GOVERNMENT OF WEST BENGAL
WATER RESOURCES INVESTIGATION &
DEVELOPMENT DEPARTMENT OFFICE OF THE
EXECUTIVE ENGINEER
WEST BENGAL ACCELERATED DEVELOPMENT OF MINOR
IRRIGATION PROJECT PHASE –II DISTRICT PROJECT
MANAGEMENT UNIT DAKSHIN DINAJPUR
JALASAMPAD BHABAN, 2ND FLOOR, NEAR SANKET CLUB, UTTAR CHAKBHABANI, DAKSHIN DINAJPUR, BALURGHAT, PIN-733101 (W.B.)
E-mail: dpmudd.blg@gmail.com

Memo. No.244/DPMU/DD Dated -29/08/2025

NOTICE INVITING e- TENDER

NOTICE INVITING e – TENDER of the Executive Engineer, DPMU, Dakshin Dinajpur, WBADMIP

Tender Reference No: 01/WBADMIP/DD/SPGW/2025-2026 (Sl No 1 to 3) Dated 29/08/2025

1. Invitation: On behalf of the Governor of West Bengal separate e-tenders for different groups in W.B. Form No **2911 (ii)** against the works as mentioned in List of schemes are invited by the Executive Engineer, DPMU Dakshin Dinajpur, WBADMIP from the Bonafide and resourceful agencies with sound technical and financial capabilities fulfilling minimum qualifying requirements i**n two bid system i.e. Technical & Financial bid.** One bidder can participate **only 2(Two) no** of the following works having sufficient credential and financial capability for execution of works of similar nature.

List of Schemes:

Sl No	Name and Location of the scheme	Nos of Scheme	Estimated Cost (In Rs.)	Earnest Money (Rs.)	Time Period of completion (Days)	Cost of Tender Paper (Reqd. at the time of entering into Agreement)	
1	Drilling , Installation & Maintenance of 150 mm dia Machine bored 6 Nos solar powered ground water based Tube Well schemes for Irrigation and Drinking purposes in Tribal Concentrated areas under Article 275(1) of the Constitution of India at Mouza-Ramrampur, Bandighi, Mahadebbati, Rajballabhchak Malahar & Rajballabhchak GP-Tapan chandipur and Harsura Plot No 222,146,581,458,885,243 in Tapan Block of Dakshin Dinajpur District under DPMU, Dakshin Dinajpur, WBADMIP **as Deposit Works**.	**6**	**₹ 69,92,372**	**₹ 1,39,847**	180 Days	₹ 2500.00	
2	Drilling , Installation & Maintenance of 150 mm dia Machine bored 7 Nos solar powered ground water based Tube Well schemes for Irrigation and Drinking purposes in Tribal Concentrated areas under Article 275(1) of the Constitution of India at Mouza-Ramkrishnapur, Debipur, Pargaon, Bara Kashipur, Amritakhanda, Nendra & Bajeharipur GP-Sukdevpur, Boaldar, Amritakhanda, Bagichapur and Ganguria Plot No. 117,543, 187,459, 81,136,1066/1067 in Harirampur, Bansihari, Gangarampur and Balurghat Block of Dakshin Dinajpur District under DPMU, Dakshin Dinajpur, WBADMIP **as Deposit Works**.	**7**	**₹ 79,53,649**	**₹ 1,59,073**	180 Days	₹ 2500.00	
3	Drilling , Installation & Maintenance of 150 mm dia Machine bored 7 Nos solar powered ground water based Tube Well schemes for Irrigation and Drinking purposes in Tribal Concentrated areas under Article 275(1) of the Constitution of India at Mouza-Gopalbati, Dakshin Ramkrishnapur, Kharail Chandpur, Chak Khetab , Gorangapur & Madhya Ramkrishnapur GP-Gopalbati, Deor, Chingishpur, Bhor, Ramkrishnapur, Plot No 290/591,141, 219,41,224,119,107 in Balurghat & Kumarganj Block of Dakshin Dinajpur District under DPMU, Dakshin Dinajpur, WBADMIP **as Deposit Works**.	**7**	**₹ 79,53,649**	**₹ 1,59,073**	180 Days	₹ 2500.00	

2. In the event of e-Filling, intending bidder may download the Tender document from the **website: http:// wbtenders.gov.in** OR **website http://etender.wb.nic.in** directly by the help of Digital Signature Certificate (Details of which has been narrated in "Instruction to Bidders").

3 The intending bidder must read the terms and condition of the NIT carefully. He should particularly go through the eligibility criteria required and satisfy himself about the requirements for eligibility. At his own responsibility and risk he should also visit the sites and its surroundings at his own expense, know every titbits of the works to be executed/ site conditions / availabity of all the materials required etc. He should submit his bid only if he considers himself eligible, in possession of all the documents required for the tender and can do the work within the allowed time. The working site may be changed within the District / scopes of works may be reduced / increased due to individual site conditions and unavoidable circumstances. Payment will be made as per actual measurement of the work physically executed at the sites as per schedule maintaining the WBFR. No escalation of price and / or price adjustment will be allowed under any circumstances. These all are to be considered before quoting rates by the agency (Percentage above/ below/ at par). All information posted on the website consisting of NIT and related documents, Form 2911, BOQ, Corrigendum and Drawings etc. all shall form the part of the tender document.

4 Technical Bid and Financial Bid both shall be submitted online concurrently duly digitally signed in the Website https:// wbtenders.gov.in as per time schedule stated herein under. The documents submitted by the bidders should be digitally signed and properly indexed & self-attested with seal.

5 The financial offer of the prospective bidder will be considered only if the Technical Bid of the bidder is found qualified by the '**Tender Inviting Authority**. The list of qualified bidders will be displayed in the website on the schedule date and time.

6. Eligibility for participation: Registered Company / Proprietorship Firm / Partnership firms / Registered Company / Unemployed Engineers Co-operative Societies/ Joint Venture are eligible to participate subject to the fulfilment of eligibility criteria mentioned in clause 8.

A prospective bidder shall be allowed to participate in the bid as follows:

i) If the bid is made by a proprietary firm, it shall be signed/digitally signed by the proprietor.

ii) If the bid is made by a firm in partnership, it shall be signed/digitally signed by all the partners of the firm or by a partner holding the power of attorney for the firm for signing the bid in which case a certified copy of the power of attorney, partnership deeds shall accompany the Bid.

iii) If the bid is made by a limited company or limited corporation, it shall be signed/digitally signed by a duly authorized person holding the registered power of attorney for signing the bid in which case a certified copy of power of attorney shall accompany the Bid. Such limited company or corporation may be required to furnish satisfactory evidence of its existence such as the Article of Association and Memorandum before the contract is awarded.

iv) Registered Unemployed Engineers Co-operative Societies are required to furnish valid Bye Law, Current Audit Report, Valid clearance Certificate from A.R.C.S for the current financial year along with other relevant supporting papers.

7. Eligibility - Conflict of Interest:

Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this bidding process, if the Bidder:

i. directly or indirectly controls, is controlled by or is under common control with another Bidder; or

ii. receives or has received any direct or indirect subsidy from another Bidder; or

iii. has the same legal representative as another Bidder; or

iv. has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

v. any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the Contract implementation.

vi. has a close business or family relationship with the concerned professional staff of the project implementing agency.

8. <u>Eligibility criteria for participation in tender:</u>

Financially capable & Bonafide contractors of Central and State Govt., Central & State Govt. Undertakings and Govt. recognized Autonomous Bodies having experience of satisfactorily completion for execution of works as detailed below will only be eligible for participation in e-tender if they have any of the credentials also as follows: -

8.1(a) The prospective bidders shall have satisfactorily completed as a prime agency at least one similar nature of work within last 5 (five) years prior to date of issue of tender notice under the authority of State/ Central Govt., State/Central

Govt. undertaking/ Statutory Bodies constituted under the statute of the Central/ State Government having a magnitude of minimum 40% (Forty percent) of the total BOQ amount put to this tender".

Or,

8.1(b) Intending tenderer should produce credentials of 2 (two) similar nature of completed work within last 5 (five) years prior to date of issue of tender notice under the authority of State/ Central Govt., State/Central Govt. undertaking/ Statutory Bodies constituted under the statute of the Central/ State Government having a magnitude of each of which having minimum value of 30% (Thirty percent) of the total BOQ amount put to this."

Or,

8.1(c) Intending tenderer should produce credential of 1(one) single running work of similar nature which has been completed to the extent of 80% (Eighty percent) of the current **BOQ** amount put to this tender. In case of running works, only those tenderers, who will submit the certificate of satisfactory running work from the concerned Executive Engineer or equivalent as competent authority, will be eligible for the tender. In the required certificate, it should be clearly stated that the work in progress is satisfactory and that no penal action has been initiated against the executed agency, i.e., the tenderer**. (Non-Statutory Documents).**

Similar nature of work covers:

Similar Nature of works in 9.1) (a), (b) & (c) above shall mean "Execution of Drilling and Installation of Machine-Bored Tubewells (Solar), fitted with 5 HP submersible pumps, including installation of solar photovoltaic cells, along with procurement and supply of all necessary materials for Minor Irrigation purposes."

N B : Payment certificate will not be treated as credential*. No credential will be considered as valid unless it is supported by work order, price schedule or BOQ of work and* ***Completion Certificate issued by an Executive Engineer or Equivalent Competent Authority clearly mentioning name, address, contact no & email Id of the office and*** *a) Name of Work, b) Estimated amount, c) Tendered amount d) value of work executed & e) the date of completion of work.*

8.2 An Intending bidder:

(a) The prospective bidders shall have Average Annual Turnover of magnitude of minimum 100 (Hundred) percent of the total BOQ amount put to this Tender, during last 5 (five) years prior to date of issue of tender notice.

(b) All intending Bidders are required to produce Valid Pan Card, Professional Tax Receipt Challan for the current year, Trade License, Valid 15-digit Goods and Services Tax payer Identification No.(GSTIN) under GST Act, 2017 with updated return.

9. Date & Time Schedule:

Sl.No	Particulars	Date &Time
1.	Date of uploading of N.I.T. Documents(online) (Publishing Date)	01.09.2025 (10.00 AM)
2.	Documents download/sell start date (online)	01.09.2025 (10.00 AM)
3.	Documents download/sell end date (online)	17.09.2025 (11.00 AM)
4.	Bid submission start date (Online)	02.09.2025 (6.00 PM)
5.	Bid Submission closing (Online)	17.09.2025 (11.00 AM)
6.	Bid opening date for technical bid (Online)	19.09.2025 (1.00 PM)
7.	Date of opening of Financial Proposal (Online)	TO BE NOTIFIED LATER
8.	Location of Bid opening	Office of the EE, DPMU Dakshin Dinajpur , WBADMIP

10. The bidders shall quote their rate online (**Percentage Excess (+)/ Less (-) / at par)** accordingly considering that no escalation and/ or price adjustment will be allowed by the Department there under any circumstances.

11. Bids shall remain valid for a period not less than **180 days** from the last date of submission of Financial Bid / Sealed Bid. If the bidder withdraws the bid during the period of bid validity the earnest money as deposited will be forfeited forthwith assigning any reason thereof.

12. Constructional Labour Welfare Cess **@ 1(one)%** of cost of construction will be deducted from every bill of the contractor. GST, Royalty & all other statutory levy/Cess will have to be borne by the Contractor.

13. There shall be no provision of Arbitration. Hence Cl. 25 of 2911(ii) is modified vide notification no.8182-F(Y) dt.

26.09.12 of the Govt. of West Bengal.

14. As per Memorandum No. 4608-F(Y) dated 18.07.2018 of Finance Department, Govt. of West Bengal, the successful bidder will have to submit Additional Performance Security @ 10% of the tendered amount, if the accepted bid value is 80% or less of the Estimated amount put to tender. The Additional Performance Security shall be submitted in the form of Bank guarantee from any scheduled Bank before issuance of the Work Order. If the bidder fails to submit the Additional Performance Security within seven working days from the date of issuance of Letter of Acceptance, his Earnest Money will be forfeited and other necessary actions as per NIT like blacklisting of the contractor, etc. may be taken. The Bank Guarantee shall have to be valid up to of the contract period and shall be renewed accordingly, if required. The Bank Guarantee shall be returned immediately on successful completion of the contract. If the bidder fails to complete the work successfully, the Additional Performance Security shall be forfeited at any time during the pendency of the contract period after serving proper notice to the contractor. Necessary provisions regarding deduction of security deposit from the progressive bills of the contractor as per relevant clauses of the contract shall in no way be altered/ affected by provision of this Additional Performance Security.

15. Earnest Money: The Earnest Money Deposit shall be received and refunded (To successful ones) online in accordance with Finance Department Memo No.3975-F(Y), dated 28-07-2016.

Necessary **Earnest Money** may be deposited by the bidder electronically: online- through his net banking enabled bank account, maintained at any bank or: offline – through any bank by generating NEFT/RTGS challan from the e-Tendering portal. Intending Bidder will get the Beneficiary details from e-tender portal with the help of Digital Signature Certificate and may transfer the EMD from their respective bank as per the Beneficiary Name & Account No., Amount , Beneficiary Bank name (ICICI Bank) and IFSC Code and e-Proc Ref. No. Intending Bidder who wants to transfer EMD through NEFT/RTGS must read the instruction of the Challan generated from e-Procurement site.

Bidders are also advised to submit EMD of their bid (through online submission) at least 3 working days before the bid submission closing date as it requires time for processing of Payment of EMD.

A. Login by bidder: -

a) A bidder desirous of taking part in a tender invited by a State Government Office shall login to the e-Procurement portal of the Government of West Bengal https: //wbtenders.gov.in using his login ID and password.

b) He will select the tender to bid and initiate payment of pre-defined EMD / Tender Fees for that tender by selecting from either of the following payments modes:
Net banking (any of the banks listed in the ICICI Bank Payment gateway) in case of payment through IClCI Bank Payment Gateway.

RTGS/NEFT in case of offline payment through bank account in any Bank.

B. Payment procedure:

i) **Payment by Net Banking (any listed bank) through IClCI Bank Payment Gateway**

a. On selection of net banking as the payment mode, the bidder will be directed to IClCI Bank Payment Gateway webpage (along with a string containing a Unique ID) where he will select the Bank through which he wants to do the transaction.

b. Bidder will make the payment after entering his Unique ID and password of the bank to process the transaction.

c. Bidder will receive a confirmation message regarding success/failure of the transaction.

d. If the transaction is successful, the amount paid by the bidder will get credited in the respective Pooling account of the State Government maintained with the Focal Point Branch of IClCI Bank at R. N. Mukherjee Road, Kolkata for collection of EMD/Tender Fees.

e. If the transaction is failure, the bidder will again try for payment by going back to the first step.

ii) **Payment through RTGS/NEFT:**

On selection of RTGS/NEFT as the payment mode, the e-Procurement portal will show a pre-filled challan having the details to process RTGS/NEFT transaction.

The bidder will print the challan and use the pre-filled information to make RTGS/NEFT payment using his Bank account. Once payment is made, the bidder will come back to the e-Procurement portal after expiry of a reasonable time to enable the NEFT/RTGS process to complete, in order to verify the payment made and continue the bidding

process.

If verification is successful, the fund will get credited to the respective Pooling account of the State Government maintained with the Focal Point Branch of IClCI Bank at R.N.Mukherjee Road, Kolkata for collection of EMD/Tender Fees. Hereafter, the bidder will go to e-Procurement portal for submission of his bid.

But if the payment verification is unsuccessful, the amount will be returned to the bidder's account.

C. **Refund/Settlement Process**:

i. After opening of the bids and technical evaluation of the same by the tender inviting authority through electronic processing in the e-Procurement portal of the State Government, the tender inviting authority will declare the status of the bids as successful or unsuccessful which will be made available, along with the details of the unsuccessful bidders, to IClCI Bank by the e-Procurement portal through web services.

ii. On receipt of the information from the e-Procurement portal, the Bank will refund, through an automated process, the EMD of the bidders disqualified at the technical evaluation to the respective bidders' bank accounts from which they made the payment transaction. Such refund will take place within T+2 Bank Working Days where T will mean the date on which information on rejection of bid is uploaded to the e-Procurement portal by the tender inviting authority.

iii. Once the financial bid evaluation is electronically processed in the e-procurement portal, EMD of the technically qualified bidders other than that of the L1 and L2 bidders will be refunded, through an automated process, to the respective bidders' bank accounts from which they made the payment transaction. Such refund will take place within T+2 Bank Working Days where T will mean the date on which information on rejection of financial bid is uploaded to the e-Procurement portal by the tender inviting authority. However, the L2 bidder should not be rejected till the LOI process is successful.

iv. If the L1 bidder accepts the LOI and the same is processed electronically in the e-Procurement portal, EMD of the L2 bidder will be refunded through an automated process, to his bank account from which he made the payment transaction. Such refund will take place within T+2 Bank Working Days where T will mean the date on which information on Award of Contract (AOC) to the L1 bidder is uploaded to the e-Procurement portal by the tender inviting authority. A prospective bidder shall be allowed to participate in a particular job either in the capacity of individual or as a partner of a firm. If found to have applied severally in a single job, all his applications will be rejected for that job, without assigning any reason thereof.

16. Earnest Money will be forfeited if:-

a) Withdrawal of e-Tender once the bid has been submitted online and after passing of end date for submission which has been accepted for further processing is not allowed. EMD will be forfeited by the Government, and the bidder/contractor will be penalized in terms of provisions in the notice of the tender & as decided by the tender inviting authority.

b) In case of successful tenderer, if the Tenderer fails to execute formal agreement within the stipulated time.

c) During scrutiny, if it has come to the notice of tender inviting authority that the credential or any other document which were uploaded & digitally signed by the Tenderer are incorrect/ manufactured/ fabricated.

17. Contractor shall have to comply with the provisions of (a) the contract labour (Regulation abolition) Act. 1970 (b). Apprentice Act.1961 (c) minimum wage Act. 1948 and any notification thereof or any other laws relating thereto and rules made, and order issued to this effect from time to time.

18. All intending bidders are requested to be present in the chamber of the Tender Inviting authority during opening of the Tender to observe the tender opening procedure.

19. NO CONDITIONAL/ INCOMPLETE TENDER will be accepted under any circumstances.

20. The Tender Inviting Authority reserves the right to cancel the e-N.I.T. due to unavoidable circumstances and no claim in this respect will be entertained.

21. During scrutiny, if it comes to notice to the tender inviting authority that the credential or any other papers of any bidders is incorrect/Manufactured/fabricated that application will be out rightly rejected without any prejudice with forfeiture of earnest money forthwith.

20. The Tender document shall be filled up in English. All literatures and correspondence in connection with this Tender shall be in English.

21. Payment will depend on availability of fund, and no claim whatsoever will be entertained for delay in payment, if any.

22. In case if there is any objection regarding qualifying of the Agency in the Bid that should be lodged to The Tender

Inviting authority, within 2 working days from the date of publication of list of qualified Agency and beyond that time schedule no objection will be entertained. In this regard the decision of the authority will be final and binding upon the tenderer and no communication will not be entertained whatsoever.

23. Before issuance of the work order and /or any time within the evaluation process, the tender inviting authority may like to verify the credential & all other documents in original of any of the tenderer if found necessary. The bidder must have to produce all the documents, whenever requisitioned for, within 48 (forty eight) hours of intimation send through either email or phone. In the case the documents are not produced within that time or wrong /invalid address provided for communication, that tender will be cancelled without going for further communication instantly. The addresses for correspondences are therefore requested to be correctly furnished. During scrutiny, if it comes to the notice of the tender inviting authority that the credential or any other papers of any bidders is incorrect / manufactured /fabricated, that tender will be out rightly rejected without any prejudice with forfeiture of earnest money forthwith. The Authority may suggest suitable punitive measures and will bring that matter to the notice to the appropriate level and the bidder may be suspended from participating in the tenders on e-Tender platform as per the discretion of the authority. In addition, his Earnest Money Deposit will stand forfeited in the favour of the Government.

24. All materials to be supplied by the contractor should be as per specification and prior approved by the Engineer – In – Charge. The materials shall be delivered in new, unused and good condition with testing certificate as required and materials shall be physical verified by the Engineer – In – Charge or his authorized representative before use. All PVC pipes, MS pipes & accessories, Pump Motor sets to be supplied by the contractor shall have to be tested by the contractor as per instruction of EIC. All materials for Solar systems must be tested and certified by MNRE ACCREDED Laboratories. Rejected materials should be cleared from the site within 24 hours of rejection.

25. The intending bidder must have to produce documents showing authorization with the manufacturers /Authorized Distributors or Dealers (Authentication certificate of manufacturers for the items of each group for

a. P.V.C. pipe & P.V.C. Strainer,

b. Column pipe and accessories, ISI marked,

c. Complete Solar PV modules with Pump motor system confirming to the MNRE's guidelines for supplying and installation/commissioning the same made with any of the MNRE certified sole manufacturers of Solar panel CE certified solar control unit manufacturer,

d. B.I.S. approved pump-motor manufacturers and must produce Test Certificate of the same from Test Centre approved by MNRE at the time of supply & installation of the scheme.

Scanned copy of such Authorizations must have to be uploaded with the Technical Bid documents. Otherwise, the tender will be liable for rejection. The Bidder may upload such Authorization for maximum 3(three) nos. manufacturers for each item. It is to be noted that supply of materials of other manufacturers beyond approved authorization so uploaded during bid submission may not be accepted.

26. **Time is the essence of the contract and the contractor shall have to put in full endeavour to maintain the target schedule by arranging adequate labour force and machineries and timely supply of materials for completion of the work within the stipulated completion period. Under normal circumstances no extension of time shall be allowed. Works should be started immediately after getting layout. If not, penal action will be imposed.**

27. The specification for the works made of execution and measurement will be governed by the specification laid down in the WRDD / PWD schedule of rates and relevant provision of IS code & as per base practice according to the direction of Engineer-in-charge. Display board must be installed at the site during execution of the works as per direction of the Engineer in charge.

28. An **Affidavit** as per given format in **Annexure-I** in non-judicial stamp paper of Rs. 100/- duly certified by a Notary should be submitted by the tenderer that he is not barred/delisted/blacklisted by Govt./ Undertaking (Govt.) during last 5(five) years.

29. All bidder(s) outside the State of West Bengal must have Office in West Bengal with all registration for payment of taxes & duties of the state.

30. *"Karmashree" Scheme: Bidders will have to engage unskilled labourers under "Karmashree" Scheme of Govt.* of WB, having Job Card under Mahatma Gandhi NREGS/as per guideline given in the following Kolkata Gazette Notification during execution of the subject mentioned work. The detailed report of the engagement of labourer has to be submitted to the undersigned as per the given format (ANNEXURE- IX) in the Gazette Notification & to be duly signed by the bidder following necessary guidelines vide The Kolkata Gazette Notification 07/03/24, Registered No. WB/SC-247, Notification No. 1140 PRD-33011/1/2024-MGNREGA SEC Dtd. 07-03-2024 of Secretary to the Govt. of WB, Panchayats & Rural Development Department by the order of the Governor of Govt. of WB. Necessary formats are attached for reference.

31. Performing activities for institutional development by formation and subsequent strengthening of registered Water User Associations (WUAs) through creation of mass awareness, hand holding training for ASS activities and capacity building during one-year continuous support from the date of successful completion of the work among them to achieve the success and sustainability of Minor Irrigation Projects.

32. Payments under the contract:

Payments for the work will be released in the following two milestones.

a) **Milestone 1:** Payment should be released after Construction of Tube Well and other auxiliary structures according to actual bill of quantities with testing report of well yield as per terms & Condition.

b) **Milestone 2:** Payment should be released after Commissioning of Solar Systems with Installation of Pump mortor, Solar panels and Solar related support structure as per specifications mentioned in BOQ and obtaining at least 50 hrs pumping data in the main central server of SPMU through RMS.

(The above milestones can be changed as per the contract and upon the sole-discretion authority of Employer)

33.Security Deposit: -

While making payment of any bill, 8% of the gross value will be retained by the Department as Security for performance. This amount added to the 2% earnest money already deposited during submission of tender will constitute the **total Security for Performance**, if not stated in any other terms elsewhere. Security for performance retained with the Department on account of payment of each and every bill will be released finally after the expiry of Defective liability period from the date of successful completion of the work as detailed. All defects arising this period regarding work will have to be rectified by the tenderer at his/her/their own cost. No interest on Security for performance will be paid by the Department. In case the contractor does not provide service during the warranty & comprehensive maintenance period, the amount so held up will be forfeited.

34.Defective Liability Period:

The comprehensive maintenance charges have been included in BOQ for both tube well and solar system for the 5 years from the date of successful completion of the work. All defects arising this period regarding work will have to be rectified by the tenderer at his/her/their own cost.

Sd/-
Samrat Biswas
Executive Engineer
DPMU -DakshinDinajpur
WBADMIP

Memo No.244/DPMU/DD/1(12) **Dated 29/08/2025**

Copy forwarded for information to: -

1. The Project Director, WBADMI Project, ICMARD Building (8 th Floor) , Kolkata - 67.
2. The District Magistrate, Dakshin Dinajpur. .
3. The Sabhadhipati, Dakshin Dinajpur Zilla Parishad.
4. The Additional District Magistrate (D), Dakshin Dinajpur.
5. The Additional Project Director, WBADMIP.
6. The MD, WBTDCCL
7. PO-Cum- DWO, Dakshin Dinajpur.
8. The officer in charge, NIC, Dakshin Dinajpur with request for publication of the same through District website.
9. The Divisional Accountant, DPMU, Dakshin Dinajpur, WBADMIP.
10. The Assistant Engineer, DPMU, Dakshin Dinajpur WBADMIP.
11. The District Horticulture officer, Uttar Dinajpur
12. Notice Board

Sd/-
Samrat Biswas
Executive Engineer
DPMU -DakshinDinajpur
WBADMIP

INSTRUCTION TO BIDDERS

Instruction / Guidelines for tenders for electronics submission of the tenders online have been annexed for assisting the contractors to participate in e-tendering.

1. **Registration of contractor:**
   Any contractor willing to take part in the process of e-Tendering will have to be enrolled & registered with the Government e-Procurement system, through logging on to **https://www.wbtenders.gov.in**. The contractor is to click on the link for e-Tendering site as given on the web portal.
2. **Digital Signature certificate (DSC):**
   Each contractor is required to obtain a Class –II or Class-III Digital Signature Certificate (DSC) for submission of tenders from the approved service provider of the National Information Centre (NIC) on payment of requisite amount details are available at the Web site stated in clause-I of Guideline to Bidder DSC is given as a USB e- Token.
3. **Collection of Tender Documents:**
   The Contractor can search & download NIT & Tender Documents electronically from computer once he logs on the website mentioned in clause 1 using the Digital Signature Certificate. This is the only mode of collection of Tender Documents.

4.1 Participation in more than one works in a e-NIT:

i) Submission of e-tender by one bidder shall be maximum 2 no having sufficient credential and financial capability for execution of works of similar nature. In excess of the number of works in any Particular e- NIT will not be considered.

4.2 E v e n though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

- made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or
- Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc.

