

EXPLANATORY NOTES OF SCHEDULE

Name of the work: Electrical TRD Works in connection with OHE modification work at NCBD Station against the Engg. Work "Provision of Direct reception at NCBD by providing crossover at MYGD end at NCBD"

GENERAL:

- a. Wherever an Item of works covers supply of materials and / or erection such Item shall include all bolts, nuts, washers, pins & split pins etc. to complete the Items of the works.
- b. Erection of any Item of equipments, whether supplied by the purchaser will include testing, commissioning and bringing the equipment into operation to the entire satisfaction of the purchaser.
- c. The basic quantity of components and materials required to make up the unit of work for the selected Items are indicated for guidance. In estimating the price for variation Items of work provision of loss and wastage in transit and during erection including cost of freight handling, taxes, duties, insurance if any etc. shall be quoted for the works mentioned in the schedule.
- d. All OHE/PSI components are to be supplied by the contractor as per latest specification & drawing of CORE or RDSO and from part-I sources of RDSO/CORE whether specifically mentioned or not, if any such Items are not covered in the approved sources then, the Sr.DEE/APDJ is authorized to approve the specific Items after complete satisfaction.
- e. All works shall be carried out as per latest/modified standard code of practice (I. E. Rules) & specifications and Drawings approved by the Railways.
- f. The materials which will be required for execution of the complete work are not in Schedule - A will be supplied by Railway. However, the cost of transportation and loading and unloading of materials from nearest depot/concerned depot to work site will be borne by the contractor.
- g. The erection or dismantling of different OHE equipments will be executed in the jurisdiction of SSE/TRD/IC/NCB as per the direction of concerned depot In-charge or his authorized representative.
- h. The rates in the Tender schedules are including GST. Tenderer is required to quote the rates inclusive of all taxes including GST for items of above Tender schedules.

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Details of Schedule:

Schedule: A

1. **Preparation of OHE design & drawing:** - The price shall cover for survey, preparation of OHE Lay Out Plan (LOP) and Structure Erection Drawing (SED) of the overhead equipment in detail. The price will include supply of verified & corrected as erected drawing in six sets, two of which will be of transparent reproducible tracing film (RTF) approved by the purchaser. The price shall also include supply of two digital copies of all the above drawings in "AUTOCAD" format in the form of DWG.
2. **Concrete for foundation / plinth including supply of sand, ballast & cement:** - The price shall include all works in all classes of normal, hard soil, rocky, concrete or, masonry/drains/walls and rock. The price shall also include the cost of cement.
 - i. The price shall be the same for any shape or size of concrete blocks. In calculating the individual volume of concrete, a fraction of a cubic meter beyond the third decimal shall be rounded off to the next nearest third decimal.
 - ii. The prices shall apply for concreting of all foundations for masts, gantries, portals, anchor blocks for guy rods, and fencing up rights.
 - iii. For purposes of computation of volume of concrete, the volume of steel work embedded in the foundation block and muff shall be ignored.
 - iv. Cost of all concrete will be paid under this item.
 - v. For purposes of computation of volume of concrete, the volume of concrete shall include the volume of sand and bitumen in sand cored foundation.
 - vi. For purposes if 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 column of portal, each head span masts, 2 or 3 track cantilever masts and special fabricated masts for which the volume of muff shall be taken as 0.08 cum. irrespective of the site and shape of muff on a flat basis.
 - vii. Price under shall also include the cost of diversion of masonry/earth drains where ever necessary for casting of foundations.
 - viii. Mixture for casting of foundation shall be M 10 and mixture for grouting shall be M 15 curing of foundation shall be done by contractor.
 - ix. No scroll will be supplied by the Railway; the contractor will use his scroll. The drawing of the scroll shall be submitted to this office for approval before commencement of work at site.
 - x. Necessary details like, type, implantation, Chainage shall be supplied by contractor.
3. **Supply of Structure Steel (Traction Mast) fabricated & galvanized of all Type: B-series mast:** The price shall cover the cost of Supply of traction masts. The price shall also include the loading, unloading & transportation of traction mast whatsoever required at site. Note: For the purpose of

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payment, the weights of individual traction mast / other special masts shall be determined for each type on the basis of the latest weight schedule as instructed by Rly. Bd./CORE/RDSO etc.

