system. The Contractor shall be liable to replace/ upgrade with the specific consent of SJVN Limited, any defective parts in the equipment supplied and erected by him under the contract arising solely from faulty design, materials and /or workmanship. All replaced

defective parts shall be returned to the Contractor unless otherwise arranged by SJVN Limited.

- 4.20.2 If it becomes necessary for the contractor to replace or renew any defective component/part of the equipment, the provision of this clause shall apply to such component/part of the equipment so replaced or renewed and the Defect Liability Period for such replaced or renewed component/part of the equipment shall be extended for a period of 45 days from the date of such replacement/renewal. The rectification / replacement / repairs shall be done at the shortest possible time to minimize the loss of the Employer and as mutually agreed to. If any defects are not remedied within a reasonable time, SJVN Limited may proceed to do the work at the risk and cost of the contractor, but without prejudice to any other rights, which SJVN Limited may have against the contractor in respect of such defects.
- 4.20.3 The repaired or new parts will be furnished and erected free of cost by the Contractor. If any repair is carried out on contractor's behalf by SJVN Limited at the site through some other Agency, the Contractor shall bear the cost of such repairs.
- 4.20.4 The cost of any special or general overhaul rendered necessary during the defect liability period due to defects in the equipment or defective work carried out by the Contractor shall be borne by the Contractor.
- 4.20.5 The acceptance of the equipment by the SJVN Limited shall in no way relieve the Contractor of his obligations under the Contract.
- 4.20.6 The Contractor shall be responsible for any loss or damage to the equipment until the end of the Defect Liability Period.

4.21 CONTRACT PERFORMANCE GUARANTEE

- 4.21.1 Within twenty one (21) days from the date of issue of Letter of Award by the Employer, the Successful Bidder shall furnish to the Employer, an unconditional/ irrevocable Contract Performance Guarantee (CPG) for an amount equivalent to 5% of total price of the Contract, with a validity up to fifteen (15) days beyond the expiry of Defect Liability Period as per Clause No 4.20 of this Bid Document.
- 4.21.2 The Bank Guarantee against CPG submitted by the contractor as per Clause No 4.21.1 shall be discharged by the Employer and returned to the Contractor without any interest, not later than fifteen (15) days after issuance of Defect Liability Certificate of the equipment under the contract and acceptance thereof by the Employer; provided, however, that if the Defects Liability Period has been extended on any part of the Facilities pursuant to Clause No 4.20.2 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. This security shall be returned to the Contractor immediately after 15 days beyond the Defect Liability period

of such equipment(s).

- 4.21.3 While issuing the physical BG, the Contractor's bank shall also send electronic message through secure Structured Financial Messaging System (SFMS) to the Employer Beneficiary bank whose details are provided in NIT.
- 4.21.4 The proceeds of the Bank Guarantee/Insurance surety Bond against CPG shall be payable to the Employer as compensation for any loss resulting from the Contractor's failure to complete its obligations under the contract.
- 4.21.5 In case of any shortfall at any stage on account of recovery of any dues from the CPG, Contractor shall make-up the recovered amount by furnishing a separate CPG for such amount.
- 4.21.6 The Contractor shall require to submit CPG within the timeline specified above. However, delayed submission of CPG may be allowed only in exceptional circumstances, and in such case, interest shall be chargeable on per day basis on the amount of CPG @SBI one-year MCLR as on date of bid submission plus 200 basis points per annum for the period of delayed submission without prejudice to right of SJVN Limited to other remedies available under the contract.
- 4.21.7 In the event of failure of the Contractor to extend the CPG for a required period, the Employer reserves the right to invoke the CPG in favour of Employer on the date of its expiry.

4.22 TERMS AND PROCEDURES OF PAYMENT

4.22.1 General

- 4.22.1.1 The Employer shall pay to the Contractor after signing the Contract Agreement, in the following manner and at the following terms, on the basis of the Price Break-up given in the Letter of Award subject to any deduction which the Employer may be authorized to make under this contract and/or to any additions or deductions provided for in this contract.
- 4.22.1.2 The Contractor's request(s) for payment shall be made to the Engineer-In-Charge in writing, upon fulfillment of required obligations stipulated in the contract.
- 4.22.1.3 The contractor shall submit the Invoice in triplicate showing description, quantity, Unit rate and total amount with all supporting documents as per terms of the contract. After due verification, the Employer shall process the verified Bill for release of payment. In case contractor fails to submit the Invoice with all the required documents, the Employer reserves the right to hold the payment against such bills.
- 4.22.1.4 Payments shall be made by the Employer within thirty (30) days after submission of an invoice along with all supporting documents as per terms of contract by the Contractor.

4.22.1.5 In case the payments in respect of amount payable as per contract is delayed beyond 45 days, the contractor will be entitled for interest on pro rata basis (for actual period beyond 45 days) at the rate of one-year SBI MCLR applicable as on the date of payment.

4.22.1.6 The contractor shall raise the invoice on monthly basis.

4.22.1.7 The contractor shall ensure to make timely payments to its sub-contractor(s)/sub-vendor(s) engaged in the execution of project(s) to ensure timely completion of works. However, in case of delayed payment/non-payment by the contractor to its approved sub-contractor(s)/sub-vendor(s), the Employer reserves the right to make direct payment to such sub-contractor(s)/sub-vendor(s) as per the terms of payment on the request of Contractor or on the request of approved sub-contractor(s)/sub-vendor(s) or otherwise, in the interest of completion of project(s).

4.22.2 Invoice Details for Taxes and duties

Except as otherwise specifically provided in the contract, the Employer shall pay to the Contractor GST & Cess thereon, applicable if any, on submission of GST Invoice containing mainly the following contents:

- (i) Name, Address & Contact Detail of the Service Provider/contractor.
- (ii) GSTIN of the Service Provider/Contractor.
- (iii) PAN of the Service Provider/Contractor.
- (iv) GSTIN of the Employer/Owner
- (v) HSN/SAC of the respective item(s)

4.22.3 E- Payment

SJVN Limited shall make all the payments in respect of Contractor through e-payment system. Contractor shall open its account with banks having Core Banking Facility (CBS Branch) and fill in Electronic Fund Transfer (EFT) Form (to be submitted at signing of Contract Agreement) and return to Employer duly signed and stamped by its bankers. In case Contractor fails to provide requisite information as sought, it may result in delay in payment for which SJVN Limited will not be responsible. Any directions, instructions or orders issued by the Government of India from time to time regarding any or all matters arising or pertaining to the Import License shall be binding on the Contractor.

4.22.4 **Payment Schedule:** The payment shall be made as per following:

4.22.4.1 **40% (Forty percent)** of Gross total Price of work mentioned at No. 3 of the Price Schedule along with 100% GST for price of item mentioned at No. 1 shall be paid after quality inspection of manufactured item by the Employer before dispatch of material from manufacturer's work on production of the

following:

- (i) Application of payment along with three (3) copies of GST Invoice.
- (ii) Material Dispatch Clearance Certificate (MDCC) issued by the Employer, wherever applicable as per relevant clause(s) of this Bid Document.
- (iii) Submission of Packing list identifying contents of each package as per Clause No. 4.8.
- (iv) Indemnity Bond as per Clause No. 4.11.6.
- (v) Insurance certificate(s) as per Clause No. 4.23.
- (vi) Submission of Guarantee/ Warranty Certificate issued by the Contractor/ OEM.
- (vii) Submission of Certificate that all applicable laws and regulations have been adhered to, payments have been released timely to the sub-contractors/ supplies/ workers and supporting records shall be maintained and can be produced during audit.

The above documents shall be submitted by the Contractor to the Employer within six (06) days from the issue of MDCC to the contractor. The Contractor will be responsible for any consequent expenses due to delay in furnishing the above documentation.

