



इरकॉन इंटरनेशनल लिमिटेड
(भारत सरकार का उपक्रम)
IRCON INTERNATIONAL LIMITED



NAVRATNA COMPANY
(A Govt. of India Undertaking)

An integrated Engineering and Construction Company

सोन भवन (प्रथम तल), दारोगा प्रसाद राय पथ, पटना - 800 001, फोन : 0612-2506446, 2506543
Sone Bhawan (First Floor), Daroga Prasad Rai Path. Patna - 800 001, Phone : 0612-2506446, 2506543

LETTER OF ACCEPTANCE

No: IRCON/2071/JCRL/SNT/ PKG-XA/KIRAN/686

Date: 07/06/2024

M/s Kiran Infra Engineers Ltd.

B-141, Road No. 9-D,
Vishwakarma Industrial Area,
Jaipur, Rajasthan - 302013
Ph: 0141 2330305, 2330427
Fax: 0141 2331808, 2260073
E-mail: contact@kiraninfra.com

Kind Attn: Shri Kishore Sharma

Sub: Design, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at Kathautia, Shahpur, Duari and Kharika station in connection with Shivpur-Kathutia New BG track with electrification in Dhanbad division of East Central Railways in the state of Jharkhand, India.

Ref: 1. Tender No. IRCON/2071/JCRL/SNT/PKG-XA dated 11.03.2024.
2. Corrigendum No.1 dated 23.03.2024.
3. Your Technical Bid Opened on 05.04.2024
4. Your Financial Bid Opened on 24.05.2024.

Dear Sir,

1. In reference to the above, your offer for above referred tender has been accepted by the Competent Authority at a total cost of ₹ 39,41,84,304 (₹ Thirty Nine Crore Forty One Lakh Eighty Four Thousand Three Hundred Four only) including GST @18% and all taxes & duties.
2. **Scope of Work:**
Design, Supply, Installation, Testing & Commissioning of Electronic Interlocking based Signalling System at Kathautia, Shahpur, Duari and Kharika station in connection with Shivpur-Kathutia New BG track with electrification in Dhanbad division of East Central Railways in the state of Jharkhand, India. For detailed scope of work refer clause 2.0 of SCC.
3. Bill of Quantities (BOQ), indicating the quantities and rates of the items is enclosed as Annexure - A.
4. **Taxes and Duties:** For compliance refer clause no 7.0 of SCC.

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5. **Price Adjustment:** As per clause no 9.0 of SCC.
6. **Completion Period:**
The entire work shall be completed within Twelve (12) months from the date of issue of Letter of acceptance (LOA). You have to submit detailed program for each major element of the work using modern network technique for project monitoring for approval of the engineer. For compliance refer clause 10.0 of SCC.
7. **Defect Liability Period:**
Defect Liability Period will be 12 months from the date of issue of completion certificate by the Engineer. For compliance refer clause 11.0 of SCC
8. **Insurance:** As per clause 12.0 of SCC.
9. **Performance Guarantee & Security Deposit/Retention Money:** (As per Clause 13 of SCC & Clause 8.0 of GCC)
- i. Performance Guarantee in the form of irrevocable Bank Guarantee (BG) on the Proforma annexed as Annexure-II from any Scheduled Bank for an amount of 5% (Five percent) of the contract value i.e. **₹1,97,09,215.00** (Rupees One Crore Ninety Seven Lakhs Two Hundred Fifteen only) to be submitted within 21 (Twenty-One) days from the date of issue of Letter of Acceptance (LOA) before signing of Contract Agreement and shall be valid upto 60 days beyond completion period.
 - ii. Retention money for all contracts shall be recovered from on account/ final bills of the Contractor @ 10% of gross value of each bill after adjusting EMD amount till the amount so recovered including EMD amount adds upto 5% of the contract value of the work.
10. Contract Agreement shall be signed between you and IRCON INTERNATIONAL LIMITED within 28 days from the date of issue of LOA. You have to submit a non-judicial Stamp Paper of **₹1000** and attend the office of CGM/S&T/Patna, IRCON INTERNATIONAL LIMITED, 6thFloor, Sone Bhawan, Daroga Prasad Rai Path, Patna – 800001 for Signing of Contract Agreement as per clause 16 of SCC.
11. You have to sign the Integrity Pact at the time of signing Contract Agreement and submit a non-judicial Stamp Paper of ₹1000 for signing the Integrity Pact as per para 10 of Instructions to tenderers.
12. **Terms of Payment:** (As per Clause 26 of SCC):
- 12.1. **Payment for Supply of material:**
- i) Payment @ 80% of BOQ rates shall be made on delivery of material at specified location on Project, acceptance by Engineer and submission of following documents:

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- a) Original Inspection certificate issued by Inspecting Officer.
- b) 100% Tax Invoice with detailed packing List in duplicate.
- c) A certificate that the materials supplied are as per the contract and the amount claimed in the invoice is correct as per terms of the contract.
- ii) 10% payment at the accepted rate for the quantity shall be made after installation of the material on complete station/section.
- iii) Balance 10% payment at the accepted rate for the quantity shall be paid on successful commissioning and issue of Completion Certificate.
- iv) Also 10% payment against supply of material supplied for installation but not installed due to non-requirement of employer, due to change in design, drawing, scope of work etc. subsequent to the award of work, shall be paid after issue of Completion Certificate for the work and handing over the materials to the client.

12.2. Payment for Installation:

- i) Payment @90% of BOQ rates for the quantity shall be made after installation of the items, duly verified by IRCON's Engineer for individual item.
- ii) Payment @10% of BOQ rates for the quantity shall be paid on successful testing and commissioning of the work by contractor for the station including opening of traffic and issue of completion certificate, and submission of all as-built documents as per the Contract.

12.3. Payment of Composite items involving both supply and installation:

On certification by IRCON's Engineer, such items shall be paid as under (only on production of documents as per clause 12.1 (i) above)

- i) Payment @ 70% BOQ rates of the item shall be made on delivery, submission of documents mentioned at clause 12.1 (i), and acceptance of material by Engineer.
- ii) Payment @ 30% BOQ rates of the item shall be made on successful installation of the materials/equipment duly certified by IRCON's Engineer.
- iii) For items which could not be installed because of valid reasons, balance payment @ 30% of BOQ rates shall be made on issue of completion certificate for the work.