5. Submission of Tenders:

5.1 General process of submission:

Tenders are to be submitted through online to the website stated above in two folders at a time for each work, one in **Technical Proposal** & the other is **Financial Proposal** before the prescribed date & time using the Digital Signature Certificate (DSC). The Bidder must upload the only required documents preferably in PDF format virus free copy and He **should not unnecessarily upload the documents** like different work orders and execution certificates & others etc. except the required one only. Otherwise, it will be difficult & time consuming for downloading and verification of the documents. Hence, **his bid may not be considered or accepted.** The documents will get encrypted (transformed into non readable formats)

5.2 Technical Proposal

The Technical Proposal should contain scanned copies of the following further in two covers (folders)

A.1. Statutory Cover Containing. (to be submitted in "Technical folder" folder)

1. Prequalification Application (as per attached sample form).
2. Cost of BID SICURITY/EMD as prescribed in the NIT, against each serial of work in favour of Executive Engineer DPMU, Dakshin Dinajpur, WBADMIP, Dakshin Dinajpur, payable at Dakshin Dinajpur.
3. Qualification Information (as per attached form)
4. Tender form no. 2911(ii) & NIT with all addendum & corrigendum (download & upload the same Digitally Singed) (*Quoting rate will only be encrypted in the B.O.Q under Financial Bid in Case quoting any rate in 2911(ii) the tender liable to summarily rejected*.)
5. Special Terms &Conditions. (if any)
6. Affidavit Annexture -I
7. Authorization Letters – Annexture -II, III,IV & V.

A-2. Non Statutory/ Technical Documents Cover Containing.

1. Professional Tax (PT) deposit receipt challan for the current financial year, valid Pan Card, IT Return for the latest financial year, valid 15-digit GST No & Updated GST Receipt, Trade License.
2. Registration Certificate under Company Act. (If any)
3. Registered Deed for partnership Firm/ Article of Association & Memorandum (if any).
4. Power of Attorney (For partnership Firm/ Private Limited Company, if any)

5. Clearance Certificate for the Current year issued by the Assistant Register of Co-Op(s) (ARCS) by laws are to be submitted by the registered labor Co-Op(s) Engineers'-Opt(s).
6. Requisite Credential in the form of Completion Certificate (as per **Eligibility criteria for participation in tender**).
7. All other documents as per clause 4 of this NIT

Note: Failure of submission of any of the above-mentioned documents (as stated in A1 & A2) will render the tender liable to be summarily rejected for both statutory & non statutory cover.

THE ABOVE STATED TECHNICAL DOCUMENTS SHALL BE UPLOADED on the website http://wbtenders.gov.in IN THE FOLLOWING MANNER.

Scanned copies of above stated documents shall be uploaded on the website after converting the same to PDF in the following manner.

Sl No.	Category Name	Sub Category Description	Documents to be uploaded
A.	Certificate(s)	Certificate(s)	(i) Valid 15-digit GSTIN as per GST Act with Latest return. (ii) PAN CARD (iii) Latest valid IT Return (iv) P. Tax Deposit Receipt Challan/ clearance certificate. (v) Valid Trade License. (vi) completion certificate, W/O and all other documents as a credential
B.	Company Detail(s)	Company Details	1) Registered *Partnership Deed or receipted application with notarised deed, Trade License* for Partnership Firm *2) Incorporation Certificate, Memorandum of Association, Trade License* for Limited Company. *3) Society Registration Copy with bye laws , Trade License for Engineers Copt. Society.* 4) Power of Attorney of the signatory of the Bid to commit the Bidder for partnership Firm / Limited Company 5) Other supporting Document if required
C	Credential	Credential-1	i) completion certificate, W/O and all other documents as a credential as stated in this NIT with details of work, date of completion and executed amount against the work.
D.	Financial Report	P/L & Balance Sheet	1. Average Annual Turnover of last 5 years.

5.3 Financial proposal:

i) The financial proposal should contain the following documents in one cover (folder) i.e. Bill of Quantities (BOQ) the contractor is to quote the rate (percentage Excess/ less/ At par) online through computer in the space marked for quoting rate in the BOQ.

ii) Only downloaded copies of the above documents are to be uploaded virus scanned & digitally signed by the contractor.

6. Addenda/Corrigenda: If published.(name of the file should be "corrigendm.pdf")

Contractors are to keep track of all the Addendum/corrigendum issued with a particular tender and upload all the above digitally signed along with the NIT. Tenders submitted without the Addendum/ Corrigendum are liable to be treated as informal and thereby rejected.

7. Opening & Evaluation of Tender:

7.1 Opening of Technical Proposal: -

Technical proposals will be opened by the Tender Inviting Authority. Intending tenderers may remain present if they so desire.

1. Cover(folder) statutory documents would be opened first &if there is any deficiency in the statutory documents, the bid will summarily be rejected
2. Decrypted (transformed into readable formats) documents of the cover will be downloaded & handed over to the tender evaluation committee.
3. Uploading of summary list of technically qualified tenderers.

N.B: While Evaluation, the committee may summon of the tenderers & seek clarification/ information or additional documents or original hard copy of any of the documents already submitted & if those are not produced within the stipulated time frame, their proposals will be liable for rejection.

7.2 **Opening and evaluation of Financial Proposal**: -

i) Financial proposals of tenderers declared technically eligible by the Tender evaluation Committee will be opened electronically from the web portal on the prescribed date and time.

ii) The encrypted copies will be decrypted, and the rates will be read out to the contractors remaining present at that time.

8. Acceptance of Tender: -

Lowest valid rate should normally be accepted. However, the Tender Accepting Authority does not bind himself to do so and reserve the right to reject any or all the tenders without showing any reasons whatsoever.

The Bidder whose Bid has been accepted will be notified by the tender Inviting & Accepting Authority through Letter of Acceptance. The letter of Acceptance will constitute the formation of the contract. The Agreement in W.B.F. No. 2911(ii) will incorporate all necessary documents e.g. NI.T. all corrigendum, special terms & condition, specification of work, Drawings, different filled up forms, B.O.Q. and the same will be constituted between the Accepting Authority and the successful Bidder.

9. Rejection of Bid: -

The tender inviting authority reserves the right to accept or reject any Bid to cancel the Bidding processes and reject all Bids at any time prior to the award of Contract without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the ground for tender inviting authority's action.

10. Execution of Agreement: -

The successful tenderer will be required to execute formal agreement in W.B. Form No. 2911 in duplicate **within 7 working days** from the date of issue of letter of Acceptance by the competent authority. Copies of tender documents for the purpose of execution of the contract agreement will be issued to the successful tenderer on realization of price (in cash) as per set. Failure to execute the agreement within the stipulated time and prescribed manner shall result in cancellation of the offer of letter of Acceptance & forfeiture of earnest money.

11. Execution Procedure: -The works will be executed as per bar chart. First Drilling works of Tube Well will be executed. Only after successful completion of Tube well, all others work will be implemented.

Sd/-
Samrat Biswas
Executive Engineer
DPMU Dakshin Dinajpur
WBADMIP

Stepwise Events in Construction of a Solar Powered Tube Well

A. Preliminary & Mobilization

1. **Mobilization of Equipment**
    - Transporting drilling rigs, compressors, pumps, testing instruments, and construction materials to site.
    - Preparing temporary site roads or access where necessary.
2. **Site Preparation**
    - Identifying and marking tube well location.
    - Excavation of foundation trenches, pits, and working area.

B. Borehole Drilling & Casing

3. **Drilling of Borehole**
    - Using mechanized rotary rigs with 320 mm dia. bit, through all types of soil/rock.
    - Depth-wise drilling:
        - 0–30 m, 30–60 m, 60–90 m, 90–120 m and so on as per BOQ
4. **Electro-Logging & Geological Investigation**
    - Conducting geophysical tests to locate water-bearing strata & identify saline aquifers.
    - Preparing & submitting compiled data and reports.
5. **Lowering of Casing & Strainer**
    - Fitting, fixing & lowering PVC housing pipes, blank pipes, slotted/strainer pipes, and bottom plug.
    - Jointing with solvent cement.
6. **Gravel Packing & Clay Sealing**
    - Supplying & filling washed gravel (2–4 mm) around strainer zone.
    - Puddle clay balls used for annular sealing.
7. **Well Head Completion**
    - Fixing 150 mm dia GI top cap.
    - Installing PVC-U end cap & MS centralizer guides.

C. Development & Testing

8. **Well Development**
    - High velocity jetting & air compressor flushing to clear fines.
    - Yield testing to determine discharge and pumping level.
9. **Water Quality Testing**
    - Collection of bacteriological & chemical samples.
    - Testing in accredited labs.

D. Civil Works

10. **Well Head & Foundation Works**

- RCC foundations, soling, shuttering, concreting.
- RCC well ring installation.
- Fixing MS/GI plates & clamps for pump cable entry.
- Painting & surface finishing (colour wash).

11. **Sign Board Installation**

- MS plate signboard on GI pipe stands, embedded in CC block.

E. Pumping Installation

12.Supply & Installation of Submersible Pump Set

- 5 HP, 3-phase, stainless steel submersible motor pump.
- Lowering with GI/MS column pipes, clamps, bends, valves, and control accessories.
- Installation of water meter, sluice valves, PVC control valves, and GI delivery pipe network.

F. Solar Power System

13. **Supply & Installation of Solar PV Array**

- ISI-marked Mono/PERC/Bifacial SPV modules (5400–5700 Wp).
- Mounting on hot-dip galvanized MS structure (manual seasonal tilt/dual axis).
- RCC foundations for module structure.

14. **Earthing & Lightning Protection**

- GI pipe earthing for modules & pump motor.
- Pole-mounted lightning arrestor with GI wire & RCC foundation.

15. **Power Conditioning Unit (PCU)**

- VFD with MPPT, dual input (solar/grid for ≥5HP).
- DC/AC surge protection, MCBs, remote monitoring unit, data logger.

16. **Cabling & Accessories**

- UV-resistant copper cables with HDPE conduit.
- Proper termination with lugs, saddles, and cable ties.

G. Commissioning

17. **System Integration & Testing**

- Connecting PV array → PCU → submersible pump.
- Checking water discharge, solar output, safety protections.

18. **Training & Handover**

- Training of Water Users Association (WUA) for operation & maintenance.
- Recording baseline yield & performance data.

H. Operation & Maintenance

19. **Routine Maintenance**

- Monthly cleaning of solar panels (except during monsoon).
- Preventive checks on cables, PCU, pump.

20. **Comprehensive Maintenance Contract (CMC)**

- 5-year coverage with inspections, breakdown repairs within 3 days, annual training.
- Remote monitoring of pump & solar system performance.

21. **Insurance & Warranty**

- 5-year insurance coverage for borewell, pump & solar plant.
- Module performance warranty: ≥90% at 10 yrs, ≥80% at 25 yrs.

NB : Testing of materials will be done simultaneously before implementation without hampering progress.

Sample Bar Chart for implementation of scheme

SCHEME EXECUTION TIMELINE FOR TW (SOLAR)																							
Sl. No.	**Activities after Issue Work Order to Agency**	**Month 1**				**Month 2**				**Month 3**				**Month 4**				**Month 5**			
1	Meeting with WUA members for formation of WUA																				
2	Layout for Execution of the Scheme																				
3	CIPET or equivalent Test for Pipe and Strainer as per Direction of EIC																				
4	Drilling of Tube Well along with Logging & Lowering																				
5	Development of Tube Well																				
6	Yield Test and Water Sample Collection for Bacteriological Test																				
7	Foundation for Solar Structure and other ancillary Civil Works.																				
9	Testing, Supply & Installation of Solar Panel																				
8	Pump Motor Lowering																				
11	Testing and Commissioning and delivery of RMS data to Central Server at SPMU																				
12	Solar Related training to WUA and Hand Over																				

Prequalification

Bid Reference No.----------

Date of Bid Submission:

To:

Subject: Implementation works for……
……

Sir,

**We, the undersigned, hereby submit our bid, in two parts, namely:

(a) the Technical Part, and
(b) the Financial Part

In submitting our Bid, we make the following declarations:
We have no reservations to the Bid Document and offer to execute the Works referred above in accordance with the Conditions of Contract enclosed therewith.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption.

We hereby confirm that this bid is valid for 180 days as required in Clause 6 of the Instructions to bidders. We meet the

eligibility requirements and have no conflict of interest in accordance with Tender Notice clause 7

We have not been debarred/removed by the Central or any State Government or any Government Undertaking.

Yours faithfully,

Authorized Signature : ---------- Date signed: ----------

Name & Title of Signatory : ----------
Name of Bidder : ----------
Address : ----------
Email ID : ----------
Mobile No : ----------

** To be filled in by the Bidder, together with his particulars and date of submission at the bottom of this Form.

ed.

Annexure-I

AFFIDAVIT

(To be furnished self-signed in Non-judicial Stamp paper of value Rs 20/- or more,

Date should not be earlier than tender PUBLICATION date)

1. I, the under-signed do certify that all the statements made in the attached documents are true and correct. In case of any information submitted proved to be false or incorrect or fabricated or concealed, the application may be rejected, and no objection /claim will be raised by the under-signed. I will abide by the penal measures adopted by the Department in the case of any false documents / information uploaded by me during bid submission.

2. The under-signed also hereby certifies that neither our firm ……. …….. ….....**(Name of Agency)** nor any of constituent partner/ (s) had been debarred to participate in tender anytime by any authority during the last 3 (three) years prior to the date of this NIT. If debarred, details are specified below in details.

3. The under-signed would authorize had no objection and request any Bank, person, Firm or Corporation to furnish pertinent information as deemed necessary and/or as requested by the Department to verify this statement.

4. The under-signed understands that further qualifying information may be requested and agrees to furnish any such information at the request of the Department. I had personally visited all the sites and my rate quotation is entirely on the basis of it.

5. Certified that I have applied in the tender in the capacity of individual or as and authorized power of attorney holder on behalf of a partnership firm/company and I have not applied severally for the same job.

Signed by an authorized individual person of the firm/company

Title of the Officer

Name of the firm /company with seal

Date:

Annexure-II

TECHNICAL PARTICULARS

(To be filled in by Bidders and submitted along with offer)

(Additional sheet shall be used if required)

However, all particulars are subject to the approval of the EIC and no claim shall be accepted in the course of the approval process or thereafter. Materials to be installed must be of same specification as declared here. (Type separate sheet in company letter head).

SL. No.	Particulars	To be Filled by the Tenderer
1.0	**P.V. Array (Photovoltaic Array)**	
1.01	**Name of the Manufacturer**	
1.02	Peak capacity at STC : min5525 Wp/ min3240Wp & min2300Wp	
1.03	Peak wattage of each module :	
1.04	Type of PV Module :	
1.05	Tested and certified by: Modules should be IEC 61215 & IEC 61730 Part-I & Part-II, qualified, properly Laminated and hermetically sealed.	
1.06	Efficiency of the P.V modules (min 15 %)	
1.07	Fill Factor (Not less than 70%)	
1.08	Power (watt peak) :	
1.09	Open Ckt Voltage, V_{oc} :	
1.10	Short Ckt. Current, I_{sc} :	
1.11	Module Dimensions L x W x H (mm)	
1.12	Weight (Kgs)	
1.13	Junction Box Protection: i) IP 65 rated ii) Each PV Module must use a RF Indicator Tag (RFID) with required information	
1.14	Warranty: i) Complete System should be warranted for 5 years. i) SPV Module shall cover warranty of 10 years for 90% Wattage output & warranty of 25 years for 80% wattage output.	
2.	**Submersible /Surface mounted Motor-Pump Set**	
2.01	Capacity of motor: 5 H.P/3 HP / 2HP	
2.02	**Name of the Manufacturer**	
2.03	Name & address , of service centre	
2.04	Pump discharge with head :	
2.05	BIS Lic. no. for Submersible Pump motor set	
2.06	BIS Lic. No for Surface Pump motor set	
2.07	Total head	
2.08	Pump type	
2.09	Combined Efficiency	
2.10	Rated rpm	
2.11	Rated voltage	
2.12	Rated Current	
2.13	Insulation Class :	
2.14	Guarantee:	
2.15	All protections provided in controller or not:	
3.00	**SPV Module Mounting Structure**	
3.01	**Name of Manufacturer:**	

4.00	**Make of Battery with 5 years warranty:**	
5.00Solar Power Control Unit:		
5.01	Name of the Manufacturer:	
5.02	IEC- IEC-61683 & 60068 Certificate No	
5.03	Functional Safety compliance certificate	
5.04	Temperature withstand Capacity : Required 50 degree	
5.05	Voltage class:	
5.06	Applicable Motor Output(KW)	
5.07	Rated output capacity(KVA)	
5.08	Rated Output Current	
5.09	Maximum output voltage	
5.10	Rated Frequency(Hz)	
5.11	Rated Input Current	
5.12	Maximum Input Voltage	
5.13	Overload Endurance (150%)	
5.14	IP protection class(IP 65)	
5.15	Operating Temperature range (0 to 50°C)	
5.16	Controller Efficiency(≥93%)	
5.17	Protection Provided or not as mentioned in Technical Specification	
6.00	**Cables, Switches & Accessories**	
6.01	**Name of AC cable manufacturer**	
6.02	**Name of DC cable manufacturer**	
6.03	AC cables ISI marked as per IS 694 and 1554	
6.04	DC Cables UV resistant as per standard UL 4703	
7.00	**Name of Changeover switch manufacturer**	
7.01	Complying as per Tech. Spec.	
8.00	**Name of HDPE pipe manufacturer**	
8.01	Whether PE63 grade compound with silicon & double coated	
9.00	**Data Logger**	
9.01	**Name of manufacturer**	
9.02	Whether complying all requirements of Tech. Spec.	
10.00	**Name of IP54 enclosure manufacturer**	
11.00	**Scheme drawing alongwith PV voltage and current calculation, wiring diagram of PCU & PV array mentioning make of each and every component.**	

Note: Please provide data against the specified component, Do not mention “as per attached sheet” Anywhere in the above data sheet.

Annexure-III

ON NON-JUDICIAL STAMP PAPER OF ANY DENOMINATION

ANNEXURE- **MFG-I (For complete Photo voltaic Water Pumping System)**

UNDERTAKING

WHEREAS M/s..... who is our authorized Dealers / Distributers have tendered to supply the **PV Water Pumping System** to WRIDD integrated by us, have requested us to guarantee the quality, quantity and delivery schedule of our manufactured materials to be supplied by the above Dealer/Distributor, we hereby guarantee as under:-

1. That we shall be responsible for the quality and standard of the materials supplied by the above authorized Dealers / Distributers in the same way as if it were supplied by us.

2. That the materials will bear I.E.C /C.E /I.S.I / MNRE accredited laboratory Certification Mark & our BRAND MARK (wherever applicable) according to the license issued to us vide No. ..... dated...../...../20.....which is
Valid up to.....a photocopy of which will be supplied to the WRIDD.

3. That in case any material is found sub-standard or defective the same will be immediate replaced by the above selling authorized Dealers / Distributers failing which we undertake replace such materials free of cost.

4. That we guarantee to supply the quantity guaranteed by the above authorized Dealers / Distributers so that the required quantities according to the delivery schedule given by the WRIDD. In case of Failure of the authorized Dealers / Distributers, we ourselves undertake to supply the materials at the prices quoted by the Dealer/Distributor directly. Then necessary adjustment in price, if any, will be settled by us with the authorized Dealers / Distributers directly.

5. That the WRIDD will have the right of pre-Delivery testing and inspection in our factory of the materials to be supplied through the authorized Dealers / Distributers in the same where as it was supplied by us.

6. The warrantee of our branded items shall be for a period of 5 years from the date of acceptance of the delivery by the consignee(s) of each item for any replacement free of cost to the Authority.

7. SPV Module shall cover warranty of 10 years for 90% wattage output & warranty of 25 years for 80% wattage output. (attach separate guarantee/ warranty declaration of PV module manufacturer).

8. That we have been permitted to issue authorization of PV module / Solar Power conditioning unit / Motor pump set by the manufacturer and a valid copy of permission is enclosed.

Group No:
Sl No:

PV module make:
Solar controlling unit make:
Make of structure:
Make of motor:

Attach Copy of Dealer ship/ Distributorship / Channel Partner.
M/s.....
Signature of Manufacturer/ Authorized Dealers / Distributers/ Channel Partners
Mobile no-
Email-
GST No:

Annexure-IV

ON NON-JUDICIAL STAMP PAPER OF ANY DENOMINATION

ANNEXURE- **MFG-II (Solar Panels / Motor Pump Set / Solar Control unit / IP 54 ENCLOSURE/ HDPE pipe & fittings / Module Mounting Structure)**

(Undertaking for components if procured from Manufacturer)

UNDERTAKING

WHEREAS M/s.....(bidder) who is our authorized Dealers / Distributers have tendered to supply the..... (m a t e r i a l) manufactured by us to WRIDD have requested us to guarantee the quality, quantity and delivery schedule of our manufactured materials to be supplied by the above Dealer/Distributor, where by guarantee as under:-

1. That we shall be responsible for Dealers / Distributers in the same way as if it were supplied by us.

2. That the materials will bear I.E.C /C.E /I.S.I / MNRE accredited laboratory Certification Mark& our BRANDMARK (wherever applicable) according to the license/certificate issued to us vide No. ..... dated...../...../20.....which is valid upto..... a photocopy of which will be supplied to the WRIDD.

3. That in case any material is found sub-standard or defective the same will be immediate replaced by the above selling authorized Dealers / Distributers failing which we undertake replace such materials free of cost.

4. That we guarantee to supply the quantity guaranteed by the above authorized Dealers / Distributers so that the WRIDD is able to get the required quantities according to the delivery schedule given by the WRID. In case of Failure of the authorized Dealers / Distributers, we ourselves undertake to supply the materials at the prices quoted by the Dealer/Distributor directly. The necessary adjustment in price, if any, will be settled by us with the authorized Dealers / Distributers directly.

5. That the WRIDD will have the right of pre-Delivery testing and inspection in our factory of the materials to be supplied through the authorized Dealers / Distributers in the same where as it was supplied by us.

6. The warrantee of our branded items shall be for a period of 5 years from the date of acceptance of the delivery by the consignee(s) of each item for any replacement free of cost to the buyer

*7. SPV Module shall cover warranty of 10 years for 90% wattage output & warranty of 25 years for 80% wattage output.

Group No:
Sl No:

PV module make:
Solar controlling unit make:
Make of structure:
Make of motor:
(Whichever is applicable)

M/s.....
Signature of Manufacturer
Mobile no-
GST no.-
Email

*Only for SPV module

Annexure-V

ON NON-JUDICIAL STAMP PAPER OF ANY DENOMINATION

MFG-III (Solar Panels / Motor Pump Set / Solar Control unit / HDPE pipe & fittings)

(Undertaking for components if procured from Dealers/ Distributers/ Channel Partners)

UNDERTAKING

WHEREAS M/s.....(bidder) has tendered to supply the …..... (material) to Water Resources Investigation and Development Department, GoWB, manufactured by.....(manufacturer) has requested us being the authorized Dealers / Distributers/ Channel Partner of the material to guarantee the quality, quantity and delivery schedule of the materials to be supplied by ……..…….(bidder).

We hereby guarantee as under:-

1. That we shall be responsible for the quality and standard of the materials supplied by …..... (bidder)in the same way as if it was supplied by us.

2. That the materials will bear CE /IEC/ I.S.I / MNRE accredited laboratory Certification Mark & the BRAND MARK (wherever applicable) according to the license issued to ……(manufacturer) vide No. ..... dated...../...../20.....which is valid upto.....a photocopy of which will be provided to WRDD.

3. That in case any material is found sub-standard or defective the same will be immediate replaced by the above..... (bidder) failing which we undertake replace such materials free of cost.

4. That we guarantee to supply the quantity guaranteed by..... (bidder)so that the Water Resources Investigation and Development Department, GoWB is able to get the required quantities according to the delivery schedule given by the WRDD. In case of failure of.....(bidder), we ourselves undertake to supply the materials directly at the prices quoted by..... (Bidder) The necessary adjustment in price, if any, will be settled among us.

5. That the WRDD will have the right of pre-delivery testing and inspection of the materials to be supplied by .....(bidder) in the same where as it was supplied by us.

6. The warrantee of our branded items shall be for a period of 5 years from the date of commissioning of the system by.....(bidder) for any replacement free of cost to the buyer.

7. That we have been permitted to issue authorization of PV module / Solar Power conditioning unit / Motor pump set by the manufacturer and a valid copy of permission is enclosed.

*8. . SPV Module shall cover warranty of 10 years for 90% wattage output & warranty of 25 years for 80% wattage output.(attach separate guarantee/ warranty declaration of PV module manufacturer)

Group No: PV module make:

Sl. No: Solar controlling unit make:

Make of motor:

*Only for SPV module (Whichever is applicable)

Attach Copy of Dealer ship/ Distributorship / Channel Partner .

M/s.....

Manufacturer/ Authorized Dealers / Distributers/ Channel Partners

Mobile no-

GST no.:- Email-

SPECIFICATION OF SOLAR TUBE WELL

Item	Specification
Drilling	Drilling of bore hole 32.0cm dia through any kind of soil by adopting mechanized rotary Rig Machine drilling method (direct or reverse circulation rotary) up to required depth including digging trenches and pits etc. all complete.
	The drilling mud to be used should be chosen to be environmentally friendly from bentonite/ polymer/bio-degradable material like Guar gum that can be easily washed after the drilling is completed. Use of Natural mud, cow dung should not be permitted at all.
Collection Of Strata Samples	Records of everyday progress in respect of boring of Tube-wells and of strata passed through shall be kept by the contractor. Enough samples of lithographic formation shall have to be collected by the contractor at every 3 m. depth or often where the stratum changes and at every change of layer. The collected samples shall be preserved and kept in a suitable box with depth records and necessary description for the Engineer-in-charge or his authorized representative not below the ranks of Assistant Engineer for inspection & preparation of assembly chart. In addition, at least 1 kg of samples of all the aquifer materials in proper sample boxes or polythene bags with detail description of depth, TW No., name, GPS location be handed over to Engineer-in Charge free of cost. Particulars of tube well No. etc, should invariably be given along with the samples. For any faulty collection of strata samples, the design of the Tube-wells may be faulty and the Tube-well may fail and in that case the agency shall be held responsible for failure of the Tube well owing to such faulty collection of strata and no payment will be made for the work to the contractor. The samples are taken out of the bucket at every 3-meter interval laid out on a hard board, dried, washed and then studies using handheld lens. The site engineer/ geologist will prepare a detailed description of the samples with mention of color, texture, mineral component, fossils, and the pack it into a transparent bag for storing in the sample box. The sample description should be used to prepare the drillers litho logical log.
Resistivity Test	1.Electro logging of bore hole of different dia of tube well for locating water bearing strata and saline aquifer, if any, after conducting relevant geophysical tests. All test reports compiled data and raw data sheets should be submitted to the Engineer-in-Charge (Cost is inclusive for all charges for equipments, labour, data aquisition and compilation of data sheets as per direction of the Engineer-in-Charge).
Lowering of well assembly	Pipe of tube well assembly consisting of 150 mm nominal diameter of PVC (CM) casing pipes, 150 mm nominal diameter Ribbed/Plain screen pipes, 150 mm dia sockets, 150 mm dia PVC End cap ,MS center guide and Top Cap etc. and jointing of tube well assembly at sites by threading as per direction of Engineer-in-Charge. lowering of the tube-well assembly will be done in presence of the Engineer-in-charge or his authorized representative not below the rank of S.A.E. The well assembly should be visible on the ground surface as 150 mm NB PVC casing pipe standing 0.9 m above the ground surface fitted with a threaded cap. The tube well above the ground level should be protected by a 200 mm diameter MSERW pipe after cleaned of rust, dirt and painted both inside and outside with two coats bitumastic paint by the contractor at his own cost before installation. The ERW Pipe will be 1.10 meter above ground level and at least 0.75 meter below ground anchored n i c e l y in concrete bedding around the protector at ground level and covered by a M.S. cap with clamping/locking arrangements.