4.22.4.2 40% (Forty percent) of Gross total Price of work mentioned at No. 3 of the Price Schedule shall be paid on receipt of supply of inverter and allied components by the Employer at project site on production of following:

- (i) Application of payment along with three (3) copies of GST Invoice.
- (ii) Proof of Dispatch: Railway receipt/Consignment note /original goods receipt etc.
- (iii) Insurance certificate(s) as per Clause No. 4.23.
- (iv) Physical Verification & discrepancy report by SJVN Limited for the equipment/material received and stored at site. Payment shall be released after making adjustment of discrepancies only.
- (v) Submission of Certificate to the effect that Payment(s) claimed conform the Terms and Conditions of the Contract Agreement and that said payment(s) had not been claimed earlier.
- (vi) Submission of Certificate that all applicable laws and regulations have been adhered to, payments have been released timely to the sub-contractors/ supplies/ workers and supporting records shall be maintained and can be produced during audit.

4.22.4.3 **Remaining 20% (Twenty percent)** of Gross total Price of work mentioned at No. 3 of the Price Schedule along with 100% GST for item mentioned at No. 2 shall be paid on successful installation, testing, commissioning and final acceptance of the entire inverter system at site and on production of the following:

- (i) Application of payment along with three (3) copies of GST Invoice.
- (ii) Submission of Completion and other Reports.
- (iii) Physical Verification & discrepancy report by SJVN Limited for the equipment/material received and stored at site. Payment shall be released after making adjustment of discrepancies only.
- (iv) Submission of Certificate that all applicable laws and regulations have been adhered to, payments have been released timely to the sub-contractors/ supplies/ workers and supporting records shall be maintained and can be produced during audit.
- (v) Issuance of Work Completion Certificate by the Employer.

4.22.5 **Delayed Payment**

Omissions on the part of the EIC to pay the amount due upon measurement or otherwise shall neither vitiate nor make the contract void. Further, no claim for interest or damages will be entertained or payable by the Employer upon

- (i) any Bank Guarantee or payments in arrears or retention of amount due to non-fulfilment of obligation on the part of the contractor
- (ii) any balance amount (to be paid if any) which may become due on final settlement/re-conciliation of the account at the time of closure of the contract or
- (iii) Amount withheld by the Employer owing to any dispute or difference between the parties.

The Contractor shall be entitled to this payment without formal notice or certification, and without prejudice to any other right or remedy.

4.22.6 **Final Bill**

The final bill relating to the EPC Contract shall be prepared only when the equipment has been installed and tested for Final acceptance under Clause No. 4.16 and it will include adjustment of all claims against the Contractor by the Engineer-in-Charge. The amount equivalent to losses or damages for which Contractor fails to settle claim with the insurer before completion of entire work would also be recovered from any amount due to contractor.

4.23 INSURANCE

4.23.1 The Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified below. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.

4.23.1.1 **Cargo/ Marine All Risk Insurance:** Covering loss or damage occurring, while in transit from the Contractor's or Subcontractor's works or stores until arrival at the site including unloading, to the Plant and Equipment (including spare parts thereof) and to the Contractor's Equipment. This policy shall cover 'ALL RISKS' under and /or on deck as per Institute Cargo Clause 'A'. The sum insured should be total price of equipment.

4.23.1.2 **Erection All Risks Insurance:** Covering any physical loss or damage to the equipment during handling, transportation, storage, erection of the Facilities at the Site, occurring prior to completion of the Facilities, with extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring up to commissioning while the Contractor is on the Site for the purpose of performing its obligations under the contract. The sum insured should be total price of equipment.

4.23.1.3 **Third Party Insurance:** Before receipt of equipment at site but without limiting his obligations and responsibilities under this clause hereof, the Contractor shall insure against his liability for any equipment, material, property (including the Employer's property and any parts of the facilities that have been accepted by the Employer), or physical damage covering bodily injury or death suffered by third parties (including the Employer's personnel) by or arising out of the execution of the contract or in the carrying out of contract.

4.23.1.4 **Workmen's Compensation Insurance:** The contractor shall protect himself against all claims applicable under the Workmen's Compensation Act, 1923. This policy shall also cover the contractor against claims for injury, disability, disease or death of his or his sub-contractor's employees, which for any reason are not covered under the Workmen's Compensation Act, 1923. The liabilities under Workmen's Compensation Insurance shall be as per statutory provisions.

Employer shall not be liable for or in respect of any damage or compensation payable in law in respect or in consequence of any accident or injury to any workman or other person in the employment of the contractor(s) or any sub-contractor(s), save and except an accident or injury resulting from any act or default of the Employer.

4.23.2 The Employer shall be named as co-insured under all insurance policies taken

out by the Contractor except for Third Party Liability, Workman's Compensation. Payment shall be released to the Contractor by the Insurance Company after receipt of NOC from the Employer. The appropriate Clause shall be incorporated in the Insurance Policy taken by Contractor to ensure this requirement.

- 4.23.3 In case the Contractor has taken/takes blanket insurance policy for "Erection All Risk policy" during storage and erection, such policy shall also be acceptable to Employer provided that; the name of the Employer and the Project is endorsed in the said policies.
- 4.23.4 The Contractor shall provide the Engineer-in-Charge with copies of all insurance policies and documents taken out by him in pursuance of the contract. Any amendment (s) of Insurance Policies, if required, shall be informed to the Contractor by Engineer-in-Charge. The Insurance Policies shall be amended by the Contractor within 15 days of the receipt of such request. In case, Contractor fails to submit amended Insurance Policy than no future/progressive payment shall be released.
- 4.23.5 The Contractor shall ensure that, where applicable, its Sub-contractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Contractor.
- 4.23.6 It shall be the responsibility of the contractor to extend the period of insurance policy (ies) if required to comply with the provisions of contract. The Engineer-in-Charge shall inform the Contractor in writing at least thirty (30) days in advance from the date of expiry for the extension of the Insurance Policy. If the Contractor fails to extend the said policy within 15 days of notice period, SJVN Limited reserves the right to extend the said policy and the cost of the premium paid towards extension of said policy shall be recovered/deducted from the amount payable/due to the Contractor.
- 4.23.7 The Contractor shall be responsible for preferring of all claims and make good the damages or loss by way of repairs and / or replacement of the work, damaged or lost. The Transfer of Title shall not in any way relieve the Contractor of the above responsibility during the period of contract. The Employer shall give to the Contractor all such reasonable assistance with respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer.
- 4.23.8 Notwithstanding the insurance requirements mentioned above, it would be the Contractor's responsibility to take adequate insurance cover as may be pertinent to protect his interest and interest of the Employer. If at any point of time during execution of the Contract, the insurance policies are found to be inadequate, the Contractor shall take fresh insurance policies meeting

