

उत्तर पश्चिम रेलवे

**NORTH WESTERN RAILWAY**

बिजली विभाग

**(ELECTRICAL DEPARTMENT)**

ई-निविदा प्रपत्र

**E-TENDER DOCUMENT**

**TOP SHEET**

निविदा संख्या

**Tender No.**

**EL-JP-11-2026-27**

कार्य का नाम

**Name of work:**

Electrical work in connection with [1] Development of 2nd entry at Dahar Ka Balaji (DKBJ) station, [2] Balance work of Development of infrastructure for maintenance of Train sets in coaching depot at Jaipur, [3] One Longer loop line with Platform and one additional line with Platform at Dahar Ka Balaji Station

कार्यालय

वरिष्ठ मण्डल बिजली इंजीनियर

उत्तर पश्चिम रेलवे

बिजली विभाग, मंडलरेलप्रबन्धक कार्यालय,

पावर हाउस रोड, जयपुर- 302006

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## **E-TENDER DOCUMENT**

### **TOP SHEET- II**

- 1 Tender No. : **EL-JP-11-2026-27**
- 2 Name of work : Electrical work in connection with [1] Development of 2nd entry at Dahar Ka Balaji (DKBJ) station, [2] Balance work of Development of infrastructure for maintenance of Train sets in coaching depot at Jaipur, [3] One Longer loop line with Platform and one additional line with Platform at Dahar Ka Balaji Station
- 3 Approximate cost of work : Rs. 9939176.32
- 4 Bid Security /Earnest Money : Rs. 198800.00
- 5 Completion Period : 12 months
- 6 Date & Time of Closing E-tender : 06.07.2026 15.00 hours
- 7 Date & Time of opening E-tender : 06.07.2026 After 15.00 hours

Issued by

मण्डल रेल प्रबन्धक (बिजली)

उत्तर पश्चिम रेलवे जयपुर

*भारत संघ के राष्ट्रपति के लिए तथा उनकी ओर से*

बिजली विभाग, मंडल रेल प्रबन्धक कार्यालय,

पावर हाउस रोड, जयपुर – 302006

**(ii)**

### **TENDER FORMS**

**Name of work:** Electrical work in connection with [1] Development of 2nd entry at Dahar Ka Balaji (DKBJ) station, [2] Balance work of Development of infrastructure for maintenance of Train sets in coaching depot at Jaipur, [3] One Longer loop line with Platform and one additional line with Platform at Dahar Ka Balaji Station

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## TENDER FORMS

To

The President of India  
Acting through the Sr. Divisional Electrical Engineer  
North Western Railway, Jaipur

**Name of work: Electrical work in connection with [1] Development of 2nd entry at Dahar Ka Balaji (DKBJ) station, [2] Balance work of Development of infrastructure for maintenance of Train sets in coaching depot at Jaipur, [3] One Longer loop line with Platform and one additional line with Platform at Dahar Ka Balaji Station**

**Tender No :** EL-JP- 11-2026-27

I/We\_\_\_\_\_ have read the various conditions to tender attached hereto and agree to abide by the said conditions. I/We also agree to keep this offer open for acceptance for a period of \_\_\_\_\_ days from the date fixed for closing of the tender and in default thereof, I/We will be liable for forfeiture of my/our "Bid Security". I/We offer to do the work for \_\_\_\_\_ Railway, at the rates quoted in the attached bill(s) of quantities and hereby bind myself/ourselves to complete the work in all respects within \_\_\_\_\_ months from the date of issue of letter of acceptance of the tender.

1. I/We also hereby agree to abide by the Indian Railways Standard General Conditions of Contract, with all correction slips up-to-date and to carry out the work according to the Special Conditions of Contract and Specifications of materials and works as laid down by Railway in the annexed Special Conditions/Specifications, Standard Schedule of Rates (SSOR) with all correction slips up-to-date for the present contract.

2. A Bid Security of ₹ \_\_\_\_\_ has already been deposited online/ submitted as Bank Guarantee bond. Full value of the Bid Security shall stand forfeited without prejudice to any other right or remedies in case my/our Tender is accepted and if:

- (a) I/We do not submit the Performance Guarantee within the time specified in the Tender document;
- (b) I/We do not execute the contract documents within seven days after receipt of notice issued by the Railway that such documents are ready; and
- (c) I/We do not commence the work within fifteen days after receipt of orders to that effect.

3. (a) I/We am/are a Startup firm registered by ..... Department of Industrial Policy and Promotion (DIPP) and my registration number is ..... valid upto ..... (Copy enclosed) and hence exempted from submission of Bid Security.

4. We are a Labour Cooperative Society and our Registration No. is ..... with ..... and hence required to deposit only 50% of Bid Security.

5. Until a formal agreement is prepared and executed, acceptance of this tender shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the letter of acceptance of my/our offer for this work.

Signature of Witnesses :

- (1) .....
- (2) .....

\_\_\_\_\_

( Signature of Tenderer (s)  
Address of the Tenderer(s)

## **SPECIAL TECHNICAL CONDITIONS FOR ELECTRICAL WORK.**

Where there is any conflict between the Tender document on one hand and GCC of works- April 2022 (With all correction slips) on the other hand, the tender documents shall prevail. The work shall be carried out strictly as per applicable rules & regulations, manuals and applicable code of practices. If any minor alterations are found necessary, the contractor will do the same within the quoted rates. The work shall be carried out in best workmanlike manner and any defect in the work of changes in the design etc. as pointed out by Inspecting authority shall be carried out by the contractor within quoted rates. In case of any dispute regarding the lay out and any other technical matter, the decision of Sr. Divisional Electrical Engineer Jaipur will be final and binding on the contractors. The work shall be carried out in accordance with the approved specification/drawing and other relevant standard of general electrical work as specified in tender by Engineer. Work shall be carried out strictly as per IE rules and wherever applicable equipment should comply with latest Indian Standards, Statutory Regulations and Labour Acts etc. Contractor shall arrange shutdown and clearance of power block also at his own cost. Contractor should have all testing equipment for testing of cable/ earthing before commissioning of line. Contractor should have all safety equipment during working at site like earthing chain, safety belts, helmet etc. First aid box must available every time at site during working.

**1. ENERGY EFFICIENT EQUIPMENT:**

Energy efficient equipment shall be used as prescribed in energy Conservation Building Code-2007 of BEE or latest and star ratings of BEE wherever applicable. Contractor shall arrange inspection of major electrical expenditure as per railway equipment at his own requirement.

**2. WORKMANSHIP AND ESTHETICALLY LOOKING OF PROJECT SITE:**

The work shall be carried out in best workmanship in term of working manner, esthetically matching with building design and any defect in the work due to changes in the design etc. as pointed out by Railway authority shall be carried out by the contractor. Though all design parameter concerning with safety, esthetically looking of electrical system will not have pertains with engineering construction official at any level.

**3. DISPUTE IN LAY OUT AND TECHNICAL MATTER:**

In case of any dispute regarding the lay out wiring plan, regarding site / location / height for fitment / installation of equipment of electrical equipment, selection of size and colour of body surface of equipment and in any other technical matter, the decision of railway Supervisor of Electrical department (Jaipur division) / Divisional Electrical engineer (Jaipur division) / Sr. Divisional Electrical Engineer (Jaipur division) Jaipur will be final and its binding on the contractor within terms and conditions of GCC April-2022 with latest amendment. All aforesaid parameter concerning with safety, esthetically looking of electrical system will not have pertains with engineering construction official at any level.

**4. DRAWING AND DIAGRAM:**

- (a) Contractor shall submit design & drawing ( with showing of colour of R Y B phase, neutral and earth wire as per IS : 732 or latest code of practice of house wiring) of different circuits of electrical power supply system for outdoor work / building wiring system for indoor work, in which clearly indicating the position / location of Main Distribution Board(MDB) i.e. Main LT panel, APFC panel and AMF panel, Secondary Distribution Board (SDB) i.e Secondary LT panel or VTPN, Branches Distribution Board (SDB)

i.e. TPN/SPN/ /RR plug/AC box, Switch boards, ceiling roses, fan boxes, all type of lights / fans, all type AC's, / Room heater / geyser to ensure safety and quality aspect of work.

- (b) Contractor must submit all drawing / diagram with written letter in Electrical construction office for getting approval from concern electrical official. Contract must get approval of aforesaid drawing / diagram before starting the work to avoid or minimize alteration or damage in masonry work of wall / floor.
- (c) All approved plans and drawing contractor may submit to concern Sr. Divisional Electrical Engineer (Jaipur division), office as complete set of (01 originals in multi colour/Jat mat paper and 06 copies in multi colour) approved drawings including soft copies. Contractor always kept one set of all above drawing/diagram / circuit plan at site for maintain technical standard of electrical work.
- (d) It is responsibilities of contractor, may ensure the present of his authorized Electrical Engineer (As mentioned in OCA & GCC) along with all approved / proposed drawing and diagram during inspection of Sr.DEE (G) /PCEE . If contractor failed, its leading delayed in work i.e. contractor has not shown sufficient interest to speed up the work as per specification / instruction of railway representative.

#### **5. SITE ORDER REGISTOR:**

Railway representative kept site order register at site for issuing written instruction to contractor and its binding on contractor to sign on site order register. If contractor deny or failed to sign site order register, its treated escaping form site and it's may become cause to work not commencement or cause of slow progress.

#### **6. INSPECTION AND LAB TESTING OF MATERIAL:**

For inspecting Major/high value items, Railway's representative/RITES/Third Party may visit the manufacturer's premises to conduct the test, if necessary. Any sample, if necessary, may be sent by Railway 's representative to manufacturer/test house for ascertaining originality/parameters as per specifications and cost of test shall be borne by the contractor. Pre commissioning tests, if needed, on various equipment shall be carried out by the contractor in presence of Railway authorized representative.

- (a) For inspection of the material as desired by Railway, Railway's representative/RITES/Third Party will visit to manufacturer's premises to conduct the tests, if necessary. Contractor shall provide all necessary assistance in carrying out tests and inspection at his own cost.
- (b) Materials having a total value exceeding 5 lakh shall be inspected by RITES/Third Party or as decided by Sr.DEE/G/JP. The cost of the initial inspection shall be borne by the Railway. In case of rejection during inspection, the cost of all subsequent inspections, including the initial inspection, shall be borne by the contractor/firm.
- (c) Pre commissioning visual consignee inspection certificate of electrical equipment may be carried out jointly by Railway site supervisor and contractor if needed. Its responsibilities contractor and Its binding on contractor to sign above certificate and kept at site office. If contractor deny or failed, its treated escaping form site and it's may become cause of slow progress.
- (d) The factory inspection of manufacturer site or materials will be testing by any authorized laboratory of any items of the schedule/part of any job or in schedule can be conducted on the desire of Railway and statutory fees charges bear by contractor. Its responsibilities contractor to sign above reports / certificate and kept at site office. If contractor deny or failed, its treated escaping form site and it's may become cause of slow progress.
- (e) The tests on any of the item /sample/equipment in the schedule/part of any job or in schedule will be performed in an NABL/Govt. Lab. or manufacturer's premises as desired by Railways.
- (f) The cost / fee of factory inspection / lab tests / documentations will be borne by the contractor.

#### **7. WARRENTY CARD:**

- (a) At the time of submission of drawings/sample prior to execution work or installation /testing /commissioned the equipment, contractor has to submit relevant documents regarding the certification / self-attested copy of purchasing invoice / bills so that railway may get clarification from manufacture / authorized dealer / seller whenever if needed.
- (b) The specifications and technical catalogues / user manual reflecting all the technical parameters of the item contractor may submit the warranty card prior to claim for / due for bills of equipment, otherwise payment shall not be process.

**8. GOVERNMENT STANDARD FOR ELECTRICAL WORK / EQUIPMENT:**

- 1. The ISI / BEE or any other relevant mark/label of Indian government or any certificate produced in support, may not be enough to approve the sample, further verifications / factory inspection/lab test may be carried out as per the discretion of Railways.
- 2. The work will be carried out as per CAMETECH recommendation on procedure order for composite tender work for building wiring vide: CAMETECH/E/2017-18/EP-2/Wiring/1.0, May 2017 or latest or others Government standard as mentioned in tender documents.

**9. MAKE OF EQUIPMENT AND APPROVAL OF SAMPLE:**

- 1. The sample of equipment will be approval by Divisional Electrical Engineer / Assistant Electrical Engineer and Electrical Supervisor is mandatory prior to execution. For this purpose, contractor may submit materials / equipment on firm's letter pad with authorizer signature. In case contractor starting the work his own risk with unapproved sample.
- 2. If such type equipment is failed or not as per specification, railway may instruct to firm to remove failed equipment and provide one new equipment with approval as per specification.
- 3. In case of any kind of confusion/conflict/dispute in drawing/design or in approval of sample / in specification, the decision of Railways Executive officers, Divisional Electrical Engineer / Assistant Electrical Engineer and Electrical Supervisor will be final and binding on the contractor.

# 10. REFERENCE LIST FOR MAKE OF ELECTRICAL PRODUCTS.

S. N.	Item	Relevant Standards / specifications (Latest Ver.)	Reference Makes
1	Power Transformer	IS: 2026/1977 -2011 (Part- 1 to 10) and IS: 1180/1989 & IS: 2026/1977 for up to 100 KVA, 11 kV outdoor type transformer.	Crompton Greaves, NGEF, Kirloskar, BHEL, Bharat Bijlee, Alsthom (Areva), ABB, Siemens, GEC or Similar.
2	11 kV/HT Vacuum Circuit Breaker, SF-6/11kV gas filled Circuit Breaker	IS: 3427/1997	GEC, Siemens, Crompton Greave, Alsthom (Areva), Jyoti, ABB, BHEL, L&T, Schneider or Similar.
3	ACB(11kV)	IS: 13118/1991	Siemens, L&T, Crompton Greave, Schneider, Jyoti, GEC, ABB, Legrand or Similar.
4	PSS/CSS with HT/LT switch gear, transformer and connected accessories	IS:11171/1985 for dry type Power transformer	ABB, Siemens, L&T, Crompton Greave, BHEL, GEC, Kirloskar, Alsthom (Areva),Schneider or Similar.
5	MCCBs, MCBs, ELCBS/ RCCBs, RCBO, DB, ICTPN, TP, HRC fuse, Changing over switch, Fuse Unit	IS: 8828/1996 for MCB IS:13947(Part-1)/1993 & part 5/Sec1)/2004 for MCCB IS: 12640/2008(Part-1) for RCCB & (Part-2) for RCBO. IS: 13703/1993 for LV HRC fuse IS: 13947(Part-3)/1993 for SFU	L&T, Crompton Greave, Siemens, Legrand, Jyoti, GEC, BCH, Schneider, ABB or Similar.
6	XLPE Cable 11/33kV grade	IS:7098(Part-2)/2011	Asian, NICCO, Universal, RPG, CCI, Fort Gloster, INCAB or Similar.
7	PVC/XLPE Power Cables up to 1.1kV grade	IS: 694/2010 for PVC cable, IS: 1554(Part-1&2)/1988 for heavy duty PVC cable, IS:7098(Part-1)/1988 for XLPE cable	CCI, Universal Cable, RPG, NICCO, Asian, Fort Gloster, Finolex, INCAB or Similar.
8	Instrument Voltmeter, Ammeter, PF meter	IS:1248/2003 for Analog, IS:13875/2008 for digital	Automatic Electric, Meco, Industrial Meter, Motwani, Toshniwal, L&T, Siemens or Similar.



9	11kV Cable End Termination & Jointing kits	<i>IS: 13573/1992 Part-1,2&amp;3/2011</i>	Raychem, M-Seal, Xicon brand of CCI, 3M, Densons (Yamuna) or Similar.
10	Relays	<i>IS: 3231(Part-0&amp;1)/1986 (Part-2&amp;3)/1987</i>	Siemens, L&T, Alsthom, ABB, BHEL, Jyoti, GE or Similar.
11	LED Luminaries, MH, HPSV, T-5 fittings, CFL, &related accessories	<i>IS: 9974(Part-1)/1981 for HPSV  IS:15111/2002 for CFL</i>	Phillips, Crompton, Bajaj, GE, Osram, Wipro or Similar.
12	PVC insulated Elect. Wires Sheathed/ unsheathed, PVC flexible LT cable, multicore, single core, Flat cable for submersible pumps	<i>IS: 694/2010 for PVC cable</i>	Finolex, Asian, Fort Gloster, CCI, NICCO, Universal, RPG, INCAB or Similar.
13	Current Transformer	<i>IS: 2705/1992</i>	Automatic Electric, CGL, MECO, Siemens, L&T, Schneider or Similar.
14	On line UPS, Servo Stabilizer, Inverter, CVT	<i>IS:13314/1992 for Inverter IS:11260/1985 for voltage Stabilizer</i>	AEI, BHEL, Hind Rectifier, L&T, NGEF, Siemens, Autometer, Pyramid, APC, Luminous, Microtech, TATA Libert or Similar.
15	Rotary Switches. Selector Switches	<i>Relevant IS</i>	Kaycee, L&T, GE, ABB, Siemens, or Similar.
16	Exhaust fan/Air Circulator/ Bracket & Pedestal fans/Ceiling fan	<i>IS: 374/1979 for ceiling fan IS: 2312/1967 for Exhaust fan</i>	Crompton, GEC, Usha, Philips, Bajaj, Polar, Orient or Similar.
17	Galvanized High Mast Tower / Tubular pole/ Octagonal pole for general purpose lighting	<i>IS:875(Part-3)/1987 for High mast Structure, BSTN-10025/1993 for High Mast Shaft, IS:2026 for other component IS: 2629/1985, BSEN ISO- 1461 for Galvanization</i>	Bajaj, Philips, GE, CGL or Similar.
18	Electronic Energy Meter	<i>IS:13779/1999 IEC:62053-21</i>	L&T, IMP, HPL, Secure, ABB, Enercon or Similar.
19	Central Air Conditioning Plants & Package type plant	<i>IS: 8148/2003 for package type.IS: 1391/1992 for Room Air Conditioners.</i>	Voltas, Blue Star, Carrier, Hitachi, O General, Mitsubishi or Similar.

20	Capacitors- PF correction for Electrical General Services	<i>IS:13340/1993</i> <i>IS:13341/1992</i>	ABB, BHEL, Unistar, WS Insulators, L&T, Hind Rectifier, Voltas, Siemens, Schneider, or Similar.
21	DG Sets- Portable	<i>IS: 13364(Part-1)/1992 for Alternator</i>	Birla Yamaha, CGL, Shriram Honda or Similar.
		<i>IS:10001/1981 for Diesel Engine</i>	
22	DG Engine	<i>IS:13364/1992 For Alternator</i>	Cummins, Kirloskar, Wartsila, Caterpillar, Ashok Leyland or Similar.
23	Alternator for DG set	<i>IS:4722/2001</i> <i>IS:4728/1975</i>	KEC, CGL, Stamford, Kirloskar-Green or Similar.
24	Induction Motor	<i>IS:325/1996</i> <i>IS:12615/2011</i>	Bharat Bijlee, BHEL, CGL, GE, Jyoti, Kirloskar, Siemens, ABB, ASHIKA, NGEF, Alstom or Similar.
25	LT Switchgear & control gears- Contactors & motor starters, Energy Efficient Soft Starter panel/ Earthing Switch, Single phase preventer	<i>IS:13947(Part1)/1993</i> <i>IS:13947(Part4)/1993</i> <i>IS:13947 (Part-5)/2004</i>	ABB, CGL, Jyoti, L&T, NGEF, Siemens, Legrand, BCH, Standard, GEC, BHEL, Schneider or Similar.
26	Pumps- Submersible	<i>IS: 8034/2002 for submersible pump sets</i> <i>IS: 9283/1995 for motors of submersible pump sets</i> <i>IS: 14220/1994 for open well submersible pump sets</i>	Calama, CGL, Jyoti, Kirloskar, KSB or Similar.
27	Timers- electronic solid state	<i>IEC: 60947(2004)</i>	ABB, BHEL, GE, Jyoti, L&T, BCH, Siemens, Legrand or Similar.
28	Water Coolers	<i>IS: 1475 Part-1/2001</i> <i>IS:1475/2005</i>	Blue Star, Kelvinator, Shriram, Voltas or Similar.
29	Electrical accessories (Piano switch, Plugs & sockets, ceiling rose, Angle holder, holders, Modular switch and socket)	<i>IS: 3854/1997 for switches</i> <i>IS: 1293/2005 for plugs &amp; sockets</i> <i>IS: 371/1999 for ceiling rose</i> <i>IS: 1258/2005 for lamp holder Bakelite</i>	SSK (Top line), Anchor (Penta-or-net), Precision (Prime), CONA(Nice- Indian), Legrand, ABB or Similar.
30	Bell Buzzer	<i>IS:2268/1994 or latest</i>	CONA, MAX, Anchor, SSK or Similar.
31	Electronic fan regulator	<i>IS:11037/1984</i>	Anchor, Usha, ERIK, Leader or Similar.

