Tender document for

Madurai Division: Provision of Electrical power supply arrangements and Electrical submersible pumps at MEJ, TEN, CVP, TN, MNM, APK, MDU, VPT, RJPM, TDN, TMQ, SRT, SVKS and SVPR Railway stations.

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Chapter – 1

Eligibility Criteria:

Technical Eligibility Criteria:

(a) The tenderer must have successfully completed any of the following during last 7 (seven) years, ending last day of month previous to the one in which tender is invited:

(i) Three similar works each costing not less than the amount equal to 30% of advertised value of the tender, or
(ii) Two similar works each costing not less than the amount equal to 40% of advertised value of the tender, or
(iii) One similar work each costing not less than the amount equal to 60% of advertised value of the tender

Similar works defined as **"Successful completion of works involving installation of wiring/ lighting with 240v, 1 phase or 415v, 3 phase system with control gear and protection arrangements in residential buildings or service buildings or railway stations/ yards or colony/ highway lightings in Central/State Governments and PSUs."**

Financial Eligibility Criteria:

The tenderer must have minimum average annual contractual turnover of V/N crores or "V" crores, whichever is less. where
V= Advertised value of the tender in crores of Rupees
N= Number of years prescribed for completion of work for which bids have been invited.

The average annual contractual turnover shall be calculated as an average of "total contractual payments" in the previous three financial years, as per the audited balance sheet. However, in case balance sheet of the previous year is yet to be prepared/ audited, the audited balance sheet of the fourth previous year shall be considered for calculating average annual contractual turnover.

The tenderers shall submit requisite information as per Annexure-VIB in GCC works April 2022, along with copies of Audited Balance Sheets duly certified by the Chartered Accountant/ Certificate from Chartered Accountant duly supported by Audited Balance Sheet.

For further more details refer clause 10.1 and 10.2 of GCC April 2022

LIST OF DOCUMETS/DETAILS TO BE ATTACHED/UPLOADED:

The scanned copies of the following documents should be up-loaded along with the e-bid at the time of submission of bid.

1. Documents for Work experience. (Proforma enclosed in Annexure – A)

2. Documents for Financial Eligibility as per Annexure VIB

3. Documents for Technical Eligibility Criteria mentioned in the clause 10.1 of GCC April 2022.

4. Documents for Financial Eligibility Criteria mentioned in the clause 10.1 of GCC April 2022.

5. Electronic Fund Transfer Mandate Form (Enclosed in Annexure – B) along with a cancelled cheque.

6. Registration on GSTIN number

7. PAN Card.

8. Certificate in the prescribed format for verification / confirmation of the documents submitted for compliance of eligibility / qualifying criteria.

Chapter – 2

GENERAL CONDITIONS OF CONTRACT

1. This is a works contract. The special conditions of contract (both General and Technical) should be read in conjunction with the Indian Railways Standard General Conditions of Contract (GCC, April 2022) along with correction slips. The GCC, April 2022 is also uploaded along with this document. The said GCC, April 2022 along with the Amendments/correction slips (with Advance correction slip no.11 issued by Railway board vide letter no, No.2022/CE-I/CT/GCC-2022/POLICY/Pt.I (E-3320424) Dated: 13.03.2026 issued from time to time shall be binding on the contract.

2. **Mode of payment:** Payment will be arranged only through Electronic Fund Transfer System. Tenderers should furnish the details in Electronic Fund transfer mandate form attached (Annexure–B) with the tender document for arranging payments through EFT/RTGS. Payment will be arranged through the Senior Divisional Finance Manager, Southern Railway, Madurai. No advance payment will be made against this contract.

3. **Contract value:** The contract value quoted shall be inclusive of all taxes, GST and duties etc. The accepted contract value must be firm till the completion of works.

4. Income Tax, GST/other taxes, if any, as applicable will be deducted from Contractor's bill at the percentage notified by the government.

5. Conservancy cess charges as applicable will be recovered from contractor's bills.

6. The contractor is liable to pay the taxes as stipulated in the GST Act and Rules and as per the clause No.6 & 37 of GCC April 2022. Also, the contractor should furnish the details of GST to be deducted from the contractor's bill.

7. The Contractor shall comply with the provision of the contract labour (Regulation and Abolition) Act, 1970 and the Contract labour (Regulation and Abolition) Central Rules 1971 as modified from time to time, wherever applicable and shall also indemnify the Railway from and against any claims under the aforesaid Act and the Rules as detailed in clause No. 55A of 'General Conditions of Contract – April 2022'

8. The contractor shall comply with the provisions of para 30 and 36-B of the Employees provident Fund Scheme, 1952; Para 3 and 4 of Employees' Pension Scheme, 1995; and Para 7 and 8 of Employees Deposit linked Insurance scheme, 1976; as modified from time to time, through enactment of "Employees Provident Fund & Miscellaneous Provisions Act, 1952, wherever applicable and shall also indemnify the Railway from and against any claims under the aforesaid Act and the Rules" as per Clause No. 55B of 'General Conditions of Contract'

9. The Tenderer shall adhere payment of minimum wages act and all other labour legislations.

10. **Updation of Labour data on Railway's Shramik Kalyan portal**

(i) Contractor is to abide by the provisions of Payment of Wages Act & Minimum Wages Act in terms of clause 54 and 55 of Indian Railways General Conditions of Contract. In order to ensure the same, an application has been developed and hosted on website '**www.shramikkalyan.indianrailways.gov.in**'. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in Public domain. The Registration/updation of Portal shall be done as under:

(a) Contractor shall apply for Onetime registration of his company/firm etc. in the Shramikkalyan portal with requisite details subsequent to issue of Letter of Acceptance. Engineer shall approve the contractor's registration on the portal within 7 days of receipt of such request.

(b) Contractor once approved by any Engineer, can create password with Login ID (PAN No.) for subsequent use of portal for all LOAs issued in his favour.
(c) The contractor once registered on the portal, shall provide details of his Letter of Acceptance (LOA)/Contract Agreements on shramikkalyan portal within 15 days of issue of LOA for approval of concerned Engineer. Engineer shall update (if required) and approve the details of LOA filled by contractor within 7 days of receipt of such request.
(d) After approval of LOA by Engineer, contract shall fill the salient details of contract labours engaged in the contract and ensure uploading of each wage payment to them on shramikkalyan portal on monthly basis.
(e) It shall be mandatory upon the contractor to ensure correct and prompt uploading of all salient details of engaged contractual labour & payments made thereof after each wage period.

(ii) While processing of any 'On Account bill' of 'Final bill' or release of 'Advances' or 'Performance Guarantee/Security Deposit', contractor shall submit a certificate to the Engineer or Engineer's representatives that "I have uploaded the correct details of contract labours engaged in connection with this contract and payments made to them during the wage period in Railway's Shramikkalyan portal at **www.shramikkalyan.indianrailways.gov.in** till _____Month,_____Year"

11. **Vitiation Clause**:
During the course of execution of the work, if there is any variation in the executed quantities over the quantities as per the Agreement, the inter se position of the tenderers may get altered. Under such circumstances the successful bidder is bound to accept the lowest value to avoid vitiation of contract.

12. **RAILWAY STORES:**
a) If any material other than those specified in the Annexure - I is supplied by the Railway either at the contractor's request or suo moto in order to prevent any possible delay in the execution of the works likely to occur due to the contractor's inability to make adequate arrangement for supply thereof or otherwise, recovery will be made from contractor's bill at the issue rate or market rate prevailing at the time of supply, whichever is higher plus 5% on account of initial freight and 2 % on account of incidental charges together with supervision charges at 12.5% of the total cost inclusive of material, freight and incidental charges. Freight between the Railway's source of supply and site of work shall be to the Contractor's account. For example:

1.	The cost of material	-	Say Rs.	100.00
2.	Initial freight @ 5%	-		5.00
3.	Incidental charges @ 2%	-		2.00
4.	Total	-		107.00
5.	Supervision charges @ 12.5%	-		13.38
6.	TOTAL	-		120.38

b) If, however, the material required by the contractor is not available in Railway's stock or the Railway decides not to supply the same, be that for whatever reason, the Railway shall not be bound to arrange for the supply at cost quoted above, or at any other cost nor will this fact be accepted as an excuse for delay in execution of works.

c) If the contractor runs short of materials and such materials are available in the Railways stock, the materials may be supplied by the Railway suo moto or on loan basis to the contractor. In case of issue of materials on loan basis, the contractor will return the same on receipt of the supplies or within 3 months whichever is earlier. Issue of materials on loan basis is subject to a written request by the contractor. If the contractor fails to return the materials issued to him on loan basis within the above mentioned period, recovery will be made from the contractor's bill as detailed in clause No.8(a) above.

13. **CONTRACTOR'S SUPPLY ITEMS:**

a) All the materials required for execution of this work except those specified in Annexure – I have to be arranged by contractor.

b) The contractor has to make his own arrangements for transporting men & materials to the site of work

c) The contractor has to make his own arrangements for storing the materials proposed to be utilized by him. No responsibility will be taken by the Railways for the loss of contractor's materials.

d) The contractor should have the expertise and all kinds of special tools/ equipments for execution of the work as per the schedule. The contractor has to make available all the tools and plants required for executing this work.

14. **FINAL ACCEPTANCE:**

a) The final acceptance of the entire equipment installed under this contract shall take effect from the date of expiry of the period of guarantee (Maintenance period), provided that the Contractor has complied fully with his obligations against the contract as per the terms & conditions of the agreement.

b) If on the other hand, the Contractor has not so complied with his obligations against the contract as per the terms & conditions of the agreement, the Railway may either extend the period of guarantee until the necessary works are carried out by the contractor or carry out those works or have them carried out suo moto on behalf of the contractor at the contractor's expense. After expiry of the period of guarantee, a certificate of final acceptance shall be issued by the Railway.

15. **QUALITY ASSURANCE OF MATERIALS:**

a) All the equipments, materials, fittings and components will be subject to quality control program of the manufacturer, being part of the quality assurance program of the contractor. The materials may also be inspected by the Sr.Divisional Electrical Engineer /General, Southern Railway, Madurai or his authorized representative at the manufacturers works or as desired by Sr.Divisional Electrical Engineer /General, Southern Railway, Madurai. Sr. Divisional Electrical Engineer /General, Southern Railway, Madurai or his authorized representative will have the right to be present during all the stages of manufacture and shall be accorded all reasonable facilities for inspection and testing as well as to examine the stage inspection report of the manufacturer in addition to the quality audit which the contractor may institute as a part of his program so as to satisfy himself that the materials are in accordance with specifications, approved drawings and designs and Railways prescribed quality assurance standards.

b) The following ledgers are to be maintained at site in connection with this Works Contract:

1. Site Order book - By Contractor.
2. Hindrance Register - By Contractor
3. Material Transaction Register- Both by Railways and the Contractor
4. Daily Progress & Labour Register. - By Contractor.

These registers are to be maintained at site and should be produced during inspection by officials. The formats for maintaining the above-mentioned registers are furnished at **Annexure II to V.**

16. **SAFETY MEASURES:**

a) The work should be carried out in the presence and under the guidance of the authorized representative of the Sr.Divisional Electrical Engineer /General, Southern Railway, Madurai

b) The contractor shall take all precautionary measures in order to ensure the protection of his own personnel moving about or working on the Railway premises, but shall then conform to the rules and regulations of the Railway, if and when, in the course of the works there is likely to be any danger to persons in the employment of the contractor due to running traffic while working in the Railway siding and premises. The contractor shall apply, in writing, to the Railway to provide flagmen or lock-out men for protection of such persons. The Railway will, however, decide as to whether it is necessary to post such flagmen for various types of work and also the number of such men required to protect the gang or gangs of contractor's staff working at site. The Railway shall remain indemnified by the contractor in the event of any accident occurring in the normal course of work arising out of the failure of contractor or his men to exercise reasonable precaution at all places of work whether or not the Railway decides to post flagmen at any particular site of work. The flagmen will be appointed by the Railway and no expense on this account will be charged from the contractor.

c) Blasting of rock for foundation work shall be done only after due notice is given to the Railway and time/s and date/s for blasting operation agreed to by the Railway. Blasting, if required to be done in the vicinity of the track, shall not be undertaken until the Railway's flagmen on duty take necessary steps to protect trains and the track is adequately protected by the contractor against damages by blasted rock. The contractor shall follow detailed instructions, which will be issued to him regarding blasting operations in the vicinity of tracks.

d) The contractor shall ensure the unauthorized, careless or inadvertent operation of switchgear, which may result in accident to staff and/or damage to equipment, does not occur.

e) The work is to be executed without causing damage to the existing arrangements of OHE at site/other railway properties at site. Defect / damages caused, if any, due to contractor's work at site, it should be rectified at the cost of the contractor.

f) The execution of the work should in no way impede normal running of train services or shunting operation.

g) While undertaking digging work in the vicinity of underground Signalling, Electrical and Telecommunication cables, special care shall be taken by the Contractor to ensure that no damage to these cables are caused due to their work. In case of any cable damage, the cost of the loss (either direct or indirect) caused by the damage shall be borne by the Contractor. The direct loss includes the cost of the cable damaged including the cost of restoration and indirect loss may include the resultant loss caused due to the dislocation in

traffic and the cost of the other equipments damaged which have direct connection with the damaged cable etc.

h) The contractor shall not permit their staff to work on the posts carrying overhead conductors or any other current carrying parts unless he had received in writing the permit to work from the authorized Railway representatives. He shall have to ensure that the supply lines are dead and earthed before commencing the work on the overhead conductors or any other current carrying parts.

i) The Tenderer/Contractor must ensure the safety of the labourers engaged by him while executing the work and the Railway will not be responsible for any injury sustained by the labourers due to any accident or any other fatalities.

j) The contractor shall obtain special permit from the Railway to enable his workers to work at, to bring to or to take materials from work spot.

k) The work should be carried out without any interference to the normal working of Railway track & structure. The contractor shall be responsible for any loss to Railway and public property and if it occurs during the course of execution, then the Railway reserves the right to have the damages made good by the contractor

l) The contractor shall be responsible for the safe custody of all equipment till provisional acceptance. Should the situation warrant posting of armed guards for protection from thefts, the same will be provided by the Railway, at his own cost and at his discretion. The contractor shall apply to the Railway explaining the circumstances under which posting of armed guards is considered necessary by him. At the same time, the details of the requirement and the number of personnel of armed guards, where and when required, shall also be furnished.

m) During stringing operations, every care shall be taken to prevent conductors hanging low over tracks on which traffic block has not been given. All conductors shall be pulled out before traffic block is cleared so that such conductors do not infringe with moving traffic.

n) The contractor shall abide by all Railway regulations and Indian Electricity Rules, 1956 in force for the time being and ensure that the same are followed by his Representative, Agent or sub-Contractor or workmen.