- 13. The Accounting unit for this project shall be Project office of IRCON at Ranchi, Bihar.
- 14. The contractor shall not claim any undue benefit arising due to any calculation/ printing error in the LOA. In case any calculation/printing error is detected in the LOA, the same shall be corrected at the time of Signing the Contract Agreement.
- 15. Until a formal agreement is executed, acceptance of this LOA by you shall constitute to be a binding of contract.
- 16. All other terms & conditions shall be as per the Tender Documents accepted by you, which shall form an integral part of this contract and shall be binding on you.



17. Two copies of this LOA are being sent herewith. Kindly acknowledge receipt as a token of unconditional acceptance and return one copy of the LOA, duly signed, and stamped by your authorized representative on each page, to this office within one week of issue of this LOA.

Thanking you,

DA:-

- i) Annexure A- BOQ
- ii) Annexure-1-(List of Signalling maintenance Tools & Plants)

for and on behalf of
Ircon International Ltd.


07/6/2024
(Manish Sharma)
CGM/S&T/Patna.



Annexure-A

Bill Of Quantity

SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
SUPPLY-Signalling Materials					
Electronic Interlocking System					
1	Design, Manufacture and Supply of Electronic Interlocking System (hot standby configuration) confirming to RDSO's specification No. RDSO/SPN/192/2019 Ver.2.0 and directive issued by Railway Board and RDSO as applicable at the date of supply/installation complete as per the Signalling Interlocking Plans (SIPs) enclosed. EI at all stations shall be complete with but not limited to:				
a)	Microprocessor Equipment (having hot standby system provided with facility of automatic changeover), other cards and assemblies/sub assemblies.				
b)	All type of interface Relays such as TPR's, WKR's, ECR's (suitable for LED signals), Point operation Relays, Point group relay other interface Relays etc and any other relay to be required to make the given EI and associated system functional. All the indoor relays shall be provided to suit 25 KV RE.				
c)	Industrial grade Operator Console with 55" VDU (2 Nos each per station) & Industrial grade Maintenance console with 42" VDU as per latest RDSO. Guideline & technical advisory note (TAN) including Supply of industrial grade inverter as per latest TAN, online Dot matrix printer with power supply etc. Also the furniture like table etc required for mounting the VDU				

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SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	shall be provided by the contractor.				
d)	Equipment racks, Relay racks, Rack fixture mounting arrangements and accessories.				
e)	Interconnecting cables and interfacing equipments required for interfacing the EI with outdoor gears, Data Logger system, Block proving Axle counter system, monitoring of Power Supply for IPS system etc.				
f)	Optical cables along with interfacing equipment etc.				
g)	Protective Devices like Fuses, Lightning arrestors (Class- A) and surge protection arrangement, equipotential bonding as per latest RDSO guidelines, etc.				
h)	All the consumables, wiring materials, fixtures, mounting arrangements and necessary accessories to install and make the EI system functional.				
i)	Supply of Software as per design for Electronic Interlocking System confirming to RDSO's specification No. RDSO/SPN/192/2019 Ver.2.0 or latest to suit Signalling Interlocking Plans (SIP's) enclosed including FAT.				
j)	Station master is to be provided with 2 VDU only. However SM Room & Equipment rooms may be situated in two different buildings and therefore may be required to be provided with augmented surge protection /optical interface by EI manufacture.				
k)	Supply of documents/manuals (six set per station) as per RDSO Specification no. RDSO/SPN/192/2019				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
l)	Supply of 10 % spares for the items such as relays, group relays, wire, terminals, cards/modules as recommended by OEM, connectors/ couplers, fuses minimum of one for use in the complete SSI / EI system.				
m)	Supply & installation of Ring Earth for EI system shall be done by the OEM as per latest TAN and guidelines issued by RDSO.				
n)	All accessories necessary to make the system functional shall be provided by the contractor even if the same is not mentioned in the BOQ.				
o)	Supply, Installation, Testing and commissioning of Fuse Autochangoover system.				
1.1	Kathautia	Nos.	1.00	2,43,48,464.00	2,43,48,464.00
1.2	Shahpur	Nos.	1.00	2,23,83,243.00	2,23,83,243.00
1.3	Duari	Nos.	1.00	2,23,83,243.00	2,23,83,243.00
1.4	Kharika	Nos.	1.00	2,40,74,993.00	2,40,74,993.00
	Notes				
a)	The EI equipment offered shall cater for 20% increase in field input quantities in future. The necessary hardware provided shall be such that it shall be possible to incorporate 20% increase in field input quantities without requirement of any additional hardware other than relays, cables.				
2	Supply of portable workstation to run alongwith EI configuration tools, data inputs, simulation and functional testing, diagnostic, troubleshooting & commissioning of EI System as per Technical Specification of the tender document. NOTE: Workstation should be capable of reconfiguring the system in case of any alterations in the yard or interlocking in future. Hardware configuration to	Nos	4.00	1,11,179.89	4,44,719.56



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	be approved by IRCON before supply.				
3	Supply of powder coated Main Cable Termination Rack complete with scaffolding, fixtures & accessories including square bars for mounting wago terminals, ladder, string rods, frame, base assembly, insulators, J bolt, nut/bolts & fasteners, bakelite sheet, etc.	Nos.	12.00	44,824.58	5,37,894.96
4	Supply of Wago/phoneix screwless 4 conductor disconnecting terminal suitable for copper wire of 0.5 sqmm to 4 sqmm as per spec no. RDSO/SPN/189/2004 ver 1.2. This also includes end stopper, End plate, Carriage Rail, Marker Strip etc. for the fixing of terminals.	Nos.	10560.00	78.42	8,28,115.20
5	Supply & Installation of Universal Earth Leakage Detector 12 Channel AC/DC as per RDSO/SPN/256/2002 or latest amendment.	Nos.	5.00	1,51,896.53	7,59,482.65
	Relays				
6	Supply of Relay AC immune miniature plug in neutral line tractive armature 24 V DC, Contacts front & back contacts metal to carbon complete with plug board retaining clip & connectors confirming to BRS - 931 A and as per RDSO Specn.No. IRS-S-34, IRS-S-23 IRS-S-60/78 or latest RDSO Specification.-QNA1 (Contact configuration 8F/8B)(outdoor)	Nos	212.00	4,725.59	10,01,825.08
	Datalogger:				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
7	Supply of Microprocessor based data logger with 512 Digital & 48 Analog Inputs as per RDSO specification No. IRS:S 99/2006 (amdt. 3) with latest amendments and shall be suitable to work with electronic interlocking system. It includes all interfacing equipments like protocol converter unit etc. It also includes design, supply and installation of all software required as standard practice of ECR and as per RDSO specification no. IRS:S 99/2006 or latest. Digital input to be taken from EI through protocol converter and in addition one digital input card to be provided for digital input of important interface relays. This also includes E1 MODEM for networking of Datalogger, power supply of adequate capacity, battery and fault diagnostic software for failure analysis. Complete Data Logger & Processor Module shall be placed in President/Rittel rack of suitable size to be supplied. This also includes supply of one no. of Computer, Computer Table (Godrej make), UPS, Printer and one no. Operator Chair (Godrej make) as per Technical Specification. It is also includes-Supply of Door Proximity switches along with 2 way rigid connector for wire termination between proximity switches and Datalogger Tag blocks.	Nos.	4.00	4,60,703.38	18,42,813.52
	Power Supply:				