32	Solar cell/Module system	<i>IS: 12834/1989 IEC 61215/200 5 IEC 60904-2006</i>	TATA BP, BEL, BHEL, REIL, MOSER BEAR, CEL or Similar.
33	Solar Lighting system	<i>RDSO/PE/SPEC/PS/0093-2008, Rev. 'O' – Amendment 'I'</i>	-----
34	GI/MS Pipe	<i>IS: 1239(Part-1)/1990</i>	TATA, Jindal, Prakash, Surya or Similar.
35	Geysers	<i>IS:2082/1993</i>	Bajaj, Usha, Crompton, Recold, Venus or Similar.
36	Lifts & Escalators	<i>IS-14665/2000 for Lift RDSO/2013/EM/SPEC/001 6 Rev (0) for Lift (Elevator) RDSO/PE/SPEC/TL/0095-2008 Rev (0) for Escalator</i>	OTIS, ThyElectrical supervisor nKrupp, Shindler, KONE, Mitsubishi or Similar.
37	LEDs	<i>IS: 16101-2012, IS: 16102-2012 Part-1,2 IS: 16103-2012</i>	NICHIA, OSRAM, SEOUL SEMICONDUCTOR, PHILLIPS LUMILEDS, LEDNIUM or Similar.
38	Solar Water Heaters	<i>RDSO/PE/SPEC/PS/0094-2008 Rev '0'</i>	As per MNRE approved sources.
39	Solar Distilled Water Plants	<i>Relevant IS</i>	As per MNRE approved sources.
40	Energy savers used for lighting loads	<i>RDSO/PE/SPEC/PS/0083-2008 Rev. '0'</i>	As per MNRE approved sources.
41	Air Cooling Plants	<i>Relevant IS for its concern equipments</i>	Voltas, Blue Star, Carrier or Similar.
42	Battery Charger for other than battery room for Train Lighting	<i>IS:2026/2011-power transformer IS:3895/1966 IS:3136/1965 IS:4540/1968</i>	Hind Rectifier, Usha Rectifier, Suresh Electrical, Pyramid, Automatic Electric, Trinity Elect., Universal Ind. Products, Venus Engg., RS Power or Similar.
43	Battery Charger for battery room	<i>As per RDSO specification having re-generation facility</i>	Amar Raja, Exide, RS Power or Similar.
44	PVC Conduit pipe & Casing capping for electrical wiring	<i>IS:9537/2000</i>	Precision, A.K.G., Polycab, Finolex, Prestoplast or Similar.
45	Aluminum Ladders	<i>IS:4571/1977</i>	Sumer, Beatfire or Similar.
46	LT Panels	<i>IS: 2147-1952 IS:2675-1966</i>	
47	Air Curtain	<i>Relevant IS</i>	Aircon, ALMONARD, Technocrate, Thermadyne, Mitzwak or Similar.

## **11. TERMS AND CONDITION OF PAYMENT:**

### **(a) Stage of payment for electrical work:**

- (i)** 70% payment against supply of material on receipt & acceptance of material by Railway. **(ii)** 30% after successful completion of items / equipment. i.e. after carrying out / execution the work to the testing and commissioned operational satisfaction of Railway. Financial progress will be considered for purpose of performance of the contractor.

### **(b) Advance payment:**

No advance payment will be made and no part payment will have made for supply of materials prior to execution the work.

### **(c) PVC clauses:**

PVC clauses will not be implementing on electrical items due to electrical work cost being less value items.

## **12. RAILWAY MATERIALS PROCLAMATION-HAND RECEIPT(RMP-HR) :** Contractor or his representative

always kept a jointly (Railway and Firm's) signed copy of railway materials proclamation-hand receipt **(RMP-HR)** kept at **site office to show during the** any inspecting of railway authorities at site or to better evolution the further requirement of materials as well as saving statement of materials. Its binding on contractor to sign and kept at site office the Railway materials proclamation-hand receipt **(RMP-HR)**. If contractor deny or failed, its treated escaping form site and its may become cause of slow progress. The tenderer shall be responsible to see that the materials such as cable or any other material supplied by the Administration are utilized for the sole purpose for, which they have been issued to him, failing which, he is liable to be dealt with according to law for any misuse of these commodities by himself, his agents or workmen etc.

## **13. SECURITY OF MATERIALS:**

1. Once the material is handed over to the contractor, the contractor shall be responsible for the security of material irrespective of the fact that the material is kept in Railway premises. The contractor shall make adequate arrangements at site as deemed necessary for guarding the same from the thefts and any sort of damage by outsiders or his labour.
2. The cost of stores lost shall be realized by the Railway out of any payments due to the contractor in this contract or from any other contract under execution by Govt. of India of its enterprises.
3. The Contractor will indemnify all the Stores handed over to him and will execute the Indemnity Bond for this purpose on standard Performa given along with these documents in Annexure-XVII of tender documents. Execution of the Indemnity Bond will precede handing over any material to the Contractor.

## **14. RETURN OF SURPLUS STORE:**

- (a)** The stores found to be surplus shall be returned to Consignee by the Contractor with his own staff with immediate effect and proper (-) minus hand receipt will be issued to contractor on receipt of surplus material by the Railway depot staff.
- (b)** The contractor shall account for all materials that were issued to him. A register shall be maintained by the contractor, which shall be signed by the Contractor as a token of receipt of materials. All the issued materials shall either be used in the installation or returned to Consignee.

## **15. RETURN OF RELEASED STORES:**

- (a)** Released materials shall be handed over to Consignee in systematic manner. Proper care should be taken while releasing & transporting the material at General Stores, or at a place as demanded by the Railways.

- (b) If any extra quantity of Railway materials over and above that shown in the drawing or any extra quantity of Railway materials over the standard scale have been issued to the contractors due to wastage, workmanship or any other reason or if in the opinion of the Engineer, the Railway materials have not been accounted for by the contractor/s, satisfactorily or have not been used on benefited Railway works allotted to the contractor(s), the cost of such Railway materials will be recovered from the contractor.
- (c) In case of Electrical items is issued to the contractor(s) by the Railway either free of cost or on cost for use on works, the supply thereof shall be made in stages, limited to the quantity/quantities computed by the Engineer's representative, according to the prescribed specifications and drawings.
- (d) The Electrical items supplied by Railway in excess of the requirement as above shall be returned at the place of issue, in perfectly good condition by the contractor/s to Railway immediately after completion of work or determination of the contract. If the contractor(s) fails to return the said materials supplied by Railway in excess of the requirements as computed by the Railway according to the specifications and approved drawings, the cost of these materials will be recovered from the contractor(s) @ one and half times the prevailing procurement cost at the time of the last issue or one and half times the current price of the material after completion of the particular phase of the work, whichever is higher plus 7% freight, viz.  $\{1.5 \times (\text{Purchase price or current price}) + 7\% \text{ freight, only}\}$ . This will be without prejudice to the rights of the Railway to take action against the contractor(s) under the conditions of the contract for not doing/completing the work according to the prescribed specifications and approved drawings.
- (e) Royalty, Octroi and other charges on materials to be supplied by the contractor for construction of work except those to be supplied by the Railway will be borne by the contractor/s.

The main tenderer shall be responsible for acts of commission and omission of the associate electrical contractor. The entire electrical work is to be executed by the associate electrical contractor only and no change shall be allowed in associated electrical contractor during currency of the contract. However in case of any force majeure, competent authority may permit another eligible associate electrical contractor.

#### 16. MAINTENANCE / WARRANTY PERIOD 12 MONTHS:

After the equipment's, system/sub-systems have been installed and commissioned, the contractor shall be responsible for proper maintenance & supervision, free of cost, of the equipment's, system/sub-systems till a period of one year (12<sup>th</sup> Months) for general electrical works /equipment from the date of commissioning as per final completion report issued by Engineer. In the free maintenance period, contractor will provide all the spares required for such maintenance free of cost.

This free maintenance period will include: -

- i. Maintenance and upkeep of all equipment.
- ii. Attending to break-downs immediately,
- iii. Periodical preventive maintenance.
- iv. Repair/replacement of defective parts.
- v. Operating the existing system satisfactorily.

- (a) The contractor shall give warranty / provide maintenance for satisfactory working of all the type LED lights fittings installed, erected & commissioned by him in this tender, for a period of five year (60<sup>th</sup> months) from the date of commissioning as per final completion report issued by Engineer.
- (b) For this purpose, contractor shall prepare a maintenance plan and make available the services of maintenance Engineer and Staff who will maintain and supervise the system.
- (c) During this free maintenance period, if any deficiency/fault is noticed in the functioning as a result of any defect in design or manufacture, the same will be rectified by the contractor at his own cost.
- (d) During such rectification if any faulty equipment/modules/ cards/system/ subsystem/part either in hardware or in software or any other form, need replacement or repair, they shall be provided by the contractor free of cost from the set of equipment or modules that the contractor should bring to the site of installation in addition to all the materials to be supplied against this contract.

- (e) Working hours for the system will be twenty-four hours. If any failure takes place, then the maintenance personnel so deputed will immediately attend & rectify the failure. If he fails to rectify the failure within 24 hours from the time of information communicated to him by means of fax, telegram, SMS, email, telephone, WhatsApps or any other method of communication. A penalty will be imposed @ Rs.1000/- per day per system and part thereof after recorded intimation of failure to contractor or his authorized representative, which will be recovered from the payments payable to contractor or from the security deposit or firm may deposit through MR or if penalty is more than SD /PG,, than recovery will be done from contractual bills of this office or this railway or IR. Further if any failure is not rectified after 48 hrs from the time of information communicated to him as above, Railway may proceed to rectify it departmentally or by outsourcing at contractor's risk & cost. Penalty of Rs.5000/- plus cost of such rectification will be deducted from the payments due to the contractor or from the SD/PG payable to the contractor.
- (f) No part refund of Security Deposit shall be permitted during the maintenance period mentioned above.

#### **17. INSTRUCTION FOR COMPLIANCE OF WARRANTY:**

- (a) The contractor shall warranty that all materials & equipment's to be supplied and installed as per this tender shall be free from defects and faults in design, material, workmanship and manufacture and shall be of the highest quality and consistent with the established and generally accepted standard for materials of the type ordered and in full conformity with the contract specifications.
- (b) The contractor shall give warranty / provide maintenance for satisfactory working of all the general equipment's & installations erected & commissioned by him in this tender, for a period of one year (12<sup>th</sup> Months) from the date of commissioning as per final completion report issued by Engineer.
- (c) The contractor shall give warranty / provide maintenance for satisfactory working of all the type LED lights fittings installed, erected & commissioned by him in this tender, for a period of five year (60<sup>th</sup> months) from the date of commissioning as per final completion report issued by Engineer.
- (d) During the period of Warranty, the contractor shall keep available experienced engineer & technician and necessary equipment to attend to any defective installation. The Contractor shall bear the cost of all modifications, additions or substitutions that may be considered necessary due to faulty material, decision regarding this shall rest with the Engineers
- (e) During the period of Warranty, the contractor shall be liable for the replacement of any equipment & any parts which may be found defective, whether such equipment be of his own manufactured or those of his sub-contractor, whether defect arising from faulty design, material, workmanship or negligence in any manner on the part of the Contractor, at his (Contractor's) own expenses. In case of defect of similar type detected in contractor's equipment & components during the warranty period, the contractor shall replace complete lot of the items irrespective of the fact that whether all such items have failed or not. The Contractor shall bear the cost of repair carried out on his behalf by the Purchaser at site due to urgent requirement. In such a case, the Contractor shall be informed in advance of the repair proposed to be carried out by the Purchaser.
- (f) If it becomes necessary for the contractor to replace or renew any defective portion/s of the system under this clause, the provisions of this clause shall apply to the portion of equipment/component/system so replaced for further period of 12 months from the date of such replacement or renewal or until the end of the warranty period whichever may be later. If any defect is not remedied within reasonable time, the Railway may proceed to do the work at contractor's risk and expense, but without prejudice to any other rights, which the Railway may have against the contractor in respect of such defects.
- (g) The repaired or renewed part shall be delivered and erected on site free of charge to the purchaser. The Railway shall have right for acceptance, rejection of materials at site if the same are not in accordance with the specifications. The terms and conditions of this contract shall also be governed with G.C.C. of Railways.

#### **18. MINIMUM ELIGIBILITY CRITERIA FOR ELECTRICAL WORKS:**

##### **(i) FOR ALL ELECTRICAL WORK:**

The contractor should have valid Electrical contractor license issued by Govt. and submit along

with tender document. The OEM or his authorized dealer will be exempted from license.

(ii) **FOR NIT VALUE MORE THAN 50 LAKH:** Applicable

SN	Type of work	Similar nature of work for eligibility
1	Supply, installation, testing and commissioning & maintenance of LT/HT network, transformer, switchgears, streetlight, high mast, APFC, solar light/heater/distilled water plant, wiring, illumination, earthing, pumping installation, desert coolers, room air conditioners (WAC/Split) water cooler, room heater, LED signage & other type illuminated signage, UPS/inverters other than coaching stock and DG sets up to 250 KVA.	Any electrical work related to HT/LT installation
2	Supply, installation, testing, commissioning and maintenance of DG sets above 250 KVA excluding Coaching Power cars	Work of DG set & associated works above 250KVA
3	Repair & maintenance of 500 kVA DG Set of Power Car	Annual maintenance of repair and maintenance/overhauling work of DG set of 250 kVA and above for stationary/mobile vans of Railways or Government Agencies or Govt. Public Sector Under taking
4	Supply, installation, testing, commissioning and maintenance of passenger/goods lifts/escalators	Work of lifts/escalators
5	Supply, installation, testing, commissioning and maintenance of fire detection & alarm system	Work of fire detection & alarm system
6	Supply, installation, testing, commissioning and maintenance of building management/automation system	Work of building management/automation system
7	Supply, installation, testing, commissioning and maintenance of fire fighting system of all types	Work of fire fighting system
8	Supply, installation, testing, commissioning and maintenance of centralized heating/air conditioning & air-cooling stationary plants.	Work of centralized air condition/cooling
9	Supply, installation, testing, commissioning, maintenance and addition / alteration/ modification in AC system of coaches.	The OEM of AC plants/RMPU used in coaches or authorised representative of OEM or work related to air conditioning on coaches with proof/ certificate of genuineness from OEM for the components/ equipment used in the system.
10	Hiring of AC coach attendant services	Work experience in providing service personnel/air condition coach attendant (ACCA) in AC coaches of trains
11	Provision of mobile/laptop points in AC/TL	Any electrical work involving

	coaches	Electrical wiring/lighting on coaching vehicle.
12	GPS based passenger information system in AC coaches	Work involving supply, erection and commissioning of GPS based passenger information system in rolling stock
13	Supply, installation & maintenance of water purifiers/ Aqua Guards for hygienic drinking water supply	Work experience in supply, installation and maintenance of water purifiers/aqua guards
14	Design, supply, erection, testing and commissioning of VVVF drive complete along with its panel and other accessories for testing of alternators	Design, manufacturing, supply, erection, testing and commissioning of VVVF drive for any application, along with its panel and other accessories
15	Automation of pumping installations at station in connection with UNDP/GEF funded project on improving energy efficiency in Indian railway.	Supply, erection, testing & commissioning of automatic electronic switching of platform lighting energy management system/automation of pumping installation/automatic street lighting and flood light towers for energy conservation. OR Automation of pumps with the help of GSM/GPRS technology OR Design, supply, installation & commissioning of Energy management system.
16	Design, manufacturing, supply, installation, testing and commissioning of heavy duty passenger elevators (Lifts) with AMC	Design, manufacturing, supply, installation, testing and commissioning of passenger/Luggage elevators (Lifts) with or without AMC
17	Provision of 640 Wp capacity Solar Photo voltaic modules	<p><b>Definition of Similar work:</b> Meaning of similar work is that any work which consists of “Design, Manufacture, Supply, Erection, Testing and Commissioning of Solar Power Plant with or without AMC”.</p> <p><b>or</b> “Design, Manufacture, Supply, Erection, Testing and Commissioning of Solar Photovoltaic Lighting Arrangement with or without AMC, shall be considered as a similar work for the purpose of proof of technical experience/competence”.</p> <p><b>In addition to above, following Eligibility criteria is mandatory in this tender as per specification</b> –The manufacturer from whom the bidder will take the PV modules must possess experience as a manufacturer for at least five years.</p> <p>And The bidder must have experience of Supplying, Installation and Commissioning</p>



		<p>of Solar Photo Voltaic Off-Grid System of Cumulative Capacity <b>15kWp</b> or above to Railways and/or to any other Government /PSUs in last three years in India.</p> <p>And</p> <p>The bidder must have the facility to integrate the system and should be MNRE Approved SystemIntegrator or their approved channel partners/dealers.</p>
18	Repair reconditioning and upgradation of out of warranty defective different make 25 kW capacity ERRUs to Rev-3 or latest	<p>The similar nature of work will be (i) repair or upgradation of 4.5kW or 25 kW ERRUs or RRUs or</p> <p>(ii) repair or AMC of 25 KVA AC coach inverters of</p> <p>(iii) Repair of pre-cooling battery chargers of 200Acapacity or (iv) repair of 4.5 kW or 25 kW alternators or (v) Repair or AMC of RMPU along with control panel of AC coaches.</p>
19	Comprehensive Maintenance Contract for Fire Fighting system& Fire Alarm System.	<p>Definition of Similar work:</p> <p>Installation or maintenance work of Fire Detection and Alarm system &amp; work of Fire Fighting System.</p>
20	33/11 kV Sub-station and allied work.	<p>Definition of Similar work:</p> <p>Design, manufacture, supply, erection, testing and commissioning of 33 KV or above substation with HT panel complete or a part of it with or without APFC panel.</p>
21	Supply, Installation, Testing and commissioning of web based energy monitoring and control system.	<p>Definition of Similar work:</p> <p>Supply, erection, testing and commissioning of automatic electronic switching of platform lighting energy management system / automation of pumping installation/ automation of pumping installation/automation street lighting and flood light towers for energy conservation.</p> <p>Or</p> <p>Automation of pumps with the help of GSM technology</p> <p>Or.</p> <p>Design, supply, installation and</p>

		commissioning of Energy management system.
22	Display cum-announcement system on important mail/express trains on Indian Railways	<p>Similar nature of work would mean the work of “Passenger information System” or “Display cum announcement system” in coaching trains of Indian Railways as per RDSO specification no. RDSO/PE/SPEC/AC/0087-2008 (Rev.1)</p> <p>Or</p> <p>“RDSO approved sources for passenger information system for AC and non AC coaches as per RDSO specification no. RDSO/PE/SPEC/AC/0087-2008(rev.1)” will also be eligible, subject to meeting the limits of eligibility criteria.</p>
23	Out sourcing of Escorting activity (Duties of ACCI & Electrical supervisor) & Trip maintenance of AC coaches	<p>Any of the approved sources of RMPU and its control panel as per latest RDSOs vendor directory.</p> <p>or</p> <p>Maintenance and escorting activities of Electrical equipment in AC coaches.</p> <p>or</p> <p>Repair and maintenance of air conditioning /DG sets/power equipment in coaches/rolling stock/power cars</p> <p>Or</p> <p>Repair and maintenance of central air conditioning units/stationary AC units /chillers/water coolers.</p>
24	Manning, operation & cleaning of lifts/Elevators	<p>The contractor should have executed any electrical work for maintenance /manning/operation of lifts/ elevators/ escalators/ travellers.</p> <p>Or</p> <p>The contractor should have executed the work for manning / operation of any lift/ elevator/ escalator/travellers.</p> <p>The work must have been carried out in any of the following organizations: -</p> <p>(a) Central govt. department or state govt. department.</p> <p>Or</p>

		(b) Central govt. PSUs or State govt. PSU.
25	Manning, Operation & cleaning of Escalators/ Travellators	<p>The contractor should have executed any electrical work for maintenance /manning/operation of lifts/ elevators/ escalators/ travellators.</p> <p>Or</p> <p>The contractor should have executed the work for manning / operation of any lift/ elevator/ escalator/travellators.</p> <p>The work must have been carried out in any of the following organizations: -</p> <p>(c) Central govt. department or state govt. department.</p> <p>Or</p> <p>(d) Central Govt PSUs or State govt. PSU.</p>
26	Daily, FNE, Monthly maintenance including cleaning activity of fans, Lights, Batteries and other electrical equipment of TL Coaches.	<p>The firm should have carried out the work of AMCoF Electrical equipment in TL/SGAC/EOG AC coaches.</p> <p>Or</p> <p>The firm should have carried out repair/rehabilitation of electrical equipment in TL/SGAC/EOG AC coaches</p> <p>Or</p> <p>The firm should have carried out electrical modification work including wiring in TL/SGAC/EOG AC coaches</p> <p>Or</p> <p>The firm should be RDSO/RCF/ICF approved sources as per latest Master list having supplied electrical equipment of TL/SGAC/EOG AC coaches.</p> <p>Or</p> <p>The tenderer should have executed any work relating to fitment of any of the electrical fitting with or without supply of the fitting in TL/AC/EMU/MEMU coaches in Division/Workshops/Production units.</p>

27	Provision of IOT devices/ Intelligent Field Devices (IFDs) for monitoring & Control (Indian Railways Native IOT based Yield Analysis Telemetry, Recording and Control-IRNIYANTRAC) of electrical general assets like pumps, platform lighting, street lighting, lifts, escalators, substation etc.	Supply, installation, testing and commissioning of IOT devices/ Intelligent Field Devices (IFDs) for web based monitoring & Control of electrical general assets like pumps or platform lighting or street lighting or lifts or escalators or substation.
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#### **19. Use of Railway Land:**

Use of Railway land required by the contractor(s) for constructing temporary offices, quarters, hutments etc. for the staff and for storing materials etc. would be permitted to him/them free of charges by Railway, if available. The location of these offices, hutments, stores etc., will be subject to the approval of the engineer or his authorized representative. The land will be restored to Railway by the contractor(s) in the same condition as when taken over or in vacant condition as desired by the engineer, after completion of the work or at any earlier day, as specified by the Engineer. The failure to do so will make the contractor(s) liable to pay the cost incurred by the Railway for getting possession of land. The tenderer(s) shall also acquaint himself /themselves with the availability of land, working space for his/their works etc. The Railway will not acquire any land for the purpose of movement of vehicles of the Contractor/s for executing the work by the contractor/s.

#### **20. Use of Private Land**

The Contractor will have to make his/their own arrangements for use of private land, outside Railway limits for due fulfillment of contract or for borrow pits, approaches, etc., directly with the land owners or local authority and to pay such rents if any as are payable as maybe mutually agreed upon between them.

#### **21. Figures, Dimensions, etc.**

Figures, dimensions and drawings shall supersede measurements by scale and drawing to larger scale shall take precedence over those to a smaller scale. Special dimensions or directions in the specification shall supersede all else.

#### **22. Plea of Custom**

The plea of custom prevailing will not on any account be permitted as excuse for an infringement of any of the conditions of the contractor specifications.

#### **23. Notice to Public Bodies**

The Contractor(s) shall give to the municipality, police and other authorities all notices that may be required by law and obtain all requisite licenses for temporary obstructions, enclosures and pay all fees, taxes and charges, which may be leviable on account of his operations in executing the contract. He should make good any damage to adjoining premises whether public or private and supply and maintain any lights, etc., required at night.