17. **RELEASED MATERIALS:** All the Released/Retrieved materials if any, shall be handed over to Railway after stacking at a convenient place at the office of Senior Section Engineer /Electrical / Works/ Madurai as directed by the Engineer in charge at free of cost. For every contract, a dumping spot should be identified as per the instruction of Senior Section Engineer /Electrical / Works/ Madurai and the debris should be dumped there only.

18. No free Electric power supply will be supplied by Railway. However, power supply if feasible will be extended by Railways on terms applicable to outsiders. For testing purpose only free power supply will be given.

19. **Performance Guarantee (PG):**

The successful bidder shall have to submit 5% of total contract value as performance guarantee (PG) within 21 (Twenty one) days from the date of issue of Letter of Acceptance (LOA). Extension of time for submission of PG beyond 21 (Twenty one) days and up to 60 days from the date of issue of LOA may be given by the authority who is competent to sign the contract agreement. However, a penal interest of 12% per annum shall be charged for the delay beyond 21 (Twenty one) days, i.e. from 22nd day after the date of issue of LOA. Further, if the 60th day happens to be a declared holiday in the concerned office of the Railway, submission of PG can be accepted on the next working day.

In all other cases, if the contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract is liable to be terminated. In case contract is terminated the bidder shall be banned from submission of bids in any works/ service tender issued by Indian Railways for a period of 12 months from the date of such banning done on e-platform IREPS.

The failed contractor shall be debarred from participating in re-tender for that work.

For more details about PG refer Clause 16(4) of GCC April- 2022 and Advance Correction Slip No.11 to Indian Railways Standard General Conditions of Contract. April-2022

20. **Security Deposit:**

The security deposit will be deducted as Clause 16(1) of GCC April- 2022.

21. **Bid Security**

(1) (a) The tenderer shall be required to submit the Bid Security with the tender for the due performance with the stipulation to keep the offer open till such date as specified in the tender, under the conditions of tender. The Bid Security shall be as under:

Value of the Work	**Bid Security**
For all works	2% of the estimated cost of the work

Note:

(i) The Bid Security shall be rounded off to the nearest ₹100. This Bid Security shall be applicable for all modes of tendering.
(ii) Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as 'Start ups' shall be exempted from payment of Bid Security detailed above.
(iii) Labour Cooperative Societies shall submit only 50% of above Bid Security detailed above.

(b) It shall be understood that the tender documents have been issued to the tenderer and the tenderer is permitted to tender in consideration of stipulation on his part, that after submitting his tender he will not resile from his offer or modify the terms and conditions thereof in a manner not acceptable to the Engineer. Should the tenderer fail to observe or comply with the said stipulation, the aforesaid amount shall be liable to be forfeited to the Railway.

(c) If his tender is accepted, this Bid Security mentioned in sub para (a) above will be retained as part security for the due and faithful fulfillment of the contract in terms of Clause 16 of the Standard General Conditions of Contract. The Bid Security of other Tenderers shall, save as herein before provided, be returned to them, but the Railway

shall not be responsible for any loss or depreciation that may happen thereto while in their possession, nor be liable to pay interest thereon.

(2) The Bid Security shall be deposited either in cash through e-payment gateway or submitted as Bank Guarantee bond from a scheduled commercial bank of India or as mentioned in tender documents. The Bank Guarantee bond shall be as per **Annexure-VIA** and shall be valid for a period of 90days beyond the bid validity period.

(3) **In case, submission of Bid Security in the form of Bank Guarantee, following shall be ensured:**

i. A scanned copy of the Bank Guarantee shall be uploaded on e-Procurement Portal (IREPS) while applying to the tender.

ii. The original Bank Guarantee should be delivered in person to the official nominated as indicated in the tender document within 5 working days before closing date for submission of bids.

iii. Non submission of scanned copy of Bank Guarantee with the bid on e-tendering portal (IREPS) and/or non submission of original Bank Guarantee within the specified period shall lead to summary rejection of bid.

iv. The Tender Security shall remain valid for a period of 90 days beyond the validity period for the Tender.

v. The details of the BG, physically submitted should match with the details available in the scanned copy and the data entered during bid submission time, failing which the bid will be rejected

vi. The Bank Guarantee shall be placed in an envelope, which shall be sealed. The envelope shall clearly bear the identification "**Bid for the ***** Project**" and shall clearly indicate the name and address of the Bidder. In addition, the Bid Due Date should be indicated on the right hand top corner of the envelope.

vii. The envelope shall be addressed to the officer and address as mentioned in the tender document.

viii. If the envelope is not sealed and marked as instructed above, the Authority assumes no responsibility for the misplacement or premature opening of the contents of the Bid submitted and consequent losses, if any, suffered by the Bidder.

Chapter – 3

SPECIAL CONDITIONS OF CONTRACT

1. **Prior approval is required from Sr.DEE/G/MDU for supply of supply items. Quantity mentioned in tender is provisional, it may increase or decrease based on site condition. Before supply of materials contractor and Railway supervisor jointly inspect the site and arrive actual required quantity of supply materials.**
2. The works shall only be executed based on approved **Drawing/Layout plan** issued by Railways. The contractor has to submit the proposed arrangements in the relevant Drawing/Layout/plan with Bill of materials (BOM) and shall get approval from Sr.Divisional Electrical Engineer/General, Madurai. In case of any deviation required during the execution of work in the approved drawing, the same shall also got to be approved.

3. **Materials:** All materials / fittings /appliances etc. used in electrical installations shall conform to BIS Specifications wherever these exist. In case of the materials for which BIS Specifications do not exist, Sr.Divisional Electrical Engineer /General, Southern Railway, Madurai or his authorized representative shall approve the materials.

4. All sample materials including switchgears shall get prior approval before using. Only reputed make of materials should be used.

5. **RAILWAY SUPPLY ITEMS:**

   a) The list of Railway supply materials are furnished in **Annexure-I**. All other materials required for the successful completion of the work shall be arranged by the Contractor.

   b) All Railway materials to be issued by Railways will be issued to the contractor as per relevant clauses of this Contract. The contractor shall make necessary arrangements so as to protect the Railway materials from pilferage/theft/loss and maintain them in good condition in such a way that while in storage they do not suffer any deterioration in quality in any manner whatsoever and shall have to compensate the Railways, in case the materials are considered to have been damaged, deteriorated, or have come to such a state that the same cannot be allowed to be installed/used. Railway will not be responsible for any damage/loss/deficiency/deterioration in quality suffered by the materials issued to them (Please refer other conditions of contract). The contractor shall maintain proper account for the materials issued to their workman for installation and the remaining quantity of the material. All Railway materials shall be exclusively used for installation/use for the purpose for which it is issued and the contractor shall not divert/remove the materials issued to Railways for any other work not connected with this tender enquiry.

   c) Railway supplied materials if any, will be supplied at the office of SSE/W/E/MDU only.

6. **INSPECTION:**

All materials coming under the contractor's scope of supply shall be inspected by RITES organization for **individual item value is more than Rs. 5 lakhs** in addition to manufacturers test certificate with sample checks to ensure proper quality of goods. **Inspection charges shall be borne by the Railway, whether the inspected material is finally utilized in the work or not.** A copy of all the test certified/Test results of test conducted by the inspecting agency shall be submitted along with bills. For materials of purchase value below Rs. 5 lakhs/item inspection shall be done by the Fwith the sample. (Suppliers Invoice and Material inspection certificate by RITES/consignee inspection must be enclosed for material acceptance).

7. COMPETENT SUPERVISORS

a) The erection of all equipment according to the specification will be done by the contractor at his cost. For this purpose, the contractor shall employ competent representatives (**Minimum qualification of Diploma in Electrical and Electronics Engineering or ITI passed with Electrical B license issued by a Government Licensing Authority)** to supervise the erection of the equipment and the carrying out of the works at all stages. The said representatives shall be present at site during working hours and any written orders or instructions which the Railway's Engineers may given to the said representatives of the contractor shall be deemed to have been duly given or communicated to the contractor.

b) **Electrical License:** The work shall only be carried out either by the contractor having valid Electrical contractor license issued by the Government of Tamilnadu / Kerala /Karnataka / any other State (or) Engage agency/person having valid electrical contractor license issued by the Government of Tamilnadu / Kerala /Karnataka / any other State for carrying out the installation work of the voltage class involved. Attested copy of the Electrical License shall be submitted to Sr.DEE/G/MDU or his authorized representative before commencement of work.

c) The contractor or his representatives will accompany the Railway's Engineers on inspection or proceed to their offices whenever called upon to do so.

d) The contractor's representatives shall give necessary direction to his workmen and ensure that they execute their work in sound and proper manner. He shall employ only such supervisors, workmen and laborers for the execution of any of the works as are careful and skilled in their respective trades and callings, If and whenever required by the Railway's the contractor shall submit a correct return showing the names of all personnel employed by him for the contract.In the event of the Railway's Engineer being of the opinion that the contractor is not employing a sufficient number of competent staff as is necessary for the proper execution of the works within the time prescribed the contractor shall forthwith on receiving intimation to this effect take on the additional number of staff as advised by the Railway's Engineer.

8. PENALTY CLAUSE: In the case of slow progress of work, shortfall in work & skipping of work, the Sr.Divisional Electrical Engineer/General service/Madurai's decision will be final and binding based on the Lump sum penalty on case to case basis with respect to the nature and offence and inconvenience caused to the Railway reported by the concerned filed supervisor

9. **PAYMENT CLAUSE:** No advance payment shall be made to the contractor. Part payments for completed portions of work will also be arranged. Payment will be arranged for the quantities executed based on the measurement recorded by the Concern Engineer / Electrical General service branch /Madurai time to time only through Electronic Fund Transfer System.

10. Before commissioning of the installation, the following tests shall be conducted and the results should be as per standards.
    i. Insulation test.
    ii. Earth continuity test path
    iii. Earth resistance value etc.

11. GUARANTEE/WARRANTY:

a) The Contractor shall guarantee satisfactory working of the installation erected by him for a **period of 12 months** from the date of commissioning. The guarantee for spares should be coincident with the guarantee for erected equipment.

b) For the period of guarantee the contractor have an experienced Engineer and necessary equipment to attend to any defective installation resulting from defective erection and/or

defects in the equipment supplied by the contractor. This engineer shall not attend to rectification of defects which arise out of normal wear and tear and come within the purview of routine maintenance work. The Contractor shall bear the cost of modifications, additions or substitution that may be considered necessary due to faulty material, design or workmanship for the satisfactory working of the equipment. The final decision shall rest with the Sr.Divisional Electrical Engineer, Southern Railway, Madurai or his representative.

c) During the period of Guarantee/Warranty the contractor shall be liable for the replacement at site of any parts which may be found defective in the fittings & Components, arising from faulty design, materials, workmanship or negligence in any manner in the part of the contractor provided always that such replaced items are promptly returned to the contractor if so required by him at his (contractor's) own expenses. In case of type defects in contractor's equipment and components detected during guarantee period, contractor shall replace all such items irrespective of the fact whether all such cost of repairs carried out on his behalf by the purchaser at site. In such a case, the contractor shall be informed in advance of the works proposed to be carried out by the purchaser.

d) If it becomes necessary for the contractor to replace or renew any defective portion of the fittings or components under the para aforesaid then the provision of the said para shall also apply to the portions of the fittings & components so replaced and renewed until the expiry of six months from the date of such replacement or of renewal or until the end of the above mentioned period, whichever is later. Such extension shall not apply in case of defects of a minor nature the decision of the Sr.Divisional Electrical Engineer /General, Southern Railway, Madurai or his successor/nominee being final in the matter. If any defect be not remedied within a reasonable time during aforesaid period the purchaser may proceed to do the work at the contractor's risk, and expense, but without prejudice to any other rights and remedies which the purchaser may have against the contractor in respect of such defects or faults.

e) Any materials, fitting or components supplied shall also be covered by the provisions of this paragraph. The liability of the contractor under the guarantee/warranty will be limited to re-supply of equipments, components and fittings.