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SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
8	Supply of SMPS Based Integrated Power Supply System (6 Lines) including supply of 110V/300AH Low Maintenance Lead Acid (LMLA) stationery battery for S&T installation as per IRS: S-88/2004 or latest and with SMPS charger as per RDSO Specification No. RDSO/SPN/165/2012 with latest ammendment with wooden battery rack for LMLA Batteries, remote indication panel, 05 nos. spare batteries and spares with tool kit as per RDSO list. Tentative drawing of IPS is attached with this tender document but current/voltage ratings of different modules may change as per actual load requirement.	Set	4.00	13,08,405.01	52,33,620.04
9	Supply of Single Phase Air Cooled, Silent DG set (CPCB approved acoustic enclosure) with alternator of 15 KVA, 0.8 pf and engine of minimum 25 BHP (multi cylinder) floor mounting type for installation in open complete with electrical control panel containing ammeter, voltmeter indicators, MCB/MCCB and key start/stop assembly, low maintenance battery of 12V-80AH as per IRS S-88/2004 of Standard/ Exide/Amco type, battery charger for charging the battery, AMF Panel etc. It also includes provision of diesel tank of suitable capacity to run minimum 10 hours fitted with a cock, supply pipe arrangement & its fixtures, clamps etc. for supplying Diesel Oil to Diesel Engine from this tank. The engine ratings are as per IS 10001, BS 5514, DIN 6271, ISO 3046 standards. The DG set ratings are as per ISO 8528 standards and are continuous ratings at STP	Set	4.00	5,17,581.27	20,70,325.08



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	conditions with 10% overloaded for 1 hour during 12 hours continuous running.				
10	Supply and installation of automatic changeover unit for changeover between incoming three phase power supply sources of 63A/230Volts single phase with provision of manual by pass arrangement. Drawing shall be got approved from engineer before supply of this item.	Nos	4.50	1,56,771.96	7,05,473.82
	Block Working				
11	Supply of Block Proving with Axle Counter System as per RDSO Specn. IRS:S-105/2012 (Ver.0) or latest using UFSBI & Block Panel for Single Line operation complete with Relays, timers consisting of following but not limited to:	Set	6.00	11,71,478.69	70,28,872.14
a)	Electronic Signaling Equipment: Universal Fail- Safe Block Interface (2nos) complete with all accessories as per RDSO Specn. No. IRS:S- 104/2012 (Ver.0) or latest.				
b)	Relay Rack with locking and sealing arrangement including Relays duly wired along with Relay bases (as per RDSO/S/32020 - Latest Amendment).				
c)	SM's Panel/Block Panel (2nos) with accessories as per RDSO Drg. No. RDSO/S/32019 (Latest Amendment).				
d)	Block Telephone with accessories (2nos) as per RDSO's Specification No. RDSO/SPN/191/2006.				
e)	OFC/Quad Media Chageover indication panel for SM's room.				
	NOTE: The entire system shall work on OFC/Quad. The block telephones also provided shall have the provision of working on OFC/Quad.				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
12	Supply of Automatic Media changeover System of modem working on redundant channels for data transmission on OFC/ Quad for seamless operation of UFSBI over multiple media as per RDSO specification no. RDSO/SPN/147/2005 with Amendment 1 or latest.	Pair	7.00	29,584.28	2,07,089.96
13	Supply of Modem compatible with existing UFSBI System to work on backup media. The back media can either unframed 2 Mbps E1 Channel from STM or on VF-channel from P-Mux or direct dark Single mode optic Fiber Cable upto 30 Km.	Pair	7.00	53,458.45	3,74,209.15
14	Supply of High Availability Single Section Digital Axle Counter (HASSDAC) System with DUAL track sensor devices (relays, surge protection devices, clamping & mounting arrangement, cables & other accessories) conforming to RDSO spec no. RDSO/SPN/177/2012 (ver.3) or latest guideline by RDSO letter no. TE/E/AC/Digital/Genl dated 27.07.2011 Dual redundant should be done as per Dual track sensor inputs fed to different channels of HASSDAC as per latest guideline issued by RDSO for the same.	Pair	7.00	7,72,991.30	54,10,939.10



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
15	Supply of SSDAC Tool Kit. Each Set will consist of: a) Portable Data Analyzer(Downloading Event Logger Data for analysis and report generation) - 1 No. b) Pure Sine Wave Digital Multimeter Fluke Make(Model-1871) or Rishab Make(Model-28S)- 1No. c) Train Simulator Mode 11TS267P)- 1 No. d) Extender Card- 1 No. e) Dummy Wheel- 1 No. f) Ring Spanner- 1 No. each g) Open End Spanner- 1 No. each h) Socket Spanner with handle- 1 No. i) Torque Wrench(Jaicom JPR 65 or equivalent 88NM)- 1 No. j) Screw Driver no.902- 1 No. k) Screw Driver no.935- 1 No. l) Marking Jig for drilling as applicable m) Dummy Load to check Power Supply(Resistive)- 1 No.	No.	4.00	1,41,261.00	5,65,044.00
	Signals				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
16	Supply of FRP CLS Unit 2 Aspect (without lenses and lamps) as per spec. no. RDSO/SPN/194/2006 Ver 2.0 or latest. This includes: (a) Signal post 140 mm dia 4.6 / 3.6 mtrs. long to IRS-S-6-81.=1no (b) Signal Base C I 140 mm dia. to drg. No.S-2011.=1no (c) CLS ladder complete with platform and Signal front staging as per Drg,Base 4.5 / 3.5 mtrs. long to drg.No.SA-23153 (Adv.) Alt 1.= 1no (d) FRP CLS unit 2 aspect complete to drg.No SA – 23003 A/M to C/M (Adv.), without Lamps,transformer,Lamp holder & lenses =1no. (e) 4 nos of Anchor bolt complete with nut washer etc as per Drg no 116 A/H (f) Supply of Universal lock with key (hand cuff) & signal number plate. (g) Offset Bracket if required	Nos.	47.00	42,807.38	20,11,946.86
17	Supply of FRP CLS Unit 3 Aspect (without lenses and lamps) as per spec. no. RDSO/SPN/194/2006 Ver 2.0 or latest. This includes: (a) Signal post 140 mm dia 4.6 / 3.6 mtrs. long to IRS-S-6-81.=1no (b) Signal Base C I 140 mm dia. to drg. No.S-2011.=1no (c) CLS ladder complete with platform and Signal front staging as per Drg,Base 4.5 / 3.5 mtrs. long to drg.No.SA-23153 (Adv.) Alt 1.= 1no (d) FRP CLS unit 3 aspect complete to drg.No SA – 23003 A/M to C/M (Adv.), without Lamps,transformer,Lamp holder & lenses =1no. (e) 4 nos of Anchor bolt complete with nut washer etc as per Drg no 116 A/H (f) Supply of Universal lock with key (hand cuff) & signal number	Nos.	31.00	48,446.30	15,01,835.30