4. **Erection of Structure Steel (Traction Mast) fabricated & galvanized of all Type: B-series mast:** The price shall cover the cost of Erection of traction masts. The price shall also include the loading, unloading & transportation of traction mast whatsoever required at site. Note: For the purpose of payment, the weights of individual traction mast / other special masts shall be determined for each type on the basis of the latest weight schedule as instructed by Rly. Bd./CORE/RDSO etc.
5. **Supply of fabricated Steel works (SPS) other than Mast including MCC, Chair etc.:** The price shall cover cost of supply of galvanized steel fabricated small parts steel work consists of DAs, super masts, suspension brackets for feeders, anchor fittings & stiffener angles, multiple cantilever cross arms, chairs, adopters and all types of backing angles etc as per relevant RDSO drawings and specifications. All the steel work is to be fully galvanized after drilling and fabrication as per RDSO Specification No. – ETI/OHE/13(4/84) with latest amendments.
6. **Erection of fabricated & Galvanized Steel parts steel (SPS):** The price shall also cover the cost of manual erection of small parts steel work on individual traction masts and main masts as per site requirements. Minimum average weight of zinc coating on all steel structures and small part steel shall be 1000 gm/sq m.
7. **Supply of fabricated & galvanized structures (O, N & R type Portals) with all necessary components other than masts:** The price shall cover supply of fabricated and galvanized traction mast/TTC/Portal. The material to be procured from CORE/RDSO approved suppliers conforming to latest CORE/RDSO approved drawings and specifications. The type of mast will be as per approved design and the supply will be made on written order of Sr.DEE/APDJ or his authorized representative.
8. **Erection of fabricated & galvanized structures (O, N & R type Portals) with all necessary components other than masts.:** The price shall cover Erection of fabricated and galvanized traction mast/TTC/Portal. The price shall also include the loading, unloading & transportation of traction mast/TTC/Portal whatsoever required at site.
9. **Supply without insulator of Single Bracket Assembly:** The price shall cover cost of supply of any bracket assembly suitable for polluted zone excluding insulators suitable for regulated type OHE on a traction mast or support on drop arm, and shall include those on high level platforms/Sheds, in the vicinity of turnouts, over bridges or overlaps and at locations with reduced encumbrance or terminating wires. The price shall cover on a flat rate basis. The price shall include the cost of supply of all components including galvanized steel tubes but excluding copper wires and small part steel work complete with bolts and nuts etc., if any. However, this does not include the anti-creep arrangement at masts/structures. Bracket components like catenary suspension bracket, mast fitting for hook insulator, mast bracket fitting assembly, register arm hook, tubular stay sleeve, register arm eye piece and drop bracket assembly should be of forged type as per latest RDSO/CORE drawing/specification.
10. **Erection of Single Bkt. Assembly completes with insulators:** The price shall cover cost of erection of any bracket assembly suitable for polluted zone including insulators suitable for regulated type OHE on a traction mast or support on drop arm, and shall include those on high level platforms/Sheds, in the vicinity of turnouts, over bridges or overlaps and at locations with reduced encumbrance or terminating wires. After adjustment of OHE and SED checking, cost of cantilever erection will be paid.

