

# Electrical TRD Tender Document



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**TENDER DOCUMENT****NORTHERN RAILWAY****(TOP SHEET)****(Version 23-04-2026)**

(A) Details to be filled in by Railway:

<b><u>Sub Tender For Inclusion In Engineering Composite Tender</u></b>	
Tender Notice No.	-
Full name of work	Design, Supply, Erection, Testing & Commissioning of 25 kV AC single phase OHE for the work of construction of 03 nos LHS (size 5.0m x5.0 m) by pushing in lieu of LC no. 124 at KM 149.158, LC-129 at KM 156.861 & 130 at KM 158.669 on DUI-BTI section over Ambala Division.
Approx. cost (TRD portion)	<b>Rs. 12,08,913.54</b>
Similar nature of Work	"Design, Supply, Erection, Testing & Commissioning of 25 kV, 50 Hz, single Phase AC OHE".


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**PART I**  
**CHAPTER II**  
**SPECIAL CONDITIONS OF CONTRACT**

- 1.2.1.1 This Tender shall be governed by Preamble and General, Special conditions, Technical Specifications.
- 1.2.1.2 If there are varying or conflicting provisions in documents forming part of contract. CEE/C/Tilak Bridge, New Delhi shall be deciding authority with regard to the intentions of the provision and decision will be final and binding on contractor.
- 1.2.3 Force Majeure- If, at any time, during continuance of this contract performance, in whole or in part, by either party, of any obligation under this Contract shall be prevented or delayed by reason of any war, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, earthquakes, explosions, epidemics, quarantine restrictions, strikes, lock-outs, any Statute, Statutory Rules, regulations, orders or requisitions issued by any Government Department or competent authority or acts of God (thereinafter referred to as event then, provided notice of happening of any such event is given by either party to the other within twenty one days from date of occurrence thereof neither party shall by reason of such event be entitled to terminate this contract nor shall either party have any claim for damages against other in respect of such non-performance or delay in performance and the obligations under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist PROVIDED FURTHER that if performance in whole or part of any obligation under this contract is prevented or delayed by reason of any such event beyond a period as mutually agreed to by Purchaser and Contractor after any event or 60 days in absence of such an agreement whichever is more, either party may at its option terminate contract, provided also that if contract is so terminated under this clause, Purchaser will at time of such termination take over from Contractor, at prices as provided for in contract, all erected equipment or equipments under erection as also all or any portion of unused, undamaged and acceptable equipments, whether in storage or in course of manufacture, at Schedule rates or at prices mutually agreed to, where Schedule rates are not available.
- 1.2.4 Loss In Transit - If loss or damage occurs to stores or any part thereof during transit by rail, contractor shall have only such remedy as is available to Public against carrier under the Indian Railway (Amendment) Act - 1961, no.39 of 1961.
- 1.2.5 Scheme of work - Within a period of 45 days beginning from date of issue of Letter of Acceptance of Tender, Contractor shall submit detailed time schedule for design and various documents enumerated in tender papers to purchaser.
- 1.2.5(a) The contractor shall submit the relevant drawings and the assessment of the material. The purchaser or his representative shall approve the same, if found correct. Material shall be supplied (by the contractor) only after the approval of drawings and assessment.
- 1.2.6 Quality Assurance Programme in Supply And Erection
- a. All materials used in work shall be of best quality and of class most suited for purpose specified and procured from sources approved by Research, Design and Standard Organisation/ Central Organisation for Railway Electrification. It is essential that manufacturer from whom supply is arranged should have long experience of design and manufacture of equipments, components, materials and fittings. Requisite facilities for testing prototypes supplied against this contract should be available with manufacturer. In case of those equipments, components or fittings for which requisite facilities for testing of prototypes are not available with manufacturer, manufacturer shall arrange to carry out prototype tests on his own cost in a testing laboratory approved by Purchaser. Only tested quality steel shall be used. Contractor shall ensure that Purchaser's



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prescribed Quality Assurance Standards are rigidly followed in manufacture and erection/installation of all materials/components and fittings/equipments required for work.

- b. Quality Of Materials And Erection - All erection work carried out shall also be of best quality acceptable to the Purchaser.

- 1.2.7 Other Railway Stores- If any material other than those specified is supplied by purchaser either at Contractor's request or suo-moto in order to prevent any possible delay in the execution of the works likely to occur due to Contractor's inability to make adequate arrangements for supply thereof or otherwise, recovery will be made from Contractor's bills at book rate or last purchase rate 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 total cost inclusive of material, freight and incidental charges or Schedule 3 rate, whichever is higher, freight between Purchaser's source of supply and the contractor's depot or Rail head shall be to Contractor's account. If, however, material required by contractor is not available in Purchaser's stock or purchaser decides not to supply same, be that for whatever reason, purchaser shall not be bound to arrange for 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.

**NOTE:** If contractor runs short of materials and such materials are available in Purchaser's stock, material may be supplied by Purchaser on loan to Contractor who will return these on receipt of his supplies or within six months whichever is earlier. Material shall be received by contractor's representative in supervisory category declared by contractor and who shall be authorised under duly executed Power of Attorney to receive material issued by purchaser to contractor. Value of loaned material would be computed by purchaser based on Schedule-3 rates and equivalent amount would be withheld from subsequent progress payments due to contractor. In case contractor fails to return material within stipulated six months period from date of loaning of material, material loaned earlier would be treated as sold. Recoveries of value of sold material would be on basis of issue rate or market rate prevailing at time of supply or market rate at end of two months period whichever is higher, plus 5% freight charges and 2% incidental charges together with supervision charges at 12.5% of total cost inclusive of material, freight and incidental charges or Schedule-3 rates whichever is higher. This recovery would be made from any bill submitted by Contractor subsequently either On Account or Progress payment duly adjusting the above referred withheld amount, if any on account of loaning material. However, in case the loaned material is returned within the stipulated six months or earlier, the withheld amount from the progress would be released.

1.2.8 **Contractor's Organisation -**

- (a) Contractor shall within fifteen days of issue of letter of acceptance of Tender, establish an fully equipped office with land line phone/mobile phone, latest Computer, UPS and Printer (to be handed over to Purchaser on successful full completion of work) at a convenient place indicated in Part-III, Para 3.10 & 3.11 for progressing designs and drawings and field works, expeditiously, in consultation and with approval of Purchaser. He shall intimate Purchaser address thereof in which all correspondence shall be sent. Any communication sent to Contractor by post at his said address shall be deemed to have reached Contractor duly and in time. Important documents shall be sent by Registered post.
- (b) List of addresses to which correspondence and documents relating to contract should be sent, is included in Part-III, Para 3.15
- (c) Main depots will be located at stations as indicated in part-III. The proposed location/s of sub-depots and stabling lines is/are to be given by Tenderer for scrutiny and approval by Purchaser.
- (d) Electricity may be supplied at places where spare capacity is available for running of machinery and for lighting. The contractor shall provide his own distribution system in consultation and with



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approval of purchaser. Cost of providing connections and of energy consumed shall be paid by Contractor to Purchaser in accordance with relevant rules and prevailing rates of Railway.

- (e) At places where piped water supply is available purchaser may supply water to the contractor at convenient points for his office, workshop and stores if necessary connection with work. Contractor shall arrange to lay his own pipe lines for distribution in consultation and with approval of the Purchaser. The Contractor shall be charged for consumption by Railways at rate prevailing at that time. The Contractor shall arrange water at the work site at his own cost carried to work site.
- (f) Contractor shall arrange at his own cost all tools, plant and facilities as necessary for erection and testing of the equipment, in compliance with the specification.
- 1.2.9 Contractor's drawings etc. – Any calculations, designs, drawings, schedules, information, data, progress charts etc. required by Purchaser's Engineer in connection with the contract shall be furnished by Contractor at his own expenses. The Contractor will not be required to furnish drawings, designs and calculations etc. for basic designs and employment schedules provided by Purchaser in case no modification/deviation is required for a particular basic design/employment schedule. In case of new developments in designs, comments on Research Designs and Standards Organisation (hereinafter called R.D.S.O.'s) and decision of Purchaser to implement the same basic drawings /designs/employment schedules will be submitted by contractor to Purchaser. If RDSO's drawings/ designs/ employment schedule is not revised, Contractor need not submit drawings/ designs/ employment schedules to Railway Electrification. In event of Contractor suggesting any alteration/deviation in standard drawings, he shall submit retraced drawings with full calculations and justification of change to Purchaser. Purchaser if convinced of need of alteration shall approach RDSO for necessary approval. In case of any ambiguity in interpretation of design and drawing, decision of purchaser shall be final and conclusive.

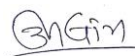
- 1.2.10 a. Quality Assurance Materials - All equipment, materials, fittings and component will be subject to Quality Control Programme of manufacturer, being a part of Quality Assurance Programme of Contractor. Materials may also be inspected by Purchaser or his representative either at manufacturer works or at Contractors' depot. Purchaser or his representative shall have right to be present during all stages of manufacture and shall be accorded free of charge all reasonable accorded facilities for inspection and testing as well as examine stage inspection report of manufacturer in addition to quality audit which Contractor may institute as a part of his programme so as to satisfy himself that materials are in accordance with specifications, approved drawings and designs and purchaser's prescribed Quality Assurance Standards.
- b. Erection - All erection work will also be subjected to Quality Assurance Programme including inspection by Purchaser or his representative to ensure that work is done in accordance with specifications and approved drawings and designs and purchaser's prescribed Quality assurance standards.
- c. Expenses Of Purchaser' Representative - All expenses of Purchaser's representative shall be borne by Purchaser whether inspected material is finally utilised in work or not.
- d. Decision of General Manager or his successor shall be final in respect of acceptability or otherwise of any material, fittings, component or equipment required for the work.
- e. Quality Assurance Programme - For proper control of quality and to ensure that materials, equipment and fittings are manufactured according to specification and erection in according to approved instructions, drawings, specifications, Contractor shall adopt a suitable quality assurance programme to ensure quality at all necessary points, whether at manufacturer's works, or in his depot or at work site as well as during erection. Such quality assurance programme shall also meet requirement of purchaser's prescribed Quality Assurance Standards. This programme of the Contractor shall generally cover the following:
1. Organisation to manage and implement Quality Assurance Programme.
  2. Documentation control system :-



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- i. Basic control system.
- ii. Adopted at manufacturer's work
- iii. Adopted at Contractor's Depot and work site.

3. Procedure adopted for:

- i. Source Inspection.
- ii. Incoming raw material inspection.
- iii. Verification of material purchased.
- iv. Fabrication Controls.
- v. Site erection controls.

4. Inspection and Test Procedure for:

- i. Manufacture and quality control procedure.
- ii. Field activity.

5. System of handling and storage.

6. System of quality audit.

7. System of maintenance of records.

8. For purpose of obtaining On Account Payment, Contractor shall submit along with invoice, documents indicated in prescribed Quality Assurance Standards which should inter-alia cover following as may be applicable in each case.

- i. Material test reports on raw materials used.
- ii. Inspection Plan with reports of the inspection plan check points.
- iii. Routine test report.
- iv. Factory test results as required under specification.
- v. Quality audit report including test check report of Purchaser's representative, if any.

**1.2.11 Traffic Blocks**

- a. Purchaser will make arrangements to obtain traffic blocks (hereinafter referred to as blocks) necessary for running and operation of work train/light ladder trolleys/track lorries for works to be carried out along or adjacent to track. Contractor shall, however, carry out maximum amount of work possible without blocks. Works such as grouting of traction masts, muffing and erection of brackets shall invariably be done without blocks. Installation of droppers and adjustment of traction overhead equipment may also be permitted to be carried out with light ladder trolleys protected by banner flags in accordance with General and Subsidiary Rules of Indian Railway. Contractor shall arrange a minimum of two mobile phones in working condition with Sim Card in working condition to improve communication with Railway Authorities at site/control/ divisional offices at New Delhi. It should be with respective divisional/control office to carry out maximum amount of work possible without blocks. Mobile sets shall be returned to contractor after completion of work.
- b. Blocks will normally be granted during day light hours, if however, it becomes absolutely necessary, blocks may be granted during night also. Contractor shall confirm that he will equip himself to carry out all construction during night blocks efficiently by suitable special lighting equipments without any extra cost if required to do so. The blocks granted will ordinarily be for one track at a time.
- c. Block period shall be counted from time track is placed at Contractor's disposal at work-spot till it is cleared by the Contractor.
- d. Blocks will be subject to normal operating conditions and rules of the Railway. All formalities of exchanging private number etc with traffic control will be carried out by Purchaser's staff and for



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this purpose Purchaser will depute a representative for each erection gang, who will be responsible for imposing traffic blocks and also removing same after men, material and equipment have been cleared by the Contractor from running tracks and same declared safe for traffic by Purchaser's representative in case of works involving safety of running tracks.

- e. Blocks required for carrying out works necessitated by thefts, pilferage, accidents or such other incidents, shall be granted by Purchaser over and above normal requirements of block.

#### 1.2.12

- a. Correctness Of Work And Materials - Contractor shall be solely responsible for correctness of positions, levels and dimensions of works according to approved drawings, notwithstanding that he may have been assisted by Purchaser or his men in setting out same.
- b. If any dimension figured upon a drawings differs from that obtained by scaling drawings figured dimensions should be normally taken as correct, unless it is a prima facie mistake. But all such cases shall be brought to notice of Purchaser's Engineers and discrepancy set right before execution.

#### 1.2.13

- a. Contractor's responsibility for discrepancy – All designs and drawings submitted by Contractor shall be based on a thorough study and shall be such that Contractor is satisfied about their suitability. Purchaser's approval will be based on these considerations, notwithstanding approval communicated by Purchaser, during progress of contract for designs and drawings, prototype samples of components, materials and equipment after inspection of materials, after erection and adjustments to installations, ultimate responsibility for correct design and execution of work shall rest with contractor unless Purchaser insists on adoption of his own designs in spite of Contractor not being agreeable to it.
- b. Contractor shall be responsible for and shall bear and pay cost for any alternation or works arising from any discrepancies, errors or omissions in designs and drawings supplied by him, whether such designs and drawings have been approved by Purchaser or not.

- 1.2.14 Additions and alterations to erected equipments - Purchaser may require ADDITIONAL INSTALLATIONS OR MODIFICATIONS OR REPLACEMENTS as per new designs as evolved or decided during currency of contract to be carried out on works he deems necessary, either during execution or after a part or whole of installations coming with purview of contract has been put into commercial service. Further it may be necessary and expedient to energise overhead equipment which has been completed and finally adjusted in portions in yard/s. This will necessitate erection of new equipment in vicinity or joining energised equipment. In case prices for such additional works or modifications are not covered by schedule of price and are such that either party considers additional prices for such works justified, such additional works or modification shall be carried out by contractor. Any additional prices for such work Items would be mutually settled between purchaser and contractor, based on proper rate analysis and with reference to current prevalent market rates or rates available with Rly. Constn Administration in that or nearby area/s. In case additional installations or modifications or replacements are required to be carried out under this para, Purchaser shall grant a reasonable extension of time, should it be necessary.

#### 1.2.15 DEPLOYMENT OF TECHNICAL SUPERVISORS

"The contractor shall employ the following Qualified Engineer during the execution of this work:

- a) One Qualified Graduate Engineer when the cost of the work to be executed is Rs.200 Lakh and above.
- b) One Qualified Diploma – Holder Engineer when the cost of the work to be executed is more than Rs.25 Lakh and less than Rs.200 Lakh.



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NOTE :- For track related contractual works of value, as specified in 1.2.15 (b) above, individuals having Diploma in Railway Engineering awarded by IPWE (India) shall also be considered as qualified Diploma Holder Engineers and contractors for track contract works can employ such individuals at their worksite on Railway.

- (c) Further, in case the contractor fail to employ the Qualified Engineer aforesaid in Para 1.2.15 above, he in terms of provisions of Clause 26 A 2 to the General Condition of Contract, shall be liable to pay an amount of Rs. 40,000/- and Rs. 25,000/- for each month or part thereof for the default period for the provision, as conditioned in Para 1.2.15 (a) & (b) above respectively.
- (d) The contractor shall submit the copy of bio data and Degree/ Diploma certificate of the above technical staff employed by him for the scrutiny by Railway and for the record. Railway reserve the right to scrutinize the records of the contractor to ascertain as to whether the qualified staff has been actually employed by him and is paid for.
- (e) While passing each "on" account bill, the AEN/XEN incharge will certify the availability to technical staff on regular basis, otherwise the recovery as above shall be made from every bill.
- (f) The decision of the Engineer Incharge, whether the required Technical staff was not employed by the contractor shall be final and binding upon the contractor.

1.2.16 Training Of Purchaser's Staff - Contractor shall train, free of charge, in a manner mutually agreed between Purchaser and contractor, such staff of Purchaser as may be deputed by him and wages and allowances and all other associated expenses of such staff shall be paid by Purchaser.

#### 1.2.17 Work By Other Agencies

- a. Any other works undertaken at same time by Purchaser or Railway direct or through some other agency at same time or section where contractor is carrying out his work will not entitle contractor to prefer any claim regarding any delays or hindrances he may have to face on this account but Purchaser shall grant a reasonable extension of time to the contractor. Contractor shall comply with any instruction which may be given to him by Purchaser in order to permit simultaneous execution of his own works and those undertaken by other contractors or Railway without being entitled on this account on any extra charge.
- b. Contractor shall not be entitled to any extra payment due to hindrance resulting from normal Railway operations, such as delay on account of adequate number of and duration of blocks not being granted, operational delay in movement of work trains etc. but Purchaser shall grant a reasonable extension of time to the contractor.
- c. Contractor shall take note that owing to works being carried out by Purchaser and others, there may be breaks in continuity of locations for work owing to works such as track remodeling being undertaken. But contractor shall not be entitled to claim any extra payment on account of such breaks. However, such breaks in continuity of work would be reasonable ground for extension of completion date/s for the work.
- d. If the purchaser is unable to supply materials to contractor as specified in contract, in time, contractor shall not be entitled to any extra payment on account of such delay in supply. However, such delays in supplied will be reasonable ground for extension of completion date/s for work.
- e. In cases where the lines to be electrified are not in their final position, Purchaser will furnish remodeling plans for such lines to Contractor and/ or peg out altered or remodeled position of tracks to be electrified to enable preparation of designs and assessment of quantities of components required for work. However, contractor may not undertake field work on such tracks



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till they are in final position. The contractor shall not be entitled to any compensation in case of delay in such remodeling work, but Purchaser will grant a reasonable extension of time for completion.

- f. In course of checking overhead equipment layout plans, contractor shall prepare a list of infringements, if any exist, and advise Purchaser in time. Purchaser will arrange for removal of these infringements. Works which will be carried out by the Purchaser are detailed below:
- i. Alterations of slewing of tracks to accommodate traction structures of overhead equipment or to suit Railway requirements.
  - ii. Alterations to over-bridges, tunnels, foot-over-bridges and irrigation troughs, raising of bridges or troughs, or lowering of tracks to give sufficient clearance for overhead equipment.
  - iii. Protection at over bridges to prevent accidental or malicious interference with overhead equipment.
  - iv. In cuttings, any work necessary to provide clearance for traction structures.
  - v. At viaducts and bridges, any alterations required to enable traction structure to be accommodated.
  - vi. Alterations to station building, signal gantries, signal cabins and other similar constructions, which may be required for erection of overhead equipment, with requisite electrical clearances.
  - vii. Diversion of drainage channels of concrete or earthen ware pipes required to accommodate foundations.
  - viii. Removal of signal, telegraph, power lines and guys to enable overhead equipment to be erected, with requisite electrical clearances.
  - ix. Any blasting work required for excavation in rock other than for foundations.
  - x. Any rail strapping or other similar work/s necessary for installation of track structures and overhead equipment on bridges and over bridges.
  - xi. Any special steel work and fittings for attachment for masts/portals on steel girder or other bridges, or for attachment to other non-traction structures of Railway for carrying or anchoring overhead equipment conductors.
  - xii. Dismantling and drilling of piers of bridges and walls, supply and grouting of dowel pins or holding down bolts, in piers of bridges or walls.
  - xiii. Clearing the way and removing all infringements for erection of 25 kV feeder lines from grid sub-stations.
  - xiv. Chopping/trimming of tree branches required for erection of Overhead equipment shall be done by contractor. At least four meter clearance shall be made available before 25 kV charging between nearest 25 kV live parts and tree branches. Also to ensure that there are no loose tree branches nearby or overhead which are likely to fall on the live OHE. However cutting of the trees is NOT covered under this sub clause.



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- g. In course of checking layout plans and general arrangement drawings for switching stations, contractor shall prepare a list of infringements if any exist, and advise purchaser in time. Purchaser will arrange for removal of these infringements at his own cost.

#### 1.2.18 Infringement of patents

- a. Contractor is forbidden to use any patents or registered drawings, process or patterns in fulfilling his contract without previous consent in writing of owner of such patent, drawing, pattern or trade mark, except where these are specified by Purchaser himself. Royalties where payable for use of such patented processes, registered drawings or patterns shall be borne exclusively by Contractor. Contractor shall advise Purchaser of any proprietary rights that may exist on such processes, drawings or patterns which he may use of his own accord.
- b. In case of patents taken out by Contractor of drawings or patterns registered by him, or of those patents, drawings, or patterns for which he holds a license, signing of Contract automatically gives Purchaser right to repair by himself the purchased articles covered by patent or by any person or body chosen by him and to obtain from any sources he desires component parts required by him in carrying out repair work. In event of infringement of any patent rights due to above action of Purchaser, he shall be entitled to claim damages from contractor on the grounds of any loss of any nature which he may suffer e.g., in case of attachment because of counterfeiting.
- c. Indemnification by contractor. - In event of any claim or demand being made or action being brought against Purchaser for infringement of later patent in respect of any equipment, machine, plant, work or thing used or supplied by Contractor under this contract or in respect of any methods of using or working by Purchaser of such equipment, machine, plant work or thing, contractor shall indemnify purchaser and keep him indemnified and harmless against all claims, costs, charges and expenses arising from or incurred by reason of such claim provided that Purchaser shall notify contractor immediately any claim is made and that contractor shall be at liberty, if he so desires with the assistance of Purchaser if required but at Contractor's expense, to conduct all negotiations for settlement of same or any litigations that may arise there from and PROVIDED THAT no such equipment, machine, plant work or thing, shall be used by Purchaser for any purpose or in any manner other than that for which they have been supplied by Contractor and specified under this contract.

#### 1.2.19 Insurance

- a. Contractor shall take out and keep in force a policy or policies of insurance against all liabilities of contractor or purchaser at common law or under any statute in respect of accidents to persons who shall be employed by contractor in or about site of Contractor's Offices for purpose of carrying out works on site. Contractor shall also take out and keep in force a policy or policies of insurance against all recognized risks to their offices and depots. Such insurance shall in all respects be to approval of Purchaser and if he so requires in his name.
- b. Insurance of materials and installations - Contractor shall take out and keep in force a policy or policies or insurance for all materials in storage and traction installation excluding foundations under erection and/or erected until such materials and installation are provisionally handed over to purchaser. For this purpose, traction installations in a section shall be deemed to have been provisionally handed over, when provisional acceptance certificate is issued for section or traction installations, in section or commissioned or on expiry of three months after installations are given ready in all respect for handing over, whichever is earlier, for commercial use. If validity of contract is extended, validity of insurance should also be extended subsequently. Contractor shall not be liable for losses or damages to equipments erected, in course of erection or in stores at contractor's depot in consequence of mutiny or other similar causes over which contractor has no



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control and which cannot be insured, such losses or damages shall, if required by purchaser, be made good by contractor, at cost of purchaser.

- c. Contractor should, however, insure materials brought to site against risks in consequence of war and invasion, as required under emergency risks (goods) Insurance Act in force from time to time.
- d. Contractor shall take out all insurance covers in connection with the contract with Govt. recognized insurance company.