#### **24. Damage by Accident, Floods or Tides**

The contractor shall take all precautions against damage from accident, floods or tides. No compensation will be allowed to the contractor for his plant or part or material lost or damaged by any cause whatsoever. The contractor shall be liable to make good the damages to any structure or part of structure, plant or material of every description belonging to the administration lost or damaged by any cause during the course of the contractor's work.

The administration will not be liable to pay to the contractor any charges for rectification or repairs to any damage which may have occurred from any cause, whatsoever, to any part of the new/existing structure, during construction.

## **25. SERVICE ROADS**

The Contractor/s will be permitted to make use of existing service roads, or service roads constructed by the Railway for its use free of cost. New service roads required by the contractor/s either near the work site or elsewhere within or outside railway limits for carriage of materials or for any other purpose whatsoever, will have to be constructed and maintained by the contractor/s at his/their own cost. For the purpose of constructions of service roads on railway land, permission will be given free of any charge. If any land other than railway land is necessary to be acquired or to be entered upon, permission to enter in the land will have to be arranged by the contractor/s at his/ their cost. The contractor/s will not refer any claim, whatsoever on this account. The Railway, however, reserves the right to make use of such service roads as may be constructed by the contractor/s without payment of any charges.

## **26. EMERGENCY WORKS**

In the event of any accident or failure occurring in, on or about the work or arising out of or in connection with the construction, completion or maintenance of the works, which in the opinion of the Engineer requires immediate attention, the Railway may bring its own workmen or other agency execute or partly execute the necessary work or carry out repairs if the Engineer considers that the contractor/s is/are not in a position to do so in time and charge the cost thereof, which will be determined by the Chief Electrical Engineer/ Chief Administrative Officer (C), North Western Railway, to the contractor.

## **27. INSTRUCTION / DIRECTIVES OF RAILWAY OFFICIALS:**

### **(a) INSTRUCTIONS / DIRECTIVES OF THE ENGINEER'S REPRESENTATIVE.**

The contractor shall at all times, execute the contract work only in the presence and under the supervision of the Engineer's Representative or a Railway employee specifically appointed on his behalf. No work under the contract shall, therefore, be commenced by the contractor without the express permission of the Engineer's representative.

The contractor shall always execute the work under this contract in strict compliance with the instructions/directives by the Engineer's representative. Any act of non-compliance with the instruction/directives issued by the Engineer's representative shall be considered as a default of the contractor where after the Railway shall be free to take further appropriate action as provided in the contract for dealing with such defaults of the contractors. The decision of the Engineer-in-charge whether there has been an act of non-compliance with the instruction/directives of the Engineer's representative for the purpose of this clause shall be final and conclusive.

The instructions/directives by the Engineer's representative shall not, however, absolve the contractor of his responsibility or reduce his responsibility in any manner whatsoever in regard

to maintaining at all times the safe working conditions at the work site.

**(b) NON-COMPLIANCE WITH THE INSTRUCTIONS/DIRECTIVES OF THE ENGINEER'S REPRESENTATIVE.**

The contractor shall always comply with the instructions/directives issued by the Engineer's representative from the time to time. In the event of any non-compliance with such instructions/directives, apart from and in addition to other remedies available to the Railway as specified herein above the Engineer's representative may employ at the works Railway's workmen with necessary equipment as considered appropriate and adequate by him to provide the requisite conditions for the safe and unhampered movement of Railway traffic. The decision of the Engineer's representatives in regard to the need of appropriateness and adequacy of the deployment of the Railway Workmen with necessary equipment shall be final and conclusive. When the Railway workmen with necessary equipment are deployed in the above manner, recovery at the following rate shall be made from the contractor's dues under this contract or any other money of the contractor available with the Railway under this contract. The recovery for the total Railway Workmen Hours employed at the **rate of Rs. 100/- (Rupees Hundred only) per Workmen-Hour** irrespective of the type and grade of the Railway Employee actually employed. The aggregate period of the Workman-Hours for the above recoveries shall be reckoned from the time the Railway Workmen are actually deployed at the work site till the work is completed to the satisfaction of the Engineer's Representative whose decision in this regard shall be final and conclusive.

During the above mentioned period of suspension of work, the contractor shall not in any manner attempt to carry out any work at the work site. Any such attempt of the contractor shall be deemed to be an unauthorized work on the work site. For such acts, the contractor shall then be liable for further appropriate action under the relevant provisions of the Indian Railway Act.

**28. SHIFTING OF ELECTRICAL/TELEGRAPH WIRES.**

In some stretches, high-tension grid towers /electric telegraph/telephones wires or posts etc. are to be shifted. It is expected that the electric lines/towers will be shifted in reasonable time strictly as per approved plan by Engineer based on extant Rules & Regulations but in case, there is any delay on this account suitable extension in date of completion will be considered and given to the contractor for only the effected portion and no compensation whatsoever in this respect or due to the delay thus caused will be payable and contractor has to adopt such methods of execution of earthwork so as not to cause any damage to existing structure lines etc.

**29. HANDING OVER OF SITE FOR WORK.**

The entire land required for this work is available. However, Railway may not hand over the entire land required for completion of this work for making bank/cutting or excavation to the contractor(s) due to any unavoidable reasons. Land may be handed over in different stretches, which may not be continuous. Contractor(s) will be required to carry out the work in available stretches. If some stretch of land cannot be handed over to the contractor for borrowing earth or making bank/cutting within the contract period then suitable extension will be granted only for the affected portion without any payment of extra claim to the contractor.

### 30. Accident/Natural calamities: -

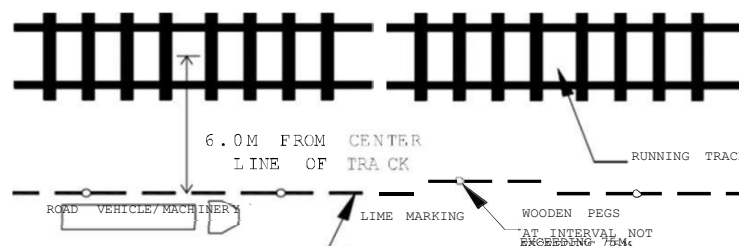
Vehicle and equipments of the contractor can be drafted by Railway Administration in case of Accidents/Natural calamities involving human lives. For payment purpose, the item may be operated as New Non-Schedule (NS Item) as per existing norms and powers delegated. Contractor may submit list of vehicles and equipment available with him.

### 31. Safe working of contractors (Extract of para 826 of IRPWM) :- A large number of men and machinery are deployed by the contractors for track renewals, gauge conversions, doublings, bridge rebuilding, railway electrification etc. It is therefore essential that adequate safety measures are taken for safety of the trains as well as the work force. The following measures should invariably be adopted.

- (i) The contractor shall not start any work without the presence of railway supervisor at site.
- (ii) Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the Railway's schedule of dimensions. For this purpose, the area where road vehicles and/or machinery are required to ply, shall be demarcated and acknowledged by the contractor. Special care shall be taken for turning/ reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per site conditions.
- (iii) The look out and whistle caution orders shall be issued to the trains and speed restrictions imposed where considered necessary. Suitable flagmen/detonators shall be provided where necessary for protection of trains.
- (iv) The supervisor/workmen should be counseled about safety measures. A competency certificate to the contractor's supervisor as per Performa annexed shall be issued by Engineer or his authorized representative, which will be valid only for the work for which it has been issued.
- (v) The unloaded materials for tender work after unloading from track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.
- (vi) Supplementary site specific instructions, wherever considered necessary shall be issued by the Engineer in Charge.

### 32. PLYING OF ROAD VEHICLES AND WORKING OF MACHINERIES CLOSE TO RUNNING TRACKS

- (i) Normally, the road vehicles shall be run or machinery shall be worked so as not to come closer than 6.0m from centre line of nearest running track.
- (ii) The land strip adjacent to running tracks, where road vehicle is to ply or machinery is to work, shall be demarcated by lime in advance in consultation with the Railway's Supervisor. Wooden pegs at



interval not exceeding 75mts shall be provided along the line marking as permanent marks. The road vehicles shall ply or machinery shall work so as not to infringe the line of demarcation.

- (iii) If a road vehicle or machinery is to work closer to 6.0m due to site conditions or requirement of work, following precautions shall be observed.
  - a. In no case the road vehicle shall run or machinery shall work at distance less than 3.5m from centerline of track.

- b. Demarcation of land shall be done by bright colored ribbon/nylon chord suspended on 75cm high wooden/bamboo posts at distance of 3.5 m from centre line of nearest running track.
  - c. Presence of an authorized Railway's representative shall be ensured before plying of vehicle or working of machinery.
  - d. Railway's Supervisor shall issue suitable caution order to Drivers of approaching train about road vehicles plying or machineries working close to running tracks. The train drivers shall be advised to whistle freely to warn about the approaching train. Whistle boards shall be provided wherever considered necessary.
  - e. Lookout men shall be posted along the track at a distance of 800m from such locations who will carry red flag and whistles to warn the road vehicle/machinery users about the approaching trains.
- (iv) On curves where visibility is poor, additional lookout men shall be posted. If vehicle/machinery is to be worked closer to 3.5m from running track. Under unavoidable conditions, if road vehicles is to ply or machinery is to work closer to 3.5m due to site conditions or requirement of work, following precautions shall be observed:
- a. Plying of vehicles or working of machinery closer to 3.5m of running track shall be done only under protection of track. Traffic block shall be imposed wherever considered necessary. The site shall be protected as per provisions of Para No. 806 & 807 of P-Way Manual as case maybe.
  - b. Presence of a Railway's Supervisor shall be ensured at worksite.
  - c. Railway's Supervisor shall issue suitable caution order to Drivers of approaching train about road vehicles plying or machineries working close to running tracks. The train drivers shall be advised to whistle freely to warn about the approaching train.
- (v) Precaution to be taken while reversing road vehicle alongside the track.  
The location where vehicle will take a turn shall be demarcated duly approved by Railway's representative. The road vehicle driver shall always face the Railway track during the course of turning/reversing his vehicle. Presence of an authorized Railway representative shall be ensured at such location.
- (vi) Road vehicle shall not be allowed to run along the track during night hours generally. In unavoidable situations, however, vehicles shall be allowed to work during night hours only in the presence of an authorized Railway's representative and where adequate lighting arrangements are made and where adequate precautions as mentioned earlier have been ensured.
- (vii) Road vehicles/machinery/plant etc. when stabled near running tracks shall be properly secured against any possible roll off and always be manned even during off hours.

### **33. EXECUTION OF WORKS CLOSE TO OR ON RUNNING LINES**

- (i) Any work close to or on running tracks shall be executed under the presence of a Railway's Supervisor only.
- (ii) Precaution to be taken to ensure safety of trains while execution of work close to the running line or on running lines.
  - a. Such works shall be planned and necessary drawings particularly with regard to infringement to moving dimensions shall be finalized duly approved by competent authority before execution of work.



The work shall be executed only as per approved procedure and drawings.

- b. All temporary arrangements required to be made during execution of work shall be made in such a manner that moving dimensions do not infringe.
- c. Suitable speed restriction shall be imposed or Traffic block shall be ensured as required.
- d. The site shall be protected as per provisions of Para No. 806 & 807 of P-Way Manual as case may be
- e. Necessary equipment for safety of trains during emergency shall be kept ready at site.

(iii) Precaution to be taken to ensure safety of electrical/signal/ telephone cables while excavating near tracks.

- a. Particular care shall be taken to mark the locations of buried electrical/signal/telephone cables on the plans jointly with S & T/Electric supervisor and also at site so that these are not damaged during excavation.
- b. Copy of the cable plan should be given to the contractor's authorized representative before handing over the site to start the work.
- c. Due care shall be taken to ensure that any part of the equipment or machinery or temporary arrangement does not come close to cables while working.

(Ref: JPO issued by Railway Board vide letter no. 2003/Tele/RCIL/1 pt. IX dated 24.06.2013 (Telecom circular no. 17/2013) for undertaking digging work in the vicinity of signalling, electrical and telecommunication cable will be followed during the execution of work. )

(iv) Precaution to be taken during execution of works requiring traffic blocks.

- a. Any work, which infringes the moving dimensions, shall be started only after the traffic block has been imposed.
- b. Before closing the work, the track shall be left with the proper track geometry so that the trains run safely.
- c. After completion of work the released sleeper and fittings should be properly stacked away from the track to be kept clear of moving dimensions.
- d. Block shall be removed only when all the temporary arrangement, machineries, tools, plants etc. have been kept clear of moving dimensions.

(v) Precaution to be taken during execution of works during night.

The work close to running line, generally, shall be carried out only during day hours. At locations, however, where night working is unavoidable, proper lighting arrangement should be made and all safety aspects should be strictly observed. The engineering indicator boards shall be lightened during night hours as per the provisions of P-Way Manual. The staff deputed for night working should have taken adequate rest before deploying them in night shift. We can specify duration of night shift from 20.00 hrs to 04.00 hrs. All other safety precautions applicable for daytime work should be strictly observed during night working.

(vi) Precautions to be taken to ensure safety of workers while working close to running lines.

- a. Necessary lookout men with red flags and whistles shall be provided to warn the workmen about the approaching train.
- b. Railway's supervisor shall issue suitable caution order to Drivers of approaching train for whistling to warn the workers about the approaching train. Whistle boards shall be provided wherever considered necessary.
- c. A "First aid kit" shall always be kept ready at site.

(vii) Precaution shall be taken for safety of public or passengers, while executing works at locations, used by passengers and public.

The worksite shall be suitably demarcated to keep public and passengers away from work area. Necessary signage boards such as "Work in progress. Inconvenience is regretted" etc. shall be provided at appropriate locations to warn the public/ passengers. Adequate lighting arrangement of worksite wherever required shall be done to ensure safety of public/passengers during night.

- (viii) Precaution to be taken before stacking materials alongside the track to ensure that safety of trains is not affected.

The following precautions shall be taken before stacking the materials along the track for stacking of Electric poles, Cables , OHE masts, Contact wires, Catenary wires etc.

- a. The sites for material stacking should be selected in advance in such a manner to ensure that no part of the material to be stacked is infringing to the Standard Moving Dimensions. A plan of proposed stacking locations be made and signed jointly by an authorized Railway's representative and contractor's representative.
  - b. The selected locations shall be marked by lime in advance.
  - c. Presence of an authorized Railway's representative while unloading and stacking shall be ensured.
  - d. The materials shall be stacked in such a height so as to not to infringe SOD in case of accidental roll off.
- (IX) Precautions to be taken during working in RE areas – Necessary precautions to be taken during working in electrified / under electrification sections by contractor or his representative/staff (Ref: Elect. HQ office letter no. EL/Safety/2/power/Pt. III dated 20.11.2013.

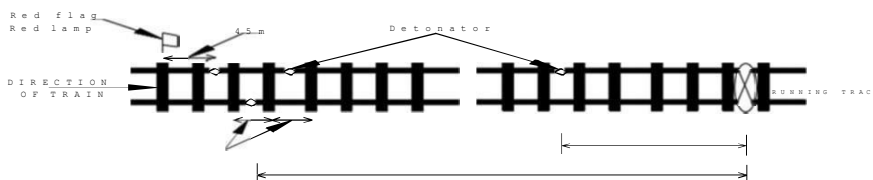
#### 34. PROTECTION OF TRACK DURING EMERGENCY

- (i) **Action to be taken when a contractor's supervisor or vehicle operator apprehends any unusual circumstances likely to infringe the track and endanger safe running of trains.**

At any time if a contractor's supervisor or vehicle operator observes any unusual circumstances likely to infringe the track and apprehend danger to safe running of track, he shall take immediate steps to advise a Railway official of such danger and assist him in protection of track.

The track shall be protected as under. One person shall immediately plant a red flag (red lamp during night) at the spot and proceed with all haste in the direction of approaching train with a red flag in hand (red lamp during night) and plant a detonator on rail at a distance of 600m from the place of obstruction of BG track (400m for MG track) after which he shall further proceed for not less than 120 0m from the place of obstruction from BG track (800m for MG track) and plant three detonators at 10m apart on rails. After this he shall display the red flag (red lamp during night) at a distance of 45m from the detonators.

Attempts shall also be taken to send an advice to nearest Railway station about the incident immediately.



- (ii) Action to be taken if train is seen approaching to site of danger and there is no time to protect the track as per guidelines mentioned above?
- (iii) In such a case the detonators shall be planted on rails immediately at distance away from place of danger as far as possible and attention of driver of approaching train shall be invited by whistling, waving the red flag vigorously, gesticulating and shouting.
- (iv) What action shall be taken if more than one track is obstructed?
  - a. In case of single line protection as above shall be done in both the directions from place of danger.
  - b. In case of double line or multiple lines, if other tracks are also obstructed, the protection as above shall be done for other track also.
  - c. The protection shall be done in that direction and on that track first on which train is likely to arrive first.
  - d. The Contractor's Supervisors, Operators and lookout men shall be properly explained about the direction of trains on running tracks.
- (v) Equipment required for protection of track.  
Minimum complement of protection equipment i.e. 10 detonators, 4 red hand flags, 4 red hand lamps, 4 banner flags and whistles etc. shall always be kept ready at worksites for use in case of emergency. Railway will arrange to provide detonators, whereas Contractor shall arrange other equipment at his own cost.
- (vi) Arrangement of lookout men and competency required for lookout man to warn labour about approaching train.
  - a. Contractor will provide lookout men.
  - b. The lookout men shall be properly trained in warning to staff at worksite about approaching train.
  - c. Only those lookout men shall be provided at site who have been issued with a competency certificate by the Railway's Supervisor.
  - d. In case, it is felt necessary to provide lookout men by Railway, the charges for the same as fixed by Railway Administration shall be recovered from Contractor.

### 35. Training to Supervisors and Operators of Contractor.

1. The Supervisors and Operators of the contractor proposed to be deployed at work site, which is close to the running track, shall be imparted mandatory training by the Railway at site free of cost about the safety measures to be adopted while working in the vicinity of running track. Engineer-in charge of the work shall decide the scale, extent & adequacy of training. In case training is imparted at a recognized Railway training institute, the charges for the same, as decided by Railway, shall be recovered from contractor. A competency certificate to this effect to the individual Supervisor/Operator shall be issued as given below, by a Railway Officer not below the rank of Assistant level. No Supervisor/Operator of the Contractor shall work or allowed to work in the vicinity of running track who is not possession of valid competency certificate.

All the labour, materials, tools, plants etc. except detonators, required for ensuring safe running of trains shall be provided by Contractor at his own cost. Wherever lookout men are provided by Railway, charges at the rate of Rs. 500/- per man day shall be recovered from Contractor.

#### Competency Certificate

Certified that Shri \_\_\_\_\_ Supervisor/Operator of M/s. \_\_\_\_\_ has been trained and examined in safety measures to be followed while working in the vicinity of running railway track for the work \_\_\_\_\_. His knowledge has been found satisfactory and he is capable of

supervising the work safely. This certificate is valid only for the work mentioned in this certificate only.

Signature and designation of the officer

### **36. JOINT PROCEDURE ORDER FOR UNDERTAKING DIGGING WORK IN THE VICINITY OF UNDERGROUND SIGNALLING, ELECTRICAL & TELECOMMUNICATION CABLES**

Following joint procedure shall be followed while carrying out any digging work near to existing signaling & telecommunication and electrical cables so that the instances of cable cut due to execution of works can be controlled and minimized.

Before taking up any digging activity on a particular work by any agency, concerned Sr. DSTE and Sr. DEE/.../Dy.CEE/... of the section shall be approached in writing by contractor for permitting to undertake the work. Sr. DSTE and Sr. DEE/.../Dy.CEE/..., after ensuring that the concerned executing agencies (contractor) have fully understood the S&T and Electrical cable route plan, shall permit the work in writing within 7 days of the request made for the same.

After getting the permission from S&T and/or Electrical department as the case may be, the relevant portion of the cable route plan shall be attached to the letter through which permission is issued to the contractor for commencement of work and ensuring that the contractor have fully understood the cable route plan and precautions to be taken to prevent damage to the underground cables. The contractor shall be asked to study the cable plan and follow it meticulously to ensure that the safety of the cable is not endangered.

On receiving the above information from contractor, SE/Sig. or SE/Tele or SE/ Electrical (Const., TRD or G) shall visit the site on or before the date of taking up the work and issue permission to the contractor to commence the work after checking that adequate precautions have been taken to avoid the damage to the cables. The permission shall be granted within 3 days of submission of such request.

The name of the contractor, his contact telephone number, the nature of the work shall be notified in the Electrical & S&T control as soon as the concerned S&T / Electrical officials issue the letter authorizing commencement of work to the contractor. Control / Test room shall be given copies. Control/Test room shall collect any further details from the Engineering control and shall pass it on to S&T/Railtel & Electrical officials regularly. In case the supervisors of concerned departments do not turn up on the day as advised in terms of Para 39.3 above, the work of contractor shall not be stopped on this account.

In all the sections where major projects are to be taken up/going on, Electrical department shall deploy their officials to take preventive/corrective action at site of work. As regards other departments, the officials may be deputed on need basis.

The works of excavating the trench and laying of the cable should proceed in quick succession, leaving a minimum time between the two activities.

In case damage is caused to OFC/Quad cable/Electrical cable/Signaling cable during execution of the work, the contractor is liable to pay a penalty for damaging the cable. Penalty shall not be levied in case of the following: -

- (i) Detailed cable route plan is not provided by concerned department or cable is not protected as per laid down procedures.

- (ii) The alignment of the cable does not tally with the information provided to the contractor.
- (iii) The cable depth is found to be less than 800 mm from normal ground level.
- (iv) No representative of S&T/Electrical department was available at site guarding the cables on the fixed pre-determined date and time.

Penalty to be imposed for damages to cable shall be as under:-

Cable damaged	Penalty per location
Only Quad cable or Signaling cable	Rs. 1.0 Lakh
Only OFC	Rs. 1.25 Lakh
Both OFC & Quad	Rs. 1.5 lakh
Electrical Cable	Rs. 1.0 Lakh

In case of damage to OFC, RailTel should be paid 5/6<sup>th</sup> of the penalty recovered. RailTel shall raise demands on the S&T department in this regard.

All types of Signaling & OHE bonds i.e. rail bond, cross bond and structure bond shall be restored by the contractor with a view to keep the rail voltage low to ensure safety of personnel.