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	plate. (g) Offset Bracket if required				
18	Supply of FRP Route Indicator 3/4 way (without lenses and lamps) as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 with latest amendments.	Nos.	8.00	44,200.37	3,53,602.96
19	Supply of FRP Route Indicator 2 way (without lenses and lamps) as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 with latest amendments.	Nos.	5.00	40,483.05	2,02,415.25
20	Supply of FRP Route Indicator 1 way (without lenses and lamps) as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 with latest amendments.	Nos.	3.00	28,755.50	86,266.50
21	Supply of FRP Calling on signal (without lenses and lamps) as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 with latest amendments.	Nos.	10.00	3,672.18	36,721.80
22	Supply of FRP Shunt signal Dependent type complete along with offset bracket (without lenses and lamps) as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 or latest.	Nos.	38.00	9,046.89	3,43,781.82
23	Supply of FRP Shunt signal Independent type complete as per RDSO Spec. no. RDSO/SPN/194/2006 Ver 2.0 or latest with steel post & CI base along with anchor bolts as per RDSO drawing (without lenses and lamps). This includes supply of Hand cuff Locks & signal number plate.	Nos.	24.00	12,964.61	3,11,150.64
24	Supply of LED Signal Lighting Unit (Red) for Main Signals as per RDSO Specification No. RDSO/SPN/199/2010 (Rev 1.0) dated 11.04.14.	Nos.	58.00	11,342.77	6,57,880.66
25	Supply of LED Signal Lighting Unit (Yellow) for Main Signals as per RDSO Specification No. RDSO/SPN/199/2010 (Rev 1.0) dated 11.04.14.	Nos.	79.00	11,432.38	9,03,158.02



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
26	Supply of LED Signal Lighting Unit (Green) for Main Signals as per RDSO Specification No. RDSO/SPN/199/2010 (Rev 1.0) dated 11.04.14.	Nos.	55.00	12,915.69	7,10,362.95
27	Supply of LED Signal Lighting Unit for Route Indicator as per RDSO Specification No. RDSO/SPN/153/2011 (Rev 4.1).	Nos.	60.00	6,503.87	3,90,232.20
28	Supply of LED Signal Lighting Unit for Calling On Signals as per RDSO Specification No. RDSO/SPN/153/2011 (Rev 4.1)	Nos.	10.00	7,798.53	77,985.30
29	Supply of LED Signal Lighting Unit for Shunt Signals as per RDSO Specification No. RDSO/SPN/153/2011 (Rev 4.1).	Nos.	138.00	7,175.18	9,90,174.84
	Point Machine				
30	Supply of Electric Point Machine 220mm stroke working on 110 V DC confirming to RDSO spec. IRS:S-24/2002 with latest amendments, with external clamp point lock as per Drg. No. RDSO/S/3376 for 52/60 Kg clamp lock and ground connections to Drg No. RDSO/S/3455 with FRP type Cable Termination Box.	Nos.	63.00	1,75,414.26	1,10,51,098.38
31	Supply of Insulation Set for 220mm IRS point machine ground connections, using for 52/60 kg rail as per RDSO drawings.	Nos.	63.00	4,301.36	2,70,985.68
32	Supply of Key Lock Relay with different ward combinations(one extra set of ward plates for Point Machine to be supplied with each relay) as per Railway Practice.	Nos.	31.00	7,479.42	2,31,862.02
	Multi-section Digital Axle counter (MSDAC)				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
33	Supply of Multi-section Digital Axle Counter conforming to spec RDSO/SPN/176/2013 (VER 3) with latest amendments, equipped for required hardware, Central Evaluator, Reset Box, LV Box, necessary fitting / fixtures, Wheel Sensors / Detection Points (DP) and Vital relays etc. as per extant RDSO specs for Kathautia, Shahpur, Duari and Kharika station. This includes all material required for installation as per OEM's installation manual. The Equipment should be fully wired, configured and equipped to work in redundant mode as per approved SIP of station. The rates are inclusive of earthing if required.	DP	264.00	2,50,117.49	6,60,31,017.36
	NOTE: a) Offered MSDAC equipment above shall cater for 10% increase in field as well as Central Evaluator equipment for future requirement and 10% spare cards for central Evaluator and field equipments. The Equipment must also include but not limited to : (i) Surge protection Device (ii) Installation materials. b) The tenderer should indicate total cost of MSDAC & list of 10% RDSO recommended spares along with break up of total cost indicating separately unit rates, quantities and total cost of each type of equipments, modules, assemblies, cards etc for spares. This list of material is indicative. Contractor has to supply complete material for commissioning of DAC. No Extra payment shall be paid to contractor for any additional items /Cards/Modules.				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
34	Supply of MSDAC Tool Kit, as recommended by OEM. Tentative list of each set is as under: a) Portable Data Analyzer(Downloading Event Logger Data for analysis and report generation) - 1 No. b) Pure Sine Wave Digital Multimeter Fluke Make(Model-1871) or Rishab Make(Model-28S)- 1No. c) Train Simulator Mode 11TS267P)- 1 No. d) Extender Card- 1 No. e) Dummy Wheel- 1 No. f) Ring Spanner- 1 No. each g) Open End Spanner- 1 No. each h) Socket Spanner with handle- 1 No. i) Torque Wrench(Jaicom JPR 65 or equivalent 88NM)- 1 No. j) Screw Driver no.902- 1 No. k) Screw Driver no.935- 1 No. l) Marking Jig for drilling as applicable m) Dummy Load to check Power Supply(Resistive)- 1 No.	Set	4.00	2,25,480.65	9,01,922.60
	Location Boxes				
35	Supply of Apparatus Case full Case as per Drg Nos WS-8842/A with latest alteration along with miniature 'E' type locks with keys (1 key per 5 location boxes and handle) of ward Nos. 42 (E type lock & key as per spec. Nos IRS S 30 & RDSO Drg.Nos. SA 3376/M & 3377/M respectively with latest Amendment) on both the doors, duly painted with red oxide. This item also includes i) Supply of Hylam sheet (Bakelite industrial laminated paper based sheet), resin bonded 10 mm thick, grade P3 in standard size of 1.22 x 1.22 mtrs. as per specn. No. IS 2036 of 1974. -as per requirement for termination of cables and for shelf for fixing equipments.	Nos.	220.00	18,958.27	41,70,819.40