Gravel treatment	After the tube well assembly has been placed in position, the gravel must be inserted in the annular space between the well pipe and the borehole. The contractor shall make arrangement for gravel treatment with clean and washed gravel with uniformity co-efficient of two or less. Gravel size should match with the formation texture and sieve slot size. 90% of the gravel should be retained in sieve. The gravel filling should be started from the bottom of the borehole and should be continuously worked upto depth as advised by engineer on site. A check of the verticality of the housing pipe and necessary correction should be made at this stage. Care should be taken both by the contractor and the Supervising Engineer to see that gravel feeding is done all round the annular space properly during its entire operation. The contractor should be paid for gravel treatment for the quantity of gravel utilized by volumetric measurement. For this purpose, the difference of stack measurement as per standard procedure of P.W. Department of Government of West Bengal, before and after work increased by 5% towards handling wastage will be the volumetric quantity admissible for payment. The diameter of the bore hole at top and bottom shall be of same size so as to leave at least 75 mm annular space around the tube well assembly. Gravel pack size should be such that it ensures sand free pumping, offers low entrance velocity, offers minimum head loss and is chemically neutral.
Test Of Verticality	The test of verticality will be carried out by actually installing a submersible pump arranged by the contractor and as per IS: 2800(part II)-1979.
Development of TW	This is done by a combination of chemical and jetting action. Development is done using rig and compressor with Designated wire line and jetting tool. After completion of the lowering of the well assembly the mud pit should be cleaned and water poured and mixed with sodium tripolyphosphate 3% which is equivalent of 4.5 Kg of sodium triphosphate mixed with 400 lts of water for a good concentrate. This solution needs to be pumped into the well and allowed to set for a minimum of 24 -36 hours to disaggregate the mud cake. This should be followed by development by operating a horizontal water jet inside the well in such a way that the high velocity of water stream shoots out through the screen openings, using jetting tool fixed to a 25mm GI pipe, for washing the screened portion and sump of the well. The tool needs to be rotated in the screened section, both raised and lowered in such a manner as to cover the entire surface of the screen. This jetting should be continued until the return water was is completely free of mud and fine sand. When the water is free of sand and mud the water should be developed by compressor combined pumping and airlift. This has to be continued till the yield stabilizes. The development should be continued for a minimum period of 2 days or as directed by the Engineer-in-charge. The development may be considered complete when sand free water is obtained with a tolerance of 10 PPM of sand by volume in sample collected after an hour of continuous run. After satisfactory completion of development of whole, the plug-cutter piece fitted at the bottom of the Tube-well should be appropriately closed. If the development of the Tube-well is not taken up within the period as mentioned above, the contractor will be liable for any eventual abandonment of the Tube-well and no payment for this will be made. Water level should be taken at the close of development after full recovery. Last water sample taken during development should be sent to laboratory for complete chemical and bacteriological analysis. Apart from the above the contractor shall also have to measure the water quality for Conductivity, pH,TDS& mud viscosity chart for the water used in the drilling, development of the Tube well to ensure use of good quality water free from salinity or any other impurities which may hamper the process of drilling development or geophysical investigations of the Tube well. Complete as per direction of Engineer in charge
Tube well efficiency test (Step Draw Down test)	On completion of development the well should be fitted with an oversized submersible pump with control valve and orifice assembly. The test should be powered by a generator Step drawn down test shall be carried out for 100 minutes each followed by 90% recovery measurement. The first step should be pumped at 30% of the discharge from the tube well (as calculated during development) for 100 minutes and recovery measurement taken, followed by second step at twice the discharge of the first step, and third step at thrice the discharge of first step. The data should be analyzed by a competent hydro geologist to calculate aquifer loss, well loss and thereby well efficiency. If the well efficiency is less than 50% then the well development needs to be repeated for another 48 hours. Well efficiency analysis will provide the correct discharge rate in which the well will perform efficiently without affecting the aquifers.
Calculation of aquifer parameters (constant	After completion of step drawn down test the well needs to be pumped for at least 1000 minutes or more as decided by the Site Engineer. The discharge should be same as the third step discharge. The water level should be measured in the pumping well and neighboring well if any. Measurement should be taken at very close interval for first hour and then every hour till close of test. There should be all arrangements for ensuring constant discharge. The primary

discharge test)	objectives of the pumping tests are to obtain information about the performance and efficiency of the well and to collect data which are used to select the permanent pumping equipment to ensure maximum pump efficiency. The information is used to evaluate the success of the design and development procedures and provides the basis to make other performance judgements and evaluations. In some cases, this information indicates that further development is necessary. Well testing will also allow collection of data from which the hydraulic characteristics of the aquifer can be evaluated. Measurements of water table recovery at the end of a pumping test (rate at which the water table rises after pumping stops) is beneficial in evaluating performance of irrigation wells aquifer hydraulic characteristics.
Test of Verticality	The test of verticality will be carried out by actually installing a submersible pump arranged by the contractor and as per IS: 2800(part II)-1979.
Water sampling	The contractor shall measure groundwater quality for pH, Conductivity, TDS during step test as well as constant discharge test. The testing should be using field kits and sampling done at beginning, midway through and end of each test. They should collect duplicate sample (2 bottles of 500 ml) of water at the end of constant discharge test and send it to the lab for complete analysis.
Successful Tube well	The successful bore holes will be stipulated by the existence of about 12 m. of good granular aquifer, materials on an average with the expected minimum discharge27 cum/hr.
Un Successful Tube well	The Engineer-in-charge or his authorized representative not below the rank of Assistant Engineer reserves the right to order for lowering the Tube well assembly in to the bore holes where the length of available aquifer is less than 12 m or where the expected discharge may fall below prescribed limit particularly in dry areas where discharge below minimum is considered beneficial for the purpose of irrigation. If in exceptional cases where lowering of the Tube well has been completed and the discharge actually available on yield test after carrying out all items of work strictly as per specification appears to be low for economic use for irrigation purposes, the tube wells may be declared abandoned by the Superintending Engineer on going through the records of the case and the contractor will ***not*** entitled for getting payment as per schedule for all items of work executed by him. In such case of abandoned tube wells the contractor should immediately arrange for withdrawal of pipe assembly to the maximum extent possible within 7 days from the date of intimation. In case of less discharge or any other geophysical issues comes during tube well boring, authority has no liability or cannot allow any compensation for shifting of pinpoints as shown by the department. Responsibility of whole work completely bored upon agency.

Materials Specification and other Specifications:	
150 mm nominal diameter of PVC casing pipes	150 mm N.D. with 7.5 mm minimum thick PVC pipes for Tube wells more than 80 meters depth screwed on both ends, one end socketed and other end protected with plastic protector, duly ISI certification marked., as per IS: 12818 with latest amendments thereof and threaded to match with GI pipes as per Is: 1239 (PART -1) with latest amends. CIPET (Central Institute of Plastic Engineering & Technology) or equivalent Test Certificate for PVC Pipe with all ISI Certification Conforming to ASTMD-1785 is to be submitted at the time of supply of material.
150mm nominal diameter Ribbed PVC screens	150 mm N.D (6'' ND) , with minimum thickness of 7.5 mm and slot width in the range of 0.5 mm to 1.5 mm , ribbed PVC screen pipe of effective length 2 or 3 m as per IS 12818 with latest amendments. CIPET (Central Institute of Plastic Engineering & Technology) or equivalent Test Certificate for PVC Strainer IS-12818 is to be submitted at the time of supply of material.
MS Protection Pipe with MS Cap	200 mm N.B.(6.4mm) 33.1 Kg / m E.R.W. Casing pipe lSI marked-IS 4270 with latest amendments of 1.85 m length should be used to protect the well assembly at the surface, to take the load of submersible pump also be well anchored in the ground to prevent into the well. The whole arrangement should be painted with anticorrosive paints.
END Cap and Centre Guide	1. Supplying, fitting, fixing of 150 mm DN PVC-U end cap conforming to IS: 12818 & lowering in position etc. as directed by the Engineer-in-Charge. 2. Supplying, fitting, fixing including fabrication (IS -2800 Part - I with latest amendments) with required materials as directed by the EIC and lowering in position etc. M.S. Centre guide.
Protective RCC structure	**Protective RCC Structure -** The tube well should be protected by a 1m x 1 m x 0.15 mr RCC structure on the ground to protect seepage in the well.

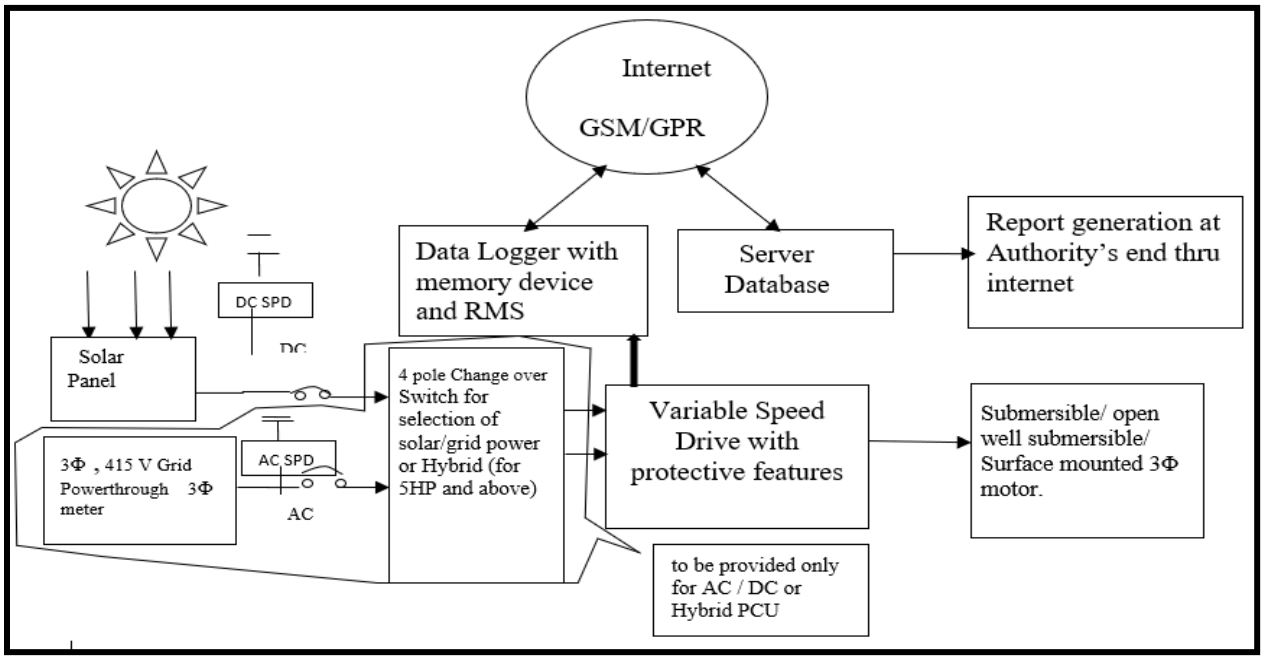
Column Pipes	(ii) 80 mm dia MS galvanized pipe (ISI marked -1239, Galv IS 4736) both end screwed and one end socketted 3 m long.(Bottom & Middle) (iii) 80 mm dia M S glavanised pipe (ISI marked -1239, Galv- IS4736) one end screwed & other end standard flanged 3m long (top)
MS Top Cap	Supplying, fitting & fixing of M.S. plate of size 20 cm x 20 cm,thickness 6 mm, make of two halves (20 cm x 10 cm), placed over Housing Pipe of TW to rest the supporting clamps, with semicircular hole of 90 mm dia. at centre including locking arrangement between the two halves on both sides, including fitting, fixing of 2 nos 25 mm dia. G.I. bend by making hole on plate for passing submersible cable smoothly and water depth measuring tape and complete in all respect.
MS Holding Clamp	Supplying, Fitting, Fixing 80 mm dia MS Galvanised Holding Clamp as per IS 1239, Galv- IS4736.
Flat Cable	3Core Flat waterproof cables lSI marked-IS 694 3C X 4 sq. mm.
Other Fittings	1.90 degree G.I Bend (both end flanged) ISI marked-IS 1239, Galv- IS 4736 . 80 mm dia. 2.Supply of G.I. reducing tee of approved brand and make 80 mm X 50 mm 3. Supplying, fitting and fixing of PVC Control Valve of approved make and quality all complete as per direction of Engineer-in-Charge . PVC Control Valve 40 mm.
Lay flat Hose pipe	Supply of 100 mm dia PVC Lay flat Hose Pipe for water distribution
Earthing	Earthing with 50 mm (2") dia Galvanized iron pipe 3.64 mm thick X 3.04 mtr.(10ft) long and 1X4 SWG G.I.(Hot Dip) Wire (4 mtr. Long) 13 mm (1/2") dia X80 mm (3") long G.I. Bolts, double nuts and double washer including S&F 15 mm dia G.I. Pipe protection (1 mtr) long to be fitted with bitumen partly under the ground level and partly above the ground level driven to an average depth of 3.56 mtr. (12") below the ground level and restoring the surface duly rammed for Soft/Morrum soil by ISI-Medium G.I. Pipe. The G.I. pipe electrode shall be cut tapered at the bottom and provided with holes of 12mm dia drilled not less than 75mm from each other in zigzag manner upto 500mm from the top of the electrode. A pair of 50mm x 6mm G.I. flat clamp with 2 nos 18mm dia drilled holes on either side shall be welded to the electrode at about 150mm below the top of the pipe. Earting Certificate is required to be submitted.
Submersible Pump Motor Set	Supply and installation of 3 phase AC electromotor pump-motor set with speed of 3000 r.p.m (synchronous speed) suitable for Solar applications and shall have 60 months guarantee for the following conditions including loading, unloading, transportation etc.:-(Refer technical specification for more detail) 5HP 3 phase AC Submersible Pump motor set for TW with external part made of stainless steel of grade 304 or higher as per IS 6911 and IS 3444 with discharge of 7.5 -5.83 LPs at 30 mtrs.-35 mts total head with cable 3 m , The pump mortor should be tested as per IS 8034 - 2048 (Third revision).
Civil Construction and Materials	For any type of Civil construction and supply of Materials Specification have to be followed as laid down in West Bengal PWD SOR.
Sign Board	Supplying, fitting and fixing including transportation of sign board for identifying the exact location of scheme , the board will be made 1.5 mm thick MS plate of size 1000 mm x 750 mm and fitted and fixed on 50 mm GI Pipe of IS 1239/90 (part-1) including cutting, welding and pasting printed digital display and bottom end of the stands pipe will be grouted in 1:2:4 CC as per drawing and direction of E.I.C.
Site Clearance	After completion of work the Contractor should remove his plant and machinery and dress, level and ground as per direction of Engineer-in charge.

TECHNICAL SPECIFICATION OF SOLAR SYSTEM

SUPPLY INSTALLATION OF SOLAR IRRIGATION PUMPING SYSTEM INCLUDING SUPPLY OF ALL MATERIALS FOR COMMISIONING 5HP TW SCHEME and COMPREHENSIVE MAINTENANCE FOR 5 YEARS.

Broad objective of the project is to supply water for irrigation through electrically operated Surface mounted / Submersible electromotor pump sets, which will be driven by solar power.

The data logger will store specified parameters and transfer them on-line to a central server and display through a web application. Remote monitoring through internet without any necessity to visit the site would be an added requirement.



1.0 General

1.1 SPV Water Pumping System set uses the solar irradiance available through SPV array. The SPV array produces DC power, which can be utilized to drive a DC or an AC pump set using pump controller.

1.2 **A SPV Water Pumping system typically consists of:**

1.2.1 **Pump Set**

Pump set may be of any one of the following types:

i) Mono-set pump.

ii) Open well submersible pump.

iii) Submersible pump.

1.2.2 **Motor**

The motor of the pump set consists of:
i) AC Induction Motor.

1.2.3 **SPV Controller**

Pump Controller converts the DC voltage of the SPV array / **GRID power supply** into a suitable DC or AC, single or multi-phase power and also include equipment for MPPT, protection devices and remote monitoring.

1.2.4 Remote monitoring for the pumps must be provided in the pump controller through an integral arrangement having followed basic functions:

- Controller must be assigned with a unique serial number and its live status must be observed remotely on online portal through login credentials.
- Live status must indicate whether controller is ON/ OFF
- The parameter i.e. the water output, water flow rate, in fault condition, array input voltage/ current, power and motor frequency should at logged at an interval of 10minutes
- Controller must have a back up to store the data locally (at least for 1 year)

2.1 Solar Photo Voltaic (SPV) Array:

The Solar Modules of **should be of Indigenous mono crystalline silicon SPV cells with PERC technology** and **ISI marked** as per **IS 14286.**

2.2 Standards &Certifications: All SPV modules should have following certifications(read with latest amendments)

Sr.no.	Applicable Standards	Description
a)	IS 14286/ IEC 61215/	Design qualification and type of approval for crystalline silicon Terrestrials photovoltaic Modules
b)	IEC 61853-1/ IS16170-1	Photovoltaic (PV) module performance testing and energy rating-Irradiance and temperature performance measurements and power rating
c)	IS/ IEC 61730-1,2	Photovoltaic (PV) Module safety Qualifications
d)	IEC 61701:	Salt Mist Corrosion Testing of Photovoltaic (PV) Modules

2.2.1 SPV arrays contain specified number of same capacities, type and specification modules connected in series or parallel to obtain the required voltage or current output. The SPV water pumping system should be operated with a PV array minimum capacity in the range of 900 Watts peak to 22500 Watts peak, measured under Standard Test Conditions (STC). Sufficient number of modules in series and parallel could be used to obtain the required voltage or current output. The power output of individual PV modules used in the PV array, under STC, should be a minimum of 300-Watt peak, with adequate provision for measurement tolerances. Use of PV modules with higher power output is preferred.

2.2.2 Modules supplied with the SPV water pumping systems shall have certificate as per IS14286/IEC 61215 specifications or equivalent National or International/ Standards. STC performance data supplied with the modules shall not be more than one year old.

2.2.3 Modules must qualify to IS/IEC 61730 Part I and II for safety qualification testing.

2.2.4 The minimum module efficiency should be minimum 19.5 percent and fill factor shall be more than 75 Percent.

2.2.5 Modules must qualify to IS 170210 (Part 1) for the detection of potential-induced degradation - Part 1: Crystalline silicon (Mandatory in case the SPV array Open Circuit voltage is more than 600 V DC)

2.2.6 In case the SPV water pumping systems are intended for use in coastal areas the solar modules must qualify to IEC TS 61701:2011 for salt mist corrosion test.

2.2.7 The name plate shall conform the IS 14286/IEC 61215

2.2.8 Module to Module wattage mismatch in the SPV array mismatch shall be within ± 3percent.

2.2.9 Variation in overall SPV array wattage from the specified wattages shall be within zero percent to +10 percent.

2.2.10 The PV Modules must be warranted for output wattage, which should not be less than90% of the rated wattage at the end of 10 years and 80% of the rated wattage at the end of 25 years.

2.2.11 The terminal box on the module should be IP 65 protected have a provision for "Opening" for replacing the cable, if required.

2.2.12 **RFID Tag**

Each PV module must use a RF identification tag (RFID), mandatorily placed inside the module laminate, which must contain the following information:

a. Name of the manufacturer of PV Module
b. Model No
c. Serial No.
d. Month and year of the manufacture (separately for solar cells and module)
e. Country of origin (separately for solar cells and module)
f. I-V curve for the module
g. Peak Wattage of the module Pm, Im, Vm and FF for the module
h. Date and year of obtaining IEC PV module qualification certificate
i. Name of the test lab issuing IEC certificate
j. Other relevant information on traceability of solar cells and module as per ISO 9000 series.
k. A distinctive serial number shall been graved on the frame of the module or screen printed on the tedlar sheet of the module.Content of the RFID tag in printed form must be supplied as a part of documentation.

2.2.13 Modules only with the same rating and manufacturer shall be connected to any single inverter.

3.1 PV System Capacity

The AC and DC Capacity of the PV system shall be based on the pump connection capacity as follows:

Sl.no.	Sanctioned load	Min. AC Inverter capacity	Min. PV Module Capacity
	HP	KW	KWp@STC
1.	5HP	7.5	5.0

4.1Motor-Pump Set

4.1.1 The SPV water pumping systems may use any of the following types of motor pump sets:

a) Surface mounted motor-pump set
b) Submersible motor-pump set
c) Floating motor-pump set
d) Any other type of motor pump set after approval from TIA/EIC.

4.1.2 The "Motor-Pump Set" should have a capacity in the range of 5 HP and should have the following features:

a) The mono block AC centrifugal motor pump set with the impeller mounted directly on the motor shaft and with appropriate mechanical seals which ensures zero leakage.

b) The motor of the capacity 5 HP should be AC. The suction and delivery head will depend on the site-specific condition of the field.

c) Submersible pumps could also be used according to the dynamic head of the site at which the pump is to be used.

4.1.3 The motor pump set shall have 60 months guarantee and therefore, it is essential that the construction of the motor and pump shall be made using parts which have a much higher durability and do not need replacement or corrode for at least 60 months of operation after installation.

4.1.4 The suction/ delivery end shall consist of flexible PVC pipe of appropriate size, electric cables, floating assembly, civil work and other fittings required to install the Motor Pump set. Flexible PVC pipe shall be as **per IS 15265 (read with latest amendment).**

4.1.5 List of Indian standard to be followed:

Sr.no.	**Applicable Standards**	**Description**

a)	8034:2018	Submersible pump sets - Specification (third revision)
c)	9283:2013	Motors for submersible pump sets

The AC motor-pump set shall be tested independently for hydraulic and electrical performance as per the relevant IS specification including the following test:

a) Constructional requirements/features
b) General requirements
c) Design features
d) Insulation resistance test
e) High voltage test
f) Leakage current test

4.1.6Submersible Motor and Pump Set:

The pump and all external parts of motor used in submersible pump which are in contact with water, shall be of stainless steel of grade 304 or higher as per IS 6911 and IS 3444. The pump enclosure should be provided with specially developed mechanical seals so as to ensure zero leakage.

i) 5 HP for TW (Low Duty Tube Well) schemes with 150mm housing Bore

Wet type water filled totally enclosed water lubricated submersible pump set with following specifications:

Motor: Submersible type **3 phase AC** Squirrel Cage Induction Motor of **5 HP** capacity.
Pump Capacity: **27- 21 Cum./ hour** discharge at **30 –35 m** total dynamic head.

4.5 PERFORMANCE REQUIREMENTS

4.5.1 Under the **"Average Daily Solar Radiation" condition of 7.15KWh /m² on the surface of PV array (i.e. coplanar with the PV Modules) on a clear sunny day** the minimum water output from a Solar PV Water Pumping System at different "Total Dynamic Heads" should be as specified below:

Daily minimum discharge requirement of installations:

Type of structure	TW				
Motor capacity	5 HP (Submersible)				
Total dynamic head	22.5m	25m	30m	35m	40m
Minimum water output / Day	205000 LPD	185000 LPD	160000 LPD	135000 LPD	120000 LPD

4.5.2 The SPV Water Pumping Systems shall be guaranteed for their performance of the nominal volume rate of flow and the nominal head at the guaranteed duty point as specified in 4.5 under the "Average Daily Solar Radiation" condition of7.15KWh/m^2 on the surface of SPV array (i.e. coplanar with the Photo Voltaic (PV) Modules). The actual duration of pumping of water on a particular day and the quantity of water pumped could vary depending on the solar intensity, location, season, etc.

4.5.3 Solar Photo Voltaic Water Pumping Systems shall be guaranteed by the manufacturer against the defects in material and workmanship under normal use and service for a period of at least 60 months from the date of commissioning.

4.5.4 Sufficient spares for trouble free operation during the Warrantee period should be made available as and when required.

4.5.5 The motor pump-set used in SPV Water Pumping Systems shall be securely marked with the following parameters declared by the manufacturer:

a) Manufacturer's name, logo or trademark.
b) Model, size and SI No of pump-set;

c) Motor Rating (kW / HP);
d) Total head, m, at the guaranteed duty point.
e) Capacity (LPD) at guaranteed head.
f) Operating head range, m.
g) Maximum Current (A);
j) Voltage Range (V) and.
k) Type - AC or DC Pump set; &
l) Photo Voltaic (PV) Array Rating in Watts peak (Wp)

5.1 Module Mounting Structures Tracking / Fixed System

Applicable Standards &Certifications (read with latest amendments**):**

Sr.no.	Applicable Standards	Description
a)	IS –2062	Hot Rolled Medium and High Tensile Structural Steel .
b)	IS – 1161	Steel Tubes for Structural Purposes.
c)	IS- 4923	HOLLOW STEEL SECTIONS FOR STRUCTURAL USE
d)	IS – 808	DIMENSIONS FOR HOT ROLLED STEEL BEAM, COLUMN, CHANNEL AND ANGLE SECTIONS
e)	IS – 5624	FOUNDATION BOLTS
f)	IS – 1079	HOT ROLLED CARBON STEEL SHEET AND STRIP
g)	IS – 4759	Hot-dip zinc coatings on structural steel and other allied products
h)	IS – 7215	Tolerances for fabrication of steel structures.
i)	IS- 822	CODE OF PROCEDURE FOR INSPECTION OF WELDS
j)	ER 70S-6	General purpose welding wire for fabrication of mild steel

5.1.1 The PV modules should be mounted on metallic structures as per drawing, to withstand high wind velocities up to 170 km per hour. The raw material used and process for manufacturing of module mounting structure including welding of joints should conform to applicable IS. The module mounting structure should be hot dip galvanized according to IS 4759. Zinc content in working area of the hot dip galvanizing bath should not be less than 99.5% by mass.

5.1.2 To enhance the performance of SPV water pumping systems arrangement for seasonal tilt angle adjustment and three times manual tracking in a day has been provided in the drawing which should be strictly followed (for tracking system)

5.1.3 The general hardware for structure fitment should be either SS 304 or 8.8 grade. Modules should be locked with antitheft bolts of SS 304 Grade. Foundation should be constructed with foundation bolt as per drawing.

5.1.4 Detail of Module Mounting Structure and specification for different capacity of SPV pumps is mentioned below in subsequent clauses. The MS sections should be at least as per Bill of Materials attached. These are indicative of minimum standards and an Implementing Agency may specify higher standards.

The no. of structures should be as follows:

1)For 5 HP - Combination of two standard MMS of 4 Modules /6 Modules.

The weight of each structure should be approx. as follows

Fixed Structure
255 Kg- For 4 module structure.
325 Kg- For 6 module structure

5.2 Foundation for MMS

R.C.C foundation for holding MMS should be as per drawing and procedure for RCC foundation is to followed as detailed in later part of the technical specification.