Such re-supply shall be effected at the contractor's depot or in the event of closure of the depot at the stores depot of the Engineer-in-charge of maintenance of overhead equipment of the section covered by the contract.

f) In the case of materials, components, fittings and equipments supplied by the purchaser, no liability will rest on the contractor for failures on account of defective materials or workmanship and for any consequential damages. Such defective materials if not yet erected on line will be returned by the contractor to the purchaser and quantities will be considered for the purpose of final reconciliation over and above allowance.

Chapter –4

SCHEDULE OF WORK

SW-A- Electrical power supply arrangements

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535 (	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
1	Excavation of trench and refilling in all kinds of soil as per specifications and drawing enclosed.	cum	180	318	400	898	448	402304
2	Excavation of trench and refilling across road, track/concrete flooring as per specification	cum	12	6	75	93	899	83607
3	Demolishing plain cement concrete including disposal of material within 50m. including tools &plant labour etc., and as per instruction of site Engineer in charge.	cum	3	5	45	53	629	33337
4	Demolishing Reinforced Cement Concrete work with the utilization of pavement breaker and disposal of unserviceable material within 50m lead	cum	8	-	-	8	1852	14816

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535 (	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
5	Providing and laying of Plain Cement Concrete by mixing of 1:3:6 including supply of cement, sand and coarse aggregate etc and tools & plant labour etc. and as per the instruction of site Engineer in charge and as required at site.	cum	11	5	45	61	4703	286883
6	Laying/Drawing and testing of LTUG power cable of up to and including 50 sqmm size complete with required tools & accessories.	metre	700	955	1800	3455	26	89830
7	Laying/Drawing and testing of LTUG Power cable of above 50 sqmm and up to and including 185 sq.mm size complete with accessories.	metre	400	-	-	400	47	18800
8	Provision of Horizontal boring underneath railway tracks to suit insertion of HDPE Pipe of 110mm dia at a depth of 1,50 below the ground level including laying of HDPE pipes by mechanized means as per specifications. HDPE Pipes only will be supplied by Railways.	m	500	-	-	500	2820	1410000

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535 (	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
9	Supply and termination and connection of LTUG cable of sizes of up to and including 50 sqmm size with single flange type brass cable gland aluminium tube terminal type crimping sockets.Note: One termination comprises of one number of single flange type brass cable gland and with four numbers of aluminium crimping sockets for all cores of the cable.	Set	12	16	34	62	442	27404
10	Supply and termination and connection of LTUG cable of sizes above 50sqmm but up to and including 185 sqmm with aluminium crimping sockets and single flange type brass cable gland. Note: One termination comprises of one number of single flange type brass cable gland and with four numbers of aluminium crimping sockets for all cores of the cable.	set	4	-	-	4	751	3004
11	Supply and fixing of medium duty GI pipe of 50 mm dia, conforming to IS.1239,part 1 (2004) ,for cable leading without clamp.	metre	30	38	76	144	939	135216
12	Supply and fixing of 'B' Class GI pipe 100 mm Diameter for cable leading/ Protection.	m	10	-	-	10	807	8070
13	Supply and provision of sealing compound for cable leading pipe for leading of power cables of upto and including 50sqmm size.	No	12	14	34	60	98	5880

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535 (	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
14	Supply and provision of sealing compound for cable leading pipe for leading of cable of above 50 sqmm but up to and including 185 sqmm.	No	4	-	-	4	131	524
15	Supply, placing of cast iron cable route indicators, cast iron plate type including MS flat size 40mm x 6mm x 350mm length concreting and coping, painting etc complete with all other accessories as per drawing No: CEE/CN/MS/11-2004	No	20	22	32	74	613	45362
16	Fabrication, supply and fixing of clamps made out MS flats of different sizes for fabrication of clamps for various requirements. This shall be made use for fixing of items indicated in the note below. The clamp shall be made out of MS flat of suitable size, painted with two coats in each of zinc chromate and grey enamel paint or suitable colour as instructed by the Engineer in charge and using GI bolts with nuts of suitable size for fixing. Note: This shall be made use for fixing of items such as UG cables, cable leading pipe,'U' brackets for shelter mains, enclosures made out of 16 SWG sheet steel contemplated elsewhere and cable tray etc.	KG	20	9	35	64	137	8768
17	Fabrication, supply and fixing of cable looping box with aluminium bus bars as per drawing No: DRM/EL/TPJ-10-2015.	No	6	4	9	19	8548	162412

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535 (	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
18	Erection of cut rail post upto and including 5.5 feet height with foundation and accessories like base plate, including supply of two coats of each Zinc chromate primer, aluminium paint as per drawing no. CEE/CN/MS/20-2004.	No	6	4	8	18	2271	40878
19	Laying of HDPE pipes of sizes upto and including 63mm dia with required couplers.	metre	700	915	1710	3325	32.00	106400
20	Laying of HDPE pipes of all sizes above 63mm Dia required couplers.	metre	400	-	-	400	61.00	24400
21	Supply and laying of 6 SWG GI wire	metre	1100	980	1650	3730	23	85790
22	Supply and installation of MS exhaust piping of following sizes thermally insulated with 50mm thick fibre glass insulation with chicken mesh lagging and 24SWG aluminium cladding including MS supports, hardwares etc. 200mm dia-2.6mm thick	m	15	-	-	15	7500	112500
23	Supply, erection, testing and commissioning of LT Panel consisting of **Incoming** 250A FP 25kA TM Based MCCB - 1 No .(DG INCOMER) 250A FP 25kA TM Based MCCB - 1 No.(EB INCOMER) Electromechanical Interlocking System. **Metering** RYB Indication Lamp with 6A SP MCB - 2 Set	Set	1	-	-	1	273000	273000

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535 (	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
	MFM Meter,2 No. 250/5A,15VA CL:1 CRCT - 6 Nos. MCCB ON/OFF/TRIP Accessories - 2 Set **Outgoings** 100A FP 25kA MCCB - 2 Nos. 63A FP 25kA MCCB - 8 Nos. Busbar 250A FP CU. Busbar							
24	Supply, erection and testing of earthing arrangements to drawing No: CEE/CN/MS/16-2004 also necessary Continuity wire of 6 SWG, GI wire, average 5 meters length and connection from earth electrode to the main distribution board/post/ installation. The earth value should be well below the value as per relevant I.E. Rules and IS specifications and mentioned elsewhere in the schedule, when measured independently.	No	21	16	25	62	6689.00	414718
	Sub Total				0			3793903

SW B: Provision of Electrical Pumping Arrangements

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
1	Supply of 3 phase, 15 HP open well submersible motor with pump, vertical type, outlet pipe dia: 100mm, Head 30-40 m,Cast iron impler and copper rotor . Delivery : 1600-1800 at head of 30m and Delivery approximately 1000 LPM at head of 40m., suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year	No	1	-	2	3	57348.00	172044
2	Supply of 3 phase, 30 HP openwell submersible motor with pump, vertical type, outlet pipe dia: 150mm, Head 30-40 m,Cast iron impler and copper rotor . Delivery : 2800-3000 at head of 30m and Delivery approximately 2000 LPM at head of 40m., suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year	no	4	-	-	4	97586.00	390344

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
3	Erection, testing and commissioning of 30 HP Open well submersible new pump assembly complete including consumables, tools and equipments. After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, GI Pipe, GI bend, GI coupler, GI flange, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).	no	4	-	-	4	15600.00	62400
4	Supply of 3 phase, 10 HP openwell submersible motor with pump, vertical type, outlet pipe dia: 100mm, Head 20-40 m,Cast iron impler and copper rotor . Delivery : 1200-1400 at head of 20m and Delivery approximately 700 LPM at head of 40m., suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year	no	3	-	-	3	48380.00	145140

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
5	Erection, testing and commissioning of 10 HP Open well submersible new pump assembly complete including consumables, tools and equipments. After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, GI Pipe, GI bend, GI coupler, GI flange, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).	no	3	-	-	3	13000.00	39000
6	Supply of 3 phase, 6 HP borewell submersible motor with pump, , Diameter of pump is 100mm, output mouth of pump is 40mm.suitable to work on Head of 175-225 m, . Delivery approximately 75-45 LPM at head of 175-225m., Impeller Noryal/SS, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year	no	-	2	-	2	43542.00	87084

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
7	Supply of 3 phase, 5 HP borewell submersible motor with pump, , Diameter of pump is 100mm, output mouth of pump is 40mm.suitable to work on Head of 100-180 m, . Delivery approximately 75-30 LPM at head of 180-100m., Impeller Noryal/SS, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year	no	-	2	-	2	32450.00	64900
8	Supply of 3 phase, 7.5 HP openwell submersible motor with pump, vertical type, Head 20m-40 m,Cast iron impler and copper rotor Delivery approximately 800 LPM at head of 30m, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB, KMP with test certificate and Minimum warranty period of 1 Year	no	4	2	-	6	43542.00	261252
9	Erection , testing and commissioning of 6/7 HP , 100mm dia, borewell pump set upto depth of 250m including borewell cover, consumable materials etc.	Set	-	4	-	4	15458.00	61832
10	Erection , testing and commissioning of 5 HP , 100mm dia, borewell pump set upto depth of 180m including borewell cover, consumable materials etc.	set	-	2	-	2	11210.00	22420

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
11	Supply of 3 phase, 5 HP open well submersible motor with pump, vertical type, Head 20m-40 m, Cast iron impler and copper rotor Delivery approximately 600 LPM at head of 30m, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB, KPM with test certificate and Minimum warranty period of 1 Year	no	4	-	-	4	29417.00	117668
12	Supply of Automatic Star-Delta Control panel board suitable 30 Hp open well submersible pump set consisting of 63 - 75Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 40A-50A (adjustable) BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, tank full cut off, Automatic restart, Auto/manual mode, sensor, float switches, copper probes or conductive sensors, Timer, etc. 0-500V voltmeter, 0-63 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 8 sq mm flexible copper cable. Minimum warranty period of 1 Year	no	5	-	-	5	40100.00	200500
13	Erection, testing and commissioning of control panel for 30hp Pump	no	4	-	-	4	1500.00	6000

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
14	Erection, testing and commissioning of 15 HP Open well submersible new pump assembly complete including consumables, tools and equipments. After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, GI Pipe, GI bend, GI coupler, GI flange, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).	No	1	-	2	3	15600	46800
15	Supply of Automatic Star-Delta Control panel board suitable 15 Hp open well submersible pump set consisting of 32-40Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 20A-30A (adjustable) BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, tank full cut off, Automatic restart, Auto/manual mode, sensor, float switches, copper probes or conductive sensors, Timer, etc. 0-500V voltmeter, 0-63 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 6 sq mm flexible copper cable. Minimum warranty period of 1 Year	No	3	-	2	5	31000.00	155000

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
16	Erection, testing and commissioning of control panel for 15 hp Pump	No	1	-	2	3	1500.00	4500
17	Erection, testing and commissioning of control panel for 10 hp Pump	no	2	-	-	2	1500.00	3000
18	Supply of Automatic Star-Delta Control panel board suitable 10 Hp open well submersible pump set consisting of 32-40 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 14A - 22A (adjustable) BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, tank full cut off, Automatic restart, Auto/manual mode, sensor, float switches, copper probes or conductive sensors, Timer, etc. 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 6 sq mm flexible copper cable. Minimum warranty period of 1 Year	No	3	-	-	3	21900.00	65700

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
19	Supply of Automatic Star-Delta Control panel board suitable 7.5 Hp open well submersible pump set consisting of 32 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 13A to 20A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year	No	4	2		6	21900.00	131400
20	Erection, testing and commissioning of control panel for 7.5 hp Pump	no	2	2	-	4	1500.00	6000

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
21	Supply of Automatic Star-Delta Control panel board suitable 7.5 Hp borewell submersible pump set consisting of 32 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 13A to 20A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year	no	-	2	-	2	29000.00	58000
22	Supply of Automatic DOL Control panel board suitable 6 Hp bore well submersible pump set consisting of 25 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 7A to 10A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year	no	-	2	-	2	17479.00	34958

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
23	Erection, testing and commissioning of control panel for 6 hp Pump	no	-	2	-	2	2000.00	4000
24	Supply of 3 phase, 7.5 HP borewell submersible motor with pump, , Diameter of pump is 100mm, output mouth of pump is 40mm.suitable to work on Head of 190-240 m, . Delivery approximately 75-45 LPM at head of 190-240m., Impeller Noryal/SS, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year	no	-	2	-	2	47790.00	95580
25	Supply of 3 phase, 7.5 HP open well submersible motor with pump, vertical type, Head 20m-40 m, Cast iron impler and copper rotor Delivery approximately 800 LPM at head of 30m, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB, KMP with test certificate and Minimum warranty period of 1 Year	No	-	-	4	4	43542.00	174168

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
26	Erection, testing and commissioning of 7.5 HP Open well submersible new pump assembly complete including consumables, tools and equipments and After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, HDPE Pipe, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).	No	4	2	4	10	13000.00	130000
27	Supply of 3 phase, 5 HP open well submersible motor with pump, vertical type, Head 20m-40 m, Cast iron impler and copper rotor Delivery approximately 600 LPM at head of 30m, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB, KPM with test certificate and Minimum warranty period of 1 Year	No	-	-	6	6	29417	176502