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SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
36	Supply of Apparatus Case Half Case as per Drg Nos WS-8842/A with latest alteration along with miniature 'E' type locks with keys (1 key per 5 location boxes and handle) of ward Nos. 412(E type lock & key as per spec. Nos IRS S 30 & RDSO Drg.Nos. SA 3376/M & 3377/M respectively with latest Amendment) on both the doors, duly painted with red oxide. This item also includes i) Supply of Hylam sheet (Bakelite industrial laminated paper based sheet), resin bonded 10 mm thick, grade P3 in standard size of 1.22 x 1.22 mtrs. as per specn. No. IS 2036 of 1974. -as per requirement for termination of cables and for shelf for fixing equipments.	Nos.	55.00	16,912.88	9,30,208.40
37	Supply of quarter size apparatus case as per design of GKP signal workshop.	Nos.	18.00	12,573.84	2,26,329.12
38	Supply of HRC Fuses 2A / 4A / 6A/10A/16A (RDSO Spec. No. IRS:S-78/92) with Fuse Block (RDSO Spec. No.IRS:S-75/2006 (Rev.2) and drg. no. SA- 23748 (Alt.4)).	Nos.	1254.00	233.10	2,92,307.40
39	Supply of ARA terminals blocks with links, 6 Way, made of PBT Specn No. IRS/75/2006 (Amd.-2) or latest RDSO specification and RDSO DRg No. SA-23756 Alt.3	Nos	23100.00	388.90	89,83,590.00
	Earthing				
40	Supply and installation of Normal Earth Electrode for earthing of S&T installations with all the associated assembly/materials including GI wire 8 SWG and MS flat as per EC railway practice and IRSEM.	Per Earth	206.00	4,980.27	10,25,935.62



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
41	Supply and installation of MAINTENANCE FREE EARTHING AND BONDING SYSTEM (Two Earth Pit) as per specification no: RDSO/SPN/197/2008 or latest RDSO specification consisting of (a) Earth electrodes made of high tensile low carbon steel circular rods, molecular bonded with copper on outer surface as per RDSO spn - 2 no. (b) RDSO approved Earth Enhancing compound (c) (MEEB) Main equipotential earth busbar of Copper of 300x25x6 mm(Min) and (SEEB) Sub equipotential earth busbar of copper 150x25x6 mm(Min) (d) Multistrand single core PVC insulated copper cable as per IS:694 -(i) of size 10 sqmm to connect individual equipment to SEEB using copper lugs with stainless steel nuts and bolts, (ii) of size 16 sqmm to connect SEEB to MEEB using copper lugs with stainless steel nut and bolts (iii) of size 16sqmm to connect Surge protection devices (SPD) to MEEB using copper lugs with stainless steel nut and bolts (iv) of size 35 sqmm(duplicated) to connect MEEB to main earth electrode (e) Copper tape of size 25x2mm to connect the two earth pits, (f) Earhpits x 150 mm to terminate on earth electrode, (g) Construction of earhpit and making of earth as per RDSO specification no.RDSO/SPN/197/2008 or latest RDSO specification.	Set	27.00	39,374.39	10,63,108.53
	Supply of cables protection material				

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SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
42	Supply and Installation of RFID Electronic marker with capability of saving the user specific data inside the marker memory chip later readable by locator during locating (10 cm diameter with floating coil to keep detection of circuit always horizontal for better detection) which can be buried upto a depth of 5 ft for Signalling & telecom cables as per the technical specification no TEC/GR/TX/TIE-07/02 march 2014.	No	200.00	3,123.45	6,24,690.00
43	Supply of DWC pipe with one snap fit coupler and 'O' ring conforming to RDSO/SPN/204/2011 Ver. 1.1 or latest RDSO specification, Non metallic, corrugated, multiwalled, normal duty, pliable, without protection against chemical attack and Non flame propagating in 6 meter length of size 120 mm outer dia & 102 mm inner dia. (Permitted tolerance in dia = +/- 2 mm).	Mtr	715.00	268.89	1,92,256.35
44	Supply of SPLIT DWC pipe conforming to RDSO/SPN/204/2011 Ver. 1.1 or latest RDSO specification, Non metallic, corrugated, multiwalled, normal duty, pliable, without protection against chemical attack and Non flame propagating in 2 meter length of size 200 mm outer dia & 175 mm inner dia. (Permitted tolerance in dia = +/- 2 mm) (TWO half round pipe constitute one split pipe)	Mtr	18000.00	300.22	54,03,960.00
45	Supply of Galvanized Iron pipe 100 mm dia medium grade with screw end both side and fitted with sockets as per specn. No.IS-1239, part 1 / 1990 or latest in length of approx 6 meters	Mtr	220.00	1,040.89	2,28,995.80

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SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
46	Supply of RCC pipes 150mm dia, 2 Mtr long along with collars as per Specn. No. IS/458/1971 or latest for use near OHE Substation for cable protection.	Mtr	94.00	150.74	14,169.56
	Operational assistance for Maintenance staff				
47	Supply of Office furniture set for relay room consisting of chairs, office table, Airy revolving & tilting cushion chair, steel almirah, steel stool of Godrej make. This includes	Nos.	9.00	56,152.78	5,05,375.02
a)	Office chairs of model no CH-1007 of Godrej or equivalent model of same make. - 2 no				
b)	Office tables of model no T9 of Godrej or equivalent model of same make. with 3 drawers on left hand side & one locker on the right hand side. Olive brown/green with duplicate keys. -1 no				
c)	Airy revolving & tilting working cushion chair with arm rests of model no PCH 7002 of Godrej make or equivalent of same make. -1 no				
d)	Supply of steel almirah - office storvel of Godrej make or equivalent model of same make. Size 1980 x 915 x 486 approx with 4 shelves making 5 compartments without locker having locking door. -1 no				
e)	Steel stool Godrej make or similar ST-2 or equivalent -4 no.				
	Fire protection & Alarm system				
48	Supply, Installation, Testing and commissioning of Automatic Fire Detection & Alarm System (AFDAS) for Signalling installations as per RDSO specification no. RDSO/SPN/217/2016 Version No. 1.0 or latest consisting of probe type bimetallic heat detector with base, UV & IR flame	Per Station	5.00	11,79,392.12	58,96,960.60



