

**Form: PS 2**

**Letter of Price Bid**

Date: .....

Invitation for Bid No.: .....

To: .....

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8;
- (b) We offer to execute the Work in conformity with the Bidding Documents;
- (c) The total price of our Bid is INR .....
- (d) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and
- (e) We have not made any deviations from the requirement of the bidding document and we have also not made any tampering or changes in the bidding documents on which the bid is being submitted and if any tampering or changes are detected at any stage, we understand the bid will invite summary rejection and forfeiture of bid security/the contract will be liable to be terminated along with forfeiture of performance security, even if LOA has been issued.
- (f) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

Name .....

In the capacity of .....

**Bid No:** HORC/HRIDC/Patli/S&T-01/2023

Signed .....

Duly authorized to sign the Bid for and on behalf of .....

Date .....

## Bill of Quantities

### 1. Preamble

- 1.1. The Bills of Quantities (BOQ) shall be read in conjunction with the Instructions to Bidders, the General Conditions of Contract, the Special Conditions of Contract, General Specifications, Particular Specifications, the Drawings and the Addenda/Corrigenda (if any).
- 1.2. The quantities given in the Bills of Quantities are estimated and provisional and are given to provide a common basis for Bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
- 1.3. The rates quoted in the priced Bill of Quantities are for complete and finished items of the work in all respects. The rates and prices shall, except in so far as it is otherwise provided under the Contract, shall include all design, manufacture, supply, installation, testing commissioning, all necessary survey work, plants, tools, machinery, labour, compliance of labour laws, supervision, materials, transportation, handling, loading & unloading, storage, sampling, testing, fuel, oil, consumables, electric power, water, all leads & lifts, dewatering, all temporary works including temporary accesses, staging, form works and false works, stacking, provision and maintenance of all temporary works area, construction of temporary store and buildings, fencing, barricading, lighting, drainage arrangements, erection & maintenance of inspection facilities above and below ground such as brick, concrete and steel etc.), restatement, remedy of any defects during the Defects Notification Period, safety measures for workmen and road users, preparation of design and drawings pertaining to the Works, & traffic diversion works, mobilization and demobilization, establishment and overhead charges, labor camps, insurance cost for labor and works, contractor's profit, all taxes including GST, insurance, royalties, duties, cess, octroi, other levies and other charges together with all general risks, liabilities and obligations set out or implied in the Contract.
- 1.4. The cost of all the items as detailed in General Specifications and Particular Specifications shall be deemed to have been included in the rates and prices in the priced Bill of Quantities unless otherwise specified in the Contract.
- 1.5. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bills of Quantities. References to the relevant sections of the Contract Documents shall be made before entering rates and prices in the priced Bill of Quantities.

- 1.6. The Bidders shall quote percentage rate (%) Excess(+)/Less (-) against total value of each Bill number.
- 1.7. The description of items in the BOQ are not exhaustive, and hence the Contractor shall be required to execute all necessary works required for completion of the concerned item of the BOQ in accordance with the Contract.

## **2. Deleted**

## **3. Measurement and Payment**

- a. As already stated under 1.1, the prices and rates quoted shall be comprehensive and must include cost for complying in all respects with the Bill of Quantities, Instruction to Bidders, the General Conditions, the Special Conditions, Specifications and Drawings and for all matters and things necessary for the proper construction, completion, and making good of any defect in of the whole of the Works.
- b. No claims for additional payment will be allowed for any error or misunderstanding by the Contractor of the work involved.
- c. The measurement shall be made as per Bill of Quantities, General Specifications, Particular Specifications, the Drawings and other relevant provisions of the Contract.

## **2. Procedures for Payment**

- a. The Employer shall make interim payments to the Contractor in accordance with the provisions of Sub-Clause 14.6 [Issue of Interim Payment Certificates] of the General Conditions, as certified by the Engineer on the basis of the progress achieved for the items of works/stages of the works.
- b. The Contractor shall base his claim for interim payment in accordance with Sub-Clause 14.3 [Application for Interim Payment Certificates] of the General Conditions for various items of work on the basis of actual progress of work executed till the end of the month for which the payment is claimed in relation to the Contractor's total executed quantity, supported with documents and updated programme in accordance with the Works Requirements.
- c. The Employer may carry out necessary test checks, either directly or through an independent agency, of the Works done by the Contractor for which payment has been accepted and certified by the Engineer. The payment shall depend upon the outcome of such test checks.