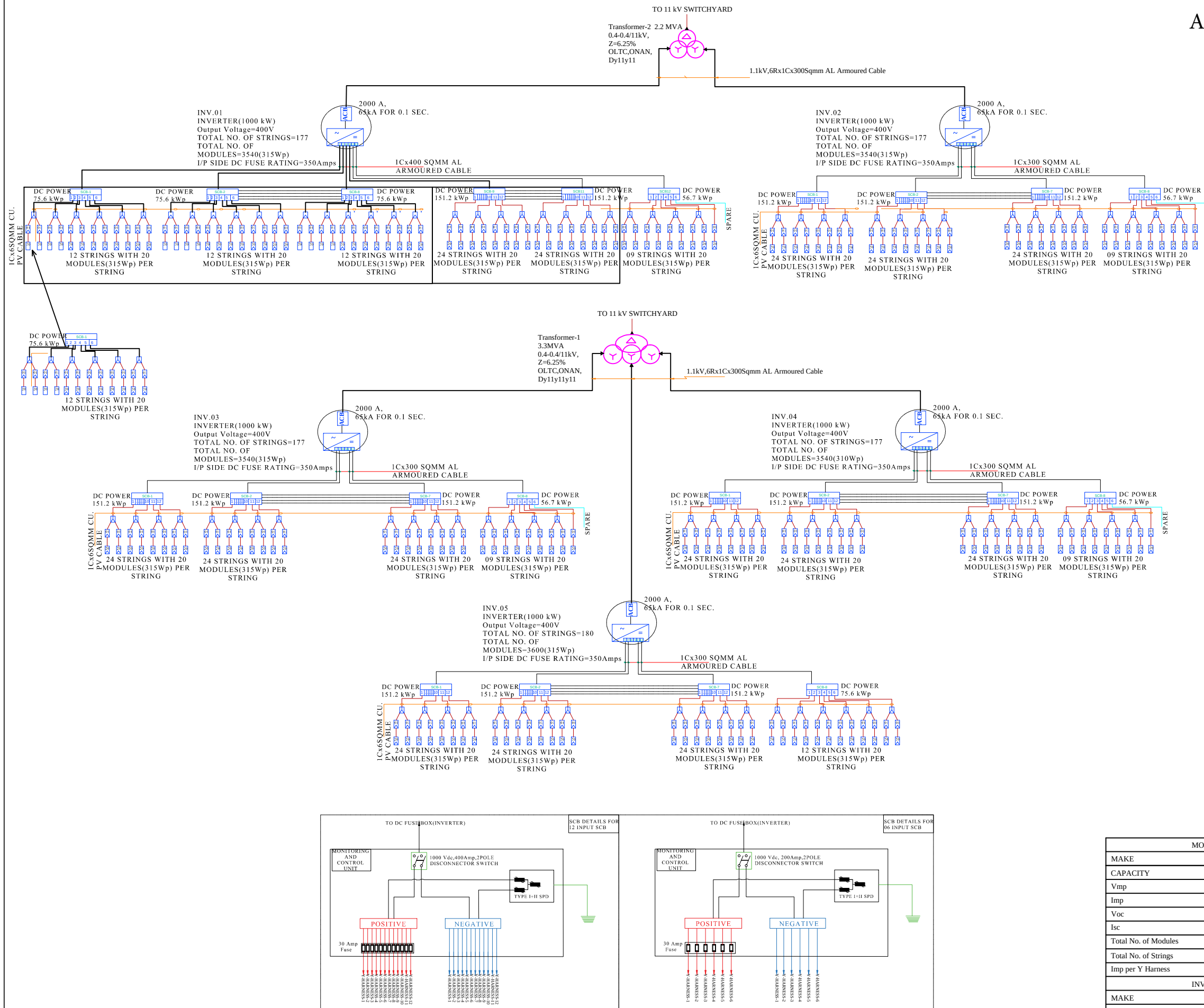
aforesaid requirements.

- 4.23.9 In case of any loss or damage or pilferage or theft or fire accident or combination of the said incidents etc. under the coverage of insurance, the Contractor shall make good the damages or loss by way of repairs and/or replacement of plant and equipment damaged or lost and lodge the claim as per rules of insurance. Any FIR required to be lodged to local Police Station shall be the responsibility of the Contractor. Notwithstanding the extent of insurances cover and the amount of claim available from the underwriter, the contractor shall be liable to make good the full replacement/rectification of all the equipment/materials and to ensure their availability as per project requirement without additional financial liability to the Employer.
- 4.23.10 All cost on account of insurance liabilities covered under the contract will be to the Contractor's account and will be included in contract price.
- 4.23.11 The Contractor shall arrange insurance with Indian Insurance Companies only.

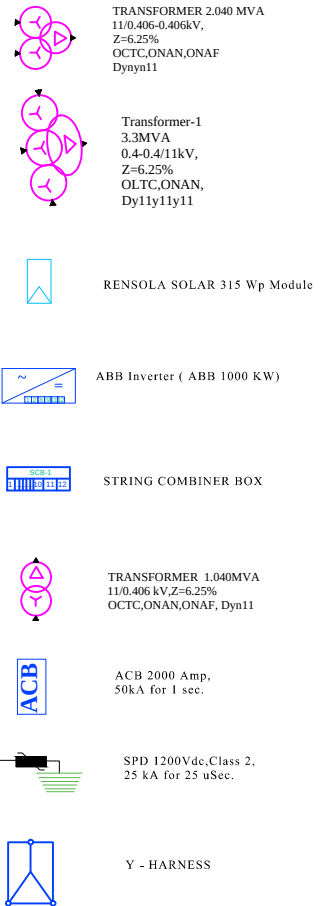
4.24 PRICE SCHEDULE

Sr. No.	Service Text	Qty	Amount (excluding GST)	GST	Amount (including GST)
1.	Supply of Inverter(s) along with allied components complete in all respect	1 Job			
2.	Installation, testing, commissioning and synchronisation of the inverter(s) along with allied components complete in all respect	1 Job			
3.	Gross Total				

ANNEXURE-1



LEGEND :-



A - ISSUED FOR REVIEW	☐
B - ISSUED FOR APPROVAL	☐
C - ISSUED FOR CONSTRUCTION	☐
D - AS BUILT	☒

DUE TO REVISE STRING CONFIGURATION	SKV	US	R05	10.12.15
DUE TO SJVN COMMENTS	SKV	US	R04	04.12.15
DUE TO CHANGED MODULE MAKE	SKV	US	R03	23.11.15
DUE TO CHANGED INVERTER MAKE	SKV	US	R02	19.11.15
DUE TO CHANGED INVERTER CAPACITY	SKV	US	R01	09.11.15
NATURE OF REVISION & DESCRIPTION	DRAWN	CHECKED	REV.	DATE

PROJECT TITLE :

5. MW CHARANKA SOLAR PV PROJECT

DWG. TITLE : DC SINGLE LINE DIAGRAM

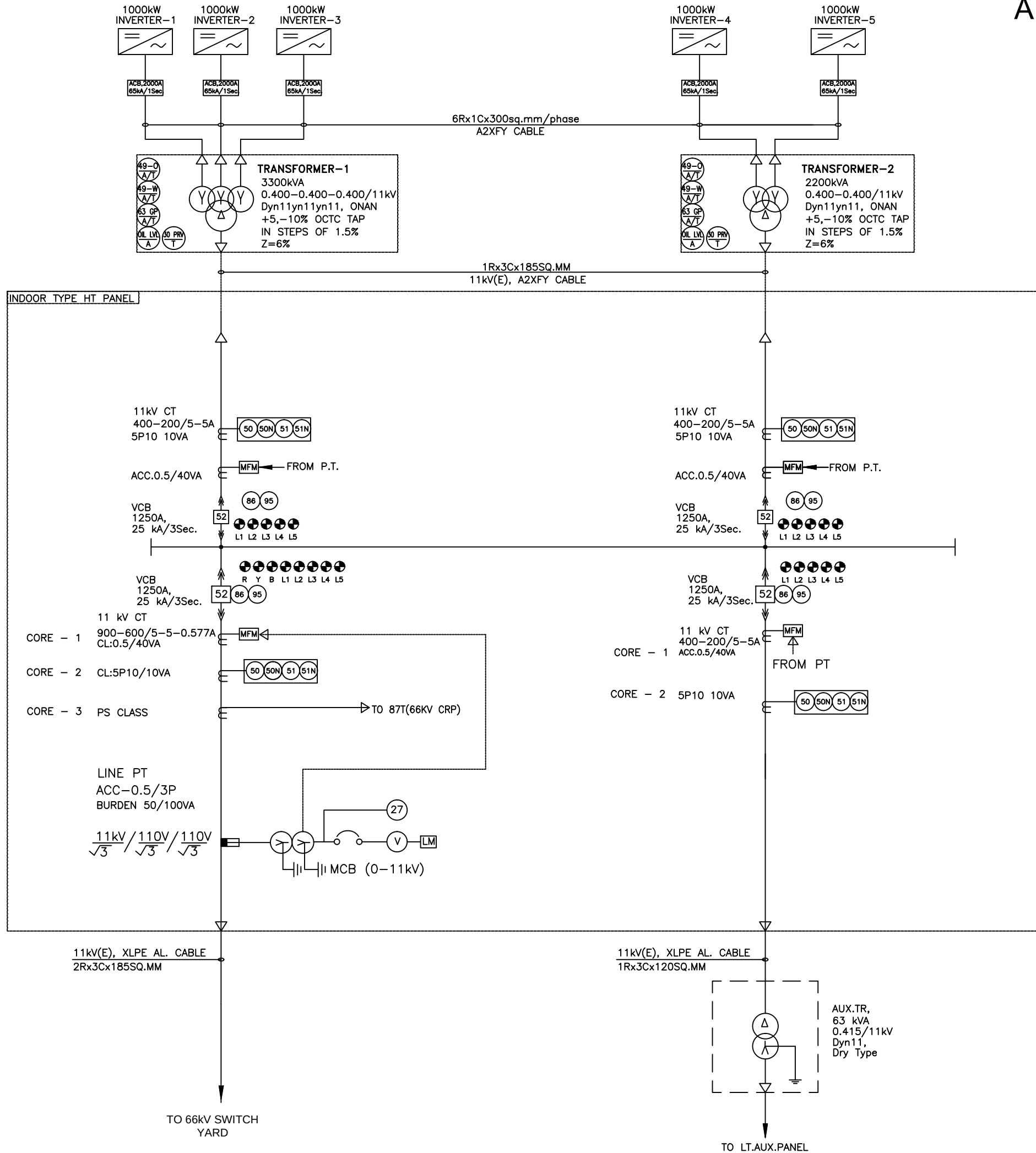
CLIENT :	SJVN LIMITED, District Centre, Saket, Delhi, India
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EPC CONTRACTOR:	RAY'S POWER EXPERTS PVT. LTD. Unit No. 114, Rectangle One, ABW Tower, District Centre, Saket, Delhi, India
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DRAWN BY : SKV	SCALE : NTS
REVIEWED BY : GS	DATE : 22/07/2017
APPROVED BY : BG	SHEET : 01 OF 01