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
28	Erection, testing and commissioning of 5 HP Open well submersible new pump assembly complete including consumables, tools and equipments . After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, HDPE Pipe, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).	No	4	-	6	10	10400	104000
29	Supply of Automatic DOL Control panel board suitable 5 Hp open well submersible pump set consisting of 25 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 7A to 10A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year	No	4	2	6	12	17479	209748

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
30	Erection, testing and commissioning of control panel for 5 hp Pump	No	2	2	6	10	1000	10000
31	Supply of 3 phase, 5 HP borewell submersible motor with pump, , Diameter of pump is 100mm, output mouth of pump is 40mm.suitable to work on Head of 100-180 m, . Delivery approximately 75-30 LPM at head of 180-100m., Impeller Noryal/SS, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year	No	-	-	12	12	32450	389400
32	Erection , testing and commissioning of 5 HP , 100mm dia, borewell pump set upto depth of 180m including borewell cover, consumable materials etc.	set	-	-	12	12	11210.00	134520
33	Erection, testing and commissioning of 3 HP Open well submersible new pump assembly complete including consumables, tools and equipments After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, HDPE Pipe, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).	no	2	-	-	2	9100.00	18200

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
34	Supply of Automatic Star-Delta Control panel board suitable 7.5 Hp open well submersible pump set consisting of 32 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 13A to 20A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year	No	-	-	4	4	21900.00	87600
35	Erection, testing and commissioning of control panel for 7.5 hp Pump	No	-	2	4	6	1500.00	9000

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
36	Supply of Automatic DOL Control panel board suitable 5 Hp bore well submersible pump set consisting of 25 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 7A to 10A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year	No	-	-	11	11	17479	192269
37	Erection, testing and commissioning of control panel for 5 hp Pump	No	0	-	11	11	2000	22000
38	Supply, erection, testing and commissioning of 150mm Dia B class GI pipe for 30HP open well submersible pump	metre	20	-	-	20	1625	32500
39	Supply, erection, testing and commissioning of 150mm Dia B class GI Bend	no	2			2	4940	9880
40	Supply, erection, testing and commissioning NRV for 63 mm Dia pipe.		-	2	4	6	2990	17940

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
41	Supply, erection, testing and commissioning of 150mm Dia B class GI Coupler	no	2	-	-	2	1690	3380
42	Supply, erection, testing and commissioning of 150mm Dia B class GI Flange	no	2	-	-	2	1690	3380
43	Supply, erection, testing and commissioning NRV for 150mm Dia B class pipe.	no	2	-	-	2	23400	46800
44	Supply, erection, testing and commissioning NRV for 63 mm Dia pipe.	no	4	-	-	4	2990	11960
45	Supply, erection, testing and commissioning NRV for 50 mm Dia pipe.	no	4	-	-	4	2600	10400
46	Supply, erection, testing and commissioning of brass gate valve suitable for 150mm Dia GI pipe.	no	1	-	-	1	19500	19500
47	Supply, erection, testing and commissioning of brass gate valve suitable for 50 mm Dia pipe.	no	4	-	-	4	5590	22360
48	Supply, erection, testing and commissioning of HDPE pipe of 75 mm Dia PN 6, PE- 100 as per IS:4894.in coil	no	80	-	-	80	214.5	17160
49	Supply, erection, testing and commissioning of HDPE pipe of 40 mm Dia PN 6, PE- 100 as per IS:4894 in coil	no	40	-	-	40	114.4	4576

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
50	Supply, erection, testing and commissioning pressure gauge 0-16 bar suitable for 150mm Dia GI pipe.	no	1	-	-	1	15600	15600
51	Supply, erection, testing and commissioning pressure gauge 0-8 bar suitable for 50mm Dia water pipe.	no	2	-	-	2	3900	7800
52	Supply, erection, testing and commissioning NRV for 100mm Dia B G.I class pipe.	No	-	-	2	2	4130	8260
53	Supply, erection, testing and commissioning pressure gauge 0-10 bar suitable for 63mm Dia water pipe.	No	1	2	4	7	4160	29120
54	Supply, erection, testing and commissioning of brass gate valve suitable for 100mm Dia GI pipe.	No	-	-	2	2	8496	16992
55	Supply, erection, testing and commissioning of brass gate valve suitable for 63 mm Dia pipe.	No	1	2	2	5	5590	27950
56	Supply, erection, testing and commissioning of HDPE pipe of 100 mm Dia PN 6, PE- 100 as per IS:4894.in coil	m	-	-	80	80	483.8	38704

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
57	Supply, erection, testing and commissioning ofHDPE pipe of 63mm Dia PN 6, PE- 100 as per IS:4894 in coil	Metre	100	100	120	320	169	54080
58	Supply, erection, testing and commissioning of HDPE pipe of 50 mm Dia PN 6, PE- 100 as per IS:4894 in coil	Metre	40	-	150	190	143	27170
59	Supply and fixing of 25mm dia nylon rope	Metre	500	100	470	1070	29.5	31565
60	Supply and wiring including termination by 3 Core 10 Sq.mm PVC insulated flexible submersible copper Flat cable conforming to IS. No: 694, 1100 V grade as directed by the Engineer in charge at site.	m	100	-	100	200	442	88400
61	Supply and wiring including termination by 3 Core 6 Sq.mm PVC insulated flexible submersible copper Flat cable conforming to IS. No: 694, 1100 V grade as directed by the Engineer in charge at site.	m	200	100	100	400	286.74	114696
62	Supply and wiring including termination by 3 Core 4 Sq.mm PVC insulated flexible submersible copper Flat cable conforming to IS. No: 694, 1100 V grade as directed by the Engineer in charge at site.	m	100	1500	2360	3960	169	669240

Sl No	Description	Unit	Estimate No. U/E/Est/CE-2535	Estimate No. U/E/Est/CE-2536	Estimate No. U/E/Est/CE-2539	Total Qty	Rate	Total
63	Supply and wiring including termination by 2 Core 1 Sq.mm PVC insulated flexible submersible copper Flat cable conforming to IS. No: 694, 1100 V grade as directed by the Engineer in charge at site.	m	100	1500	2060	3660	33.99	124403
64	Supply of UPVC pipe of 1 ½" size with coupler type and pressure carrying capacity of 26 kg/cm2 . Preparable make: Ashirwad , KMP, Finolex, pipe with RED colour stip. Each pipe of 3m length.	No	-	285	410	695	560.5	389548
65	Supply of 18 mm Nylon Rope	m	-	1400	1200	2600	11.8	30680
66	Supply of MS 1 ½" Borewell clamp	No	-	6	11	17	483.8	8225
67	Supply of 1 ½" Borewell Adopter	set	-	6	11	17	483.8	8225
68	Supply of 1 ½" G.I coupler and Bend	set	-	6	11	17	743.4	12638
	Sub Total							5796060

Overall tender value

S.No	Item No.	Amount
1	SW I	3793903
2	SW II	5796060
		9589963

Chapter – 5

EXPLANATORY NOTES FOR SCHEDULE OF WORK

Scope of the work is providing power supply arrangements and provision of Electrical submersible open well & bore well pumps along with starter arrangements at ,Vanchi Maniyachi junction, Tirunelveli, Kovilpatti, Tuticorin, Manamadurai, Aruppukkottai, Madurai, Virudhunagr, Rajapalayam, Tiruparankundram, Tirumangalam, Sattur, Sivakasi and srivilliputur Railway stations in Madurai division.

SW-A- Power supply Arrangements.

1	The earth for cable trench shall be excavated in all kinds of soil and obstructions in the way of cable trench shall also be removed. The route will be marked by the Railway representative. The cable trench shall be as per drawing No: U/E/DRG-1901. The excavated earth should be filled back duly ramming for consolidation throughout the length of cable trench.
2	The earth for cable trench shall be excavated in concrete flooring/Road/Track and obstructions in the way of cable trench shall also be removed. The route will be marked by the Railway representative. The cable trench shall be as per drawing No. U/E/DRG-1901. The excavated earth should be filled back duly ramming for consolidation throughout the length of cable trench
3	Demolishing plain cement concrete including disposal of material within 50m. including tools &plant labour etc., and as per instruction of site Engineer in charge.
4	Demolishing Reinforced Cement Concrete work with the utilization of pavement breaker and disposal of unserviceable material within 50m lead
5	Providing and laying of Plain Cement Concrete by mixing of 1:3:6 including supply of cement, sand and coarse aggregate etc and tools & plant labour etc. and as per the instruction of site Engineer in charge and as required at site.
6&7	Drawing of LTUG cables of size mentioned in schedule in the existing HDPE pipe already laid in the excavated cable trench duly pulling the cable from drum / loose coil, manually. (Only cable will be supplied by Railways). **Cable laying.** Cable installation shall include power, control lighting cables. These shall be laid in trenches, cable trays, conduits, trunkings etc., as more detailed in the drawings. Cable routing given on the layout drawings shall be checked in the field so as to avoid interference with structures, heat sources, drains, piping, air-conditioning duct etc. The quantities, sizes and types of which are indicated in Bill of Quantity / cable schedule. However, any change in routing shall be done to suit the field conditions wherever deemed necessary, after obtaining approval of the Engineer-in-charge. Sufficient care shall be taken while laying cables to avoid formation of twist, sharp bend etc. in order to avoid mechanical injuries to cables. Rollers shall be used for pulling of power cables. Cable installation shall provide minimum cable bending radii as recommended by manufacturer. However, the bending radius for various types of cables shall not

be less than those specified below, unless specifically approved.

Type of cable	Single core	Multi core
Unarmoured	10 times the outer diameter of cable	10 times the outer diameter of cable
Armoured	15 times the outer diameter of cable	12 times the outer diameter of cable

Cables as far as possible shall be laid in full uncut length from one termination to the other, without any straight through joints.

Cables shall be neatly arranged in the trenches / trays in such a manner that criss-crossing is avoided and final take off to the motor / switchgear is facilitated. Arrangement of cables within the trenches / trays shall be the responsibility of the contractor. Cable routing between cable trench and equipment/motors shall be taken through GI pipe sleeves of adequate size. Pipe sleeves shall be laid at an angle of maximum 450 to the trench wall. In case of larger diameter cables i.e. 50 mm and above. Adequately sized pipe with larger bending radius shall be provided for ease of drawing of cable. In places where it is not possible, cables shall be laid in smaller branch trenches.

All cables shall be identified close to their termination point by cable numbers as per cable schedule. Cable tag numbers shall be punched on aluminum straps (2mm thick, 20 mm wide) securely fastened to the cable and wrapped around it. Alternatively, cable tags shall be circular in construction.

Each underground cable shall be provided with identity tags of lead securely fastened every 30 m of its underground length with at least one in the end trench before the cable enters / leaves the ground. In unpaved areas, cable trenches shall be identified by means of markers as per standard drawing. These cable markers shall be placed at location of changes in the direction of cables and at intervals of not more than 25 m and at cable joint locations.

All temporary ends of cables must be protected against dirt and moisture to prevent damage to the insulation. For this purpose, ends of cables shall be taped with approved PVC end cap or rubber insulating tape.

Each row of cables shall be laid in place and before covering with sand, every cable shall be tested for an insulation test in presence of the Engineer -in-charge. Any cable which proves defective shall be replaced before the next group of cables is laid.

Where cables pass through foundation walls or other underground structures, the necessary ducts or openings shall be provided in advance for the same. However, should it become necessary to cut holes in existing foundations or structures, the electrical contractor shall determine their location and obtain approval of the Engineer-in-charge before cutting is done.