#### 1.2.20 Accident

- a. Contractor shall, in respect of all staff engaged by him or by his sub-contractor, indemnify and keep purchaser at all times indemnified and protected against all claims made and liabilities incurred under Workmen's Compensation Act, the factories Act and Payment of Wages Act and rules made there under from time to time or under any other labour and Industrial Legislation made from time to time.
- b. Contractor shall indemnify and keep purchaser indemnified and harmless against all actions, suits, claim demands, costs, charges or expenses arising in connection with any death or injury sustained by any person or persons within Railway premises and any loss or damage to Railway property sustained due to acts or omission of contractor, his sub-contractors, his agents or his staff during executions of this contract irrespective of whether such liability arises under the Workman's Compensation Act, or Fatal Accident Act or any other statute in force for time being.
- c. Contractor's liability to meet third party claims of the type outlined above will be applicable only in cases where accidents have been caused by bad design, workmanship, material or negligence on part of contractor and further liability of contractor will be limited to Rs. 25 lacs for any one accident.
- d. Contractor shall be responsible for all repairs and rectification of damages to traction installations erected or under erection due to railway accidents, thefts, pilferage or any other cause, without delay to minimize or to avoid traffic detentions, in a section until installation is provisionally handed over to purchaser.
- e. Clearing Damaged Installations - Contractor shall at his cost arrange for expeditious clearing of Railway Track/s of traction installations, obstruction or fouling track/s when they are damaged as a result of railway accident or any other cause, upon oral/telephonic/written instructions from Purchaser's representative, until installations are provisionally handed over to purchaser. If contractor fails to clear tracks expeditiously and within reasonable time, purchaser will arrange to clear track/s of damaged installations and recover expenses incurred from contractor. If during such clearance operations further damage is caused to installations, purchaser is not liable to reimburse contractor cost of such further damage to installations.
- f. Contractor shall arrange for temporary slewing of overhead equipment for crane operations for derailment of rolling stock due to accidents for which contractor is not responsible, if required by Railway or purchaser, at the cost of purchaser until the installations are provisionally handed over to purchaser. If contractor fails to slew overhead equipment within reasonable time the purchaser will arrange to slew equipment and recover extra expenses, if any incurred from the contractor. After the crane operations are completed, the contractor shall restore overhead equipment to its normal position.

#### 1.2.21 Safety measures –

- a. The Contractor shall take all precautionary measures in order to ensure the protection of his own personnel moving or working on the Railway premises, but shall then conform to the rules and



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regulations of the Railway. If and when, in the course of the work 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 provide necessary protection i.e. Flagmen, Flag etc. required in block working. Competency for the above shall, however, be given by the Railway authorities. The Purchaser 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.

- b. Blasting of rock for foundation work shall be done only after due notice is given to the Purchaser and time/s and date/s for blasting operations agreed to by the Purchaser. Blasting, if required to be done in the vicinity of the track, shall not be undertaken until the Purchaser's flagmen on duty take necessary steps to protect trains and the track is adequately protected by the Contractor against damage by blasted rock. The Contractor shall follow detailed instructions which will be issued to him regarding blasting operations in the vicinity of tracks. The flagmen for protection of trains and the Track in such cases will be provided by the contractor but deputation at site will be done by the purchaser.
- c. 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.
- d. Ladder trolleys shall be used with caution. They shall not be put on tracks until the flagmen are on duty to protect the trolleys and the Purchaser's representative authorises in writing for the trolleys to be put on the tracks. Ladder trolleys shall be promptly removed on instructions from the Purchaser's representative and well in advance of trains. No claims shall rest on the Purchaser in the event of a ladder being run over by train. The flagmen for the above job will be provided by the contractor.

Competency for the above shall, however, be given by the Railway authority. Protection of track by banner flags shall be done in accordance with General Rules of Indian Railways and Subsidiary Rules of the concerned zonal Railway where work is being carried out. Flagmen so deployed by the contractor shall be medically fit for A/3 category (as per Indian Rly Medical Manual). prescribed fee for which shall be borne by the contractor.

- e. Contractor shall abide by all Railway regulations in force for the time being and ensure that the same are followed by his representatives, Agents, sub-contractors or workmen. He shall give due notice to his employees and workers about provision of the para.
- f. While working within station limits, especially on passenger platforms, contractor shall ensure that all times sufficient space is left for free movement of passenger traffic. He must cover and/or barricade excavations carried out in such areas and continue to maintain these till the work is completed, with a view to avoid any accident to public, contractors or to Railway staff.
- g. Works must be carried out most carefully without any infringement of Indian Railway Act or General and Subsidiary Rules in force on Railway in such a way that they do not hinder Railway operation or affect proper functioning of or damage any Railway equipment, structure or rolling stock except as agreed to by purchaser, provided that all damage and disfiguration caused by contractor to any Railway property must be made good by contractor at his own cost failing which cost of such repairs shall be recovered from contractor.
- h. If safety of track or track drainage etc. is affected as a consequence of works undertaken by contractor, contractor shall take immediate steps to restore normal conditions. In case of delay, purchaser shall, after giving due notice to contractor in writing, take necessary steps and recover costs from contractor.



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- i. Moreover, if any time works to be carried out directly concern safety of trains, contractor's staff must comply fully with Railway regulations given to him by the authorized Railway Staff. The contractor's employees and workers may for no reasons operate in installation concerning train safety or train movement. They shall notify authorized representative of purchaser who will take all necessary steps in this regard.
- j. Contractor shall be responsible for safe custody of all equipment till provisional acceptance.
- k. Contractor's liability to meet third party claims of the type outlined above will be applicable only in cases where accidents have been caused by bad design, workmanship material or negligence on the part of the contractor and further liability of contractor will be limited to Rs. 25 lacs for any one accident.
- l. Contractor shall ensure that unauthorized, careless or inadvertent operation of switchgear, which may result in accident to staff and/or damage to equipment, does not occur.
- m. Contractor shall abide by all instructions issued by the purchaser from time to time in connection with protection/safety of track/ Railway installations /personnel as well as quality control. Contractor should not leave excavated pits un-filled overnight. Due to any reason if it becomes necessary to leave pit unfilled overnight, it should be filled back effectively with sand bags to the satisfaction of Purchaser's representative.
- n. During execution of work, contractors shall ensure that all safety precautions are taken by their men to protect themselves and site to prevent any untoward incident. In this regard contractor will ensure that adequate number of safety helmets, safety belts, safety jackets with reflective arms band, rope, ladders, emergency light etc. are available at site before the work is actually started. Above list is only indicative and is not exhaustive and safety item will be arranged as per requirement. Railway reserve the right to stop work in absence of proper safety gear and no claim shall be entertained in this regard. Decision of the Engineer-in-charge will be final and binding upon contractor. Cost of all safety gear is deemed to have been included in rates quoted and nothing extra is payable under this contract.
- o. **ELECTRICAL CONTRACTOR LICENSE**  
The contractor shall submit a valid Electrical contractor's Licence as applicable from the concerned statutory authority before signing of Contract Agreement.

OR

**In case of subletting of Contract,**

The contractor shall make a formal Agreement with suitable sub-contractor, for executing Electrical Portion of Work with sub-contractor, for executing Electrical portion of work with sub-contractor, holding a valid Electrical Contractor's licence as applicable. The contractor shall submit a formal agreement duly notarized, legally enforceable in the Court of Law, between main contractor and sub-contractor for the Electrical component of work proposed to be executed by the sub-contractor prior to signing of the contract agreement.

**Note:-** In case the contractor is a partnership firm, the Electrical contractor License shall be either in the name of partnership firm or in the name of any of the constituent partners of such partnership firm. In case the contractor is a JV, the electrical contractor's License shall be either in the name of the JV or in the name of any constituent partners of such JV. In case one of the constituent of JV firm is a partnership firm, the Electrical contractor Licence shall be either in the name of partnership firm or in the name of any of the constituent partners of such partnership firm.

**1.2.22 Provisional Acceptance**

- a) Immediately after completion of works at each switching station/LT transformer or in a section of overhead equipment, the Contractor shall certify and advise Purchaser in writing that station/s or section is/are (i) complete (ii) ready for satisfactory commercial service and (iii) ready to be handed over. He will also place at the disposal of Purchaser the required staff for checking it and putting it into operation.
- b) Test or tests as stipulated in Part-II, Chapter VII of specification excluding current collection tests which would be carried out subsequently in connection with the taking over by the Purchaser of the



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- equipment and installations shall be carried out jointly by Purchaser and contractor within a month after receipt of contractor's notifications, as stated in sub-para/s above.
- c) After inspection and satisfactory conclusion of tests and when purchaser is satisfied with satisfactory working of installations he will issue a Provisional Acceptance Certificate which would be signed by both the parties. The Provisional Acceptance Certificate will not be withheld for any minor defects.
  - d) Should the result/s of inspection and the test/s be not satisfactory, an extension of one month will be granted to contractor to make good defects and deficiencies pointed out by Purchaser. Fresh inspection and test will then be carried out after contractor has attended to defects and deficiencies. If these tests are also not satisfactory, Purchaser may proceed at contractor's expenses by all means deemed expedient, to have installation made satisfactory until they comply with specifications and approved drawings and designs.
  - e) In such a case, or in case of delay in completing the work under this contract within time limit, Purchaser reserves right if he deems it possible to use in a reasonable manner any section or any part of section even if some installations of section are not completely erected. Purchaser will give to contractor for this purpose seven days previous notice. Contractor shall then take at his own expenses all necessary steps to complete works in accordance with, provisions of the contract. In case it becomes impossible to proceed with above mentioned taking over tests, for reasons other than for which contractor is responsible, the Provisional Acceptance Certificate shall be issued at or within a mutually agreed reasonable period not exceeding three months after completion of relevant sections as indicated in sub-para/s above

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Note:

1. Provisional Acceptance Certificate for each section will be issued immediately after all tests (excluding current collection tests) are completed to satisfaction of purchaser. Should purchaser be unable to complete tests and energisation of line within a reasonable time which shall not exceed One month from date of contractor's notification, issue of Provisional Acceptance Certificate shall not be delayed and shall be issued within a maximum time of Three months after notification has been issued. Current collection tests shall normally be carried out for entire section within three months of date of energisation of section.
  2. The issue of Provisional Acceptance Certificate shall not be withheld for rectification of minor defects which may reasonably be considered not essential for energisation and operation of installation. In such cases, only value of materials and cost of rectification of minor defects shall be withheld from payments of Provisional Acceptance until rectification is completed.
  3. Contractor shall be responsible for upkeep of OHE & other assets even after issue of PAC till CRS inspection, section/station is put in commercial use & handing over to the Division.
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### 1.2.23 Defective equipments to be changed

- a) Notwithstanding issue of Provisional Acceptance Certificate and partial or full use of any equipment, if completed equipment or any portion thereof before it is finally taken over at the end of the guarantee period be found to be or to have become defective in course of usage by the Railway due to faulty material, design or workmanship, or otherwise fails to fulfill the requirement of the Contract and/or its purpose, Purchaser shall normally give Contractor prompt notice setting forth particulars of each defects or failure and Contractor shall forthwith make the defects good or modify or replace the equipment, as may be directed by Purchaser's Engineer, at his own cost in all respects to make it comply satisfactorily with said requirements. Should the Contractor fail to do within a reasonable time service of the said notice upon him or should time not permit of service of such notice, the Purchaser may repair or reject and replace the whole or part of such defective equipment as the case may be, at cost of the Contractor. Contractor's full liability under this clause shall be satisfied by payment to Purchaser of extra total cost, if any, of such replacement delivered and erected as provided for in original

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Contract, such extra cost being the ascertained difference between the price paid by Purchaser under provisions above mentioned for such replacement and Contractor's price for the plant so replaced, plus the sum, if any, paid by Purchaser to the Contractor in respect of such defective equipment. Should Purchaser not so replace rejected equipment within a reasonable time, the Contractor's liability under this clause shall be satisfied by the repayment by Contractor of all moneys paid by the Purchaser to him in respect of such rejected equipment. Rejected/defective materials shall be returned to Contractor to extent possible.

- (b) Provisions of this para will apply only in respect of equipment and components supplied by Contractor or his sub-Contractor.

#### 1.2.24 Use Of Rejected Equipments

In event of such rejection as aforesaid, purchaser shall, without prejudice to his other rights and remedies and, in particular, without prejudice to his rights under clause just preceding, be entitled to use of rejected equipment for a time reasonably sufficient to enable him to obtain other replacement equipment. During such period, if rejected equipment is used commercially, the contractor shall not be entitled to payment on energisation until such rejected equipment is rectified and/or replaced, but Purchaser shall not be entitled to claim any damages arising out of rejected equipment in respect of such period.

#### 1.2.25 Guarantee

- a) Contractor shall guarantee that all equipment and works executed under this contract shall be free from all defect and faults in material, design, workmanship and manufacture and shall be of acceptable standards for contracted work and in full conformity with technical specifications, drawings and other contract stipulations, for a period of **18 (Eighteen) months** from date of commercial operation or from date of Provisional Acceptance by Purchaser whichever is earlier.
- b) During period of guarantee Contractor shall keep available an experienced engineer and necessary equipment to attend to any defective installations resulting from defective erection and/or defects in equipment supplied by 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. Contractor shall bear the cost of modifications, additions or substitutions that may be considered necessary due to faulty materials, design or workmanship for satisfactory working of the equipment. The final decision shall rest with the General Manager/Chief Electrical Engineer or his successor(s)/ Nominee.
- c) During period of Guarantee the Contractor shall be liable for replacement at site of any parts which may be found defective in equipment whether such equipment be of his own manufacture or those of his sub-contractor whether arising from faulty design, materials, workmanship or negligence in any manner on part of Contractor provided always that such defective parts as are not repairable at site are promptly returned to 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 should replace all such Items irrespective of fact whether all such Items have failed or not. The Contractor shall bear cost of repairs carried out on his behalf by Purchaser at site. In such a case, contractor shall be informed in advance of works proposed to be carried out by Purchaser.
- d) If it becomes necessary for Contractor to replace or renew any defective portion of equipment under para aforesaid then provision of said para shall also apply to portions of equipment so replaced or renewed until expiration of six month from date of such replacement or renewal or until end of above mentioned period whichever is later. Such extension shall not apply in case of defects of a minor nature, decision of General Manager or his successor/nominee being final in the matter. If any defect be not remedied within a reasonable time during aforesaid period Purchaser may proceed to do work at Contractor's risk and expense, but without prejudice to any other rights



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and remedies which Purchaser may have against the Contractor in respect of such defects or faults.

- e) Repaired or renewal parts shall be delivered and erected at site free of charge to purchaser.
- f) Any materials, fittings, components or equipments supplied under para 1.1.17 shall also be covered by provisions of this paragraph. Liability of Contractor under guarantee will be limited to re-supply of equipment, components and fittings made under para 1.1.17. Such re-supply shall be effected at the Contractor's depot or, in event of closure of depot, at stores depot of Engineer-in-charge of maintenance of overhead equipment of section covered by contract.
- g) In case of materials, components, fittings and equipment supplied by Purchaser no liability will rest on 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 Contractor to Purchaser and such quantities will be considered for purpose of final reconciliation over and above allowances as per Part I, Chapter IV.

#### 1.2.26 Final Acceptance

- (a) Final acceptance of entire equipment installed shall take effect from date of expiry of period of guarantee as defined in clause 1.2.25 of expiry of last of respective periods of guarantee of various sections for which provisional Acceptance Certificates are issued or brought into commercial operation, provided in any case that Contractor has complied fully with his obligations under clause 1.2.25 in respect of each section provided also that attention has been paid by way of maintenance by Purchaser.
- (b) If on other hand contractor has not so complied with his obligation under clause 1.2.25 in respect of any section, Purchaser may either extend period of guarantee in respect of that section until necessary works are carried out by Contractor or carry out those works or being them carried out suo moto on behalf of Contractor at Contractor's expenses. After expiry of period of guarantee for each section, a certificate of final acceptance for section shall be issued by Purchaser and last of such certificate will be called last and final acceptance certificate. Contract shall not be considered as completed until issue of final acceptance certificate by Purchaser.
- (c) Purchaser shall not be liable to Contractor for any matter arising out of or in connection with contract or execution of work unless Contractor shall have made a claim in writing in respect thereof before issue of final acceptance certificate under this clause.

Notwithstanding issue of final acceptance certificate the Contractor and the Purchaser (subject to sub-clause as above) shall remain liable for fulfillment of any obligation incurred under provision of contract prior to issue of final acceptance certificate which remains unperformed at time such certificate is issued and for determining nature and extent of such obligation contract shall be deemed to remain in force between parties hereto.

#### 1.2.27 Payment

Payment will be governed by terms specified in Part-I, Chapter III and in accordance with accepted schedule of prices, read with relevant para of other parts and Chapters of Tender Papers. Purchaser retains right to withhold money due to contractor arising out of this contract for any default of contractor from other contracts which the contractor may have with Government of India.

- i) Contractor shall, whenever required, produce or cause to be produced for examination by Purchaser any quotation/invoice, cost of other account, book of account, voucher, receipt letter, memorandum paper or writing or any copy of or extract from any such document and also furnish information and returns verified in such manner as may be required in anywise relating to



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execution of this contract or relevant for verifying or ascertaining the cost of execution of this Contract (the decision of the purchaser on the question of relevancy of any documents, information or return being final and binding on parties). Contractor shall similarly produce vouchers etc., if required, to prove to the Purchaser that materials supplied by him are in accordance with specifications laid down in contract.

- ii) If any portion of work be carried out by a sub-contractor or any subsidiary or allied firm or company Purchaser shall have power to secure books of such sub-contractor or any subsidiary or allied firm or company, through Contractor, and such books shall be open to his inspection. The Contractor should seek prior permission from purchaser for subletting whole and/or part of work to any sub-contractor.
- iii) Obligations imposed by sub clause (i) and (ii) above are without prejudice to obligation of Contractor under any statute, rules or order binding to Contractor or other conditions of contract.
- iv) It is an agreed term of contract that purchaser reserves to itself right to carry out post-payment Audit and/or technical examination of works and final bill, including all supporting vouchers, abstracts etc. and to make a claim on Contractor for refund of any excess amount paid to him if as a result of such examination any over payment to him is discovered to have been made in respect of any work done or alleged to have been done by him under contract.

#### 1.2.28 Equipments, components and material received for work

Contractor shall utilize all equipments, components or materials, procured specifically for purpose of execution of work, in work or other requirements. Any surplus materials left over at the end of the work shall not be disposed off without prior approval of Purchaser in writing. Purchaser may within a period of six months from the date of Provisional Acceptance of last section/switching station, notify Contractor of Purchaser's interest in any or all of the surplus materials and shall have right to take over the materials, so indicated at quoted prices. Materials so notified by Purchaser shall be taken over by Purchaser and paid for in full. Contractor may use in any manner deemed fit, only such surplus materials which are not covered by Purchaser's notification after getting approval of Purchaser in writing.

- 1.2.29 All payments in respect of contract during currency of the contract shall be made through National Electronic Funds Transfer (NEFT) or Real Time Gross Settlement (RTGS). The successful tenderer on award of contract must submit NEFT /RTGS mandate form complete in all respect as detailed at Annexure J of the tender document. However, if facility of NEFT/RTGS is not available at a particular location, the payments shall be made by cheque. In such cases the successful tenderer on award of contract will have to furnish contractor's Bank Account Number and Name of the Bank against which all payments in respect of the contract during the currency of the contract shall be made.

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PART-I  
**CHAPTER - III**  
**PRICE AND PAYMENT**

**1.3.1 SCOPE :**

This Chapter deals with prices to be paid for supply and/or erection of various items of work or for supplies and other amounts payable in accordance with accepted schedules of prices and rates and terms and conditions of payment mentioned herein. This is a works contract. The total prices for the completed items of work are the actual prices payable to the Contractor as per the terms and condition of the Contract.

**1.3.2 SCHEDULE OF PRICES :**

**(a) (i) PRICES FOR ITEM WITH S.O.R.**

The rates given against various items of work in five sections of Schedule-1 in Tender Document are the standard schedule of rates (S.O.R.). The tenderers are required to quote a single percentage below/at par/above against the S.O.R. cost of each section separately. The actual payment to be made against any item of any sections of Schedule-1, shall be derived after loading the SOR prices of that sections with the tenderer's quoted percentage for the same section. The prices so obtained shall be the unit prices for the various items of work given in Schedule-1.

**(ii) Non-Schedule Items**

Tenderer shall quote a single percentage below/at par/above against the non-schedule cost of each section in Part V Schedule-1 along with summary of prices of items with SOR to arrive at the total cost.

All prices as above shall be FIRM irrespective of minor variations in basic quantities and use of alternative types of various components and fittings approved by the Purchaser. Minor changes in the basic designs shall not affect unit prices, so long as such changes are mutually agreed to by the Purchaser and the Contractor. The prices shall be for materials and erection, except for those materials specified in Part-IV, Annexure-4, for which only erection charges will be payable and for execution of work in accordance with specifications and approved drawings and designs. The Contractor shall carefully note the items of materials, equipments, fittings and components which will be supplied by the Purchaser.

**(b) OTHER PRICE ADJUSTMENTS:-**

**(i) UNIT PRICES FOR MATERIALS**

The unit prices indicated in all Schedules are inclusive of the prices of materials including all incidental charges for transport, loading/ unloading and handling of materials, commission for arranging dispatch by rail direct from manufacturer's factory and completing all necessary formalities in this respect, such as submission of forwarding notes, arranging placement of wagon, collection of railway receipts, all insurance premia, bankers charges for bank guarantee, indemnity bonds inclusive of cost of stamps etc. as also siding or shunting charges, if any, levied by the Railway.

The prices shall include all taxes, duties and levies (including Octroi etc.) applicable on this works contract. Therefore, they should quote their prices taking into account the rate of taxes as leviable in the event of sale through works contract to the Central Government Organization in that state. It is clarified that required forms applicable for this purpose will be supplied to the contractor as applicable in the state where the contract is being executed. The price shall also include provision for losses and wastages in transit and erection.

**FOR ERECTION**

The unit prices indicated in column 5 of all Schedules are inclusive of cost of erection and testing to be done by the Contractor to the extent indicated in part-II, Chapter-VII and also cover all cost of administration of the contractor, insurance premia, banker's charges for guarantees, cost of stamps, cost of storage, loading and unloading and handling of materials, and for any road transport which the Contractor may use for carriage of materials between his depot and depot/s



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and site of work. The unit prices shall include cost of works and adjustments necessary to be done by the Contractor during or after the tests carried out by the Purchaser as per tender conditions.

(d) **QUANTITIES**

The approximate estimated quantities of various items of work are included in Schedule-1.

(e) **EXPLANATORY NOTES**

Explanatory notes for various items of work included in Schedule 1, Section 1 to 6 are given in part-I, Chapter IV.

(f) **NEW ITEMS OF WORK**

- i) If during the execution of the work the Contractor is called upon to carry out any new item of work not included in Schedule 1, the Contractor shall execute such works at such prices as may be mutually agreed upon with the Purchaser before commencement and these will be based on the rate analysis as per the current market /prevalent rates of such or similar items available with the Rly Administration in that or nearby areas.
- ii) Provided that if the Contractor commence work or incurs any expenditure in regard thereto before the rates are determined and agreed upon as lastly hereon-to-forementioned, then and in such a case the Contractor shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of determination of the rates as aforesaid according to the rates as shall be the Purchaser. However, if the contractor is not satisfied with the decision of the Purchaser in this respect he may appeal to Dy Chief Electrical Engineer within 30 days of getting the decision of the Purchaser, supported by analysis of the rates claimed. The Dy Chief Electrical Engineer's decision after hearing both the parties in the matter would be final and binding on the contractor and the Railway.

1.3.3 **Price of Equipments, Components and Materials -**

Payment will be made in accordance with price and payment clause 1.3.7.

**( For OHE)**

Rates given in Schedule-3 Form -6 of tender paper loaded by same percentage increase/decrease quoted by tenderer against S.O.R. rates for Schedule-1 item shall be effective on account rates for items given in Schedule-3.

1.3.4 **Price of Additional supplies-(TSS) :-** Payment will be made in accordance to clause 1.3.5.

**(For OHE):-** Additional supplies will be taken over from contractor at prices indicated in Schedule 3.

1.3.14 **Measurements**

- (a) Payment for field work shall be made in accordance with approved designs and drawings and measured in relevant units except where provided for otherwise. In case dimensions of work are more than those shown in approved designs and drawings, the contractor will not be entitled to any extra payment, unless dimensions are increased on account of physical impossibility of carrying out work in accordance with approved drawings and designs. In case dimensions of work are less than those shown in approved designs and drawings and work is accepted without being rejected, payment will be made as per work actually done.
- (b) Measurements will be made generally in accordance with standard engineering practice and in conformity with the explanatory notes for Schedule - 1 ( Part I, Chapter IV).
- (a) It shall be open to the Contractor and the Railway to take specific objection to any recorded measurement or classification on any ground within seven days of the date of such measurements. Any re-measurements taken by the Engineer or the Engineer's representative in the presence of the Contractor or in his absence after due notice has been given to him in consequence of

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objection made by the contractor shall be final and binding on the contractor and no claim whatsoever shall thereafter be entertained regarding the accuracy and classification of the measurement.