6.1 SPV Controller

Standards &Certifications: All SPV controllers should comply with the following IEC/ BIS standard (read with latest amendments.

Sr.no.	Applicable Standards	Description

a)	IS 16221-1,2 / IEC 62109-1,2	Safety of power converters for use in photovoltaic power systems
b)	IEC 62891	Overall efficiency of grid connected photovoltaic inverters
c)	IEC 61683	Photovoltaic Systems –Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% & 90-100% Loading Conditions)
d)	IEC 600682(1,2,14,27,30,64)	Environmental testing of PV system –Power Conditioners and inverters
e)	IEC 60529	Degree of protection provided by the enclosure
f)	IS/IEC 60947(1,2,3),	General Requirements for connectors, switches, circuit breakers (AC/DC)
g)	IEC 60255-27:2013	Measuring relays and protection equipment - Part 27: Product safety requirements
h)	IEC 60269-6	Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems
i)	IEC 61643-11/IS 15086-5	Low voltage surge and protection devices, requirements and test methods
j)	IEC 62093	Balance-of-system components for photovoltaic systems - Design qualification natural environments

6.1.1 **Components and Features**:

a) Variable frequency Drive with inbuilt MPPT, voltage range suitable for 1HP to 10 HP.
b) Power input: AC / DC source or hybrid for 5HP and above.
d) Incomer: DC MCB 2 Pole 16 amp (upto 7.5 HP), as per IS/IEC 60947-2
e) Incomer: AC MCB 4 pole 16 amp (upto 5.0 HP), as per IS/IEC 60947-2
f) Type II DC SPD of 40 KA.
g) Type II AC SPD of 40 KA for AC/ DC or Hybrid input.
h) Dual input (solar/Grid) 25-amp changeover switch (5HP and 7.5 HP),
i) Reverse protection diode 1600 VDC with heat sink.
j) Data Logger.
k) Remote monitoring system.
l) Sshould have built –in EMC filters.
m) IP 65 glands for cable in and out.

6.1.2 The SPV Controller must have IP (65) protection or shall be housed in a cabinet having at least IP 65 protection.

6.1.3 **Adequate protections shall be provided in the SPV Controller to protect the solar powered pump set against the following**:

a) Dry running.
b) Open circuit.
c) Accidental output short circuit.
d) Over voltage, Under voltage, Overload
e) Reverse polarity.
f) SPD to arrest high current surge; and
g) Lightning.

6.1.4 Maximum Power Point Tracker (MPPT) shall be included to optimally use the power available from the SPV array and maximize the water discharge. The MPPT unit shall confirm to IEC 62093. Static MPPT efficiency should be equal or more than 98% during operation of 10 to 100% of rated STC PV power, and average MPPT tracking efficiency in the dynamic condition should be greater than 97 % with hot and cold profiles when feeding the water pumping loads, so as to maintain MPPT irrespective of variation in solar energy or irradiance. DC input terminals must be in enough numbers so as each terminal is connected to dedicated single input from the PV string. Two DC inputs cannot be connected to a single input DC terminal of the inverter. If adequate number of inputs are not available in the selected inverter, then a DC junction box shall be incorporated into the design.

6.1.5 **Display:** The controller shall have local LCD (Liquid crystal display) and keypad for monitoring instantaneous parameters, event logs and data logs. Display should be simple and self-explanatory, and should indicate:

(a) Instantaneous DC power input
(b) DC input voltage
(c) DC Current
(d) Instantaneous active AC power output
(e) AC voltage (all the 3 phases and line)
(f) AC current (all the 3 phases and line)

(g) Motor frequency
(h) Cumulative energy generation during entire day, for a month, year and 5 years.

6.1.6 The inverter shall have an RS-485 interface and support communication of its operational parameters and logs over Modbus protocol. The register mapping/memory mapping of the inverter data shall be made available by the Contractor from the inverter supplier, and the Contractor/ inverter supplier shall provide full support for integration of inverter's communication data with third- party software and hardware for data logger.

6.1.10 **Remote monitoring for the pumps must be made in the Solar pump controller through an integral arrangement having followed basic functions:**

- Controller must be assigned with a unique serial number, and its live status must be observed remotely on online portal through login credentials.
- Live status must indicate whether controller is ON/ OFF.
- The parameter i.e. the water output(calculated), water flow rate(calculated), in fault condition, array input voltage, current, power and output voltage, current &motor frequency should at logged at an interval of 10minutes
- Controller must have a back up to store the data locally (at least for 1 year)

6.1.11 Should be windows plug and play device with Ethernet/Bluetooth/USB/Wi-Fi connectivity to configure parameters, notifications, communication interval, set points etc. or to retrieve locally stored data. Controller should have support of sufficient Internal memory/ SD card / memory card to support remote monitoring.

6.1.12 The controller shall be tested from MNRE approved test centers/NABL/BIS/IEC- accredited testing/ calibration laboratories.

6.1.13SPV controller shall conform to the following details:

Sl.no.	Description	Desired requirement
1.	Nominal AC Output Voltage	250-280V(for 5HP) ±5%, 3 phase
2.	Output frequency	50 Hz +3% to - 5% Hz
3.	Characteristic of voltages	Pure sinusoidal or Filtered AC output voltage at motor terminal. No PWM pulses allowed at the motor terminal, as it generates pronounced voltage spikes. The voltage output is intended to use for the traditional induction motors-based applications which are design for sinusoidal grid supply.
4.	Total Harmonic Distortion (THD) of motor terminal voltages	Below 3%.
5.	THD of motor current (in case of balance/linear motor)	Below 5%
6.	Balance supply	Three phases should be balanced and no negative sequence components to be allowed
7.	Desired motor operation	Constant V by F or constant motor flux control
8.	Switching Devices	MOSFET/ IGBT-based
9.	Maximum Input Voltage	Not more than 1000 VDC
10.	Power Factor	0.8 lag- 0.8 lead
11.	Controller power efficiency	≥ 93%
12.	Ambient dry bulb temperature range	0 to 50˚ deg C
13.	Humidity	15% to 95 % non- condensing
14.	Enclosure	At least IP21 for indoor installation and at least IP54 for outdoor installation.
15.	Alarms and Protections	Output voltage low, Output frequency low/high, Low irradiance/PV power, Current overload, Peak Torque overload
16.	Communication protocol and interface	Modbus protocol over RS-485 interface

6.1.14 Controller shall be integrated with GSM/GPRS Gateway with Geo tagging. GSM/ GPRS Charges to be included in the Costing till the end of Warranty period of the Pumping system.

7.1 Remote Monitoring System (RMS)

7.1.1 There will be a State Implementing Agency (SIA), which will have a common SWPS (Solar Water Pumping System) Management platform for monitoring of operation and performance of SWPS installations.

7.1.2 Remote Monitoring System (RMS) of SWPS should have following minimum features or modules:

a) **Solar System Performance**: Array input voltage, current, power and output voltage, current & motor frequency, etc.

b) **Pump Performance**: Running Hours, Water Discharge (Output)imps, LPD(calculated) etc.

c) **RMS Performance**: %Device Connectivity, %Data Availability, etc.

d) **Geo Location**: Real time latitude and longitude should be captured. This is required to ensure that system is not moved from its original location.

e) **Events and Notifications**: Faults related to Pump Operation, Solar generation, Controller/Drive faults like overload, dry run, short circuit, etc.

f) **Consumer Management**: Name, Agriculture details, Service No. Contact Details, etc.

g) **Asset Management**: Ratings, Serial Number, Make, Model Number of Pump, Panel and Controller, Geo Location, IMEI number (of communication module) and ICCID (of SIM).

h) **Complaint and Ticket Management**: Complaint management system is a part of centralized monitoring software platform – State Level Solar Energy Management Platform to be operated and maintained by the State implementing agency (SIA).

i) **Consumer Mobile Application**: Generation, Running Hours, Water Discharge, Complaint logging, etc.

7.1.3 RMS provided by all bidder, should connect to State Level Solar Energy Data Management platform, which will have interface with National Level Solar Energy Data Management platform. All vendors should provide SIM card of suitable ISP having maximum Signal Strength in the respective location of SWPS and ensure connectivity as well as pushing of data to centralized platform as mentioned in specifications.

7.1.4 **Communication Architecture should be as per following:**

a) **Communication Connectivity**:

i. **Pump Controller Connectivity**: Communication between RMS and Pump Controller (through data logger) should be on UART/RS485 MODBUS RTU protocol to ensure interoperability irrespective of make and manufacturer.

ii. **Remote Connectivity**: RMS of SWPS should be using GSM/GPRS/2G/3G/4Gcellular connectivity

iii.**Local Connectivity**: Ethernet/Bluetooth/USB/Wi-Fi connectivity to configure parameters, notifications, communication interval, set points etc. or to retrieve locally stored data.

iv. **Sensor Connectivity**: RMS should have provision for at least two Analog/Digital inputs with 0.1% accuracy to address the requirement of local sensors connectivity if required by SIA/Consumer for applications such as irradiation, flow meter for water discharge, moisture sensor for micro irrigation, etc. Analog/digital sensor inputs will be required for integration of flow meter for water discharge, moisture sensor for micro irrigation, level sensor for overhead tank water storage etc. Only provision for Analog/digital inputs with 0.1% accuracy of Full-Scale Range is required. **Sensors will not be in scope of bidder**.

v**.**Option for digital Input for authentication of the door opening for theft protection with battery backup at night. (optional)

vi. RMS should have provision to give remote On/Off command to pump through farmer mobile app. To save ground water.

b) **Communication Modes**:

i. **Push Data on Event/Notification**: such as pump on, pump off, protection operated, etc.

ii.**PushData Periodically**: important parameters of solar pump (as mentioned above) should be pushed to central server on configurable interval. Interval should be configurable for 15 mins. However, if required, it should be possible to configure the periodic interval in multiple of 1 minute starting from 1 minute and up to 15 minutes. Further, in case of any abnormalities or event, RMS should push on event immediately.

iii. **Command On Demand**: It should be possible to send commands via GSM or GPRS to RMS either to control pump operations or to update configuration.

c) Communication Protocol: RMS should provide data on MQTT protocol to establish communication with thousands of systems.

d) Security:

i) Communication between RMS and Server should be secured and encrypted using TLS/SSL/X.509 certificate etc.

ii) As a part of IoT protocol, Authentication and Authorization should be implemented using token/password mechanism

e) Message Format: RMS should provide data in a JSON message format as required by respective SNA

f) Data Storage: In case of unavailability of cellular network, RMS should store data locally and on availability of network it should push data to central Server. Local data storage in Internal memory/ SD card / memory card should be possible for at least one year in case of unavailability of cellular network.

g) Configuration update over the Air of multiple parameters such as IP, APN, Data logging Interval, Set Points etc. is essential. Software updating should be possible with 2G and even without the presence of SD card. Software updating process and/or failure to update software shouldn't disrupt pumping operations

Use of indigenous components:

It will be mandatory to use indigenously manufactured solar modules with indigenous mono/Mult crystalline silicon solar cells. Further, the motor-pump-set, controller and balance of system should also be manufactured indigenously. The vendor has to declare the list of imported components used in the solar water pumping system.

8.0 Enclosure Standard (IP) :

IP65Metallic Enclosure with test certificate from CPRI/ERDA/ MNRE accredited test house (issued not more than 10(ten) years from the date of this NIT) to be installed at a suitable position on civil structure / Solar module structure.

- IP65 cable glands and louver filters with cover must be used
- Canopy arrangement to be provided for protection from rainwater
- Enclosure should have padlock / lock & key arrangement.

If Stainless Steel enclosure, then it must be minimum SS 304 grade.

If Power coated, enclosure must have followed Paint Process:
Triple surface treatment painting on enclosure surface – pass salt spray tests up to 760Hrs.
1st Phase: Nano ceramic coating: A pre-treatment procedure for spray coat-priming-the nano ceramic coating.
2nd phase Electrophoretic dip coat-priming: thickness approx. 20 µm
3rd phase - Textured powder-coating: thickness approx. 80 µm

9.1 Cabling

9.1.1 **DC Cable**

a) Standard: UL-1581 (UV Rated).
b) Working voltage: Up to 1100V.
c) Temperature range: -15 Deg C to +70 Deg C.
d) Outdoor Suitability: UV Resistant.

9.1.2 **AC Cable :**All cables shall be of the following specifications and shall be of sufficient length for inter-connection between the SPV array to SPV Controller and the SPV Controller to solar powered pump set:

a) PVC insulated (Heavy Duty) 1.5, 2.5 sq.mm. electric cable duly ISI marked as per IS- 694/1990 with latest amendments.

b) Electrical wire: 1.1 KV single core stranded FR PVC insulated & unsheathed single core stranded copper wire as per IS: 2551-1963 &IS: 9823-1978 / IS 694 / 1990; BS 2004 (1861)

9.1.3 **Electronic Signal Cable:** Cat 6 or better and should be protected from mutual interference.

9.2 Cable Conduit

- All DC & AC cable must be laid underground through HDPE PLB cable conduit while goes from one stand to another stand
- This HDPE pipe must be PE63 grade
- Cable sealing plug must be used for cable entry and exit into the conduit
- In case of pipe joint, **pipe coupler** must be used
- Underground cable must be laid inside the ground at a trench depth of minimum 600mm

10.1 Surge Protection Device:

- IEC 61643-1, Class-II
- Recommended discharge current 40KA

11.1 Solar Lighting

- The system shall have dusk to dawn lighting arrangement in lighting pole with 12 V, 15Ah 2-in-1 Lithium ion/ Ferro-Phosphate battery with in-built 7-11 watt LED lamp, 50 Wp solar panel(min 19% efficiency) to cover the scheme area. The lighting system should be warranted for 5years from the date of installation.

12.1 Earthing: Installation of electrode and connection of grounding conductor:

Earthing of the motor shall be done in accordance with the relevant provisions of IS 3043. Separate earthing shall be provided for Controller, pump and SPV array. For safety purpose, it shall be ensured during installation that the earthing is capable of taking care of leakage current. In case of uPVC/HDPE pipes used as discharge pipe, a separate non-corrosive, low resistance conductor from motor earth terminal to control panel earth terminal shall be provided for earthing.

Earthing with 50 mm dia GI pipe 3.64 mm thick x 3.04 Mts. long and 1 x 4 SWG GI (Hot Dip) wire (4 Mts. long), 13 mm dia x 80 mm long GI bolts, double nuts, double washers incl. S & F 15 mm dia GI pipe protection (1 Mts. long) to be filled with bitumen partly under the ground level and partly above ground level driven to an average depth of 3.65 Mts. below the ground level as per attached drawing.

The electrode shall be buried in the ground vertically with its top not less than 200mm below the ground level. The pipe earth electrode shall be surrounded by, either salt & charcoal in alternate layers or a homogeneous mixture of both, for a radius of about 150mm and up to a height of about 350mm below the top of the electrode. The balance portion of the excavated pit shall be filled with good quality soil and properly compacted.

The earthing lead connecting the earth electrode to the apparatus or installation directly shall be of the same material as earth electrode. The earthing leads shall be either wires or strips of adequate size as specified and of either G.I. or tinned copper. The G.I. leads shall be connected to the electrode by means of 16mm dia G.I. nut bolts with flat & spring washer.

The earthing lead from electrode onwards shall be suitably protected from mechanical injury by means of 15mm dia G.I. pipe for G.I. wires. The portion of this protection pipe within ground shall be buried at least 350 mm deep from ground level.

An earthing electrode shall not be situated within a distance of 2 meters from the building whose installation system is being earthed. The cross-sectional area of earth continuity conductor in electrical installation shall be of 8swg GI wire. The earth resistance for various installations shall be within 5(five) ohm for installation capacity up to 5 KW and 1(one) ohm for installation of higher capacity.

All three-phase medium voltage equipment's shall be earthed by two separate and distinct connections with earth through earth electrodes. Single phase equipment's shall be earthed at least at one point. Pipe electrode earthing should be provided for the system.

Earth bus bar:

Supplying and fixing earth bar of galvanized M.S. Flat 40 mm × 5 mmx250mm on wall having clearance of 25 mm. from wall including providing 10mm drilled holes (on busbar) about 30 mm. apart complete with G.I. bolts, nuts, washers etc. as required for tapping.

Testing of electrical installation.

Before the completed installation is put into service, the following tests shall be carried out by the contractor in presence of the Engineer-in-Charge or his representative.

a) **Polarity of switches**

It must be ensured by test that all single pole switches have been fitted on the live side of the circuits they control.

b) **Insulation Test**:

i) By applying a 500 volt meter between earth and the whole system of conductors or any section thereof, with all fuses in place and all switches closed, all lamps in position or both poles of installation otherwise electrically connected together:- The result in mega ohm shall not be less than 50 divided by the number of points on the circuit, and should not be less than 1 mega ohm.

ii) Between all conductors connected to one phase and all such conductors connected to the neutral or to the other phase conductors of the supply after removing all metallic connections between the two poles of the installation and switching on all switches. The insulation resistance shall be as in (i) above.

c) **Earth continuity Test**

The earth continuity conductor including metal conduits, and metal sheaths of cables in all cases shall be tested for electrical continuity. Electrical resistance of the above along with the earthing lead , measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed 1 (one)ohm.

d)**Earth Resistance Test**

To ensure effectiveness of installation earth, the value of earth resistance shall be within 5(five) ohm for installation capacity up to 5 KW and 1(one) ohm for installation of higher capacity.

The completed work will be taken over only if the results obtained in above tests are within the limits mentioned above, and in accordance with I.E. Rules.

13.1 Lightning Protection (pole mounted): The Bidder has to setup lightning protection system including lightning rod, ground rod and conductors to protect the entire system. A lightening arrestor shall be provided with every SPV Water Pumping System.

Lightning protection with 3" X 1.5" G.I pipe with base flange in Proper foundation and S & F Lightning Conductor Air Terminal made of 20 mm dia 1000 mm long GI pipe (ISI Medium) having five discharge prongs of 4 SWG GI (Hot Dip) wire at top. Earthing with 65 mm dia GI pipe (Medium) 3.0 Mts. long and 1 x 19/10 stranded GI (Hot Dip) wire (4 Mts. long), 20 mm dia x 125 mm long galvanized bolt, double nuts, double washers including socketing at both ends of stranded GI (Hot Dip) wire by crimping sockets/ thimbles and S & F 65 mm dia GI pipe (ISI-Medium) protection (3 Mts. long) to be filled with bitumen partly under the ground level and partly above ground level to an average depth of 3.65 Mts.

14.1 License/Certification

In case the equipment needs any special license or certification (e.g. license for radio transmission in certain frequency bands), it will be the Bidder's responsibility to comply with the requirement.

15.1. **HDPE Pipes and fittings**: All materials should be BIS marked as per guidelines of **Pradhan Mantri Krishi Sinchai Yojana** and as per detail noted in BOQ.

16.1 Temporary Flooding

All the subsystems and wiring will be installed at a minimum height from ground to avoid damage due to temporary flooding and also convenient for human operation.

17.1 Documentation

Full documentation for installation, operation and maintenance of the system in both in English and Bengali language, should be provided with each of the solar PV pumping system. The Manual should have information about solar energy, photovoltaic, modules, motor pump set, mounting structures, electronics and switches. It should also have clear instructions about mounting of PV module, DO's and DONT's and on regular maintenance and Trouble Shooting of the pumping system. Two hardcopies (in printed form) and two softcopies in separate media in CDROM/DVD of each manual will be a part of deliverables.

Manuals shall be for the system and each subsystem as detailed in the following sections.

Documentation shall include System Block Diagrams, Layout Diagrams, and Line Diagrams and Wiring Diagrams for external connections, Interface Specifications, Protocols supported and configuration procedures, as applicable.

Diagnostic Programs and Tools - Diagnostic Hardware and Software (including all necessary tools and tackles) required for maintenance shall have to be explained in detail in the documentation.

Installation manual of system and each subsystem supplied by the respective manufacturers (solar panel, pump, motor, data logger etc.) shall be a part of documentation. Installation procedure/guidelines recommended shall have to be followed during the installation process. **Name and address of the person or Centre to be contacted** in case of failure or complaint, should also be provided. A warranty card for the modules and controlling unit should also be provided to the beneficiary.

18.1 Training

Scope of work includes training the users on operation and maintenance of the system. Apart from departmental staff, the training should include the local WUA, who should be able to take care of minor day-to-day problems. They should also be able to report the problem properly to the appropriate authorities in proper format. Training plan indicating course outline, brief contents and schedules shall have to be submitted at time of execution of agreement.

Training will be repeated each year during the Warranty and CMC periods for refreshing the trained staff and training additional staff.

19.1 Warranty and Comprehensive Maintenance for 5 years.

The entire system should be covered under a warranty for a period of 5 years for satisfactory operation after commissioning.

All goods supplied for installation and commissioning of the project should be new, unused, and most recent or current models and incorporate all recent improvement in drawing and technical specification unless provided otherwise in the contract. The PV Modules must be warranted for 25 years. However, the PV modules must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years

The PCU should have free replacement warranty of 5(five) years. The warranty shall cover the following:

a) Complaints about fault (s) received by courier , telephone, fax, email or SMS or whatever communication method shall be attended by the supplier within three (3) working days by site visit etc.

b) Adequate stock of spare parts should be maintained so that unit becomes operational within maximum 3(three) days of complaint.

c) Technical backup to the beneficiaries: They shall have to provide training to the beneficiaries regarding capacity building in all the aspects of the system like use and maintenance of PV modules and associated electrical controlling units for optimum output etc.

d) Monthly checking up of the system as per requirement, for proper operation of the system.

e) The scope of work includes repairing /replacement to make the system functional within comprehensive warranty period whenever a complaint is lodged by the user. The contractor shall attend the same within a reasonable period of time and in any case a breakdown shall be rectified within a period not exceeding 3(three)days.

Day-to-day operation will be done by the beneficiaries.

Note: Total comprehensive maintenance charge is to be withheld in addition to Security Deposit. Comprehensive maintenance charges will be released @ ii) Rs 0.6 for 5 HP submersible &surface per Wp per year at the end of each maintenance period i.e. at the end of Ist year, 2nd year, 3rd year, 4th year, 5th year. In case the "Bidder" does not provide service during the warranty & comprehensive maintenance period, the amount so held up will be forfeited.

19.2 Cleaning and washing of Solar Modules

Cleaning and washing of modules once in month with clear water to remove deposited dust and dirt on the module surface and keep the modules clean throughout the year. The activity to be performed for 08(eight) months in a year excluding the 04 (four) monsoon months. A log book should be maintained at the scheme site for the said purpose. A GPS photograph with date and time stamping, before and after cleaning should be submitted to the Engineer-in-Charge for verification.

Note: Total cleaning and washing charge is to be withheld in addition to Security Deposit. cleaning and washing charge s will be released @ 20% per year at the end of Ist year, 2nd year, 3rd year, 4th year, 5th year. In case the "Bidder" does not provide service during the period, the amount so held up will be forfeited.

20.1Insurance: Insurance coverage shall have to be provided to cover theft and natural calamity, and acceptance for replacement or repair of any part of the system due to damage or loss for a period of 5 years after satisfactory commissioning. The insurance is to be executed in the name of the bidder.

Note: Ist Year's Insurance charge is to be paid on production of Original Receipt of Premium Payment. Remaining 4 Years Insurance Payment is to be withheld as additional securities Deposit which will be released during 2nd , 3rd, 4th & 5th year on production of original Receipt of premium payment.

21.1. Performance Criteria

The following performance parameters must be strictly maintained.

i) **Average uptime – 99% computed over one year**
ii) MTBF (Mean Time Between Failures) - 6 months
iii) MTTR (Maximum Time To Repair): 72 hours

Down time will be computed on 24x7 basis from the time Authority communicates the problem to the bidder over telephone, SMS, email, courier, written report or any other mode of communication.

BILL OF MATERIALS For structure holding 6 & 4 nos Mono perc Modules (FIXED TYPE)

					6 modules (PERC)		4 modules (PERC)	
Sl. No.	**Description of items**	**Qty**	**unit weight**	**Unit**	**L(m) /A(m^2)/ nos**	**Wt. in Kg**	**L(m) /A(m^2)/ nos**	**Wt. in Kg**
1	Main Pole OD (168.3 X 4.5), IS 1161, 6 & 4 Mod	1	17.8	Kg/m	2.137	38.04	2.137	38.04
2	Rafter Tube 50 x 50 x 3 6 Mod	3	4.33	Kg/m	4.15	53.91		
3	Purlin Tube 40 x 40 x 3 6 Mod	6	3.43	Kg/m	3.87	79.64		
4	Rafter Tube 40 x 40 x 3 4 Mod	3	3.43	Kg/m			4.15	42.70
5	Purlin Tube 40 x 40 x 3 4 Mod	4	3.43	Kg/m			2.53	34.71
6	Main Support OD (88.9 X 4.0 thk), IS 1161, (6 & 4 Mod)	1	8.36	Kg/m	3.24	27.09	1.9	15.88
7	Cleat for fixing rafters with purlins (ISA 40 x 40 x 5x 100 long) -6 & 4 Mod	36	3	Kg/m	0.1	10.80	0.1	10.80
8	Long Bracket (Rafter-pole Tie) Tube 50 x 50 x 3 (Back)	1	4.33	Kg/m	2.685	11.63	2.685	11.63
9	Short Bracket (Rafter-pole Tie) Tube 50 x 50 x 3 (Front)	1	4.33	Kg/m	1.725	7.47	1.725	7.47
10	Bracket (Rafter-pole Tie) Tube 50 x 50 x 3 (SIDE) 6 Mod	2	4.33	Kg/m	2.085	18.06		
11	Bracket (Rafter-pole Tie) Tube 50 x 50 x 3 (SIDE) 4 Mod	2	4.33	Kg/m			1.685	14.59
12	Base plate (0.41 x 0.41 x .015)	1	19.79	Kg/no	1	19.79	1	19.79
13	Base Plate Stiffeners (0.180 x 0.121 x 0.008) (Trapezoi)	1	1.37	Kg/no	4	5.48	4	5.48
14	Top plate (0.5 x 0.2 x .012thk), 6 Mod	1	9.42	Kg/no	1	9.42		
15	Top plate (0.5 x 0.2 x .010thk), 4 Mod	1	7.85	Kg/no			1	7.85
16	Top plate stiffners (0.15 x 0.15 x 8 thk)	1	0.7	Kg/no	2	1.40	2	1.40
17	Slotted plate (0.32 x 0.070 x 8thk) fixed on Main Pole for holding Front & Rear Brackets, 6 & 4 Mod	1	1.41	Kg/no	4	5.64	4	5.64
18	Plate (0.1 x 0.070 x 8thk) fixed on Main Pole for holding Side Brackets 6 & 4 Mod	1	0.44	Kg/no	4	1.76	4	1.76
19	Ring/Metal strip ,15x3 mm	1	0.37	Kg/no	0.2	0.07	0.2	0.07
20	Round clamp from 75 x 8mm M S flat, 350mm long with 4 nos 14Ø bolts for holding 88.9mm dia Main Support Pipe. 6 & 4 Mod	1	1.65	Kg/no	2	3.30	2	3.30
21	Round clamp from 50 x 5mm M S flat, 310mm long with 2 nos 14Ø bolts for holding Side Brackets with 88.9mm dia Main Support Pipe. 6 & 4 Mod	1	0.61	Kg/no	2	1.22	2	1.22

					6 modules (PERC)		4 modules (PERC)	
Sl. No.	Description of items	Qty	unit weight	Unit	L(m) /A(m^2)/ nos	Wt. in Kg	L(m) /A(m^2)/ nos	Wt. in Kg
22	Plates 180 x 50 x 5 thk for holding Round Clamp 50 x 5mm with 88.9mm dia Main Support Pipe for holding Side Brackets, 6 & 4 Mod	1	0.353	Kg/no	2	0.71	2	0.71
23	Plates 50 x 50 x 5 thk for holding Side Brackets welded with plate (180x50x5) fixed on Main Support Pipe , 6 & 4 Mod	1	0.1	Kg/no	4	0.40	4	0.40
24	Plates on main pole for holding rafters, (0.100 x 0.25 x 10thk), 6 & 4 Mod	1	1.96	Kg/no	3	5.88	3	5.88
25	U-Clip 50 x5 M S flat, 270 mm long with 2 nos 12Ø bolts for holding Front & Rear Brackets .	1	0.53	Kg/no	2	1.06	2	1.06
26	Nut Bolt M14 x 40 mm for fixing the top Plate with Clamp for holding Main Support Pipe (Marked- A)	1	0.068	Kg/no	8	0.54	8	0.54
27	Nut Bolt M12 x 70 mm for Rafter,Purlin, Plate & Bracket Connection (Marked-B)	1	0.093	Kg/no	154	14.32	166	15.44
28	Nut Bolt M12 x 75mm for Rafter,Purlin, Plate (Marked-C)	1	0.098	Kg/no	12	1.18		
29	Nut Bolt M14 x 20mm for fixing the Clamp with Main Support Pipe for holding side Brackets (Marked D)	1	0.033	Kg/no	4	0.13	4	0.13
30	Foundation holding bolts (25mm) 1525mm	2	3.85	Kg/m	1.525	11.74	1.525	11.74
31	Foundation holding bolts (25mm)1375mm	2	2.47	Kg/m	1.375	6.79	1.375	6.79
						337.47		265.03
					3.7 % less	324.98		255.23
					Say	325.00		255.00

Note: 1. All drilling and cutting edges if any after galvanization should be protected from rusting.
2. The pipe material grade should be of Yst 240 as per IS 1161/1239 and E250 as per 1079/2062
3. Plate material grade should be E250 as per: - IS: 1079 / 2062
4. Rafters and purlins should be of E250 as per IS 4923, read with latest amendment.
5. All structural steel should be Hot Dip Galvanized as per: - IS: 4759. Preece test- CuSO4 dip test as per IS 2633 may be conducted if required.
6. Welding should be done as per IS: -822 & grade of welding wire should be (ER70S-6).
7. Tolerances applicable as per respective IS.