At road crossings cables shall be taken through ERC (Electrical Road Crossing) consisting of required number of 150 mm diameter RCC/PVC/HDPE pipes or through CTC (Cable Tray Culvert) or through pipe culvert in trays as specified in layout drawings. Also, at road crossing and other places where cables enter

	pipe sleeves adequate bed of sand shall be given so that the cables do not slack and get damaged by pipe ends. Wherever cable trench crosses storm water waste channel / drain, cables shall be taken through PVC/RCC/HDPE pipes. Where cables are required to cross drains of depth more than 1200 mm, cables shall be taken over the drain on cable trays supported suitably using ISMC 150/200 sections. Ends of cables leaving trench shall be coiled and provided with protective cover till such time the final termination to the equipment is completed.
8	Provision of Horizontal boring underneath railway tracks to suit insertion of HDPE Pipe of 110mm dia at a depth of 1,50 below the ground level including laying of HDPE pipes by mechanized means as per specifications. HDPE Pipes only will be supplied by Railways.
9 to 10	Supply of cable termination kit consisting of single flange type brass cable gland and 4 numbers of aluminium crimping sockets. And termination and connection of LTUG cable of sizes mentioned in schedule with single flange type brass cable gland aluminium tube terminal type crimping sockets. Note: One termination comprises of one number of single flange type brass cable gland and with four numbers of aluminium crimping sockets for all cores of the cable. **Cable Termination** Termination shall be done by using compression type lugs in accordance with the manufacturer's instruction. Termination and connection shall be made in such a manner, so as to avoid strain on terminals. Cable termination at the equipment end shall be carried out by the following methods. a. Power cables up to 120 sq. mm : crimping (manual) b. Power cables above 120 sq. mm : crimping (hydraulic) c. Control cables : crimping (manual) For cables up to 120mm2, each lug shall be crimped at minimum two places. For cables above 120mm2, each lug shall be crimped at minimum three places. Lugs provided shall be suitable for hydraulic crimping. All PVC cables of 1. 1 KV grade shall be terminated at the equipment by means of compression type cables glands suitable for the cable size. They shall have a screwed nipple with conduit electrical threads and check- nut. All cable entries for outdoor termination shall be preferably through bottom. Outdoor cable termination through top of equipment shall not be permitted. Power cables wherever colour coding is not available, shall be identified with red, yellow and blue PVC tapes. Where copper to aluminium connections are made, necessary bimetallic washers shall be used. For trip circuit identification, additional red ferrules shall be used only in the particular cores of control cables at the termination points in the switchgear / control panels and control switches. In case of control cables, all cores shall be identified at both ends by their

	terminal numbers by means of PVC ferrules suitable for core size. Wire numbers shall be as per schematic / wiring/inter-connection diagram. All unused spare cores of control cables shall be neatly punched and ferruled with cable tag at both ends for future use. Contractor shall drill holes for fixing cable glands wherever necessary. Gland plate shall be of nonmagnetic material/ aluminium sheet in case of single core cables. All unused cable entries on equipment/panels shall be plugged / sealed. The cable shall be terminated at electrical equipment through glands of proper size. The individual cores shall then be dressed and taken along the cables ways or shall be fixed to the panels with polyethylene straps. The cable glanding shall be done as per manufacturer's instructions. Cable armour shall not be exposed after termination is complete. In case of termination of cables at the bottom of a panel over a cable trench having no access from the bottom close fit holes shall be drilled in the gland plate for all the cables in one line. Then, gland plate shall be split in two parts along the centre line of holes. After fixing bottom plate, uncovered cable holes/gaps shall be sealed with cold setting' compound. Crimping of lugs to cable leads shall be done by hand crimping / hydraulically operated tool as per requirement. Insulation of the leads shall be removed before crimping. Conductor surface shall be cleaned and shall not be left open. Suitable conducting jelly shall be applied on the conductor lead. Lugs shall enclose all strands of cable core. Cutting of strands shall not be allowed. The contractor shall bring to the notice of the Engineer-in-charge any mismatch in cable glands, lugs provided with the equipment vis-à-vis to the cable size indicated in the cable schedule for taking corrective action. The jointing and termination of medium voltage power cables shall be carried out by trained personnel only. Jointing and termination of high voltage cables shall be done by skilled and experienced jointer duly approved by the Engineer- in-charge. Only type tested termination kits of approved make shall be used. No unauthorized repairs, modifications shall be carried out in the hazardous area equipment terminal box and junction box. Damaged enclosures of hazardous area equipment shall be brought to the notice of the Engineer-in-charge by contractor- After termination is complete, all the bolts, nuts, hardware of terminal box shall be properly placed in its position and tightened. Where required, cable sealing boxes intended to be used with the apparatus shall be filled with solid setting type bituminous compound unless otherwise specified.
11	Supply and fixing of medium duty GI pipe of 50 mm dia, conforming to IS.1239,part 1 (2004) ,for cable leading without clamp.

12	Supply and fixing of 'B' Class GI pipe 100 mm Diameter for cable leading/ Protection . without clamp
13	Supply and provision of sealing compound for cable leading pipe for leading of power cables of upto and including 50sqmm size.
14	Supply and provision of sealing compound for cable leading pipe for leading of cable of above 50 sqmm but up to and including 185 sqmm.
15	Supply, placing of cast iron cable route indicators, cast iron plate type including MS flat size 40mm x 6mm x 350mm length concreting and coping, painting etc complete with all other accessories as per drawing No: CEE/CN/MS/11-2004
16	Fabrication, supply and fixing of clamps made out MS flats of different sizes for fabrication of clamps for various requirements.This shall be made use for fixing of items indicated in the note below. The clamp shall be made out of MS flat of suitable size,painted with two coats in each of zinc chromate and grey enamel paint or suitable colour as instructed by the Engineer in charge and using GI bolts with nuts of suitable size for fixing. Note: This shall be made use for fixing of items such as UG cables, cable leading pipe,'U' brackets for shelter mains, enclosures made out of 16 SWG sheet steel contemplated elsewhere and cable tray etc.
17	Fabrication, supply and fixing of cable looping box with aluminium bus bars as per drawing No:DRM/EL/TPJ-10-2015.
18	Erection of cut rail post upto and including 5.5 feet height with foundation and accessories like base plate, including supply of two coats of each Zinc chromate primer, aluminium paint as per drawing no. CEE/CN/MS/20-2004.
19	Laying of PN-6, PE 63 grade HDPE pipe of all size including and upto 63mm dia in the excavated trench. The actual length of the HDPE pipe laying shall be measured after preparing the location drawing and finalizing the cable route.. For jointing the HDPE pipes wherever required suitable, ISI marked PVC coupling of suitable rating/ suitable MS coupler shall be used and both the pipes shall be joined together firmly with suitable solvent/ hardware. No Extra payment will be admissible for supply and fixing the PVC/ MS couplings. The rate offered shall be inclusive of all the cost of labour required for uncoiling and laying the HDPE pipe at site.
20	Laying of PN-6, PE 63 grade HDPE pipe of all size above 63mm dia in the excavated trench. The actual length of the HDPE pipe laying shall be measured after preparing the location drawing and finalizing the cable route.. For jointing the HDPE pipes wherever required suitable, ISI marked PVC coupling of suitable rating/ suitable MS coupler shall be used and both the pipes shall be joined together firmly with suitable solvent/ hardware. No Extra payment will be admissible for supply and fixing the PVC/ MS couplings. The rate offered shall be inclusive of all the cost of labour required for uncoiling and laying the

	HDPE pipe at site.
21	Supply and laying of 6 SWG GI wire for earth continuity, GI wire should be drawn in Already laid HDPE pipe along with LTUG cable including termination / Laid in the ground for earth Continuity between Electrical installation and Earth pit as directed by senior section Engineer In-charge.
22	Supply and installation of MS exhaust piping of size 200mm dia, 2.6mm thick, thermally insulated with 50mm thick fibre glass insulation with chicken mesh lagging and 24SWG aluminium cladding including MS supports, hardwares etc.
23	Specification for LT Panel (Design, fabrication, supply, erection, testing and commissioning of following cubicle type fully compartmentalized LT switch boards dust tight and vermin proof, fabricated out of 16SWG CRCA sheet, chemically treated and Powder Coated using 7 tank treatment of approved shade. The switchboard should have a set of suitably rated TPN busbar using electrolytic grade conductors with specified size, current and fault level, insulated with heat shrinkable, colour coded PVC sleeves and supported using DMC/SMC supports. The design should be as per the CEIG standarads of the Tamilnadu Electrical Inspectorate. Name plate of panels/DBs danger boards, incoming & outgoing feeders with ampere rating of switches/ACB/MCCB/MCB to be fixed on the front door above or below the respective switches. All ACB/MCCB's shall have O/C, S/C releases and extended rotary handle. Note: The Panel Fabricator must have CPRI Certification, All Feeders Above 100A should be provided with ON, OFF , TRIP INDICATIONS, RYB INDICATIONS and MFM Meter with RS485 Communication Port.) Construction of LT panel The Medium Tension Main Distribution Board shall be of cubicle type, sheet-steel totally enclosed, compact construction completely dust, weather and vermin proof, floor-mounting type, fabricated from 16 SWG MS CRCA sheet, fully compartmentalized design, individual switches mounted on sheet-steel base plate which is fixed to the frame in compartments. Each compartment should have a hinged door in the front. Each feeder switch shall be front operated type and interlocked with the respective compartment door in such a way that the door cannot be opened unless the switch is in the 'OFF' position. Neoprene rubber gaskets shall be used to make the MTMDB perfectly weather & insect proof. The panel board should be Powder Coated using 7 tank treatment of approved shade. Cable entries shall be made from the top/bottom of the Control Panel with suitable base plates. For fixing of individual cable glands suitable resting plates shall be provided but no cable glands need be supplied. Internal connection to switches should be only with electrolytic copper flats / rods of adequate cross section to carry

the rated current as per the current density requirement given elsewhere in this specification. For internal wiring for instrumentation, signaling and protection and control circuits etc use cables of 660V grade PVC insulated, multi stranded copper conductors. The sizes of wires shall be as follows:

(i) For controls and signaling : 1.5 Sqmm for internal wiring.
2.5 Sqmm for external cabling.

(ii) For C.Ts. : 2.5 Sqmm for internal wiring.
4.0 Sqmm for external cabling.

Necessary provision should exist in the Main Distribution Board for earthing. A minimum of two earthing arrangements should be ensured per board. Whenever such connections are made soldered brass lugs or crimped copper lugs of appropriate size and brass GI bolts and nuts should be used. Suitable notification 'DANGER-440V' shall be written on the MDB as approved by the Engineer-in-Charge in Red or any other approved paint. Also for the sake of easy and correct operation of switches mark the ON and OFF positions with suitable double headed arrows. The bus bars should be of electrolytic grade and continuous current rating of bus bars should be such that the current density shall not exceed 1.5 Amps / sqmm. Neutral bus bars shall also be of the same rating as that of phase bus bar. The short time rating of electrolytic bus bars should be 50 kA at 415V for 1 second, temperature rise should not be more than 40º C over 45º ambient. Bus bar clearance should not be less than 50 mm clear for phase and neutral bus bars. Earth buses should also be of electrolytic copper bus bars of 25 mm X 6 mm size.

Approximate size of the conventional panel board with only switches shall not exceed 2500 mm long, 450 mm width and 2400 mm height (of which 75 mm height is of bottom channel, 225 mm dummy bottom mounting chamber to ensure handle of the bottom most rows is at a convenient height and 1800 mm is the height of switches cubicle and 300 mm height of horizontal bus bar chamber on the top). If the switch configuration of the panel does not permit to hold the length of the panel within 2500 mm, the same shall be splited into more than one panel, but yet allowing it to be assembled as one at site duly extending horizontal bus bars. Also, if indicated in the schedule to supply the panel as more than one unit, the same shall be complied with.

NOTE:

1. Electrical clearances to be maintained as regards to design, fabrication and installation of switch gears and MT MDB should be strictly as per I.E. Rules, 1956 latest edition.

2. The governing IS Specifications are:

a) Electrolytic copper bars and marking arrangements : IS. No: 375.

b) Measuring Instruments : IS. No: 1248.

c) Current Transformers : IS. No: 2705.

d) Degree of Protection. : IS. No: 2147.

e) Wiring cables. : IS. No: 694 & 8130.

f) Factory built assemblies of switchgear : IS. No: 8623

g) General Requirements for switch gear and control gear for voltages not exceeding 1000 V : IS. No: 4237.

h) MCCB units : IS 13947 part 2 / IEC-60947-2 or latest i). Heavy duty switches. : IS.No:4064.

j) Potential Transformers : IS. 3156.

All items should conform to relevant IS Specification, latest editions and revisions, if any.

3. The body of the every switch should be connected to the main earth bus with earth flat of sizes indicated elsewhere in the specification.

4. All outgoing switches/MCCB on the cubicle panel should be indicated about the following:

a. Normal ON and OFF positions should be indicated with a double-headed semicircular arrow

b. Load the particular switch controls

c. The Amperage capacity of the switch.

d. Type of the switch like TP, TPN, FP etc.

5. Both ends of the top horizontal bus bar chamber shall be covered with removable sheet metal cover fastened with bolts and nuts so that the bus bars can be extended on either ends whenever required.

6. Technical Literatures / Maintenance Manuals / Operation Instructions and Routine / Test certificates of the Manufacturer of Switchgears should be supplied to Railway.

7. The panel should be supplied with complete accessories so as to make the panel to comply with all the provisions of I.E. Rules irrespective of whether the same is indicated in the Specification or not.

8. All components / requirements should conform to relevant IS Specifications, latest versions.

9. Use SMC / DMC insulators for supporting bus bars.

10. The horizontal and vertical bus bars should be fully covered in their front with FRP sheet of 3 mm thick duly supported using small M.S.Sheet pieces and screws. It shall be clearly marked / painted on these covers with red paint, the following. " DANGER. 440 VOLTS. LIVE BUS BARS ARE AVAILABLE BEHIND. ISOLATE THE INCOMING SWITCH BEFORE THIS COVER IS REMOVED". The same sheet shall also be used for switches for covering of live parts also.

11. Adequate numbers of eyebolts shall be provided for easy transportation of the panel board without any damage.

12. At the bottom shall be provided suitable holes, equal to the numbers of incoming and outgoing switches, to take incoming and outgoing cables of sizes proportionate to the capacities of the switches.

13. Suitable provisions should be made at appropriate locations in the cable alleys for LTUG cables to be neatly wired and placed in positions without any twist in cables.

14. The Board also includes all standard accessories like Bus-bars fixing SMC / DMC insulators, brass and GI bolts and nuts, neoprene rubber gasket wherever necessary to make the Board insect and weather-proof type. Apply heat shrinkable sleeves on all the R, Y and B phase and Neutral buses with Red, Yellow, Blue and Black colours respectively and painting of the earth buses with green paint, screws, washers, hinges, locks, eye bolts etc.