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**PART- I**

1.4

**CHAPTER-IV "A"**

**EXPLANATORY NOTES OF SCHEDULE (FOR OHE, SWS, BT STATION & LT SUPPLY  
TRANSFORMER STATIONS) SCHEDULE OF PRICES**

**Part "A"- OHE GENERAL**

**1.4.1** Explanatory notes for various items of work in Schedule-1 are given below:

**1.4.2** The basic quantities of components and materials required to make up a unit of work for selected items, are indicated for guidance only. There may be minor variations to suit erection but no adjustment in prices of Schedule -1 (Pt. I, Ch. IVA) shall be made on that account. In estimating the prices for various items of work, provision for loss and wastage in transit and erection should be provided for over and above the basic quantities of components and materials required to make up a unit of work, indicated herein, except where otherwise specified for materials supplied by the Purchaser.

**1.4.3** In the explanatory notes given in Part-"B"- Particular of this Chapter, the term 'Small parts steel work' is meant to cover fabricated steel work made from rolled steel sections, complete with bolts and nuts and washers where required for fastening the small parts steel work to any structural member. The term "attachment" wherever used is intended to cover castings, forgings, machined or welded components or fittings, which are attached directly to a structural member, or mounted on small parts steel work and shall include bolts and nuts for fastening the attachment to the structural member or small parts steel work.

**1.4.4** In the explanatory notes given in Part-"B"- Particular of this chapter, the term "bimetallic connection" is meant to cover any connection between a copper conductor and an aluminum conductor. The clamps used for such connections shall be made of a suitable aluminum alloy or copper alloy and the copper/aluminum conductor shall be wrapped with a bimetallic (aluminum copper) strip to prevent direct contact between aluminum and copper.

**1.4.5** Special notes for measurements are included in Part-"B"- Particular of this chapter under various items, where necessary.

**1.4.6** Reconciliation of materials supplied by the Purchaser

- (a) The following procedure shall be adopted for the final reconciliation of the various equipments, materials, fittings and conductors supplied by the Purchaser for OHE..
- (b) All the materials supplied by the Purchaser shall be correctly accounted for and quantities reconciled on completion of the work by the Contractor. On completion of work, all surplus materials supplied by the Purchaser together with the ones found defective or that have become defective or broken on account of defective materials and/or workmanship shall be returned to him by the Contractor.
- (c) Steel - Cost of rolled steel masts, gantry masts, fabricated steel work damaged or not accounted for, will be recovered at rates specified in note at the end of this para.
- (d) Wires and conductors - The purchaser will supply to the contractor all wires and conductors as per Annexure-4 required for the work based on unit quantities, inclusive of erection allowances in accordance with column 6 Annexure- 6 together with the lengths of finished wires and conductors for new Items of work. Out of the quantity as calculated above, the contractors shall return to the purchaser wires and conductors



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in longest possible bits or in the form of scrap as calculated on the basis of final quantities of Item of work of schedule and the quantities specified in column 5, Annexure-6. The total length of finished wires and conductors deemed to have been erected will be the difference viz as calculated on the basis of the final quantities of schedule-I and the bare unit length specified in column 4, Annexure 6 together with the lengths of finished wire and conductors for new Items of work.

Notwithstanding the above, it is general condition that the contractor shall return to the purchaser all wires and conductors which have been supplied to him but not utilized on works. Should the contractor be unable to do so, the purchaser shall be entitled to recover the cost of such wires and conductors as specified in note at the end of para 1.4.6(f). For the purpose of reconciliation the length of wire or conductors deemed to have been supplied by purchaser to contractor will be the length stenciled on the drum and the length deemed to have been returned by the contractor will be the actual length of cut pieces and/or the length calculated on the basis of the actual weight of cut pieces scrap and liner density specified in column 2, Annexure-6.

(e) (iii) **SUPPLY OF STEEL BY RAILWAYS:** In case the Purchaser chooses to supply galvanised, rolled steel masts, gantry masts, fabricated steel works, to the Contractor, the cost of rolled steel masts, gantry masts, fabricated steel work damaged or falling short will be recovered at rates specified in NOTE at the end of para 1.4.6 (f) (Pt. I, Ch. IVA).

(e) (iv) **SUPPLY OF COPPER CONDUCTORS BY RAILWAYS:** In case the Purchaser chooses to supply copper wires and conductors to the contractor, the procedure to be adopted would be as under:-  
Soon after the approval of layout plan and cross section drawings the Contractor shall assess the quantity of the wires and conductors required for the work and submit his assessment indicating the phased requirement of each type of wires and conductors in total running lengths or in MT for verification by the Purchaser. The Purchaser will supply to the Contractor all wires and conductors required for the work based on unit quantities, inclusive of erection allowances in accordance with column 6, Annexure-6 together with the lengths of finished wires and conductors for new items of work (see para 1.3.2 (j) (Pt. I, Ch. IIIA) and the lengths of wires and conductors under items 31(h) of Schedule-1 (Pt. I, Ch. IVA). Out of the quantity as calculated above, the contractor shall return to the Purchaser wires and conductors in longest possible bits or in the form of scrap, as calculated on the basis of the final quantities of items of work of Schedule-1 (Pt. I, Ch. IVA) and the quantities specified in column 5, Annexure-6. The total length of finished wires and conductors deemed to have been erected will be the difference, viz., as calculated on the basis of the final quantities of Schedule 1(Pt. I, Ch. IVA) and the bare unit lengths specified in column 4, Annexure-6 together with the lengths of finished wires and conductors for new items of work (see para 1.3.2 (j) (Pt. I, Ch. IIIA) and the lengths of wires and conductors under item 31(h) of Schedule-1 (Pt. I, Ch. IVA).

Notwithstanding the above, it is a general condition that the Contractors shall return to the Purchaser all wires and conductors which have been supplied to him but not utilised on works. Should the Contractor be unable to do so, the Purchaser shall be entitled to recover the cost of such wires and Conductors as specified in NOTE at the end of para 1.4.6 (f) (Pt. I, Ch. IVA). For the purpose of reconciliation the length of wire or conductor deemed to have been supplied by the Purchaser to Contractor will be the length stenciled on the drum and the length deemed to have been returned by the Contractor will be the actual length of cut-pieces and/or the length calculated on the basis of the actual weight of cut pieces scrap and linear density specified in column 2, Annexure-6.

(f) **OTHER EQUIPMENTS, FITTINGS AND COMPONENTS:**

The Purchaser will supply the requirement of the various other equipments, components or fittings listed in Annexure-4. If there are any shortages during final reconciliation, their cost will be recovered by the Purchaser from the Contractor at the prices inclusive of all charges as specified in note below:-



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- NOTE : (1) If there are any shortages during final reconciliation, their cost will be recovered by the Purchaser from the Contractor at the book rate or the last purchase rate or the prevailing market rate, whichever is higher, plus 5% on account of initial freight, 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 Purchaser's source of supply and the Contractor's depot shall be to the Contractor's account.
- (2) No recovery/reconciliation shall however, be made as per the preceding paras if the items stated under clause 1.4.6 (Pt. I, Ch. IVA) are made contractor supply by including the respective optional items in the contract.

#### 1.4.7 Released Material

The contractor shall return to the purchaser all the released OHE material from the existing system at the first available opportunity but not later than a week at the purchaser's store at Ajmeri Gate, New Delhi/ Dy. COS/SSB. If the contractor fails to return the released material in specified time, the cost of released material will be recovered from the progress bill before releasing any payment.

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**PART- I**  
**CHAPTER-IV "B"**  
**OHE PARTICULAR**  
**Schedule-1, Section-1 to 5**

(1) Notwithstanding anything to the contrary in this section, the entire requirement of the equipments components and fittings for the work, listed in Annexure - 4 will be supplied by the Purchaser to the Contractor. The prices in Schedule-1, Section 1 to 5 shall be exclusive of cost of supply of these items mentioned in Annexure-4 of Part-IV.

(2) In the case of wires, conductors, etc., the prices for erection shall include any assembly work to be done in the Contractor's depot prior to erection at site, such as fabrication of droppers etc to shapes and sizes required.

**ITEM No.1 (a) Preparation of designs and drawings for overhead equipment and verification of Purchaser's pegging plans.**

The price shall cover verification of Purchaser's overhead equipment pegging plans indicating location of structures which will be furnished by the purchaser, in stages, and preparation of all drawings and designs required to be finalised by the Contractor. The price shall include the following:-

(i) Making minor modifications with the approval of the Purchaser to the layout of the structures and overhead equipment, if necessary, and submission of overhead equipment layout plans, including stagger, location of cut in insulators etc.

(ii) Preparation of cross section drawings and structure erection drawings for each structure locations [see para 2.5.6(f)].

(iii) Choice of type and size of foundations to suit soil and loading conditions, except for the ones which are considered as "Works under other Agencies" (see para 1.2.17).

(iv) Preparation of long section drawings of overhead equipment where such drawings are required including detailed study of overline structures such as foot over bridges, road over bridges etc. for maintaining the specified height of contact wire and requisite clearances.

(v) Preparation of other designs and drawings including drawings of small parts steel work (other than those for which RDSO standard drawings are available) and detailed designs for booster transformer stations and LT. Supply Transformer stations (see para 1.2.9).

(vi) Supply of requisite no. of copies of all drawings, including completion drawings specified in part -II, Chapter V to the Purchaser.

(VII) Preparation, design, development of Bonding Plans based of Track Circuit plans supplied by the purchaser, clearly specifying the location of various bonds, +ve, -ve rails and other relevant details as required for bonding plan and supply of requisite number of copies of Bonding Plans drawings. In case preparation of the overhead equipment pegging plans by the Purchaser for any part of the section is delayed, the Contractor may be asked to prepare pegging plans for the section. No extra payment will be made for the preparation of such pegging plans. The total length of track for which the Contractor may be asked to prepare such pegging plans will not exceed 2% of the final total quantity against this item. This price shall also cover soil investigation and testing in an approved manner.

**NOTES FOR MEASUREMENTS :** *For the purpose of payment against this item, the length of track shall be measured as under :-*

1. General: *By the difference in the chainages of the length under consideration, as incorporated in the layout plans.*

2. Turnouts: *The track taking off shall be deemed as starting from the toe of the switch of the Turnout.*



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3. Cross-overs : *The length of track shall be taken as the difference in the chainages of the toes of switches of the two turnouts constituting the crossover.*

4. Diamond crossing with or without slips: *The two tracks crossing each other shall be measured independently as per note 1 above as though there were no crossing. No extra shall be provided for slip points.*

5. Dead ends and tops of loops: *The lengths for payment under this item shall be upto the chainage of anchor mast of the terminating OHE.*

6. Feeders and return feeders from grid sub-station to feeding station

*This item will also be applicable independently in case of feeders/return feeders/ conductors from grid substation to overhead equipment feeding stations or in a case of feeders/conductors running on independent structures (not supporting OHE) along or across tracks.*

*In such a case the length of line to be considered for purpose of item (a) shall be measured by the distance between the center of gantries of the grid sub-station and feeding stations in case of feeder/return feeders/conductors line from grid sub-station, or by the distance between the center line of the two structures to which the feeders/ return feeders/conductors are anchored in case of feeders running along the track if such feeder/return feeders/conductors are running completely on independent structures or by the distance between the center of the two structures supporting the OHE on either side of the first and last independent structure in case of feeders/return feeders/conductors running along the track supporting OHE.*

#### **ITEM No.1 (b) Preparation of designs and drawings for switching stations (FP/SP/SSP)**

The price shall cover on a flat rate basis per switching station, survey, investigation of soil bearing pressure, preparation of cross section drawings, preparation of general arrangement drawings, detailed layout of equipment, bus-bar connections and insulators, layout of earthing system and earth connections, cable run layout, detailed designs and drawings for steel work and structural support, excluding the ones for which supply is made by the Purchaser, suitable concrete plinths for equipment and drawings for equipments, components, fitting and materials supplied by the Contractor. The price shall include supply of requisite number of copies of all drawings, including completion drawings as specified in Part -II, Chapter-V to the Purchaser (see para 1.2.9).

#### **ITEM No. 2 (a) (i) Concrete for foundation and plinth in hard soil.**

##### **(ii) Concrete for foundation and plinth in rocky soil.**

##### **(For concrete mix of M 10 and M 15 Grade in Foundation)**

The price shall cover excavation, supply and handling of all materials and accessories, temporary arrangements for excavation in hard soil and concrete/masonry drains/walls requiring use of chisel and hammer 2(a)(i) or requiring blasting 2(a)(ii), Shoring where necessary, casting concrete including frame work where necessary, tamping of concrete, grouting of masts and finishing the top of concrete foundation or anchor blocks. The price also includes dismantling of all connected temporary arrangements, back filling with earth and compacting the same to the required height and width as per drawing to ensure safety of foundation, confining the exposed height of foundation block to within 10 cm., and removal of spoil.

The Purchaser's Engineer shall certify where use of chisel and hammer or blasting has been necessary. The contractor shall arrange for supply of explosives and all tools and plants for blasting operations at his own cost. If half or more of the depth or width of excavation is in hard soil/concrete/masonry drains/walls or in rock, the entire foundations shall be paid for under item 2(a)(i) or 2(a)(ii) as the case may be. If half of the depth or width of the excavation is in hard soil/concrete/masonry drains/walls and the other half is in rock, the entire foundation shall be paid under item 2(a)(ii). The price shall include the cost of cement.

Notes for measurement for items 2 (a) (i) and (ii):-

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1. The payable volume of the foundations under item 2(a)(i) and (ii) shall be the designed one as shown in the drawings for which the hole has been blasted, irrespective of the actual configuration assumed by the latter due to the blasting.
2. The depth of the excavation shall be measured from the formation level to the maximum excavated point.

**ITEM No. 2 (az) (i) Concrete for foundation and plinth in hard soil.**

**(ii) Concrete for foundation and plinth in rocky soil.**

**(for concrete mix of M 15 and M 20 Grade in Foundation)**

Same as 2(a)(i) and 2(a)(ii) above.

**ITEM No. 2 (b) Concrete for foundation and plinth in other than hard soil and rock.**

**(for concrete mix of M 10 and M 15 Grade in Foundation)**

The price shall include all works mentioned in item 2(a) in all classes of soil except hard soil, concrete or masonry drains and walls and rock.

**ITEM No. 2 (bz) Concrete for foundation and plinth in other than hard soil and rock.**

**(for concrete mix of M 15 and M 20 Grade in Foundation)**

Same as 2(b) above.

**ITEM No. 2 (c) Reinforced concrete for foundation and plinth**

The price shall cover excavation and all reinforced concrete work for foundations including supply of steel for reinforcement and other materials including bending, binding, laying of the reinforcement, shoring where necessary, casting concrete including frame work where necessary, grouting and finishing the tops of foundation blocks. The price shall also include dismantling of all connected temporary arrangements, back filling as required and removal of spoil. The price shall also cover all concrete work for foundation or anchor blocks on bridge piers, irrespective of whether they are actually reinforced or not, and counter weight foundations. Rails and fasteners required for counter weight foundations shall be supplied by the Purchaser free at the Contractor's depot or work spot according to convenience of the Purchaser. Dowel bars as may be required for bond with bridge structures shall be supplied and erected free of cost by the Purchaser. Dowel bars will not be considered as reinforcement for the purpose of this item. The price shall, include the cost of cement.

NOTE: Nominal reinforcement will be necessary in black cotton soil foundations. Such nominally reinforced foundations in black cotton soil will be payable under item 2(b) and not under item 2(c).

The steel for nominal reinforcement will be arranged by the Contractor and the concrete mixture, in such a case shall be as for normal foundations. (see para 2.2.4).

**ITEM No. 2 (d) Deleted-**

Notes for items 2 (a) to (c)

1. The prices under item 2 shall be same for any shape or size of concrete blocks. In calculating the individual volume of concrete, fraction of a cubic metre beyond the third decimal shall be rounded off to the next nearest third decimal.
2. The prices under items 2(a), (b) and (c) shall apply for concreting of all foundations for mast, gantries, portals, anchor blocks for guy rods, and fencing uprights.
3. For purposes of computation of volume of concrete under item 2, the volume of steel work embedded in the foundation block shall be ignored.
4. Cost of all concrete will be paid for only under item 2 and the prices of other items shall not include cost of concrete except for Item-17.
5. For purpose of computation of volume of concrete under item-2. The volume of concrete shall include the volume of sand and bitumen in sand cored foundation. However, for the purpose of computation of quantity of cement utilised in sand core foundations, the volume of the sand and bitumen used in core hole should be deducted from the total volume of the foundation.

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6. For purposes of computation of volume of concrete, the volume of each muff for all masts shall be taken as 0.02 cum except for masts with balance weights and for each column of portal, each headspan mast, 2 or 3 track cantilever masts, and special fabricated masts for which the volume of muff shall be taken as 0.08 cu.m. irrespective of the size and shape of muff, on a flat basis.

7. The prices under items 2 (a), (b) and (c) shall also include the cost of concrete cable trenches and trench covers at the switching stations as well as embodiment of drain pipes, where required.

8. The prices under items 2 (a),(b) and (c) shall also cover the cost of diversion of masonry/earth drain wherever necessary for casting of foundations.

9. Concrete mix for foundation and grouting/muffing under item 2(a),(b) and (c) will be as per para 2.2.4.

**ITEM No. 2 (e) Extra for supply & sinking of concrete shells**

The price shall cover extra on items 2(a),(b) and (c) for supply and sinking of a concrete shell before casting of concrete for traction structure foundations or anchor blocks including pumping of water where necessary. Purchaser's Engineer shall decide whether sinking of concrete shells is necessary.

NOTE : The above price shall be per concrete shell of standard size specified in para 2.2.7. If more than one concrete shell is used in a foundation, the price shall be proportionately augmented.

**Item No.2 (f): Casting of Foundations using mechanised Augur:**

The price shall cover excavation, supply and handling of all materials including supply and erection of steel for reinforcement, accessories/temporary arrangements and all associated operations for casting of foundations by mechanised Augur in all type of soils except rocks. All machines, tools and equipment needed for the above shall be supplied by the Contractor at his own cost. The price shall include the cost of cement.

NOTE : 1. The payable volume of the foundation shall be the designed one as shown in the drawings for which the pit has been excavated irrespective of the actual configuration assumed by the latter after auguring.

2. The depth of the excavation shall be measured from the formation level to the maximum excavated point.

**ITEM No. 2(h)(i) : -DELETED-**

**ITEM No. 3(a)(i) :Supply and Erection of traction masts fabricated from Rolled mild steel beam (BFB) of size 152mm x 152mm x 37.1 Kg/m and galvanised in length 9.5 m or 8.5 m long.**

The price shall cover the cost of supply of finished traction mast fabricated from Rolled mild steel beam (BFB) 152mm x 152mm x 37.1 Kg/m designated SC-150, table 3.1 of IS-808/1989 duly drilled as per RDSO's Drawing No. ETI/OHE/G/00144, Sh.No.3 Mod-C, with latest mod. and galvanised as per Specification No. ETI/OHE/13 (4/84) with A&C Slip No.1 to 3 with latest spec. The length of mast will be 9.5 or 8.5 meter as required. The steel shall be conforming to IS-2062/2006 (latest) Gr 'A' SK Zinc conforming to IS-209/1992 (or latest).

The price shall cover cost of erection, alignment and setting before grouting of individual traction masts. The price shall also include the cost of repairing of platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a mast at platforms.

**ITEM No. 3(a)(ii): Supply and Erection of traction masts, main mast of Switching stations and Booster transformer stations fabricated from Rolled mild steel Joist (RSJ) of size 203 mm x 152 mm x 52.0 kg/m and galvanised in various lengths.**

The price shall cover the cost of supply of traction mast, main mast of Switching stations and Booster transformer stations fabricated from Rolled mild steel joist (RSJ) 203mm x 152mm x 52.0 Kg/m designation WB-200, table 2.2 of IS-808/1989 duly drilled as per RDSO's Drawings given below for

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various types of masts and galvanised as per Specification No. ETI/OHE/13 (4/84) with A&C Slip No.1 to 3, with latest spec. The steel shall be conforming to IS-2062/1992 (latest) Gr 'A' SK Zinc conforming to IS-209/1992 (or latest).

Drg No. (i) ETI/OHE/G/00144, Sh.No.3 latest Mod	9.5 M long
(ii) ETI/C/0030 latest Mod	11.4 m (S1)
(iii) ETI/C/0031 latest Mod	11.4 m (S2)
(iv) ETI/C/0036 latest Mod	8.0 m (S4)
(iv) ETI/C/0181 latest Mod	12.4 m (S6)
(iv) ETI/C/0184 latest Mod	9.4 m (S9)

The price shall also cover the cost of supply of any other structures fabricated out of RSJ beam.

The price shall cover cost of erection, alignment and setting before grouting of individual traction masts and main masts of Switching and Booster Transformers stations including those for head spans. The price shall also include the cost of repairing of platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a mast at platforms.

**ITEM No. 3(b)(i) :Supply and erection of fabricated and galvanized structures (O,N&R type portals) with necessary components other than masts.**

The price shall cover the cost of supply of O, N and R type portals with components as per RDSO's Drg No. :

- (i) ETI/C/0008 Sheet No.1 latest Mod for 'N' type
- (ii) ETI/C/0017 Sheet No.1 latest Mod for 'O' type
- (iii) ETI/C/0011 Sheet No.1 latest Mod for 'R' type

The structures shall be fabricated from steel conforming to IS:2062/2006, Gr.E-250 (Fe 410 W), Quality-A, IS-808/1989 and galvanised as per RDSO's specification No.ETI/OHE/13 (4/84) with A&C slip Nos 1 to 3 , with latest spec.

The price shall cover, cost of erection, alignment and setting before grouting, wherever required, of portals assembly of boom components and erection of the same. The prices shall also include supply and erection of galvanised bolts, nuts washers etc. wherever required as per approved designs and drawings. The price shall cover assembling, adjustment and erection of all types of booms including TTC booms and any special structures across the track, not covered under item 3(b)(iii). The price shall also include the cost of repairing of platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a portal at platforms.

**ITEM No. 3(b)(ii) : Supply and erection of structural steel (traction mast) fabricated and galvanized, of all type B-Series Mast.**

The price shall cover the cost of supply of B-Series traction mast 9.5 m and/or 11.4 m long i.e. B-Series Mast fabricated and galvanized as per RDSO Drg No. ETI/C/0071 (Mod-E), TI/DRG/CIV/B-Mast/00001/13/0 with latest mod and specification No. ETI/OHE/13 (4/84), with latest spec. Steel shall be conforming to IS-2062/2011 Gr. A and Zinc conforming to IS-209 latest.

The price shall also cover the supply of all size of B-Series mast required which has not been mentioned.

The price shall cover cost of erection, alignment and setting before grouting of individual traction masts and main masts of Switching and Booster Transformers stations including those for head spans. The price shall also include the cost of repairing of platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a mast at platforms.

**Note:** 11.4 m long masts shall have provision for erection of Brackets (Cantilevers) for conventional as well as for High Rise OHE.

**ITEM No. 3(b)(iii) Supply and erection of special fabricated & galvanised steel structure other than portals and traction masts not covered under item 3(b)(i) & 3(b)(ii).**



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The price shall cover the cost of supply and erection of special fabricated & galvanised steel structures (other than BFB/RSJ/B-Series masts and portals) for conventional and High Rise OHE. The structure to be supplied under this item shall be TTC, G-type, BFB type portals, Bridge masts, emergency masts and double/fabricated "S" series masts such as S3, S5, S7, S8, S-100, S-101, T-150, Dwarf Masts etc. Any other similar structure required during the execution of work shall also be supplied under this item. The price shall include the cost of steel, fabrication, galvanization, and supply at site for erection. Steel shall be conforming to IS-2062 Gr.'A ' SK 2011 (latest), Zinc conforming to IS- 209/1997 (latest) and galvanization to RDSO's specification No. ETI/OHE/13(4/84) with A&C slip No.1 to 3, with latest spec. The various structures covered under this item are:-

SN	Description	Drg No.	Mod
1	TTC with 5.5/8.0m boom	ETI/C/0009 sheet 1	Latest
2	G-type portal upright & end pieces	ETI/C/0056	Latest
3	BFB portal	ETI/C/0026 Sh.1	Latest
4	S-7,12.4m	ETI/C/0182	Latest
5	S-8,12.4m	ETI/C/0183	Latest
6	S-100, for LT, transformer at SWS	ETI/C/0043	Latest
7	S-101, for Isolators inside SWS	ETI/C/0044	Latest
8	S-3,11.4m	ETI/C/0180	Latest
9	S-5,11.4m	ETI/C/0042	Latest
10	T-150, for LT supply transformer	ETI/PSI/037	Latest
11	Dwarf Mast	ETI/OHE/G/1402	Latest
12	Special BFB Portal for 5 tracks (General Arrangement) for High Rise OHE	TI/DRG/CIV/BFB-POTAL/00001/13/0 Sh. No. 1	Latest
13	G-Type Portal Special Upright and End Piece for High Rise OHE	TI/DRG/CIV/G-PORTAL/00001/13/0	Latest
14	Two Track Cantilever Structure (TTC) General Arrangement for High Rise OHE	TI/DRG/CIV/TTC/00001/13/0 Sh.-1	Latest

The price shall cover, cost of erection, alignment and setting before grouting , wherever required, gantries, including tower/ steel tower/steel work for feeders for traction sub-station, drop arms, standard super masts and suspension brackets for feeders and return conductors, dwarf masts or stub masts for anchoring, complete with anchor plates drilled and welded in position, multiple cantilever cross arm, chairs, adopters for bracket assemblies and all other small part steel works, the erection of which is carried out by the Contractor irrespective of whether they are supplied by the Purchaser or the Contractor. The prices shall also include supply and erection of galvanised bolts, nuts washers etc. wherever required as per approved designs and drawings. The prices shall also include the cost of repairing of platform shelters in case the shelter is dismantled/ removed/damaged during the course of erection of a mast/portal at platforms.