DRAWING NO.	
RPE/PV/PR20151030-E01	
	REV. NO.

ANNEXURE-II



LEGEND:-

- (50) INST. O/C RELAY
- (51) IDMT O/C RELAY
- (50N) INST. E/F RELAY
- (51N) IDMT E/F RELAY
- (95) TRIP SUPERVISION RELAY
- (86) MASTER TRIP RELAY
- (27) UNDER VOLTAGE RELAY
- (49) TEMPERATURE DEVICE
- (63) BUCHHOLZ RELAY
- (74) PRESSURE RELIEF DEVICE
- (26) MAGNETIC OIL LEVEL GAUGE
- [LM] LOAD MANAGER
- [MFM] MULTIFUNCTION METER
- [52] BREAKER
- [PI] PHASE INDICATOR
- [CT] CURRENT TRANSFORMER
- [PT] POTENTIAL TRANSFORMER
- [F] FUSE
- [LA] LIGHTING ARRESTOR
- L1 [L] BREAKER ON INDICATION
- L2 [L] BREAKER OFF INDICATION
- L3 [L] BREAKER TRIP INDICATION
- L4 [L] SPRING CHARGE INDICATION
- L5 [L] TRIP CIRCUIT HEALTHY INDICATION
- R [L] R PHASE INDICATION
- Y [L] Y PHASE INDICATION
- B [L] B PHASE INDICATION

A - ISSUED FOR REVIEW	☐
B - ISSUED FOR APPROVAL	☒
C - ISSUED FOR CONSTRUCTION	☐
D - AS BUILT	☐

DUE TO SJVNL COMMENTS	SKV	US	R03	10.12.15
DUE TO CHANGED 11kV TRANSF. CAPACITY	SKV	BG	R04	25.11.15
DUE TO CHANGED 66 kV TRANSF RATING	SKV	BG	R03	24.11.15
DUE TO CHANGED INVERTER CAPACITY	SKV	BG	R02	23.11.15
DUE TO CHANGED CT RATIO	SKV	BG	R01	17.11.15

NATURE OF REVISION & DESCRIPTION	DRAWN	CHECKED	REV.	DATE
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PROJECT TITLE:
5 MW SJVNL SOLAR PV PROJECT
AT CHARANKA SOLAR PARK, GUJARAT

DWG. TITLE:
11 kV SINGLE LINE DIAGRAM

CLIENT:  SJVN LIMITED
(A Joint Venture of Govt. of India & Govt. of Himachal Pradesh)
A 'Mini Ratan' & Schedule 'A' PSU.
An ISO 9001:2008 Certified Company

EPC CONTRACTOR:  RAYS POWER EXPERTS PVT. LTD.
Unit No. 114, Rectangle One, ABW Tower
District Centre, Saket,
Delhi, India

DRAWN BY: SKV	SCALE : NTS
REVIEWED BY: US	DATE : 10.12.15
APPROVED BY: BG	SHEET : 01 OF 01
PROJECT NO. RPE/PV/PR20151030	DRAWING NO. RPE/PV/PR20151030-E03
	REV. 05

**ABB Solar PV Central Inverter - PVS800**

Inverter Technical Specifications

A	General	
	Ratings	1000 kVA (50°C)
1	Manufacturer	ABB
2	Model	PVS800-57-1000kW-C
3	Negative Grounding	Available
B	Input Parameters	
1	Maximum input power (PPV, max)	1200 kWp
2	DC voltage range, mpp (UDC, mpp)	600 to 850 V
3	Maximum DC voltage (Umax (DC))	1100 V
4	Maximum DC current (Imax (DC))	1710 A
5	Number of protected DC inputs	8 fused (Fuses on +ve side only)
C	Output Parameters	
1	Nominal power (PN(AC)) @ 50°C	1000kVA at P.F=1
2	Output power @25°C	1200 kW
3	Output power @50°C	1000kW
4	Nominal AC current (IN(AC))	1445 Amps
5	Nominal output voltage (UN(AC))	400 V
6	Output frequency	50 Hz
7	Power Factor Compensation	Yes (0-1 Cap / Ind)
8	Harmonic distortion, current	<3%
9	Distribution network type	TN & IT (Inverter side must be IT type)
10	Maximum Efficiency	98.8%
11	Euro Efficiency	98.6%
12	Own consumption in operation	730 Watts
13	Standby operation consumption	70 Watts
14	External auxiliary voltage	230 V, 50 Hz
15	Degree of protection	IP42 (This for Indoor) ✓
16	Ambient temp. range	-15 to +25 °C
17	Maximum ambient temperature	+55°C
18	Relative humidity, not condensing	15 to 95%
19	Dimensions Width/Height/Depth, mm (W/H/D)	3630/2130/646
20	Noise	75 dBA
21	Cooling Air Flow Requirement	9450 Cu Mtr / Hr



TECHNICAL SPECIFICATION OF (0.400-0.400-0.400/11KV),3300 kVA Transformer_SJVNL_11KV		
T.F should be as per IS-5,IS-12944,IS-1554(P-I),IS-1570(P-V),IS-1576,IS-1866,IS-2026,IS-2099,IS-2705,IS-2927,IS-3024,IS-3637,IS-4253,IS-5561,IS-13234,IS-6209,IS-6600,IS-8468,IS-10028,IS-10593,IEC-60076,IEC-137,IEC-185,IEC-60214		
GENERAL SPECIFICATIONS		
S. No.	Particulars	
1.01		
1	Rated KVA	3300
2	Winding Arrangement	4 winding(3 LV/1 HV)
3	Type	Three Pahse, 0.400-0.400-0.400/11KV step up transformer,Double limb wound, core type for out door application
4	Type of cooling	ONAN
5	Winding	Copper Wound
6	Winding Insulation	Class-A
7	Type of insulation	Uniformly insulated as per IS:2026 Part III
8	Winding Material	Electrolytic grade copper
9	Type Of core	CRGO
1.02	SYSTEM PARTICULARS	
1	Nominal Voltage(V)	11000
2	Highest System Voltage(V)	12000
3	Rated primary current(Amp)	1445/1445/1445
4	Rated Seconday Current(Amp)	173.6
5	No.of phase	3
6	Frequency(Hz)	50
1.03	Variations	
1	Voltage variation(%)	Plus/Minus 10%
2	Frequency variationC/S	48 to51
1.04	Impulse Withstand Voltage (KVp/KVrms)	
		(1.2 / 50 micro second wave)
1	HV	75
2	LV	Not applicable
1.05	One minute power Frequency withstand voltage (KV)	
1	HV	28
2	LV	3
1.06	RATING	
1	Rated voltage of L.V(V)	400-400-400
2	Max temrise of oil (above ambient)	50
3	max tem rise of winding (above ambient)	55
4	Oil Grade	EHV(IS-12463)
1.07	WINDING CONNECTION DETAILS	