- d. Format for the Contractor's application for payment shall be agreed between the Engineer and the Contractor.
- e. All necessary supplementary details to support progress claims, including all certified Request for Inspection in hard bound copy, shall be included with application for payment. Sketches, drawings, approvals, calculations, test reports etc. shall accompany an application for payment to be substantiated by the Contractor, certified by the Engineer and submitted to the Employer.
- f. Even if no work is executed during the month, or the Contractor does not choose to issue an application for payment, a 'NIL' application shall be submitted.
- g. The Employer may deploy external agencies, other than the Engineer, to cross check the work done by the Contractor. If at a later stage it is discovered that excess payment has been released to the Contractor or the work is found to be defective, suitable recoveries would be affected from the first available bill of the Contractor.
- h. The Engineer is not obliged to issue an Interim Payment Certificate until such breakdown structure of payment schedule has been submitted and accepted by the Engineer.

### **3. Methodology for Claiming Payment**

- a. The Contractor shall prepare his monthly application for payment in the agreed format in six hard copies and one soft copy. This shall be accompanied by supplementary details in accordance with Sub-Clause 14.3 [Application for Interim Payment Certificates] of the General Conditions. All hard copies shall bear the original signatures of the Contractor's Representative and be submitted to the Engineer.
- b. If these are found in order, in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates] of the General Conditions, then the Engineer shall forward two certified copies of the application along with certified supplementary details to the Employer, with his recommendation for payment; otherwise, all documents shall be returned to the Contractor for rectification and resubmission.

### **4. Work Items**

The Bill of Quantities usually contains the following part Bills, which have been grouped according to the nature or timing of the work:

Signalling and Telecommunication - Supply of Material and execution of the work

### **5. Payment Terms**

#### **a. Supply of equipment & material:**

- i) 70% of payment for items shall be made to the Contractor on receipt of:
  - a) Bill/ Tax invoice

- b) Receipt of material at site/ Employer's project depot managed by the Contractor
  - c) Insurance of material for the project execution period
  - d) Inspection certificate from the competent inspecting authority
  - e) Delivery Challan
  - f) Certificate from the Contractor & OEM that material being supplied is new with latest version and complies with the Specification
  - g) Commitment from OEM for support to the Contractor/ HORCL/ Railway for the product being supplied and minimum for 7 years.
- ii) 20% payment shall be made on installation & commissioning of equipment/ material at site
  - iii) 10% payment shall be made on commissioning of complete work & issue of Taking Over Certificate.

**b. For : Installation & Commissioning:**

- i) 90% payment shall be made on execution/ installation & commissioning of item at site.
- ii) 10% of payment shall be made on commissioning of complete work & issue of Taking Over Certificate.

# Bill of Quantities

## Patli cable shifting Bill of Quantity

SI No.	Description of Item	Unit	Estimated Rate (INR)	Quantity	Total Value (in INR)
<b>Schedule 'A' Supply of material</b>					
1	Supply of Armoured Optical Fiber Cable (OFC) (24 Fiber) Mono Mode as per Spec. No. IRS-TC – 55/2006 (rev.1) Amdt1.1 & RDSO/SPN/TC/110/2020.	Kms.	₹ 1,06,925	2	₹ 2,13,850
2	Supply of permanently lubricated HDPE duct, 40 mm outer dia, as per RDSO spec. No. RDSO/SPN/TC/45/2013 Rev.2 Amndt.2 or latest, along with all accessories like end caps, collars, bends, couplers etc.	Kms.	₹ 82,731	2	₹ 1,65,462
3	Supply of basic material to construct unit maintenance free earth as per RDSO Specs. No. RDSO/SPN/197 Ver. 1.0 or latest to achieve a resistance less than 1 ohm. It consist of following: (a) Copper bonded steel electrode of minimum 3.0 meter long, minimum 17.0 mm dia with copper bonding thickness of minimum 250 microns and UL listed and marked = 1 No. (b) Earth enhancement material supplied in sealed bags of minimum 10 kg = 3 Nos. (c) Copper strip of 150x25x6 mm, to terminate earth rod = 1 No. (d) Copper strip of 300x25x6 mm (MEEB) = 1 No. (e) Copper strip of 150x25x6mm (SEEB) = 1 No. (ii) Supply of 35 sq. mm multi strand single core PVC insulated copper cable as per IS: 694 for connecting main earth electrode to MEEB in the equipment room in duplicate.(minimum 10 meter.) (iii) Supply of 16 sq. mm multi strand single core PVC insulated copper cable as per IS: 694 for connecting MEEB to SEEB and SPD to MEEB (minimum 10 meter. ) (iv) Supply of 10 sq. mm multi strand single core PVC insulated copper cable as per IS: 694 for connecting various equipments to SEEB (v) Supply of copper lug sleeve for 3/16 cable	Set	₹ 17,941	2	₹ 35,882