**Note for Item 3(a)(i), 3(a)(ii), 3(b)(i), 3(b)(ii) & 3(b)(iii) :**

- (i) The price for the items 3(a)(i), 3(a)(ii) and 3(b)(i), 3(b)(ii) , 3(b)(iii) shall also include the cost of stenciling of location number on masts/portal uprights in the manner as directed by the Purchaser. The price shall also include straightening of masts/portals uprights wherever approved by the purchaser and cutting of mast/portals/upright to suit the site condition.
- (ii) For the purpose of payment for supply and/or erection, the black weights as per respective RDSO drawing for individual traction masts (RSJ, BFB & B series, S-1, S4, S-6 & S-9), head span, Portal structures (O, N & R type), special steel structures (TTC, BFB, G & P type portal, Dwarf masts, S3, S5, S8, S100, S101, T-150 etc) shall be payable to the contractor.
- (iii) For the purpose of payment for supply and/or erection, of bridge mast or any other structures which are not covered in RDSO's drawings, if any, the black weights of such structures including all components as shown in respective approved drawing, shall be payable to the contractor by purchaser.
- (iv) No payment is permissible for increased weight of any structure or their components on account of galvanization.

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(v) The payment shall be made on the basis of the final lengths/weight of the structures, in case the same are cut or modified as indicated above before erection.

(vi) In case of any dispute in unit weights mentioned in drawings, the matter will be decided by the CPM of the project and decision taken in the matter will be final and binding on to the contractor.

**Item 3(b) (iv) : Design, Supply, Fabrication, Erection & Painting of Height Gauge at level crossings (for clear span up to 7.3m and / or above 7.3m upto 12.2m)**

The price shall cover supply of Height Gauges duly fabricated painted complete in all respect. However, provision of particular type of Height Gauge at various level crossings shall be decided and advised by the purchaser during execution of work. Contractor shall procure the structures/Steel required for the work accordingly. Following RDSO/ CORE drawings are applicable for different types of Height Gauges.

SN	Description	RDSO/CORE Drg. No.
1	Standard Plan, Details of Height Gauge for span 7.3 m to 10.0 m, Details of structure and foundation.	CORE Drawing No. RE/CIVIL/S/148-2011 Mod-1 & 2 OR TI/DRG/CIV/HGAUGE/RDSO/00001/14/0 Mod-A
2	Standard Plan, Height Gauge for level crossing (For clear span up to 7.3 m) Details of structures and foundation.	TI/DRG/CIV/HGAUGE/RDSO/00001/05/0
3	Standard plan, Height Gauge for level crossing (For clear span above 7.3 m up to 12.2 m) Details of structures and foundations.	TI/DRG/CIV/HGAUGE/RDSO/00002/05/0

Price shall cover supply of various steel sections conforming to IS 2062/2011, IS 808/1989, Fabrication at site or supply duly fabricated from CORE/IS approved sources for structures & SPS. Price shall cover supply of bolts, nuts & washers etc necessary for fastening the components of Height Gauge.

Price shall cover cost of painting of Booms & upright with Red Oxide / Zinc Chromate to IS: 2074 as first coat and 2nd coat with enamel paint to IS: 2933-1975 Black and white colour alternatively 300 mm wide band.

Crash Barrier and Rail Barricading shall be provided as required and as per provision in drawings.

The price shall cover cost of erection, alignment and setting while grouting of upright and side supports. The price shall cover labour charges required for welding / fabrication of side supports / uprights and other components at site.

**Note:**

- For the purpose of payment against item 3(b)(iv) for all the components (upright, boom, side supports, crash barrier / Barricading etc.), weight of structures/ fabricated steel works will be calculated according to standard unit weight of respective sections for required quantity. Contractor will be required to submit Bill of materials for each type of Height Gauge along with Black weight thereof for approval by the purchaser before claiming the payment.
- In case of any dispute in unit weights, the matter will be decided by the CPD of the project and decision taken in the matter will be final and binding on to the contractor.
- No crane / tools & Plants will be provided by purchaser for fabrication, erection or transportations of Height Gauge or black steel required for the work.
- Prices for foundation works (CC & RCC) shall be admissible under item 34(b) and 2(c) respectively.
- Prices for steel Reinforcement required for foundation work, shall be admissible under item 3(g).

**ITEM 3 (c): Supply only of fabricated steel work other than mast**

The price shall cover the cost of supply only of all fabricated steel work excluding fasteners which are required to be supplied by the Contractor. The cost of erection for such steel work, if carried out by the Contractor shall be paid for under item 3(b)(iii).

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For standard fabricated steel work for which RDSO'S approved drawings are available, the weight of steel work as specified in RDSO'S drawing shall be considered for payment. However, in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification, the weight of the fabricated steel work shall be calculated on the basis of latest IS specification and the same will be considered for payment. For the non-standard fabricated steel work, the calculated weight to be considered for payment under this item shall be included in the relevant drawing based on, latest IS sectional weight at the time of submitting the designs for approval of the Purchaser.

The price shall include the cost of supply of bracket top and bottom mast fittings suitable for PSC masts.

**ITEM No. 3(d)- DELETED-**

**Notes for Items 3(a)(i), 3(a)(ii), 3(b)(i), 3(b)(ii), 3(b)(iii) & 3(c)**

1. For the purpose of payment against items 3(a)(i), 3(a)(ii), 3(b)(i), 3(b)(ii), 3(b)(iii) & 3(c), weight of structures or fabricated steel work will be calculated according to the weight of black steel given in section books for the lengths of various members shown in the approved drawings. There will be no addition for increased weight due to galvanizing or painting or weld material or reduction for holes or skew cuts.

2. The rates against item 3(b)(iii) shall be applicable to the erection of small part steel work, which are not covered under the various other items of work. Unless specifically indicated none of the other items of work shall include the cost of supply and/or erection of small part steel work, which will invariably be paid for under item 3(b)(iii) or and 3(c) as applicable.

**ITEM No. 3(e)(i) : Supply and erection of a Guy Rod Assembly**

The price shall cover supply and erection of Guy Rod Assembly, for both conventional and High Rise OHE, of various lengths for traction masts, feeder line towers or supports complete with mast guy rod fittings, guy rod with adjustments and part/s be grouted in the anchor block. The price shall not include the cost of supply and erection of a dwarf or stub mast with anchor plates drilled and welded in position, where required, for anchorage, and small parts steel work, complete with bolts and nuts etc., if any for attaching the mast guy rod fittings to the mast/structure which shall be paid for separately under the relevant item. Prices indicated against all other items should be exclusive of the price of supply and erection of guy rod, if any which will be paid for under this item.

**COMPONENTS REQUIREMENT**


Rly. Id. No.	Description of components	Qty. per unit
3232	Mast guy rod fitting (welded) complete with 4 short bolts, nuts, lock nuts and washers for attachment to mast/S.P.S including appropriate fittings.	1 off
5001/ 5001-1/ 5001-3	Anchor bolts (complete with nuts lock nuts and split pins)	1 Set
5002	Guy rod stirrup	1 off
5004 or 5005 or 5005-2 or 5006-1 or 9070 or 9071 or 5006-2	Guy rod with nut, lock nut, washer and split pin	1 off
5007-1	Anchor 'v' bolt	2 off
5008	Anchor	2 off
5220	Guy rod double strap assembly	1 off or 2 off (as required)


NOTE: 1. In case the Contractor desires to adopt a different design for guy rod assembly, the same shall be indicated by him in the Tender and the components required should be clearly listed under this item as deviation.

2. Supply and erection of guy rod assembly at anticreep portals will also be paid for under this item.

**ITEM No. 3(e)(ii) : Supply and erection of Anchoring Arrangement of traction mast with Galvanised steel stranded wire**

  
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The price shall cover supply and erection of Anchoring Arrangement with Galvanised steel stranded wire of required length for traction masts, feeder line towers or supports complete with mast guy rod fittings, Galvanised steel stranded wire of 9.3 or 9.7 m and part/s be grouted in the anchor block as per RDSO's drawing No. TI/DRG/OHE/GSSW/0002/09/0. The price shall not include the cost of supply and erection of a dwarf or stub mast with anchor plates drilled and welded in position, where required, for anchorage, and small parts steel work, complete with bolts and nuts etc., if any for attaching the mast guy rod fittings to the mast/structure which shall be paid for separately under the relevant item. Prices indicated against all other items should be exclusive of the price of supply and erection of guy rod, if any which will be paid for under this item.

### COMPONENTS REQUIREMENT

Rly.Id.No.	Description of components	Qty. per unit
3232	Mast guy rod fitting (welded) complete with 4 short bolts, nuts, lock nuts and washers for attachment to mast/S.P.S including appropriate fittings	1 of
5023-1	Eye Bolt (complete with M24 nut, Lock nut Plain washer, thimble and split pins 5x40)	1 Set
5002	Guy rod stirrup	1 off
5004-1or 5005-1	Galvanised Steel Stranded Wire 12.5 mm dia	1 off
5007-1	Anchor 'v' bolt	2 off
5008	Anchor loop	2 off
5220	Guy rod double strap assembly	1 off or 2 off (as required)

#### Item No.3(f) : Erection of PSC Mast.

The erection price shall cover cost of erection, alignment and getting before grouting of individual PSC masts wherever these are to be located. The price shall also include the cost of stenciling of location number on masts in the manner directed by the purchaser.

#### Item No.3(g) : Supply of Steel reinforcement for RCC work

The item covers the price of supply of tested quality of steel for reinforcement of appropriate size and for reinforcement steel above 8 mm or suitable dia shall be High strength deformed steel bars conforming to IS:1786/1985 and below 8 mm dia shall be mild steel and medium tensile steel bars conforming to IS:432(Pt.I)/1982.

Price shall cover the all taxes (Octroi etc.,if any) & Freight etc. However, the cost towards cutting, straightening hooking, bending, binding, erecting and placing and keeping in position including all lead and lift and including cost of binding wire.

Test certificates for steel will be furnished by the Contractor at his own cost from a laboratory approved by the Engineer-in-Charge. Nothing extra will be paid for unauthorised overlaps and wastage of steel involved in cutting the bars to their required sizes.

#### Item No.3(h)(i) : -DELETED-

#### Item No. 3(h)(ii) : -DELETED-

#### Item No.3(i) : Supply and Erection of 25 kV Caution Boards/Plates

The price shall cover price of material including Caution Boards, SPS items, nuts, bolts etc. as required and erection charges Caution Boards shall be of two types.

- (i) General Caution Notice at entrance to Railway station (Hindi & English). No. ETI/OHE/G/7551 latest Mod.
- (ii) Caution Plate 25000 V. No. ETI/OHE/G/7531 latest Mod.

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Price shall cover the all taxes (Octroi etc.,if any) & Freight etc. Boards shall required to be installed on a steel structure/Rail post/wall of a building therefore mode of erection shall be as per requirement of the site.

**ITEM No.3(j) : -DELETED-**

**Item 3(k) Supply and erection of Danger Plate on a Height Gauge**

The price shall cover supply of Danger Board (as per RDSO drawing No. ETI/C/0069 Rev-C) including necessary Bolts, Nuts, Washers etc and erection thereof on the boom of each Height Gauge.

**Item 3(j) Supply and erection of Protective screen on ROB/FOB**

The price shall cover on per track basis on both sides of ROB/FOB, the cost of all material required for fabrication of protective screen including angle, Tee, expanded metal(jail) , GI sheet, paints etc. The price shall also include the labour cost for fabrication, erection and painting at various locations. The fabrication and erection work shall be done as per RDSO drg. No. ETI/C/0068 latest mod.

**ITEM No.4(a) (i) : Supply without Insulator and erection of a single bracket assembly**

The price shall cover on a flat rate basis any bracket assembly on a traction mast or support on drop arm and shall include those on high/low level platform, in the vicinity of turnouts, over bridges or and at locations with reduced encumbrance or terminating wires. The price shall include the cost of supply of all components including galvanised steel tube, dropper wires, bolts and nuts etc. but excluding small parts steel work and solid core insulators. Cost of insulators will be paid in Schedule-1, Section-5 and cost of SPS will be paid under item 3(c) of Schedule-1, Section-3. The price shall cover erection of all components including insulators, small parts steel work and dropper wires. However, this does not include the anticreep arrangement at masts/structures. The price shall include:

<b>Rly. Id No.</b>	<b>Description of components</b>	<b>Qty. per unit</b>
3020-1	Mast fitting for hook insulator (Forged)with 2 off bolts, nuts, lock nuts and washers of 16 dia.	1 set
2400	Tubular stay arm assembly (including galvanised steel tube).	1 set
2110/ 2130/ 2380	Catenary suspension bracket assembly or hook bracket	1 off
1160)	Suspension clamp	1 off
2120, 2140, 2040, 2080	Bracket tube assembly complete with tube cap and sleeve where required (including galvanised steel tube).	1 set
3070-1/2 )	Mast bracket fitting assembly including 2 off bolts, nuts, lock nuts and washers of 16 m for attachment to structure or to small part steel work.	1 set
2151-2, 2152-2, 2161-2, 2162-2	Register arm hook Top & Bottom complete (Forged) with bolts, nuts and lock nuts.	1 off
2420 or 2430, 2270-4 or 5	Register arm assembly or raised register arm assembly (including galvanised steel tube).	1 set
2460 Style 02 or 2470Style 02	Register arm dropper assembly including dropper wire complete with bolts, nuts etc.	1 set
2391-1, 2540/2520	Steady arm hook (BFB) (Forged) or bent steady arm (where required)	As required
2361-1, 2491-2, 2492-2	25 mm drop bracket (Forged) with bolts & locknuts. 25 mm Steady arm clamp (Forged) with bolts & locknuts.	-do-
1220/1370/-1	Contact wire swivel clip or raised register arm clamp	1 off
2550-1/2	Antiwind clamp	As required

**ITEM No. 4(a)(ii): Extra on 4(a) (i) for supply and erection of additional fittings on a single bracket assembly for supporting two OHEs**

The price is applicable as an extra to item 4(a) (i) or 4(a) (v) for the provision of additional fittings required to support an additional OHE on a single bracket assembly payable under item 4(a)(i) or

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4(a)(v). The price shall include supply of all extra fittings excluding the double contact wire swivel clip. The price shall include erection of all extra fittings, including the double contact wire swivel clip.

**ITEM No. 4(a)(iii) : Supply without insulator and erection of a single bracket assembly suitable for tramway type overhead equipment (regulated).**

The price shall cover on a flat rate basis any bracket assembly, on a traction mast or support on drop arm, and shall include those on high level platform, in the vicinity of turnouts, over bridges or over-laps and at locations with reduced encumbrance or terminating wires. The price shall include the cost of supply of all components including galvanised steel tubes, dropper wires, bolts and nuts etc. but excluding small parts steel work and solid core insulators (Cost of insulators will be paid in Schedule-1, Section-5). Cost of SPS will be paid under item 3(c) of Schedule-1, Section-3. The price shall cover erection of all components including insulators, small part steel work and dropper wires. However, this does not include the anticreep arrangement at masts/structures. The price shall include:

Rly. Id. No	Description of Component.	Qty. per Unit.
3021-1	Mast fitting for hook insulator (Forged) with 2 off bolts, nuts, lock-nuts & washers of 16 mm dia.	set 1
2400	Tubular stay arm (including galvanised steel tube).	set 1
2403-1, 2402	Tubular stay sleeve with Adjuster.	set 1
2380	Hook bracket	set 1
2140	Large catenary direct clamp	set 1
2160-1	Large register arm hook	set 1
2080	Large bracket tube assembly (49 mm) (including galvanised steel tube).	set 1
3070-1/2	Mast bracket fitting assembly including 2 off, bolts, nuts, lock-nuts and washers 16 mm.	set 1
2540-1	BFB steady arm assembly	set 1
2550-3	Standard anti-wind clamp	set 1
1220	Contact wire swivel clip	set 1

**ITEM No.4(a)(iv) : Extra on item 4(a)(iii) for supporting two tramway type OHE (Regulated).**

The price is applicable as an extra to item 4(a)(iii) for the provision of additional fittings required to support an additional OHE on complete bracket assembly payable under item 4(a)(iii). The price shall include supply of all extra fittings, excluding the double contact wire swivel clip.

**ITEM No.4(a)(v) :** -DELETED-

**Item No.4 (ax): Supply of Insulators for item Nos.4 (a)(i) & 4 (a) (iii).**

The price shall cover only supply of the following Insulators mentioned against each items required for execution of work covered under items 4(a)(i) & 4(a)(iii). Erection cost of insulators are inclusive in items 4(a)(i) & 4(a)(iii) respectively.

Item No.	Insulator
4(ax)(i)	Stay Arm Porcelain (CD-1050 mm)
4(ax)(iv)	Bracket Porcelain (CD-1050 mm)
4(ax)(ii)	Stay Arm Composite (CD-1050 mm)
4(ax)(v)	Bracket Composite (CD-1050 mm)
4(ax)(iii)	Stay Arm Composite (CD-1600 mm)
4(ax)(vi)	Bracket Composite (CD-1600 mm)

**ITEM No. 4(b)(i) : Supply without insulator and erection of pull-off arrangement for one OHE**

The price shall cover supply of all components required for a pull-off arrangement to pull one equipment only including supply of copper conductors, small jumper(50) wire, head-span mast fittings complete with M.S. angle, equalising plate assembly, steady-arm, catenary dropper clip, contact wire swivel clip and fittings excluding solid core insulators (Cost of insulator will be paid in Schedule-1,

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Section-5). The price shall cover erection of all components including solid core insulators, small jumper wire and conductors.

**NOTE :** (i) For composite OHE' a catenary dropper clip with necessary bimetallic strip/ washer to be used in place of catenary dropper clip (Id. No.1192).

(ii) 5 mm diameter Hard drawn Copper wire shall be used for Register Arm Dropper for all locations except for those on long Girder Bridges, where wear rate is high for which 7 mm diameter Hard drawn Copper wire shall be used for Register Arm Dropper.

**ITEM No. 4(b)(ii): Extra for each additional equipment pulled.**

The price shall cover as an extra to item 4(b)(i) supply and erection of all additional fittings required including the supply of required conductors/ jumper wires, in case the pull off pulls more than one equipment the prices applicable for each extra equipment pulled.

**ITEM No. 4(b)(iii) Supply without insulator and erection of a pull-off arrangement for regulated Tramway type OHE.**

The price shall cover supply of all components including conductors required for a pull off arrangement to pull one equipment only, complete with steady arm, contact wire swivel clip and fittings, including solid core insulator (Cost of insulator will be paid in Schedule-1, Section-5), . The price shall cover erection of all components including solid core insulators, small jumpers.

**ITEM No. 4(b)(iv) :** DELETED

**ITEM No.4 (bx) : Supply of Insulators for item Nos. 4 (b)(i) & 4 (b)(iii)**

The price shall cover only supply of following Insulators mentioned against each item required for execution of work covered under items 4(b)(i) & 4(b)(iii). Erection cost of insulators are inclusive in items 4 (b)(i) & 4 (b)(iii) respectively.

Item No.	Insulator
4(bx)(i)	Porcelain 9 Tonne (CD-1050 mm)
4(bx)(ii)	Composite 9 Tonne (CD-1050 mm)
4(bx)(iii)	Composite 9 Tonne (CD-1600 mm)

**ITEM No. 5(a)(i) : Supply and erection of mounting arrangement for span wire.**

The price shall cover supply of all components including adjusters, terminal fittings and mast attachments required to attach a span wire or a head-span wire or a cross span wire or a steady span wire or a support span wire for supporting contact wire only, at both ends, to traction masts/structures or special brackets. The price shall include the cost of solid core insulators (Cost of insulator will be paid in Schedule-1, Section-5), and small parts steel work, if any. The price shall cover erection of all components including mounting arrangements for span wire and solid core insulators but excluding small parts steel work, if any.

**ITEM No. 5(a)(ii):Supply and erection of a span wire**

The price shall cover supply and erection of a span wire per meter. The payable length in case of head span wires shall be the horizontal distance between the inner faces of all traction masts/structure on which the mast attachments are mounted, and in case of Large Span Wire, the actual length shall be measured at the time of erection. No extra payment shall be made on account of the sag. The price is applicable for all types of span wires including Large Span Wires. Erections of a meter beyond the first decimal shall be rounded off to the nearest first decimal.

**ITEM No. 5(az)(ii):Supply and erection of a span wire**

Same as item 5(a)(ii) but excluding supply of Catenary wires

**NOTE :** The quantity for which the payment is made for the supply and erection of large span wire under this item shall be deducted from the corresponding length in the span for which payment is made under item 6(a).



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**ITEM No. 5 (b): Supply without insulator and erection of suspension of one conventional OHE/ composite OHE from headspan**

The price shall cover supply of a suspension assembly to carry complete all copper OHE/ Composite OHE on head spans inclusive of all dropper assemblies (exclusive of dropper wire) and from head-span, cross-span steady wire attachment, steady arm/rod, catenary suspension clamps and other fittings required to make complete suspension arrangements for copper OHE/Composite OHE on head span. The price shall cover the erection of all components, fittings, and droppers for suspension of OHE from head span.

**ITEM No. 5 (c) : Supply of without insulator and erection of Suspension /registration of contact wire only**

The price shall cover supply dropper wire and supply and erection of all fittings required for suspension/ registration of a contact wire only whether under head spans carrying other types of OHE or not or on any bracket for carrying contact wire only. The price shall include the followings:-

- (i) Vee clamp or double vee clamp with adjuster, or steady arm with steady wire clamp.
- (ii) Contact wire swivel clip.

**ITEM No.5 (ax): Supply of Insulators for item 5(a)(i), 5(b) and 5(c)**

The price shall cover only supply of any of the following Insulators mentioned against each item required for execution of item covered under items 5(a)(i), 5(b) and 5(c). Erection cost of insulators are inclusive in items 5(a)(i), 5(b) and 5(c) respectively.

Item No.	Insulator
5(ax)(i)	Porcelain 9 Tonne (CD-1050 mm)
5(ax)(ii)	Composite 9 Tonne (CD-1050 mm)
5(ax)(iii)	Composite 9 Tonne (CD-1600 mm)

**ITEM No. 6 (a):Supply and erection of overhead equipment only.**

The price shall cover the supply of contact wire (107 Sqmm HDGCC), catenary(65 Sq. mm 19/2.1mm), dropper wire(5mm), jumper wires (50 Sq.mm, 19/1.80mm or ) as per the specifications indicated under para 2.4.9 of the tender paper.


The price shall cover supply of all components including dropper clips, parallel clamps for jumpering and splices (where their use is approved) and small parts steel works complete with bolts and nuts etc. for attachment of number plates to mast/structure, if any. The price shall cover erection of all components and wires and conductors including contact wire, catenary, droppers, jumpers and terminating wires, if any, but excluding small parts steel work, if any. The price shall be excluding the cost of erection of large span wire, which will be paid under item 5(a)(ii).

The price shall include provision of Retro reflective and enameled number plates on traction masts and structures as per latest guidelines. The prices shall exclude supply of small parts steel work for fixing of retro reflective number plate (like as Clamps & plates) will be paid under item no.3(c). The price shall include bolts and nuts for attachment of enameled number plates/ Retro reflective number plates to masts/structures. The price shall also include the cost of painting the setting distance and rail level on masts/structures, stenciling of symbol for direction of emergency telephone socket. The price shall not include termination of conductors which will be paid for under item 8.