1	Connections	
a	H.V winding	Delta
b	L.V winding	Star-Star-Star
c	Netural brought out for earthing	yes-but not to be earthed
2	Tapings	
a	No.Of positions	7
b	Range	plus 5, minus 10% in step of 1.50%
c	Voltage of each step	1.5% of rated voltage
3	Vector Group Three Wdg.	Dy11y11y11
1.08 Efficiency at unity PF		
	At 0.85 PF	at unity PF
1	At 100% load	98.65%
2	At 75 % Load	98.88%
3	At 50% load	99.07%
1.09 Termination details		
1	HV/LV	Cable Box on both HV and LV
2	No. of Run on LV/HV side	6 Run per LV side and 1 Run at HV (A)
1.10 LOSSES AND OTHERS		
1	No load losses at rated frequency & voltage	3.8KW
2	CU losses at rated current and rated frequency at 75 deg c	20.55KW
3	Percentage Impedance %	6.25
4	Harmonic Suppression/ (as per IS) for 3rd, 5th & 7th Harmonic	Has to be there
5	Flux Density-use of lazor make 0.23 grade laminations is necessary	Less than 1.6 Tesla
1.11 PROTECTIONS		
1	Buchholz alarm and trip	Available
2	Winding temperature trip and alarm	Available
3	Oil temperature trip and alarm	Available
4	Pressure relief valve	Available
5	Temperature indication for winding and oil	Available
1.12 TEST		
1	Stage Test	
a	Test for oil tightness	Available
b	Material test on core conductor and insulating material	Available
c	Leakage test for radiator	Available
d	All weld shall be test to ensure that no weld would sweat	Available
2	Routine Test	
a	Ratio test for all teps ?	Available
b	Check test for polarity, vector relationship and terminal marking	Available



(101)

c	Measurement of load losses at rated load current and calculation of losses at 75 Deg Cent	Available	
d	Impedance voltage between winding at rated current and calculation of impedance at 75deg cent.	Available	
e	Insulation resistance between winding and winding to earth at 75 deg Cent	Available	
f	High voltage test	Available	





TECHNICAL SPECIFICATIONS (TS)

SHEET -3

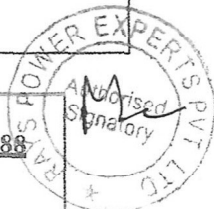
TECHNICAL PARTICULARS OF 415V/11 kV and 11kV/66kV STEP-UP TRANSFORMER

(To be furnished by the bidder)

S. No.	Description	Guaranteed particulars to be filled in by the manufacturer
1.	Service	
2.	Type	Step-Up Transformer(400/11KV) and 11KV/66KV
3.	Rating kVA	3300KVA*1, 2200KVA*1 and 6250KVA*1
4.	Rated frequency Hz	50
5.	Number of phase	
	HV side	3-Ph
	LV side	
	Neutral (separate outside)	
6.	Rated Voltage	
	a) HV winding Kv	0.400-0.400-0.400/11KV,
	b) LV winding kV	0.400-0.400/11kv,
		11/66KV
7.	Vector group	Dyn11yn11yn11,Dyn11yn11 and Dyn11
8.	Type of cooling (ONAN/ONAF)	ONAN
9.	Insulation level	
	a) Power frequency withstand -kV rms. (HV/LV)	At 11kv 28/3 , At 66kv 140/30kV
	b) Impulse withstand voltage - kV (HV/LV)	At 11kv 75 , 66KV 350/90Kvp/kV rms
10.	Method of Earthing	Body Earthing
11.	Duty	Inverter Duty Type
12.	Short circuit level	At 11kv-25KA for 3 Sec , at 66KV – 31.5KA for 3 sec
13.	Off circuit tap changer:	
	a) Range %	+5% to -10% for 0.4/11 kV,+5 to -15% for 11/66kV Transformer
	b) In steps of	1.5% for 0.4/11kV,1.25% for 66/11kV Transformer
	c) Tapping provided on HV side	7
14.	Tap changer type	OCTC
15.	Impedance voltage at 75°C	
	a) At principal tapping %	6.25 and 9

Sr. Manager
(Contract BD & MS)

DEVELOPMENT OF 5MW SJVN TECHNICAL SPECIFICATIONS
CHARANKA SOLAR PV PROJECT
SJVN/SOLAR/5MW/GJ/NIT/001-2015



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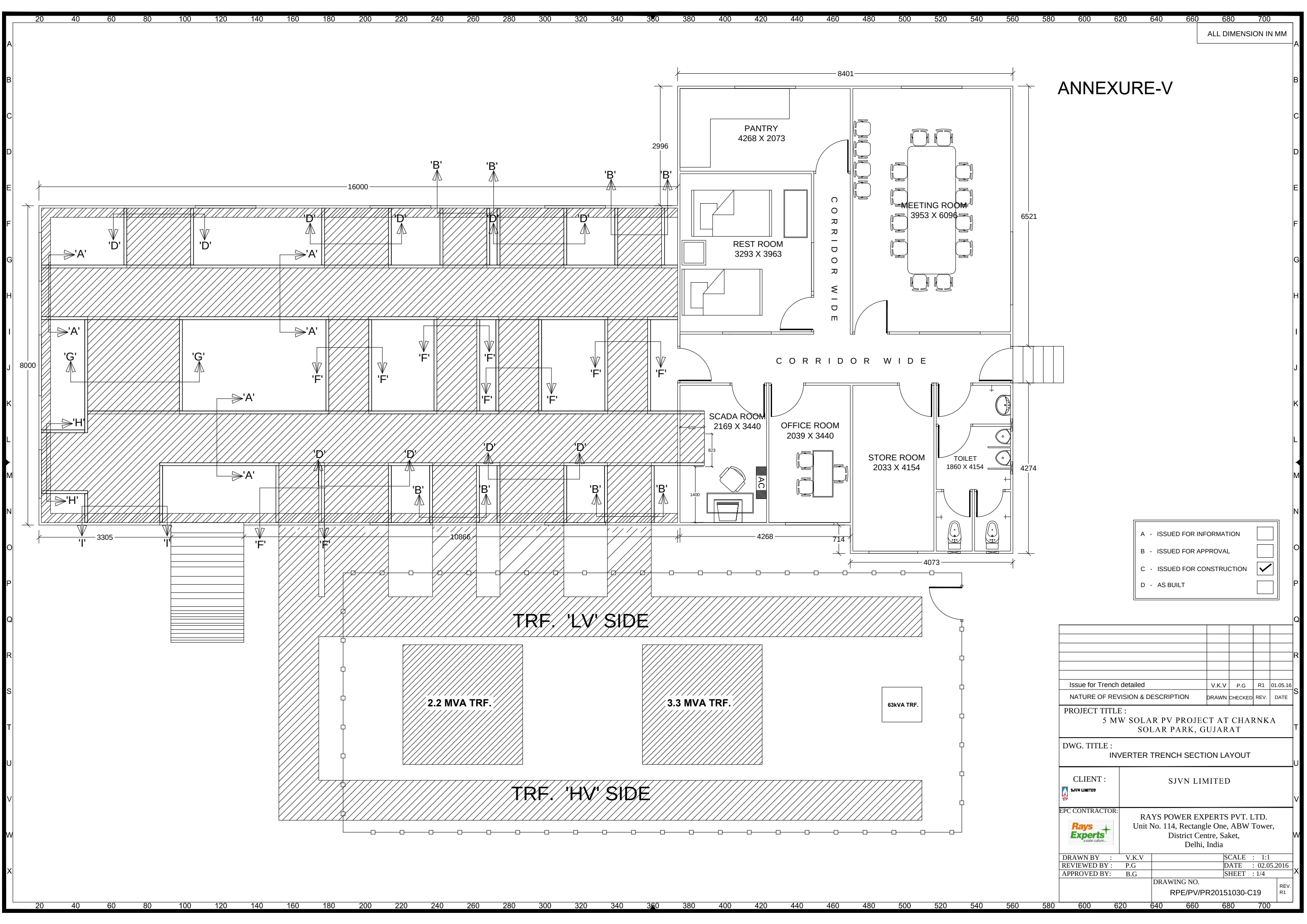
TECHNICAL SPECIFICATIONS (TS)