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SI No.	Description of Item	Unit	Estimated Rate (INR)	Quantity	Total Value (in INR)
<b>Schedule 'A' Supply of material</b>					
4	Supply of underground railway jelly filled 6 Quad cable 0.9 mm dia copper conductor as per RDSO Spec IRS TC 30/2005 (Ver-I) (Amnd 1 to 5) or latest	Kms.	₹ 3,91,842	3	₹ 11,75,526
5	supply of 12 core x 1.5 Sqmm (copper conductor) PVC Insulated armoured unscreened underground railway signalling cable as per RDSO spec. IRS:s-63/2014 (Rev. 4.0) or Latest	Kms.	₹ 2,53,137	38	₹ 96,19,206
6	supply of 6 core x 1.5 Sqmm (copper conductor) PVC Insulated armoured unscreened underground railway signalling cable as per RDSO spec. IRS:s-63/2014 (Rev. 4.0) or Latest	Kms.	₹ 1,62,510	8	₹ 13,00,080
7	Supply of 24 fiber optical fiber cable straight joint enclosure (SJC) complete with all accessories along with enclosures with heat shrinkable splice protection sleeve as per RDSO spec. RDSO/SPN/TC68/2014 Revision 1.0, Amndt. 1.0 or latest. Splice losses in no case should be more than 0.1 dB.	Nos.	₹ 6,195	2	₹ 12,391
8	Supply of Q-Series Track Relay (QTA2 Type), AC immunized, 9 Ohms, 2F/1B along with plug board (base plate), connectors, retaining clips etc and conforming to BRS:939A & 966(Appendix F2) or latest and RDSO Specn.No.IRS:S-34, S-23 , S-60 or latest, as applicable. Th e interlocking code for this unit shall be "FGHKX"	Nos.	₹ 4,281	15	₹ 64,209
9	Supply of Q-Series Line Relay (QNA1 Type),AC immunized, 8F/8B, 24 V DC along with plug board (base plate), connectors, retaining clips etc and conforming to BRS931A and RDSO Specn.No.IRS:S-34, S-23 , S-60 or latest, as applicable. Th e interlocking code for this unit shall be "ABDGH"	Nos.	₹ 5,014	20	₹ 1,00,283



Sl No.	Description of Item	Unit	Estimated Rate (INR)	Quantity	Total Value (in INR)
<b>Schedule 'A' Supply of material</b>					
10	Supply of Key Lock Checking Relay (KLCR) working on 24V DC, AC Immunized, metal to metal, with different ward combinations and contact configuration 4F/4B with 2 extra ward plates, RDSO spec No. RDSO/SPN/219/2016 Ver 1.0 with Amendment-1 or latest.	Nos.	₹ 9,029	5	₹ 45,146
11	Supply of 16/0.2 mm (0.5 sq mm) PVC insulated multi strand, single core, tinned copper conductor, as per RDSO Specn.No.IRS:S-76/89 (Amnd-3) or latest. Each coil should be of 100/200/500 meters length. Colour of the wire will be specified by the Engineer incharge.	mts.	₹ 12	1600	₹ 19,584
12	Supply of 1 x 6 Sq mm (Red/Black/Green) multi strand copper power wire , 85 conductor each dia 0.30 +/- 0.01 with insulation thickness of 0.8 mm and nominal conductor resistance of 3.3 ohms/km and test parameters as per RDSO Specn.No.IRS:S-76/89 (Amnd.3) or latest. Colour of the wire will be specified by the Engineer incharge.	mts.	₹ 54	200	₹ 10,800
13	Supply of Track Lead Junction Box(TLJB), 4 way, 250 mm x 255 mm x120 mm made from FRP, as per Drg.No. 20101/M(IRS) or latest, including brass bolts and hylam board sheet with terminals etc. The FRP material shall be as per RDSO spec. RDSO/SPN/151/1997 or latest. The technical specifications are as follows: (a) TLJB complete with cover to be in black/red/grey with all the holes required for mounting on FRP stump (vertical two for each FRP angle) HDPE pipe , cable etc. (b) Each TLJB shall have two bakelite terminal block fitted horizontally, each bakelite terminal block shall have two nickel chrome plate with brass terminal. Alongwith each TLJB , nickel chrome plated brass links(two nos.of adequate strength for vertical linking of the terminals to be supplied. (c) HDPE pipe alongwith two nuts for fixing on the TLJB hole . (d) The FRP stump for mounting the TLJB	Nos.	₹ 6,006	30	₹ 1,80,191