S&T cable and Electrical cable route plan should be prepared by the concerned S&T and Electrical officers respectively and go t approved before undertaking the work. The completion cable route plan should be finalized block section by block section as soon as the work is completed. All cable laying works shall be executed as per laid down technical specifications, such as protection measures/ protective cover, compaction of refilled material etc. (Ref: JPO issued by Railway Board vide letter no. 2003/Tele/RCIL/1 pt. IX dated 24.06.2013 (Telecom circular no. 17/2013) for undertaking digging work in the vicinity of signaling, electrical and telecommunication cable will be followed during the execution of work.

## SCHEDULE OF RATES & TECHNICAL SPECIFICATIONS

NORTH WESTERN RAILWAY	
Schedule of Rates	
Tender No.: EL/JP/11/2026-27	Date of opening: 06.07.2026
Details of sanctioned estimate: NWR-JP-JP/240/2025-O/o Dy.CE/GSU/JP/NWR dt 25.02.2026, NWR-JP-JP/241/2025-O/o Dy.CE/GSU/JP/NWR dt 07.01.2026, NWR-JP-JP/7/2026-O/o Dy.CE/GSU/JP/NWR dt 06.03.2026 (PH-16,42 & 53)	
<b>Name of work:</b> Electrical work in connection with [1] Development of 2nd entry at Dahar Ka Balaji (DKBJ) station, [2] Balance work of Development of infrastructure for maintenance of Train sets in coaching depot at Jaipur, [3] One Longer loop line with Platform and one additional line with Platform at Dahar Ka Balaji Station	

NS	Description	Ut	Qty	Rate	Total
A	Electrical Work				Cash
1 NS	Supply of material and wiring of LP/TP/FP/Ex.Fan point with 1.5sqmm PVC single core multi-stranded copper wire insulated concealed in stone/brick masonry wall in 19/20 mm PVC conduit with 1.5sqmm PVC wire insulated copper for earth wire 1-way/2-way switch 5/6A as required and good quality ceiling rose including connection (MODULAR) as per spec	No.	290	336.20	97498
2 NS	Supply and fixing 5/6A plug 5-pin 230V with switch, board and wiring with 2.5sqmm PVC CU cable as per spec.	No.	77	182.15	14025.55
3 NS	Supply and fixing 15/16A power socket with switch on flush type sheet metal box and connection as per spec	No.	60	181.20	10872
4 NS	Supply and fixing of Metal Clad Plug Socket 20A single phase with 32A MCB including fixing and sheet metal enclosure box with one 20A plug top (Ray roll type) to be supplied with board as per spec.	No.	34	708.55	24090.7
5 NS	Supply and fixing ceiling of fan regulator electronic type 5-step as per spec	No.	75	301.43	22607.25
6 NS	Supply and fixing 12 module plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC	No.	35	237.25	8303.75
7 NS	Supply and fixing 8 module plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC	No.	23	215.41	4954.43
8 NS	Supply and fixing 6 module plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC	No.	20	167.46	3349.2
9 NS	Supply and fixing 4 module plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC	No.	13	122.92	1597.96
10 NS	Supply and fixing 2 module plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC	No.	13	94.03	1222.39
11 NS	Wiring of sub-main with 2x2.5 sqmm PVC insulated, single core, multi-stranded copper wire in PVC conduit concealed and 1.5sqmm PVC insulated, single core, multi-stranded copper wire for earth wire as per spec	Mtr	1000	66.04	66040
12 NS	Wiring of sub-main with 2x4 sqmm PVC insulated, single core, multi-stranded copper wire in PVC conduit concealed and 1.5sqmm PVC insulated, single core, multi-stranded copper wire for earth wire as per spec	Mtr	760	112.29	85340.4
13 NS	Wiring of sub-main with 2x6 sqmm PVC insulated, single core, multi-stranded copper wire in PVC conduit concealed and 2.5sqmm PVC insulated, single core, multi-stranded copper wire for earth wire as per spec	Mtr	450	114.07	51331.5
14 NS	Supply, Laying, connection and commission of sub-main 2x10 sqmm with PVC insulated single core copper conductor cable and same size (10sqmm) PVC insulated copper conductor for earthing wire in 19/20 mm ISIPVC conduit in	Mtr	200	303.02	60604

	recessed/ on surface as per site requirement etc. of various size cable as below as per specification.				
15 NS	Fixing of LED light fitting with PVC insulated, multi-stranded copper wire for connection as per site requirement as per spec	No.	323	62.06	20045.38
16 NS	Fixing of ceiling fan with clamp, hooks and down rod as per requirement and connection as per spec	No.	65	197.29	12823.85
17 NS	Supply and Providing GI Pipe Earthing of 4meter length as per spec	No.	32	1457.32	46634.24
18 NS	Supply, fixing, testing and commissioning of RCBO 63A, Four pole, 30mA with Earth leakage, overload and short circuit protection as per spec	No.	8	3032.75	24262
19 NS	Supply, fixing, testing and commissioning of Distribution Board double door, 3-phase and neutral with incoming 63A 4-pole MCB and outgoing 12Nos. MCB 6-32A single pole as per spec.	No.	8	4579.84	36638.72
20 NS	Supply, fixing, testing and commissioning of RCBO 25A, double pole, 30mA with Earth leakage, overload and short circuit protection as per spec	No.	13	1960.68	25488.84
21 NS	Supply, fixing, testing and connecting of Distribution Board with incoming 32A, single phase, DP MCB and outgoing 8Nos. single pole MCB 6-16A as per spec	No.	13	2588.32	33648.16
22 NS	Supply, fixing, testing, installation, commissioning and charging of 11kV 250kVA 11/0.4kV copper wound Dry type transformer with natural air cooled and standard fitting and, confirming to IS 2026-1977 or latest. The installation, commissioning, charging, transportation, loading & unloading of released transformers if required as per spec	No.	2	851643.20	1703286.4
23 NS	LT Distribution Panel: Supply and providing LT distribution panel board of MS sheet 1.6mm consisting 2x400A 4-pole 36kA MCCB as incoming and 10x100A 4-pole 36kA MCCB as outgoing having suitable size Copper bus bar and 3-phase 50A electronic digital energy meter 2 No. in incoming, indicating lamp with A-meter, V-meter, ASS/VSS, CT, selector switches, Copper bus and earth bus etc as required Railway complete in all respect. All MCCBs should be of Load adjustable feature.	No.	2	165103.36	330206.72
24 NS	Supply fixing testing and commissioning of RMU single extensible RMU consisting of 2 Nos. 630A Load break switches and 1 No. 630A TEE off with SF6 circuit breaker and with O/C + E/F relay type VIP35 with SF6 gas pressures indicator 11kV, 21kA 3-way RMU type ring master as per spec	No.	1	314178.72	314178.72
25 NS	Supply, installation, testing and commissioning of 11KV outdoor Ring main unit, mannual type, 630A, 20kA, 2 incomers and 2 output consisting of all VCB Make-ABB or similar as per spec	No.	1	985844.27	985844.27
26 NS	Supply of Rubber mat (ISI mark) non stick type suitable for 11kv AC supply of size 3600x1000x25mm as per spec	No.	5	1342.50	6712.5
27 NS	Supply, fixing, testing and commissioning of fabricated Feeder Pillar distribution box made of MS sheet 1.6mm thick size 600x300x600mm with suitable MS stand Copper bus bar of 200A capacity and 2x63A MCB 4 pole as per spec	No.	14	4107.08	57499.12
28 NS	Supply, fixing and connecting modular type exhaust fan 225/250mm as per spec	No.	11	725.23	7977.53
29 NS	Supply, testing and commissioning of LT distribution panel 2x250A MCCB incoming and 4x100A MCCB with A&V meter selector switch indications etc as per spec	No.	2	66053.76	132107.52
30 NS	Supply and fixing Gate light make Bajaj 160614 or similar as per spec	No.	4	6013.28	24053.12
31 NS	Laying of LT/HT Cable IN AIR / Pipe/ Wall/tray as per spec	Mtr	9370	16.55	155073.5

32 NS	Laying testing commissioning of 11/33kv HT XLPE cable in air ground /in trench spun pipe with transportation from main depot to required site as per spec.	Mtr	800	100.95	80760
33 NS	Supply and laying of HDPE pipe conforming to IS 4984:1995 50mm dia wall thickness 3 mm PN-6 under the road/air. The work involves laying of HDPE pipe.	Mtr	8200	90.04	738328
34 NS	Supply and laying of HDPE pipe conforming to IS 4984:1995, 75/80mm dia wall thickness 3 mm PN-4 under the road/air. The work involves laying of HDPE pipe.	Mtr	2000	107.41	214820
35 NS	Supply and laying of HDPE pipe dia 160mm under road ground/floor/Railway track or as per site requirement already excavated trench as per spec.	Mtr	1500	439.29	658935
36 NS	Digging and filling of trench size 0.4x1.2 mtr as per spec (trench work may be on kuchha/pucca and land and all type of soil as per site requirement and without protective layer of brick) surface of trench shall be made good in all respect and satisfaction of site engineer	Mtr	7200	33.98	244656
37 NS	Horizontal Directional Drilling (HDD)/Boring and trenchless cabling. Supply, transportation and insertion of self lubricated HDPE pipe and laying of cables in boring under the track /road /ground/ masonry building by using self lubricated HDPE pipe of 120mm outer dia and 103.5mm inner dia in the bore and laying of cables in the bore under the track/road/ground/masonry building. The depth of horizontal boring should be minimum 1 mtr from rail flange/road level/ground, as per site requirement.	Mtr	330	981.48	323888.4
38 NS	Supply, installation, testing & commissioning of VTPN type metal double door type 8 way DB with having 01 No. 250 Amp., 4 pole MCCB, 36 KA as incomer & 8 Nos. TP MCB, 10 KA 'C' curves, 40-63 Amp. Cap. as outgoing having suitable IP-54,IK-09 protection	No.	4	44697.10	178788.4
39 NS	Supply and fixing of octagonal pole 5meter long, Hot dip galvanized with foundation, base plate with fixing of 1No. arms 1000mm for the fittings including smart pack junction box with 6A MCB and terminals as per spec.	No.	56	7685.05	430362.8
40 NS	Supply and Providing Copper Plate Earthing 4meter deep, copper plate size 600x600x3mm as per spec.	No.	7	6003.04	42021.28
41 NS	Supply and fixing of Copper Earth Flat strip size 25x3mm as per spec	Mtr	70	277.00	19390
42 NS	Supply & fixing bell with switch and wiring by 1.5sqmm PVC insulated multi-stranded copper wire with board as per spec	No.	8	246.71	1973.68
43 NS	Supply of single stage Monoblock open well submersible pump set with control panel rating 2HP/1.5kW, Head Range (M); 26 meter or above, size (MM) suction X delivery 50x40, Discharge (LPM); 180 or above at 26 meter head suitable for single phase 50Hz AC supply make CRI, CG, Kirloskar as per spec	No.	2	15176.87	30353.74
44 NS	Supply of single stage Monoblock open well submersible pump set, rating 10HP/7.5kW, Head upto 52 meters size (mm) suc. X Del. 65x50, 2900 RPM, Suitable for 3 phase 50 Hz, 415 Volt, Accepted Make-KSB or similar as per spec	No.	2	36603.92	73207.84
45 NS	Supply of single stage Monoblock open well submersible pump set, rating 12.5HP/9.3kW, Head Range (M); 40 or above, Discharge (LPM); 550 or above suitable for 3-phase, 50 Hz, 400/415 Volt AC supply, Make- KSB or similar as per spec	No.	2	44639.39	89278.78
46 NS	Supply of Submersible energy efficient Pumps (3 star or above) 10HP, 20 stages, 3-phase, 415V AC with all accessories at site as per spec	No.	2	60046.07	120092.14
47 NS	Installation of pump set with GI pipe, nut, bolts, washer, rubber packing, valve, copper cable etc as per spec	No.	1	4498.61	4498.61



48 NS	Supply and laying of copper flat cable size 3x6sqmm as per spec	Mtr	1000	103.49	103490
49 NS	Supply and fixing pipe fittings bends sockets flanges, delivery valve and non return valve and supporting clamps (2 sets) etc. as per spec	No.	2	5753.09	11506.18
50 NS	Supply and installation of automatic control panel with star delta starter for 10HP three-phase pump including connections and providing cable from main board to control panel and connection for WLG in open well as per spec.	No.	2	18465.23	36930.46
51 NS	Supply and laying of GI Pipe B-class 50mm dia including bends, sockets required as per spec	Mtr	300	247.56	74268
52 NS	Supply fabrication fixing and installation of MS sheet steel enclosure free standing outdoor type with heat dissipation sides 2feet above ground level for control panel and accessories of 16swg sheet size 120x70x60cms with painting and locking arrangement and foundation with installation of automatic control panel inside the box as per spec.	No.	1	12082.10	12082.1
53 NS	Supply, fixing, testing and commissioning of 40A MCCB 4 pole as per spec	No.	2	7892.41	15784.82
54 NS	Provision of capacitor 5KVAR as per spec	No.	2	6442.51	12885.02
55 NS	Supply, installation, testing and commissioning of control panel housing suitable timer contactor circuit for automatic ON & OFF of the mast lights at a pre-set time, (16M) as per spec	No.	3	11623.33	34869.99
56 NS	Supply, erection, testing and commissioning of 16 Mtrs high mast shaft totally hot dip galvanized and suitable for wind velocity as per IS 875 part-3 as per spec	No.	3	214181.22	642543.66
57 NS	Design and casting of suitable foundation with M-20 concrete for the 16mtr high mast having the safe soil bearing capacity at site as 10T/sqmtr at 2 meter depth including supply of foundation bolts manufactured from special steel along with nuts, washers and anchor plates and templates.	No.	3	19830.70	59492.1
58 NS	Supply installation testing and commissioning of twin aviation obstruction lights with lamps as per spec	No.	3	828.97	2486.91
59 NS	Supply and fixing of LED emergency light slimray 60-LED Rechargeable batten, adjustable brightness, power : 4 watt as per spec	No.	15	1947.40	29211
60 NS	Supply, fixing testing and commissioning of Astronomical timer multifunctional digital as per spec	No.	6	9699.55	58197.3
61 NS	LT CABLE STRAIGHT JOINT: Supply, installation, testing and commissioning of heat shrinkable straight through joint with required accessories complete in all respect suitable for LT cable, 25-185mmsq cable as per site requirement.	No.	13	1731.97	22515.61
62 NS	Supply fixing and commissioning HT XLPE heat shrinkable straight HT cable joint box size 185sqmm as per spec	No.	5	20061.32	100306.6
63 NS	Supplying and installing fire bucket stand including sheet metal (16 gauge) shade, platform and associated civil works each stand should have four nos fire buckets of 24 gauge galvanized steel sheet, standard 9 litre capacity and of round bottom shape, painted white inside and red outside and black on the bottom, inscribed with letters "Fire" in black and gold & one no fire man's axe at approved location as per approved make.	No.	2	6917.26	13834.52
64 NS	Supply and fixing of MS jali 1"x1"welded on MS angle as per spec.	Kg	800	54.22	43376
65 NS	Supply fixing and commissioning of HT XLPE heat shrinkable type cable end box indoor type size 50 to 185 sqmm as per spec	No.	8	5076.97	40615.76
66 NS	Supply and fixing MCB 63A four pole 10kA as per spec	No.	5	1266.83	6334.15
67 NS	Providing and fixing High/Medium Voltage danger notice	No.	5	165.96	829.8

	plate 250 mm. x 200 mm. made of M.S. 2 mm. thick and vitreous enameled white on both sides and with inscription in signal red colour on front side as required as per spec				
68 NS	Supply of name signage, backlit alpha-numeric signage for name plate as per specification IN HINDI/English - size 6600x1200mms (Per word)	No.	60	6327.22	379633.2
69 NS	Supply and laying of Electrical copper cable 2.5 sqmm/ 3 core	Mtr	570	73.08	41655.6
70 NS	Supply and laying of Electrical copper armoured cable 1.5sqmm /3 core	Mtr	200	148.69	29738
71 NS	Wiring of shed LP/TP in covered shed with 1.5sqmm copper wire PVC insulated & multi-stranded in PVC conduit, ISI mark 1.5mm thick, size 19/20mm dia and 1.5sqmm PVC insulated multi stranded copper earth wire with ceiling rose fixed with saddles or tied properly and junction box as per spec.	No.	40	200.11	8004.4
72 NS	Supply and fixing casing capping of PVC size 75x75mm and 2mm thick with suitable nut bolts for fixing or tied with copper wire 14swg for 5/7 nos. of copper wire & earth wire as per spec.	Mtr	140	128.61	18005.4
73 NS	Supply, laying and fixing five wire of PVC copper cable size 10sqmm flame retardant, low smoke single core insulated un sheathed multi-stranded copper conductor, voltage grade 1.1 KV (1100 v) conf to IS694-1990 or latest in five with one no 8 SWG copper earth wire as per spec.	Mtr	100	514.44	51444
74 NS	Supply and provide MS flat of iron size 40x3mm with spacers and fixing clamps as per spec	Mtr	140	141.47	19805.8
75 NS	Supply, fixing, testing and commissioning of microprocessor auto change over 630A 70kA as per spec	No.	1	267803.71	267803.71
76 NS	Supply & fixing of 7W LED Tilt able Mirror light in Aluminium body with glass cover in sand gray finish in 6000k, Approx dimension 320x78x28mm, catalogue no. LLT 004 (make Ledlum, Bajaj, Wipro or equivalent) as per spec.	No.	6	806.74	4840.44
77 NS	Supply and Fixing of PVC conduit pipe size 25mm dia thickness 1.6mm ISI marked concealed in wall as per spec	Mtr	100	24.23	2423
78 NS	Supply, fixing and connecting Bracket fan/ Air circulator 600mm sweep as per spec	No.	20	6687.03	133740.6
79 NS	Supply, installation, testing and commissioning of 3 phase, 415V 63A, heavy duty ray roll plug and socket complete with 100A MCCB in MS enclosure as per spec	No.	4	8920.75	35683
80 NS	Erection of SH rail pole 1.5 meter long as per spec	No.	8	362.71	2901.68
81 NS	Supply and fixing of glow sign boards having train timing or utility signage with flex star/hanwa 19 onze solvent multicolour printing, ISI LED tube light per 5sqft; 30gauges GI sheet on all four sides; 1"x1" sq steel tube & angle frame with red oxide, including transportation, labour charge, angle fittings charges for all boards as per spec	Sqft	12	188.76	2265.12
	<b>Total Cost of work</b>				<b>9939176.32</b>

NORTH WESTERN RAILWAY	
Technical Specification	
Tender No.: EL/JP/11/2026-27	Date of opening: 06.07.2026
Details of sanctioned estimate: NWR-JP-JP/240/2025-O/o Dy.CE/GSU/JP/NWR dt 25.02.2026, NWR-JP-JP/241/2025-O/o Dy.CE/GSU/JP/NWR dt 07.01.2026, NWR-JP-JP/7/2026-O/o Dy.CE/GSU/JP/NWR dt 06.03.2026 (PH-16,42 & 53)	
<b>Name of work:</b> Electrical work in connection with [1] Development of 2nd entry at Dahar Ka Balaji (DKBJ) station, [2] Balance work of Development of infrastructure for maintenance of Train sets in coaching depot at Jaipur, [3] One Longer loop line with Platform and one additional line with Platform at Dahar Ka Balaji Station	
NS	Specification
1 NS	<p>Supply of material and wiring of LP/TP/FP/Ex-Fan point wiring shall be done by 03 x 1.5 Sqmm multi stranded copper flexible PVC insulated ISI marked Copper wire 1100 volts grade wire, confirming to relevant IS specifications and make of reference list shall be used for point wiring wire /switches for phase, neutral and earth shall be laid / done in concealed with heavy duty ISI marked PVC Conduit pipe, minimum 19/20 mm dia and thickness 01.5 mm along with bend / junction, inside PVC duct/ conduit as per instruction of site Engineer. One-way piano type modular switch type 5/6A and good quality ceiling rose. Switches shall be provided on phase wire. The entire M.S. box shall have modular plate for switches and 05 Amp modular plug with required modular design groove cutting for fixing of switches / sockets etc. The wiring shall be done in such fashion that minimum conduit pipes run inside the room as far as possible. Piano type switches, 05 amp. Modular Sockets, ceiling rose, batten holder etc. shall be of reference list. The contactor shall dismantle old wiring completely in case it is replaced with new wiring. Samples of all wiring items shall be got approved from Railway before installation. The copper wire used for earthing purpose shall not be less than wire used for wiring. Wire shall be ISI marked confirming to relevant IS specifications and make of reference list shall be used. The sub wiring shall be done in such fashion that minimum conduit pipes run inside the room as far as possible. The contactor shall dismantle existing /old wiring completely in case it is replaced with new wiring. The circuit wiring in is to be done by 03 x 1.5 sqmm insulated multi-strand copper wire for phase, neutral and earth inside PVC duct/ conduit 19/20 mm as per instruction of site Engineer. The PVC conduit shall be properly fixed with the help of MS clamps /rawal plugs as per the instructions of site Engineer. The contractor will be responsible for proper plastering and distempering / fixing of tiles to restore the original finish of wall such that it matches with original surface and colour of wall on which conduit pipe has been laid. There should be no loose connections and joints in the wiring circuit. Bends or flexible conduits should be used as per the site requirement. The wiring should be in well dressed up manner.</p> <p>Any discrepancy occurred in engineering work during the wiring should be restored in the original condition by the contractor, at his own cost. All metallic parts, fittings etc. shall be connected to the earth wire.</p>
2 NS	5/6A SOCKET: Supply & providing 5/6A plug 5/6-pin 230V or above modular type switch socket on board and connection with 2.5sqmm PVC CU cable.
3 NS	POWER PLUG: Supply and fixing modular type 15/16A power plug 6-pin 230V or above and switch modular type with metal box concealed in wall and connection with 4sqmm PVC CU cable.
4 NS	METAL CLAD PLUG SOCKET: Supply and fixing metal clad plug socket 20A single phase with 32A MCB 10kA including fixing and sheet metal enclosure box with one 20A plug top (Ray roll type) to be supplied with board.
5 NS	FAN REGULATOR: Supply and providing modular type electronic fan regulator 5step type on existing board and connection as per Railway requirement.
6 NS	Module Plate MS/PVC: Supply and fixing 12 module modular plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC as per site requirement.
7 NS	Module Plate MS/PVC: Supply and fixing 8 module modular plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC as per site requirement.
8 NS	Module Plate MS/PVC: Supply and fixing 6 module modular plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC as per site requirement.
9 NS	Module Plate MS/PVC: Supply and fixing 4 module modular plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC as per site requirement.
10 NS	Module Plate MS/PVC: Supply and fixing 2module modular plate for fixing of switches and sheet metal box of good quality concealed fixing of MS/PVC as per site requirement.
11 NS	SUB-MAINS: Supply of material and wiring of sub-main with single core insulated, multi-stranded