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	detectors with base, heat & smoke multisensor with base, aspirating type smoke detectors with base, linear heat sensing (LHS) cables, LHS interface module, LHS cable end of line box with modular junction box, monitor module for LHS cable alarm input to fire panel, addressable hooter, fire alarm control panel with sufficient input ports for connecting various sensors/detectors along with their interfaces, if any, and shall have sufficient output ports for controlling fire extinguishing system, operating/switching off electrical units and having provision for remote monitoring network along with software, intelligent addressable Manual call points, audio visual alarm, fire survival circuit integrity cables etc. The AFDAS shall also consist of fire suppression system as per RDSO specification. The fire alarm panel should also consist of switched mode power supply system, battery backup and charger, display board which will have character display with touch key pad, RS-232/485 Networking Circuit, USB 2.0 Port, Programmable inputs, NAC's and Programmable relays, and loop card circuits, necessary software for display of fire alarm, necessary interconnecting cables etc. Power supply Board will have SMPS fully protected board, battery backup with built in charger as per RDSO spec. This also included Supply of required number of CO2 Based Fire Extinguisher (Squeeze Grip Type) - 4.5 Kg				
	Tools & Plants				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
49	Supply of Signalling maintenance Tools & Plants as per Annexure-1	Set	4.00	1,04,133.35	4,16,533.40
	Signalling & Telecom Cables				
50	Supply of PVC Insulated Armoured, Unscreened, Underground, Railway Signalling Cable 12 core X 1.5 sq. mm (Copper Conductor), as per Spec No; IRS:S-63/2014 (Rev.4.0) including latest amendments.	KM.	290.00	2,06,187.55	5,97,94,389.50
51	Supply of PVC Insulated Armoured, Unscreened, Underground, Railway Signalling Cable 6 core X 1.5 sq. mm (Copper Conductor), as per Spec No; IRS:S-63/2014 (Rev.4.0) including latest amendments.	KM.	12.00	1,32,236.96	15,86,843.52
52	Supply of Underground Railway Jelly filled 6 Quad Cable of size 0.9 mm dia for Signalling and Telecom Installations as per Spec. No.IRS:TC-30/2005 (Ver-1) with Amdt.5. including latest amendments.	KM.	66.00	3,19,187.54	2,10,66,377.64
	MISC.				
53	Supply of Thermoshrink jointing kit for Jely filled Six quad cable conforming to RDSO Spec. IRS:TC-77/2006(Rev 1) with latest amendment.	Nos	37.00	5,761.38	2,13,171.06
54	Supply and fixing of VF Tapping Transormers (1120:470) as per the Spec. IRS TC 22-76 or latest RDSO specification.	Nos	51.00	1,387.89	70,782.39
55	Supply of EPDM Modular based Cable Sealing & Protection System Frame GOH 8+8x1 Galvanised, Roxylon Modules, Wedge, Stay Plates, Sealing Gasket, Mounting Hardware and lubricant for in/Out transit cables in Relay Room-CT Rack.	Nos.	16.00	30,014.40	4,80,230.40



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
56	Supply of EPDM Modular based Cable Sealing & Protection System Frame GOH 6+6x1 Galvanised, Roxylon Modules, Wedge, Stay Plates, Sealing Gasket, Mounting Hardware and lubricant for in/Out transit cables in Relay Room-(Relay Room to panel room & Maintenance Room to Panel Room	Nos.	24.00	23,856.95	5,72,566.80
57	Supply of EPDM Modular based Cable Sealing & Protection System Customized Openable Aluminium frame-1 nos/ComSeal 16- one nos along with base plate, Roxylon Modules, Stay plates, Sealing Gasket, Mounting Hardware and Lubricant for UFSBI	Nos.	12.00	5,370.30	64,443.60
Execution of Signalling Works					
Electronic Interlocking System					
58	Installation, wiring, testing & commissioning of complete indoor EI system and other associated equipment as supplied in item no. 1 of Schedule -A. It shall consists of the following but not limited to: 1. Grouting, cutting of floors, walls etc. refilling of same, re plastering, required CC/ masonry works. 2. Termination of indoor cables on disconnecting terminals on Din rail, painting/lettering on Equipment Rack, Relay Rack/Termination Rack 3. Fixing of racks PBT terminals Disconnect Type/Wago terminals, ND Fuses, Bus Bars, Eyelets, hylam strips of required thickness (12mm, ISI mark) as per length required at site etc. 4. Fixing of VDU, all types of Relays, Wiring and testing as per				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	wiring diagram. 5. Installation, wiring & testing of Relay Rack/Equipment Rack/CT Rack. 6. Testing of earthing arrangement as per latest RDSO guideline/Technical advisory Note. 7. Contractor organising testing of wiring as per wiring diagram with Ircon/Railway. The testing includes -Functional testing, selection table testing with contractor's simulation panel. 8. Commissioning of Electronic Interlocking system after interfacing of indoor equipments with outdoor gears in association with Railway Personnel during testing. Competent Engineer of manufacturer must be available during Pre commissioning, commissioning and Post Commissioning. 9. EI system shall be design, Installation, wiring, testing & commissioning considering the complete requirement but not limited to:				
a)	Writing of application logic for Single Line Working as per attached Tentative SIP.				
b)	Grouting, cutting of floors, walls etc. refilling of same, re plastering, required CC/masonry works.				
c)	Termination of indoor cables on disconnecting terminals on Din rail, painting/lettering on Equipment Rack, Relay Rack/Termination Rack				
d)	Fixing of racks PBT terminals Disconnect Type/Wago terminals, ND Fuses, Bus Bars, Eyelets, hylam strips of required thickness (12mm, ISI mark) as per length required at site etc.				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
e)	Fixing of VDU, all types of Relays, Wiring and testing as per wiring diagram.				
f)	Installation, wiring & testing of Relay Rack/Equipment Rack/CT Rack.				
g)	Testing of earthing arrangement as per latest RDSO guideline/Technical advisory Note.				
h)	Testing and commissioning of EI system at a station as a whole includes outdoor gears. All Engineers, Artisan Staff and labours required for testing and commissioning of EI with MACLS work shall be provided by contractor for indoor and outdoor work. Testing equipment such as simulation panel, signal and point operation simulation arrangement, multimeter etc. shall be provided by contractor at his own cost. Testing shall be carried out by contractor in presence of engineer-in-charge up to his satisfaction and necessary alterations shall be done. Testing & commissioning of overall circuits & ground gears, signals & commissioning of approved interlocking arrangements.				
i)	All installation & wiring material shall be supplied by contractor & shall be procured from RDSO approved sources, wherever applicable.				
j)	Pre-commissioning check list for installation of EI shall be signed jointly by OEM representative and IRCON's representative and have to be submitted alongwith OEM Certificate as per RDSO guidelines.				
58.1	Kathautia	Nos.	1.00	12,71,186.44	12,71,186.44
58.2	Shahpur	Nos.	1.00	12,71,186.44	12,71,186.44
58.3	Duari	Nos.	1.00	12,71,186.44	12,71,186.44
58.4	Kharika	Nos.	1.00	12,71,186.44	12,71,186.44