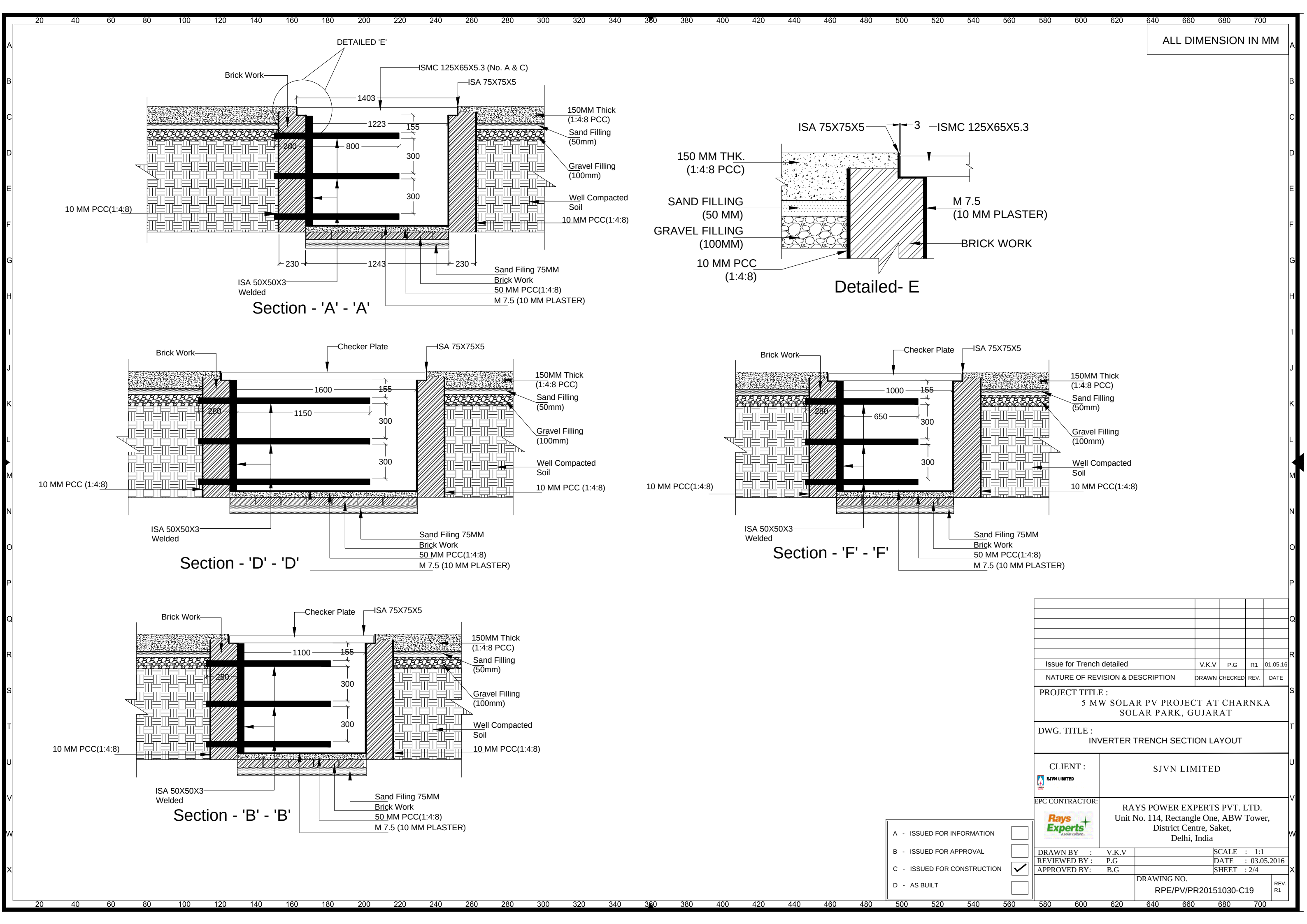
S. No.	Description	Guaranteed particulars to be filled in by the manufacturer
16.	Temperature rise above 50°C ambient a) Top of oil by thermometer °C b) Womdomg by resistance °C	50 55
17.	Terminal details a) HV side b) LV side	Cable Box Cable Box
18.	Losses (at 75°C and principal tapping) a) No load loss at rated voltage kW and frequency b) Load loss at rated current kW (ONAN) c) Total loss at maximum rated power kW	For 2.2MVA-2.56, For 3.3MVA-3.80, For 6.25MVA- 7.30 For 2.2MVA-13.94, For 3.3MVA-20.55, For 6.25MVA- 39.58 For 2.2MVA-16.5, For 3.3MVA-24.35, For 6.25MVA- 46.88
19.	Efficiency at 75°C and 0.9 PF a) At full load (ONAN) % b) At 75% load (ONAN) % c) At 50% load (ONAN) %	98.65 98.88 99.07
20.	Hot spot temperature in winding limit to °C	?
21.	Shipping dimensions a) Height m b) Breadth m c) Length m	Will be provided during dispatch
22.	Painting	Will be provided by vendor
23.	Reference Standards	IS-2026

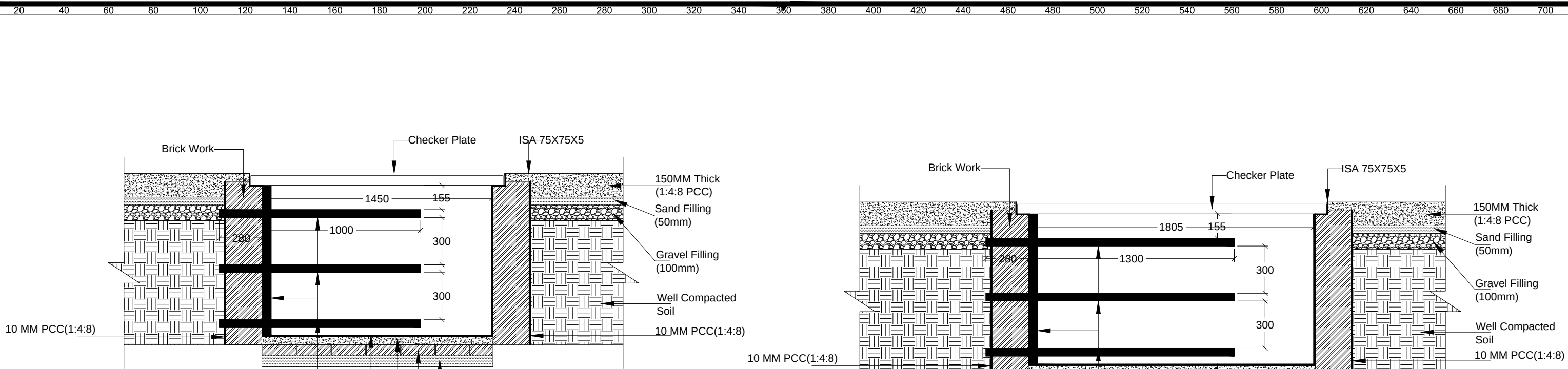
22✓
Sr. Manager
(Contract BD & MS)
S J V N LTD. New Delhi