	2x2.5mm <sup>2</sup> PVC CU cable in PVC conduit ISI mark 19/20 or 25mm concealed in stone/ bricks masonry wall separate or same conduit & 1.5sqmm PVC CU cable insulated multi-stranded for earth wire. For separate conduit the size shall be 19/20mm 1.5mm thick and for same conduit the size shall be minimum 25 mm dia.
12 NS	SUB-MAINS: Supply of material and wiring of sub-main with single core insulated, multi-stranded 2x4mm <sup>2</sup> PVC CU cable in PVC conduit ISI mark 19/20 or 25mm concealed in stone/ bricks masonry wall separate or same conduit & 1.5sqmm PVC CU cable insulated multi-stranded for earth wire. For separate conduit the size shall be 19/20mm 1.5mm thick and for same conduit the size shall be minimum 25 mm dia.
13 NS	SUB-MAINS: Wiring of sub-main with single core insulated, multi-stranded 2x6mm <sup>2</sup> PVC CU cable in PVC conduit ISI mark 19/20 or 25mm concealed in stone/ bricks masonry wall separate or same conduit & 2.5sqmm PVC CU cable insulated multi-stranded for earth wire. For separate conduit the size shall be 19/20mm 1.5mm thick and for same conduit the size shall be minimum 25 mm dia.
14 NS	Supply, laying, connection and commission of sub-main 2x10 Sqmm with PVC insulated single core copper conductor cable and same size ( 10sqmm) PVC insulated copper conductor for earthing wire in 19/20 mm ISI PVC conduit in recessed/ on surface complete in all respect as per site requirement .
15 NS	Fixing of LED light fitting with 2.5sqmm insulated multi-stranded copper wire for connection with necessary conduit, casing/caping as per site and railway requirement complete in all respect.
16 NS	FIXING OF FAN: Fixing of ceiling fan 1200/1400mm sweep with MS flat clamp 25x3mm and 12mm dia hook and nut bolts, GI down rod as per site requirement and connection with 2.5sqmm PVC insulated multi-stranded Copper cable
17 NS	PIPE EARTHING: Supply of material and providing earth electrode 4meters long of GI 'B' class pipe 50mm dia fixed vertically downward with 12mm dia holes around the pipe at a distance of 30 cms each with 50Kg charcoal and 10Kg salt with RCC/bricks cement earth enclosure with 3'' thickness top cover of either RCC slab or single pucca stone slab and earth electrode should be connected by 8 swg G.I earth wire from earth pit to main MSB/DB/LT panel /HT apparatus. The GI cap on top of earth pipe to be provided for protection against foreign material. The GI pipe to be tapered at one end. The 8swg GI earth wire to be fixed at bottom and top of earth pipe with 12mm dia MS nut and bolt. Dimension of digging area below ground level should be min.350 mm or above either cylindrical or square shape to provide adequate area for filling charcoal and salt.
(i)	Earthing should be as per I.S. 3043-1987 or latest and should give desired value of resistance as per I.E. Rules.
(ii)	The location of earth electrode will be such where the soil has reasonable chance of remaining Moist.
(iii)	As far as possible entrenches, permanent road ways etc. are to be definitely avoided for locating the earth electrodes.
(iv)	A plate of 14 SWG MS sheet size 150 x 100 mm painted with black enamel paint shall be fixed near the earth and following information shall be indicated (i) Earth No. (ii) Individual value of earth (iii) date of testing.
(v)	For easy tightening /un-tightening of nut bolt for measurement of earth value. Size of earth pit (enclosure) should be 12''x12''x18'' excluding thickness of wall which should be 4.5''min. Area below earth pit (foundation) should be soiled with thickness of 6'' minimum
(vi)	The distance between two electrodes should not be less than eight meter and shall not situated within a distance of 1.5 meter from the building whose installation system is being earthed.
(vii)	The GI pipe should be tapered at one end. Hot dip G.I. earth wire shall be used and connected from earth to main board/ meter board/equipment. The wire shall be run in 15 mm 'A' class G.I. pipe, along with wall / pole. The depth of 8 SWG wire in ground shall be minimum 30 cms running in 'A' class G.I. pipe. Value of each earth shall be measured after commissioning of earth.
18 NS	RCBO: Supply, fixing, testing and commissioning of RCBO. Confirming to IEC 61009 or latest, sensitivity 30mA with connections capacity 63A, 4-pole, 50Hz AC on separate main board as per site requirement. The RCBO to be connected in the Separate board as per requirement by making proper connection in the main board and fixing the RCBO. Any alteration in the wiring of main board if required is to be done by the contractor. The features of RCBO should have inclusive of following features: (a) Isolation with positive break indication. (b) Immune to nuisance tripping due to transit over voltage (Lighting, switching surges) (c) Trip indication
19 NS	DISTRIBUTION BOARD 63A: Supply fixing testing and commissioning of distribution board double door 3-phase and neutral concealed in wall with 63A four pole, 10kA incoming MCB and 12Nos. outgoing MCB 6-32A single, as per site requirement pole with front cover locking arrangement, 4MCB per phase as required by Railway.

20 NS	RCBO: Supply, fixing, testing and commissioning of RCBO double pole. Confirming to IEC 61009 or latest, sensitivity 30mA with connections capacity 25A, 230V or above, 50Hz AC on existing/separate main board as per site requirement. The RCBO to be connected in the existing/Separate board as per requirement by making proper connection in the main board and fixing the RCBO. Any alteration in the wiring of main board if required is to be done by the contractor. The features of RCBO should have inclusive of following features: (a) Isolation with positive break indication. (b) Immune to nuisance tripping due to transit over voltage (Lighting, switching surges) (c) Trip indication.		
21 NS	Distribution Board 32A SPN 8OG: Supply, fixing, testing, and commissioning of distribution board single-phase and neutral with 32A DP MCB incoming and 8 Nos. outgoing 6A-16A MCB single pole as per Railway requirement.		
22 NS	<b>Dry Type Transformer 250 KVA</b>		
	<b>SN</b>	<b>Description</b>	<b>Unit</b>
		<b>Parameter</b>	
	1	General Description	Dry Type Transformer
	2	Reference standard	IS 11171, IS 2026, IEC 60076
	3	Installation	Indoor/Outdoor with enclosure ( if required ) as per Railway requirement
	4	Duty	Continuous
	5	Application	Distribution (Voltage Step down)
	6	Altitude	m
	7	Rated power (based on AN cooling)	kVA
	8	Rated No-load Voltage Ratio (HV/LV)	kV
	9	Rated Frequency	Hz
	10	Number of Phases	Nos.
	11	Material of Winding (HV/LV)	....
	12	Vector group	....
	13	Connection (HV/LV)	....
	14	Tapping	....
	15	Type of Tap changer	....
	16	Taping range/Tap step	....
	17	No. of steps	Nos.
	18	For HV Variation /LV Variation	...
	19	Class of insulation	Class
	20	Method of cooling	...
	21	Avg. Temp. Rise of Winding (HV/LV)	Deg.C
	22	Ambient Temp. (Max./Mini/Year/Day)	Deg.C
	23	Environment /Climatic/Fire Behaviour class	
	24	No-Load Loss at Rated Voltage & Frequency (+15% IS Tol.)	kW
	25	Full Load Loss at Rated Current , at 75 Deg. C & at principal Tap (+15% IS Tol.)	kW
	26	Total Loss at Rated Voltage at principal Tapping . Rated Frequency & at 75 Deg. C (+10% IS Tol)	kW
	27	% Impedance at Rated Current at 75 Deg. C & at principal Tap ( $\pm 10\%$ IS Tol)	%
		A. Reactance	%
		B. Resistance	%
	28	No Load Current at Rated Voltage & Frequency ( as % of FLRC )	%
	29	Efficiencies at 75 Deg. C at Unity Power Factor	
		A. At Full Load	%

		B. At 3/4 Full Load	%	98.47
		C At 1/2 Full Load	%	98.56
30		Regulation at Full Load at 75 Deg. C		
		A. At Unity Power Factor	%	1.49
		B. At 0.8 Power Factor (Lagging)	%	3.7
31		BIL ( Insulation Level):		
32		Full Wave Lightning impulse withstand Voltage (HV/LV)	kV peak	75/-
33		Separate Source Power- Frequency Voltage Withstand (HV/LV)	kV rms	28/03
34		Enclosure		
35		Degree of protection of Enclosure	IP	IP21
36		Termination Arrangements		
37		HV		Cable box
38		LV		
39		Orientation between HV & LV	Deg.	180
40		Fitting / Accessories		Rating & Diagram plate, Base Channel, Earthing , terminals, Lifting lugs & 3 PT-100 Sensors
41		List of Tests to be conducted at Manufacturer's Works		Routine Test according to IS 11171 & IS 2026
42		Noise Level when measured at 1 Meter Distance	dB	As per NEMA TR-1
1.1	<b>List of Fittings and accessories to be supplied along with transformers</b> HV Cable box, LV Cable box , Off circuit tap changer, Lifting Lugs, Bi-directional Flat Rollers, Earthing Terminals, Inspection cover, Rating & Diagram plate, connectors, temperature control system etc.			
	<b>Minor deviation in specifications mentioned as above are allowed depending upon make offered and subject to suitability to Railway requirement and approval of Sr.DEE or his nominated representative.</b>  The dismantling, loading, transportation & unloading of released transformers at required site by Railway along with Re- installation, testing, commissioning, charging of transformer, if required. No extra payment will be made by Railway for this.			
1.2	<b>PACKING &amp; FORWARDING:</b>			
	The equipment shall be packed in crates suitable for vertical transport as the case may be, and suitable to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbol. Wherever necessary, proper arrangement for lifting, such as lifting hooks etc., shall be provided. Any material found short inside the packing cases shall be supplied immediately by supplier without any extra cost.			
	Each consignment shall be accompanied with a detailed packing list containing the following information.			
a.	Purchase order No. & date			
b.	Name of the consignee.			
c.	Details of consignment.			
d.	Destination.			
e.	Total weight of consignment			
f.	Handling and packing instructions.			
g.	Bill of Material indicating contents of each package.			
	The packing shall be done as per the manufacturer's standard practice.			
	<b>INSPECTION :</b>			
a	The purchaser's representative shall, at all times, be entitled to have access to the works and at all places of manufacture where equipment offered shall be manufactured and the representative shall have full facilities for unrestricted inspection of the bidder's works, raw materials and process of manufacture and conducting necessary tests as detailed herein.			
b	The supplier shall give 15 days advance intimation to enable the purchaser to depute his representative for witnessing acceptance and routine tests.			
c	No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested, unless the inspection is waived off by the purchaser in writing.			
23 NS	LT Distribution Panel: Supply, fixing, testing and commissioning of LT distribution panel board dust and			

	vermin proof of MS sheet 1.6 mm thick, IP 42 degree protection consisting 2x400A 4-pole 36kA MCCB, as incoming and 10x100A 4-pole 36kA MCCB as outgoing having suitable size Copper bus bar and 3-phase 50A electronic digital energy meter 2 No. in incoming, indicating lamp with Digital A-meter, Digital V-meter and one set of Neon type indicating lamp with fuses, CT, selector switches, Copper bus and earth bus etc as required by Railway complete in all respect. All MCCBs should be of Load adjustable feature and vertical type.		
24 NS	<b>TECHNICAL SPECIFICATION FOR 11KV SF6/VCB INSULATED 3WAY OUTDOOR RING MAIN UNITS</b>		
1.0	SCOPE: This specification covers design, engineering, manufacture, assembly, stage testing, inspection and testing before supply and delivery of the 11kV Ring Main Unit Outdoor Type (SF6/VCB) with 2 load break switches and 1 circuit breaker.		
1.1.	It is not the intent to specify completely herein all the details of the design and construction of equipment. However the equipment shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation upto the Bidder's guarantee, in a manner acceptable to the purchaser, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which, in his judgment is not in accordance there with. The offered equipment shall be complete with all components necessary for their effective and trouble free operation. Such, components shall be deemed to be within the scope of Bidder's supply irrespective of whether those are specifically brought out in this specification and/or the commercial order or not.		
2.	STANDARDS: The equipment shall conform in all respects with the requirements of the latest editions of the IEC <b>standards stated below/or latest</b> except where specified otherwise.		
	Indian Standard	Title	International & Internationally recognized Standard
	IS/13118:1991	High Voltage Alternating Current Circuit Breaker	IEC- 62271(IEC56)
	IS/9920:1981, 1982	High Voltage Switches	IEC-60 265
	IS:2099	Dimensions of Indoor & Outdoor post insulators with voltages > 1000 volts	IEC-60 273
	IS/9921	Alternative current disconnectors and earthing switches	IEC-60 129
	IS 12729:1988	General requirements for switchgear and control gear for voltages exceeding 1000V.	IEC60298
	IS 13947 (Part-1)	Degrees of protection provided by enclosures for low voltage switchgear and control gear.	IEC-60 529
	IS/2705 : 1992	Current Transformers	IEC- 60 185
2.1	<b>CONFLICT OF STANDARDS:</b> Equipment conforming to other internationally accepted standards, which ensure equal or higher quality than the standards mentioned above would also be acceptable. In case the Bidders who wish to offer material conforming to the other standards, salient points of difference between the standards adopted and the specific standards shall be clearly brought out in relevant schedule. Four copies of such standards with authentic English Translations shall be furnished along with the offer. In case of conflict the order of precedence shall be (i) IS (ii) IEC (iii) Other standards. In case of any difference between provisions of these standards and provisions of this specification, the provisions contained in this specification shall prevail.		
3.	<b>CLIMATIC CONDITIONS:</b>		
	i)	Location	At various locations in Rajasthan
	ii)	Max. ambient air temperature (deg.C)	40
	iii)	Min. ambient air temperature (deg.C)	7.5
	iv)	Average daily ambient air temperature (deg.C)	35
	v)	Max. Relative Humidity (%)	100
	vi)	Max. altitude above mean sea level (Meters)	1000
	vii)	Average Annual rainfall (mm).	925
	viii)	Max. wind pressure(kg/sq.m.)	200

	ix)	Isoceraunic level (days per year)	50
	x)	Seismic level (Horizontal accn.)	0.3 g.
<b>4.</b>	<b>PRINCIPAL PARAMETERS:</b>  <b>Ring main unit outdoor type (SF6/VCB)</b>  <b>4.1. Switchgear Data</b> a) Service Installation Service/operation at 40 deg without any derating Outdoor IP 54 type tested b) Type Metal enclosed c) Number of Phases 3 d) System Voltage 11kV (+10% to -20%) e) Rated Frequency 50 Hz (+/- 5%) f) Rated Current 630 Amps <b>4.2 Load Break Switch (Isolators)</b> a) Type SF6/VCB Load breaking and fault making b) Rated Current 630 Amps c) Rated Breaking capacity (kA rms min.) 630 Amps d) Fault making capacity (kA peak min.) 52.5 KA e) No. of poles 3 f) Operating mechanism Spring assisted mechanism with Operating handle for ON/OFF. Earth positions with arrangement for padlocking in each position. Also independent manual operation with mechanically operated indicator. g) VCB/SF6 Chamber With VCB/SF6 gas, pressure gauge indicator and filling arrangement. h) Interlocks In addition to interlocking which prevent access into compartments the following interlocking shall be provided. <b>a) Operation of load break/circuit breakers switch cannot be performed when the</b> Load Break Switch /Circuit breaker is padlocked. Earthing switch is in the closed position. <b>b) Operation of an earthing switch cannot be performed when the Load switch/circuit breaker is in closed position.</b> <b>c) Suitable interlocks shall also be provided for.</b> Cables test terminals on the orifices will be accessible only in "earth" position. To prevent operation from "ON" position to "Earth" position or vice versa in a single operation.  <b>4.3. SF6/VCB Circuit Breaker</b> a) Type SF6/VCB b) Rated Voltage 12KV c) Rated Current 630A d) Breaking current 21 KA e) Making current 52.5 KA f) No. of poles 3 g) Operating mechanism Circuit breaker with spring assisted anti reflex mechanism.  <b>4.4. Busbars</b> a) Material Copper b) Rated Current 630 Amps c) Short time rating Current for 3 sec. 21 kA d) Insulation of busbars SF6/VCB		



e)	Busbar connections	Anti-oxide grease
f)	Busbar end Caps	Yes
4.5.	RMU	Load break switches to be coupled with each other by common bus bars and circuit breakers.
<b>4.6.</b>	<b>Current Transformers</b>	
a)	Current Transformer ratio (for 11kV)	100-50/1-1 or as per Railway requirement
b)	Over current factor	To correspond to breaking capacity circuit breaker
c)	Class of accuracy	Class X
d)	Rated burden	Suitable for self powered relay
	In addition to above other accessories as may be required for the smooth erection commissioning and operation of the RMU detailed in the technical specification should also be provided.	
<b>5.1.</b>	<b>SF6/VCB GAS INSULATED COMPACT RING MAIN UNIT (RMU):</b>	
5.1.1	The Ring Main Unit shall be installed at 11kV junction points to have continuous supply by isolating faulty sections. The Ring Main Unit shall be <b>extensible</b> and consist of 2 Nos. load break switches and 1No. Circuit Breaker for a nominal voltage of 12kV using VCB/SF6 gas as insulating and SF6/VCB arc quenching medium.	
5.1.2	The Ring Main Unit shall be of Single bus bar VCB/SF6 gas insulated outdoor, tropicalised and metal enclosed type.	
5.1.3	The RMU should be compact in construction and suitable for outdoor installation without any further covers/protection. The RMU metal parts shall be high tensile steel which must be grit /short blasted, thermally spayed with Zinc alloy, phosphated and subsequently painted with polyurethane based powder paint ,the overall paint layer thickness shall be not less than 60 microns.	
5.1.4	Incase indoor duty RMU's are offered without door enclosures must meet the following specifications:	
5.1.5A	Relevant IE rules for clearances, safety and operation inside the enclosure shall be applicable. The enclosure shall be IP 54 and type tested for weather proof at EREDA/CPRI.	
5.1.5B	The enclosure should be made of GI sheet steel.	
5.1.5C	The RMU shall be tested for Internal Arc fault with this enclosure as per IEC 60298 or latest and to have the facility to have a safe evacuation of gases.	
5.1.5D	The base of the enclosure shall be made with min of 2.5/4 mm thickness MS and hot dip Galvanized.	
5.1.5E	Suitable temp rise test on the RMU with enclosure shall be carried out & test reports shall be submitted.	
5.1.6.	All live parts except for the cable connection shall be insulated with VCB/SF6 gas. The VCB/SF6 enclosure shall be made of metallized cast resin or robotically welded stainless steel.	
5.1.7	The cubicle shall be metal enclosed with a sheet steel of not less than 2mm thick and provided with a pressure relief arrangement away from operator.	
5.1.8	Remote Control of the RMU's: NW Railway intends to implement the distribution automation at later dated. Hence the RMUs shall be suitable for remote operation as follows:	
5.1.9A	Both the Load break switches and the tee off Circuit breaker shall be suitable for motorisation.	
5.1.10	Safety:-	
i.	Extensive interlocking shall be provided as per IE regulations to prevent small operation.	
ii.	Each switch gear be identified by an appropriately sized label which clearly indicates the functional units and their electrical characteristics.	
iii.	The Switchgear shall be designed so that the position of the different devices is visible to the operator.	
iv.	In accordance with the standards in effect, the switch board shall be designed so as to prevent access to all live parts during operation without the use of tools.	
v.	Any accidental over pressure inside the sealed chamber shall be limited by the opening of a pressure limiting devices in the rear/top part of the enclosure. Gas will be release to the rear of the switch board away from the operator.	
vi.	All manual operations will be carried out on the front of the switch board.	