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11. **Supply of Stay Insulator:** The price shall cover supply of porcelain type Stay insulator under this item. All materials supplied shall be strictly as per specification mentioned for respective item or Governing RDSO/CORE specification for the item. All items are to be procured from CORE/ RDSO approved manufacturers only and the contractor shall produce documentary evidence for the same. The contractor shall intimate in advance for readiness of material for inspection. The minimum Creep-age Distance of Stay insulators shall be 1050 mm.
12. **Supply of Bracket Insulator:** The price shall cover supply of porcelain type Bracket insulator under this item. All materials supplied shall be strictly as per specification mentioned for respective item or Governing RDSO/CORE specification for the item. All items are to be procured from CORE/RDSO approved manufacturers only and the contractor shall produce documentary evidence for the same. The contractor shall intimate in advance for readiness of material for inspection. The minimum Creep-age Distance of Bracket insulators shall be 1050 mm.
13. **Supply and erection of 9-Tonne Insulator, Porcelain (CD-1050 mm):** The price shall cover supply of Porcelain 9-Tonne Insulator (1050 mm CD) as per RDSO's Specification No. TI/SPC/OHE/INS/0070 (04/2007) with A&C Slip Nos. 1 & 2 or latest if any. Porcelain 9-Tonne Insulator (1050 mm CD) shall be procured from RDSO approved sources only and the contractor should submit documentary evidence for the same.
The price shall cover erection of Porcelain 9-Tonne Insulator (1050 mm CD) as per RDSO's Specification No. TI/SPC/OHE/INS/0070 (04/2007) with A&C Slip Nos. 1 & 2 or latest if any.
14. **Supply without insulator 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 dropper wires for special droppers for supporting the equipment and all terminal fittings for conductors and the section insulator assembly including 9 tonne Insulator (RI No.6020) (Cost of insulator will be paid in Schedule-1, Section-5) on the catenary and Sectioning insulator (RI No.6110).
15. **Erection of a Section insulator assembly:** The price shall be exclusive of Contact and Catenary wires, required if any. The price shall cover erection and adjustment of all components including section insulator assembly, 9 ton insulator on the catenary, Sectioning Insulator, Contact wire and droppers. Required quantity of Contact wire for the work shall be supplied by the purchaser.
16. **Supply of regulating equipment (3 pulley type) with counter weight assembly for conventional/composite OHE:** The price shall cover supply of Regulating equipment, 3 pulley modified type with counter weight [3:1 ratio] as per RDSO specification No. TI/SPC/OHE/ATD/0060 [8/06] with A & C Slip No. 1 to 2, but excluding small parts of steel works if any, the SPS required will be paid under item-1. All the components shall be as per latest specification & drawing of RDSO/CORE & procured from RDSO/CORE approved sources.
17. **Erection of regulating equipment (3 pulley type) with counter weight assembly for conventional/composite OHE:** The price shall cover erection of counter weight assembly including 9-ton adjuster with double strap assembly and normal/anti-theft guide tube assembly, regulating equipment (3-pulley modified type), stainless steel wire rope required for the regulating equipment (3-pulley modified type) and small parts of steel works if any. The price also covers adjustment of the entire regulating equipment.
18. **Supply of Guy rod assembly:** The price shall cover supply of guy rod assembly of various lengths for traction masts, feeder line towers or supports complete with mast guy rod firings, guy rod with adjustments and part(s) be grouted in the anchor block as per RDSO/CORE specification & drawing of RDSO/CORE procured from RDSO/CORE sources.

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19. **Erection of Guy rod assembly:** The price shall cover erection of guy rod assembly of various lengths for traction masts, feeder line towers or supports complete with mast guy rod firings, guy rod with adjustments and part/s be grouted in the anchor block as per RDSO/CORE specification & drawing.

The price shall not include the cost of 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 and 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 erection of guy rod, if any, which will be paid for under this item.