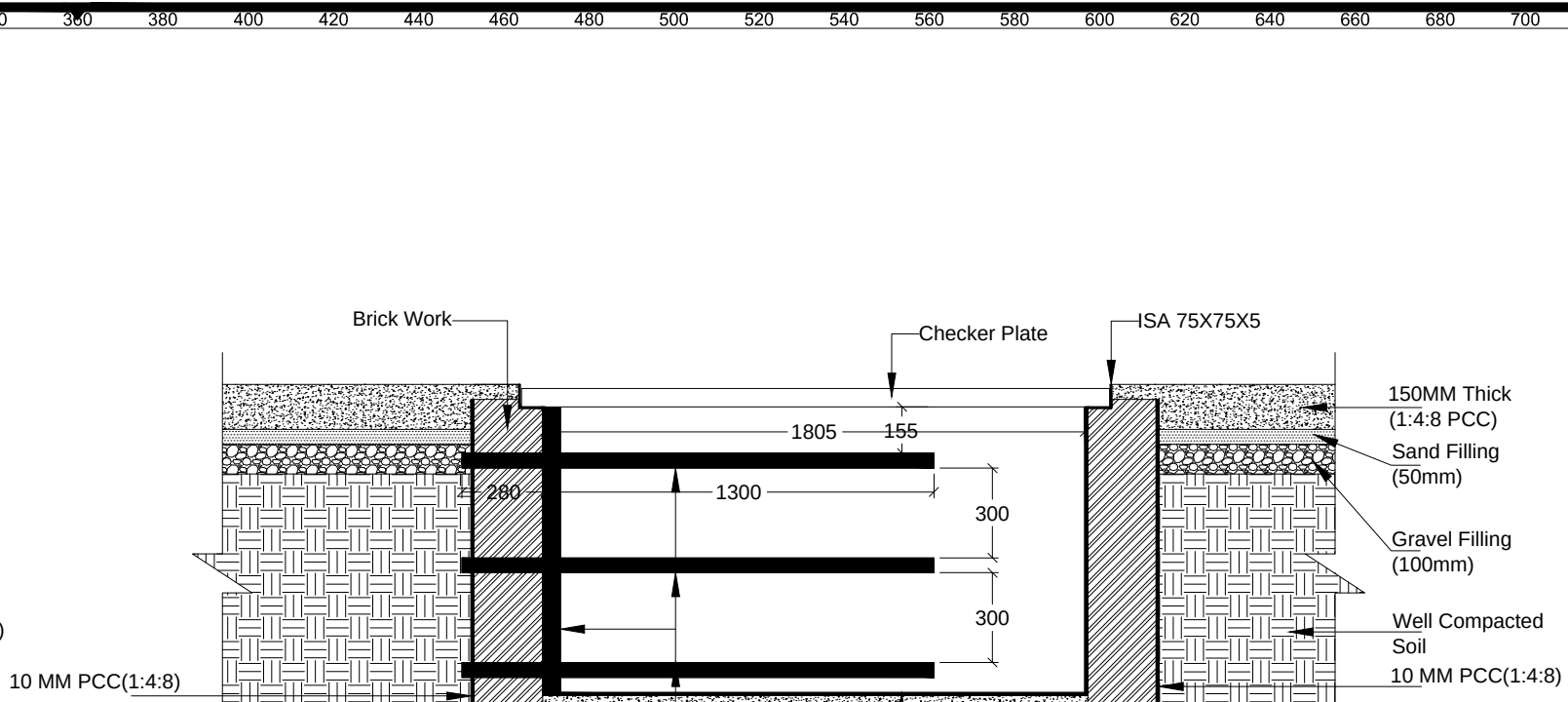
DEVELOPMENT OF 5MW CHARANKA SOLAR PV PROJECT	TECHNICAL SPECIFICATIONS SJVN/SOLAR/5MW/GJ/NIT/001-2015	PART-IV	Page 159 of 188 000208
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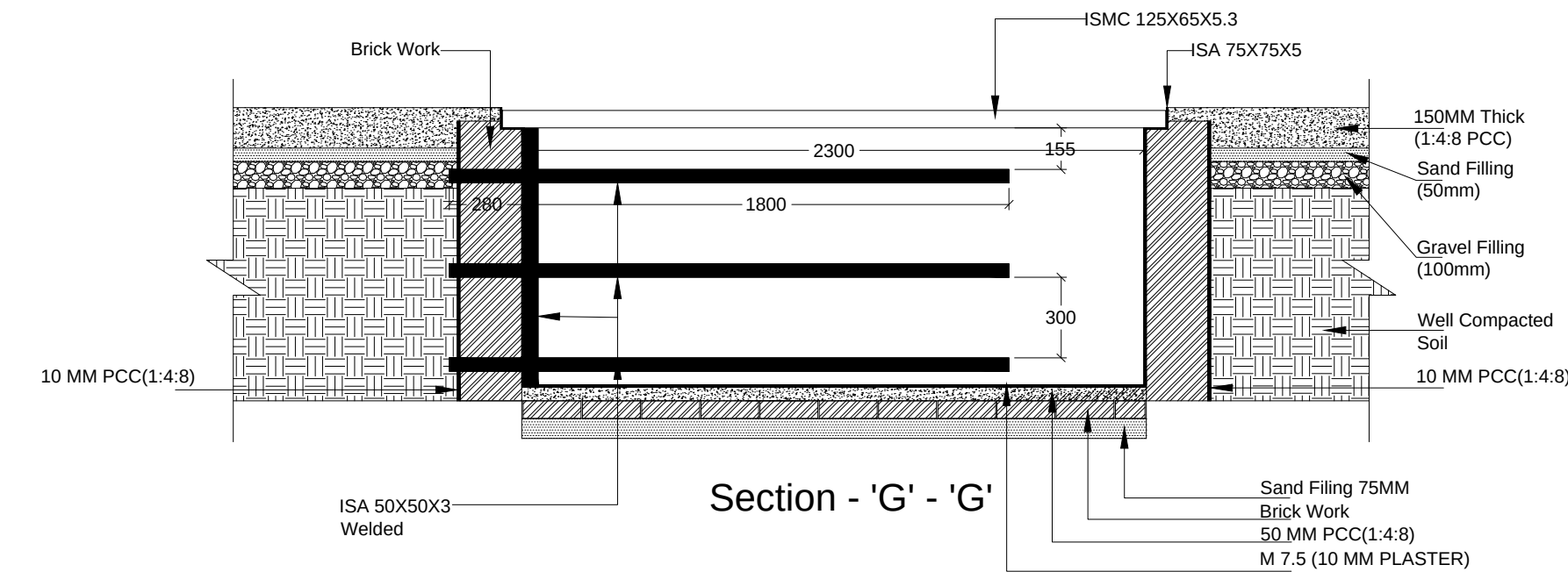




Section - 'H' - 'H'