15. The Panel Board should be equipped with all accessories / materials for its proper functioning as described in the foregoing specification even if such accessories are not specifically mentioned.

16. A suitable horizontal dummy chamber shall be provided at the bottom of the panel board to ensure operating height of handles of switches of the bottom most row is at convenient level as per standard. Mounting shall be using a MS channel of 75mmX40mmX3.7 mm size.

17. Current Transformers for metering and control systems should be Resin Cast / PVC moulded type with 5 A secondary rating and of suitable burden and conforming to class 1.0 accuracy.

18. The Contractor should carry out all necessary tests as instructed by the Engineer - in -

Charge, as may be necessary at site and furnish the results to the Engineer - in – Charge and as detailed below elsewhere in the specification.

19. Electrical supply particulars.

- System voltage (Nominal) : 440 V AC
- Number of Phases : 3
- Frequency : 50 c/s
- Neutral earthing : Solidly earthed
- Voltage variation limit on LT side : ± 10%
- Frequency variation limits : ± 3%
- Control supply : 240V. 1 Phase AC /24 V D.C

20. Drawing and documentation.

- All the panels and distribution boards shall be manufactured by panel builders having test certificate from CPRI for short circuit withstand strength on bus bars on their name for at least one panel board.
- The manufacturer shall develop his own general arrangement and schematic drawings showing the main equipment, auxiliary devices and accessories.
- Manufacturer shall submit for approval the single line general arrangement drawings including component list, foundation drawings and control wiring. The approval of general arrangement drawing should be obtained before the fabrication of cubicle is started.

21. Tests to be carried out:

- Tests shall be carried out at manufacturer's works. All routine tests as specified by the applicable standard code shall be conducted.
- In addition, specific tests shall be conducted to check mechanical and electrical operation and switchboard wiring.
- Acceptance tests for these panels shall be as follows.
  a) A general visual check covering measurement of overall dimensions, location, number and type of devices, terminal arrangement connection to terminals, wiring, bus bar supports, etc.
  b) Manual and electrical operation of Switchgear items under the worst conditions of supply voltage and by simulating the conditions.
  c) Continuity test on wiring.
  d) Insulation resistance of the main and auxiliary circuits before and after high voltage test.
  e) High voltage test at 2.5 kV.
  f) For equipment purchased from other sub-suppliers test reports of test carried out at their works shall be submitted.
  g). All testing instruments required to carry out the work shall be arranged by the contractor.

22. Commissioning Check List:

1. Site Inspection and Testing.

The inspection, testing and commissioning procedure shall generally be as follows.

a). Visual Inspection.

This shall be carried out by the site engineer on all items to ensure that the equipment meets the dimensional accuracy and quality requirements laid down in the specification and to ensure that the equipment is not visibly damaged during transportation to the site.

All tests as specified shall be conducted and test results shall be recorded. In addition, following tests shall also be conducted.

b). Earthing.

Measure resistance of each earth pit / rod by isolating the same from station grid as well as from other earth pit/rods and then measure resistance of earth grid.

Check continuity of grid conductors and wires.

Soil resistivity tests.

Earth loop impedance.

c). Insulation Resistance

Insulation resistance tests on all L.V cables, wiring and switch gear.

d). Functional Checking

Polarity checks.

Checks on controls and interlocks.

The testing shall be witnessed by the site engineer and the Railways representative.

Check list of all defects, balance work, malfunctioning of devices etc., shall be tabulated. Such work shall be attended before the final commissioning is carried out.

After the tests are successfully completed, and the installation is inspected and

approved by statutory authorities the equipment can be energized.

REQUIREMENT OF SWITCH GEARS.

This panel shall have one horizontal and vertical bus bar chambers in between every two columns of switches with bus bars of appropriate ratings (as indicated elsewhere), all phase and neutral bus bars in all chambers being of same sizes. Phase and Neutral bus bars of suitable size. The panel board should conform to IP.42 protection class as per relevant latest IS specification.

Incoming

1. 250A FP 25kA TM Based MCCB - 1 No. (DG INCOMER).
2. 250A FP 25kA TM Based MCCB - 1 No.(EB INCOMER).

Metering

RYB Indication Lamp with 6A SP MCB - 2 Set
MFM Meter- 2 No.
400/5A,15VA CL:1 CRCT - 6 Nos.
MCCB ON/OFF/TRIP Accessories - 2 Set

Outgoings

1. 100A FP 25kA TM BASED MCCB - 2 Nos.
5. 63A, FP, 25kA, TM based MCCB- 8 Nos

Busbar

250A FP CU. Busbar
Preferred Make for MCCB: Havells, L&T, ABB, Legrand and Schneider

Check on Circuit Breakers.

- Check name plate details according to specification
- Check for physical damage
- Check tightness of all bolts clamps and connecting terminals.
- Check earth connections.
- Check cleanliness of insulators and bushings if any.
- Check all moving parts are properly lubricated
- Check alignment of breaker trucks for free movement. Check correct operation of shutters.
- Closing/opening operation.

	• Check control wiring for correctness of connections, continuity and IR values. • Motorised / Manual operation of breakers • Power closing/opening operation manually and electrically • Check electrical and mechanical interlocks provided • Check on C.Ts.
24	Supply, erection and testing of earthing arrangements to drawing No: CEE/CN/MS/16-2004 also necessary Continuity wire of 6 SWG, GI wire, average 5 meters length and connection from earth electrode to the main distribution board/post/ installation. The earth value should be well below the value as per relevant I.E. Rules and IS specifications and mentioned elsewhere in the schedule, when measured independently.

SW-B Provision of Pumping Arrangements

1	Supply of 3 phase, 15 HP open well submersible motor with pump, vertical type, outlet pipe dia: 100mm, Head 30-40 m, Cast iron impler and copper rotor . Delivery : 1600-1800 LPM at head of 30m and Delivery approximately 1000 LPM at head of 40m., suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year
2	Supply of 3 phase, 30 HP open well submersible motor with pump, vertical type, outlet pipe dia: 150mm, Head 30-40 m,Cast iron impler and copper rotor . Delivery : 2800-3000 LPM at head of 30m and Delivery approximately 2000 LPM at head of 40m., suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year
3	Erection, testing and commissioning of 30 HP Open well submersible new pump assembly complete including consumables, tools and equipments. After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, GI Pipe, GI bend, GI coupler, GI flange, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).
4	Supply of 3 phase, 10 HP open well submersible motor with pump, vertical type, outlet pipe dia: 100mm, Head 20-40 m,Cast iron impler and copper rotor . Delivery : 1200-1400 LPM at head of 20m and Delivery approximately 700 LPM at head of 40m., suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year
5	Erection, testing and commissioning of 10 HP Open well submersible new pump assembly complete including consumables, tools and equipments. After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc...

	for proper running of pump should be checked. (Only pump, NRV, GI Pipe, GI bend, GI coupler, GI flange, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).
6	Supply of 3 phase, 6 HP borewell submersible motor with pump, , Diameter of pump is 100mm, output mouth of pump is 40mm.suitable to work on Head of 175-225 m, . Delivery approximately 75-45 LPM at head of 175-225m., Impeller Noryal/SS, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year
7	Supply of 3 phase, 5 HP borewell submersible motor with pump, , Diameter of pump is 100mm, output mouth of pump is 40mm.suitable to work on Head of 100-180 m, . Delivery approximately 75-30 LPM at head of 180-100m., Impeller Noryal/SS, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year
8	Supply of 3 phase, 7.5 HP open well submersible motor with pump, vertical type, Head 20m-40 m,Cast iron impler and copper rotor Delivery approximately 800 LPM at head of 30m, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB, KMP with test certificate and Minimum warranty period of 1 Year
9	Erection , testing and commissioning of 6/7 HP , 100mm dia, borewell pump set upto depth of 250m including borewell cover, consumable materials etc. (Only pump, UPVC Pipe of required length, flat copper wire, nylon rope and starter panel will be supplied by Railway)
10	Erection , testing and commissioning of 5 HP , 100mm dia, borewell pump set upto depth of 180m including borewell cover, consumable materials etc. (Only pump, UPVC Pipe of required length, flat copper wire, nylon rope and starter panel will be supplied by Railway)
11	Supply of 3 phase, 5 HP openwell submersible motor with pump, vertical type, Head 20m-40 m,Cast iron impler and copper rotor Delivery approximately 600 LPM at head of 30m, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB, KPM with test certificate and Minimum warranty period of 1 Year
12	Supply of Automatic Star-Delta Control panel board suitable 30 Hp open well submersible pump set consisting of 63 -75Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 40A-50A (adjustable) BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, tank full cutoff, Automatic restart, Auto/manual mode, sensor, float switches, copper probes or conductive sensors, Timer, etc. 0-500V voltmeter, 0-63 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 8 sq mm flexible copper cable. Minimum warranty period of 1 Year

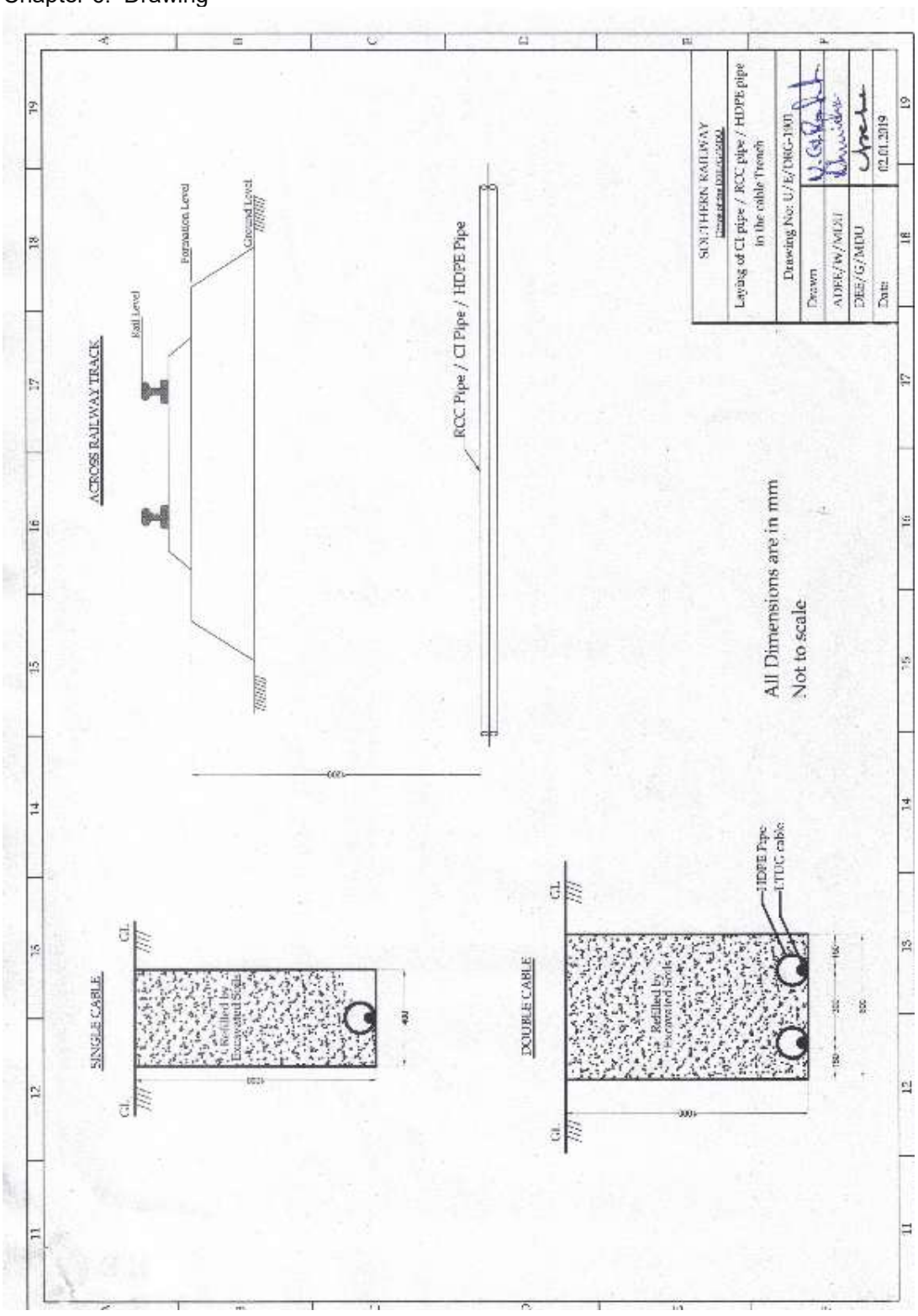
13	Erection, testing and commissioning of control panel for 30hp Pump
14	Erection, testing and commissioning of 15 HP Open well submersible new pump assembly complete including consumables, tools and equipments. After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, GI Pipe, GI bend, GI coupler, GI flange, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).
15	Supply of Automatic Star-Delta Control panel board suitable 15 Hp open well submersible pump set consisting of 32-40Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 20A-30A (adjustable) BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, tank full cutoff, Automatic restart, Auto/manual mode, sensor, float switches, copper probes or conductive sensors, Timer, etc. 0-500V voltmeter, 0-63 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 6 sq mm flexible copper cable. Minimum warranty period of 1 Year
16	Erection, testing and commissioning of control panel for 15 hp Pump
17	Erection, testing and commissioning of control panel for 10 hp Pump
18	Supply of Automatic Star-Delta Control panel board suitable 10 Hp open well submersible pump set consisting of 32-40 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 14A -22A (adjustable) BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, tank full cutoff, Automatic restart, Auto/manual mode, sensor, float switches, copper probes or conductive sensors, Timer, etc. 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 6 sq mm flexible copper cable. Minimum warranty period of 1 Year
19	Supply of Automatic Star-Delta Control panel board suitable 7.5 Hp open well submersible pump set consisting of 32 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 13A to 20A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year
20	Erection, testing and commissioning of control panel for 7.5 hp Pump