5.2	<b>RING MAIN SWITCH:</b>																														
5.2.1	<p>The technical particulars of switch are:</p> <table> <tr> <td>a) Construction per phase</td><td>SF6/VCB-Single Break</td></tr> <tr> <td>b) Current Capacity</td><td>630A</td></tr> <tr> <td>c) Making Capacity</td><td>52.5 KA(peak)</td></tr> <tr> <td>d) Breaking capacity normal load current</td><td>630A (0.7 pf)</td></tr> <tr> <td>e) Short time rating</td><td>21 KA for 3 second</td></tr> <tr> <td>f) Short circuit current making capacity (KAP)</td><td>52.5 KA</td></tr> <tr> <td>g) Impulse withstand voltage to earth between poles.</td><td>75 kV</td></tr> <tr> <td>h) Power frequency withstand voltage to earth and between poles</td><td>28kV RMS</td></tr> </table>	a) Construction per phase	SF6/VCB-Single Break	b) Current Capacity	630A	c) Making Capacity	52.5 KA(peak)	d) Breaking capacity normal load current	630A (0.7 pf)	e) Short time rating	21 KA for 3 second	f) Short circuit current making capacity (KAP)	52.5 KA	g) Impulse withstand voltage to earth between poles.	75 kV	h) Power frequency withstand voltage to earth and between poles	28kV RMS														
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5.2.2	Each load break switch shall be of VCB/SF6 gas insulated type with gas as insulating medium and SF6/VCB interrupting medium.																														
5.2.3	Each load break switch shall be of the triple pole, simultaneously operated, non automatic type with quick break contacts and with integral earthing arrangement.																														
5.2.4	The mechanism of the switch shall be quick-break and quick make type, the speed of operation being independent of operation force with mechanically operated indicator.																														
5.2.5	Each load break switch shall be fitted with a direct manually operated mechanism having three positions, "ON", "OFF" and "EARTH" provided with pad locking facility. All operating handles shall be located on the front panel of the ring main unit.																														
5.2.6	The operating mechanism shall be maintenance free without the need for any lubrication during its life time.																														
5.2.7	The switches should be designed such that they can be operated remotely if required by providing motor drives																														
5.3.	<p><b>RING MAIN CIRCUIT BREAKER:</b> The technical particulars of the Circuit Breaker are</p> <table> <tr> <td>a) Construction</td><td>SF6/VCB</td></tr> <tr> <td>b) Current capacity</td><td>630A</td></tr> <tr> <td>c) Making capacity</td><td>52.5KA</td></tr> <tr> <td>d) Short time rating</td><td>21kA for 3 Sec.</td></tr> <tr> <td>e) Impulse flashover withstand voltage</td><td>75KV peak</td></tr> <tr> <td>f) Power frequency withstand voltage</td><td>28KV (rms)</td></tr> <tr> <td>g) Current Transformer</td><td>11KV tape wound</td></tr> <tr> <td>i) CT ratio</td><td>100-50/1-1 or as per Railway requirement</td></tr> <tr> <td>ii) Over current factor</td><td>To correspond to breaking capacity</td></tr> <tr> <td>iii) Class of accuracy</td><td>Class X suitable for self powered relay</td></tr> <tr> <td>v) Impulse flash over withstand voltage</td><td>75KV (peak)</td></tr> <tr> <td>vi) Power frequency withstand voltage</td><td>28KV (rms)</td></tr> <tr> <td>h) Protection</td><td>Self powered IDMT Protection relays, No external AC/DC aux power required for tripping. Static type, with 3 over current and single earth fault elements. The over current element should follow a fuse replica or extremely inverse curve and earth fault element should be definite time type. The protection system should be suitable for protecting transformers of rated power from 160 KVA.</td></tr> <tr> <td>i) The circuit breakers shall be provided with interlocked earth switch</td><td></td></tr> <tr> <td>j) Three Nos. CT.s on the bushings incase of cable mounted ring CT's adequate insulation shall be provided to the full rated voltage of the RMU, including impulse withstand voltage.</td><td></td></tr> </table>	a) Construction	SF6/VCB	b) Current capacity	630A	c) Making capacity	52.5KA	d) Short time rating	21kA for 3 Sec.	e) Impulse flashover withstand voltage	75KV peak	f) Power frequency withstand voltage	28KV (rms)	g) Current Transformer	11KV tape wound	i) CT ratio	100-50/1-1 or as per Railway requirement	ii) Over current factor	To correspond to breaking capacity	iii) Class of accuracy	Class X suitable for self powered relay	v) Impulse flash over withstand voltage	75KV (peak)	vi) Power frequency withstand voltage	28KV (rms)	h) Protection	Self powered IDMT Protection relays, No external AC/DC aux power required for tripping. Static type, with 3 over current and single earth fault elements. The over current element should follow a fuse replica or extremely inverse curve and earth fault element should be definite time type. The protection system should be suitable for protecting transformers of rated power from 160 KVA.	i) The circuit breakers shall be provided with interlocked earth switch		j) Three Nos. CT.s on the bushings incase of cable mounted ring CT's adequate insulation shall be provided to the full rated voltage of the RMU, including impulse withstand voltage.	
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5.4	<b>CABLES &amp; CONNECTORS:</b> The cable termination shall be suitable for PVC/XLPE Cables to conductor sizes of 300 Sqmm. The bidder shall provide adequate cable terminal protectors for safe operation.																														
5.5	<b>FAULT PASSAGE INDICATORS (FPI):</b> These shall facilitate quick detection of faulty section of line. The fault indication may be on the basis of monitoring fault current flow through the device. The unit should be self contained requiring no auxiliary power supply. The FPI shall be integral part of RMU, shall be capable of displaying the fault and phase currents. The FPI shall have LCD display, automatic reset facility. Also a potential free contact for SCADA.																														
5.7	<b>GENERAL:</b>																														
5.7.1	<b>Single Line Diagram:</b> Single line diagram indicating the operational status of the RMU shall be provided at the front of the RMU.																														
5.7.2	<b>Earthing:</b> The Switchgear shall have an earth bar. The earth bar shall be bolted to the main frame and																														

	located so as to provide convenient facilities for earthing cable sheaths and for use with earthing device means shall be provided for coupling earth bars of adjacent units. The system earthing shall be such that at least one of the neutral points of a three phase system is permanently earthed, either solidly or through a resistor or reactance of low impedance. It shall not be possible to remove the earth bar during operation.
5.7.2.1	All metal parts of the switchgear which do not belong to main circuit and which can collect electric charges causing dangerous effect shall be connected to the earthing conductor made of copper having CS area of minimum 75 mm <sup>2</sup> . Each end of conductor shall be terminated by M12/equivalent quality and type of terminal for connection to earth system installation. Earth conductor location shall not obstruct access to cable terminations.
5.7.2.2	The following items are to be connected to the main earth conductor by rigid or flexible copper conductors having a minimum cross section of 75mm <sup>2</sup> (a) earthing switches (b) Cable sheath or screen (c) capacitors used in voltage control devices, if any.
5.7.3	<b>Tropicalisation:</b> Due regard should be given to the climatic conditions under which the equipment is to work. Ambient temperature normally vary between 21° C and 32° C, although direct sun temperature may reach 50° C. The climate is very humid and rapid variations occur, relative humidity between 90% and 100% being frequently recorded, but these values generally correspond to the lower ambient temperatures. The equipment should also be designed to prevent Ingress of vermin, accidental contact with live parts and to minimize the ingress of dust and dirt. The use of materials which may be liable to attack by termites and other insects should be avoided.
5.7.4	<b>SF6/VCB Gas:</b> VCB/SF6 gas should be used for the dielectric medium. OIL/AIR insulated RMU's will not be considered. VCB/SF6 gas shall be meeting IEC 376 or as applicable. The filling shall be sufficient for life time. In case required it should be possible to fill the gas at site. The filling pressure shall be 0.8 bar at 20deg and operating pressure shall be 0.5 bar.
5.7.5	<b>Voltage presence Indicators:</b> It shall be possible for the each of the function of the RMU to be equipped with a voltage permanent voltage indication as per IEC 601958 to indicate whether or not there is voltage on the cables.
5.8	<b>Padlocking:</b> Provision shall be made for padlocking the load break switches/Circuit Breaker and the Earthing switches in either open or closed position. The switchgear shall be tested according to IEC recommendations. The recommended working pressure and the lowest possible pressure where the switchgear can be operated shall be stated.
5.9	<b>GUARANTEED TECHNICAL PARTICULARS:</b> The technical particulars as per IEC shall be guaranteed and Guaranteed Technical particulars shall be furnished
6.0	<b>TESTS:</b>
6.1.	The type, acceptance and routine tests and tests during manufacture, shall be carried out on the Ring Main Unit as per the relevant standards.
6.2.	<b>TYPE TESTS:</b> The Ring Main Units shall be fully type tested as per the relevant standards including the type tests mentioned below. The type tests must have been conducted on 11kV Ring Main Units of same type from recognized test laboratories. The bidder shall furnish two sets of type test reports as per relevant standards.
6.2.1	<b>TYPE TESTS :</b>
a.	Short time current test on main circuits.
b.	Short time current test on earthing circuit.
c.	Partial discharge test.
d.	No load operation and mechanical endurance test.
e.	Impulse withstands test 75kV rms (1 min.)
f.	Out door test for RMU IP 54
g.	Temp rise test.
6.3	<b>ACCEPTANCE ROUTINE TESTS:</b> The following routine tests shall be carried out on each Ring Main Unit before dispatch. The purchaser reserves the right to insist for witnessing the acceptance/routine testing of RMU.
a.	Power frequency voltage.
b.	Partial discharge test.
c.	Resistance test for the circuits.
d.	Mechanical operating tests.
6.4.1	In case of failure in any type test, the supplier is required to modify the design of the material and the material

	shall be type tested again for the modified design, without any extra cost to the purchaser. No delivery extension shall be given for this type testing.
6.4.2	The entire cost of testing for the acceptance and routine tests and tests during manufacture shall be treated as included in the quoted unit price.
6.5.	<b>TEST REPORTS:</b>
6.5.1	Record of routine test reports shall be maintained by the Bidder at his works for periodic inspection by the purchaser's representative.
7.0	<b>INSPECTION :</b>
7.1	The purchaser's representative shall, at all times, be entitled to have access to the works and at all places of manufacture where equipment offered shall be manufactured and the representative shall have full facilities for unrestricted inspection of the bidder's works, raw materials and process of manufacture and conducting necessary tests as detailed herein.
7.2	The supplier shall give 15 days advance intimation to enable the purchaser to depute his representative for witnessing acceptance and routine tests.
7.3	No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested, unless the inspection is waived off by the purchaser in writing.
8.0.	<b>DOCUMENTATION:</b> All drawings shall conform to International Standards Organisation.
9.1	<b>LIST OF DRAWINGS AND DOCUMENTS:</b> The bidder shall furnish four sets of following drawings.
a.	General outline drawing showing plan, elevation and end view dimensions, assembly and constructional drawings of the equipment.
b.	Schematic & wiring drawings.
c.	Operation manuals, leaflets literature etc.
9.2	The successful Bidder shall, within 2 weeks of placement of order, submit three sets of final versions of all the above said drawings for Railway. The Railway shall communicate his comments on the drawings to the supplier within two weeks.
9.3	Three sets of the type test reports, duly approved by the purchaser, shall be submitted by the supplier for distribution before commencement of supply. Adequate copies of acceptance and routine test certificates, duly approved by the purchaser, shall accompany the dispatch consignment.
9.4	The manufacturing of the equipment shall be strictly in accordance with the drawings and no deviation shall be permitted without the written approval of the Railway. All manufacturing and fabrication work in connection with the equipment prior to the drawing shall be at the supplier's risk.
10.0.	<b>PACKING &amp; FORWARDING:</b>
10.1.	The equipment shall be packed in crates suitable for vertical transport as the case may be, and suitable to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbol. Wherever necessary, proper arrangement for lifting, such as lifting hooks etc., shall be provided. Any material found short inside the packing cases shall be supplied immediately by supplier without any extra cost.
10.2	Each consignment shall be accompanied with a detailed packing list containing the following information.
a.	Purchase order No. & date
b.	Name of the consignee.
c.	Details of consignment.
d.	Destination.
e.	Total weight of consignment
f.	Handling and packing instructions.
g.	Bill of Material indicating contents of each package.
10.3	The packing shall be done as per the manufacturer's standard practice.
25 NS	<p>TECHNICAL SPECIFICATION OF 11KV SF6 METAL ENCLOSED, Outdoor RING MAIN UNIT (RMU) Consisting of 4 VCB consisting of 2 incomers and 2 outgoing.</p> <p>2.1 Scope:- Supply, installation, testing and commissioning of 11kV, 630Amp, 21kA, Outdoor (with IP54) type extensible 4-way SF6 gas insulated, floor mounted with copper bus bar Compact Distribution board consisting of 02 VCB as incoming 2 Nos outgoing VCB as outgoing. The extensible bushing should be at the top of RMU through bolted connection for ease of coupling. No plug-in type bushings are acceptable. All live parts, bus bars, VCB will be enclosed a single tank (Minimum 5 VCB in a single tank) in</p>

robotically welded 3+/-0.5mm thick non-ferrite and non-magnetic 304 grade Stainless steel tank filled with SF6 at 1.4 bar with IP class IP 67, leak rate less than 0.1% and tested for Internal arc 20kA/1-sec as per latest IEC 62271-200. The Compact Switchgear should be of IP54 degree of protection such that the main enclosure door should cover complete front part including front cover and cable covers. The earthing busbar should be of copper. The earthing busbar shall be provided in each cable compartment and throughout the length of Switchgear. Ring Main unit shall be internal arc proof and tested and totally safe for human beings. The release of gas to be from the top of the unit, so that even if the person is operating the unit with the cover open; the release will be at the top. The release in no case should be from any side or bottom of the unit, as the same is unsafe for the operating personnel/pedestrian or general public. RMU shall be compliant to Internal Arc Classification (IAC) AFLR 21kA/1 second. The unit shall include the following with all necessary standard fitting required at site all as specified and directed by EIC:-  
This RMU should be complete with all components necessary for its effective and trouble free operation along with associated equipment etc. such components should be deemed to be within the scope of supplier's supply.

2.2 The RMU should be fixed type SF-6 insulated with Vacuum circuit breakers with O/C & E/F relay for the protection of the transformer. It should be maintenance free equipment, having stainless steel robotically welded IP67 enclosure. Outdoor enclosure should be IP54.

### 2.3 STANDARDS AND REFERENCE DOCUMENTS

i) Codes and Standards: The RING MAIN UNIT (RMU) / COMPACT SWITCHGEAR (CSG) should be designed, manufactured and tested to the latest version of:

- IEC 60694 Common specifications for high-voltage switchgear and control gear standards.
- IEC 62271-200 : A.C metal-enclosed switchgear and control gear for rated voltages above 1KV and up to and including 72KV and the IEC Codes herein referred.
- IEC 60129/ IEC 62271-102: Alternating current disconnections (isolators) and earthing switches
- IEC 60529: Classification of degrees of protection provided by enclosures
- IEC 60265 High-voltage switches-Part 1: Switches for rated voltages above 1kV and less than 52 kV
- IEC 60056: Circuit breakers
- IEC 60420 High-voltage alternating current switch-fuse combinations
- IEC 60185 Current transformers
- IEC 60186 Voltage transformers IEC 60255 Electrical relays
- Any other codes recognized in the country of origin of equipment might be considered provided that they fully comply with IEC & Indian standards.

ii) The design of the switchgear should be based on safety to personnel and equipment during operation and maintenance, reliability of service, ease of maintenance, mechanical protection of equipment, interchangeability of equipment and ready addition of future loads.

2.4 RMU of the Package Sub-station should have following configuration:

i) 11KV SF6 Outdoor Ring Main Unit (RMU), comprising of 630A Load break Switches, and Fixed-Type 630 A Vacuum Circuit Breakers with (3 O/C & 1E/F ) Relays, 1 No. metering module and Aux. Supply Unit with Battery backup

ii )The CSG shall be manual operated for VCB.

1. Circuit Breaker (630A) –with manual operation Circuit Breaker should have the following: - Manually operated 630 A fixed type Vacuum circuit breaker with series disconnecter cum

- earthing switch with making capacity
- Mechanical tripped on fault indicator
- Auxiliary contacts 1NO and 1NC
- Anti-reflex operating handle
- “Live Cable” LED Indicators thru Capacitor Voltage Dividers mounted on the bushings.
- 3O/C + 1E/F self powered relay with Low and High set for Over current and Earth Fault. Relay should have facility to display the maximum loaded phase current also. Relay should have facility to trip the breaker from remote commands without shunt trip coil.
- Protection Class CTs of suitable ratio, 2.5VA burden, Class 10P10 for Protection
- Mechanical ON/OFF/EARTH Indication

- The ON-OFF operation of the VCB shall be manual/motorised at local & operated through SCADA from remote
  - Breaker ON/OFF/TRIP LED Indications
2. Common Items –
- Gas Pressure Low Manometer
  - Suitable isolation MCB, control and terminals etc.

2.5 RMU of the Package Sub-station should have following features:

- i ) Modular, metal enclosed design.
- ii) RMU must be made of robotically welded Non Ferrite, Non magnetic stainless steel of grade 304 with thickness of minimum 2.5 mm with all live parts inside stainless steel tank
- iii) The RMU/CSG should have provision of Gas refilling at site, in case there is some leakage of the gas.
- iv) Cable covers must be interlocked with Earth switch to have complete safety of operating person. The cable bushings shall be bolted type design.

#### DIELECTRIC MEDIUM

- i) SF6 GAS shall be used for the dielectric medium, Arc quenching should take place in vacuum for 11KV RMU's/CSG's in accordance with IEC376. It is preferable to fit an absorption material in the tank to absorb the moisture from the SF6 gas and to regenerate the SF6 gas following arc interruption. The SF6 insulating medium shall be constantly monitored via a temperature compensating gas pressure indicator offering a simple go, no-go indication.

#### 2.6 DESIGN CRITERIA

##### 1. Service conditions

- i)The offered switchgear and control gear should be suitable for continuous operation under the basic service conditions indicated below. Installation should be in normal indoor conditions in accordance with IEC 60694.

- Ambient temperature -10 C to +450 C
- Relative humidity up to 95%
- Altitude of installation up to 1000m, IEC 60120

##### 2.7 General structural and mechanical construction

- i) The offered RMU/CSG should be of the fully arc proof metal enclosed, free standing, floor mounting, flush fronted type, consisting of modules assembled into one or more units. Each unit is made of a cubicle sealed-for life with SF6 and contains all high voltage components sealed off from the environment. The overall design of the switchgear should be such that front access only is required. It should be possible to erect the switchboard against a substation wall, with HV and LV cables being terminated and accessible from the front.
- ii) The units should be constructed from robotically welded Non Ferrite ,Non Magnetic grade stainless steel of grade 304 of minimum 2.5mm thickness to ensure very high degree of precision in sealing of SF6 tank. The design of the units should be such that no permanent or harmful distortion occurs either when being lifted by eyebolts or when moved into position by rollers.
- iii) The cubicle should be have a pressure relief device. In the rare case of an internal arc, the high pressure caused by the arc will release it, and the hot gases is allowed to be exhausted out at the bottom of the cubicle. A controlled direction of flow of the hot gas should be achieved.
- iv) The switchgear should have the minimum degree of protection (in accordance with IEC 60529) --IP 67 for the tank with high voltage components
  - IP 2X for the front covers of the mechanism
  - IP 3X for the cable connection covers
- v) The RMU/CSG shall be internally arc tested for 20kA for 1 sec for the gas tank & it should be internally arc tested for cable compartment with arc proof doors. Relevant type test reports should be submitted by the manufacturer.

##### vi) CIRCUIT BREAKERS

- 1. Vacuum bottles should be use as interrupters of the currents. The circuit breaker main circuit should be connected in series with a three-position disconnecter – earthing switch. The operation between circuit breaker and disconnecter earthing must be interlocked.

2.Vacuum circuit breaker must self tripping and have self powered relay

##### vii) Bus bars

- 1. Comprising the 3 single phases copper bus bars and the connections to the switch or circuit breaker. The

bus bar should be integrated in the cubicle Bus bars should be rated to withstand all dynamic and thermal stresses for the full length of the switchgear.

viii) Earthing Switch

1. Earthing switches should be rated equal to the switchgear rating.
2. Earthing switches should be quick make type capable of making Rated Fault Current. Ear thing switch should be operated from the front of the cubicle by means of a removable handle.

ix) The mechanisms

1. All mechanisms should be situated in the mechanism compartment behind the front covers outside the SF6-tank. The mechanism for the switch and the earthing switch is operating both switches via one common shaft. The mechanism provide independent manual operation for closing and opening of the switch, independent closing of the earthing switch and dependent opening of the earthing switch.
2. The mechanism for the T-off switch and earthing switch is operating both switches via one common shaft. The mechanism has stored spring energy and provide independent manual operation for closing and opening of the switch, independent closing of the ear thing switch and dependent opening of the ear thing switch. The mechanism for the vacuum circuit breaker (VCB) and disconnecter- earthing switch is operating the VCB and the disconnecter earthing switch via to separate shafts. The mechanism for the VCB has stored spring energy and provides independent manual operation for closing and opening of the VCB. The mechanism has a relay with related CT's and/or remote tripping device. The mechanism for the disconnecter earthing switch provide independent manual operation for closing and opening of the disconnecter, independent closing of the earthing switch and dependent opening of the earthing switch.

x) Front covers

1. The front cover contains the mimic diagram of the main circuit with the position indicators for the switching devices. The voltage indicators are situated on the front panels. Access to the cable bushings is in the lower part of each module.

xi) Position indicators

1. The position indicators are visible through the front cover and are directly linked to the operating shaft of the switching devices.

xii) Voltage indicator

1. The voltage indicators are situated on the front cover, one for each module, and indicate the voltage condition of each incoming cable. Identification of the phases is achieved with labels L1, L2 and L3 on the front of the voltage indicators. The voltage indicator satisfies the requirements of IEC61243.

xiii) Cable compartment

1. The Cables access in the RMU/CSG shall be from the front.
2. The cable bushings shall be bolted type and should be replaceable at site whenever required.

xiv) Power connection.

1. The cables are installed in the dedicated compartment below the mimic front cover. At the bottom of the cable compartment, an earthing bar system made of copper/GI with a minimum cross section of 120 mm<sup>2</sup> should be fitted. In each compartment the earthing bar should be fitted with 4 screws M10. The earthing system is connected to the tank by a copper/GI bar, which rises up to the connecting point of the tank behind the rear partition wall on the middle of the switchgear.

xv) INTERLOCKING.

1. The mechanism for the cable switch should be provide a built in interlocking system to prevent operation of the switch when the earthing switch is closed, and to prevent operation of the earthing switch when the switch is in the closed position.
2. The mechanism for the T-off switch should be provide a built in interlocking system to prevent operation of the switch when the earthing switch is closed, and to prevent operation of the earthing switch when the switch is in the closed position. The mechanism for the VCB and the disconnecter-earthing switch should be has a built in interlocking system to prevent operation of the disconnectorearthing switch when the VCB is in the closed position.
3. Further is should not be possible to Open the Cab

0 TECHNICAL DATA

S.No.	Particular	Description
1	Standard to which Switchgear complies	IEC & IS
2	Type of Ring Main Unit / Compact Switchgear	Metal Enclosed, Panel type, Compact Module

3	Number of phases	3
4	Whether RMU is type tested	Yes
5	Whether facility is provided with pressure relief	Yes
6	Insulating gas	SF6
7	Nominal operating gas pressure	1.4 bar abs. 20° C
8	Gas leakage rate / annum %	0.1% per annum
9	Expected operating lifetime	30 years
10	Whether facilities provided for gas monitoring can be delivered	Yes, temperature compensated manometer
11	Material used in tank construction	Stainless steel sheet, grade AIS 304 / equiv.
12	Rated operating sequence of Circuit Breaker	O –3min-CO-3min-CO
13	Mechanical operations of switch	CO 1000
14	Mechanical operations of circuit breaker	CO 3000 or higher
15	<i>Degree of protection</i>	
	High Voltage live parts	<u>SF6 tank IP 67</u>
	Front cover mechanism	IP 2X
	Cable covers	IP 3X

## 2.11 TESTING AND CERTIFICATION.

### i) TYPE TESTS.

1) Units should be type tested in accordance with IEC standards 60056, 60129, 60265, 60298,60420,60529 and 60694. The following type tests should perform on the HT Switchgear and report should submit with offer.