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	NOTE:-				
59	Preventive and periodic maintenance/breakdown maintenance & supervision of SSI equipment within the period of maintenance for one year	Per Station	4.00	3,47,155.14	13,88,620.56
60	Training Consisting of training of Railway Personnel for EI system. This also includes supply of Hard and soft copies of course materials.	Man month	3.00	76,271.19	2,28,813.57
61	Preparation & Submission of 'as planned' and 'as made' documents for EI. It includes but not limited to: 1. Equivalent Circuit of Application logic 2. Interface circuits. 3. Selection table/Route Control Chart. 4. Video Display Diagram. 5. SWR & SWRD 6. Signal Interlocking Plan modification if required It should be done as per extent practice of EC Railway. The documents shall be supplied as per technical specification of tender document.	Set Per Station	4.00	2,45,285.39	9,81,141.56
62	Preparation & Submission of 'as planned' and 'as made' of all outdoor drawings for outdoor signalling work. It should be done as per extent practice of EC Railway. The documents shall be supplied as per technical specification of tender document.	Set	4.00	1,38,051.57	5,52,206.28
63	Testing of point to point insulation / continuity test for all laid out cables, Measuring Parameters and preparing the records	Per Station	4.00	51,241.87	2,04,967.48
	Datalogger				
64	Installation, wiring, testing and commissioning of Data Logger with 512 Digital & 48 Analog Inputs as per spec. IRS: S-99/2006 with Amendment-2 or latest. This also includes but not limited to the following:	Nos.	4.00	47,720.22	1,90,880.88



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	1. Supply and loading of diagnostic software for failure analysis 2. Interface wiring between Relay Rack to Datalogger for all the digital & Analog inputs as per standard Railway practice. 3. Relay Room Door locking checking arrangement, commercial power supply monitoring arrangement & DG Sets, 4. Interlinking & Networking of Datalogger. 5. Modification in Software & Hardware if required and networking with other Data Loggers along with fault logic design at Control Centre. 6. Training as per Railway Practice. 7. Software programming of Datalogger to enable Preventive maintenance of all S&T assets, 8. Failure analysis, GUI of Yard Layout, extract of report in common language, accident analysis as per RDSO Guideline. 9. All installation & wiring material including supply of Relay Room Door locking checking arrangement shall be supplied by contractor & shall be procured from RDSO approved sources, wherever applicable.				
	NOTE: Data Logger will be installed, wired, tested and commissioned by OEM's engineer as per guidelines issued by RDSO. The Pre-commissioning checklist issued by RDSO for Data Logger System will be prepared by OEM's engineer and signed jointly with Employer's Site Engineer. Before commissioning of Data Logger, OEM will submit Site Installation Certificate to Employer by mentioning that Data				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	Logger has been installed, wired tested and commissioned by approved vendor of RDSO (i.e., by OEM).				
	Power Supply				
65	Installation, Wiring, Testing & commissioning of SMPS based Integrated Power Supply system conforming to Specn. No. RDSO/SPN/165/2012 (Ver. 3.0) or latest and to suit pre-commissioning Check List issued by RDSO. This includes installation & commissioning of 55 Nos. Battery for S&T installations as per IRS: S-88/2004 alongwith installation of Remote Indication Panel in SM/ASM's room. Any masonry work, if required, will be carried out by contractor's own material. The contractor will fix exhaust fan in IPS room & Battery Room including hole on wall (if not available), wire mesh and flap cover to protect the room against dust. All wiring will be done by using flexible multi strand copper wires of suitable size as recommended by RDSO. This includes extending various power supplies (by connecting power cables etc) up to bus bars in relay room and up to battery room. IPS should be connected to Ring earth of EI. This also includes supply of all types of wires / distribution Board required for interconnection from IPS to Relay rack, CT Rack etc. as per RDSO/ECR guidelines. Note:- IPS will be installed, wired, tested and commissioned by OEM's engineer as per RDSO guidelines. Pre commissioning checklist of RDSO for IPS will be prepared by OEM's engineer and signed jointly with Site engineer. Before commissioning of IPS,	Nos.	4.00	2,28,973.48	9,15,893.92