20. **Supply of 107 sq. mm HDGC Contact Wire:** The price shall cover Supply of Joint less grooved contact wire 107 sq.mm made out of continuous cast copper wire RDSO as per Spec. ETI/OHE/76(6/97) with A & C Slip No. 1,3,4,5,6 or latest.
21. **Supply of 65 sq. mm cadmium copper catenary wire:** The price shall cover supply of uninsulated cadmium copper catenary wire 65 sq.mm 19/2.10mm), confirming to RDSO Specification No. - ETI/OHE/50/(6/1997) WITH A&C Slip No. 1&5 or latest.
22. **Supply of a copper jumper (5 mm dia dropper wire) (SM547) pg 185:** The price shall cover supply of 5 mm dia Round Copper Dropper Wire (Small Dropper Wire) as per IS Specification No. IS : 282 : 1982. Small Dropper Wire shall be procured from RDSO approved sources only and the contractor should submit documentary evidence for the same.
23. **Supply of span wire:** The price shall cover Supply of large span wire (130 sq.mm) (37/2.10mm) Cadmium copper as per RDSO Spec. No.ETI/OHE/50/6/97 Rev-1 or latest.
24. **Erection of span wire:** The price shall cover erection of large span wire (130 sq.mm) (37/2.10mm) Cadmium copper as per RDSO Spec. No.ETI/OHE/50/6/97 Rev-1 or latest.
25. **Supply of Contact wire Splices (toothed type), RI No. 1081-1:** The price shall cover supply of Contact splices from RDSO/CORE approved source as per latest specification and drawing of CORE/RDSO.
26. **Erection of Contact Splices:** The price shall cover erection of Contact splices from RDSO/CORE approved source as per latest specification and drawing of CORE/RDSO.
27. **Supply of Catenary Splices (65), RI No. 1091, 1092, 1093 & 1094:** The price shall include supply of Catenary Splices as per the RDSO Drawing No. ETI/OHE/P/1090 and RDSO's Specification No. TI/SPC/OHE/FITTINGS/0130 with A & C Slip No. 1 with Railway Identification 1091, 1092, 1093 and 1094 or latest with all other accessory parts required for splicing of catenary wire.
28. **Erection of Catenary Splices:** The price shall include erection of Catenary Splices as per the RDSO Drawing No. ETI/OHE/P/1090 and RDSO's Specification No. TI/SPC/OHE/FITTINGS/0130 with A & C Slip No. 1 with Railway Identification 1091, 1092, 1093 and 1094 or latest with all other accessory parts required for splicing of catenary wire.
29. **Supply of Overhead equipment's only:** The price shall cover supply of all OHE equipments components including dropper clips, parallel clamps for jumpering and splices (where their use is approved), but excluding contact wire, catenary wire, dropper wire, jumper wire and terminating wire/small parts steel work complete with nuts and bolts etc, for attachment of number plate to mast / structure, if any.
30. **Erection of Overhead equipment's only:** The price shall cover erection of all OHE equipment's components including dropper clips, parallel clamps for jumpering and splices (where their use is approved), but excluding contact wire, catenary wire, dropper wire, jumper wire and terminating wire/small parts steel work complete with nuts and bolts etc, for attachment of number plate to mast / structure, if any.

The price shall also cover erection of all components and wires and conductors including contact wire, catenary wire, droppers, jumpers and terminating wires, if any, but excluding small part steel work, if any.

The price shall also include the checking of OHE for final adjustment & inspection of OHE, the cost of painting the setting distance of mast/ structure, contact height, rail level, location of emergency sockets on mast / structure. No additional payment will be made for manual stringing of conductor viz catenary, contact wire etc. Only for final adjustment and inspection tower wagon will be provided by Railways.

The OHE is generally consists of the following items: -			
RI. No.	Description of item	Qty.	As per site requirement.
1030-2	Contact wire parallel clamp.	8/TKM	
1040-2	Contact wire parallel clamp.	36/TKM	
1180	Contact wire dropper clip.	180/TKM	
1192	Catenary wire dropper clip complete with bolts, nuts etc.	180/TKM	
	Contact wire ending clamp	02 Nos.	
1120	Catenary ending clamp.	02 Nos.	
1140	Large span wire clamp.	01 No.	
5020-1/2	Adjustor	01 No.	
5030	Anchor double strap assembly	02 Nos.	
5191/5192	Compensating plate /equalizing plate	01 No.	

31. **Supply of Retro reflective number plate complete as per RDSO's Spec. ETI/OHE/33a(12/97) Rev-6 or latest:** The price shall cover Supply of **Retro reflective** including SPS, nut, bolt etc., whichever is required for fixing the number plate. The work will be executed as per instructions of the railway's representative.
32. **Erection of Retro reflective number plate complete as per RDSO's Spec. ETI/OHE/33a(12/97) Rev-6 or latest :** The price shall cover erection of **Retro reflective** including SPS, nut, bolt etc., whichever is required for fixing the number plate. The work will be executed as per instructions of the railway's representative.
33. **Supply of Dead section caution board (power block working limit) (inclusive of Erection charges):** The price shall cover Supply & Erection of **Retro reflective type Power block working limit board** including SPS, nut, bolt etc., whichever is required for fixing the number plate. The work will be executed as per instructions of the railway's representative.
34. **Supply of Dead section caution board (Danger)(inclusive of Erection charges):** The price shall cover Supply & Erection of retro reflective type danger board for 25 KV including SPS, nut, bolt etc., whichever is required for fixing the number plate. The work will be executed as per instructions of the railway's representative.
35. **Supply & Erection of a Galvanized Steel stranded wire structure bond:** The price shall cover supply of all materials including **Galvanized 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 with latest mod.