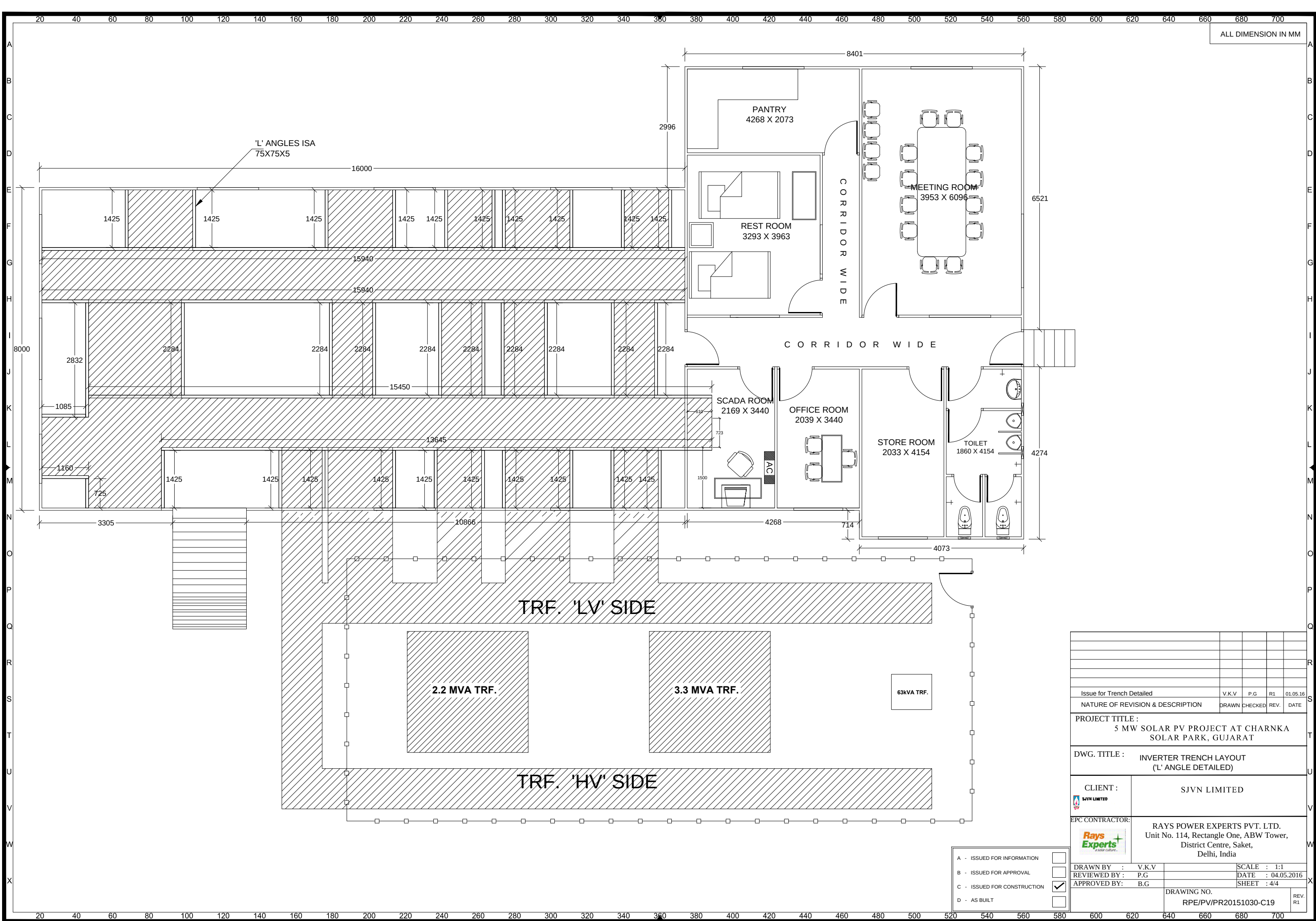
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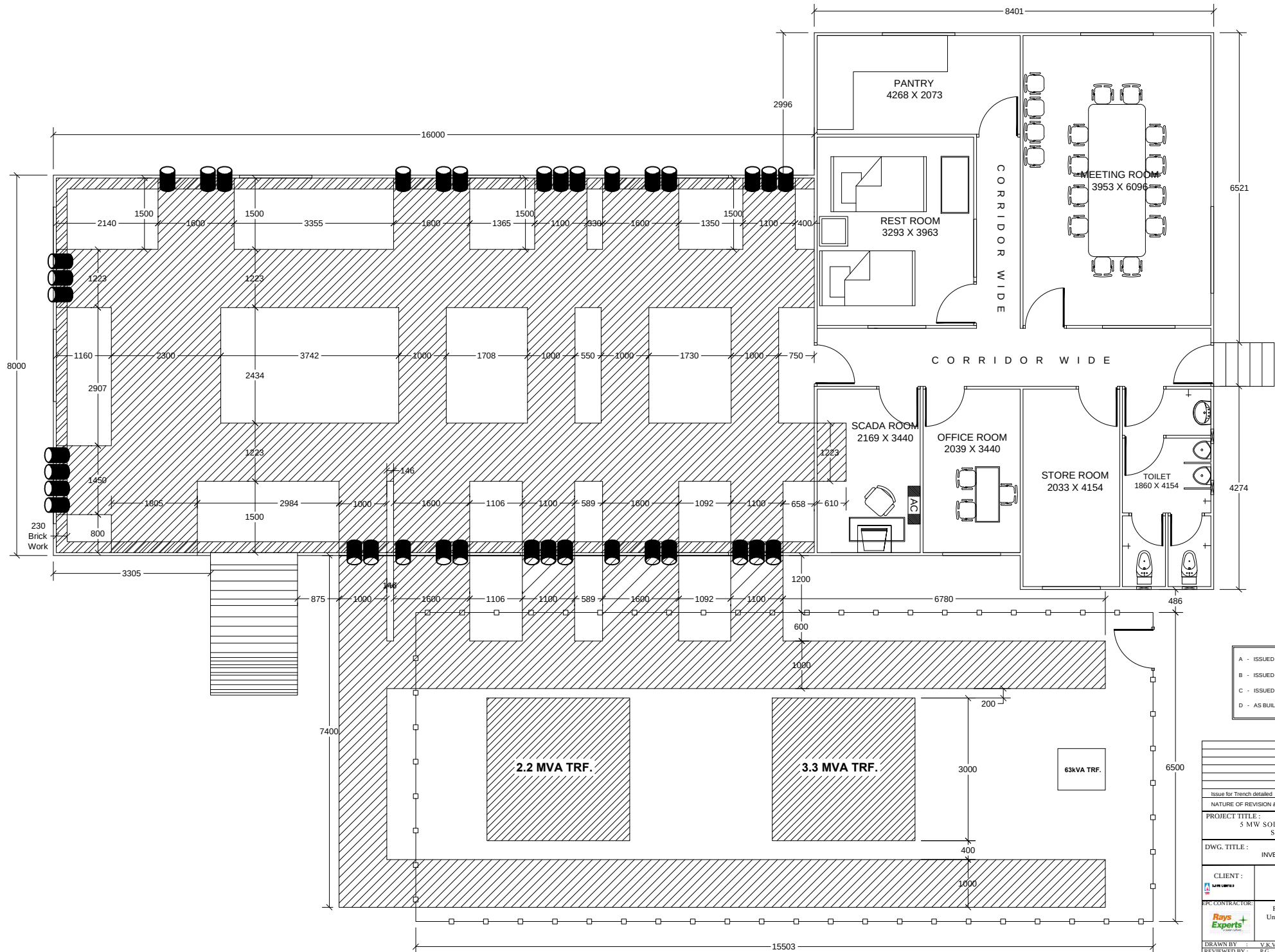


Section - 'G' - 'G'

A - ISSUED FOR INFORMATION	☐
B - ISSUED FOR APPROVAL	☐
C - ISSUED FOR CONSTRUCTION	☒
D - AS BUILT	☐

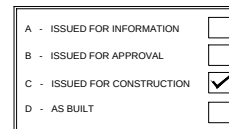
Issue for Trench detailed				
NATURE OF REVISION & DESCRIPTION				
PROJECT TITLE :				
5 MW SOLAR PV PROJECT AT CHARNKA SOLAR PARK, GUJARAT				
DWG. TITLE :				
INVERTER TRENCH SECTION LAYOUT				
CLIENT :		SJVN LIMITED		
EPC CONTRACTOR:		RAYS POWER EXPERTS PVT. LTD. Unit No. 114, Rectangle One, ABW Tower, District Centre, Saket, Delhi, India		
DRAWN BY :		V.K.V	SCALE : 1:1	
REVIEWED BY :		P.G	DATE : 03.05.2016	
APPROVED BY:		B.G	SHEET : 3/4	
DRAWING NO.				REV. R1
RPE/PV/PR20151030-C19				





A - ISSUED FOR INFORMATION	☐
B - ISSUED FOR APPROVAL	☐
C - ISSUED FOR CONSTRUCTION	☒
D - AS BUILT	☐

Issue for Trench detailed	V.K.V.	P.G.	B.S.	04.05.16
NATURE OF REVISION & DESCRIPTION	DRAWN	CHECKED	REV	DATE
PROJECT TITLE :	5 MW SOLAR PV PROJECT AT CHARNKA SOLAR PARK, GUJARAT			
DWG. TITLE :	INVERTER TRENCH LAYOUT			
CLIENT :	SJVN LIMITED			
EPC CONTRACTOR :	RAYS POWER EXPERTS PVT. LTD. Unit No. 114, Rectangle One, ABW Tower, District Centre, Saket, Delhi, India			
DRAWN BY :	V.K.V.	SCALE :	1:1	
REVIEWED BY :	P.G.	DATE :	01.05.2016	
APPROVED BY :	B.G.	SHEET :	2/2	
DRAWING NO.	RPE/PV/PR20151030-C19			REV. 01

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