SI No.	Description of Item	Unit	Estimated Rate (INR)	Quantity	Total Value (in INR)
<b>Schedule 'A' Supply of material</b>					
14	Supply of Adjustable Track Feed Resistance 30 Ohms (Disc Type), Phenolic moulded base, as per RDSO Drg. No.SA-20161-66/M or latest	Nos.	₹ 2,566	15	₹ 38,492
15	Supply of Track feed Battery Charger as per RDSO Specn. No.IRS: S-89/2013 Ver.1.0 or latest. Charging capacity rating should be suitable for charging 80 AH Battery.	Nos.	₹ 6,641	15	₹ 99,613
16	Supply of B Type Choke as per RDSO Specn.No.IRS:S-65/83 (Amnd. 3) or latest.	Nos.	₹ 6,651	30	₹ 1,99,530
17	Supply of uncharged Low Maintenance Lead Acid (LMLA) secondary cell, 2V, 80 AH, in dry condition, shelf mounting type, conforming to RDSO Specn.No.IRS:S-88/2004 or latest, with inter cell connectors, nuts and bolts, washers, microporous vent plug, float etc.	Nos.	₹ 3,500	45	₹ 1,57,494
18	Supply of Apparatus Case/Location Box Full as per RDSO drg. no. RDSO/S-11500 or latest, with 'E' type lock and key ward no. 42, . The key and handle should be supplied at the rate of one no. per four Apparatus cases. The 'E' type key lock is as per RDSO Spec. IRS;S-30/64 or latest, RDSO drg. no.SA 3376/M or latest and Key is as per Drg. No. 3377/M or latest.Note: This item includes the supply of 2 Nos E Type Lock fitted on both doors, along with two Key.	Nos.	₹ 30,951	15	₹ 4,64,265

SI No.	Description of Item	Unit	Estimated Rate (INR)	Quantity	Total Value (in INR)
<b>Schedule 'A' Supply of material</b>					
19	Supply of Apparatus Case/Location Box Half as per RDSO drg. no. RDSO/S-11507 or latest, with 'E' type lock and key ward no. 42, . The key and handle should be supplied at the rate of one no. per four Apparatus cases. The 'E' type key lock is as per RDSO drg. no.SA 3376/M or latest and Key is as per Drg. No. 3377/M or latest.Note: This item includes the supply of 2 Nos E Type Lock fitted on both doors, along with two Keys.	Nos.	₹ 21,503	10	₹ 2,15,033
20	Supply of phenolic laminated Sheet, resin bonded, grade P3 in standard size of 1220 X 1220 x 12 mm as per spec. No. IS 2036 of 1995 or latest. Test report of manufacture to be supplied.	Nos.	₹ 6,476	25	₹ 1,61,888
21	Supply of Cartridge Fuse block, made of PBT, as per RDSO spec. No. IRS: S-75/2006 (Rev.2) or latest and as per Drawing. No. SA- 23748 (Alt.-4) or latest.	Nos.	₹ 275	100	₹ 27,450
22	Supply of Non deteriorating type , Round head type low voltage cartridge fuse as per Spec No IRS:S-78/92 with latest amend. 2/4/6/8/10A rating capacity.	Nos.	₹ 138	100	₹ 13,838
23	Supply of ARA Terminal Block made of PBT as per Drg No SA 23741 alt 3 & spec. No IRS S 75/91 with latest amendments with disconnecting links as per Drg no. RST/11336.	Nos.	₹ 134	2000	₹ 2,67,750
24	Supply of Disconnect Terminal block for four conductors with screwing cage/clamp type, sliding switch disconnect, as per RDSO spec. RDSO/SPN/189/2004 Ver. 3.0 or latest, for each conductor size up to 2.5 sq. mm, equivalent of M6 terminals. Each terminal block equipped with two markers, on top and bottom, an end plate, two end clamps and adequate length of rails for fitting terminal blocks.	Nos.	₹ 217	100	₹ 21,713

SI No.	Description of Item	Unit	Estimated Rate (INR)	Quantity	Total Value (in INR)
<b>Schedule 'A' Supply of material</b>					
25	Supply of Medium class GI pipes 100 mm dia (4.5 mm thickness) with thread collars as per IS 1239 (Part 1) 2004 or latest with coupling on culverts/bridges, perforated at a distance of 20 cm or less with 10 mm dia hole, or at any other locations as decided by Site Engineer. It includes supply of all material required for fixing arrangement. Contractor will also supply flexible/corrugated HDPE pipe at the end of GI pipe to protect the cables from sharp edges and sudden bends.	mts.	₹ 1,116	48	₹ 53,568
26	Supply of Double Walled Corrugated (DWC) Pipe/duct with associated collars etc. as per RDSO Specification No. RDSO/SPN/204/2011 or latest anti-rodent & anti-oxidant and non flame propagating type in 6 meters straight length and of size 120 mm outer dia,& 103.5 mm inner dia. (The manufacturers, suppliers must produce valid IS license and should be certified under ISO 9000 and shall submit copy of certificate). One coupler with suitable rubber O-ring should be supplied with every 6m of pipe length. (The total quantity of above items is equal to no. of pipes supplied.) DWC pipe shall be marked at every 1 mtr length in such a way that manufacturer's name, vendor name and year of manufacture can be easily identified.	mts.	₹ 739	480	₹ 3,54,780
27	Supply of thermo shrink jointing kit as per RDSO Specn.No. IRS: TC 77-2012 (Rev.3.0) with (Amdt.-1 to 3) or latest, suitable for 6 Quad/jelly filled cables for straight through/derivation joints. It includes supply of all the accessories, without transformer.	Nos.	₹ 3,782	10	₹ 37,823