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36. **Erection of a Galvanized Steel stranded wire structure bond:** 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 tape for structure bond under track circuited rail. This would also cover connection or earthing terminals of equipment like LT supply Transformers with structure and then to rails as per relevant drawings.
37. **Supply of longitudinal bonds:** The price shall cover the supply of longitudinal bonds mild steel flat (40 x 6 mm), fasteners etc. required to provide longitudinal bond connecting 2 rails at the rail joint at the locations to be specified by the purchaser.
38. **Erection of longitudinal bonds:** The price shall cover the erection of longitudinal bonds mild steel flat (40 x 6 mm), fasteners etc. required to provide longitudinal bond connecting 2 rails at the rail joint at the locations to be specified by the purchaser. Price shall cover erection of different types of bonds with two coats of red oxide paint and bitumen paint. The price shall include shaping and drilling of the bond & rail and erection of all materials including the bonds.
39. **Supply of Transverse/Cross /Special bonds:** Price shall cover supply of Transverse / Cross / Special bonds mild steel flat (40 x 6 mm), fasteners etc. required to provide a structure bond on platform or other than platform, cross bond/longitudinal bond/transverse or special bond connecting a traction mast or structure or between two rails or earth electrode including all fasteners at both ends. The price shall include shaping and drilling of the bond complete with fasteners duly manufactured in accordance to RDSO's approved drawings.
40. **Erection of Transverse/Cross /Special bonds:** Price shall cover erection of Transverse / Cross / Special bonds mild steel flat (40 x 6 mm), fasteners etc. required to provide a structure bond on platform or other than platform, cross bond/longitudinal bond/transverse or special bond connecting a traction mast or structure or between two rails or earth electrode including all fasteners at both ends. The price shall include shaping and drilling of the bond complete with fasteners duly manufactured in accordance to RDSO's approved drawings.
41. **Supply and fitment of PVC Sleeve for bond:** Price shall cover supply and fitment of PVC Sleeve for bond.
42. **Adjustment of OHE and Tower Wagon Checking:** The price under this item shall cover per TKM length adjustment and tower wagon checking of the OHE wires. The price will include checking the tightness of cantilever fittings, dropper clips, jumper connections, if any. The price will include adjustment of height and stagger of contact wire, if required. The price will cover adjustment of X & Y values of ATDs as per Tension-Temperature Chart, if required. The price will also cover final checking of the OHE by tower wagon. The purchaser will provide a tower wagon **free of cost** for final adjustment and tower wagon checking of OHE. Railway will arrange for power & traffic block. The contractor should take all safety steps, so that there is no untoward incident at site.
43. **Supply of single earth electrode:** The price shall cover supply of earth electrode conforming to RDSO's drg. no. ETI/OHE/P/7020, mod3, lugs and MS flat of minimum size (40 mm x 6mm for OHE and 50 mm x 6mm for Switching station) of required length.
44. **Erection of single earth electrode.** The price shall cover erection of earth electrode conforming to RDSO's drg. no. ETI/OHE/P/7020, mod3, lugs and MS flat of minimum size (40 mm x 6mm for OHE and 50 mm x 6mm for Switching station) of required length. The price shall cover erection of earth electrode by driving or otherwise complete with construction of concrete box & cover, earthing the structure/equipment with MS Flat conforming the code for bonding and earthing for 25 KV A.C. 50 Hz. Single phase traction System "conforming to RDSO's code no. ETI/OHE/71/ (11/90) A&C No. 2(3/93). The price shall cover filling of charcoal & salt in earth pit & supply and erection of all additional materials required for embedding the earth pipe as per RDSO specification. Testing of

Earth Resistance Value and painting of earth resistance values on the earth pit box by Black Enamel Paint over Enamel Yellow base Paint. The top cover should have a proper lifting handle.