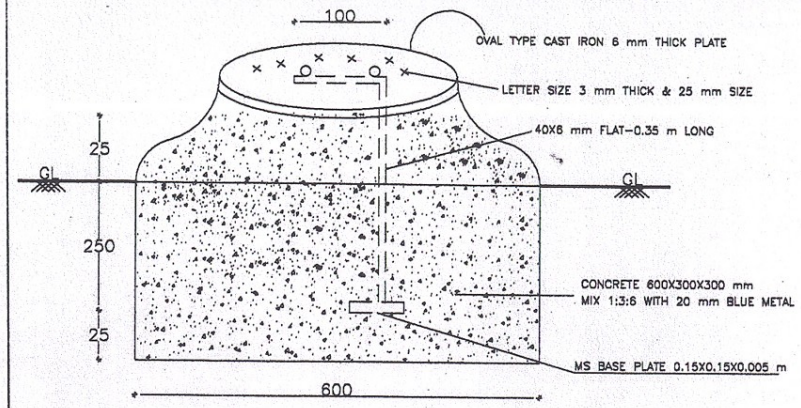
21	Supply of Automatic Star-Delta Control panel board suitable 7.5 Hp borewell submersible pump set consisting of 32 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 13A to 20A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year
22	Supply of Automatic DOL Control panel board suitable 6 Hp bore well submersible pump set consisting of 25 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 7A to 10A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year
23	Erection, testing and commissioning of control panel for 6 hp Pump
24	Supply of 3 phase, 7.5 HP borewell submersible motor with pump, , Diameter of pump is 100mm, output mouth of pump is 40mm.suitable to work on Head of 190-240 m, . Delivery approximately 75-45 LPM at head of 190-240m., Impeller Noryal/SS, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year
25	Supply of 3 phase, 7.5 HP openwell submersible motor with pump, vertical type, Head 20m-40 m,Cast iron impler and copper rotor Delivery approximately 800 LPM at head of 30m, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB, KMP with test certificate and Minimum warranty period of 1 Year
26	Erection, testing and commissioning of 7.5 HP Open well submersible new pump assembly complete including consumables, tools and equipments and After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, HDPE Pipe, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).
27	Supply of 3 phase, 5 HP openwell submersible motor with pump, vertical type, Head 20m-40 m,Cast iron impler and copper rotor Delivery approximately 600 LPM at head of 30m, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB, KPM with test certificate and Minimum warranty period of 1 Year
28	Erection, testing and commissioning of 5 HP Open well submersible new pump assembly complete including consumables, tools and equipments . After the installation of pump

	with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, HDPE Pipe, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).
29	Supply of Automatic DOL Control panel board suitable 5 Hp open well submersible pump set consisting of 25 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 7A to 10A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year
30	Erection, testing and commissioning of control panel for 5 hp Pump
31	Supply of 3 phase, 5 HP borewell submersible motor with pump, , Diameter of pump is 100mm, output mouth of pump is 40mm.suitable to work on Head of 100-180 m, . Delivery approximately 75-30 LPM at head of 180-100m., Impeller Noryal/SS, suitable to work on 415v, 50 Hz AC supply. make : Decan, Karvel, KSB.KMP with test certificate and Minimum warranty period of 1 Year
32	Erection , testing and commissioning of 5 HP , 100mm dia, borewell pump set upto depth of 180m including borewell cover, consumable materials etc. . (Only pump, UPVC Pipe of required length, flat copper wire, nylon rope and starter panel will be supplied by Railway)
33	Erection, testing and commissioning of 3 HP Open well submersible new pump assembly complete including consumables, tools and equipments After the installation of pump with fittings and accessories, water discharge, Leakage, IR value, Amps taken, etc... for proper running of pump should be checked. (Only pump, NRV, HDPE Pipe, flat copper wire, nylon rope, brass gate valve, pressure gauge and starter panel will be supplied by Railway).
34	Supply of Automatic Star-Delta Control panel board suitable 7.5 Hp open well submersible pump set consisting of 32 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor and 13A to 20A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year
35	Erection, testing and commissioning of control panel for 7.5 hp Pump
36	Supply of Automatic DOL Control panel board suitable 5 Hp bore well submersible pump set consisting of 25 Ampere BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER contactor

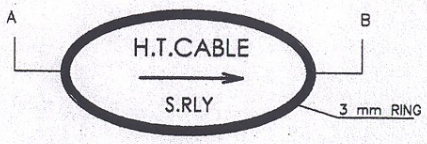
	and 7A to 10A BCH / L&T / SIEMENS / ABB/ C&S/ SCHNEIDER over load Relay, single phasing cum dry run preventer, 0-500V voltmeter, 0-32 Ampere meter, voltmeter phase selector switch, phase indicator 3 Nos, ON-OFF switch all are in powder coated metal box of 1.6mm thickness. The internal wiring of panel board should be done by 4 sq mm flexible copper cable. Minimum warranty period of 1 Year
37	Erection, testing and commissioning of control panel for 5 hp Pump
38	Supply, erection, testing and commissioning of 150mm Dia B class GI pipe for 30HP open well submersible pump
39	Supply, erection, testing and commissioning of 150mm Dia B class GI Bend
40	Supply, erection, testing and commissioning NRV for 63 mm Dia pipe.
41	Supply, erection, testing and commissioning of 150mm Dia B class GI Coupler
42	Supply, erection, testing and commissioning of 150mm Dia B class GI Flange
43	Supply, erection, testing and commissioning NRV for 150mm Dia B class pipe.
44	Supply, erection, testing and commissioning NRV for 63 mm Dia pipe.
45	Supply, erection, testing and commissioning NRV for 50 mm Dia pipe.
46	Supply, erection, testing and commissioning of brass gate valve suitable for 150mm Dia GI pipe.
47	Supply, erection, testing and commissioning of brass gate valve suitable for 50 mm Dia pipe.
48	Supply, erection, testing and commissioning of HDPE pipe of 75 mm Dia PN 6, PE- 100 as per IS:4894.in coil
49	Supply, erection, testing and commissioning of HDPE pipe of 40 mm Dia PN 6, PE- 100 as per IS:4894 in coil
50	Supply, erection, testing and commissioning pressure gauge 0-16 bar suitable for 150mm Dia GI pipe.
51	Supply, erection, testing and commissioning pressure gauge 0-8 bar suitable for 50mm Dia water pipe.
52	Supply, erection, testing and commissioning NRV for 100mm Dia B G.I class pipe.
53	Supply, erection, testing and commissioning pressure gauge 0-10 bar suitable for 63mm Dia water pipe.
54	Supply, erection, testing and commissioning of brass gate valve suitable for 100mm Dia GI pipe.
55	Supply, erection, testing and commissioning of brass gate valve suitable for 63 mm Dia

	pipe.
56	Supply, erection, testing and commissioning of HDPE pipe of 100 mm Dia PN 6, PE- 100 as per IS:4894.in coil
57	Supply, erection, testing and commissioning of HDPE pipe of 63mm Dia PN 6, PE- 100 as per IS:4894 in coil
58	Supply, erection, testing and commissioning of HDPE pipe of 50 mm Dia PN 6, PE- 100 as per IS:4894 in coil
59	Supply and fixing of 25mm dia nylon rope
60	Supply and wiring including termination by 3 Core 10 Sq.mm PVC insulated flexible submersible copper Flat cable conforming to IS. No: 694, 1100 V grade as directed by the Engineer in charge at site.
61	Supply and wiring including termination by 3 Core 6 Sq.mm PVC insulated flexible submersible copper Flat cable conforming to IS. No: 694, 1100 V grade as directed by the Engineer in charge at site.
62	Supply and wiring including termination by 3 Core 4 Sq.mm PVC insulated flexible submersible copper Flat cable conforming to IS. No: 694, 1100 V grade as directed by the Engineer in charge at site.
63	Supply and wiring including termination by 2 Core 1 Sq.mm PVC insulated flexible submersible copper Flat cable conforming to IS. No: 694, 1100 V grade as directed by the Engineer in charge at site.
64	Supply of UPVC pipe of 1 ½" size with copuler type and pressure carrying capacity of 26 kg/cm2 . Preparable make: Ashirwad , KMP, Finolex, pipe with RED colour stip. Each pipe of 3m length.
65	Supply of 18 mm Nylon Rope
66	Supply of MS 1 ½" Borewell clamp
67	Supply of 1 ½" Borewell Adopter
68	Supply of 1 ½" G.I coupler and Bend

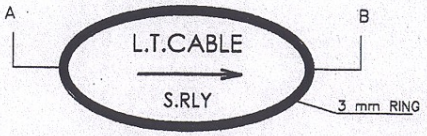

SOUTHERN RAILWAY
Laying of CI pipe / RCC pipe / HDPE pipe in the cable Trench
Drawing No: U/E/DRG-1001
Drawn
ADEE/W/MDU
DEE/G/MDU
Date
02.01.2019
ACROSS RAILWAY TRACK
Rail Level
Formation Level
Ground Level
RCC Pipe / CI Pipe / HDPE Pipe
All Dimensions are in mm
Not to scale
SINGLE CABLE
GL
Refilled by Excavated Soil
DOUBLE CABLE
HDPE Pipe
LTUC cable
Refilled by Excavated Soils



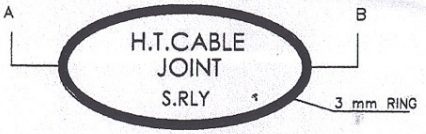
SECTION ON "AB" - ELEVATION



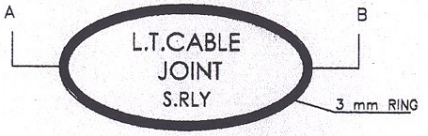
CABLE ROUTE INDICATOR (HT)



CABLE ROUTE INDICATOR (LT)

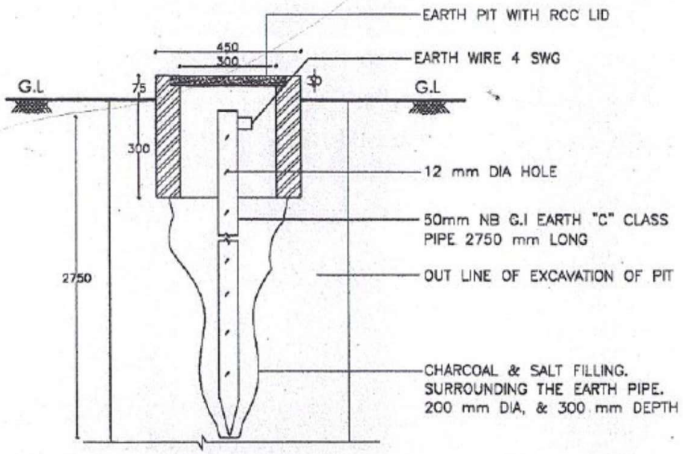


CABLE JOINT INDICATOR (HT)



CABLE JOINT INDICATOR (LT)

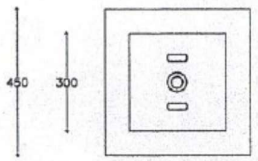
SOUTHERN RAILWAY		
TITLE: HT/LT CABLE ROUTE INDICATOR WITH CAST IRON PLATE		
Dwg. No.	CEE/CN/MS/11–2004	
XEE/CN/MMC	XEE/CN/ERS	XEE/CN/MDU
Dy.CEE/G/CN/MS		
CEE/CN/MS		