GENERAL TERMS AND CONDITIONS

1. RESPONSIVE TENDERER:

Tender fulfilling all conditions and criteria set forth and qualifying in Technical Bid as well as making submission of Financial Bid in stipulated manners shall be considered as responsive

2. Conditions & Criteria for Qualifying In Technical Bid: -

(A) Qualification in Technical Bid will be evaluated from Tender documents submitted by the Bidder as stipulated in Sub-clause A1& A2 of Clause 5 of the Instruction to Bidders of the Tender Document.

(B) For qualifying in Technical Bid, the Tenderer while participating in any group, shall have to submit a minimum credential as **stipulated above in the NIT**.
(C). **Payment Certificate will not be considered as credential** as per notification no.03-A/PW/O/10C-02/14 dtd. 12.03.15. Completion Certificate should be obtained from not below the Rank of the Executive Engineer from any Govt, Semi- Govt, or Undertaking Authorities.

(D). **Financial Capability for evaluating eligibility of Qualification of Tenderer: As detailed iin NIT**

3. Quoting of Rates for any Groups in the BOQ:-

a) Tenderer shall have to quote the rate **as percentage cell provided in the BoQ**. L1 bidder shall be selected on the basis of the total amount reflected in BoQ as generated by e-tender website.

b) However, The **Tender Inviting Authority r e s e r v e s** the right to reject any or all the offer if the rate arrived is not within the permissible limit without assigning any reason whatsoever.

c) The price should be firm, final, and irrevocable and not subject to any change whatsoever even due to increase in cost of material component, labour cost etc. and any change of statutory levies till the completion of the contract.

4. Rate validity: The rate should be valid within the bid cycle. However, the validity of rate may be extended up to **180 days after expiry of the bid validity period on acceptance by the bidder**. **The rate should be valid for any location within the district mentioned in the tender.**

5. Evaluation for Technical Bid: All Tenders will be evaluated and compared on the basis of statutory documents and other criteria as indicated in the tender document. Tender, which do not fulfill the conditions specified in the tender documents or do not fulfill the requirement of the tender in any respect will be liable for rejection.

6. Evaluation for Financial Bid : The BoQ will generate the LI bidder based on rate quoted by the tenderers**.** The **Tender Inviting Authority c a n** invite open / sealed BID after opening the financial BID ,if the rate arrived is not within the permissible limit.

7. The tender inviting authority has the right to revoke the tender evaluation process if any technical problems arise at any stage of evaluation process mentioned in clause -6 and 7.

8. Award of Contract: Award is to be made to the Tenderer whose responsive Bid is determined to be the Lowest Evaluated Tender. The Authority reserves the right to accept or reject any or all the **Tenders** without showing any reason whatsoever. In case of the amongst responsive L1 bidders offering same rate, the Tender Inviting authority reserves the right to distribute the entire work amongst them the Authority also reserves the right to waive any minor deviation or omission.

Special Terms and Conditions.

Notwithstanding anything contrary to the conditions laid down in W B Form No. 2911(i)/(ii), the following terms and condition shall apply for execution of the work under this contract: -

1. No claim out of typing, printing, arithmetical and/or clerical mistakes anywhere in the tender shall be entertained.

2. In case of confusion over any clause/terms/conditions of the tender, the decision of **Tender Inviting Authority shall** be final and binding.

3. Display board must be installed at the site during execution of the works as per direction of the Engineer in charge.

4. The rates are inclusive of all necessary expenditures/demands to cover all incidental factors like location, condition and approachability of the site. No extra claim on any ground of damaged road, unfavorable site condition etc shall be entertained.

5. No escalation of rates within the validity period of the tender shall be entertained under any circumstances.

6. No claim for any idle labour will be entertained under any circumstances.

7. The exact location of the site for execution of the works will be shown and handed over to the contractor by the Engineer-in-charge or his representative. After completion of the work the scheme will be handed over to WUA. The **site of work may be changed within the district under special circumstances for which no extra claim will be entertained**.

8. Time is the essence of the contract, and the contractor shall have to put in full endeavor to maintain the target schedule by arranging adequate labour force and timely supply of construction materials for completion of the work within the stipulated completion period. Under normal circumstances no extension of time shall be allowed.

9. Immediately after taking over the site, the contractor shall inform the Engineer-in-charge, about the work program in bar chart in writing.

10. The work shall be carried out strictly according to the tendered schedule of work and specification laid down therein. No extra or supplementary item of work shall be taken up nor shall any deviation from scheduled specification or drawing be made without prior written approval of the Engineer-in-charge.

11. The mode of execution of all construction work and mode of measurement shall be as laid down in the current PWD &WRDD schedule of Rates if not otherwise mentioned in this contract.

12. The workmanship and finishing of the work should be of first class and up to the entire satisfaction of the Engineer-in-charge.

13. The contractor shall supply necessary labour (skilled and unskilled) as well as proper construction equipment including tools and plants for execution of the work.

14. All provisions of labour laws including all amendments thereof shall be strictly followed by the contractor for execution of the work under this contract.

15. Contractor shall make necessary arrangement for water required for construction and for drinking purpose of his labour force including accommodation of the workers at the site at his own cost.

16. The contractor shall maintain a Site register book having duplicate pages serially machine numbered at site.

17. The contractor shall have to arrange proper storing of materials at site at his own cost to full satisfaction of the Engineer-in-charge or his authorized representative shall be always provided access to the site store for checking. In case of damage or loss of any material from site the department will not be responsible for that.

18. Depth of excavation for the foundation for SPV module structure shall be as per approved drawing. Refilling of the trenches should be done carefully to prevent any damage to SPV structure. The filling should be made initially with soft earth and not with lump soil or hard pieces of boulder/moorum.

19. Security deposit (10%) will be admissible for refund after satisfactory completion of the defective liability period. Any defect arising during this period regarding construction will have to be rectified by the contractor at his own cost.

20. Cess will be deducted from the bill amount as per prevailing Govt. norms.

21. **For checking the quality of the materials following inspection will be undertaken: -**

A) Departmental Inspection

The Tender Inviting Authority or his authorized representative shall have the right to visit the worksite of the Manufacturer to inspect the raw/basic materials, Machinery and Equipment's used in the manufacture of the tendered items and testing equipment.

Such inspection may also be carried out at any stage of manufacturing of the materials required for the scheme.

B) Third Party as well as Departmental Inspection of the following materials will be done for obtaining clearance to utilize the same:

a) **PVC / UPVC Pipes and Accessories, etc.: -Third Party Inspection by CIPET. approved by Govt. and Departmental Inspection will be done.**
b) **Pump Motor sets: - Inspection will be done by Departmental Inspection Team at factory then office and site also.**

The acceptance of materials shall be subject to inspection, Written approval and clearance by the third-party inspection agency as well as by Departmental Inspection/ Verification. The working drawing, technical Specification relevant BIS Licenses certificate from the manufacturers including test certificate regarding supply of raw/basic materials as well as component parts for the manufacturing of finished products are to be made available to the inspector for verification / approval. The above inspection will be without prejudice to the accepted guarantee / warranty. Inspection charge is to be borne solely by the tenderer and will not be reimbursed.

22. If, any item not included in the schedule, the payment of the same will follow observing supplementary tender formalities.

23. The engagement of Contract labour by the Agency should comply with the provisions of various Labour Laws including Contract Labour (Regulation & Abolition) Act,1970 and minimum wages etc. should comply with the Notification (Memo No. 795-I.R,dated 1.09.2009) of Deptt. ofLabour, Govt. of West Bengal & ESI Act 1948 and EPF & Misc. Fund Act 1952 if applicable.Provisions of the accidental benefits of the labours /employees of the Tenderer are to be born solely by the tenderer. Any type of claim regarding any accident will not be entertained.

24. Insurance charges, if any, are to be borne by the tenderer.

25. If the tenderer fails to make execute the works within the time specified or any granted extended period, tender inviting authority may by written notice to the tenderer, terminate the right of the tenderer to proceed with any or all the remaining part of the contract.
Such breach by the tenderer will result in the forfeiture of Tenderer's security deposit.

26. The Bidder shall warrant that the materials (except departmental issue) utilized for construction under the contract shall have no defect (except the allowable tolerance) or from any act of omission of the tenderer that may develop under normal use of the utilized materials in the condition obtained in the country of destination. The tenderer also guarrants/warrants that the materials utilized shall perform satisfactory as provided in the contract.

27. The successful tenderer should engaged Job Card holders in Karmashree Scheme in various Tube Well schemes where unskilled workers are required for execution of their schemes as per order no No. 329-WI-13015/4/2024-EIC(WRIDD)-Dept. Of WRID Dated Kolkata, the 28/03/2024 of Principal secretary to the Govt. Of WB. and vide Memo no. 1248(sec)-PRD-33011/1/2024-MGNREGA dtd 04/06/2024 of special secteratary of P & RD Dept. Of Govt. Of WB. The successful tenderer should ensure the said wage employment to each job card holder household in a financial year through their concern work.

The successful tenderer shall execute agreement with the **Tender Inviting authority** within stipulated days (7 days) from the date of issuance of letter of acceptance .The agreement shall be made in duplicate in W B Form no. 2911 (i)/(ii) after purchasing duplicate set of tender documents from the office of the **Tender Inviting authority** on payment of stipulated charges in cash. Earnest money (2 %) will be converted to initial security deposit and balance amount to complete 10% will be deducted from bill.

28. Any contractor/bidder intending to participate in the tender process may submit a bid for only two serial number (Sl. No.) listed in this NIT. If a bidder submits bids for more than two Sl. No., only two bids will be selected at random, and all other bids submitted by that bidder will be cancelled.

30.Failure to execute the agreement within stipulated time and prescribed manner shall result in cancellation of the offer of acceptance and forfeiture of Earnest Money.

31. In addition to the Security of Performance deposited (2%), 8% of the bill value shall be deducted from the bills as Security Deposit and will be released after defective Liability Period as per conditions stipulated in NIT.

Term & Condition for Institutional Development Activities through Formation and Strengthening of WUAs

Title:
Performing activities for institutional development by formation and subsequent strengthening of registered Water User Associations (WUAs) through creation of mass awareness, hand holding training for ASS activities and capacity building during **one-year** continuous support among after completion of schemes them to achieve the success and sustainability of Minor Irrigation Projects.

Clause:

1. The successful bidder shall, in consultation with the concerned Executive Engineer, engage a suitable **Support Organisation/NGO** having proven experience in the field of WUA formation, institutional development, capacity building, and awareness generation among communities.
2. The **experience certificate** of the proposed Support Organisation/NGO, in the format prescribed by the Tender Inviting Authority, shall be submitted by the bidder for approval prior to its engagement.
3. The **cost of these activities** shall be deducted from the contractor's bill and deposited as **Additional Security Amount** in the account of the concerned Drawing & Disbursing Officer (DDO). This amount shall be released to the contractor only upon **successful completion and certification** of the assigned activities.
4. The scope of activities to be undertaken through Support Organisation/NGO shall include but not be limited to the following:

Sl. No.	Description of Activities	Deliverable
1	Campaigning in the command area of Sub-Projects for mass awareness and capacity building to achieve sustainability of sub-projects.	
2	Demarcation of command area, List of beneficiaries, and preparation of land schedule under this scheme.	Documents to be submitted.
3	Organising meetings for WUA formation at field.	Meeting Resolution to be submitted with Photos.
4	Facilitating registration of WUA covering sub-project under the West Bengal Society Registration Act, 1961 (as per No. 2142/MI/2R-3/2004 dated 31st August 2012 of WRID Department) , PAN Card and assisting in opening of a Joint Bank Account in favour of the WUA to be operated by its President, Secretary, and Treasurer. Cost for WUA registration will be borne by Agency.	Documents to be submitted.
5	Quarterly Meetings and onsite demonstrations for operation & maintenance of tubewells, water management, Livelihood plan through ASS activities, collection of water tax, building of corpus fund, etc.	Documentation with still Photos for each meeting to be submitted.
6	Documentation of WUA activities in the command area of the sub-project, through still photography, report booklets, and submission of both hard and soft copies.	Documents to be submitted.
7	Conducting impact study & monitoring of the scheme during a period of 12 months after commissioning of the Project.	Report to be submitted

5. The bidder shall remain responsible for ensuring that all the above activities are completed in a timely and satisfactory manner, and that the WUAs formed are fully functional and sustainable.

Special Terms and Condition

Bidders are requested to engage unskilled labourers under "Karmashree" Scheme of Govt. of WB, having Job Card under Mahatma Gandhi NREGS/as per guideline given in the following Kolkata Gazette Notification during execution of the subject mentioned work. The detailed report of the engagement of labourer has to be submitted to the undersigned as per the given format in the Gazette Notification& to be duly signed by the bidder following necessary guidelines vide The Kolkata Gazette Notification 07/03/24, Registered No. WB/SC-247, Notification No. 1140 PRD-33011/1/2024-MGNREGA SEC Dtd. 07-03-2024of Secretary to the Govt. of WB, Panchayats& Rural Development Department by the order of the Governor of Govt. of WB. Annexure Form No-VI Sample Copy enclosed.

KARMASHREE: EMPLOYMENTSHEET

(to be used by the implementing agency for recording the employment provided)

WORK DETAILS. **Form –VI (Pg 1)**

Financial Year		District	
Work Code(system-generated)		Work Sector	
Work Name			
Work site Location			
Block/Municipality		GP (for Block)	
Funding Dept. (to be filled by the Office)		Implementing Dept.	
Implementing Agency (Office) Of the Dept.			
Work Order No.			
Contractor/ Agency Name		Contact No. of Contractor/Agency	

WORKER DETAILS

Sl. No.	**Nameof Worker**	**JobCard No. (full)**	**Gender (M/F)**	**Age**	**Caste(SC /ST/OBC /Gen)**	**Whether Minority (Y/N)**	**Whether Migrant Worker (Y/N)**	**Mobile No.**	**AadhaarNo. (not mandatory)**
[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**[8]**	**[9]**	**[10]**
1									
2									
3									
…									
…									
10 etc.									

Counter signature of Engineer
With Office Seal Name & Signature of
Contractor/ Agency

KARMASHREE: EMPLOYMENTSHEET

(to be used by the implementing agency for recording the employment provided)

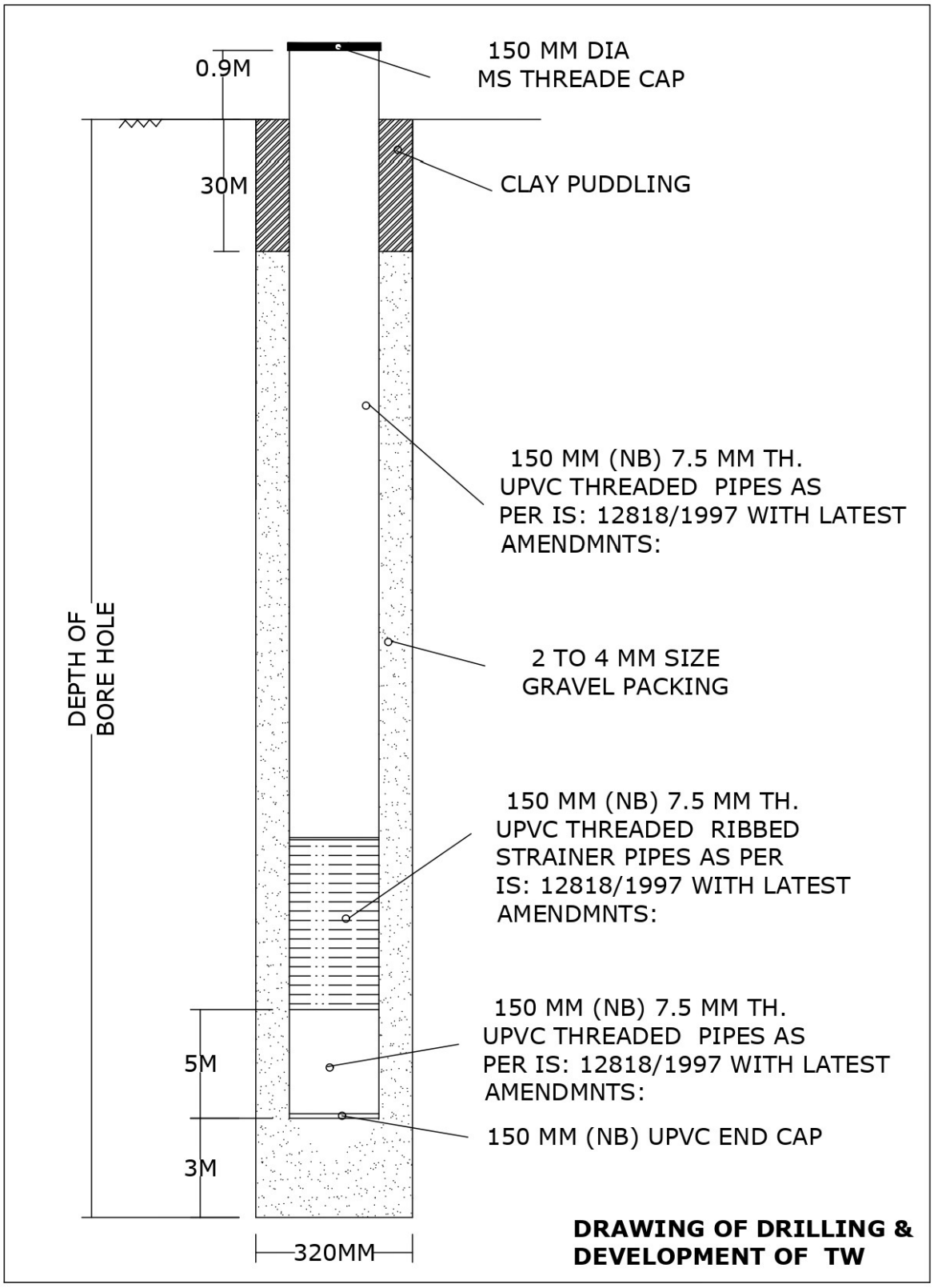
FORM-VI
(Page 2)

EMPLOYMENT DETAILS;

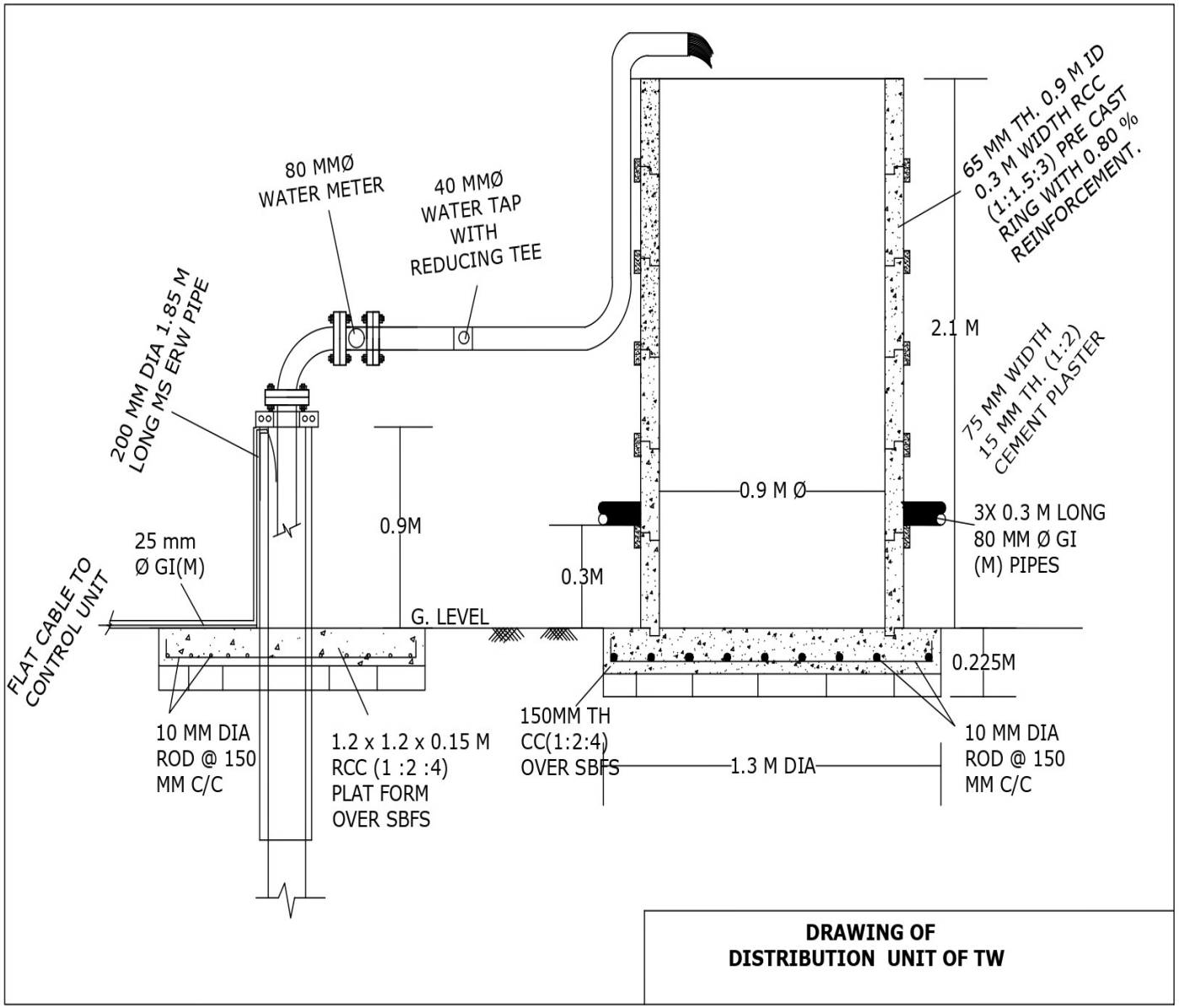
Sl. No.	Name of Worker	Date of application Forwork*	Noof Days work demanded**	Work allocated from (date)	Work allocated upto (date)	Work provided from (date)	Work ided Upto (date)	No. of Days work provided	Total Wage Paid (Rs.)	Date of payment
[1]	[2]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1										
2										
3										
…										
…										
10 etc.										