45. **Supply of 25kV Post Insulator:** The price shall cover only supply of 25 kV Solid Core Insulators (Post Insulators) for execution of work covered. Erection cost of insulators is inclusive.
46. **Supply of 18 mm solid copper busbar with components:** The price shall cover supply of solid copper busbar 18mm.
47. **Erection of 18 mm solid copper busbar with components:** The price shall cover erection of solid copper busbar 18mm including bending and shaping.
48. **Supply of copper bus-bar connectors: Bus terminal (RI-6310):** The price shall cover supply 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.
49. **Erection of copper bus-bar connectors: Bus terminal (RI-6310):** The price shall cover 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.
50. **Supply of solid copper bus bar connector: Bus splice (RI-6320):** The price shall cover supply 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.
51. **Erection of solid copper bus bar connector: Bus splice (RI-6320):** The price shall cover 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.
52. **Supply of 160 sq. mm large jumper wire:** The price shall cover the cost of Supply 160 sq. mm large jumper wire.
53. **Dismantling of Overhead equipment's:** 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).
54. **Dismantling mast/structure/upright by cutting (If required):** The price shall cover cutting of Traction Mast/leg of TTC uprights, portal upright including all accessories and hand over to nearest OHE depot through challan as advised by Rly Engineer at site. The price shall also cover shifting, loading, transportation & unloading of all cut traction mast/ leg of TTC uprights, portal upright etc. to nearest OHE Depots. The dismantled materials shall be handed over to the concerned depot with proper challan by the contractor.
55. **Dismantling of cantilever assembly:** Price shall cover dismantling of cantilevers (with insulators and SPS etc.) holding existing OHE and adjustment if any required to be dismantled to suit alignment of laid OHE. The dismantled materials shall be handed over to the concerned depot with proper challan by the contractor.
56. **Dismantling of Regulating Equipment's:** Price shall cover dismantling of 3 pulley type (3:1) ratio complete with all accessories including counter weight assembly and SS wire rope for conventional/tramway OHE. The dismantled materials shall be handed over to the concerned depot with proper challan by the contractor.
57. **Dismantling of Guy Rod:** The price shall cover dismantling of guide tube assembly wherever required. The dismantled materials shall be handed over to the concerned depot with proper challan by the contractor.
58. **Transportation of materials from depot to work site and work site to depot:** Price shall cover transportation of all railway supplied materials from consignee's depot to work site including loading and unloading at different work sites. The transportation of released materials from the site to depot by contractor and handed over through challan to concerned depot incharge.

- 59. Erection: installation, testing and commissioning of 25 KV/240 V, Auxiliary Supply Transformer (25 KVA capacity):** The price shall cover erection and connecting up a 25 kV/240V, 10 kVA /25 kVA LT Supply Transformer (oil type) complete, with all fittings and accessories including terminal connectors. The price shall include mounting of the transformer on its supporting structure and supply and erection of an enameled number plate. The price shall also cover oil filtration, testing and commissioning of the transformer. The Contractor shall make his own arrangement for oil filtration plant as well as power supply for the same. 25kV/240V Auxiliary Supply Transformer (10/ 25 kVA capacity) Oil type shall conform to RDSO specification no. ETI/PSI/15 with A&C slip No. 1 (12/24) or latest amendments.
- 60. Erection of Anti climbing device for L.T. supply transformer station:** The price shall cover 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.
- 61. Providing LT junction box for AT price shall include supply and erection of LV termination box assembly complete:** The price shall cover supply and erection 240 V, LV terminal box on AT mast (T-150) suitable for termination of 25 sq. mm XLPE cable as per latest RDSO drawing. The material used for LV box shall be of good quality and of reputed make/Brand.
- 62. Supply without insulator of 25 kV D.O fuse switch assembly:** The price shall cover supply 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.
- 63. Erection without insulator of 25 kV D.O fuse switch assembly:** The price shall cover 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.
- 64. Supply of 50x6 Sq.mm M.S Flat earthing lead:** The price shall cover supply as per meter length of 50x6 mm mild steel flat painted all around with two coats of painting to colour grass green shade-218 of IS:5 passing through cable trench or exposed above ground level. The price shall also cover the connections of the steel flats to the main earth ring and to the steel structures and metallic frame work/terminals of various outdoor equipments as required.
- 65. Erection of 50x6 Sq.mm M.S Flat earthing lead:** The price shall cover erection as per meter length of 50x6 mm mild steel flat painted all around with two coats of painting to colour grass green shade-218 of IS:5 passing through cable trench or exposed above ground level. The price shall also cover the connections of the steel flats to the main earth ring and to the steel structures and metallic frame work/terminals of various outdoor equipments as required.
- 66. Supply and erection of Split type arcing horn for AT:** The price shall cover supply and erection of split type arcing horn for AT.
- 67. Supply of Copper strips for equipment earthing:** The price shall cover supply 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.
- 68. Erection of Copper strips for equipment earthing:** The price shall cover 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.