Rly. Ident No.	Description of components	Qty. for unit
1040-2 or SK-534/1 & SK-575/2 or SK- 576/1 & SK-535/2 or 1041-3.	Contact wire parallel clamp small	As required
1180/SK-572/1 &SK-572/2	Contact wire dropper clip (107)	-do-
1192	Catenary dropper clip complete with bolts, nuts etc	-do-
7501/7503	Enameled/ Retro reflective number plates complete with 2 Galv. MS. bolts m 10x35/30,	-do-

  
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	nuts and lead washer for m 10 bolts but excluding SPS for attachment of number plate to masts/structures.	
1110-2	Contact wire ending clamp	-do-
1120	Catenary ending clamp	-do-
1140	Large span wire clamp (130)	-do-
5020-1/5020-2	9-T, Adjuster (Forged)	-do-
5030	Anchor double strap assembly	-do-
5191/5192	Compensating plate/equalizing plate	-do-

**ITEM No. 6 (az) :Supply and erection of overhead equipment only**

Same as item 6(a) but excluding supply of Contact and Catenary wires.

**ITEM No. 6 (ax)(i) :Supply of Hard Drawn Grooved Copper Contact Wire 107 Sq. mm required for item nos. 6(az), 6(bz), 6(cz), 10(az), 10(bz), 10(cz), 12(az), 12(cz) and 31(gz).**

The price shall cover only supply of 107 Sq. mm Hard Drawn Grooved Copper Contact Wire required for item nos. 6(az), 6(bz), 6(cz), 10(az), 10(bz), 10(cz), 12(az), 12(cz) and 31(gz) in MT.

**ITEM No. 6 (ax)(ii) :Supply of Cadmium Copper Catenary Wire 65 Sq. mm, 19/2.10mm required for item nos. 5(az)(ii), 6(az), 9(dz), 9(ez), 10(az), 10(bz), 10(cz), 12(cz), 15(az)(iii) and 31(gz).**

The price shall cover only supply of 65 Sq. mm, 19/2.10mm, Cadmium Copper Catenary Wire required for item nos. 5(az)(ii), 6(az), 9(dz), 9(ez), 10(az), 10(bz), 10(cz), 12(cz), 15(az)(iii) and 31(gz) in MT.

**ITEM No. 6(b) : Supply and Erection of contact wire only**

The price shall cover the supply of contact wire (107 Sqmm HDGCC as per the specifications indicated under para 2.4.9 of the tender paper, and erection of contact wire only. The price shall exclude termination which will be paid for under item 8. The price shall include provision of Retro-reflective and enameled number plates on traction masts/structures and painting of setting distance structures and rail levels on masts/structures. The price shall exclude the supply of small part steel works complete with bolts and nuts for attachment of enameled number plates to masts/ structures.

Description	Qty. for unit	Supplied by
Contact wire (107 Sq mm)	As required	Contractor
Retro-reflective and Enameled number plates	As required	Contractor

**ITEM No. 6(bz) : Supply and Erection of contact wire only**

Same as item 6(b) but excluding supply of Contact wires.

**ITEM No. 6(c) : Supply and Erection of contact wire only (regulated with bridle wire)**

The price shall cover the supply of contact wire (107 Sqmm HDGCC), dropper wire (5mm), 7/2.10, 20 Sq.mm Bridle wire as per the specifications indicated under para 2.4.9 of the tender paper, erection and provision of bridle wires with clamps and two droppers including clips, Retro-reflective and enameled number plates on traction masts/structures, painting of setting distance and rail levels on masts/ structures, stenciling of symbol for direction of emergency telephone socket if required. The price shall exclude supply of required small part steel works complete with bolts and nuts for attachment of enameled number plates to masts/ structures. The price shall exclude termination which will be paid for under item 8.

**ITEM No. 6(cz) : Supply and Erection of contact wire only (regulated with bridle wire)**

Same as item 6(c) but excluding supply of Contact wires.

**ITEM No. 6(d) : DELETED**

Note : All bolts and nuts below 14mm dia on current carrying parts of OHE shall be stainless steel.

**Note for Measurement:**

1. For the purpose of payment against item 6(a), (b), (c), & (d) the length of over head equipment, which shall include terminating wires, shall be measured from the center lines of the traction masts/structures at which the two ends of each tension length of over head equipment are anchored.

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2. The length shall be the difference between the actual chainages of the two traction masts/structures at which the ends of each tension length are anchored or by the sum of the actual spans between the same two points whichever is higher as included in the "As Erected" layout plans. No extra payment will be made on account of either due to sag in these wires/conductors or scraps generated.. The price under items 6(a),6(b),6(c) & 6(d) does not cover the cost of supply and erection of cut-in-insulators, the supply and erection of which shall be paid for under item 11.

3. For the purpose of progress payment reference to layout plans "As Approved" shall be made. However, the price under this item shall be adjusted according to the final length of OHE indicated in the "As Erected" layout plan.

**Note for Number Plates:** Enameled Number plates on all the traction masts or structures except

(i) One no. of retro-reflective OHE number plates should be provided in each Kilometers at the beginning of Kilometer.

(ii) Retro-reflective number plates should be provided at critical locations like before the stop signals and before the permanent speed restrictions. Location of these shall be advised by purchaser.

**ITEM No. 7(a): Supply and Erection of all Aluminum 25 KV feeder/return conductor (Single Spider)**

The price shall cover supply and erection of Hard-drawn stranded All Aluminum conductor conforming to IS-398(Pt.I) with ammendment-1 and of size 19/3.99mm (240 Sq.mm) feeder/return conductor (along or across the tracks). The price shall not include the cost of suspension assembly (which will be paid for under item-11) and termination (which will be paid for under item-8.) and small part steel work, complete with bolts and nuts etc, if any. The price shall also cover on a flat rate basis, the cost of supply of splices to the extent required.

**ITEM No. 7(b)DELETED -**

**ITEM No. 7(c) : Supply and erection of earth wire**

The price shall cover supply and erection of earth wire made of 7/4.09 mm steel reinforced aluminum conductor (RACCOON) excluding termination which will be paid for under item 8 and shall include cost of fittings on structures for supporting the earthwire including bonding of the earth wire to the structure and the structure to earth electrodes or a non-track circuited running rail or impedance bond which will be provided by the Purchaser. The price shall include disc insulators, cut-in-insulator to isolate sections of earth wire which will be paid for under item 11(c) and the cost of small part steel works complete with bolts and nuts to attach the earth wire mast clamp to masts/structures, if any.

**Note for Measurement:**

1. The prices under items 7(a) and ( b) shall not include. Termination which will be paid for under item 8. The connection (a) between feeders, or return conductors and (b) of feeders, or return conductors to a bus bar, overhead equipment or isolator switch which will be paid for under item 15, & cut-in-insulators and suspension insulators which shall be paid for under item 11.

2. For the purpose of payment against item 7 (a) and (b) the length of feeders, return conductors or earth wire shall be measured from the center lines of the mast/structure at which the two ends of each length of feeder or conductor run are anchored, by adding actual spans. In case of feeders/return conductors crossing a track, the length shall be measured between the faces of traction masts/structures at which the two ends of the cross feeder or return conductors are anchored, as indicated in the as erected structure erection drawings for traction masts/structures. No payment will be made for the extra length of the conductor/s on account of sag or scrap.

3. For purposes of progress payment reference to "As Approved" drawings shall be made. However, the price under this item shall be adjusted according to the final length of OHE indicated in the "As Erected" layout plan/drawings

**Item No.7(d): Supply and Manual Erection of All Aluminum 25 kV Feeder/Return (Single Spider).**

Same as item 7 (a) but the work is to be executed manually instead of with wiring train.

**Item: 7(e) : Supply and Erection of Copper cross feeder wires (37/2.25 mm HDBC) across the track at SP/SSP/FP/BT locations.**

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The price shall cover the supply and erection of 25KV feeder wire across/ along the track at the location of SP/SSP/FP/BT/Gantries stations. Feeder wire shall be made of hard drawn bare copper conductor of size 37/2.25 mm. The price shall be inclusive of cost of feeder wire but exclusive of termination (which will be paid under item 8(b)(ix) and small parts steel work complete with bolts, nuts etc if any.

**ITEM No. 8(a)(i) :** DELETED

**ITEM No. 8(a)(ii) :** DELETED

**ITEM No. 8(a)(iii) :** DELETED

**ITEM No. 8(a)(iv) :** DELETED

**ITEM No. 8(a)(v) :** Supply and erection of regulating equipment (3 pulley type) with Counter weight assembly for conventional/composite OHE.

The price shall cover supply and erection of counter weight assembly (for both conventional and High Rise OHE) including 5 ton adjuster with double strap assembly and normal/anti-theft guide tube assembly, the supply of regulating equipment and stainless steel wire rope (of various length as required) required for the regulating equipment and small part steel work, if any. The price shall also cover adjustment of the entire regulating equipment. The price shall not include supply and erection of termination, which will be paid for under item No. 8(b).

**ITEM No. 8(a)(vi) :** Supply and erection of a regulating equipment (3 Pulley type) with counter weight assembly for Tram Way Type OHE (Regulated)

Same as 8(a)(v) above but with counter weight assembly conforming to style – 01 of the relevant termination arrangement drawing No.: ETI/OHE/G/04212, with latest mod.

**ITEM No.8(a)(vii) :** DELETED

**ITEM No. 8(a)(viii) :** DELETED

**ITEM No.8(a)(ix) :** DELETED

**ITEM No. 8(a)(x) :** Supply and erection of a regulating equipment (3 Pulley type) with counter weight assembly for conventional/ composite OHE

Same as item 8(a)(v) but excluding stainless steel wire rope required for the regulating equipment. For shorter tension lengths OHE (like Emergency x-overs) GI Sleeve of 20 mm dia to be inserted in the hexagonal tie rod of ATD of cross-over OHE in accordance with RDSO's SMI No.TI/MI/0035 (Rev-O).

**ITEM No. 8(a)(xi) :** Supply and erection of a regulating equipment (3 pulley type) with counter weight assembly for tramway type OHE (Regulated) Same as item 8(a)(vi) but excluding stainless steel wire rope required for the regulating equipment.

Same as item 8(a)(vi) but excluding stainless steel wire rope required for the regulating equipment. For shorter tension lengths OHE (like Emergency x-overs) GI Sleeve of 20 mm dia to be inserted in the hexagonal tie rod of ATD of cross-over OHE in accordance with RDSO's SMI No. TI/MI/0035 (Rev-O).

**ITEM No. 8(a)(xii) :** Marking of 'Y' measurement at BWA locations

The price shall cover marking/ painting of temperature and 'Y' measurement on OHE masts at BWA locations including cost of paint.

**ITEM No. 8(b)(i) :** Supply without Insulator and erection of materials for termination of single conductor of overhead equipment or a terminating wire.

The price shall cover supply of all material necessary for the termination of single conductor of overhead equipment or terminating wire on a traction mast or structure, including appropriate mast anchor fittings, clevis assembly, adjuster, anchor double straps, ending clamp for the catenary or contact wire or terminating wire and fittings including 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly and terminating wire, if any. The price shall cover erection of all materials including the 9 ton insulator assembly and terminating wire, if any.

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NOTE : In case of "V" type anchorage is adopted for terminating a single conductor such an arrangement would be counted as two off under item 8(b)(i), for the purpose of payment.

**ITEM No. 8(b)(ii) : Supply without Insulator and erection of materials for termination of double conductors.**

The price shall cover supply of all materials necessary for the yoked termination of two overhead equipment conductors on a traction mast or structure, including appropriate mast anchoring, clavis assembly, two adjusters, ending clamps for catenary and contact wires, anchor double strap assembly, equalising/ compensating plate and fittings including 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly and terminating wire, if any. However, the price shall cover erection of all materials including the 9 ton insulator assembly.

**ITEM No. 8(b) (iii): Supply without Insulator and erection of materials for termination of all Aluminum 25 KV feeder/return conductor (single SPIDER).**

The price shall cover supply of all materials required for the termination of an All Aluminum 25 KV feeder/return conductor (SPIDER), including appropriate mast anchor fittings adjuster, strain clamp end fitting including 3 KV cut-in-insulator and 9 ton insulator assembly. However, the price shall cover erection of all materials including the 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5) assembly and 3 KV cut-in-insulator (Cost of insulator will be paid in Schedule-1, Section-5). The price shall include the cost of 9 ton insulator assembly and erection cost thereof.

**ITEM No. 8(b)(iv) :** DELETED

**ITEM No. 8(b)(v) : Supply without Insulator and erection of materials for termination of an earth wire.**

The price shall cover supply and erection of all materials required for the termination of an earth wire including appropriate mast anchor fittings, adjuster, terminal clamp and fittings.

**ITEM No. 8(b)(vi) : Supply without Insulator and erection of materials for termination of tramway type OHE (Regulated).**

The price shall cover supply and erection of all materials required for the termination of a single contact wire (regulated) and will exclude the parts covered under item 8(a)(iii)/(vi).

**ITEM No. 8(b)(vii) : Supply without insulator and erection of materials for termination of double conductors for composite OHE.**

The price shall cover supply of all materials necessary for the yoked termination of two overhead equipment conductors on a traction mast or structure including appropriate mast anchor fittings clevis assembly three adjuster, ending clamps for aluminum Alloy catenary and copper contact wires, anchor double strap assembly, unequal tension compensatory plate and fittings excluding the 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly and terminating wire, if any. The price shall cover erection of all materials including the 9 ton insulator assembly.

**ITEM No. 8(b)(viii) : Supply without insulator and erection of materials for termination of an aluminum conductor of the composite overhead equipment.**

The price shall cover supply of all materials necessary for the termination of single Aluminum conductor of composite OHE or terminating wire on a traction mast or structure, including appropriate mast anchor fittings, clavis assembly, adjuster, anchor double straps, ending clamps for the aluminum catenary or terminating wire and fittings including 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly and termination wire, if any. The price shall cover erection of all materials including the 9 ton insulator assembly and termination wire, if any.

**Item : 8(b)(ix) : Supply without insulators and erection of materials for termination of copper cross feeder with gantries.**

The price shall cover the supply of all materials required for termination of copper cross feeder wire (37/2.25 mm HDPC) including appropriate mast anchor fitting (3231), 18 mm Single clevis (5040), 9-Tone adjuster (5020-2), Feeder ending clamp (1130), double clevis (3010) and other components as necessary excluding 9-Ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly. The price shall also cover the erection of all materials including 9-Ton

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insulator assembly and termination of cross feeder at either ends. Fittings/components required for termination of one cross feeder at both ends constitute one set.

#### Notes to item 8 :

- (1) Small parts steel work complete with bolts and nuts wherever required, will be paid under item 3(a) or 3(b) and 3(c) as applicable and shall not be including in this item.
- (2) The prices under item 8(b)(iii) shall not include the cost of jumper connection (i) between feeders or return conductors and (ii) or feeders or return conductors to a busbar, overhead equipment or isolator switch which will be paid for under item 15.
- (3) The prices under items 8(b)(i) to 8(b)(viii) shall also include the cost of double eye distance rod (ID no. 5183), if provided for any type of terminations.
- (4) Supply and erection of materials for termination of catenary wire on either side of the portals at anticreep locations, will also be paid for under this item.

#### ITEM No. 8 (bx) : Supply of 9-T Insulators for item 8(b)(i), (ii), (iii), (vi), (vii), (viii) & (ix)

The price shall cover only supply of following 9 tonne insulator assembly required for termination of OHE covered under item 8(b)(i), 8(b)(ii), 8(b)(iii), 8(b)(vi), 8(b)(vii), 8(b)(viii) & 8(b)(ix). Erection cost of insulators are inclusive in items 8(b)(i), 8(b)(ii), 8(b)(iii), 8(b)(vi), 8(b)(vii), 8(b)(viii) & 8(b)(ix) respectively.

Item No.	Insulator
8(bx)(i)	Porcelain 9 Tonne (CD-1050 mm)
8(bx)(ii)	Composite 9 Tonne (CD-1050 mm)
8(bx)(iii)	Composite 9 Tonne (CD-1600 mm)

#### ITEM No. 9(a) : Supply without Insulator and erection of anti creep with Galvanised steel wire.

The price shall cover supply of all materials for anti-creep including adjusters, galvanised steel wire, mast anchor fittings at its terminations on either side on structures, ending clamps and fittings excluding 9 ton insulator assembly (Cost of insulator will be paid in Schedule-1, Section-5) and small parts steel work, if any. Cost of SPS will be paid under item 3(c) of Schedule-1, Section-3. The price shall cover erection of all materials including 9 ton insulator assembly and small parts steel work, if any.

RLY.IDENT No.	DESCRIPTION OF COMPONENTS	QTY. PER UNIT
-	Galvanised steel wire (19/2.50 mm)	As required
6020	9 ton insulator assembly.	As required
1360	Steel wire ending clamp	2 off
5020-1/5020-2	9 ton adjuster (Forged)	2 off
5030	Anchor double strap assembly	As required
3010/5040	Clevis assembly	2 off
3231	Mast anchor fitting with bolts, nuts etc.	2 sets.
1170	Double suspension clamp	1 off
Less 1160	Suspension clamp	(-)1 off
5183	Double eye distance rod	As required.

#### ITEM No. 9(b) : Supply without insulator and erection of anti-creep with galvanized Steel wire suitable for tramway type overhead equipment (Regulated)

The price shall cover supply and erection of all materials (Cost of insulator will be paid in Schedule-1, Section-5) for anti-creep for the tramway type equipment (Regulated) similar to the fittings catered for an item 9(a).

#### ITEM No. 9(c) : DELETED

##### NOTE for 9(a) & 9(b) :

1. The price shall include the cost of any additional cut-in or suspension insulator which will be paid for under item 11(a) (i) or 11(a) (ii) as applicable.

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2. In case the anti-creep extends beyond one span on either side of anti creep center, payment for the supply and erection of extra length shall be paid additionally at the rate of 20% of the rate for 9(a) for each extra span.

**ITEM No. 9(d) : Supply without Insulator and erection of anti-creep with cadmium wire in polluted area.**

The price shall cover the supply of all materials for anti-creep including adjusters, mast anchor fittings at its terminations on either side, structure ending clamps, fittings and cadmium copper catenary wire but excluding 9-ton insulator assembly and small parts steel work, if any. The price shall cover erection of all materials including cadmium copper catenary wire, 9- ton insulator assembly and small parts steel work, if any.

RLY. Ident No.	Description of components	Qty. per unit
-	Cadmium copper catenary wire (65 sq.mm)	As required
6020-1	9 ton insulator assembly	As required
1120 or 1122or1123	Catenary ending clamp (65)	2 off
5020-1/5020-2	9 ton adjusters (Forged)	2 off
5030	Anchor double strap assembly	As required
3010/5040	Clevis assembly	2 off
3231	Mast anchor fitting with bolts, nuts etc.	2 sets
1170	Double suspension clamp	1 off
Less 1160	Suspension clamp	(-) 1 off
5183	Double eye distance rod.	As required

**ITEM No. 9(dz) : Supply without Insulator and erection of anti-creep with cadmium copper catenary wire in polluted area.**

Same as item 9(d) but excluding supply of Catenary wire.

**ITEM No. 9(e) : Supply without Insulator AND Erection of anti-creep with cadmium copper catenary wire suitable for tramway type OHE (Regulated) in polluted area.**

Same as ITEM 9(d) (Cost of insulator will be paid in Schedule-1, Section-5) with the following changes:- Id No. 2140, large catenary contact clamp to be used in place of Id. No. 1170

**ITEM No. 9(ez) : Supply without Insulator AND Erection of anti-creep with cadmium copper catenary wire suitable for tramway type OHE (Regulated) in polluted area.**

Same as item 9(e) but excluding supply of Catenary wire.

**NOTE :-** Note 1&2 given under item 9(a) shall also be applicable for item 9(b) to 9 (ez).

**ITEM No.9(ax) : Supply of 9-T Insulators for Items 9(a), 9(b), 9(c), 9(d) and 9(e)**


The price shall cover only supply of any of the following 9 tonne insulator assembly to be supplied at site for execution of work under items 9(a), 9(b), 9(c), 9(d) and 9(e). Erection cost of insulators are inclusive in items 9(a), 9(b), 9(c), 9(d) and 9(e) respectively.


Item No.	Insulator
9(ax)(i)	Porcelain 9 Tonne (CD-1050 mm)
9(ax)(ii)	Composite 9 Tonne (CD-1050 mm)
9(ax) (iii)	Composite 9 Tonne (CD-1600 mm)

**ITEM No. 10 (a), (b) & (c) : Extra on item 6(a), 6(b) & 6(c).**

- (i) For supply and erection of additional fittings. &
- (ii) Required at a turnout, diamond crossing or over-lap.

  
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The price shall cover on flat rate basis supply of additional components and fittings required at turnouts, crossings or over-laps (insulated or un-insulated) including overlaps, knuckle or crossing equipment at a turnout, or a diamond crossing and parallel clamps/bimetallic parallel clamp for jumper connections between two sets of overhead equipment conductor at a turnout, diamond crossings, overlaps or neutral section. The price shall cover supply of required copper conductors & jumper wires and erection of all materials including jumper wire, and all adjustments required at turnouts, crossings, overlaps and neutral sections.

The price shall also cover erection of potential equaliser jumpers at insulated overlaps and neutral sections.

The price shall not include extra bracket assemblies, overhead equipments, termination of overhead equipment and cut-in-insulators in the case of insulated overlaps and neutral section which will be paid for under items 4, 6, 8, and 11 respectively.

**ITEM No. 10 (az), (bz) & (cz) : Extra on item 6(az), 6(bz) & 6(cz).**

Same as item 10(a), (b) & (c) but excluding supply of Contact and Catenary wire.

NOTE : A cross-over shall be paid for as 2 off of Item 10, special configuration of OHE commonly known as half overlap shall be paid for as 1 off under this item. This shall apply in case of half overlap used in changing over from regulated to unregulated equipment or unregulated to regulated equipment.

**ITEM No. 11(a)(i) : Supply without insulator and Erection of a cut-in (9 Tonne) insulator**

The price is applicable to the provision of the an additional 9 Tonne cut-in-insulator on a flat rate basis such as in a head-span, cross span or in span wire or an overhead equipment conductor at an insulated overlap, anti-creep not provided for in other items.

The price shall cover supply of all components required for the cut-in-insulators assembly, including appropriate terminal fittings for the conductor but excluding the cost of 9 ton insulator assembly. This price shall cover erection of all components, including the 9 ton insulator. This price shall also be applicable as an adjustment price for non-provision of insulators under items 8(b)(i) to 8(b)(viii).

**ITEM No. 11(a)(ii): Supply without insulator and Erection of a suspension insulator.**

The price is applicable to the provision of 9 ton suspension insulator assembly for suspension of an All Aluminum 25 kV feeder (single or double SPIDER), 130 sq.mm or 65 sq.mm overhead equipment conductor or any other similar type of suspension.

The price shall cover supply of all components, required for the suspension assembly including the appropriate suspension clamp but excluding 9 ton insulator assembly and small parts steel work with bolts nuts etc., if any. The price shall cover erection of all components, including the 9 ton insulator assembly but excluding small parts steel work, with bolts and nuts etc. if any.

The price shall include the cost of provision of a flat armour tape only to be used in connection with suspension of 'SPIDER' conductor.

**ITEM No. 11(ax) : Supply of 9-Tonne Insulators for Item 11(a)(i) & 11(a)(ii)**

The price shall cover only supply of any of the following 9 tonne insulator assembly to be supplied at site for execution of work under items 11(a)(i) & 11(a)(ii) respectively. Erection cost of insulators are inclusive in items 11(a)(i) & 11(a)(ii) respectively.

Item No.	Insulator
11(ax)(i)	Porcelain 9 Tonne (CD-1050 mm)
11(ax)(ii)	Composite 9 Tonne (CD-1050 mm)
11(ax) (iii)	Composite 9 Tonne (CD-1600 mm)

**ITEM No. 11(b): Supply without Insulator and Erection of a 25 kV Post Insulator.**

The price is applicable to the provision of a 25 kV Post Insulator to support copper or aluminum jumper/busbars. The price shall cover supply of all components and fittings/angle iron (outrigger) to

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support the jumpers but excluding post insulator and small parts steel works with bolts and nuts etc., if any. The price shall cover erection of all components required for the assembly, including post insulator, but excluding small parts steel work with bolts and nuts etc. if any.

**ITEM No. 11(bx): Supply of a 25 kV Post Insulator for Item 11(b)**

The price shall cover only supply of 25 kV Post insulator to be supplied at site for execution of work under items 11(b). Erection cost of insulators is inclusive in items 11(b).