Counter signature of Engineer with Office Seal Name & Signature of Contractor/ Agency

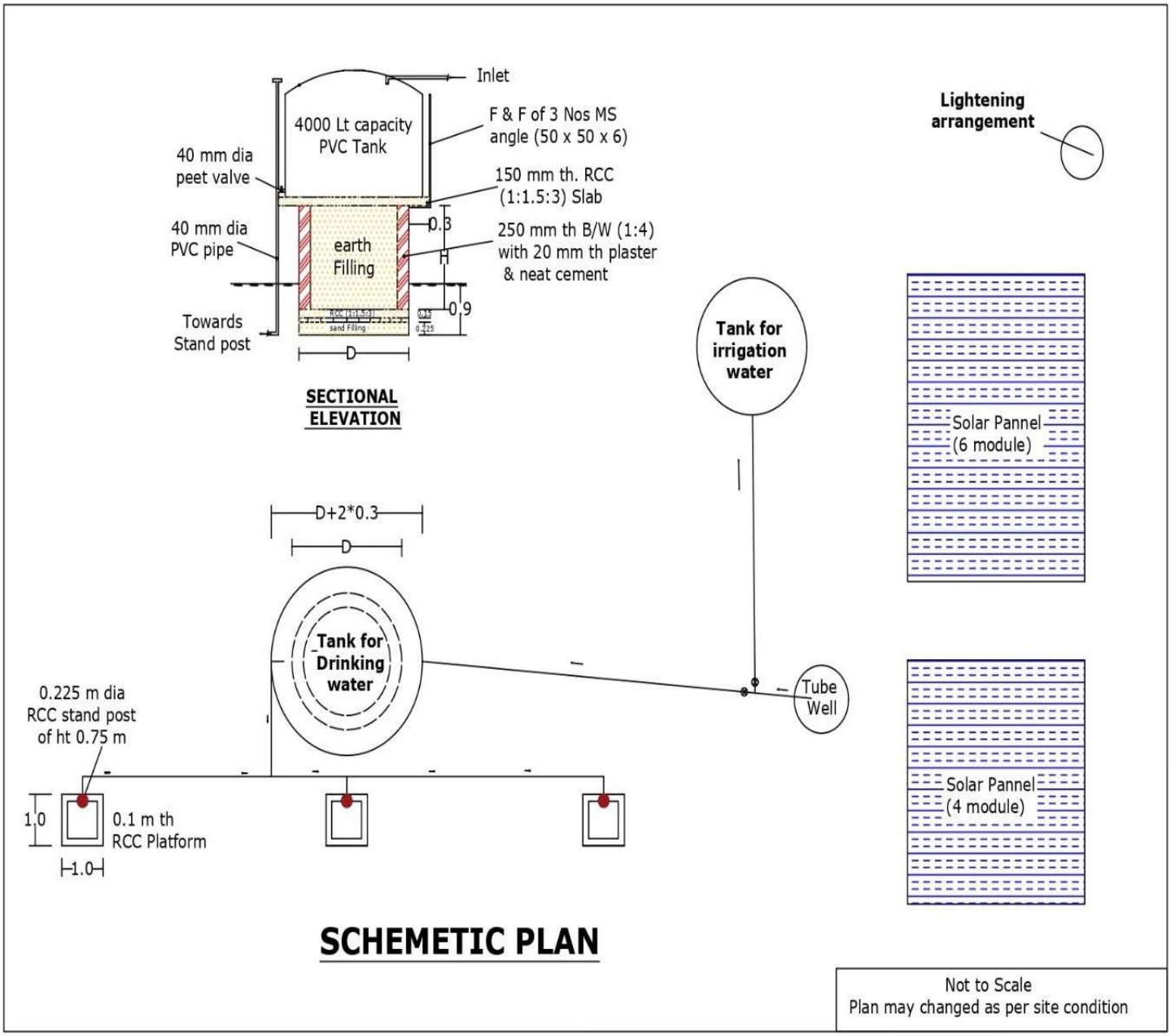
Date of application for work: -
As per application of workers/First day of reporting for work, if not Previously applied for work
*****No. of days' work demanded=No. of days' work allotted (if not previously applied for)***



DRAWING OF DRILLING & DEVELOPMENT OF TW

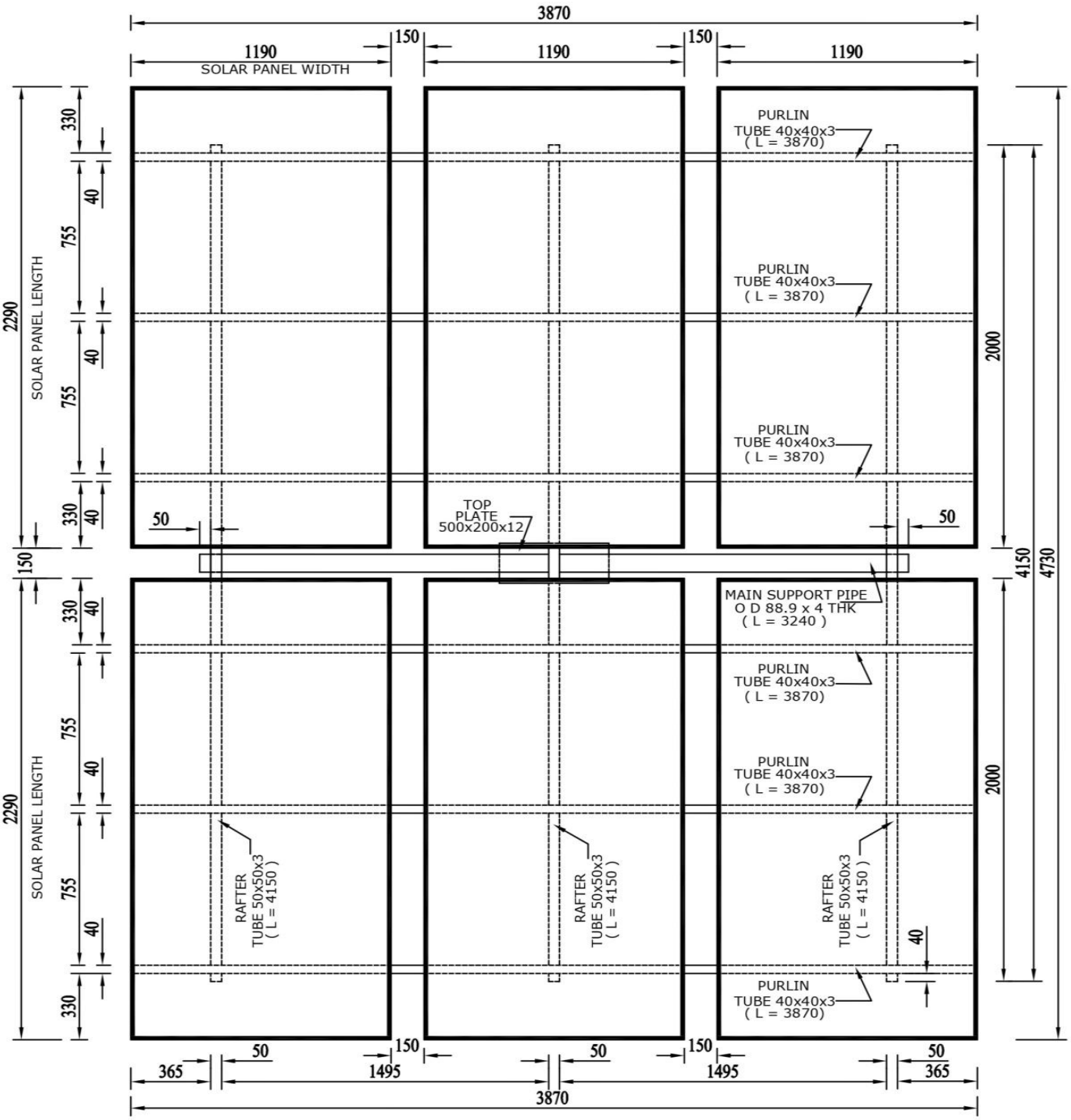


DRAWING OF
DISTRIBUTION UNIT OF TW


Inlet
4000 Lt capacity PVC Tank
F & F of 3 Nos MS angle (50 x 50 x 6)
40 mm dia peet valve
150 mm th. RCC (1:1.5:3) Slab
40 mm dia PVC pipe
earth Filling
0.3
H
250 mm th B/W (1:4) with 20 mm th plaster & neat cement
0.9
Towards Stand post
D
SECTIONAL ELEVATION
Lightening arrangement
Tank for irrigation water
Solar Pannel (6 module)
D+2*0.3
D
Tank for Drinking water
Tube Well
0.225 m dia RCC stand post of ht 0.75 m
1.0
0.1 m th RCC Platform
1.0
Solar Pannel (4 module)
SCHEMETIC PLAN
Not to Scale
Plan may changed as per site condition

PLAN FOR GENERAL LAYOUT OF PANELS, TUBES , PURLIN ETC.

6 – NOS. MONOPERC MODULE

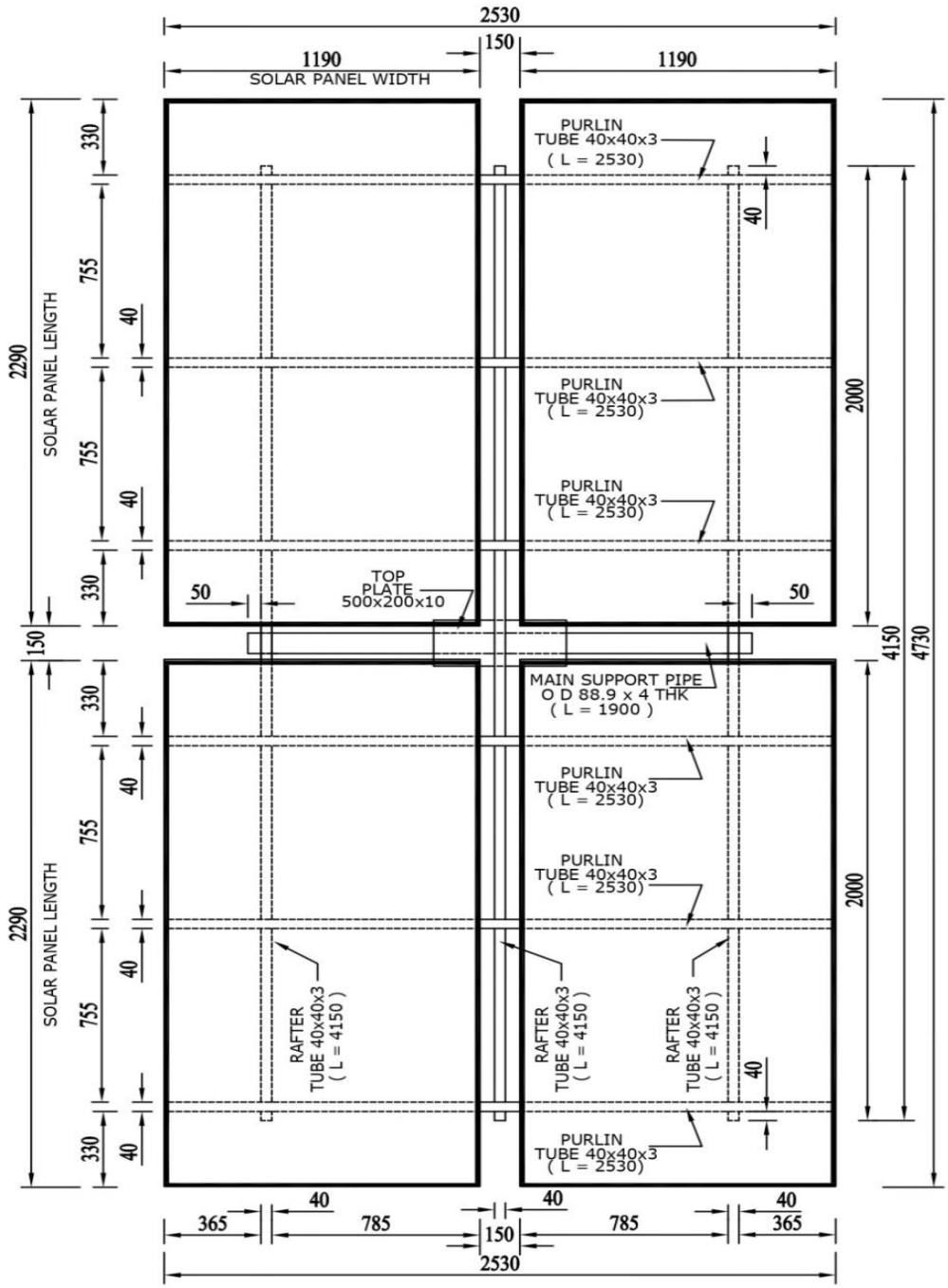


N.B.- DIMENSION OF SOLAR MODULE MAY VARY SLIGHTLY FROM MANUFACTURER TO MAMANUFACTURER. THE POSITION OF SIDE TUBES AND PURLINS WILL VARY ACCORDINGLY WHICH IS TO BE TAKEN CARE AT THE TIME OF FABRICATION AND INSTALLATION .

DRAWN BY - *SUMAN DUTTA J.E.(C)*	*PAGE- 2*
PLAN FOR GENERAL LAYOUT OF PANELS, TUBES, PURLIN ETC. FOR 6 Nos. MONOPERC MODULE *WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT.* GOVT. OF WEST BENGAL	TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM
	ALL DIMENSIONS ARE IN MM U. O. STATED | SCALE - 1 : 25

PLAN FOR GENERAL LAYOUT OF PANELS, TUBES , PURLIN ETC.

4 – NOS. MONOPERC MODULE

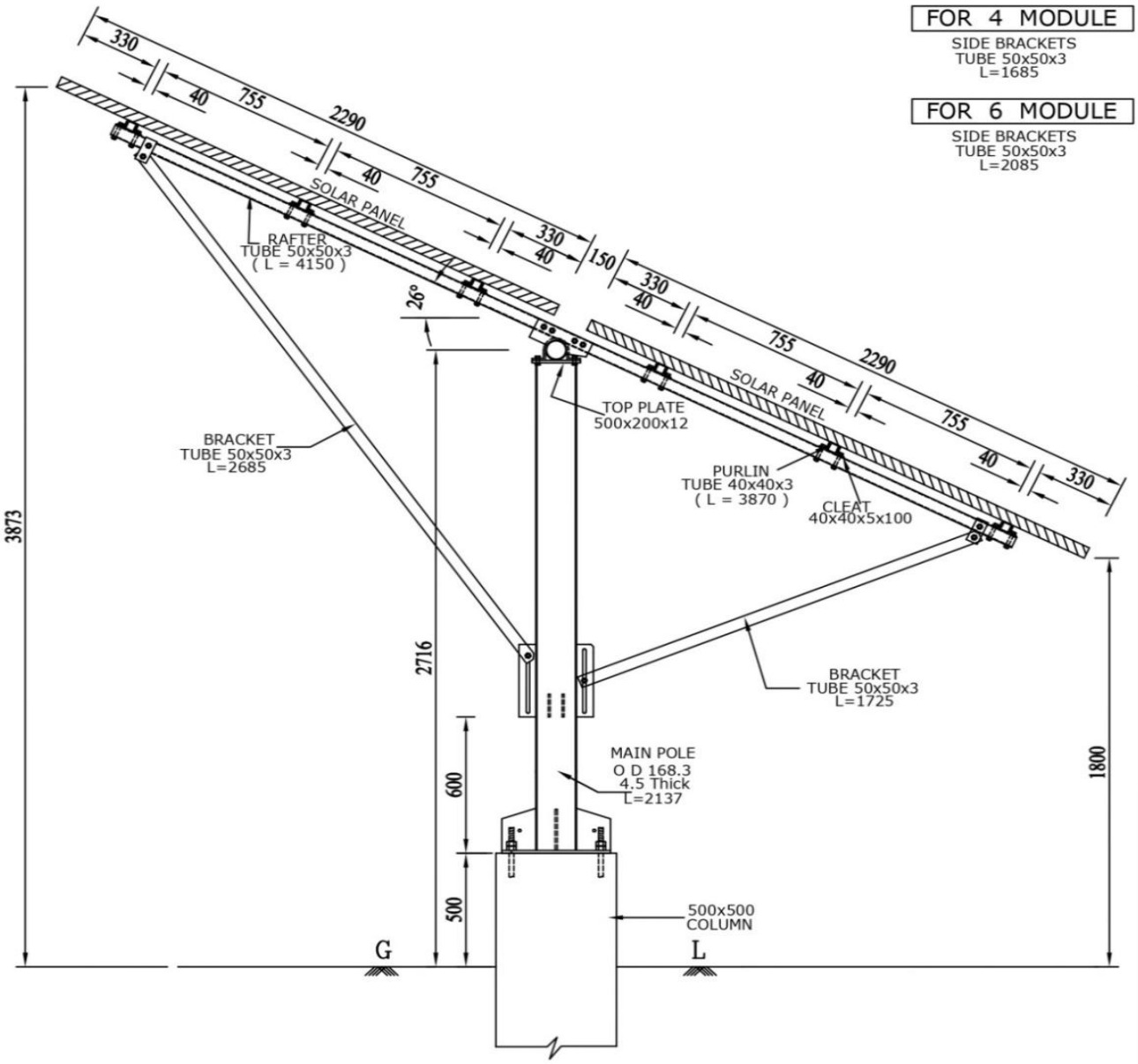


N.B.- DIMENSION OF SOLAR MODULE MAY VARY SLIGHTLY FROM MANUFACTURER TO MAMANUFACTURER. THE POSITION OF SIDE TUBES AND PURLINS WILL VARY ACCORDINGLY WHICH IS TO BE TAKEN CARE AT THE TIME OF FABRICATION AND INSTALLATION .

DRAWN BY - *SUMAN DUTTA J.E.(C)*	*PAGE- 1*
PLAN FOR GENERAL LAYOUT OF PANELS, TUBES, PURLIN ETC. FOR 4 Nos. MONOPERC MODULE *WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT.* GOVT. OF WEST BENGAL	TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM
ALL DIMENSIONS ARE IN MM U. O. STATED	SCALE - 1 : 25

SECTION FOR SOLAR STRUCTURE – (26°)

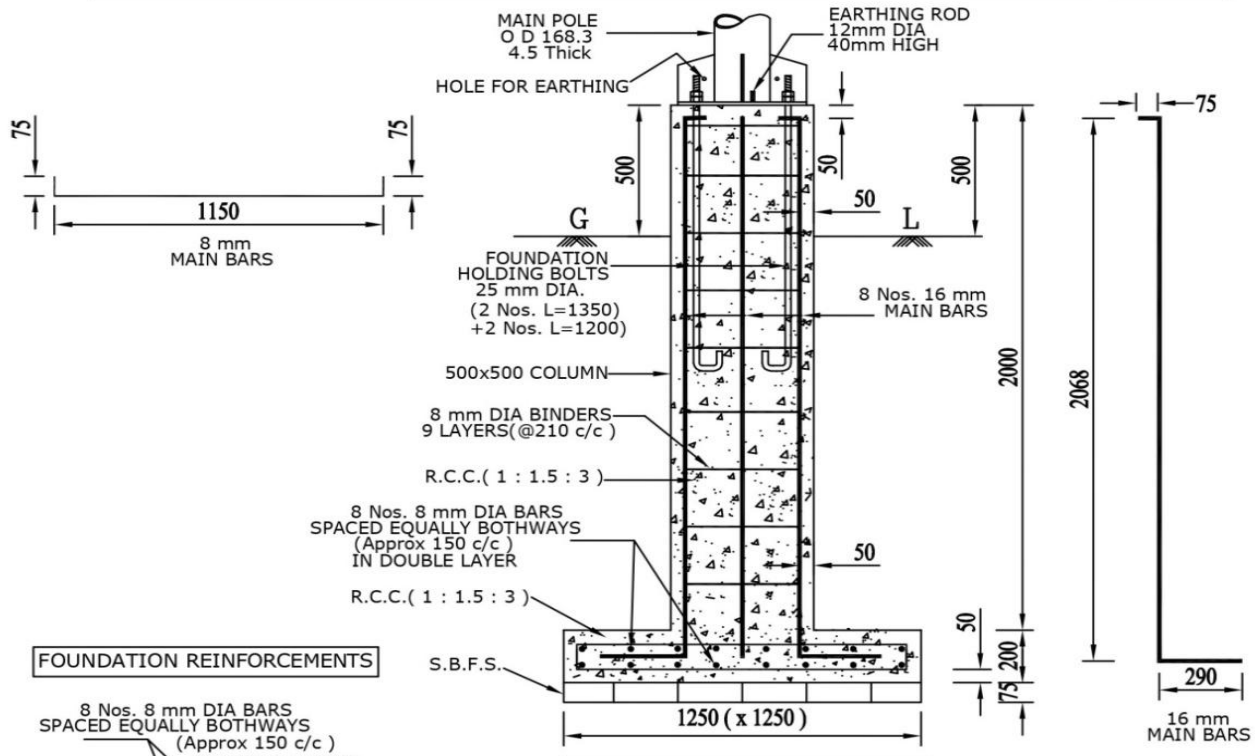
6 – NOS. MONOPERC MODULE



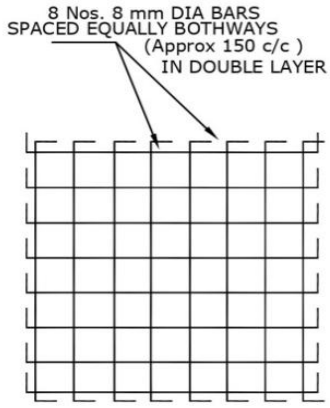
N.B.- DIMENSION OF SOLAR MODULE MAY VARY SLIGHTLY FROM MANUFACTURER TO MAMANUFACTURER. THE POSITION OF SIDE TUBES, RAFTERS AND PURLINS WILL VARY ACCORDINGLY AND THE TILTING ANGLE MAY ALSO VARY FROM 22° TO 26° WHICH IS TO BE TAKEN CARE AT THE TIME OF FABRICATION AND INSTALLATION .

	DRAWN BY - *SUMAN DUTTA J.E.(C)*	*PAGE- 3*
DETAILS OF SECTION (26°) **6 NOS. MONOPERC MODULE** *WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT.* GOVT. OF WEST BENGAL	TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM	
	ALL DIMENSIONS ARE IN MM U. O. STATED	SCALE - 1 : 25

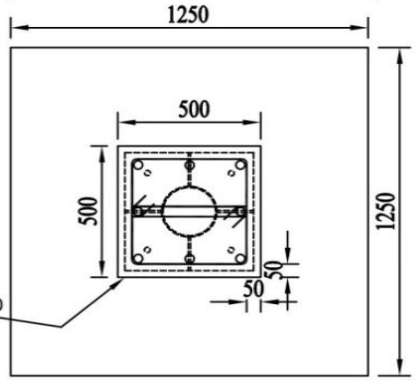
FOUNDATION DETAILS FOR 4 – NOS. MONOPERC MODULE



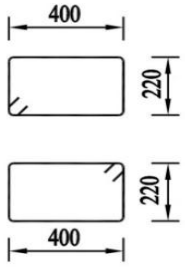
FOUNDATION REINFORCEMENTS



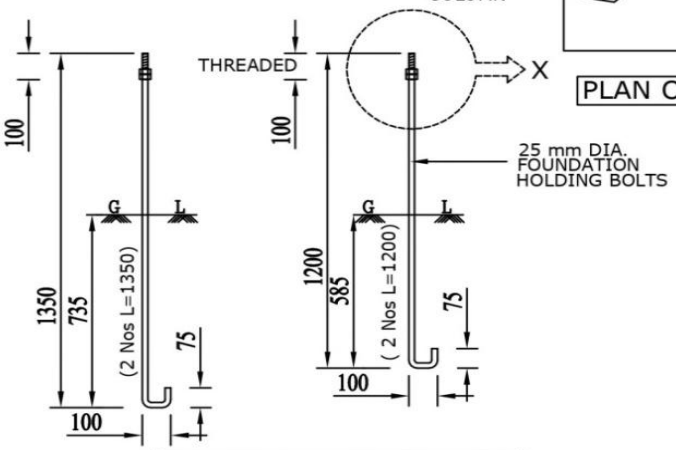
DETAILS OF FOUNDATION



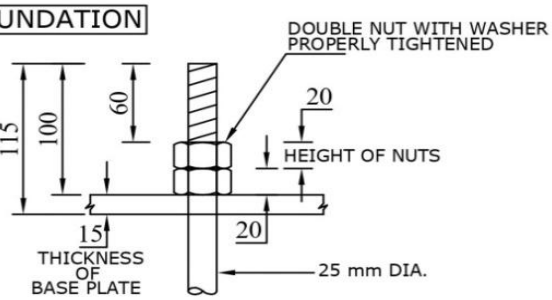
PLAN OF FOUNDATION



8 mm DIA BINDERS
2 Nos. AT EACH LAYER



DETAILS OF FOUNDATION HOLDING BOLTS

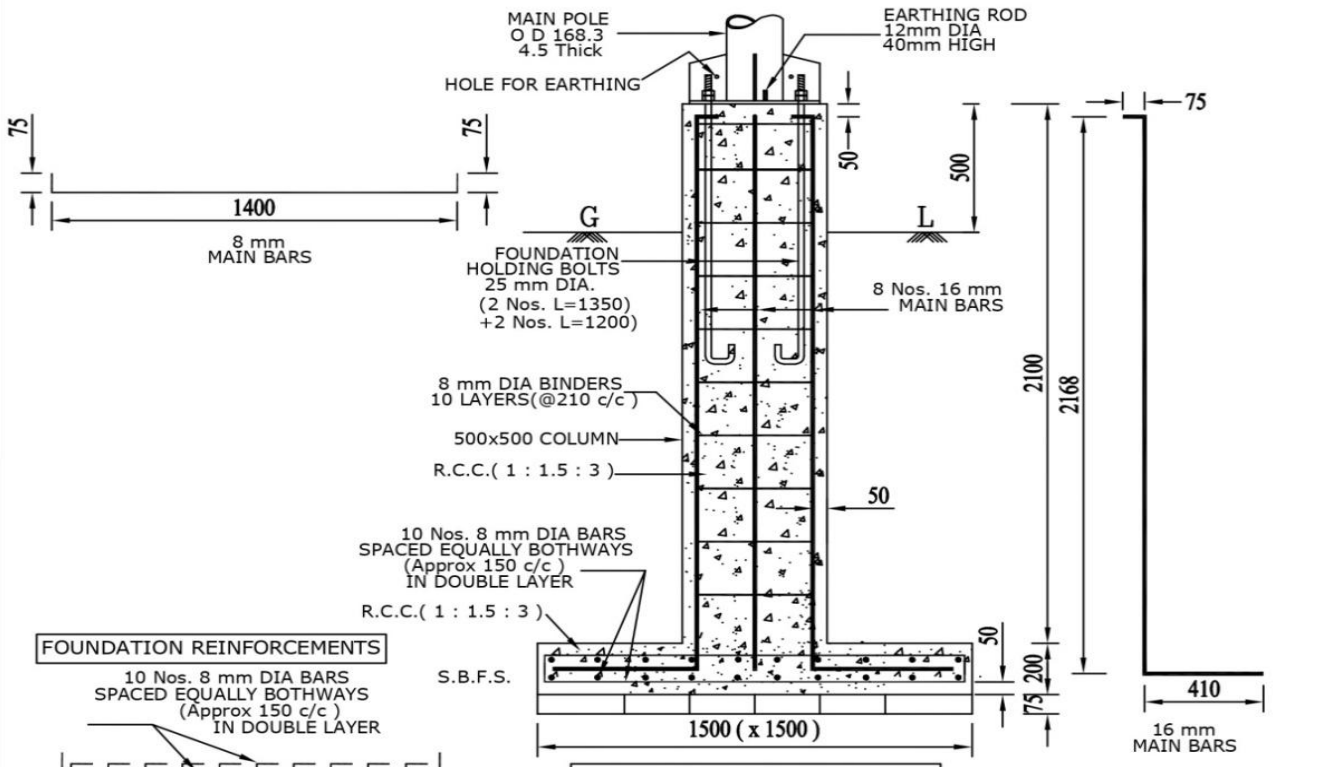


DETAILS AT - X
SCALE - 1 : 5

DRAWN BY - *SUMAN DUTTA J.E.(C)* | *PAGE- 4*

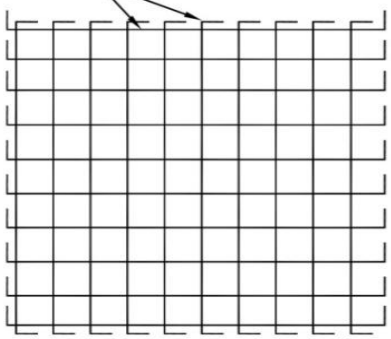
FOUNDATION DETAILS FOR 4 MONOPERC MODULE *WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT.* GOVT. OF WEST BENGAL	TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM
	ALL DIMENSIONS ARE IN MM U. O. STATED | SCALE - 1 : 25

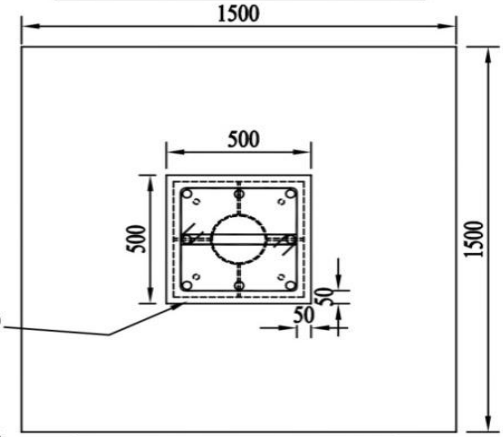
FOUNDATION DETAILS FOR 6 – NOS. MONOPERC MODULE