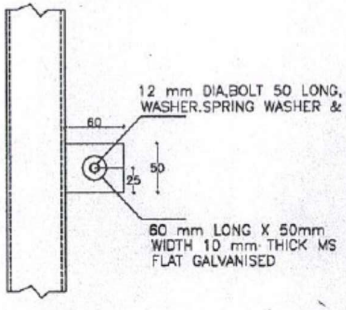


ELEVATION

NOTE:-

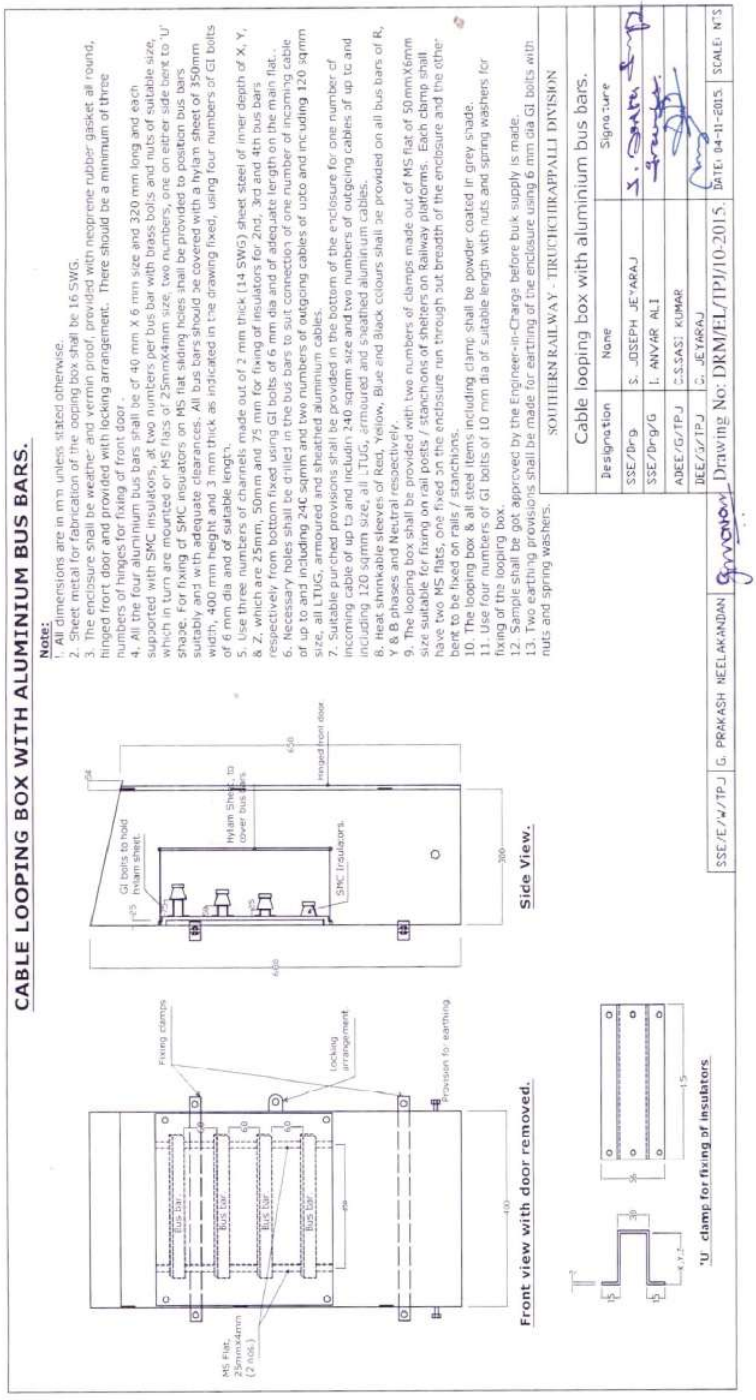
1. ALL DIMENSIONS ARE IN mm UNLESS STATED OTHERWISE
2. TUBE DIMENSIONS–50 mm NOMINAL BORE "C" CLASS HEAVY DUTY AS PER IS:1239.
3. CHARCOAL & SALT FILLING TO BE IN THE FORM OF A CYLINDER 200 mm DIA, SURROUNDING THE PIPES, 300 mm DEPTH OR THE QUANTITY MENTIONED IN THE SCHEDULE
4. EARTH POT SHALL BE MADE UP OF CEMENT CONCRETE WITH LID/BRICKWORK WALL WITH COVERING RCC SLAB.
5. IF SPECIFIED EARTH RESISTANCE CANNOT BE OBTAINED WITH ONE EARTHING. STATION–EARTHING STATIONS IN MULTIPLE SPACED AT A DISTANCE OF 10M & INTERCONNECTED TOGETHER MAY BE ADOPTED.
6. THIS DWG IS BASED ON RDSO DWG. NO. ET2/OHE/P/7020, ISS CODE FOR EARTHING STATION IS : 3043 AND CEE/MAS DRG.NO : EL/P/TYPE/122
7. ALL MATERIALS INCLUDING CEMENT STEEL, G.I PIPE ETC., SHOULD BE SUPPLIED BY THE CONTRACTOR ONLY.
8. EARTH PIT SIZE IS 0.9X0.9X2.9 m

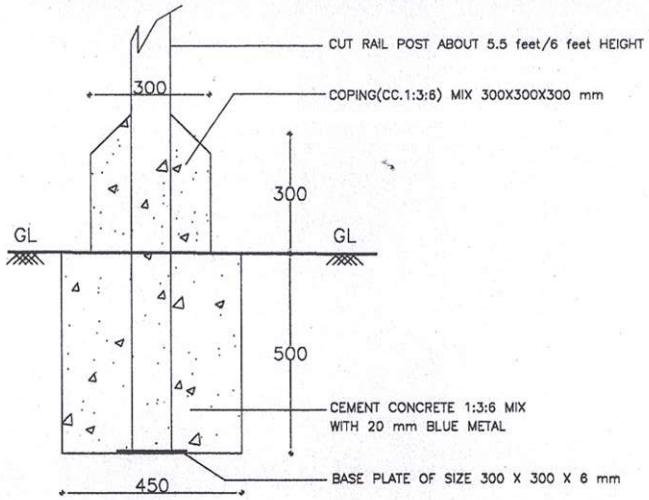




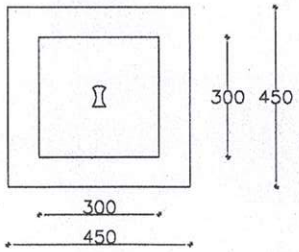
SOUTHERN RAILWAY		
TITLE: L.T. EARTHING ARRANGEMENTS		
Dwg.No.	CEE/CN/MS/16–2004	
XEE/CN/MMC	XEE/CN/ERS	XEE/CN/MDU
Dy.CEE/G/CN/MS		
CEE/CN/MS		

4.0. Cable looping box with aluminium bus bars.





ELEVATION



PLAN

NOTE

1. ALL DIMENSIONS ARE IN mm UNLESS STATED OTHER WISE
2. RAIL SHALL BE 60 lbs /75 lbs / 90 lbs TYPE
3. HEGHT OF THE CUT RAIL POST IS ABOUT 5.5 feet/6 feet
4. BASE PLATE SHALL BE 300X300X6 mm SIZE.
5. ALL CONCRETE SHOULD BE OF 1:3:6 CC MIX AND WITH 20 mm BLUE METAL
6. PAINTING – 2 COATS PRIMER ZINC CHROMATE & FINISHED WITH 2 COATS OF ALUMINIUM
7. COPING TO BE APPLIED WITH A COAT OF BLACK ANTI – CORROSIVE PAINT

SOUTHERN RAILWAY		
TITLE: ERECTION OF CUT RAIL POST (About 5.5 feet/6 feet Ht.)		
Dwg. No.	CEE/CN/MS/20–2004	
XEE/CN/MMC	XEE/CN/ERS	XEE/CN/MDU
Dy.CEE/G/CN/MS		
CEE/CN/MS		

7.CONSERVANCY CESS CHARGES

(Ref: Rly. Board letter No. F(X) 1/95/1/1 dated 07.09.2021)

Item No.	Item Description	Avg. No. of Labourers/workman employed per day	Conservancy Cess charges to be recovered (per month)
I	Railway Contractors: (a) Engg.Works Contractors (Engg., Elect., Mech., Signal etc.) (b) Genl. Goods handling Contractors including Contractors awarded by Stores dept. (c) Coal handling Ash pit cleaning contractors (d) Railway siding use by the contractors (e) Contractor supplying water to engines.	1 to 5 6 to 10 11 to 25 26 to 50 51 to 100 101 to 200 201 to 300 301 to 750 751 to 1500 1501 to 3000 3000 & over	₹ 159/- ₹ 312/- ₹ 785/- ₹ 1,143/- ₹ 1,534/- ₹ 1,926/- ₹ 2,318/- ₹ 2,676/- ₹ 5,382/- ₹ 10,768/- ₹ 21,508/-

8. ANNUXURES

ANNEXURE-I

LIST OF RAILWAY SUPPLIED MATERIAL

Sl.No.	Description of item to be supplied by the Railway	Item No. in the "Schedule of Work"
1	LTUG Cable	S.No.6,7 of SW A
2	HDPE Pipe	S.No.8, 19 & 20 of SW A
3	Cut Rail post	S.no.18 of SW A

NOTE: All the materials required for execution of this work except above have to be arranged by contractor.

ANNEXURE-II

SOUTHERN RAILWAY

SITE ORDER BOOK

Name of Work: ……
AGT. No. / Date: ……..
Name of the contractor: …… Starting date of construction: …….

Sl. No.	Site Order by Inspecting officials	Signature of the official	Noting Signature		Compliance details	Remarks	Compliance Signature	
			Contractor	SSE			Contractor	SSE

Notes:
1. For every work, separate site order book should be maintained.
2. Site order should be recorded specifically and chronogically.
3. Wherever required site orders may be supported by sketches.

Special Note: Any objection of the contractor to the site order should be brought to the notice to the Executive Engineers or his higher officials immediately by the contractor separately

ANNEXURE – III

SOUTHERN RAILWAY

HINDRANCE REGISTER

Name of Work: ……
AGT. No. / Date: ……..
Name of the contractor: …… Starting date of construction: ……

Sl. No.	Nature of hindrance	Date of Occurrence	Date of removal	Period of hindrance	Over lapping period	Total period of hindrance	Extension recommended	Extension approved	Clause under GCC	Signature	
										Contractor	SSE

Notes: Separate register to be maintained for each work.

ANNEXURE – IV

SOUTHERN RAILWAY

MATERIAL TRANSACTION REGISTER

Name of Work: ……
AGT. No. / Date: ……. Starting date of construction : …….
Name of the contractor: …… Location of Stores : …….

Date of Receipt	Name /Nature of work	Opening Balance	Item Description	Details of Receipt				Total received (with unit)	Total certificate	Signature		Details of issues			Closing Balance	Remarks reg. performance	Signature	
				Voucher No.	Brand	Quantity	Expiry date			Contractor	SSE	Date	Quantity	Total issued			Contractor	SSE

Notes: Separate register to be maintained for each work

ANNEXURE – V

SOUTHERN RAILWAY

DAILY PROGRESS & LABOUR REGISTER

Name of Work: ……
AGT. No. / Date: …….. Starting date of construction : ……..
Name of the contractor: ……

Date	Status of work (in the beginning)	Progress (on date)	Contractor labour (available at site)	Remarks	Signature	
					Contractor	Rly Representative

Note: Separate register to be maintained for each work

TENDERER'S CREDENTIALS REGARDING ELIGIBILITY CRITERIA
(Give details of similar works executed so far in the Proforma given below)

PROFORMA FOR FURNISHING EXPERIENCE CERTIFICATE

S.No	Description	Details
1	Name of work	
2	Executing department/office	
3	Letter of Acceptance (LOA) Number with Date of award of work	
4	Agreement number with Date	
5	Agreement value of the work	
6	Name and address of Contractor	
7	Original completion period as per LOA/ Agreement	
8	Number of extensions granted	
9	Whether completed/ongoing work, If completed work, give date of actual completion	
10	Final completion value of the contract (for completed works)/ Payment received so far(for ongoing contracts)	
11	Whether any penalty is imposed. (YES/NO) If Yes, Details of penalty and total penalty amount to be furnished	
12	General remarks about performance	

Signature and Seal of the Authority
issuing Certificate.

Note: If the tenderer has completed more than one similar work, give the details of each work separately in the above format.

ANNEXURE – B

MANDATE TO BE SUBMITTED BY CONTRACTOR FOR UPLOADING OF INFORMATION REGARDING BILLS AND FOR PAYMENT THROUGH EFT/RTGS

ELECTRONIC FUND TRANSFER MANDATE FORM

1. **CUSTOMER DETAILS:**

   a. Customer Name:

   b. Customer Address:

   c. Email ID:

   d. Telephone Number:

2. **ACCOUNT DETAILS:**

   a. Account Number:

   b. Type of Account:

   c. Name of the Bank:

   d. Name of the Branch Address:

   e. Bank Telephone number:

   f. IFSC Code of the Branch:

   g. MICR Code of the Branch:

I hereby declare that the particulars given are correct and complete.

Date:

Seal Customer signature

Certificate that the particulars furnished above are correct as per our records.

Date

Seal: Signature of the Authorized official of the Bank

Reference -Para 10.2 & 17.15.2 of Tender Form (Second Sheet) of Annexure I of ITT

Each Bidder or each member of a JV must fill in this form separately:

NAME OF BIDDER/JV PARTNER:

Annual Contractual Turnover Data for the Previous 3/4 Years (Contractual Payment only)			
Year	**Amount Currency**	**Exchange Rate**	**Indian National Rupees Equivalent**
Average Annual Contractual Turnover for last 3 years			

1. The average annual contractual turnover shall be calculated as an average of "total contractual payments" in the previous three financial years. However, in case balance sheet of the previous year is yet to be prepared/ audited, the audited balance sheet of the fourth previous year shall be considered for calculating average annual contractual turnover.
2. The information supplied shall be substantiated by data in the audited balance sheets and profit and loss accounts for the relevant years in respect of the bidder or all members constituting the bidder.
3. Contents of this form should be certified by a Chartered Accountant duly supported by Audited Balance Sheet duly certified by the Chartered Accountant.

SEAL AND SIGNATURE OF THE BIDDER

Certified that all figures and facts submitted in this form have been furnished after full consideration of all observations/notes in Auditor's reports._____

(Signature of Chartered Accountant)

Name of CA:_____

Registration No: _____

(Seal)

----------"End of Tender Document" ----------