- Short time and peak withstand current test
- Temperature rise tests
- Dielectric tests
- Test of apparatus i.e. circuit breaker and earthing switch - Arc fault test
- Measurement of resistance of main circuit.
- Mechanical endurance test.
- Duty cycle test.
- Internal arc test for HT chamber.
- RMU should be AFLR type tested.

Type test reports for above type shall be submitted with the offer.

### (ii) ROUTINE TESTS.

1. Routine tests should be carried out in accordance with IEC 60298 & IS standards. These tests should be ensure the reliability of the unit.

2. Below listed test should be performed as routine tests before the delivery of units;

- Withstand voltage at power frequency
- Measurement of the resistance of the main circuit
- Withstand voltage on the auxiliary circuits
- Operation of functional locks, interlocks, signalling devices and auxiliary devices - Suitability and correct operation of protections, control instruments and electrical connections of the circuit breaker operating mechanism - Verification of wiring
- Visual inspection
- Time travel characteristics measurement facility for Breaker should be available with the manufacturer to access the quality of RMU.

## 2.12 VCB -Consisting of the following:

Short time current - 21 kA/ 3 sec

Making Capacity - 52.5 kA

Auxiliary contacts - 2NO + 2NC

Power frequency withstand voltage - 50 kV



	<p>Impulse withstand voltage - 95 kV  Nominal operating gas pressure - 1.4 Bar abs.  Front cover mechanism - IP2X  Cable covers - 3X and IP54 with Outer enclosure for outdoor type  Three position disconnect/earthing switch downstream vacuum circuit breaker.  Three position single spring mechanism for disconnect/earthing switch  The operating handle of VCB should be preferably built-in type in mimic  "Live cable" LED indicators through Capacitor Voltage Dividers mounted on the bushings.  Green (ON) / Red (OFF) push buttons to operate VCB.  3O/C + 1E/F self powered numerical protection relay with Low and High set for Over current and Earth Fault. The relay shall have LCD display. Relay should have facility to display the maximum loaded phase current also. Relay shall record minimum 5 fault records with time stamping. The relay shall have RS485 port for communication on MODBUS protocol  Mechanical ON/OFF/EARTH/Spring Charging Indication  Cable boxes should be Arc Proof with hinged doors interlocked with respective Earthing Switches.  Resin cast ring core protection CT 100-50/1 Amp, 5P10, 2.5VA - 03 Nos.  Interlock between incomers  The successful tenderer shall submit the arrangement GTP and other relevant drawings for approval as per standard make prior to supply and execution of work.</p>
	<b>INSPECTION :</b>
	The purchaser's representative shall, at all times, be entitled to have access to the works and at all places of manufacture where equipment offered shall be manufactured and the representative shall have full facilities for unrestricted inspection of the bidder's works, raw materials and process of manufacture and conducting necessary tests as detailed herein.
	The supplier shall give 15 days advance intimation to enable the purchaser to depute his representative for witnessing acceptance and routine tests.
	No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested, unless the inspection is waived off by the purchaser in writing.
26 NS	Supply of Rubber mat (ISI mark) non stick type suitable for 11kv AC supply of size 3600x1000x25mm or as per latest available size complete in all respect as per railway requirement.
27 NS	Supply, fixing, testing and commissioning of Feeder Pillar Distribution Box made of MS sheet 1.6mm thick size 600x300x600mm or above with suitable MS stand and Copper Bus Bar 200A capacity with 2 No. MCB 63A 4-pole as per requirement of Railway complete in all respect and connections for supply.
28 NS	Supply and fixing modular type exhaust fan 225/250mm heavy duty including air curtain and making hole in wall if not exist including repairing the same properly with cement-sand or concrete and connection complete in all respect
29 NS	LT Distribution Panel: Supply and providing LT distribution panel board of MS sheet 2mm consisting 2x250A 4-pole 36kA MCCB as incoming and 4x100A 4-pole 25kA MCCB as outgoing having suitable size Copper bus bar and 3-phase 50A electronic digital energy meter 2No. in incoming, indicating lamp with A-meter, V-meter, ASS/VSS, selector switches, Copper bus and earth bus etc as required Railway complete in all respect. All MCCBs should be of Load adjustable feature type. All MCCB should have Ics= 100% Icu
30 NS	Supply and fixing LED Gate light as per BGCTN 45W LED or similar 230V AC complete in all respect as per Railway requirement
31 NS	Laying of LT/HT Cable in AIR / Pipe/ Wall/ Cable tray with proper fixing arrangement by MS iron clamp, MS strip, nut bolts complete in all respect as per site requirement.
32 NS	<p><b>HT XLPE CABLE LAYING</b></p> <p>Laying and commissioning of PVC / XLPE HT insulated armored sheathed aluminum conductor 11000/33000 V volts grade cable underground /under the road / under the track along-with pole / wall / in air already laid pipe. Before laying of cable in the trench, it should be thoroughly checked for sharp ballast and stones so that the cable may not be damaged. Before and after laying cable the IR value should be checked. While laying the cable care should be taken that no tree roots/water lodging area come on the way of cable, as it may damage the outside insulation of cable. Armoring at both ends of the cable should be earthed. At termination point of cable aluminum lugs and Brass glands of suitable size and good quality shall be provided. The contractor shall restore the original condition of the space after laying of cable. Bending radius of the cable shall not be less than 16 times of dia of the cable. The trench shall be 35 cm. Wide and 100 cm. Deep and the cable shall be covered with good quality bricks /RCC cover of 50 mm thick</p>

	of ratio 1;3:6. The trench shall be refilled with soil available. Wherever the cable emerges out of the ground at least two loops of sufficient radius should be laid. Installation of cable along with wall / pole/roof top / underneath sheds wherever required shall be done with support of G. I. Saddles / clamp of proper size / G. I. Pipe. The cost of G. I. Pipe is taken separately. Breaking of floor / wall / road and other civil structures and repairing upto original condition, shall be done by the contractor, and no extra cost will be paid for it. Permission for crossing any road if required shall be arranged by the contractor in coordination with concerned rail supervisor, and all the expenditures will be borne by the contractor. Test report if any should be jointly signed by the contractor and concerned supervisor. All the instruments required for insulation testing high voltage testing shall be arranged by contractor at his own cost. The cable shall be transported by the contractor through his own means from major electrical depot to required site of work. Before transportation of the cable it shall be tested at site to ascertain the serviceability of the cable by the contractor and the cable will be supplied by Railway.
33 NS	Supply and laying of HDPE pipe conforming to IS 4984:1995 50mm dia wall thickness 3 mm PN-6 under the road/wall/air with proper fixing arrangement. The work involves laying of HDPE pipe
34 NS	Supply and laying of HDPE pipe conforming to IS 4984:1995 or latest, 75/80mm dia wall thickness 3 mm PN-4 under the road/air. The work involves laying of HDPE pipe. Whenever laying is to be done across the road, than road should be repaired with Concrete Cement properly.
35 NS	<p>HDPE PIPES (dia 160 mm under road/ground/floor/railway track) This item covers supply &amp; laying of HDPE pipe in already excavated trench under road/ground/floor/railway track etc. with technical specification 160 mm dia (OD), wall thickness between 6.2 mm to 7.1 mm, material grade PE-80 and class of pipe should be PN-4 with confirming to IS:4984/1995 or latest. Make: Sangir, Dutron, NOCIL, Hasti, Reliance, Supreme or equivalent.</p> <p>After laying of HDPE pipe, the trench should be refilled with same soil and restored to original position &amp; pipe should be laid in trench such that possible to withdraw the cable for repair or replacement. The pipe shall be laid with a gradient to facilitate drainage of water and it shall be right angle to the track, For each power crossing, contractor shall have to lay two length of pipe, for 02 Nos. of cable to be laid or as per instruction of site engineer.</p> <p>Accessories related with laying of HDPE pipe like fitting, bends joints/coupler, junction, flange end cap etc. as per site requirement will be provide by contractor and no extra payment will be given for above items. The contractor shall arrange inspection of HDPE pipe at manufacture's works before dispatch at his own cost if required by the railway and have to submit manufacture's test certificate of HDPE pipe.</p>
36 NS	Digging and filling of trench size 0.4x1.2 mtr as per spec (trench work may be on kuchha/pucca and land and all type of soil as per site requirement and without protective layer of brick) surface of trench shall be made good in all respect and satisfaction of site engineer as per Railway requirement.
37 NS	Horizontal Directional Drilling (HDD)/Boring and trenchless cabling. Supply, transportation and insertion of self lubricated HDPE pipe and laying of cables in boring under the track /road/ground/ masonry building by using self lubricated HDPE pipe of 120mm outer dia and 103.5mm inner dia in the bore and laying of cables in the bore under the track/road/ground/masonry building. The depth of horizontal boring should be minimum 1 mtr or more from rail flange/road level/ground, as per site requirement.
38 NS	VTPN 250A 8 Way: Supply, installation, testing & commissioning of VTPN type metal double door type 8 way DB with having 01 No. 250 Amp., 4 pole MCCB, 36 KA as incomer & 8 Nos. TP MCB, 10 KA 'C' curves, 40-63 Amp. Cap. as outgoing having suitable IP-54, IK-09 protection, As per site requirement.
39 NS	OCTAGONAL POLE: Supply and fixing 5meter long Hot dip galvanized octagonal pole with foundation and base plate size 200x200x12mm as per standard specifications with fixing of 1No. arms 1000mm for the fittings as per requirement including smart pack junction box with 6A MCB and terminals and connection.
40 NS	COPPER PLATE EARTHING: Supply of material and providing copper plate earthing 4meter deep size 600x600x3mm with 4meter long GI 'B' class pipe 19/20mm for pouring of water with 10Kg salt and 60Kg charcoal including masonry/RCC earth enclosure with pull out handle and 25x3mm copper flat earth strip from earth pit bottom to earth pit top. The copper plate to be provided with 2 Nos. holes of 10mm dia and copper flat to be joined by 10mm brass nut and bolts. The copper flat shall be provided with three holes of 10mm dia 2 Nos. for earth plate and 1 No. hole on top for connection of extra flat. The earth value to be measured and should maintained resistance level as per IE rule and marked on earth pit.
41 NS	Copper Earth Flat: Supply and laying copper earth flat strip 25x3mm from earth pit top to main board/ equipment/ item.
42 NS	BELL: Supply and fixing electronic bell with switch and wiring by 1.5sqmm PVC CU cable with board and connection.

43 NS	Supply of single stage Monoblock open well submersible pump set with control panel rating 2HP/1.5kW, Head Range (M); 26 meter or above, Size (mm) suction X delivery 50x40, Discharge (LPM); 180 or above at 26 meter head suitable for single phase 50Hz AC supply make CRI, CG, Kirloskar or similar with all accessories at site requirement.
44 NS	Supply of single stage Monoblock open well submersible pump set, rating 10HP/7.5kW, Head upto 52 meters, Size (mm) Suc. X Del. 65x50, 2900 RPM, Suitable for 3 phase 50 Hz, 415 Volt, Make-KSB or similar, complete in all respect as per Railway requirement. 31.1 OPEN WELL/SUMP MONOBLOCK SUBMERSIBLE PUMPING SET: The pump sets shall confirm to relevant ISS and shall be guaranteed for the pump discharge range of head between +25% and -10% of the specified head. The pump set shall be suitable for open well/sump. The open well/sump submersible pumping sets should be in accordance with the provisions of IS-14220 or latest. The pump set should have the following features. (a)Water cooled and water lubricated motor. (b) Motor body preferably of stainless steel construction. (c) Complete motor shaft of stainless steel. (d) All rotating parts to be dynamically balanced. (e) The rotor as well as stator should be impregnated under vacuum or air-drying and both should be baked repeatedly under controlled condition to ensure long life of varnish/epoxy and to give a hard finish to the motor surface. The rotor should be dynamically balanced at high speed.
45 NS	Supply of single stage Mono-block submersible Pump set 12.5HP/9.3kW, 3-phase, 400/415V AC Head Range (M); 40 or above, Discharge (LPM); 550 or above suitable for 3phase, 50 Hz make –KSB or similar with all accessories at site requirement. OPEN WELL/SUMP MONOBLOCK SUBMERSIBLE PUMPING SET: The pump sets shall confirm to relevant ISS and shall be guaranteed for the pump discharge range of head between +25% and -10% of the specified head. The pump set shall be suitable for open well/sump. The open well/sump submersible pumping sets should be in accordance with the provisions of IS-14220 or latest. The pump set should have the following features. (a)Water cooled and water lubricated motor. (b) Motor body preferably of stainless steel construction. (c) Complete motor shaft of stainless steel. (d) All rotating parts to be dynamically balanced. (e) The rotor as well as stator should be impregnated under vacuum or air-drying and both should be baked repeatedly under controlled condition to ensure long life of varnish/epoxy and to give a hard finish to the motor surface. The rotor should be dynamically balanced at high speed.
46 NS	Supply of Submersible energy efficient Pumps (3 star or above) 10HP, 20 stages or above, 3-phase, 415V AC with all accessories at site. 1.1 SUBMERSIBLE PUMP SET- The pump set shall Energy Efficient Pumps (3 star or above) confirm to latest relevant IS and shall be guaranteed for the pump discharge range of head between +25% and -10% of the specified head. The pump set shall be suitable for 8" dia bore well. Rotor dynamically balanced suitable for operation on 3-phase 50Cycles 415Volts -10% +5% AC Supply. Motor squirrel cage induction type and shall be adequate capacity to provide the pump discharge within the range as specified. The Electric motor shall be water-cooled and water lubricated sealed against pollution from outside water. The thrust bearing shall be hydrodynamic Mitch well type preferably and provided with tilting thrust pads designed to make up all outward loads at the most unfavourable conditions. The motor shall be of ISI 410grade material; starter of motor should be impregnated with superior quality epoxy paint having type it thermal insulation as per IS5831-1970 or latest the rotor shall be dynamically balanced. All nut-bolts in contact with water of bore well should be of stainless steel. The motor should confirm to IS 9283-1979 or latest and shall be suitable for star delta starter and have nameplate as specified in IS 9283-1979 or latest. Discharge: 120 LPM or Above; Head range: 160m or above; Phase: 3 Phase; HP: 10 HP; Stage:20 or above. 1.2 PUMP: The hydraulic components of pump shall be lightweight and high-grade engineering material having excellent wear resistance and resistance of corrosion. The pump shaft shall be stainless steel, suction casing of pump be of cast iron from grade F6200 of IS 210-1970 or latest. The impellers shall be enclosed type and shall be of glass filled Noryl. Each pump shall be complete with the following assemblies. a) Suction case with strainer. b) Coupling. c) Non return valve fitted in pump assembly. d) Pressure compensation device and rubber device for water.
47 NS	Installation of pump set mono block & amp; submersible in bore well/ open well with nut, bolts, washer and rubber packing etc. with GI pipe and copper cable (GI pipe and cable will be supplied by Railway)
48 NS	FLAT SUBMERSIBLE CABLE: Supply and laying of flat submersible cable copper 3x6sqmm for pump set ISI mark as per IS 694 Part-I 1964 or latest.
49 NS	Supply and fixing pipe fittings bends sockets flanges, delivery valve and non return valve and supporting clamps (2 sets) etc complete in all respect.
50 NS	AUTOMATIC CONTROL PANEL: Floor mounted panel board fully automatic air break Star-Delta starter

	<p>suitable to 10HP pump motor set offered with over load and under voltage protection relay. All the contractor of starter shall be of min 32A with O/L relay setting of 0.6 times, the actual load current of pump motor and O/L shall be suitable for contactor mounting type. The starter confirms to relevant IS and complete for automatic operation of pump and shall be provided with.</p> <p>a) One single phasing preventer of suitable for pump motor.</p> <p>b) One ammeter of 95x95mm size</p> <p>c) One voltmeter 0-500V with selector switching for measuring different phase voltage (size 95x95mm)</p> <p>d) Indication lamp for start/run position of pump.</p> <p>e) MCB triple poles of suitable capacity or railway requirement.</p> <p>f) Water level guard for dry run protection with probe and connecting cable for WLC in bore well.</p> <p>g) Electronic hours meter seven digits 5+2 decimal.</p> <p>h) Electronic Time switch for automatic operation of pump.</p> <p>i) 2 Nos. Earthing terminals of controls panel at suitable location.</p> <p>j) All the components/starter/relay/contactor etc shall be confirm to relevant ISS</p> <p>k) The control panel shall be dust tight vermin proof of made out of sheet metal (18swg) suitable for floor mounting &amp; lockable type with provision of louvers for heat dissipation.</p> <p>l) The automatic control panel shall have one switch for selecting manual and automatic control.</p> <p>m) Switching ON &amp; OFF of pump shall be through electronic time switch.</p> <p>n) The panel shall be complete with wiring with copper PVC cable 6mmsq for load wires of pump including connections and provide with 2 Nos. earthing terminals.</p> <p>o) Size of control panel (70x40x25cms or above) and fixing of panel as per Railway requirement. The panel shall be painted with one coat of red oxide and two coats of enamel paint.</p>
51 NS	GI pipe: Supply and fixing/laying GI pipe 'B' class as per IS 1239 or latest size 50mm dia for cable use including all bends sockets required for the work. When GI pipe is laying through/across road or pucca platform the same should be repaired with concrete-cement properly
52 NS	Supply fabrication fixing and installation of MS sheet steel enclosure free standing outdoor type with heat dissipation sides 2feet above ground level for control panel and accessories of 16swg sheet size 120x70x60cms or above with painting and locking arrangement and foundation with installation of automatic control panel inside the box.
53 NS	<p>MCCB: Supply and fixing of MCCB 40A 16kA, 3-phase, 415-Volt, 50Hz, 4-pole with having fixed thermal magnetic setting.</p> <p>The products should have positive isolation feature. MCCB should have Ics= 100%Icu MCCBs should be confirmed to IS 13947-2 or latest &amp; IEC 60947-2 or latest.</p>
54 NS	Supply, fixing testing and commissioning of capacitor 5KVAR capacity complete in all respect as per site requirement.
55 NS to 58 NS	<b>Specification for High mast ( 16Mtr ) :</b>
1.1	<b>SCOPE:</b> The scope of this specification covers the manufacture, transport, installation, testing and commissioning of the complete lighting system, using raising and lowering type of High mast towers, including the civil foundation works. The Railway will only provide the supply point and rest all the work to be done by the contractor. However, all items required for the safe and efficient operation and maintenance of the lighting system, including the high mast, whether explicitly stated in the following pages or not, shall be included by the contractor.
2.0	<b>APPLICABLE STANDARDS:</b> The following or latest shall be the reference standard for the loading of the high mast:
A	IS 875 (Part III): 2015
B	BSEN 10025/DIN 17100
C	BS 5135/AWS
D	BS ISO 1461
E	TR No. 7 1996 of ILE, UK
3.0	<b>HIGH MAST: (16 Mtr Height)</b> The high mast shall be of continuously tapered, polygonal cross section, at least 20 sided, presenting a good and pleasing appearance and shall be based on proven in-tension design confirming to be standards referred to above, to give an assured performance, and reliable service. The structure shall be suitable for wind loading as per IS 875 part-III 1987 or latest. The mast height shall be 16M, with minimum diameters of 150mm at the top and 460mm or more at the bottom. Minimum plate thickness of bottom section shall be 4mm and other section 3mm. The PCD of the mast flange shall be

	minimum 590mm.
4.1	<b>CONSTRUCTION:</b> The mast shall be fabricated from special steel plates, confirming to BS-EN 10-025 or equivalent, cut and folded to form a polygonal section as stated at 4.1 above and shall be telescopically jointed and welded. The welding shall be in accordance with BS 5135/AWS. The procedural weld geometry and the workmanship shall be exhaustively tested on the completed welds. Mast shall be delivered to site in two sections only. <i>Each section shall be fabricated out of individual plates duly folded and welded. There shall be only one longitudinal seam weld per section. Sections fabricated out of multiple plates or with more than one weld shall not be accepted. There shall not be any other internal or external welds in the mast sections.</i> At site the sections shall be jointed together by slip-stressed-fit method. No site welding or bolted joint shall be done the mast. The minimum over lap distance shall be 1.5 times the diameter at penetration. The dimensions of the mast shall be decided based on proper design and design calculations shall be submitted for verification.
4.2	The mast shall be provided with fully penetrated flange, which shall be free from any lamination or incursion. The welded connection of the base flange shall be fully developed to the strength of the entire section. The base flange shall be provided with supplementary gussets between the bolt-holes to ensure elimination of helical stress concentration. For the environmental protection of the mast, the entire fabricated mast shall be hot dip galvanized, internally and externally, having a uniform thickness of 65 micron for the bottom and top sections. The mast sections shall be galvanized by single dipping method. Sections galvanized by double/multiple dipping methods shall not be accepted.
4.2	<b>DOOR OPENING:</b> An adequate door opening shall be provided at the base of the mast and the opening shall be such that it permits clear access to equipments like winches, cables, plugs and sockets etc and also facilitate easy removal of the winch. The door opening shall be complete with a close fitting, vandal resistant, weatherproof door, provided with a heavy-duty double internal lock with special paddle key.
4.2.1	The door opening shall be carefully designed and reinforced with welded steel section, so that the mast section at the base shall be unaffected and undue bucking of the cut portion is prevented.
4.2.1.1	Size of door opening shall not be more than 1100x280mm to avoid bucking of the mast section under heavy wind condition.
4.2.1.2	<b>DYNAMIC LOADING FOR THE MAST:</b> The mast structure shall be suitable to sustain an assumed maximum reaction arising from a wind speed as per IS 875 or latest (three second gust), and shall be measured at a height of 10 meters above ground level. The design life of the mast shall be a minimum of 25years.
4.3	<b>LANTERN CARRIAGE:</b> The lantern carriage shall be of hot-dip galvanized steel construction designed to support and uniformly mount flood light luminaires, complete with guide rollers, suspension arrangement, and automatic locking system for smooth raising and lowering operation of the high mast.
4.4	<b>FABRICATION:</b> A fabricated lantern carriage shall be provided for fixing and holding the flood light fittings and control gearboxes. The lantern carriage shall be of special design and shall be of steel tube construction, the tubes acting as conduits for wires, with holes fully protected by grommets. The lantern carriage shall be so designed and fabricated to hold the required number of flood light fittings and the control gear boxed and also have a perfect self-balance.
4.4.1	The lantern carriage shall be fabricated in two halves and joined by bolted flanges with stainless steel bolts and nyloc type stainless steel nuts to enable easy installation or removal from the erected mast. The inner lining of the carriage shall be provide with protective PVC arrangement, so that no damage is caused to the surface of the mast during the raising and lowering operation of the carriage. The entire lantern carriage shall be hot dip galvanized after fabrication.
4.4.1.1	<b>JUNCTION BOX:</b> Weather proof junction box, made of cast Aluminium shall be provided on the carriage assembly as required, from which the inter-connections to the designed number of the flood light luminaries and associated control gears fixed on the carriage, shall be made
4.4.2	<b>RAISING AND LOWERING MECHANISM:</b> For the installation and maintenance of the luminaries and lamps, it will be necessary to lower and raise the lantern carriage assembly. To enable this, a suitable winch arrangement shall be provided, with the winch fixed at the base of the mast and the specially designed head frame assembly at the top.
4.5	<b>WINCH:</b> The winch shall be of completely self sustaining type, without the need for brake shoe, springs or clutches. Each driving spindle of the winch shall be positively locked when not in use, by gravity activated PAWLS. Individual drum also should be operated for fine adjustment of lantern carriage. The capacity, operating speed, safe working load, recommended lubrication and serial number of the winch shall be clearly marked on each winch.