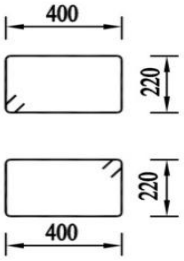
DETAILS OF FOUNDATION

FOUNDATION REINFORCEMENTS

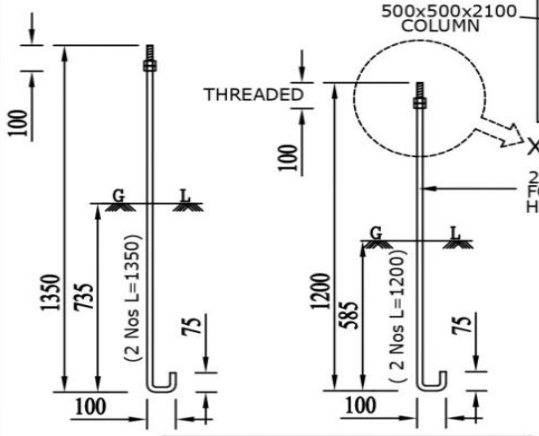




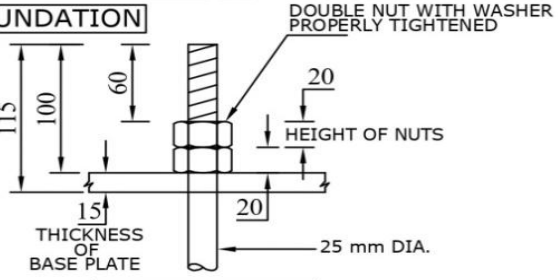
PLAN OF FOUNDATION



8 mm DIA BINDERS
2 Nos. AT EACH LAYER



DETAILS OF FOUNDATION
HOLDING BOLTS



DETAILS AT - X
SCALE - 1 : 5

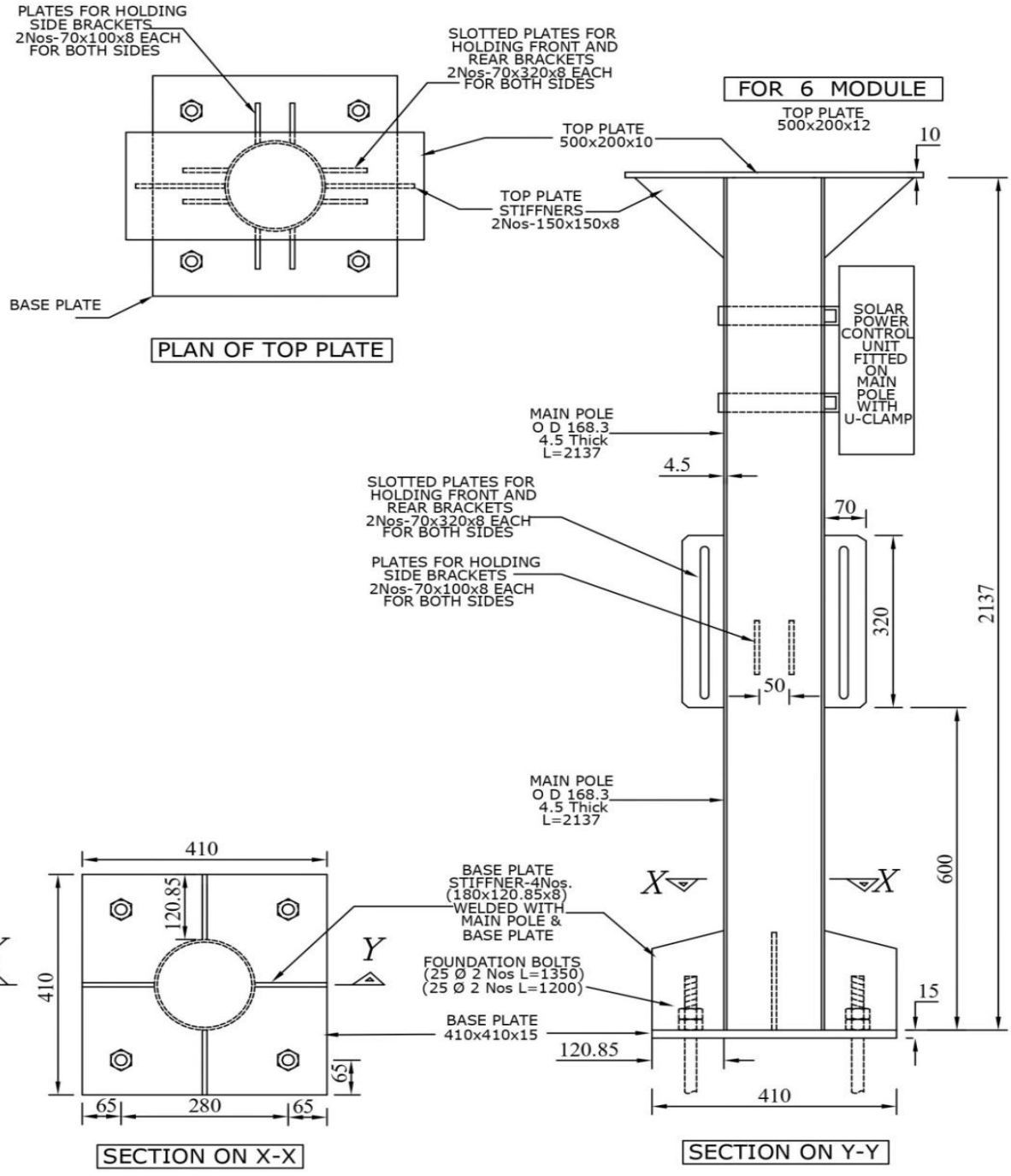
DRAWN BY - *SUMAN DUTTA J.E.(C)* | *PAGE- 5*

FOUNDATION DETAILS
FOR 6 MONOPERC MODULE
WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT. GOVT. OF WEST BENGAL

TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM

ALL DIMENSIONS ARE IN MM U. O. STATED | SCALE - 1 : 25

DETAILS OF MAIN POLE FOR 4 & 6 MONOPERC



N.B.- 1) WELDING SHOULD BE DONE AS PER I.S.- 822 & GRADE OF WELDING WIRE SHOULD BE ER70S-6 .
2) POSITION OF SOLAR POWER CONTROL UNIT IS TO BE DECIDED AS PER SITE CONDITION.

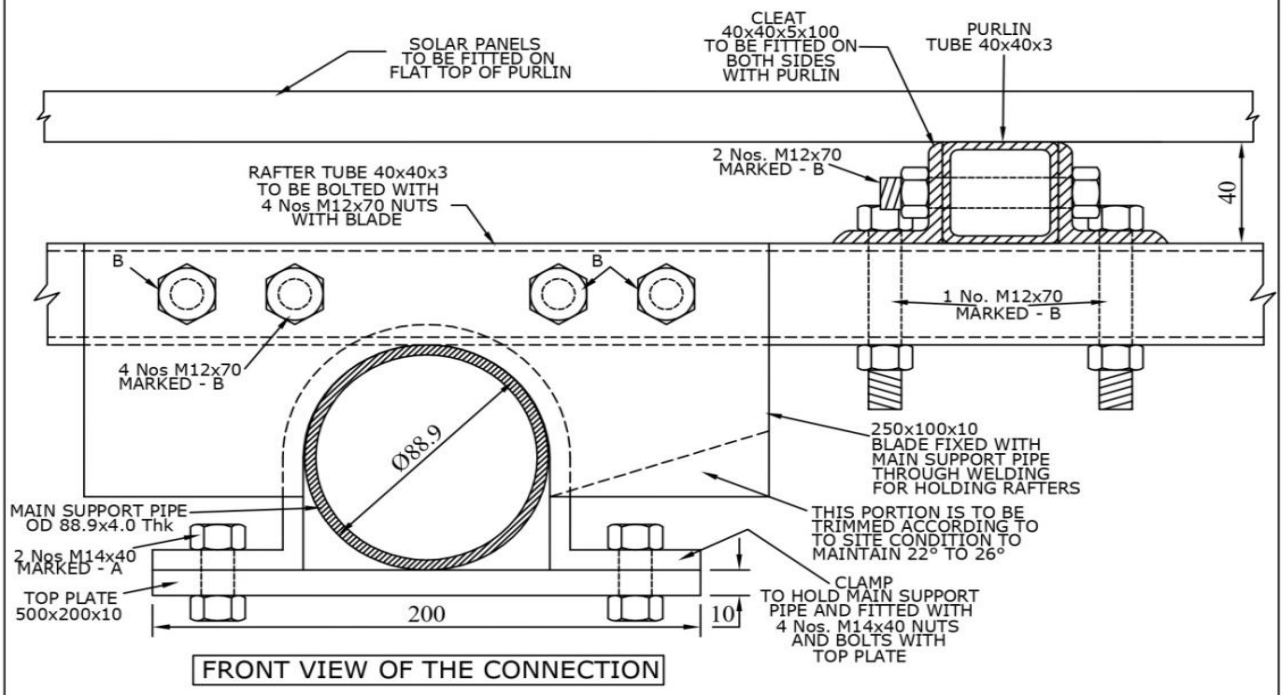
DRAWN BY - *SUMAN DUTTA J.E.(C)* | *PAGE- 6*

DETAILS OF MAIN POLE FOR 4 & 6 MONOPERC MODULE
WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT. GOVT. OF WEST BENGAL

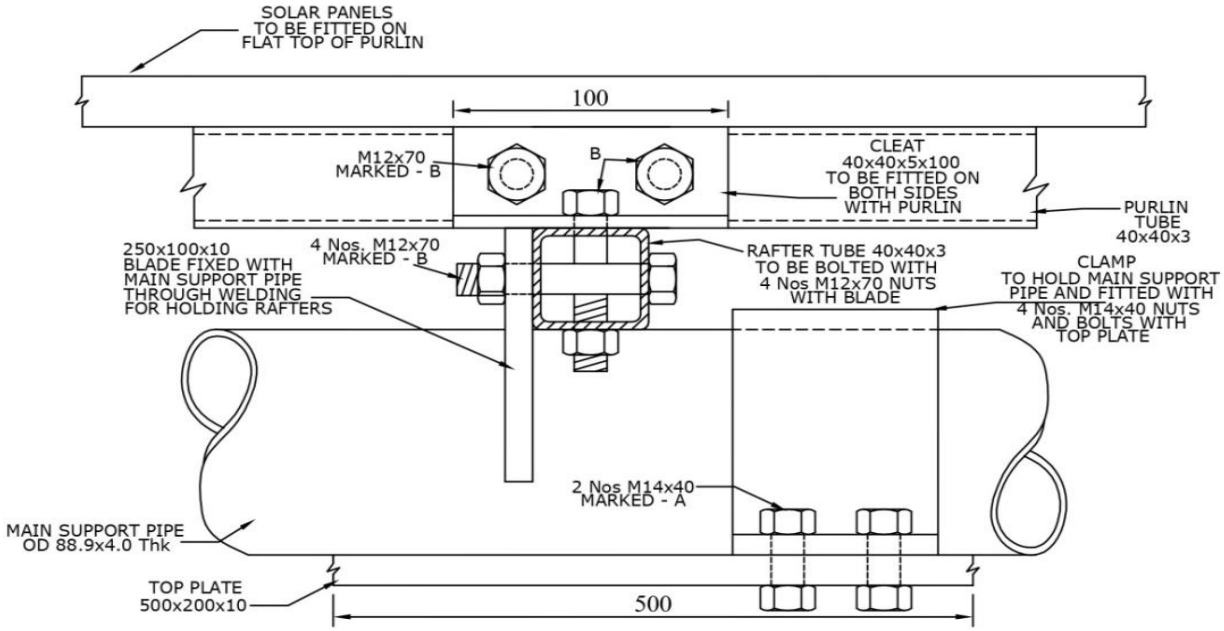
TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM

ALL DIMENSIONS ARE IN MM U. O. STATED | SCALE - 1 : 10

DETAILS OF CONNECTION WITH RAFTER, PURLIN, CLEAT AND BLADE FOR 4 MONOPERC



FRONT VIEW OF THE CONNECTION



RIGHT SIDE VIEW OF THE CONNECTION

DRAWN BY - *SUMAN DUTTA J.E.(C)* | *PAGE- 7*

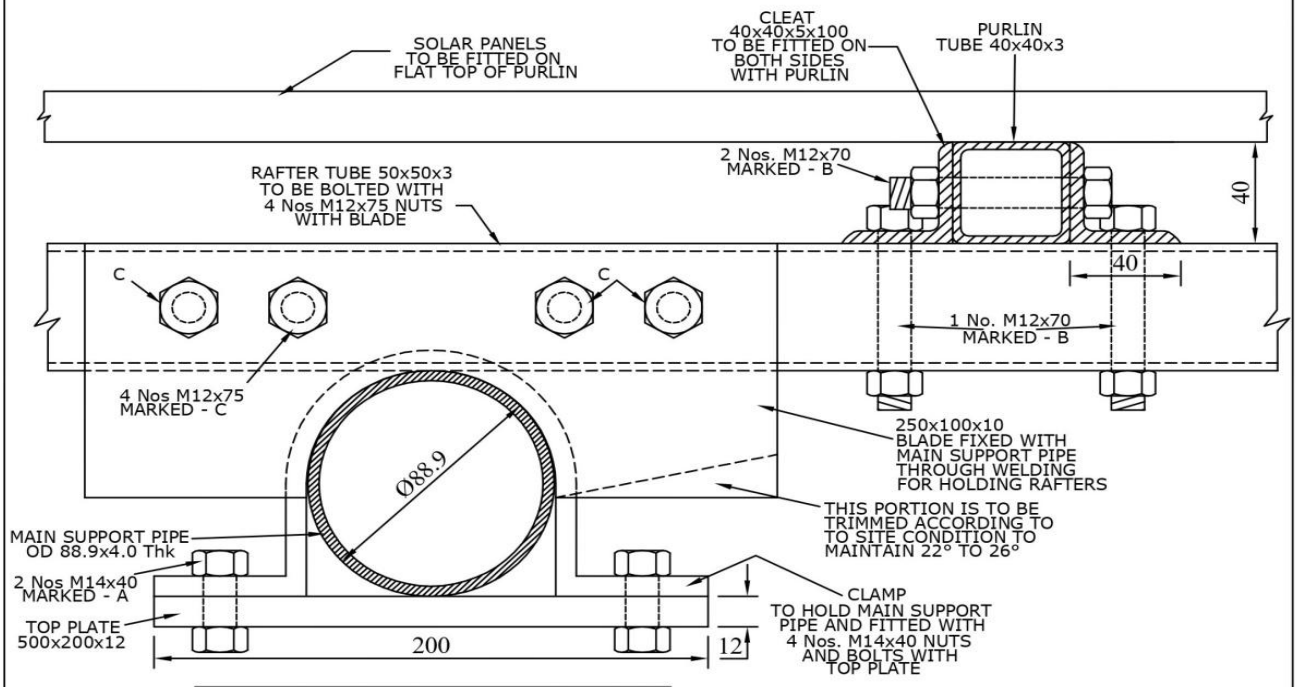
DETAILS OF CONNECTION WITH RAFTER, PURLIN, CLEAT AND BLADE FOR 4 MONOPERC

WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT. GOVT. OF WEST BENGAL

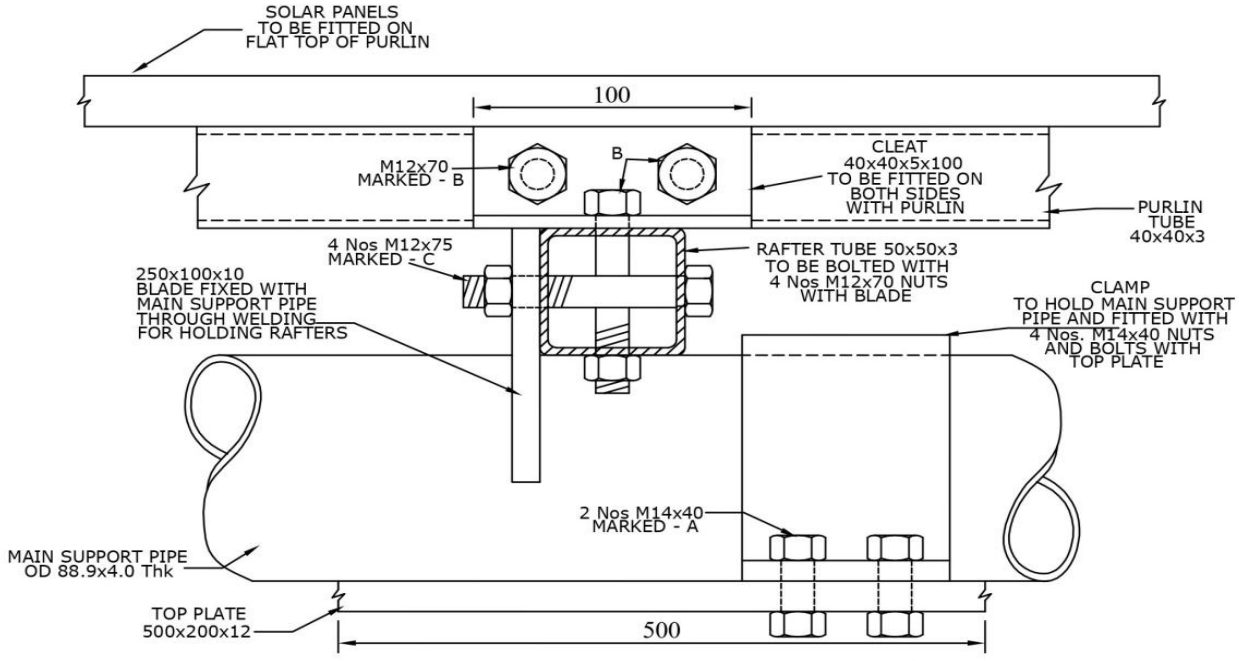
TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM

ALL DIMENSIONS ARE IN MM U. O. STATED | SCALE - 1 : 2.5

DETAILS OF CONNECTION WITH RAFTER, PURLIN, CLEAT AND BLADE FOR 6 MONOPERC



FRONT VIEW OF THE CONNECTION



RIGHT SIDE VIEW OF THE CONNECTION

DRAWN BY - *SUMAN DUTTA J.E.(C)* | *PAGE- 8*

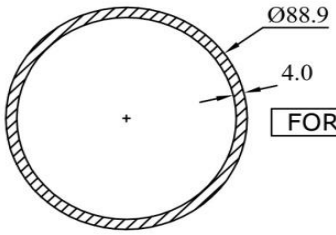
DETAILS OF CONNECTION WITH RAFTER, PURLIN, CLEAT AND BLADE FOR 6 MONOPERC

WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT. GOVT. OF WEST BENGAL

TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM

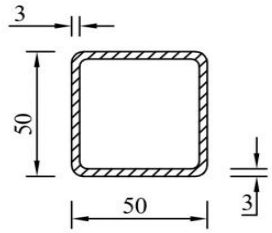
ALL DIMENSIONS ARE IN MM U. O. STATED | SCALE - 1 : 2.5

DETAILS OF MAIN SUPPORT PIPES, RAFTOR, PURLIN & CLEAT



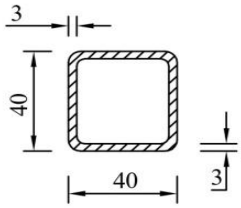
FOR 6 & 4 MODULE

MAIN SUPPORT PIPE



SECTION OF RAFTER 50x50x3

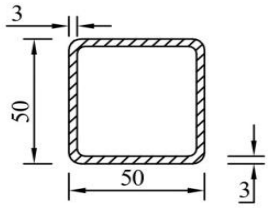
FOR 6 MODULE



SECTION OF RAFTER 40x40x3

FOR 4 MODULE

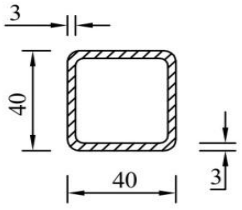
RAFTER



SECTION OF BRACKET 50x50x3

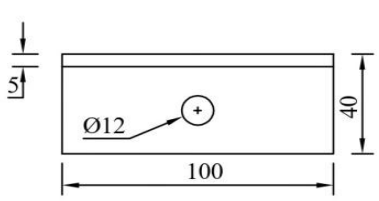
FOR 6 & 4 MODULE

SECTION OF PURLIN 40x40x3

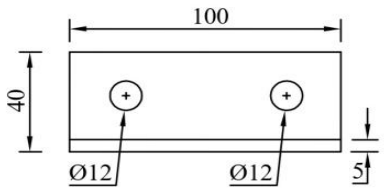


BRACKET

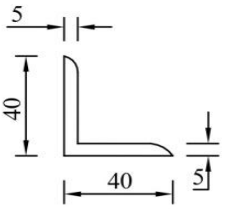
PURLIN



PLAN



FRONT VIEW



SIDE VIEW

FOR 6 & 4 MODULE

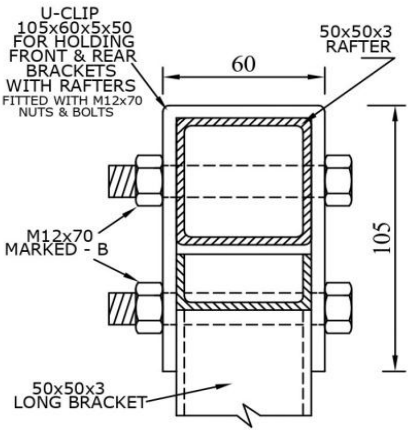
CLEAT

FOR FIXING PURLINS WITH RAFTORS

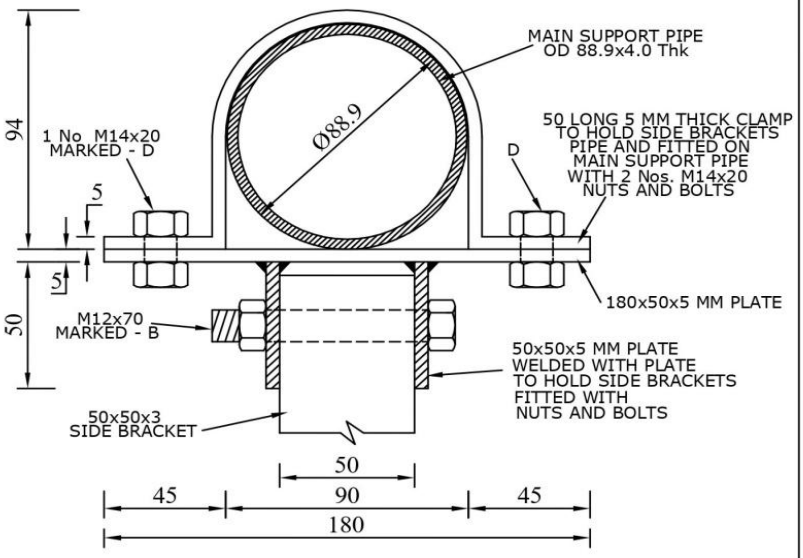
DRAWN BY - *SUMAN DUTTA J.E.(C)* | *PAGE- 9*

DETAILS OF MAIN SUPPORT, RAFTOR, PURLIN & CLEAT *WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT.* GOVT. OF WEST BENGAL	TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM
	ALL DIMENSIONS ARE IN MM U. O. STATED | SCALE - 1 : 2.5

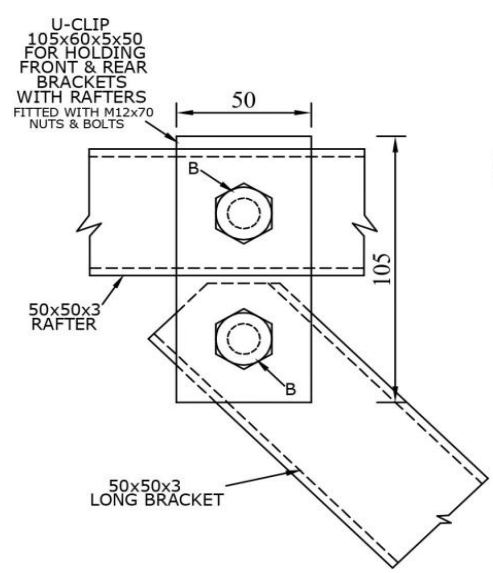
DETAILS OF BRACKET HOLDERS



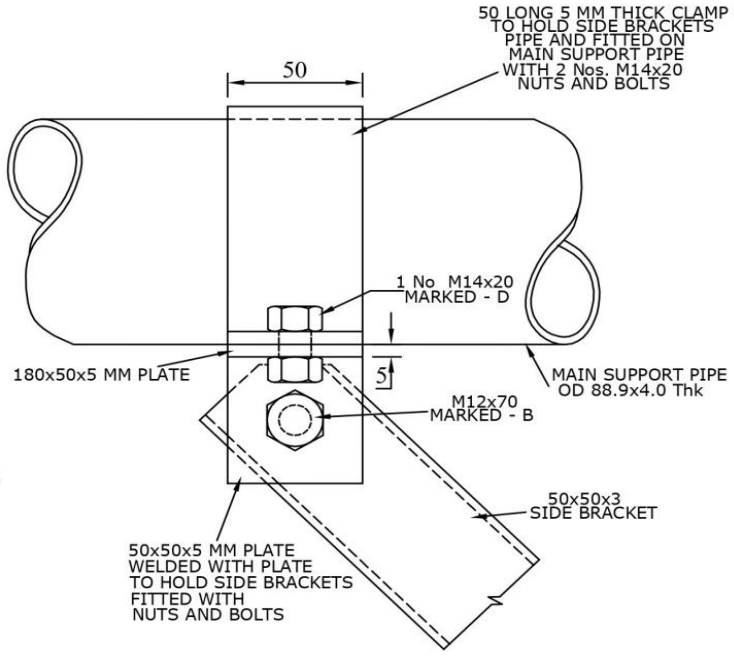
FRONT VIEW OF THE CONNECTION FOR LONG BRACKET



FRONT VIEW OF THE CONNECTION FOR SIDE BRACKETS



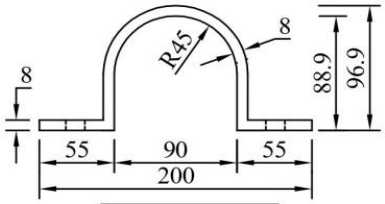
RIGHT VIEW OF THE CONNECTION FOR LONG BRACKET



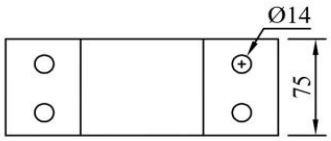
RIGHT VIEW OF THE CONNECTION FOR SIDE BRACKETS

	DRAWN BY - *SUMAN DUTTA J.E.(C)*	*PAGE- 10*
DETAILS OF BRACKET HOLDERS *WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT.* GOVT. OF WEST BENGAL	TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM	
	ALL DIMENSIONS ARE IN MM U. O. STATED	SCALE - 1 : 2.5