SI No.	Description of Item	Unit	Estimated Rate (INR)	Quantity	Total Value (in INR)
<b>Schedule 'A' Supply of material</b>					
28	Supply and installation of earth electrode as per standard practice and as per Drawing no. S&T/CONST/6.4/97. It includes supply of GI pipe of 3m length. It includes connecting the earth electrode to the equipments which are required to be earthed including digging of earth pit 3 mtr deep and fixing earth electrode pipe, casting of cement concrete enclosure with cover (cover as per drawing no. S&T/CONST/6.3/97. It includes installation of 7 strand GI wires as earth lead wires, supported on MS flat size 5mm x 40 mm, soldering and nut bolt both, one end of both earth lead wire and MS flat to earth electrode and other end to Location boxes, block equipments, power equipments, cable sheath, signals etc. as per site requirement and as per instructions given by engineer incharge.	Nos.	₹ 3,882	25	₹ 97,059
29	Supply and laying of RCC Duct cable channel, size 300 mm, height 300 mm (internal/external), length 700 mm/suitable length and cover as per drawing No.GC/HRIDC-SK-GEN-017 dated 09.09.2023. , for laying of signalling/telecom cables	mts.	₹ 3,000	800	₹ 24,00,000

SI No.	Description of Item	Unit	Estimated Rate (INR)	Quantity	Total Value (in INR)
<b>Schedule 'A' Supply of material</b>					
30	Supply, Installation, Testing and Commissioning of High Availability Single Section digital axle counter (HASSDAC) with Dual sensor system as per RDSO/ SPN/177/2012 (Version 3) or latest. Th is includes the supply of High frequency web mounting type Tx coil/Rx coil, VR/PR Box duly wired, Vital relays, PR Relays, Clamp with defl ector plates & hardware, Dual display reset box/monitoring console with auto resetting facility, Surge voltage protection devices and fi lter card to be mounted on DIN rail etc as per OEM for complete installation & testing & commissioning of (HASSDAC) system. Th is include fi xing of track device, relays, wiring, lacing /dressing, cable termination with lug eyelet, drilling holes in rails, Installation of track devices and make it functional along with existing UFSBI/block instrument. Material required other then supply item of HASSDAC shall be arranged by contactor to make it functional. Note: One set of HASSDAC system will include equipment required to monitor One Up line or One Dn line of a full Block Section between two stations.	Set	₹ 7,48,224	1	₹ 7,48,224
<b>Total of Schedule 'A'</b>					₹ 1,83,01,129

<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>Sl No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
31	<p>Installation of DC track circuits (Straight Portion) including supply of materials as per directive of site Engineer. NOTE : (i) This includes drilling 9/32" holes on rails, provision K26 double continuity GI wire bonding, provision of Block Joints 60 Kg/D2752 Kg/90R with machined fish plates, installation of Track lead junction box (separately for (+) and (-) rails), provision of track lead jumper wires/cables, fixing of track circuit equipment i.e. track charger, resistance, fuses, batteries, chokes, relays, anti-titling arrangement and painting, lettering and numbering of DC track circuit equipment etc., (ii) [a] Un-machined fish plates shall be supplied by the Railway's, but machining of fish plates shall be done by the Tenderer. In case of provision of Glued Joints by Engineering Department in lieu of RDSO Block joint, the cost of machining of fish plates@ 100/- per straight track circuit and @ 500/- per point zone track circuit will be deducted. [b] This includes insulation of gauge tie plates, Crossing plates, rod in siding points if required or any other place as instructed by Railway Site Engineer, by Tenderer's insulation materials. Railway will supply Track Charger, B-type choke, Resistance, Un-charged battery, TLJB and relays through a separate schedule/from the stores of railway consignee. These are to be transported to site of work at contractor's cost. Tenderer/Contractor shall supply any other materials that are required for the work.</p>	Nos.	₹ 8,684	5	₹ 43,419