4.5.1	The gear ratio of the winch shall be 53:1. However the minimum-working load shall be not less than 750kg. The winch shall be self-lubricating type by means of an oil bath and the oil shall be readily available grades of reputed producers.
4.5.1.1	The winch drums shall be grooved to ensure perfect seat for stable and tidy rope lay, with no chances of rope slippage. The rope termination in the winch shall be such that distortion or twisting is eliminated and at least 5 to 6 turns of rope remains on the drum even when the lantern carriage is fully lowered and rested on the rest pads. <i>It should be possible to operate the winch manually by a suitable handle and/or by an external power tool. Operation of the winch with manual handle shall be independent of the power tool. Winches with manual operation through the power tools shaft shall not be accepted. Individual drum operation of the winch shall be possible. A Double drum winch shall have 2 drums and two worm gears independent in operation for increased safety.</i> It shall be possible to remove the double drum after dismantling, through the door opening provided at the base of the mast. Also, a winch gearbox for simultaneous and reversible operation of the double drum winch shall be provided as part of the contract.
4.5.1.2	The winch shall be type tested in presence of a reputed institution and the test certificates shall be furnished before supply of materials. A test certificate shall be furnished by the contractor from the original equipment manufacturer, for each winch in support of the maximum load operated by the winch.
4.5.1.3	<b>HEAD FRAME:</b> The head frame which is to be designed as a capping unit of the mast, shall be of welded steel construction, galvanized both internally and externally after assembly. The top pulley shall be of appropriate diameter, large enough to accommodate the stainless steel wire ropes and the multi-core electrical cable. The pulley block shall be made of non-corrodible material, and shall be of die-cast Aluminium Alloy (LM-6). Pulley made of synthetic materials such as plastic or PVC are not acceptable. Self-lubricating bearings and stainless steel shaft shall be provided to facilitate smooth and maintenance free operation for a long period.
4.5.2	The pulley assembly shall be fully protected by a canopy galvanized internally and externally.
4.5.2.1	Close fitting guides and sleeves shall be provided to ensure that the ropes and cables do not dislodge from their respective positions in the grooves. The head frame shall be provided with guides and stops with PVC buffer for docking the lantern carriage.
4.5.2.2	<b>STAINLESS STEEL WIRE ROPES:</b> The suspension system shall essentially be without any intermediate joint and shall consist of only non-corrodible stainless steel of AISI 316 or better grade.
4.5.3	The stainless steel wire ropes shall be of 7/19 construction, the central core being of the same material. The overall diameter of the rope shall not be less than 6mm. the breaking load of each rope shall not be less than 2350kg giving a factor of safety of over 5 for the system at full load as per the TR-7 referred to in the beginning of this specification. The end constructions of rope to the winch drum shall be fitted with talurit.
4.5.3.1	The thimbles shall be secured on ropes by compression splices. Two continuous lengths of stainless steel wire ropes shall be used in the system and no intermediate joints are acceptable in view of the required safety. No intermediate joints/terminations, either bolted or else, shall be provided on the wire ropes between winch and lantern carriage.
4.5.3.2	<b>ELECTRICAL SYSTEM, CABLE AND CABLE CONNECTIONS:</b> A suitable terminal box shall be provided as part of the contact at the base compartment of the high mast for terminating the incoming cable. The electrical connections from the bottom to the top shall be made by special trailing cable. The cable shall be EPR insulated and PCP sheathed to get flexibility and endurance. Size of the cable shall be minimum 5 core 2.5sqmm copper. The cable shall be of reputed make. At the top there shall be weather proof junction box to terminate the trailing cable. Connections from the top junction box to the individual luminaries shall be made by using 3 core 1.5sqmm flexible PVC cables of reputed make. The system shall have in-built facilities for testing the luminaries while in lowered position.
4.6	Also, suitable provision shall be made at the base compartment of the mast to facilitate the operation of internally mounted, electrically operated power tool for raising and lowering of the lantern carriage assembly. The trailing cables of the lantern carriage rings shall be terminated by means of specially designed, metal clad, multi-pin plug and socket provided in the base compartment to enable easy disconnection when required.
4.6.1	<b>POWER TOOL FOR THE WINCH:</b> A suitable high powered, electrically driven, internally mounted power tool, with manual over ride shall be supplied for the raising and lowering of the lantern carriage for maintenance purposes. The speed for the power tool shall be to suit the system. The power tool shall be single speed. Provided with motor of the required rating. The power tool shall be supplied complete with a suitable control switch so that the operation of the mast can be done at a safe distance. The capacity and speed of the electric motor used in the power tool shall be suitable for the lifting of the design load installed

	on the lantern carriage.
4.7	The power toll mounting shall be so designed that it will be not only self supporting but also aligns the power toll perfectly with respect to the winch spindle during the operations. Also, a handle for the manual operation of the winches in case of problems with the electrically operated toll, shall be provided and shall incorporate a torque limiting device.
4.7.1	There shall be a separate torque-limiting device to protect the wire ropes from over stretching. It shall be mechanical with suitable load adjusting device. The torque limiter shall trip the load when it exceeds the adjusted limits. There shall be suitable provision for warning the operator once the load is tripped off. The torque limiter is a requirement as per the relevant standards in view of the over all safety of the system. Each mast shall have its own power toll motor.
4.7.2	<b>LIGHTING FINIAL:</b> One number heavy duty dip galvanized lighting finial shall be provided for each mast. The lighting finial shall be minimum 1.2M in length and shall be provided at the centre of the head frame. It shall be bolted solidly to the head frame to get a direct conducting path to the earth through the mast. The lightning finial shall not be provided on the lantern carriage under any circumstances in view of safety of the system.
4.8	<b>AVIATION OBSTRUCTION LIGHTS:</b> Suitable aviation obstruction lights of reliable design shall be provided on top of each mast.
4.9	Supply installation testing and commissioning of twin aviation obstruction lights type BJAOL 100 of Bajaj or similar with lamps or equivalent.
4.9.1	<b>EARTHING TERMINALS:</b> Suitable earth terminal using 12mm diameter stainless steel bolts shall be provided at a convenient location on the base of the mast for lightning and electrical earthing of the mast.
4.10	<b>FEEDER PILLAR:</b> Each mast shall be provided with a feeder pillar fabricated out of 14swg CRCA and finished with two coats of red oxide primer and gray enamel paint of shade 631 of IS-5. the feeder pillar shall comprise of incoming 32A TPN switch, HRC fuses, copper wiring, outgoing 32A SP, TP MCB for power toll contactors for reversing the motor. Feeder pillar shall be mounted on suitable foundation near the mast.
4.11	<b>INCOMING POWER CABLE:</b> A cable size 4x16sqmm AL conductor, armored cable for power supply (Max 10M) and 4x1.5sqmm copper conductor armored cable for motor supply shall be provided from feeder pillar to the base compartment of the high mast. Cable shall be taken to the base compartment of the high mast through the provision made in the foundation. Power cable of suitable size up to the feeder pillar from supply point shall be provided by the contractor. The Al cable is taken as separate NS. All copper cables are included in the cost of the tender.
4.12	<b>FOUNDATION:-</b> Design and casting of suitable foundation with concrete ( M-20 for the 16mtr high mast) having the safe soil bearing capacity at site as 10T/sqmtr at 2 meter depth including supply of foundation bolts manufactured from special steel along with nuts, washers and anchor plates and templates suitable for high mast.
5.0	<b>CONTROL PANEL:</b> Supply, installation, testing and commissioning of control panel housing with suitable timer contactor circuit for automatic ON & OFF of the mast lights at a pre-set time.
59 NS	Supply and fixing of LED emergency light slimray 60-LED Rechargeable batten, adjustable brightness, power : 4 watt or above and complete in all respect as per Railway requirement.
60 NS	Supply, fixing testing and commissioning of Astronomical timer multifunctional digital Legrand Make (Catalogue No.412657 or latest) or similar complete in all respect as per railway requirement
61 NS	<b>LT CABLE STRAIGHT JOINT:</b> Supply, installation, testing and commissioning of heat shrinkable straight through Joint kit with required accessories complete in all respect suitable for LT cable, 25-185sqmm cable as per site requirement.
62 NS	<b>HT CABLE Straight Joint:</b> Supply, installation, testing and commissioning of heat shrinkable straight HT cable joint suitable for 11kV with required accessories complete in all respect suitable for 3 core 180sqmm XLPE cable.
63 NS	Supplying and installing fire bucket stand including sheet metal (16 gauge) shade, platform and associated civil works each stand should have four nos fire buckets of 24 gauge galvanized steel sheet, standard 9 litre capacity and of round bottom shape, painted white inside and red outside and black on the bottom, inscribed with letters "Fire" in black and gold & one no fire man's axe at approved location as per approved make.
64 NS	Supply and fixing of MS jail 1"x1"welded on MS angle frame30x30x3mm which is fixed on base angle frame of 50x50x6 mm and 40x6mm MS flat in center to support the jali. The whole structure painted with one coat of red oxide and two coats of enamel paint as per railway requirement The structure is to be supported by erection of rails, if required (rails will be supplied by railway, but shall be cut in length,

	erected and painted by contractor). Providing roof on existing MS rail/angle structure by AC/GI sheet, with suitable nut bolts and washer if required.																		
65 NS	Supply fixing and commissioning of HT XLPE heat shrinkable type cable end box indoor type size 50 to 185 sqmm complete in all respect as per Railway requirement.																		
66 NS	Supply and fixing MCB 63A four poles 10kA complete in all respect as per Railway requirement.																		
67 NS	Supply and fixing High/Medium Voltage danger notice plate 250 mm. x 200 mm. made of M.S. 2 mm. thick and vitreous enameled white on both sides and with inscription in signal red colour on front side as required complete in all respect as per Railway requirement.																		
68 NS	Name Signage: Single side thermoformed alphanumeric name signage with back lit RGB LED array having synchronous three colour changing programme.																		
I	Each alphabet will be thermoformed using 3mm unbreakable, non-yellowing 0/40 sheet with the alphabet having a vertical peak height of 600mm and proportionate horizontal span. The thermoforming will be to a minimum depth of 30mm with suitable flange width.																		
II	The alphabet will be embedded and sealed using suitable epoxy resin in an aluminium composite sheet fascia which is laser cut to allow only the projected profile of the alphabet to be visible. The fascia will have a navy blue background surrounding the alphabets.																		
III	The aluminium composite sheet fascia will be fixed in a weatherproof enclosure made using 18swg CRCA sheet steel duly powder coated in ivory-white colour and having suitable gasketing for protection against water and vermin ingress.																		
IV	The entire signage panel will be provided with mounting assembly to ensure secure grouting/fastening of the panel designed to withstand high wind velocity during extreme weather conditions.																		
V	The matter on the signage is: IN HINDI/ENGLISH – Matter will be provided by Railway at the time execution of work																		
VI	The minimum English/Hindi signage panel size will be (Length x Height) 6600X1200mm.																		
VII	The alphabets will have to be backlit using LED modular arrays comprising Red, Green and Blue LEDs.																		
VIII	LEDs will be 4 pin super flux hi-bright having specifications as given below:																		
	<table><tr><td>Red:</td><td>2.2V</td><td>(Typ.)/20mA/1800mcd/100</td><td>deg.</td><td>Viewing</td><td>angle</td></tr><tr><td>Green:</td><td>3.5V</td><td>(Typ.)/20mA/3300mcd/100</td><td>deg.</td><td>Viewing</td><td>angle</td></tr><tr><td>Blue:</td><td>3.5V</td><td>(Typ.)/20mA/1800mcd/100</td><td>deg.</td><td>Viewing</td><td>angle</td></tr></table> Average rated life = > 75000 hrs.	Red:	2.2V	(Typ.)/20mA/1800mcd/100	deg.	Viewing	angle	Green:	3.5V	(Typ.)/20mA/3300mcd/100	deg.	Viewing	angle	Blue:	3.5V	(Typ.)/20mA/1800mcd/100	deg.	Viewing	angle
Red:	2.2V	(Typ.)/20mA/1800mcd/100	deg.	Viewing	angle														
Green:	3.5V	(Typ.)/20mA/3300mcd/100	deg.	Viewing	angle														
Blue:	3.5V	(Typ.)/20mA/1800mcd/100	deg.	Viewing	angle														
IX	LED driver will have to be 3 channel microprocessor controlled PWM (Pulse width Modulation) out put providing synchronous programme control over the three signages in the three languages.																		
X	The master controller cum driver, slave driver and the switch mode power supply (SMPS) console will have to be an independent panel for ease of maintenance. The signage panel will contain only the LED module arrays.																		
XI	The master controller cum driver should be programmed to provide three colour changing in RED, Green and Blue in sequence synchronously in all the alphabets in all languages.																		
XII	The master controller should also have the function to provide any single colour in constant mode through a function switch, which can be manually set in the master control panel.																		
XIII	The master control panel should have the appropriate switchgear for protection and isolation in the eventuality of electrical fault or manual shutdown.																		
XIV	The master control panel should also have a time switch for programmable auto ON-OFF operation																		
XV	The master control panel should be made using 14swg CRCA sheet steel duly powder coated and designed for outdoor operation having a stand made using 35x35x5mm of height as per site condition.																		
XVI (a)	All ICs shall be of industrial grade.																		
XVI (b)	Electrolytic capacitor shall be rated for maximum temperature of 105 degree C.																		
XVI (c)	Paper polyester capacitors to be rated for maximum temperature of 85 degree C.																		
XVI (d)	All resistances shall preferably be metal film of adequate rating.																		
XVI (e)	All switching devices such as transistors, MOSFET's, IGBT's shall have junction temperature of 150 degree C.																		
XVI (f)	All devices shall have adequate thermal margin at ambient of 55 degree C.																		
XVI (g)	All protective cum adhesive coating used on PCB's should be clean and transparent and should not affect colour code of electronic component or the product code of the component.																		
XVI (h)	Heavy components should be properly fixed and the shoulder connection should be with good finish.																		
XVI (i)	The system has a warranty of two years from date of supply against any manufacturing defects on all the																		



	electronic circuits and LEDs.
69 NS	Supply, laying and connecting for power supply by copper cable 2.5sqmm 3 core as per relevant and latest IS.
70 NS	Supply, laying and connecting for power supply by copper cable 2.5sqmm 3 core as per relevant and latest IS
71 NS	Wiring of shed LP/TP in covered shed with 1.5sqmm copper wire PVC insulated & multi- stranded in PVC conduit, ISI mark 1.5mm thick, size 19/20mm dia and 1.5sqmm PVC insulated multi stranded copper earth wire with ceiling rose fixed with saddles or tied properly and junction box as per railway requirement.
72 NS	PVC CASING-CAPING: Supply and fixing casing caping of PVC size 75x75mm or above and 2mm thick with suitable nut bolts for fixing or tied with copper wire 14swg for 5/7 nos. of copper wire & earth wire as per Railway requirement
73 NS	FIVE WIRE SYSTEM: Supply, laying and fixing five wire of different colours of PVC copper cable size 10sqmm flame retardant, low smoke single core insulated unsheathed multi-stranded copper conductor, voltage grade 1100V confirm to IS694- 1990 or latest with one no 8 SWG copper earth wire. The five wire system shall be installed in shed.
74 NS	MS Flat 40x3mm: Supply and fixing of MS flat of iron size 40x3mm with nut bolts, spacers and fixing clamps complete in all respect as per Railway requirement.
75 NS	Supply, fixing, testing and commissioning of microprocessor Auto change over 630A 70Ka FP make-Legrand Cat. 625385 or latest or similar complete in all respect as per site requirement
76 NS	Supply and fixing of 7W LED Tiltable Mirror light in Aluminum body with glass cover in sand gray finish in 6000k, Approx dimension 320x78x28mm or above, catalogue no. LLT 004 Make Ledlum or similar, complete in all respect as per Railway requirement
77 NS	Supply and fixing of PVC conduit size 25mm dia; thickness 1.6mm ISI marked surface/concealed and repairing of wall/Column with cement and wall putty and paint matching colour with existing colour complete in all respect as per Railway requirement
78 NS	Air Circulator: Supply, fixing and connecting Heavy Duty Air Circulator Fan 600mm sweep with fastener, and nut bolts in wall as per site requirement and connection with cord flexible and complete in all respect as per Railway requirement.
79 NS	<p>Supply, installation, testing and commissioning of 3 phase, 415V, 63A capacity, ray roll plug &amp; socket with 100 A TPN MCCB housed in MS box of size 450 mm (W) x 600 mm (H) x 330 mm(D) or as per site requirement suitable for outdoor mounting and fabricated with 14 SWG thick MS sheet and slotted angle of 50 x 50 x 5 mm size with dust and vermin proof enclosure. The box should be compact in design and suitable for 3 phase, 4 wire, 415V 50 Hz supply system. The box shall have bottom opening with removable plate of 2 mm thickness.</p> <p>The box shall have the following arrangements:-</p> <p>1 No. MCCB 100 A, 25 KA, 4 pole.</p> <p>1 No. Decontactor socket 63A, 5 pin type with wall box.</p> <p>1 Set tinned copper bus bar of size 200 x 30 x 5 mm for three phase and neutral with insulators.</p> <p>The box shall be internally wired by PVC insulated, single core flexible copper cable of 16 mm<sup>2</sup> size with copper crimping lugs.</p> <p>The door of the box shall have locking arrangement in the middle and two Nos. screwed knobs also on the bottom and top.</p> <p>The box should be treated with rust proofing process and painted with two coats of anticorrosive red oxide primer and final two coats of gray enamel paint/powder coated.</p> <p>The box shall be provided with earthing terminals on the side and danger board on the front side shall be provided.</p> <p>The box shall be fixed on the rail poles/ existing walls/portals with proper size of clamps and nuts &amp; bolts</p>
80 NS	SH RAIL POST: Erection of providing SH rail post size 50/60/75/90/120lbs, 1.5 meters long with painting two coat of red oxide and two coat of enamel paint and proper foundation with RCC ratio 1:3:6. (Rails will be supplied by Railway).
81 NS	Supply and fixing of glow sign boards having train timing or utility signage with flex star/hanwa 19 onze solvent multicolour printing, ISI marked LED light fitting 1 No. per 5sqft; 30gauges GI sheet on all four sides; 1"x1" sq steel tube & angle frame with red oxide, including transportation, labour charge, angle fittings charges for all boards.Matter will be provided by Railway

आजुषीत  
अमृत महोत्सव

भारत सरकार Government of India  
रेल मंत्रालय Ministry of Railways  
रेलवे बोर्ड (Railway Board)

आजुषीत  
अमृत महोत्सव

RBA No.26/ 2022

No.2020/ACII/9/6/e

New Delhi, dated:07.04.2022

General Managers,  
All Zonal Railways/ PUs.

Sub: Online BG verification through IPAS.

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The matter regarding online verification of BGs by the vendors/contractors through Structured Financial Messaging System (SFMS) platform in association with SBI was under consideration from quite some time. Now, this facility is available on IPAS. In order to avail this facility, it is necessary that following details may be entered into SFMS while issuing Bank Guarantees by vendors/contractors in favour of Railways:

IFSC CODE	SBIN000RAIL
IFSC TYPE	BRANCH
BANK NAME	STATE BANK OF INDIA
BRANCH NAME	RAIL
CITY NAME	NAVI MUMBAI
ADDRESS	SECTOR-11,CBD BELAPUR, NAVI MUMBAI
DISTRICT	NAVI MUMBAI
STATE	MAHARASHTRA
BG ENABLED	YES

This IFSC Code is only valid for BG issuance and verification in favour of Railways.

(Ajay Bartwal)  
Jt. Director Finance (CCA)  
Railway Board  
Ph.No. 23047018  
E mail ID: ajay.bartwal@gov.in

Copy to

1. Principal Financial Advisors/All Zonal Railways/ PUs.
2. PF/ CRIS, Chanakyapuri, New Delhi-110021.
3. EDRS/G, EDCE/G
4. CGM/SBI/GBU/New Delhi
5. GM/IT Trade & TF/SBI/New Delhi
6. Advisor/MR, OSD/MR, OSD/Co-ord/MR, Additional PS/MR.