DETAILS OF CLAMP, SLOTTED PLATE & BLADE



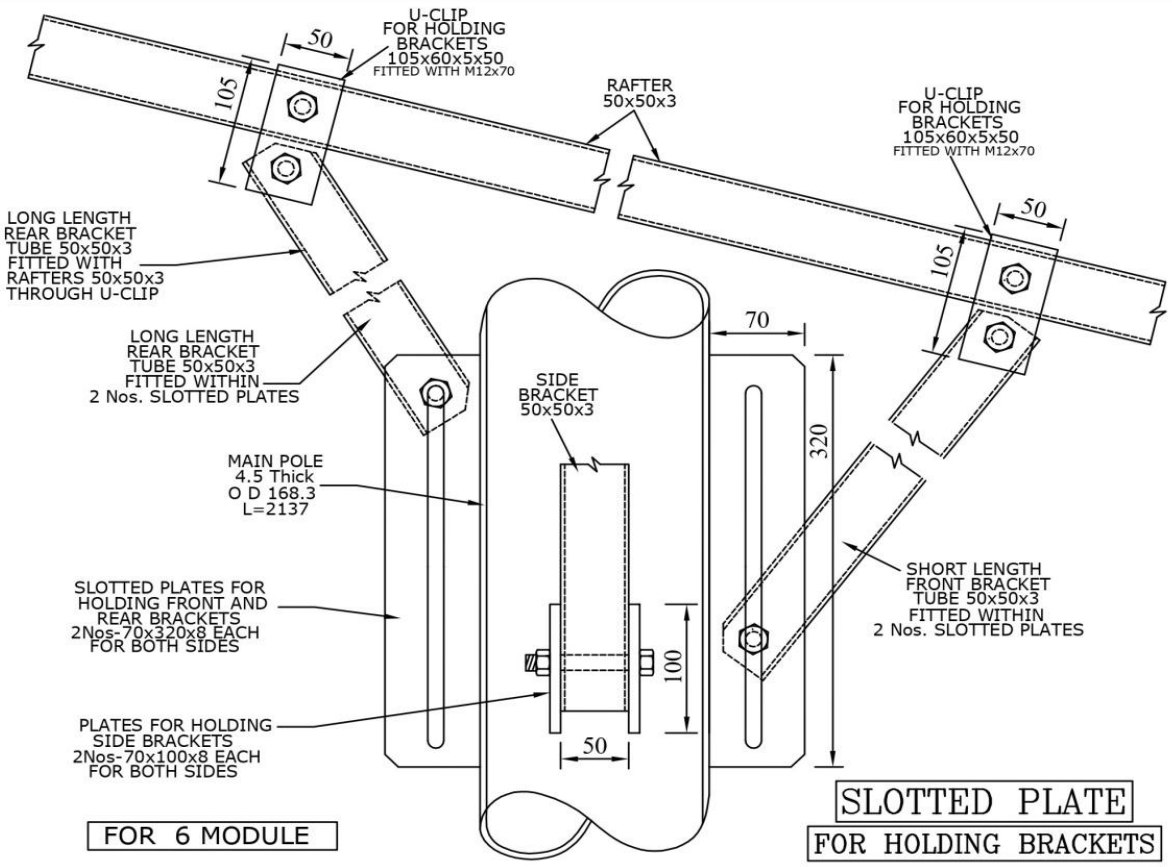
FRONT VIEW



PLAN

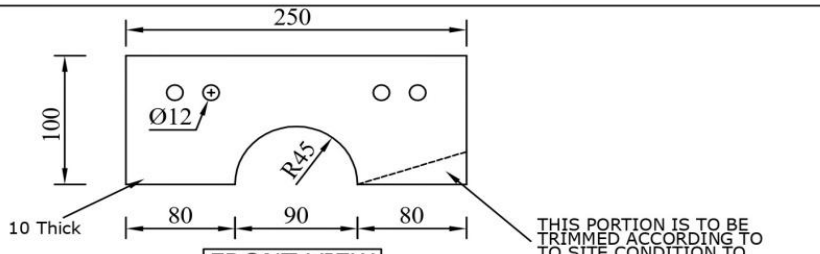
FOR 4 & 6 MODULE

CLAMP FOR HOLDING MAIN SUPPORT PIPE SUPPORT



FOR 6 MODULE

SLOTTED PLATE
FOR HOLDING BRACKETS



FRONT VIEW

FOR 4 & 6 MODULE

BLADE FOR FIXING RAFTOR WITH MAIN PIPE SUPPORT

DRAWN BY - *SUMAN DUTTA J.E.(C)* | *PAGE- II*

DETAILS OF CLAMP, SLOTTED PLATE & BLADE

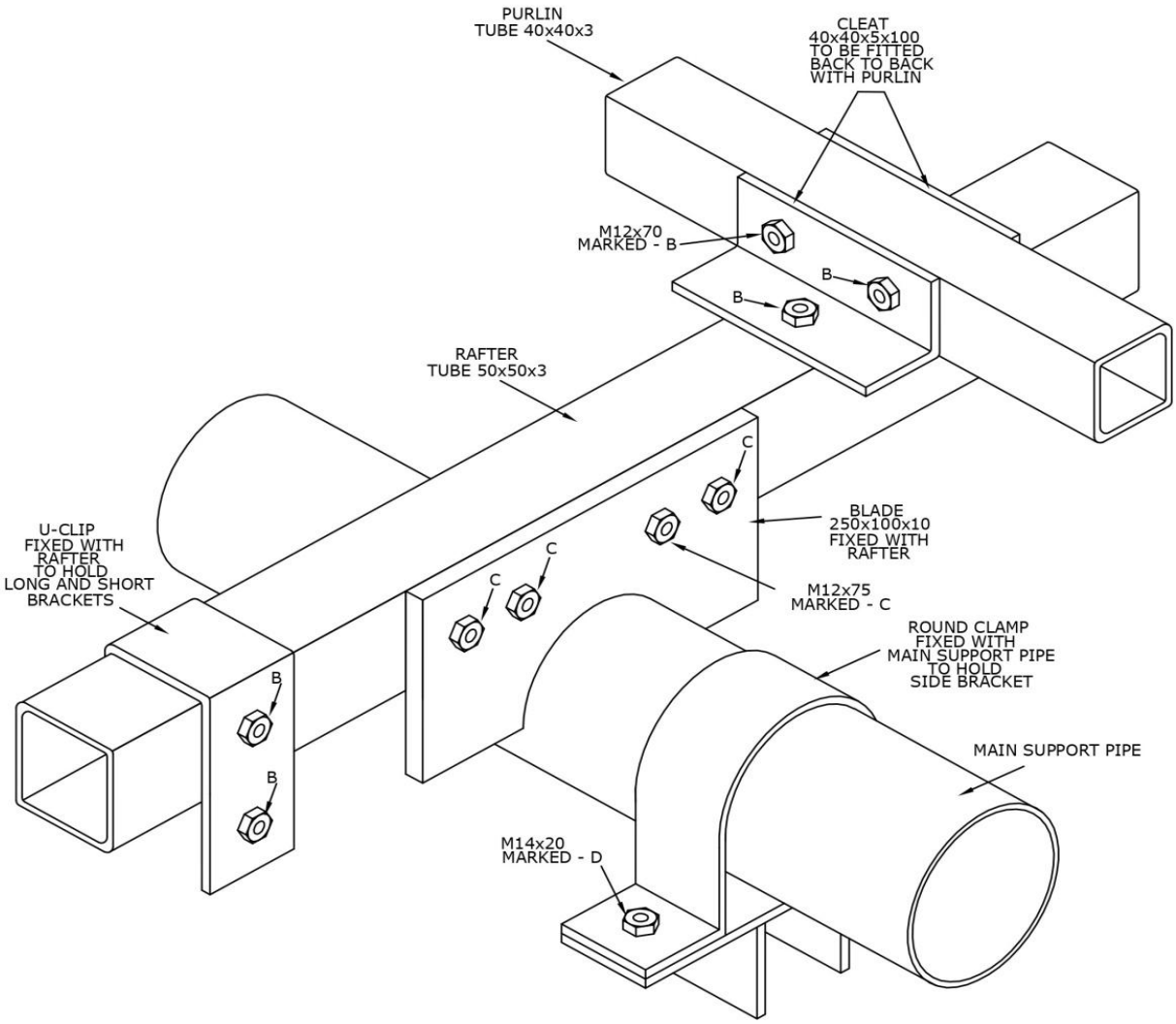
WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT. GOVT. OF WEST BENGAL

TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM

ALL DIMENSIONS ARE IN MM U. O. STATED | SCALE - 1 : 5

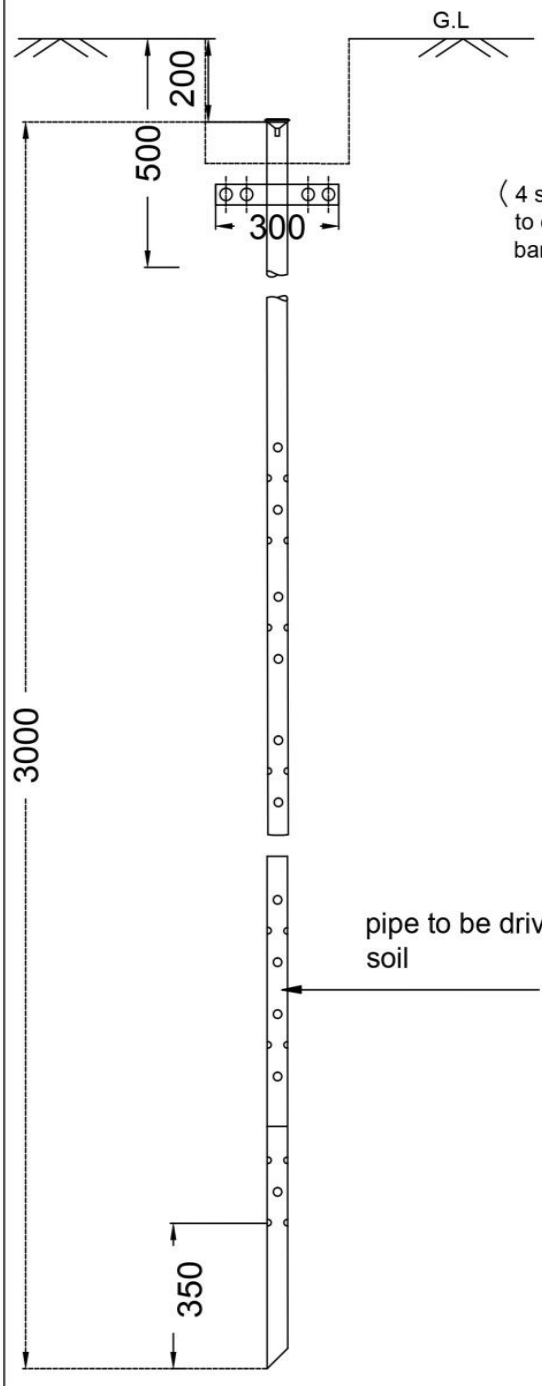
DETAILS CONNECTION OF MAIN SUPPORT PIPES, RAFTOR, PURLIN ,CLEAT, U CLIP & ROUND CLAMP (For Brackets)

ISOMETRIC VIEW

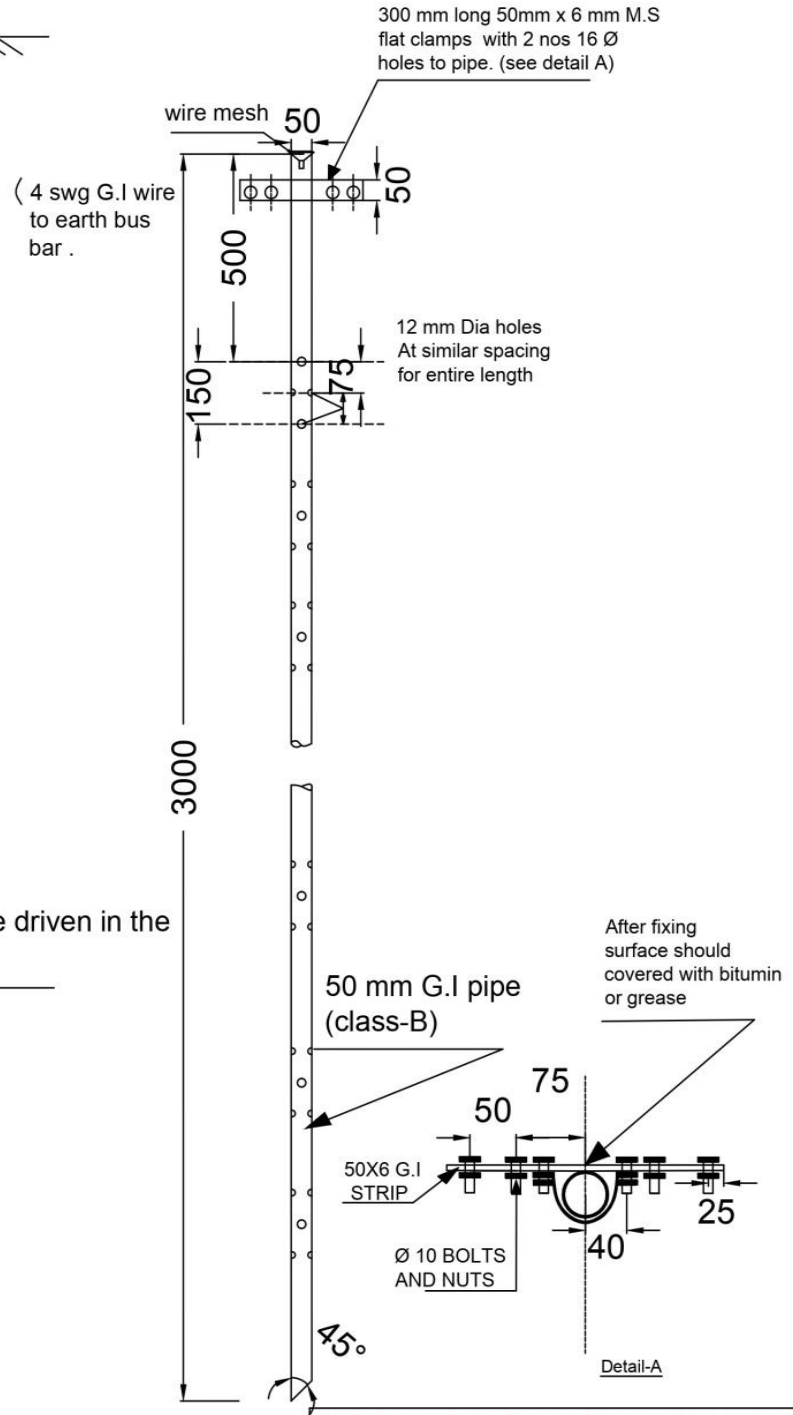


DRAWN BY - *SUMAN DUTTA J.E.(C)* | *PAGE- 12*

DETAILS CONNECTION OF MAIN SUPPORT PIPE, RAFTOR, PURLIN, CLEAT, U-CLIP & ROUND CLAMP *WATER RESOURCES INVESTIGATION AND DEVELOPMENT DEPARTMENT.* GOVT. OF WEST BENGAL	TITLE - FIXED TYPE MMS FOR SOLAR WATER PUMPING SYSTEM	
	ALL DIMENSIONS ARE IN MM U. O. STATED	NOT TO SCALE



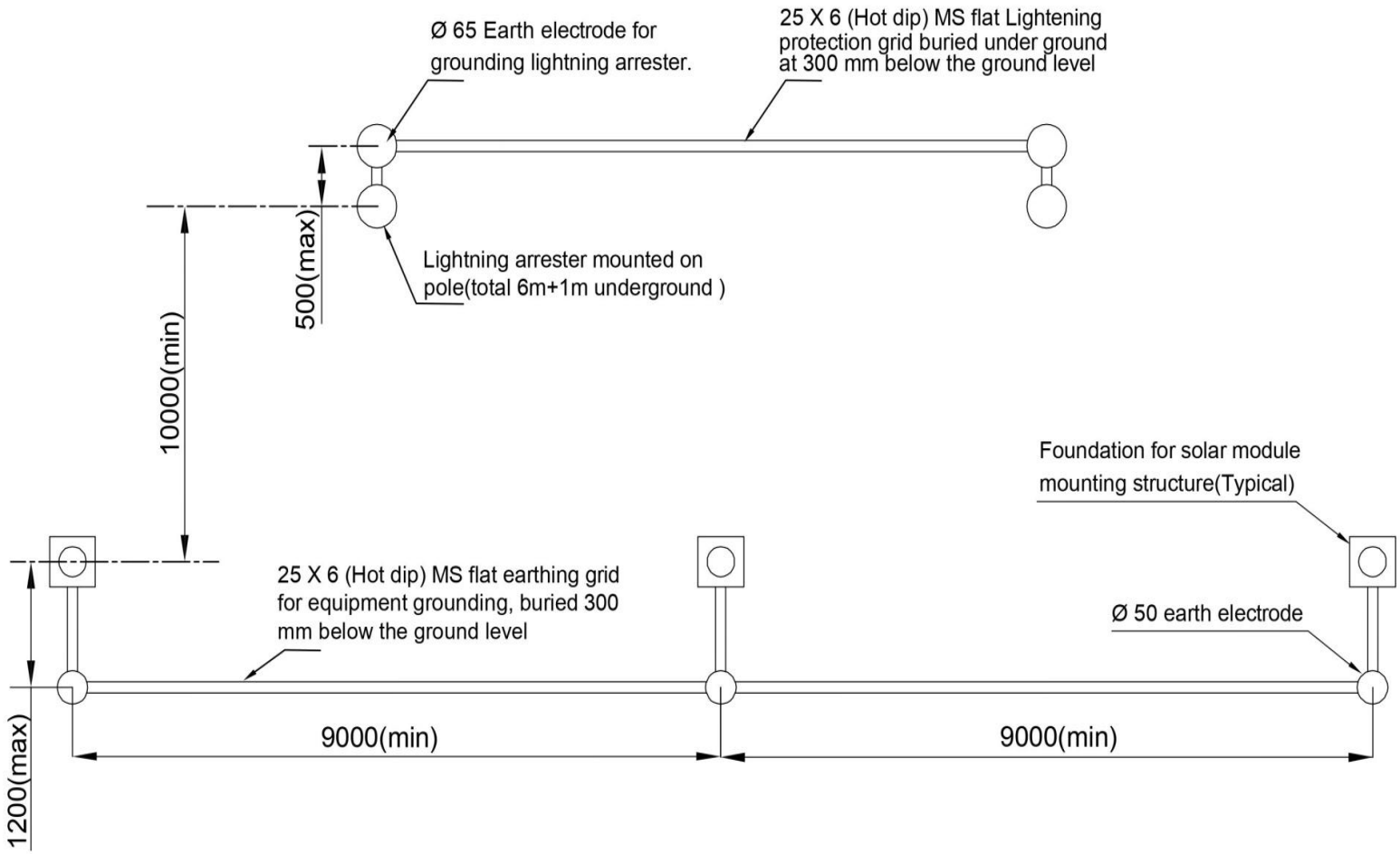
Arrangement of pipe electrode earthing .



Detail of earth electrode.

All dimension are in mm

GOVERNMENT OF WEST BENGAL,W.R.I.D.D DIVISION-	
TITLE: TYPICAL ARRANGEMENT OF AN EARTH ELECTRODE FOR EQUIPMENT EARTHING	
DRAWN BY:	APPROVED BY:
CONVENTION:	SCALE: 1:1



NOTE:

1. The earthing grid and lightning grid should not get connected at any point. This should be properly ensured.

2. 1 (One) No.- Lightning pole of 4.0 M + 0.75 M (underground) for 1 No. structure. (Refer drawing of Lightning pole)

3. 2 (Two) Nos.- Lightning pole of 6.0 M + 1.0 M (underground) for 2 Nos. / 3 Nos. structure. (Refer drawing of Lightning pole)

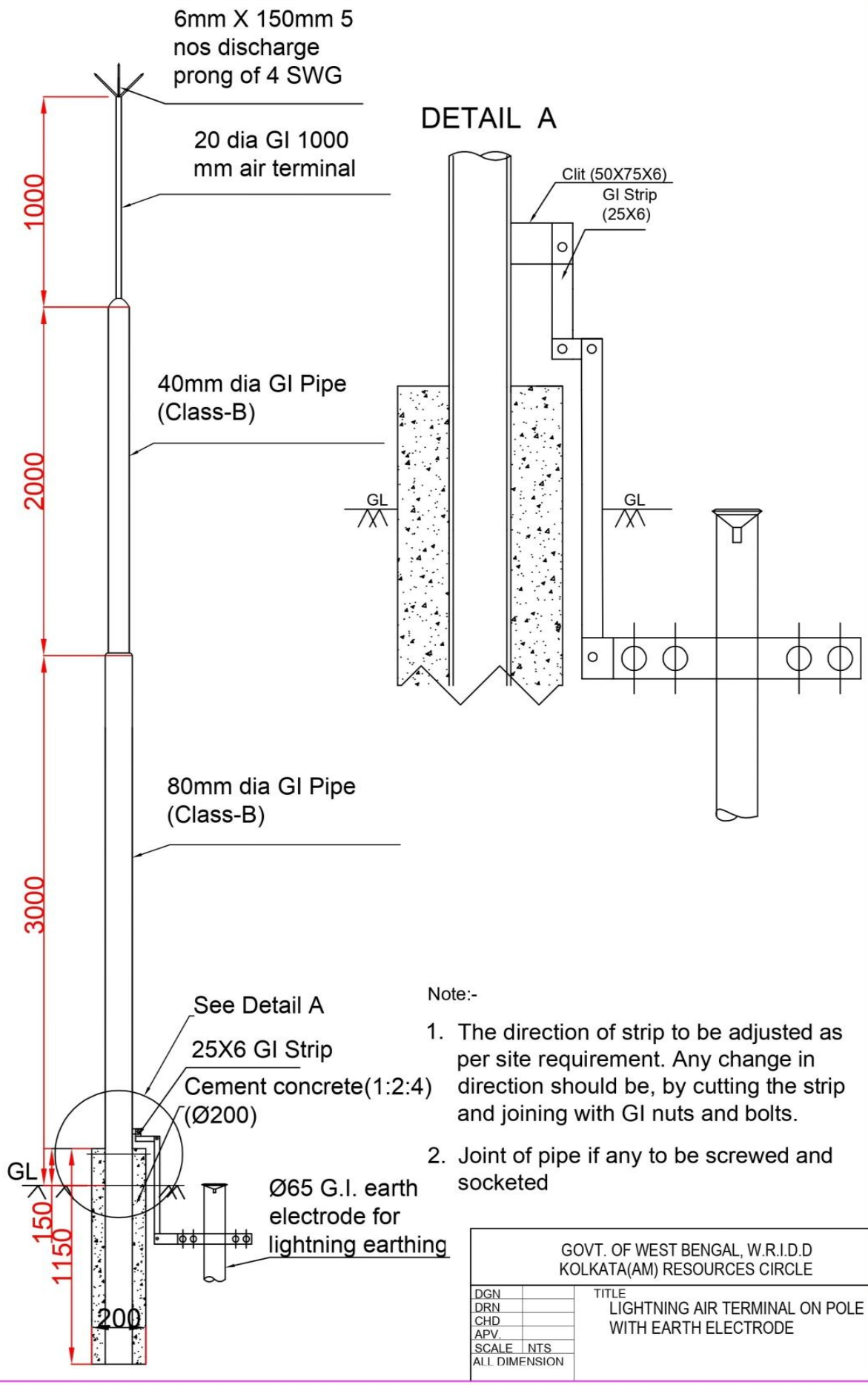
GOVT. OF WEST BENGAL, W.R.I.D.D

DGN	
DRN	
CHD	
APV.	
SCALE	NTS
ALL DIMENSION ARE IN mm	

TITLE

LAYOUT OF LIGHTNING AND EARTHING SYSTEM FOR SOLAR IRRIGATION PUMPING SYSTEM

PAGE-



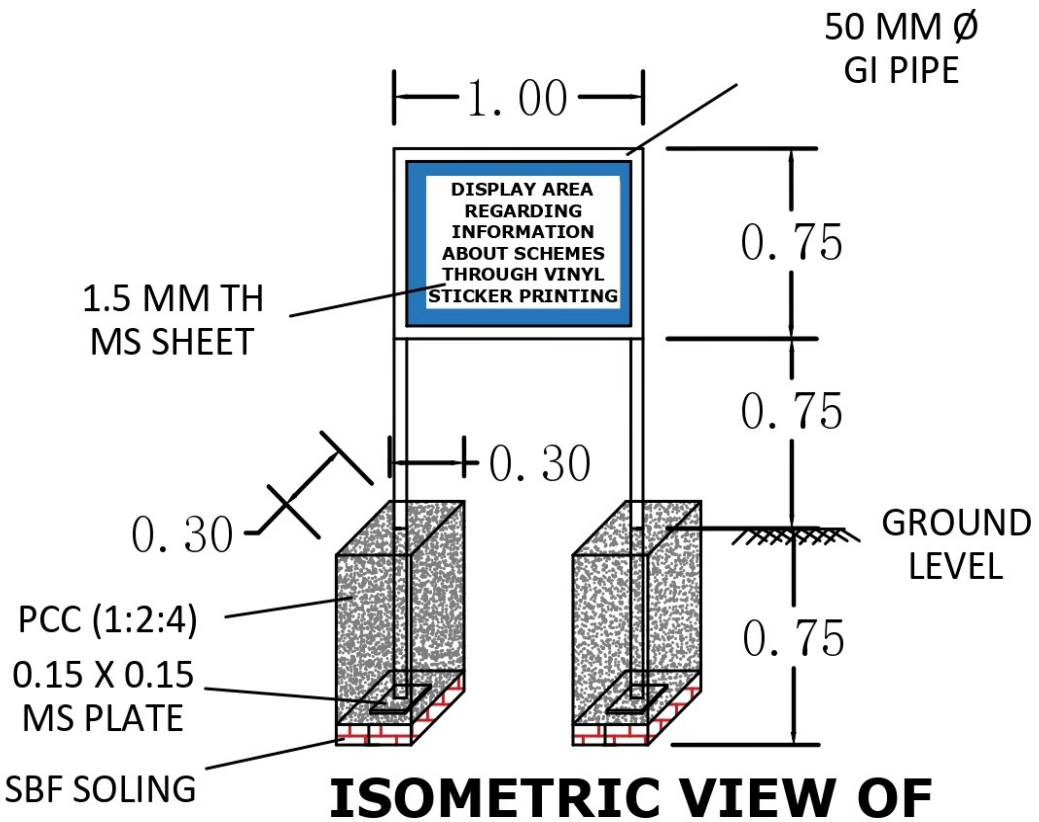
Note:-

1. The direction of strip to be adjusted as per site requirement. Any change in direction should be, by cutting the strip and joining with GI nuts and bolts.
2. Joint of pipe if any to be screwed and socketed

GOVT. OF WEST BENGAL, W.R.I.D.D
KOLKATA(AM) RESOURCES CIRCLE

DGN	
DRN	
CHD	
APV.	
SCALE	NTS
ALL DIMENSION	

TITLE
LIGHTNING AIR TERMINAL ON POLE WITH EARTH ELECTRODE



ISOMETRIC VIEW OF DISPLAY BOARD