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69. **Digging of cable trench for single cable for 2 core 150 sq.mm armoured cable:** The price shall cover of Digging of cable trench for single cable for 2 core 150 sq.mm armoured cable. This work is done in presence of Railway representative.
70. **Supply of 2 core 150 sq.mm LT UG Aluminum armoured cable XLPE having heat resisting insulation (98):** The price shall cover supply per meter length of an 1100V grade 150 sq.mm aluminum conductor 2 Core PVC insulated and armoured cable from each LT supply transformer to the LT A.C. distribution boards.
71. **Erection of 2 core 150 sq.mm LT UG Aluminum armoured cable XLPE having heat resisting insulation (98):** The price shall cover erection per meter length of an 1100V grade 150 sq.mm aluminum conductor 2 Core PVC insulated and armoured cable from each LT supply transformer to the LT A.C. distribution boards.
72. **Providing of L.T cable marker:** The price shall cover of Providing of L.T cable marker (cast iron cable) as per Technical Specification as per approved drawing.
73. **Providing GI pipe 100 mm diameters as per Technical Specification:** The price shall cover supply of 100 mm dia (OD) light ("A") class GI pipe & to be laid underground in excavated trench or to be provided on wall or along the mast/pole with proper clamping arrangement for cable laying. For cable entry inside changeover rooms' compatible bend shall be used.
74. **Preparation of design and drawing for AT:** The price shall cover preparation of all Drawings and designs required to be finalized by the contractor with the approval of Sr.DEE/TRD. Price shall also cover for supply of soft copies of approved cable route plan.
75. **Supply of 8 SWG GI wire for Earthing:** The price shall cover supply of 8 SWG GI wire per meter, used for earthing at remote control cubicles and fencing panels.
76. **Erection of 8 SWG GI wire for Earthing:** The price shall cover erection of 8 SWG GI wire per meter, used for earthing at remote control cubicles and fencing panels.
77. **Machine boring is to be done where necessary with horizontal boring of hole a depth of 2 mtr below GL by HDD machine. The entire work is to be executed as per direction of Railway Engineer:** The price shall cover Machine boring is to be done where necessary with horizontal boring of hole a depth of 2 mtr below GL by HDD machine. The entire work is to be executed as per direction of Railway Engineer.
78. **Supply, laying, commissioning & testing of CI Pipe 100 mm dia Class LA type (IS 1536-2001) to be laid partly along the pole and partly through ground under railway track/road in cable trench for protection of cable with suitable fixing arrangement by MS clamp, nut, bolt, washer etc.as per instruction of Engineer incharge at site:** The price shall cover Supply, laying, commissioning & testing of CI Pipe 100 mm dia Class LA type (IS 1536-2001) to be laid partly along the pole and partly through ground under railway track/road in cable trench for protection of cable with suitable fixing arrangement by MS clamp, nut, bolt, washer etc.as per instruction of Engineer incharge at site.
79. **Dismantling of existing AT with all associated equipment, panel etc:** The price shall cover Dismantling of existing AT with all associated equipment, panel etc. The dismantled materials shall be handed over to the concerned depot with proper challan by the contractor.

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Schedule - B: Extra Erection Charges under Power Block on Schedule-A

- **Extra erection charges 100% under power block in mentioned in Schedule Items (SN from 1 to 14):**
The price under this item cover extra charges over and above the erection rates of such items for erection of equipment in the vicinity of energized overhead equipment and feeders or erection of equipment with joints equipment already energized or an 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 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. The extra erection rate under this item will not be payable, if power block is given for a total duration of 4 hours or more in a day whether continuously or in different spells. Where the price under this item is applicable, the contractor shall finalize the quantities of various items of work to be done under a power block, jointly with the Railway engineer prior to taking the work in hand.

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The purpose of this study was to determine the effect of the use of the following procedure on the results of the study. The procedure was as follows: The subjects were divided into two groups. The first group was the control group and the second group was the experimental group. The subjects in the control group were given the standard procedure and the subjects in the experimental group were given the modified procedure. The results of the study were as follows: The subjects in the control group had a mean score of 75 and the subjects in the experimental group had a mean score of 85. The difference between the two groups was significant at the 5% level.

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