<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>Sl No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
32	<p>Installation of DC track circuits (Point zone) including supply of materials as per directive of site Engineer. NOTE : (i) This includes drilling 9/32" holes on rails, provision of double continuity GI wire bonding, provision of Block Joints 60 Kg/52 Kg/90R with machined fish plates, installation of Track lead junction box (separately for (+) and (-) rails), provision of track lead jumper wires/cables, fixing of track circuit equipment i.e. track charger, resistance, fuses, batteries, chokes, relays, anti-titling arrangement and painting, lettering and numbering of DC track circuit equipments etc., (ii) [a] Un-machined fish plates shall be supplied by the Railway's, but machining of fish plates shall be done by the Tenderer. In case of provision of Glued Joints by Engineering Department in lieu of RDSO Block joint, the cost of machining of fish plates@ 100/- per straight track circuit and @ 500/- per point zone track circuit will be deducted. [b] This includes insulation of gauge tie plates, Crossing plates, rod in siding points if required or any other place as instructed by Railway Site Engineer, by Tenderer's insulation materials. Railway will supply Track Charger, B-type choke, Resistance, Un-charged battery, TLJB and relays through a separate schedule/from the stores of railway consignee. These are to be transported to site of work at contractor's cost. Tenderer/Contractor shall supply any other materials that are required for the work.</p>	Nos.	₹ 14,031	8	₹ 1,12,248



<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>Sl No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
33	Installation of Charging of Lead Acid Batteries, 2V, 80 AH, with contractors own battery grade sulphuric acid and distilled water with minimum two charge - discharge cycles, installation of charged batteries in groups & their connection & wiring. The work shall be done as per the procedure prescribed by the OEM and extant practice of N.C.Rly and instruction of Engineer-in-charge. Detailed measurements of initial charging shall be recorded jointly by contractor & Rly's site-in-charge.	Nos.	₹ 278	45	₹ 12,504
34	Installation of thermo shrink jointing kit as per RDSO Specn.No. IRS: TC 77- 2012 (Rev.3.0) with (Amdt.-1 to 3) or latest, suitable for 6 Quad/jelly filled cables for straight through/derivation joints. It includes supply of all the accessories, without transformer.	Nos.	₹ 1,893	10	₹ 18,934

<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>Sl No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
35	<p>Installation of Unit Maintenance Free Earth to achieve a resistance less than 1 ohm as supplied under item no.3 of BOQ. It includes (i) Digging the earth to the required depth. (ii) Insertion of electrode. (iii) Filling of earth enhancing compound (Approx.30 Kg) (iv) Provision of exothermic weld connections to copper tape of 25 mm x 6 mm x 150 mm to the earth electrodes. All material tools and features required for weld will be arranged by contractor. (v) This also includes CC cover 1.5 ft x 1.5 ft . 1 ft wall thickness 2 inch with cover 3 inch thickness. Cables 35 Sq mm/ 16 Sq mm/10 sq mm for connecting earth to busbar, busbar to busbar and busbars to various equipments. Earth electrode of 17.20 mm dia and 3.00 meter long high tensile low carbon steel circular rods molecularly bonded with copper and outer surface (minimum copper bonding thickness of 250 microns to meet requirement of under writer's laboratories (UL) 467-2007 or latest. Copper strips of 150 mm x 25 mm x 6 mm to be welded with each earth electrode, copper strips of 300 mm x 25 mm x 6 mm for main equip-potential busbar, copper strips of 150 mm x 25 mm x 6 mm sub equip-potential busbar in relay room, power room and panel room. GI strip 25 mm x 2 mm for ring formation of earth pits Earth enhancement material in bags for each Earth Electrode. Inspection chamber of size 300 mm x 300 mm x 300 mm (Inside dimension) of approximate 50 mm thick with pulling hooks to cover the earth pits. Note: The installation of this item shall be carried out by the contractor as per RDSO Specn. No. RDSO/SPN/ 197 Ver 1.0 or latest. Typical RDSO approved drawings referred in the RDSO specification document are : (i) SDO/RDSO/E&amp;B/001 for typical installation of Earth, (ii) SDO/RDSO/E&amp;B/002 for typical bonding and earthing connections, (iii) SDO/RDSO/E&amp;B/003 for typical arrangement for earth resistance measurements.</p>	Set	₹ 8,187	2	₹ 16,373

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<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>SI No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
36	Laying of HDPE duct as per the approved cable route plan in the excavated trenches/other protected works/RCC channel etc. including all accessories like end caps, collars, bends, couplers etc. The ends of the duct to be sealed with end plugs till OFC blowing is done.	Kms.	₹ 9,104	2	₹ 18,207
37	Laying of S&T Cables of various cores/ pairs/ quads in trenches/ GI pipes/ RCC pipes/ DWC pipes etc. as per the site requirement and as per approved cable route plan. This also includes laying of cables in track crossings & road crossings.(Cables will be meggered before and after its laying by contractor under supervision of Railway Representative and he will submit the meggering report of each testing). Length of the cable laid includes the length of the cable coiled for termination purpose	mts.	₹ 8	49,000	₹ 3,77,055
38	Laying and fixing of Medium class GI pipes 100 mm dia (4.5 mm thickness) as per IS 1239 ( Part 1) 2004 or latest with coupling on culverts/bridges, perforated at a distance of 20 cm or less with 10 mm dia hole, or at any other locations as decided by Site Engineer.The GI pipe is to be filled with chattered compound. It includes supply of all material required for fixing arrangement. Contractor will also supply flexible/corrugated HDPE pipe at the end of GI pipe to protect the cables from sharp edges and sudden bends. The laying and fixing to be done as per RDSO drawings no. SDO/cable laying/011 and SDO/cable laying/012, issued vide RDSO document no. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014, or latest	mts.	₹ 398	48	₹ 19,116