**ITEM No. 11(c): Supply without insulator and Erection of a 3 kV Disc Insulator.**

The price is applicable to the provision of a 3 kV Disc Insulator for suspension of an All Aluminum return conductor or any other similar type of suspension. The price is also applicable to a 3 kV cut-in-insulator for earthwire.

The price shall cover supply and erection of all components required for the assembly, including appropriate suspension clamp, ending clamp for cut-in-insulator on earth wire, but excluding 3 kv Disc Insulator and small parts steel work, with bolts and nuts etc., if any. The price shall include the cost of provision of a flat armour tape to be used in connection with the suspension of SPIDER/RACCOON conductor.

**ITEM No. 11(cx) : Supply of 3 kV Disc Insulator for Item 11(c).**

The price shall cover only supply of 3 kv Disc Insulator to be supplied at site for execution of work under items 11(c). Erection costs of insulators are inclusive in items 11(c).

**ITEM No. 11(d) : Supply without insulator and Erection of a 11 kV Post Insulator.**

The price shall cover, on a flat rate basis for supply of all necessary fittings for erection of 11 KV post insulator to support return conductor, Aluminum or copper busbars or return conductor jumper connections but excluding 11 KV post insulator and small parts steel work with bolts and nuts etc. if any. The price includes the erection of all the fittings including 11 kV Post Insulator.

**ITEM No. 11(dx) : Supply of 11 kV Post Insulator for Item 11(d).**


The price shall cover only supply of 11 kV Post Insulator to be supplied at site for execution of work under items 11(d). Erection cost of insulator is inclusive in item 11(d).


**ITEM No. 12(a) : Supply without Insulator and erection of a Section Insulator Assembly.**

The price shall cover supply of all components required for a standard section insulator assembly (serving both the overhead equipment conductors) including supply of copper conductors, dropper wires for special droppers for supporting the equipment and all terminal fittings for conductors and the section insulator assembly including 9 ton Insulator (RI No.6020) (Cost of insulator will be paid in Schedule-1, Section-5) on the catenary and Sectioning insulator (RI No.6110). The price shall cover erection and adjustment of all components including section insulator assembly, 9 ton insulator on the catenary, Sectioning Insulator and droppers.

Rly. Ident. No.	Description of components	Qty. per Unit
1120/or SK/ or 1122 & 1123	Catenary ending clamp	2 off
1192/ETI/OHE/SK/333.	Catenary dropper clip assembly.	As required
6170	Parallel clamp for double contact wire	12 off
6180	Section insulator dropper assembly.	3 sets
6100	Section insulator assembly	To be supplied by the Contractor.
6020	9 ton insulator assembly	To be supplied by the Contractor.

  
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**ITEM No. 12(az) : Supply without Insulator and erection of a Section Insulator Assembly.**

Same as item 12(a) but excluding supply of Contact and and dropper wires.

**ITEM No.12(ax) : Supply of 9 Tonne and Sectioning Insulators for Item 12(a) & 12(az)**

The price shall cover only supply of Sectioning Insulator with any of the following 9 Tonne Insulator for execution of work under item 12(a). Erection cost of insulators is inclusive in items 12(a).

Item No.	Insulator
12(ax)(i)	Porcelain 9 Tonne (CD-1050 mm) & Sectioning Insulator
12(ax)(ii)	Composite 9 Tonne (CD-1050 mm) & Sectioning Insulator
12(ax)(iii)	Composite 9 Tonne (CD-1600 mm) & Sectioning Insulator

**ITEM No. 12(b) : Supply without Insulator and erection of a double wire section insulator assembly.**

The price shall cover supply of all components required for a double wire section insulator assembly (to serve both wires of two overhead equipments and special droppers, including supply of dropper wires, for supporting this equipment) at any location, including terminal fittings for the conductors and the double wire section insulator assembly including 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5). The price shall include erection and adjustment of the entire assembly including double wire section insulator assembly, droppers and the 9 ton insulators.

**ITEM No.12(bx) : Supply of 9 Tonne and Sectioning Insulators for Item 12(b)**

The price shall cover supply of 2 Nos Sectioning Insulators and any of the following 9Tonne Insulator only for execution of work under item 12(b). Erection cost of insulators is inclusive in items 12(b).

Item No.	Insulator
12(bx) (i)	Porcelain 9 Tonne (CD-1050 mm) & Sectioning Insulator
12(bx)(ii)	Composite 9 Tonne (CD-1050 mm) & Sectioning Insulator
12(bx)(iii)	Composite 9 Tonne (CD-1600 mm) & Sectioning Insulator

**ITEM No. 12(c) : Supply without Insulator and erection of a Section Insulator Assembly suitable for tramway type OHE (Regulated)**

The price shall cover supply of all components required for a standard Section Insulator Assembly including special arrangements for supporting the equipment and terminal fittings for conductors and the section insulators assembly as required with Sectioning Insulator (RI No.6110) (Cost of insulator will be paid in Schedule-1, Section-5). The price shall cover the supply of required copper conductors, erection and adjustment of all components including sectioning insulator.

**ITEM No. 12(cz) : Supply without Insulator and erection of a Section Insulator Assembly suitable for tramway type OHE (Regulated)**

Same as item 12(c) but excluding supply of Contact and Catenary wires.

NOTE : (1) The same price will apply if the section insulator is provided in the tramway type equipment (contact wire only).

(2) The supply and erection of a bracket assembly shall be paid under item 4(a) (iii). No adjustment of price due to non-provision of steady arm, in this case, shall be made.

**ITEM No.12(cx):Supply of Sectioning Insulators for Item 12(c) and 12 (cz)**

The price shall cover only supply of Sectioning insulator for execution of work covered under item 12(c) and 12 (cz). Erection cost of insulators are inclusive in items 12(c).



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**ITEM No. 12(d): Supply and erection of Ceramic/ beaded Glass fibre type (PTFE) short neutral section assembly.**

The price shall cover Supply of Ceramic/Glass fibre or PTFE type short neutral section assembly and erection and adjustment of Glass Fibre or PTFE type short neutral sections, which will be supplied by the Contractor. The price would cover fittings for contact and catenary wire as necessary including supply of required dropper wire.

**ITEM No. 13(a) & (b): Supply without Insulator and erection of 25 KV SP Isolators without earth contact assembly.**

The prices under sub-items (a) and (b) shall cover supply and erection of Isolator switches of approved make, complete with arcing horns, operating rods, operating rod guides, mounting base including cost of 25 KV Solid Core Post and Operating rod insulator (Cost of insulator will be paid in Schedule-1, Section-5). The price shall also cover supply and erection of a number plate of approved design for each isolator. The price shall not include supply and erection of small parts steel work complete with bolts and nuts etc. for support of isolators and for support of operating rods on gantries/ masts, and insulator to support jumper and jumper connectors.

**ITEM No. 13(c): Supply without Insulator and erection of 25 KV Double Pole Isolator.**

The price shall cover supply and erection of a Double Pole Isolator complete with mounting base, operating rod and operating rod guides including the cost of Operating Rod Insulator and 25KV Solid Core Post Insulator required for the operation of the isolator (Cost of insulator will be paid in Schedule-1, Section-5). The price shall also cover supply and erection of Al-Cu strips, a padlock and a number plate of approved design for each isolator. The price shall not include supply and erection of small parts steel work for support of isolators and for support of operating rods on gantries masts.

**ITEM No. 13(d) : Extra for supply and erection of an earth contact assembly in an isolator.**

The price shall be payable as extra for erection of an earth contact assembly in any isolator. The price shall cover the cost of supply and erection of 3x25 mm copper connections between the earth contact assembly and the structures.

**ITEM No. 13(e): Extra on item 13(a), (b) or (c) for an interlocking device.**

The price shall cover supply and erection of an inter locking mechanism on an isolator to permit working of two or more isolators or an isolator and an interrupter in a desired sequence. This item shall be applicable individually for each isolator or interrupter.

NOTE: Prices under item 13 do not include the cost of supply and erection of (i) any post insulator to support jumpers/busbars which shall be paid for under item 11(b), (ii) flexible jumper connection which will be paid for under item 15 and (iii) busbar/bus-rod terminals which will be paid for under item 26(b) or (c). The price does not include also the cost of supply and erection of an aluminum/copper busbar or a copper bus rod the cost of which will be paid for under item 26(a)(i) or 26(a) (ii), as applicable.

**ITEM No. : 13(ax), 13(bx) and 13(cx) : Supply of Post and Operating Rod Insulators for Single and Double Pole Isolator for Item 13(a), 13(b) & 13(c)**

The price shall cover only supply of 25 kV Solid Core Post and Operating Rod Insulators for execution of work covered under item 13(a), 13(b) & 13(c) respectively. Erection cost of insulators are inclusive in items 13(a), 13(b) & 13(c).

**ITEM No. 14: Supply and erection of connection between return conductor and the rail.**

The price shall cover fabrication and erection of connections between all aluminum return conductor to cross rail/impedance bond (both of which as required will be supplied by the Purchaser free of cost at the Contractor's Depot) excluding the aluminum jumper connections from the return conductor to the steel flat which will be paid for under item 15(b) and any 11 KV post insulator for supporting the jumper which will be paid under item 11(d).



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The price shall include the cost of necessary supports on the traction structure, terminal connections and covering the mild steel flats with two coats of red oxide zinc chromate primer to IS:2074, CNSL based and finished with 2 coats of Bitumen 85/25 blown grade.

**ITEM No. 15(a)(i): Supply and erection of 105 Sq. mm (19/7/1.02 mm) Large copper jumpers.**

The price shall cover the supply of Large jumper wire size 105 Sq.mm(19/7/1.02mm) made of annealed stranded 100% pure copper conductor as per RDSO's specification No.ETI/OHE/3(2/94) with A&C Slip No 1( latest spec.), and on a flat rate basis, the supply of all components and fittings required for providing a flexible copper large jumper connection, including supply of parallel clamps, bi-metallic and Aluminum Copper Al-Cu strips, wherever required, and bolted type terminal connectors where ever required.

The price shall also cover the erection of the complete jumper assembly including jumper wire. The price shall not, however, be applicable for jumper connections already including under item 6(a) and 10, but shall be applicable for any jumper of 105 Sq.mm (19/7/1.02mm) connections in any combination between feeders, lightening arrestors, isolators and boosters stations. Continuity jumper at Boom anchor anti-creep will be payable under this item.

**ITEM No. 15(a)(ii):Supply and erection of 50 Sq.mm(19/1.8 mm) small copper jumpers.**

The price shall cover supply of Small jumper wire size 50 Sq.mm(19/1.80 mm) made of annealed stranded 100% pure copper conductor, and on a flat rate basis, the supply of all components and fittings required for providing a flexible small copper jumper connection, including supply of parallel clamps, bi-metallic and Aluminum Copper Al-Cu strips, wherever required, and bolted type terminal connector where ever required.

The price shall also cover the erection of the complete jumper assembly including jumper wire. The price shall not, however, be applicable for jumper connections already including under item 6(a) and 10, but shall be applicable for any small jumper connection in any combination required for lightening arresters and isolators etc. Anti-theft jumper as per drawing No. ETI/OHE/G/ 05107, with latest mod. for connecting out-of-run OHE with the in running OHE at insulated/un-insulated over-lap locations and also anticreep locations at polluted zone wherever considered necessary will be payable under this item.

**ITEM No. 15(a)(iii): Supply and erection of a copper jumpers (65 Sq mm catenary)**

The price shall cover the supply of 65 sq mm catenary wire & 50 sq mm Small Jumper and on a flat rate basis, the supply of all components and fittings required for providing a flexible copper jumper connection, including supply of parallel clamps, bi-metallic and Aluminum Copper Al-Cu strips, wherever required and bolted type terminal connector where ever required.

The price shall also cover the erection of the complete jumper assembly including jumper wire. The price shall be applicable for jumper connections using 65-Sqmm catenary wire in any combination required for lightening arresters and isolators etc., not included under item 6(a), 10, 15(a)(i), and 15(a)(ii). The supply of all components and fittings including catenary wire and the erection of all the components and fittings including the catenary wire for providing double catenary contact wire in place of catenary under overline structures as per DRG. No. ETI/OHE/SK/446 and ETI/OHE/SK-529, with latest mod. respectively will also be payable under this item, treating the double catenary as one jumper irrespective of its length including the catenary/contact wire ending clamp.

**ITEM No. 15(az)(iii): Supply and erection of a copper jumpers (65 Sq mm catenary)**

Same as item 15(a)(iii) but excluding supply of Catenary wire.

**ITEM No. 15(a)(iv) : Supply and erection of copper jumpers (5 mm dia dropper wire).**

The price shall cover supply of conductors/ jumper wires, and on a flat rate basis, the supply of all components and fittings required for providing a single strand / flexible copper jumper connections not included under items 6(a), 10, 15(a)(i), 15(a)(ii) & 15(a)(iii), including supply of parallel clamps, bi-metallic and Aluminum Copper Al-Cu strips, wherever required, including supply of bolted type terminal connector where ever required.

The price shall also cover the erection of the complete jumper assembly including jumper wire, to be provided between the Over head equipment and L.T. Transformers, drop out switch.

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NOTE for items 15(a)(i), 15(a)(ii) & 15(iii): Please see the note under item 15(e).

**ITEM No.15 (b) : Supply and erection of an aluminum jumper.**

The price shall cover on a flat rate basis the supply and erection of an aluminum jumper complete with all components and fittings required for providing jumper connection, including parallel clamps, bimetallic ALCU strips wherever required, and terminal or tee clamps at either end. The price shall be applicable for any aluminum jumper/connections in any combination between feeders, return conductors, overhead equipment, isolators and out going busbars or switching stations and booster stations. Jumper connections for 25 KV feeders at angle tower traction sub-station or at feeding stations will also be paid under this item.

**ITEM No.15 (c) : Supply and Erection of Insulated Catenary cable in the span under Over-Line Structure.**

The price shall cover supply of insulated catenary wire, catenary splice (1090) for each location and required dropper clip and erection of the same for each location. The prices shall also cover erection and adjustment of special droppers wherever required. The insulated catenary wire to be supplied shall be as per RDSO's specification No.ETI/OHE/75(04/95) with A&C slip Nos.1&2(with latest spec.). The work shall be executed in accordance with drawing No.ETI/OHE/ SK/570, with latest mod. The price shall also cover the cutting of existing Catenary wire, supply and erection of all materials and components including adjustment of dropper wires.

**Item : 15 (d) : Supply of materials and erection of a large copper jumper 160 Sq. mm between Aluminum bus and cross feeder.**

This jumper shall be provided between 36 mm Aluminum bus and the copper cross feeder at SP/SSP/FP/BT locations. The price shall cover the supply of 160sqmm flexible copper jumper wire, made of annealed stranded 100% pure copper conductor as per RDSO's specification ETI/OHE/3(2/94) with A&C Slip No 1 (latest spec.), all components and fittings required for providing a flexible copper jumper (160 Sq. mm) and connection between 36 mm Aluminum bus and cross feeder including Terminal connector 19mm multiple hole bolted type (1009), parallel clamps (1050-3), Al-Cu bimetallic strips, fasteners. The price shall also cover the erection of the complete jumper assembly including jumper wire.

**Item : 15 (e) : Supply of materials and erection of a large copper jumper 160 Sq. mm between cross feeder and OHE.**

This jumper shall be provided between copper cross feeders and OHE. The price shall cover supply of 160 sqmm flexible copper jumper wire, made of annealed standard 100% pure copper conductor as per RDSO's specification ETI/OHE/3(2/94) with A&C Slip No 1(latest spec.), and all components and fittings required for providing a flexible copper jumper (160 Sq. mm) between copper cross feeder and existing OHE, including Parallel clamps (1030-3 & 1050-3) complete with fasteners etc as required. The price shall also cover the erection of the complete jumper assembly including jumper wire.

**ITEM No.16 (a)(i) : Supply and erection of a structure bond**

The price shall cover supply of all materials including mild steel flat required to provide a structure bond connecting a traction mast or structures to the nearest non-track circuited rail, or earth electrode, including all fasteners at both ends. The price shall include shaping and drilling of the bond and erection of all materials including the bond. The price shall also include provision of heat shrinkable PVC tube for structure bond under track circuited rail. This would also cover connection or earthing terminals of equipments like L.T. Transformers with structure and then to rails as per relevant drawings.

The price shall cover provision of buried rail to running rail as per RDSO drawing No.ETI/OHE/G/05306, with latest mod and shall include supply, fabrication and erection of all connections (including drilling at both ends) and refilling of buried rail pit. The digging up of 1 m deep pit for the purpose of buried rail shall be done by the Railways.

**ITEM No.16 (a)(ii) : Supply and erection of a Galvanised steel stranded Wire structure bond**



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The price shall cover supply of all materials including **Galvanised steel stranded wire** required to provide a structure bond connecting a traction mast or structures to the nearest non-track circuited rail including all fasteners at both ends as per RDSO's drawing No. TI/DRG/OHE/GTBLUG/RDSO/0001/04/0. The price shall include fixing of lugs and drilling of the rails and erection of all materials including the bond.

The price shall also include provision of heat shrinkable PVC tube for structure bond under track circuited rail. This would also cover connection or earthing terminals of equipments like L.T. Transformers with structure and then to rails as per relevant drawings.

**ITEM No. 16(b): Supply and erection of longitudinal bond**

The price shall cover the supply of all materials including mild steel flats, fasteners etc. required to provide longitudinal bond connecting two rails at the rail joint at the locations to be specified by the Purchaser. The price shall include shaping and drilling of the bond and erection of all materials including the bonds.

**ITEM No.16(c) : Supply and erection of transverse and special bond**

The price shall cover supply of all materials including mild steel Flats, fasteners etc. required to provide transverse bond connecting rails of the same/ adjacent tracks at the locations to be specified by the Purchaser. The price shall also cover the supply of all materials including mild steel flat to provide special bonds at a level crossing, foot over/road over bridge/protective screen etc. for which the location will be specified by the Purchaser. The price shall include shaping and drilling of the bond and erection of all materials including the bond.

**ITEM No. 17(a) : Supply and erection of single earth electrode**

The price shall cover supply and erection of an earthing station with a single pipe embedded into the ground by driving or otherwise complete with protective concrete box and lugs suitable for directly connecting two mild steel flats of minimum size 50 mm x 6 mm.

**ITEM No. 17(b) : Extra for special embodiment of earth electrode.**

The price shall be payable as extra on item 17 (a) where an earth electrode is embedded by driving or otherwise in an earth pit filled with charcoal and salt. The price shall cover supply and erection of all additional materials required for embedding the earth pipe.

**ITEM No. 17(c) : Supply and erection of earth bus.**

The price shall cover the supply of all materials including 50 mm x 6 mm mild steel flats for providing earth bus. The price shall also cover erection of earth bus either buried at a depth of 300 mm below ground level painted with 2 coats of red oxide zinc chromate primer and 2 finishing coats of bitumen as per the particulars specified in para 2.1.49 or fixed on wooden gutties on walls. It shall include connecting the earth bus to earth electrodes and to various floor-or-wall-mounted equipments or structures to be earthed and also connections to non-track-circuited rails, wherever required it shall also cover the cost of making recesses in concrete foundation blocks or floor or cubicles and covering them up. The connection of earth strips to each other shall be made either by riveting or by welding. The connection of earth strips to various equipment, structures or fencing post shall be made with G.I. bolts and nuts and spring washer/ lock-nuts.

**ITEM No. 17(d) : Supply and erection of copper strips for equipment earthing.**

The price shall cover supply and erection of 25mmx3mm copper strips to connect the earth terminals of equipments like potential transformers, lightening arrestors, L.T. supply transformers and booster transformer to the main masts of the gantries on which they are mounted. The price shall cover all fastenings required for fixing the copper strips along any structure member of the gantry.

**ITEM No. 17(e) : Supply and erection of 8 SWG G.I WIRE for earthing.**

The price shall cover supply and erection of 8 SWG G.I wire per Meter, used for earthing at remote control cubicles and fencing panels.

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**ITEM No. 18(a) : Supply and Erection of 25 kV, SF-6 gas filled Interrupters.**

The price shall cover supply of 25 KV, AC, 50 Hz, Single Pole, outdoor type, SF-6 Gas Interrupters complete with all accessories and components as per RDSO's specification No.ETI/PSI/167(09/97), with latest spec. at site and erection of the same complete with supporting frame-work and terminal connectors. The price for erection shall include alignment and grouting of the Interrupter on its foundation block and mounting of accessories, if any, in their respective positions. The required SF-6 gas will be supplied by the Contractor and make his own arrangements for filling of the same. The price shall also cover supply and erection of enameled number plates. All necessary tools, equipments instruments, including power supply required for carrying out necessary checks, tests and commissioning shall be arranged by the Contractor.

NOTE : The replenishment of SF6 gas required due to leakages during the warranty period shall be done by the Contractor at his own cost.

**ITEM No. 18(b) : Supply and Erection of 25 kV, vacuum type Interrupters.**

The price shall cover supply of 25 kV, AC, 50 Hz, Single Pole, outdoor type, vacuum Interrupters complete with all accessories and components as per RDSO's specification No.ETI/PSI/167(09/97), with latest spec. at site and erection of the same complete with supporting frame work and terminal connectors. The price for erection shall include alignment and grouting of the Interrupter on its foundation block and mounting of accessories, if any, in their respective positions. The price shall also cover supply and erection of enameled number plates. All necessary tools, equipments, instruments including power supply required for carrying out necessary checks, tests and commissioning shall be arranged by the contractor.

**ITEM No. 19 : Supply and erection of 25 KV Potential Transformers (Type-I).**

The price shall cover supply and erection of a 25 kV potential transformer type-I complete with all fittings and accessories as per relevant specifications, including terminal connectors and fixing bolts. The price for supply and erection shall include proper alignment of the transformer in position. The price shall also cover the supply and erection of an enameled number plate and fixing bolts. The price shall not include the cost of any small parts steel work.

**ITEM No. 20(a) : Supply and erection of 42 kV lightning arrestors.**

The price shall cover supply and erection of 42 kV lightning arrestors complete with all fittings and accessories as per relevant specifications including terminal connectors. The cost of supply and erection shall include proper alignment of the lightning arrestor in position. The price shall not cover supply and erection of cadmium copper jumper (65) which will be paid under ITEM No 15. The price shall not include the cost of any small parts steel work.

**ITEM No. 20(b) : Supply and erection of lightning arrestors 7.5 kV.**

The price shall cover supply and erection of 7.5 kV lightning arrestor complete with all fittings and accessories. The cost of supply and erection shall include proper alignment of the lightning arrestor in position. The price shall not include the cost of any small parts steel work.

**ITEM No. 21 : Supply and erection of terminal boards in control cubicles.**

The price shall cover supply and erection of a wall mounted terminal board with six numbers of two-way terminal blocks for connecting the cables from the outdoor equipment of a switching station as per Railway Drawing given in Annexure-1(Part-IV).

**ITEM No. 22(a) : Supply and erection of an iron clad 110 V D.C. fuse box.**

The price shall cover supply and erection of a 15A, 110V iron clad two way fuse box on the wall inside the remote control cubicles. The fuse box shall be complete with two fuse carriers and bases.

**ITEM No. 22(b) : Supply and erection of iron clad 230 V A.C. fuse box.**


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The price shall cover supply and erection of a 15A, 230V, A.C. iron clad 4-way fuse box on the wall inside the remote control cubicle, for heater supply of interrupters. The fuse box shall contain four fuse carriers and bases.

**ITEM No. 23 : Supply and erection of lead acid batteries.**

The price shall cover supply and erection of 110V, 40AH lead acid battery complete with stand, accessories and a tool board. The price for erection shall include installation and connecting up of the battery, but exclude the cost of connecting cables (cable will be supplied by the purchaser), erection of which will be paid for under item 25. Price shall include supply of 110V, 40AH lead acid battery complete with accessories and connectors as per relevant RDSO's specification given in Annexure-1. Price shall also cover supply of Mild Steel stand, electrolyte and Tool Board with thermometer, hydrometer & wrench.

**ITEM No. 24 : Supply and erection of battery chargers.**

The price shall cover supply and erection of battery charger for a 110 V, 40 AH lead acid battery complete with connecting lead and plug for connection to 230 V A.C. supply. The price for erection shall include mounting of the charger in position and connecting it up to the 230 V A.C. distribution boards, which will be provided by the Purchaser in the control cubicles. The price shall not include supply and erection of any cable for connecting the charger to the 110 V battery which shall be paid for under item 25.