<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>Sl No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
39	Fabrication and fixing of phenolic laminated sheet of grade P3, minimum 10 mm thick, as per Apparatus case diagram/plan, in location box by providing all fixtures like ARA/Disconnect terminals, fuse blocks, fuses, relays on square bars etc. including fixing of PVC coated string rods at the back side for cable support with contractor's own material like iron angle, nuts, bolts etc. The iron angle for fixing shall be minimum 3 mm thick. This also includes fixing of teak wood shelf minimum 25 mm thick for holding track circuit equipments. This includes letting of all termination & equipments details in a sheet and fixing in the location box. The work shall be done as per instructions of engineer at site. (Apparatus case Full)	Nos.	₹ 5,039	15	₹ 75,583
40	Fabrication and fixing of phenolic laminated sheet of grade P3, minimum 10 mm thick, as per Apparatus case diagram/plan, in location box by providing all fixtures like ARA/Disconnect terminals, fuse blocks, fuses, relays on square bars etc. including fixing of PVC coated string rods at the back side for cable support with contractor's own material like iron angle, nuts, bolts etc. The iron angle for fixing shall be minimum 3 mm thick. This also includes fixing of teak wood shelf minimum 25 mm thick for holding track circuit equipments. This includes letting of all termination & equipments details in a sheet and fixing in the location box. The work shall be done as per instructions of engineer at site. (Apparatus case Half)	Nos.	₹ 2,733	10	₹ 27,326
41	Fixing of ARA(M-6) Terminals /Screw less connectors / modular disconnect terminal blocks and fuse blocks on phenolic laminated sheets and fixing by stainless steel/brass nuts & bolts. This includes provision of two additional holes on the board on either side for cable conductor entry. The work shall be carried out as per instructions of railway Engineer in charge. (Supply of all above terminals has been covered separately).	Nos.	₹ 20	2,000	₹ 40,500

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<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>SI No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
42	Termination of Outdoor Cables (Main Cables /tail cables) at ARA/Disconnect type terminals provided in Apparatus Cases, Cable termination rack in relay room, station building, generator room etc. The item includes dressing of cables and wires with dressing threads as per standard practice. All material required for this item will be supplied by contractor. The outdoor cable shall be terminated in Relay Room, DG Room, ASM Room etc under supervision and instructions issued by Engr. incharge of the work	Per Conductor	₹ 17	4,000	₹ 67,500
43	Dismantling and Releasing of existing Location boxes/Apparatus cases/Jn boxes and other associated S&T fittings. All the released material will be transported to the SSE/Consignee depot	Nos.	₹ 1,094	25	₹ 27,338
44	Excavation of cable trench as per cable route plan, 1.2 meter deep and of 0.3 meter to 0.6 meter wide at bottom as per RDSO sketch No. SDO/CABLE LAY- ING/003, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014 or latest, alongside the track in normal soil/strata (including soft rock), conforming to distances as per cable route plan and refilling and ramming of loose soil. This work includes clearing of route from bushes etc, covering of cable laid in trench by loose soil for a layer of 50mm thickness approximately before covering by bricks. The work shall be done as per the extant practice on North Central Railway and instructions of Railway Engineer at site. In case the full depth is Not available, there shall be no proportionate payment and after the approval of minimum JAG officer, the concreting shall be done as per the RDSO drawing No. SDO/Cable laying/003, issued vide RDSO document No. RDSO/ SI/G/2010 Version 1.1 dated 04.02.2014 or latest.	mts.	₹ 73	2,000	₹ 1,46,250