**ITEM No. 25: Supply and Installation of Cables for:-**

**ITEM No. 25 (a) Control and Indication.**

The price shall cover supply, installation and connecting up of cables for control and indication from the interrupter to the terminal board. The price shall include supply and erection of terminal connectors at both ends, if required the conduits may be provided where it is necessary.

**ITEM No. 25 (b) Heater Supply.**

The price shall cover supply, installation and connecting up of heater supply cable from interrupter to interrupter or from the interrupter to the 230V A.C. fuse box mounted on wall inside the control cubicle and from this fuse box to L.T. distribution board inside the control cubicle. The price shall include cost of supply and erection of terminal connectors at each end, if any required, and conduit, if any at the interrupter end.

**ITEM No. 25 (c) Catenary Indication**

The price shall include supply, installation and connecting up of cable for catenary indication, between potential transformer Type-I and the terminal board inside the control cubicle. The price shall include supply and erection of terminal connectors at both the ends if required and conduit to be embedded between the steel work based and the cable trench and shall include all fastenings on masts and structural members to support them.

**ITEM No. 25 (d) L. T. Power Supply**

The price shall cover supply, installation in trenches and connecting up of L.T. Power supply cable between the L.T. supply transformer at switching station and L.T. distribution board, inside the control cubicle. The price shall cover supply and erection of suitable cable boxes, if required, and connectors at both ends.

**ITEM No. 25 (e) 110 V D. C. Supply**

The price shall cover supply, installation and connection up of cable between 110V battery charger and battery, between battery and the D.C. fuse box and between the D.C. fuse box and terminal board. The price shall include terminal connectors, wherever required.



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**NOTE :** 1. The length of cables shall be the actual distance measured along the lengths of the cable between the starting and terminating points of each cables.

2. for purposes of payment fraction of a metre in the total length of cable of each type used at a switching station shall be rounded off to the next higher metre.

3. Price under item 25 do not include cost of concrete cable trenches which will be paid for under item 2(c).

**ITEM No. 26(a) : Supply and erection of bus bars**

**(i) Aluminum bus bar 36 mm x 28 mm**

The price shall cover supply and erection of aluminum bus bars 36mm x 28mm including bending, shaping and clamping on to insulators, connectors or equipment terminals.

**(ii) Solid copper bus bar 18 mm**

The price shall cover supply and erection of solid copper busbar 18mm including bending and shaping.

NOTE:- The price under item 26(a)(i), (a)(ii) does not cover the cost of terminal connectors which will be paid for under items 26(b) or (c) as applicable.

**ITEM No. 26(b) (i) to (vii) : Supply and erection of aluminum bus-bar connectors**

The price shall cover supply and erection of bus-bar junctions and connectors of various types specified, including bolts, nuts etc, required at junctions or terminations of bus-bars.

**ITEM No. 26(c) (i) to (iv) : Supply and erection of solid copper bus-bar connectors**

The price shall cover supply and erection of solid copper bus-bar junctions and connectors of various types specified, including bolts, nuts, etc, required at junctions or terminations of solid copper bus-bars.

**ITEM No. 27(a) : Supply, Erection, oil filtration, testing and commissioning of 25 kV/240 V 10 kVA L.T. supply transformers.**

The price shall cover Supply of 25 kV/240V 10 kVA LT supply transformers, at site, as per the RDSO's specification indicated in Annexure-1 of Part-IV of this tender paper, and erection of the same complete with terminal connectors on a mast or gantry. The price shall be applicable for transformers mounted on steel pedestals at switching stations also. The price shall also cover supply and erection of an enameled number plate of approved design. The price shall also cover oil filtration and pre-commissioning tests as approved by the railways. The contractor shall make his own arrangement for oil filtration equipments, as well as power supply required for the same. All necessary tools, equipments, instruments required for carrying out oil filtration/ checks/tests and commissioning shall be arranged by the contractor.

**ITEM No. 27(b) : Supply, Erection, oil filtration, testing and commissioning of 25 kV/240 V, 5 kVA L.T. supply transformers.**

The price shall cover supply of 25 kV/240 V, 5 kVA LT supply transformers, at site, as per the RDSO's specification indicated in Annexure-1 of Part-IV of this tender paper, and erection of the same complete with terminal connectors on a mast or gantry. The price shall be applicable for transformers mounted on steel pedestals at switching stations also. The price shall also cover supply and erection of an enameled number plate of approved design. The price shall also cover oil filtration and pre-commissioning tests as approved by the railways. The contractor shall make his own arrangement for oil filtration equipments, as well as power supply required for the same. All necessary tools, equipments, instruments required for carrying out oil filtration/ checks/tests and commissioning shall be arranged by the contractor.

**ITEM No. 27(c) : Supply, Erection, oil filtration, testing and commissioning of 25 kV/240 V, 25 kVA L.T. supply transformers.**



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The price shall cover Supply of 25kV/240V 25 kVA LT supply transformers, at site, as per the RDSO's specification indicated in Annexure-1 of Part-IV of this tender paper, and erection of the same complete with terminal connectors on a mast or gantry. The price shall be applicable for transformers mounted on steel pedestals at switching stations also. The price shall also cover supply and erection of an enameled number plate of approved design. The price shall also cover oil filtration and pre-commissioning tests as approved by the railways. The contractor shall make his own arrangement for oil filtration equipments, as well as power supply required for the same. All necessary tools, equipments, instruments required for carrying out oil filtration/checks/tests and commissioning shall be arranged by the contractor.

**ITEM No. 27(d) : Supply, Erection, oil filtration, testing and commissioning of 25 kV/240 V, 50 kVA L.T. supply transformers.**

The price shall cover supply of 25kV/240V, 50 kVA LT supply transformers, at site, as per the RDSO's specification indicated in Annexure-1 of Part-IV of this tender paper, and erection of the same complete with terminal connectors on a mast or gantry. The price shall be applicable for transformers mounted on steel pedestals at switching stations also. The price shall also cover supply and erection of an enameled number plate of approved design. The price shall also cover oil filtration and pre-commissioning tests as approved by the railways. The contractor shall make his own arrangement for oil filtration equipments, as well as power supply required for the same. All necessary tools, equipments, instruments required for carrying out oil filtration/checks/tests and commissioning shall be arranged by the contractor.

NOTE for item 27(a), 27(b), 27(c) & 27(d): The replenishment of the transformer oil on account of testing and leakages during the warranty period shall be done by the Contractor at his own cost.

**ITEM No. 28 : Supply without Insulator and Erection of 25 kV D.O. Fuse Switch**

The price shall cover supply and erection of 25 kV drop out fuse switch complete with all mounting accessories and terminal connectors as required but without the cost of the supply of 25 kV solid core insulator. The price shall not include erection of small parts steel work.

**ITEM No.28(x) : Supply of Post Insulators for Item 28**

The price shall cover only supply of 25 kV Solid Core Insulators (Post Insulators) for execution of work covered under item 28. Erection cost of insulators are inclusive in item 28.

**ITEM No. 29(a) : Erection, oil filtration, testing and commissioning of Booster Transformers**

*The price shall cover erection of a 150 or 100 KVA booster transformer supplied by the purchaser complete with terminal connectors on a gantry. The price shall include proper alignment of the transformer on the gantry, but shall exclude any steel work required for mounting the transformer. The price shall also cover supply and erection of an enameled number plate. The price shall also cover oil filtration and pre-commissioning tests as approved by the Railways. The contractor shall make his own arrangement for oil filtration equipments as well as power supply required for the same. All necessary tools, equipments, instruments required for carrying out oil filtration /checks/tests and commissioning shall be arranged by the contractor.*

**ITEM No. 29(b) :** DELETED

**ITEM No. 30(a)(i) :** Supply and erection of fencing panels at Switching Stations

The price shall include supply and erection of fencing panels painted with two coats of red oxide zinc chromate primer to IS:2074:1979 and finished with two coats of aluminum paint. The prices shall not include supply and erection of fencing up-rights, anti-climbing devices but shall include the cost of fasteners and the price shall be for a metre length of the panels, 2.4 meter height measured in the plan view of the appropriate approved drawings.

**(ii) Supply and erection of fencing uprights**

The price shall cover supply and erection of fencing uprights panels painted with two coats of red oxide zinc chromate primer to IS:2074:1992 and finished with two coats of aluminum paint. The price



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shall be on the basis of black weight of the steel with no deduction for holes or skew cut or no increase for weld materials. The cost of foundation of uprights will be paid under item-2.

**ITEM No. 30(b) :**

**(i) Supply and erection of anti-climbing device at Switching Stations**

The price shall cover supply and erection of an anti-climbing device consisting of galvanised steel fixtures mounted on the fencing panels as per approved design. The price shall be per metre length of the panel.

**(ii) Supply and erection of anti-climbing device for B.T. Stations**

The price shall cover on a lump sum basis the supply and erection of anti-climbing device consisting of galvanised steel fixtures mounted on the masts, of the gantry below the transformer. The price shall be for each B.T. Station provided with the device.

**(iii) Supply and erection of anti-climbing devices for L.T. Supply Transformer Stations.**

The price shall cover on a lump sum basis the supply and erection of anti-climbing device consisting of galvanised steel fixtures mounted on the masts below the transformer. The price shall be for each mast provided with the devices.

**(iv) Supply and erection of Anti Monkey Menace.**

The price shall cover supply and erection of anti monkey menace consisting of Hot dip galvanized fixtures (MS angle 60mm x 60mm x 8mm) including all bolts, nuts, MS Flat and barbed wire as per requirement, mounted on masts as RDSO's drawing Nos. TI/SK/OHE/ANTIMON/RDSO/00001/08/0 & TI/SK/OHE/ANTIMON/RDSO/00001/09/0. The location for provision of "Anti Monkey Menace" if any shall be advised by the concerned project after award of the contract. All components shall be hot dip galvanized after fabrication and take approval from the project with the type of mast also.

**ITEM No.31 : Modifications to erected equipment**

The price under this item shall cover various modifications required to be carried out, in a section of completely erected overhead equipment energised or fit to be energised, certified as such by the Purchaser's Engineer provided such modifications are not on account of non-compliance of specifications, approved drawings and instructions given by the Purchaser for the execution of the work from time to time, during the progress of the work. All the prices are on a flat basis and cover only the important and most frequent type of modifications required to compensate the contractor for additional work involved. No payments shall be admissible for other minor modifications which may be necessary in the course of work. All work originally done shall be paid for at normal rates for items 1 to 30 of schedule 1 as applicable. Dismantling of foundations and masts/structures shall be done by the Purchaser at his own cost.

In all the following cases, the dismantled equipment shall be handed over by the contractor to the Purchaser's Engineer at the spot of dismantlement or at the contractor's Depot, as required by Purchaser's Engineer. Where prices under this item are applicable, the Contractor shall finalise the quantities of work jointly with the Purchaser's Engineer before taking the work in hand.

**ITEM No. 31(a) Transfer of equipment from one mast or support to another**

The price shall cover transfer of overhead equipment to a bracket assembly on a new mast or support and dismantling of the erected bracket assembly from the old mast of support and consequent adjustment to overhead equipment required such as re-spacing of droppers (including cost of dropper wire), leveling etc. the foundation and steel work and bracket assembly for the new mast or structure will be paid for under appropriate items 2,3 and 4 respectively.

**ITEM No. 31(b) : Provision of an additional bracket assembly/assemblies on mast or support**

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The price shall cover dismantling of an existing bracket assembly/assemblies and provision of a multiple cantilever cross arm wherever required, supplied free of cost by the Purchaser and erection of bracket assemblies on the multiple cantilever cross arm. The price shall include any consequential adjustment to traction overhead equipment such as re-spacing of droppers, leveling, etc. This prices shall not include the price for supply and erection of any additional bracket assemblies, which will be paid for under item 4.

**ITEM No. 31(c): Re-adjustment of a head-span**

The price shall cover the re-adjustment of the head span polygon to enable the additional equipment/s to be suspended from the head span. Payment for the suspension of additional overhead equipment shall be made for under item 5 as extra to item 31(c).

**ITEM No. 31(d): Dismantling of overhead equipment**

The price shall cover cost of dismantling of equipment including Terminations, tensioning devices, guy rod assemblies, bracket assemblies and associated small parts steel work(excluding components embedded in concrete).

**ITEM No. 31(e): Dismantling of feeder/return conductor**

The price shall cover dismantling of feeder, or return conductor including guy rods, terminations, suspension assemblies, super masts and associated small parts steel work.

**ITEM No. 31(f): Splicing and extension of anchored overhead equipment**

The price shall cover splicing of terminated overhead equipment for extension and consequent adjustment of the affected equipment. The dismantled equipment (excluding portions embedded in concrete) shall be returned to the Purchaser's Engineer. The cost of dismantling of overhead equipment would be paid for under item 31(d) for the whole length of the anchoring span irrespective of the physical position of the splices. The extended overhead equipment shall be deemed as starting from the center line of the structure preceding the old terminating structure and the extended overhead equipment shall be paid for under item 6(a) or 6(b) or 6(c) as applicable.

**ITEM No. 31(g): Dismantling of a section insulator**

The price shall cover cost of 107 sq mm contact wire, 65 sq mm catenary wire, dropper wire and dismantling of an section insulator, splicing of catenary and contact wires and the necessary adjustments to droppers. The price shall include the supply of required copper conductors for the adjustment. The dismantled equipment shall be handed over to the Purchaser's Engineer at the spot of dismantling or at the contactor's Depot/s.

**ITEM No. 31(gz): Dismantling of a section insulator**

Same as item 31 (g) but excluding supply of Contact and Catenary wires.

**ITEM No. 31(h):Slewing and putting back of OHE in original shape**

The price shall cover for temporary slewing or lowering of erected OHE adjusted and /or unadjusted to ground for special works, at the request of the Purchaser and restoration and re-adjustment of the equipment after completion of special works. The price shall be per span or part thereof, including anchoring spans.

Additional components or materials used during such restoration or re-adjustment will be paid for at rates included in schedule 3 plus handling charges of 10% provided such use has, in the opinion of the Purchaser, become necessary due to reasons beyond the control of the Contractor.

**ITEM No. 31(i)Dismantling of an isolator**

The price shall cover cost of dismantling of an isolator, single or gang-operated, including dismantling of connections to the overhead equipment and associated small parts steel work.



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**ITEM No. 31(j) Dismantling of a post/pin insulator**

The price shall cover cost of dismantling of a pedestal pin insulator including dismantling of jumper connections, if any and associated small parts steel work.

NOTES FOR ITEM No. 31 : All claims under this item have to be supported by the following certificate to be furnished by the Contractor on the connected bill.

(a) The modifications are not on account of non-compliance of specifications approved and instructions given by the Railways for execution of works.

(b) The quantities of work involved for modification have been finalised jointly with the Railway's Engineers before taking the work in hand.

(c) The dismantled material have been handed over to the Purchaser's representative.

**Item No. 31 (m)(i) & 31(m)(ii):****Manning of Switching Stations/Traction Sub-stations**

The prices shall cover the payment/wages to the staff to be deployed at each switching station and traction sub-station as directed by purchaser's Engineer. Manning shall be done round the clock. The staff to be deployed must be skilled and fully conversant with operation of various equipments installed in switching station and traction sub-stations. The staff shall be deployed after test and trial by purchaser and on issue of competency certificate. The staff deployed shall act in accordance with instructions/ directions given by Traction Power Controller/representative of purchaser. The staff shall not leave the working place (Switching station and Traction Sub-station) in any case without prior permission of purchaser's representative. The price shall cover conveyance charges to the staff for going and coming to the working place. The period of manning shall be decided by the purchaser during execution of contract and manning shall commence on receipt of intimation in writing from the purchaser one month in advance.

**Note:** In case Feeding Post is situated in adjacent to TSS same will also be included for manning alongwith TSS.

**ITEM No. 32: Extra on erection rate for work under a power block**

The price under this item cover extra charges over and above erection rates of item 3 to 15 and 18 to 31 of Schedule 1, (Pt. I, Ch. IVA) for erection of equipment in the vicinity of energized overhead equipment and feeders or erection of equipment with joints equipment already energized or on energized equipment which calls for a power block (shut off of traction power). The price payable under this item shall be 100% extra over the erection rates of the item referred to above, provided such work is not called for on account of non-compliance with specifications, approved drawings and instructions given by the Purchaser from time to time.

The extra erection rate under this item will not be payable, if power block is given for a total duration of a 4 hour or more in a day. Where the prices under this item are applicable, the Contractor shall finalise the quantities of various items of work to be done under a power block, jointly with the Purchaser's Engineer prior to taking the work in hand.

**ITEM No. 33(a):****Extra on erection rates for stringing work manually under Item No. 6(a) to 7(c)**

The price under this item covers extra charges over and above the erection rates of item 6(a) to 7(c) of Schedule-1(Pt. I, Ch. IVA) without use of Wiring Train/Tower Wagon. The price payable under this item shall be 50% extra over the erection rates of the items referred to above, provided such work is not called for on account of non-compliance with specifications, approved drawings and instructions given by the Purchaser from time to time.

**ITEM No. 33(b) : Extra on erection rates for steel work manually under Item 3(a)(i), 3(a)(ii), 3(b)(i), 3(b)(ii) & 3(b)(iii)**


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The price under this item covers extra charges over and above erection rates of item No. 3 (a) (i), 3 (a)(ii), 3 (b)(i), 3 (b)(ii) & 3 (b)(iii) of Schedule-1(Pt. I, Ch. IVA) without use of rail crane. The price payable under this item shall be 50% extra over the erection rates of items referred to above, provided such work is not called for on account of non-compliance with specifications, approved drawings and instructions given by the purchaser from time to time.

Note : Where the works under these item 33(a) i.e "Manual Stringing" and 33(b) i.e "Manual Erection of Masts" are feasible, the Contractor shall finalise the quantities of various items of work jointly with the purchaser's engineer prior to taking up the work in hand, subject to a maximum of two percent each for item 6(a) to 7(c) and 3 (a) (i), 3 (a)(ii), 3 (b)(i), 3 (b)(ii) & 3 (b)(iii) of Schedule-1.

**Item No.34(a): Supply of materials and construction of Super-structure of SP/SSP building**

The price shall cover the construction of Control room of SP/SSP building above plinth and will include labour and material cost for the following works:-

- i) RCC work in plinth, lintels, chajja, Roof slab.
- ii) Pre-cast RCC slab, RCC jali.
- iii) Cement concrete in flooring and cable trench.
- iv) Brick masonry in walls.
- v) Plastering works.
- vi) Provision of Doors, windows grills, Rolling shutters, water pipe line ventilators and painting thereof.
- vii) White washing and colour washing.
- viii) Acid proof or painting of floor and wall in battery room.
- ix) Spreading of stone metal.
- x) Provision of RCC pipe etc.
- xi) Any other item of work required to complete the work which has not been mentioned/included above shall also be done by the contractor and nothing extra shall be paid the same.

Construction of switching station shall be done strictly as per RDSO's drawing **No.ETI/C/0067** (Latest version as given in Annexure-1) and Technical specification included in Part-II Chapter-VIII of the Tender Papers.

The price shall cover the provision of all shuttering, frame works, arrangement of water, all tools and plants required for the work, consumable materials etc.

The materials used for the work such as brick, sand, stone aggregates, steel for door frame, grill/Rolling shutters, RCC pipe shall be of best quality in accordance with Railways specification.

The price shall also cover the provision of suitably sized of opening on the wall, for installation of Exhaust fan in the battery room.

**Item No.34 (b) : Cement concrete for foundation with stone ballast 40 mm nominal size rammed in layers not exceeding 15 cm thick in cement and sand, ratio 1:3:6 :-**

The price covers the supply of all necessary materials for casting cement concrete including cement, sand, ballast, arrangement of water and labour. The price shall cover the arrangement of all tools and plants such as mixer, vibrator (mechanical/electrical).

The price shall cover provision of shuttering and dismantling thereof. The price shall cover cost of screening and washing of aggregate mixing as well grinding of mortar, preparation, deposition and curing of concrete and rendering or finishing the exposed surface were required. The price shall cover the cost of transportation of all materials, tools and plants to the site or from the site.

**Item No. 34 (c) : RCC work of foundation**

The price shall cover the price of reinforcement concrete work for construction of column including supply of cement, concrete, structuring arrangements and dismantling thereto but excluding cost of steel required for reinforcement which has been covered under item 3(g). The price shall cover cutting,

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bending and lying of reinforcement in column. The concrete mixture shall also be before casting in accordance with IS:456/2000.

**Item No. 34(d) : Brick work in foundation, plinth ,Retaining walls and drainage**

The price shall cover all labour and materials including cement and brick. The price covers supply, fixing, erecting, and removal of scaffolding, timber or steel frame work, shuttering, centering etc. The price covers arrangement of water at site, mixing of mortar, soaking bricks and all watering during the work and prescribed period of curing afterwards. The price shall cover the arrangement of all tools and plants required for work. The price shall cover all consumable materials e.g. fuel, oil, string, rope, wedges etc.

**Item No. 34(e):**

**Construction of retaining wall with Random rubble masonry in cement & sand 1:6**

The price shall cover all labour and materials including cement. The price shall cover supplying, fixing, erecting, and removal of scaffolding, timber or steel frame work, Shuttering, centering etc. The price shall cover watering during the work. The price covers the arrangement of water at site.

NOTE:- In case the stone rubbles are not available nearby the work site then the Retaining wall shall be constructed by Brick Masonry work and the payment should be made to the contractor under item 34 (d).

**Item No. 34(f) : Earth work in excavation and filling**

The price shall cover the earth filling at the site of SP/SSP control room at specified area upto required level. The price covers all labour and materials required including arrangement of necessary tools and plants required for the work. This price also includes the transportation cost of earth in case, earth is not available for filling up the nearby area. The price covers the watering and ramming of levelled/ filled earth either manually or by mechanical means. The price shall cover arrangement of necessary water required for the work.

**Item No. 34(g) : Earth work in excavation for foundation**

Same as for above, item No.34(f) except that no watering and ramming of earth is required in this case, but includes the disposal of excavated earth /leveling etc. for foundations, drainage etc.

**Item No. 34(h) :**

**Excavation of pile 100 to 200 mm dia with Single under ream up to 3.5 m deep**

The price shall cover the cost of all labour tools and plants required at site during making of a 100 to 200 mm dia bare hold along-with single under ream upto a depth of 3.50 metre. The excavated earth from the bare hole shall be disposed off and leveled all around. The price shall also cover the cost of all consumable materials and water required at site during execution of work.

**Item No. 34(i) : Plastering of Retaining wall**

The price shall cover the supply of all materials and labour cost including cement for plastering of Retaining wall either constructed by Ruble masonry work or by Brick work. Plastering work shall be done by cement mortar in 1:4 (1cement and 4 sand). The price shall also cover the cost of arrangement of necessary water required for the work. The price shall cover the cost of necessary tools and plants required for the work and necessary consumable items. Nothing extra shall be paid to the contractor for any rehandling of materials from the place of delivery to place of work. The price shall cover the cost of cleaning and wetting the surface of the work. The price shall also cover the cost of curing of the plastered surface as per extant practice.

**Item No. 34(j) : Supply & Spreading of Ballast/Gravel in the switch yard**

The price shall be per cu.m. rate and shall cover supply and spreading of uniformly graded gravel/ballast of size 20/25mm, in the outdoor switch yard after completing all the works and leveling the switch yard area, but before commissioning of the sub-station. The gravel/ballast shall be of good quality

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and free from any dust and dirt. Prior approval of ballast shall be taken from the Purchaser for the gravel samples. The gravel/ballast shall be spread out uniformly to a depth of 10cm. over the area indicated by the Purchaser's Engineer.

**Item No. 35 : Supply & Erection of materials for Internal and External Lighting of Switching Station Building (SP/SSP).**

The price shall cover all cost of labour and materials required for the work. Wiring work shall be done in accordance with IE rules, IS-732 and specifications given in Part-II Chapter-VIII of the tender paper. The price shall also cover the cost of testing and commissioning of the installations. The various activities involved in the work are as follows:-

Fixing of MS conduits on wall and drawing of wires for circuit and point wiring.

Provision of C.I. Switch boxes of appropriate size concealed in wall at appropriate height with phenolic laminated (Hylum) sheet for fixing of switches, plugs etc.

Provision of Main Board and Distribution Boards and connection thereof.

Provision of light fittings, Exhaust fan, Outdoor luminaries complete with tubes and bulbs.

Provision of Earthing station and connection between earthing station to Main Board with the help of 8 SWG GI wire. Earthing work shall be done in accordance with IS:3043/1987.

Materials such as light fittings, Exhaust fan, switches sockets, Ceiling Rose, Socket outlets all shall be with ISI mark and shall be one of the make mentioned in technical specification.

Provision of Switches, sockets outlets, Ceiling Roses on respective switch boards and points in appropriate numbers and connection thereof.

Provision of 150 Watt HPSV street light fitting complete in all respect including lamp on the wall of the building.

After completion of wiring work necessary testing of wiring and Earthing station shall be done and results submitted to the site-in-charge duly signed by representatives of both the contractor and purchaser.

**Item 36 (a) : Unloading of all type of Steel Structures :**

The price shall cover unloading charges for all type of steel structures (BFB/ RSJ, B-Series, Spl structures, N,O, R type structures etc) from BFR/ trailer/ truck over and above the requirement given by the contractor for the completion of the present work or actual qty utilised in the completion of work; whichever is higher.

**Item 36(b): Loading of all type of Steel Structures :**

The price shall cover loading charges for all type of steel structures (BFB/ RSJ, B-series, Spl structures, N,O & R type structures etc) into BFR/ trailer/ truck over and above the requirement given by the contractor for the completion of the present work or actual qty utilised in the completion of work; whichever is higher.

**Item 37 (a) : Unloading of all type of Copper & Aluminum conductors :**

The price shall cover unloading charges for all type of copper conductors (contact wire, catenary wire, Dropper, Bridle wire, Jumpers etc) and Aluminum conductors (spider conductor etc) into BFR/ Tower wagon/ trailer/ truck over and above the requirement given by the contractor for the completion of the present work or actual qty utilised in the completion of work; whichever is higher.

**Item 37 (b) : Loading of all type of Copper & Aluminum conductors :**

The price shall cover loading charges for all type of copper conductors (contact wire, catenary wire, Dropper, Bridle wire, Jumpers etc) and Aluminum conductors (spider conductor etc) into BRF/ Tower wagon/ trailer/ truck over and above the requirement given by the contractor for the completion of the present work or actual qty utilised in the completion of work; whichever is higher.



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**Schedule-1, Section-6 & 7****EXPLANATORY NOTES TO NON SCHEDULE ITEMS as per item wise details given in Schedule-1, Section-6 and instruction of purchasers****Item No. NS-1(a): Dismantling of mast.**

The price shall cover dismantling of old abandoned masts, which are not in use of OHE.

**Item No. NS-1(b): Extra on erection under power block for item no. 1(a)**

The price under this Item covers extra charges over and above, the erection rates of N.S. Item 1(a) for the work in the vicinity of energized OHE and feeders, which call for a power block (shut-off of traction power). The price payable under this Item shall be extra over the erection rates of the Items referred to above, provided such work is not called for on account of non-compliance with specification approved drawings instructions given by the purchaser. Extra erection rates under this Item will not be payable if power block is given for a total duration of 4 hours or more in a day. Where the prices under this Item are applicable, the contractor shall finalize the quantities to be done under a power block jointly with the purchaser's engineer prior to taking work in hand.

**Item No. NS-2(a) : Dismantalling of a Copper/ Aluminium Jumper**

The price shall cover on a flat rate basis the dismantling of a copper/aluminum jumper for feeder/X-feeder or over head equipment, which are not covered under any other item.

**Item No. NS-2(b): Extra on erection under power block for item no.2 (a)**

The price under this Item covers extra charges over and above, the erection rates of N.S. Item 2(a) for the work in the vicinity of energized OHE and feeders, which call for a power block (shut-off of traction power). The price payable under this Item shall be extra over the erection rates of the Items referred to above, provided such work is not called for on account of non-compliance with specification approved drawings instructions given by the purchaser. Extra erection rates under this Item will not be payable if power block is given for a total duration of 4 hours or more in a day. Where the prices under this Item are applicable, the contractor shall finalize the quantities to be done under a power block jointly with the purchaser's engineer prior to taking work in hand.

**Item No. NS- 3(a): Shifting of OHE Termination (Fixed) from one mast/support to another.**

The price shall cover shifting of a fixed OHE termination from one mast/support to another. The price shall include the cost of dismantling of all material like termination, guy Rod, SPS from old location and erection at new location.

**Item No. NS-3(b): Extra on erection under power block for item no.4 (a)**

The price under this Item covers extra charges over and above, the erection rates of N.S. Item 3(a) for the work in the vicinity of energized OHE and feeders, which call for a power block(shut-off of traction power). The price payable under this Item shall be extra over the erectionrates of the Items referred to above, provided such work is not called for on account of noncompliancewith specification approved drawings instructions given by the purchaser. Extraerection rates under this Item will not be payable if power block is given for a total duration of4 hours or more in a day.Where the prices under this Item are applicable, the contractor shall finalize the quantities tobe done under a power block jointly with the purchaser's engineer prior to taking work in hand.

**Item No. NS-4(a): Shifting of OHE Termination (Regulated) from one mast/support to another.**

The price shall cover shifting of a regulated OHE termination from one mast/support to another. The price shall include the cost of dismantling of all material like regulated equipment, guy Rod, SPS from old location and erection at new location.



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**Item No. NS-4(b): Extra on erection under power block for item no. 4(a)**

The price under this Item covers extra charges over and above, the erection rates of N.S. Item 4(a) for the work in the vicinity of energized OHE and feeders, which call for a power block (shut-off of traction power). The price payable under this Item shall be extra over the erection rates of the Items referred to above, provided such work is not called for on account of non-compliance with specification approved drawings instructions given by the purchaser. Extra erection rates under this Item will not be payable if power block is given for a total duration of 4 hours or more in a day. Where the prices under this Item are applicable, the contractor shall finalize the quantities to be done under a power block jointly with the purchaser's engineer prior to taking work in hand.

**Item No. NS-5(a): Adjustment on bracket assembly for lowering/raising the height of Catenary and Contact wires where Encumbrance is changed.**

The price shall cover supply & replacement of all required components of bracket assembly for changing the encumbrance at a cantilever location to lower/raise the height of contact and catenary wire and adjustment of droppers on adjacent spans. The price shall also include all necessary adjustment on the bracket assembly and the adjacent spans on both sides to suit the required profile of OHE. The price shall cover temporary off loading and reloading of OHE from/on the cantilever, whichever required.

**Item No. NS-5(b): Extra on erection under power block for item no.5(a)**

The price under this Item covers extra charges over and above, the erection rates of N.S. Item 5(a) for the work in the vicinity of energized OHE and feeders, which call for a power block (shut-off of traction power). The price payable under this Item shall be extra over the erection rates of the Items referred to above, provided such work is not called for on account of non-compliance with specification approved drawings instructions given by the purchaser. Extra erection rates under this Item will not be payable if power block is given for a total duration of 4 hours or more in a day. Where the prices under this Item are applicable, the contractor shall finalize the quantities to be done under a power block jointly with the purchaser's engineer prior to taking work in hand.

**Item No. NS-6(a): Adjustment on bracket assembly for lowering/raising the height of catenary and contact wires where Encumbrance is not changed.**

The price shall cover lowering/raising the height of contact and catenary wire without changing encumbrance. The price shall also include all necessary adjustment on the bracket assembly to suit the required profile of OHE. The price shall cover temporary off loading and reloading of OHE from/on the cantilever, whichever required.

**Item No. NS-6(b): Extra on erection under power block for item no. 6(a)**

The price under this Item covers extra charges over and above, the erection rates of N.S. Item 6(a) for the work in the vicinity of energized OHE and feeders, which call for a power block (shut-off of traction power). The price payable under this Item shall be extra over the erection rates of the Items referred to above, provided such work is not called for on account of non-compliance with specification approved drawings instructions given by the purchaser. Extra erection rates under this Item will not be payable if power block is given for a total duration of 4 hours or more in a day. Where the prices under this Item are applicable, the contractor shall finalize the quantities to be done under a power block jointly with the purchaser's engineer prior to taking work in hand.

**Item No. NS-7: Loading, leading, transportation, unloading and stacking of steel structures & Conductors etc. from TRD stores of SSE/C/TRD/Chandigarh/Jalandhar/Ajmeri Gate, New Delhi/Shakurbasti, Delhi/Ambala/Lucknow to different sites and released material from different sites to the stores of SSE/C/TRD/Chandigarh/ Jalandhar/Ajmeri Gate, New Delhi/Shakurbasti/ Jagadhari workshop, Delhi/Ambala/Lucknow.**

The price shall cover handling, leading, loading/unloading, transportation and stacking of OHE steel structures like Masts/TTCs/Portals of different sizes, small parts structures, conductors, equipments etc. from the stores of SSE/C/TRD/Chandigarh/Jalandhar/ Ajmeri Gate, New



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Delhi/Shakurbasti, Delhi/Ambala/Lucknow to different sites and released material from different sites to the stores of SSE/C/TRD/ Chandigarh/ Jalandhar/Ajmeri Gate, New Delhi/Shakurbasti/ Jagadhari workshop, Delhi/ Ambala/ Lucknow as per instructions of Purchaser



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## NORTHERN RAILWAY

## PART-V

FORM- 1B  
SHEET-1

## SUMMARY OF PRICES

From: \_\_\_\_\_  
\_\_\_\_\_

To,

The President of India,  
Acting through the General Manager,  
or his successor,  
Office of the  
Dy. Chief Elect. Engineer/Const.  
Northern Railway, Moradabad

Dear Sir,

Sub: Tender for Traction over head equipment \_\_\_\_\_

I/We the undersigned hereby offer the summary of prices for the subject work as under: -

(ALL FIGURES IN RUPEES)

Sub-section	Supply Cost	Percentage above	Amount	Erection Cost	Percentage above	Amount	G. Total Supply + Erection (Rs.)	Remarks
1	2	3	4	5	6	7	8	9
<b>OHE</b>								
Schedule a- SCHEDULE-1- SECTION-1 (GENERAL)	15612.00	160.77%	40711.41	79552.00	155.23%	203040.57	243751.98	To be quoted in percentage above /below/At Par on G.Total (S.No.8)
Schedule b- SCHEDULE-1- SECTION-2 (CONCRETE)	25680.00	264.60%	93629.28	6792.00	268.27%	25012.90	118642.18	To be quoted in percentage above /below/At Par on G.Total (S.No.8)
Schedule c- SCHEDULE-1- SECTION-3 (FERROUS)	163700.50	192.23%	478381.97	25027.00	182.85%	70788.87	549170.84	To be quoted in percentage above /below/At Par on G.Total (S.No.8)



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Schedule d- SCHEDULE-1- SECTION-4 (NON- FERROUS)	25668.00	198.71%	76672.88	5664.00	184.03%	16087.46	92760.34	To be quoted in percentage above /below/At Par on G.Total (S.No.8)
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**FORM- 1B  
SHEET-2**

1	2	3	4	5	6	7	8	9
Schedule e- SCHEDULE-1- SECTION-5 (INSULATOR)	27269.80	157.19%	70135.20	0.00	0.00%	0.00	70135.20	To be quoted in percentage above /below/At Par on G.Total (S.No.8)
Schedule e- SCHEDULE-1- SECTION-6 NON- SCHEDULE ITEMS (ERECTION AND UNDER POWER BLOCK)							134453.00	To be quoted in percentage above /below/At Par on G.Total (S.No.8)
<b>G.Total (Schedule-1 to 6)</b>							<b>1208913.54</b>	

Notes:

- Figures rounded off to the nearest rupee.
- The above prices are inclusive of Excise Duty, Sales Tax, Octroi, Local levies, Sales tax, labour cess on work contract etc.
- The tenderer should quote single uniform percentage Above/At par/Below for all sections of SOR items & Non SOR. If the percentage quoted by the tenderer does not clearly indicate the rates are Above/ At par/Below through sign convention, the indicated rates will be considered to be above SOR/Non SOR.

Yours faithfully,

Place:

Date:

Seal of the Tenderer

Signature/s of the Tenderer

Witnessed by:

- Signature  
Name in Block Letters

- Signature  
Name in Block Letters

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Address.


Address



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SCHEDULE 1 FORM-5, Sheet-1									
SCHEDULE OF PRICES & TOTAL PRICES									
SECTION - 1 (GENERAL)									
This schedule shall be read in conjunction with its explanatory notes in Part-I Chapter- IV "A" for detailed description for various items included therein. The rates at which payments are to be made shall be arrived at by loading these rates uniformly for each item with escalation of estimate (% above SOR) and loading of percentage quoted by the tenderer over advertised value of the section.									
Item No.	Description	Unit	(All prices are in Rs.)						
			SOR Rate		Qty.		Total Prices		
			Materials	Erection	Materials	Erection	Materials	Erection	Total (M+E)
1	2	3	4	5	6	7	8	9	10
8(b) (i)	Supply without insulator and erection of material for termination of Single conductor of Over head equipment or terminating wire.	Each	2411	408	4	4	9644	1632	11276
11(a) (i)	Supply without Insulator and erection of cut-in(9Tonne) Insulator	Each	688	283	4	4	2752	1132	3884
<b>31</b>	<b>Modification to erected equipments :</b>								
31(a)	Transfer of equipment from one mast or support to another.	Each	804	1179	4	4	3216	4716	7932
31(f)	Splicing & extension of an anchored overhead equipment.	Each	0	1156	0	2	0	2312	2312
31(h)	Slewing and putting back of OHE in original shape	Span	0	937	0	32	0	29984	29984
32(a)	Extra on erection rates (Items of sub-section - I) for work under a power block @ 100%	As per Annexure-A					0	39776.00	39776.00
	<b>Total for section-1</b>						<b>15612.0</b>	<b>79552.0</b>	<b>95164.0</b>



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SCHEDULE 1 FORM-5, Sheet-2									
SCHEDULE OF PRICES & TOTAL PRICES									
SECTION 2 (CONCRETE)									
This schedule shall be read in conjunction with its explanatory notes in Part-I Chapter- IV "A" for detailed description for various items included therein. The rates at which payments are to be made shall be arrived at by loading these rates uniformly for each item with escalation of estimate (% above SOR) and loading of percentage quoted by the tenderer over advertised value of the section.									
Item No.	Description	Unit	(All prices are in Rs.)						
			SOR Rate		Qty.		Total Prices		
			Material	Erection	Material	Erection	Materials	Erection	Total (M+E)
1	2	3	4	5	6	7	8	9	10
2(b)	In other than hard soil and rock	Cum	2140	566	12	12	25680	6792	32472
<b>Total for section-2</b>							<b>25680.00</b>	<b>6792.00</b>	<b>32472.00</b>



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SCHEDULE 1 FORM-5, Sheet-3									
SCHEDULE OF PRICES & TOTAL PRICES									
SECTION 3 (FERROUS)									
This schedule shall be read in conjunction with its explanatory notes in Part-I Chapter- IV "A" for detailed description for various items included therein. The rates at which payments are to be made shall be arrived at by loading these rates uniformly for each item with escalation of estimate (% above SOR) and loading of percentage quoted by the tenderer over advertised value of the section.									
Item No.	Description	Unit	(All prices are in Rs.)						
			SOR Rate		Qty.		Total Prices		
			Material	Erection	Material	Erection	Materials	Erection	Total (M+E)
1	2	3	4	5	6	7	8	9	10
3(b)(ii)	Supply and erection of Structure steel(traction masts) fabricated and galvanised Type : B-Series Mast	MT	45423	1037	1	1	45423	1037	46460
3(b)(iii)	Supply & Erection of special fabricated and galvanised steel structures other than Portals & traction-Masts not covered under items 3(b)(i) & 3(b)(ii)	MT	47703	3546	0	0.50	0	1773	1773
3(c)	Supply only of fabricated steel other than masts	MT	66257	0	0.50	0	33128.5	0	33128.5
3(e)(i)	Supply and erection of a Guy Rod Assembly	Each	4086	473	2	2	8172	946	9118
3(i)	Supply and erection of 25KV Caution Boards including staff caution Board	Each	131	42	6	6	786	252	1038
4(a)(i)	Supply without insulator and erection of Single bracket assembly.	Each	5734	429	4	4	22936	1716	24652
16(a)(i)	Supply and erection of a structure bond.	Each	528	131	4	4	2112	524	2636
16(b)	Supply and erection of a longitudinal bond	Each	298	117	10	10	2980	1170	4150
16(c)	Supply & erection of a transverse and special bond.	Each	679	140	10	10	6790	1400	8190
17(a)	Supply & erection of a single earth electrode.	Each	1191	498	3	3	3573	1494	5067
17(c)	Supply and erection of earth bus	Metre	126	35	300	300	37800	10500	48300
32(b)	Extra on erection rates(Items of sub-section - III) for work under a power block @ 100%	As per Annexure-A					0	2810	2810
33(b)	Extra on erection rates for steel work manually under item 3(a)(i), 3(a)(ii), 3(b)(i), 3(b)(ii) & 3(b)(iii) @ 50%.	As per Annexure-C					0	1405.00	1405.00



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Total for section-3					163700.50	25027.00	188727.50
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SCHEDULE 1 FORM-5, Sheet-4									
SCHEDULE OF PRICES & TOTAL PRICES									
SECTION 4 (NON-FERROUS)									
This schedule shall be read in conjunction with its explanatory notes in Part-I Chapter- IV "A" for detailed description for various items included therein. The rates at which payments are to be made shall be arrived at by loading these rates uniformly for each item with escalation of estimate (% above SOR) and loading of percentage quoted by the tenderer over advertised value of the section.									
Item No.	Description	Unit	(All prices are in Rs.)						
			SOR Rate		Qty.		Total Prices		
			Materials	Erection	Material	Erection	Materials	Erection	Total (M+E)
1	2	3	4	5	6	7	8	9	10
15(a) (i)	Supply & erection of large copper jumpers	Each	2508	236	10	10	25080	2360	27440
15(a) (ii)	Supply & erection of small copper jumpers	Each	294	236	2	2	588	472	1060
32(c)	Extra on erection rates (Items of sub-section - IV) for work under a power block @ 100%	As per Annexure-A					0	2832.00	2832.00
<b>Total for section-4</b>							<b>25668.00</b>	<b>5664.00</b>	<b>31332.00</b>



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SCHEDULE 1 FORM-5, Sheet-5									
SCHEDULE OF PRICES & TOTAL PRICES									
SECTION 5 ( INSULATORS)									
This schedule shall be read in conjunction with its explanatory notes in Part-I Chapter- IV "A" for detailed description for various items included therein. The rates at which payments are to be made shall be arrived at by loading these rates uniformly for each item with escalation of estimate (% above SOR) and loading of percentage quoted by the tenderer over advertised value of the section.									
Item No.	Description	Unit	(All prices are in Rs.)						
			SOR Rate		Qty.		Total Prices		
			Materials	Erection	Materials	Erection	Materials	Erection	Total (M+E)
1	2	3	4	5	6	7	8	9	10
4(ax)	Supply of insulators for item 4(a)(i) & 4(a)(iii)								
4(ax)(i)	Stay Arm Porcelain (CD-1050mm)	Each	1554.72	0	4	0	6218.88	0.00	6218.88
4(ax)(iv)	Bracket Porcelain (CD-1050mm)	Each	1338.07	0	4	0	5352.28	0.00	5352.28
8(bx)	Supply of 9- Tonne insulators for item 8(b)(i),(ii),(iii), (iv),(vi),(vii), (viii)&(ix)								
8(bx)(i)	Porcelian (CD-1050mm)	Each	1962.33	0	4	0	7849.32	0.00	7849.32
11(ax)	Supply of 9- Tonne insulator for item 11(a)(i) & 11(a)(ii)								
11(ax)(i)	Porcelian (CD-1050mm)	Each	1962.33	0	4	0	7849.32	0.00	7849.32
	<b>Total of Section 5</b>						<b>27269.80</b>	<b>0.00</b>	<b>27269.80</b>



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Annexure - A					
Tender No.					
Qty. for work to be executed under Power Block					
Item No.		Unit	App. Qty	Rate	Amount
1	2	3	4	5	6
<b>SECTION -1 (GENERAL)</b>					
8(b)(i)	Supply without insulator and erection of material for termination of Single conductor of Over head equipment or terminating wire.	Each	4	408	1632
11(a)(i)	Supply without Insulator and erection of cut-in(9Tonne) Insulator	Each	4	283	1132
<b>31</b>	<b>Modification to erected equipments :</b>				
31(a)	Transfer of equipment from one mast or support to another.	Each	4	1179	4716
31(f)	Splicing & extension of an anchored overhead equipment.	Each	2.00	1156	2312
31(h)	Slewing and putting back of OHE in original shape	Span	32.00	937	29984
<b>TOTAL</b>					<b>39776.00</b>



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FORM-5  
SHEET-7

Annexure - A					
Tender No.					
Qty. for work to be executed under Power Block					
Item No.		Unit	App. Qty	Rate	Amount
1	2	3	4	5	6
<b>SECTION - 3 (FERROUS)</b>					
3(b)(ii)	Supply and erection of Structure steel(traction masts) fabricated and galvanised Type : B-Series Mast	MT	1	1037	1037
3(b)(iii)	Supply & Erection of special fabricated and galvanised steel structures other than Portals & traction- Masts not covered under items 3(b)(i) & 3(b)(ii)	MT	1	3546	1773
<b>TOTAL</b>					<b>2810</b>


FORM-5  
SHEET-8


Annexure - A					
Tender No.					
Qty. for work to be executed under Power Block					
Item No.		Unit	App. Qty	Rate	Amount
1	2	3	4	5	6
<b>SECTION - 4 (NON-FERROUS)</b>					
15(a)(i)	Supply & erection of large copper jumpers	Each	10	236	2360
15(a)(ii)	Supply & erection of small copper jumpers	Each	2	236	472
<b>TOTAL</b>					<b>2832.00</b>

FORM-5  
SHEET-9

Annexure - C					
Extra on erection rates for steel work manually					
Item No.		Unit	App. Qty	Rate	Amount
1	2	3	4	5	6
3(b)(ii)	Supply and erection of Structure steel(traction masts) fabricated and galvanised Type : B-Series Mast	MT	1	1037	1037
3(b)(iii)	Supply & Erection of special fabricated and galvanised steel structures other than Portals & traction- Masts not covered under items 3(b)(i) & 3(b)(ii)	MT	1	3546	1773
<b>TOTAL</b>					<b>2810.00</b>
50% of Total Amt.					<b>1405.00</b>

  
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**SCHEDULE - 1: SCHEDULE OF PRICES**  
**SECTION - 6**  
**NON-SCHEDULE ITEMS**

**FORM-5**  
**SHEET-11**

This schedule shall be read in conjunction with its explanatory notes in Part - I Chapter - IV for detailed description for various Items included therein:

**SCHEDULE-1 SECTION-6-NON-SCHEDULE ITEMS- (ERECTION AND UNDER POWER BLOCK)**

ITEM NO.	BRIEF DESCRIPTION OF ITEMS	Unit	Qty	Unit Rate	Total Amt.
NS-1a	Dismantling of Mast.	Tonne	1	5385.00	5385.00
NS-1b	Extra on erection under a power block @100% for item no. NS-1a.	Tonne	1	5385.00	5385.00
NS-2a	Dismantling of a Copper/ Aluminium jumper.	Each	6	417.00	2502.00
NS-2b	Extra on erection under a power block @100% for item no. NS-2a.	Each	6	417.00	2502.00
NS-3a	Shifting of OHE Termination (Fixed) location from one mast/support to another.	Each	1	3403.00	3403.00
NS-3b	Extra on erection under a power block @100% for item no. NS-3a.	Each	1	3403.00	3403.00
NS-4a	Shifting of OHE Termination (Regulated) from one mast/support to another.	Each	1	3636.00	3636.00
NS-4b	"Extra on erection under a power block @100% for item no. NS-4a.	Each	1	3636.00	3636.00
NS-5a	Adjustment on bracket assemblies for lowering/raising the height of contact and catenary wires where Encumbrance is changed.	Each	6	2510.00	15060.00
NS-5b	"Extra on erection under a power block @100% for item no. NS-4a.	Each	6	2510.00	15060.00
NS-6a	Adjustment on bracket assemblies for lowering/raising the height of contact and catenary wires where Encumbrance is not changed.	Each	12	2299.00	27588.00
NS-6b	"Extra on erection under a power block @100% for item no. NS-4a.	Each	12	2299.00	27588.00
NS-7	Loading, leading, transportation, unloading and stacking of steel structures & Conductors etc. from TRD stores to site and released material from site to the store	Tonne	5	3861.00	19305.00
				<b>Total</b>	<b>134453.00</b>

**NOTE:** FOR NON-SCHEDULE ITEMS, the Tenderer should quote single uniform percentage Above/At par/Below for Non-Schedule Items. If the percentage quoted by the tenderer does not clearly indicate the rates are Above/At par/Below through sign convention, the indicated rates will be considered to be above Non-Schedule items.

**END OF TENDER DOCUMENT**  
**(LAST PAGE)**



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