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<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>Sl No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
45	Horizontal Boring/Manual moling without damage to surface road /track for laying/insertion of DWC/GI/HDPE pipe. The bore shall be done at the depth of minimum 1200 mm from the ground level. The ground level shall be considered ignoring the bank height of the bank of the road. Note:- DWC/HDPE/GI Pipe Supply is not covered under this item. Contactor shall provide all material required for work and adequate nos. of labours for proper laying of cables into the bore. Cable shall be laid cautiously so that it should not get damage due to rough handling & pressure on cable. Payment of boring shall be made only after DWC/HDPE/GI pipe is laid in the bore.	mts.	₹ 693	480	₹ 3,32,640
46	Lettering and Numbering of all S&T gears like Signals, Loc. Boxes, Pt. Machines, TLJBs, Block joints etc. Each item to be taken as one unit.	Nos.	₹ 97	100	₹ 9,675
47	Excavation, casting, curing of foundation and Installation and Erection of Apparatus case Full (App. Case as per drg. no. NR/S&T/CON/2.7/97 or latest) with contractor's own frame, cement and other material in the ratio 1:3:6. 'E' type lock to be supplied and installed with App. case. This includes filling of location foundations with river bed sand and plastering on top with a mixture of 1:4 of cement and sand. Supply & fixing of lamp holder, switch, lamp, scrapping and painting of location boxes in Apparatus Case	Nos.	₹ 13,813	15	₹ 2,07,191

<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>Sl No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
48	Excavation, casting, curing of foundation and Installation and Erection of Apparatus case Half (App. Case as per drg. no. NR/S&T/CON/2,8/97 or latest) with contractor's own frame, cement and other material in the ratio 1:3:6.'E' type lock to be supplied and installed with App. case.This includes filling of location foundations with river bed sand and plastering on top with a mixture of 1:4 of cement and sand. It covers supply & fixing of lamp holder , switch , lamp , scrapping and painting of location boxes in Apparatus Case.	Nos.	₹ 11,624	10	₹ 1,16,235
49	Blowing/drawing of OFC cable in the HDPE pipe duct and protective work already provided in the trench. Th e cable shall be laid only aft er the successful completion of the DIT (Duct Integrity test). Th e DIT should be certifi ed by the Railway engineer at site. All the equipments/machinery required shall be arranged by the contractor.	Kms.	₹ 19,230	2	₹ 38,459
50	Cutting of all types of platforms/road crossing and trenching and excavation to a width and depth of 300 mm x 300 mm, laying of DWC/HDPE/GI pipe in the trench and refilling and concreting it afterwards as per original condition. In hard rocky ground area, cables will be laid normally on layer of soft earth of 0.05 meter thickness previously deposited at bottom of the trench. The cutting to be filled and finished with cement/concrete, as per the RDSO drawing No. SDO/ Cable laying/008, issued vide No. NR/SIG/CABLE LAYING/010	mts.	₹ 178	200	₹ 35,550

<b>Schedule 'B' Installation, Testing &amp; Commissioning</b>					
<b>Sl No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
51	Installation of KLCR & its box in location boxes, supply & installation of heavy duty push button, LED indicator on M.S sheet of 4.5 mm thick inside location box for crank handle locking. The work includes fixing & wiring of magneto telephones, wiring of KLCR, push buttons and termination of tail cables as per instructions of Engineer's representative. All material except KLCR relay & its box and magneto telephone (Covered in this schedule at other Sno.) to be supplied by the contractor. This also includes fixing of wards on point machine. Foundation & installation of location box is covered as separate item of schedule. (Per unit is Per Installation).	Nos.	₹ 15,341	5	₹ 76,703
52	Design, preparation & supply of Six (06) hard copies of each documents along with soft copy for the mention below alongwith original tracing on a standard 7.5 microne polyester film in AUTO CAD FORMAT. (The item includes supply of two sets of drawings for approval and corrections thereon as suggested by HRIDC) , i) Cable route plan , ii) Location box details with location wiring diagram , iii) Cable termination details , iv) Cable corage plan , v) C.T. Rack details , vi) Track bonding plan , vii) Cable jointing details.	Stn.	₹ 49,853	1	₹ 49,853
53	Splicing of 24 core optic fi bre cable and making the splicing joint with contractor's own machine and tools. Joint should be prepared in such a way that the top of the enclosure should be at a depth of minimum 1.2 meter and the enclosure should be covered with soft soil and bricks. Splice loss of each fi bre should be less than 0.05 dB	Nos.	₹ 13,512	2	₹ 27,025



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<b>SI No.</b>	<b>Description of Item</b>	<b>Unit</b>	<b>Estimated Rate (INR)</b>	<b>Quantity</b>	<b>Total Value (in INR)</b>
54	Supply and fixing of RCC cable route marker, made with concrete in the ratio 1:3:6, engraved "NCR" "S&T" on top portion and painted on both sides, along the route at every 50 meter and at route diversion. The cable marker is to be fabricated as per RDSO drawing No. SDO/cable laying/020, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014, or latest. The fix- ing work is to be done as per extant practice of NC Railway and as per Railway site supervisor incharge.	Nos.	₹ 483	60	₹ 28,958
<b>Total of Schedule 'B'</b>					₹ 19,24,642
<b>Grand Total (A+B)</b>					₹ 2,02,25,771