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SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	OEM will submit Site installation Certificate that IPS has been provided by approved vendor of RDSO				
66	Installation, Wiring, Testing & commissioning of Single phase DG Set including Metal Clad Changeover unit, laying of Power Cable from DG Room to ASM Room for remote operation & wiring of AMF panel. Laying of cables/wires should be carried out in PVC conduit pipe. All material required for installation i.e. cables , pipes etc shall be supplied by contractor at his own cost.	Nos.	4.00	89,154.11	3,56,616.44
	MSDAC				
67	Installation , wiring, Testing and commissioning of Multi-section Digital axle counter System including but not limited to: Fixing of Track Transducers on the rails, drilling of holes ,installation of Electronic Junction Box in Location Box, termination of cables and wiring. Installation of Evaluator. Fixing of relays, bus bar & fuse. Installation, wiring, testing & commissioning of reset box/Line verification Box etc. RDSO check list for Installation are to be complied by Manufacturer's engineer. Note:- Installation to be done by OEM/Authorised Representative of OEM & pre-commissioning check list should be duly signed by OEM/ Representative of OEM & Railway/IRCON representative.				
a	Track side electronic Unit inclusive of evaluator & earthing if required.	Nos	240.00	6,233.03	14,95,927.20
	Block Working				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
68	Installation, wiring & testing of axle counter based block panel (UFSBI) for one complete block section along with other accessories. The work involves supply of wiring material and wiring right from telecom DP to block Panel and Block Panel to relay room, Block panel to OFC/Quad media indication panel and connection with power supply including fuse wiring, fixing. Note: Installation, testing & commissioning of UFSBI shall be done by RDSO approved equipment manufacturer and Pre-commissioning check list should be signed jointly by representative of OEM's & Engineer at site as per guidelines issued by RDSO.	Pair	6.00	98,140.76	5,88,844.56
69	Installation, wiring, testing & commissioning of new Digital axle counter system (HASSDAC). Outdoor work includes : Fixing of track transducers on the rails. Drilling of holes in rails. supply and laying of HDPE pipe, Laying of track transducers cable from rail to HASSDAC unit in HDPE pipe, digging/trenching as per instruction of Site Engineer. Installation of HASSDAC/SSDAC unit in location box. Termination of cables & wiring of HASSDAC unit. Indoor work includes: Installation of Reset Box, wiring and termination of quad cable. Laying & termination of cable from C.T.rack to Reset Box. Fixing of relays, bus bars & fuses. Installation, wiring, testing & commissioning of reset box & line verification box in SM room / cabin. This includes: Fixing of reset box/line verification box on Wooden/hylam sheet. Supply & fixing of MS angles. RDSO Check	Pair	6.00	1,02,541.21	6,15,247.26

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SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	list for installation are to be complied by manufacturer's engineer.				
	Signals				
70	a) Excavation of pit, fixing of foundation scaffolding, casting & plastering of concrete foundation, removal of scaffolding, water curing and earth filling for Colour Light Main Signal and Casting of cement concrete foundation for signal ladder as per ECR practice. This includes : Supply of cement, sand, stone chip & mixing in the ratio 1:3:6. b) Erection of Multi aspect colour light signals. This includes : Erection of surface base, signal post, signal unit, junction type route indicator, and shunt signal on OFF set bracket, calling on signal, ladder with guard & platform, fixing of P/C/G marker, supply & fixing of Heat enamelled signal number plate & blanking-off signals as per the requirement. Making of holes in CLS post, supply of other minor material like clamps, nuts & bolts, wiring material etc. Fixing of signal lamps/LED's with accessories on 2/3/4 aspect signal unit, shunt, route, calling on unit, offset bracket as per the requirement. Termination of the tail cable in the signal units, wiring of signal and testing, focusing of signal etc.	Signal	70.00	14,744.46	10,32,112.20

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SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
71	a) Excavation of pit, fixing of foundation scaffolding, casting & plastering of concrete foundation, removal of scaffolding, water curing and earth filling for Independent Shunt Signal as per ECR practice. This includes : Supply of cement, sand, stone chip & mixing in the ratio 1:3:6. b) Erection & wiring of shunt signal. This includes : Erection of surface base, shunt signal post, shunt signal unit. Supply & fixing of Heat enamelled signal number plate, Fixing of lenses, signal/LED lamp, supply and fixing of antitheft protection etc., where ever required. Termination of the tail cable, supply of wire & wiring of signal unit. Focusing and testing of shunt signal.	Signal	21.00	4,556.64	95,689.44
72	Supply and installation of Goods Warning Board/Caution Board/Stop Board/Block Section Limit Board(BSLB)/Shunting Limit Board/Calling on Board/Change of Signalling territory board etc as per ECR practice. All the above said boards will be supplied, in sizes and dimensions as mentioned in Signal Engineering Manual & GR with luminous strips yellow as well as black. This includes burying of post atleast 1.2 mtrs and concreting of size 0.5 mtr x 0.5 mtr x 0.5 mtr with cement concrete in the ratio 1:3:6. All material will be supplied by the contractor.	Nos.	16.00	17,422.39	2,78,758.24



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
73	Supply and Fixing of 'P', 'C', 'A', 'G', 'AG' etc marker conforming to RDSO Drg no. SA 23476 ADV as per standard practice (as per ECR drg.) with contractor's complete material including fixing of clamps. The work shall be done as per instructions of Rly engineer at site. Wooden white cross-arms (1000x100 mm) to be provided by the contractor till the signals are commissioned with contractor's own material.	Nos.	16.00	614.62	9,833.92
	Note: The above signal items includes supply and installation of petty materials for fixing, clamping & mounting arrangement including wiring material (different sorts of wires etc).				
	Point Equipments				
74	Installation, Wiring, Testing & Commissioning of Point Machines including wiring of point JB, fixing of GI Pipe, Ground Connections and other work related to functioning of Point Machine. The work shall be done as per existing practice of ECR & the instruction of Engineer.	Nos.	57.00	22,759.58	12,97,296.06
75	Fixing of Key Lock Relay AC immunized with different ward combinations (Two extra set of ward plate for Point Machine to be supplied with each relay) of RDSO approved Make working on 60/24V DC or functional equivalent.	Nos.	27.00	1,358.57	36,681.39
76	Supply & Fixing of Pre-wired Crank Handle cum key lock relay box alongwith LEDs, push buttons, 8-way terminal strips, string rod, etc. suitable for 6 crank handle relay per box. It includes supply of any minor bracket, nuts, bolts, teakwood, sunmica, lock, drilling holes as directed by engineer at site.	Nos.	27.00	10,569.23	2,85,369.21
	Location Boxes				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
77	Excavation, casting, concreting, curing and plastering (above ground level) of Apparatus case foundation as per practice of ECR & erection with contractors own Metal Sheet frame, cement, anchor bolts with nuts & washers and other materials. The items also include additional earth work if required as per instruction of Rly. Engineer at site for :-				
a	Full Location Box as per ECR Drg	Nos.	200.00	12,827.44	25,65,488.00
b	Half Location Box as per ECR Drg	Nos.	50.00	9,134.04	4,56,702.00
	Note: The above item includes supply and installation of petty material for fixing, clamping & mounting arrangement, fixing of ARA /WAGO/Disconnect type Terminals and fuse block, fabrication and fixing of Hylam sheet in location box, wiring of relays etc., by providing all fixtures as per railway drawing including fixing of PVC coated string rods at the back side for cable support with contractor's own material, Termination of cable cores, this includes all associated works of pulling out the cable from underground.. The work shall be done as per as per instructions of Engineer Incharge.				
78	Excavation, casting, concreting, curing and plastering (above ground level) of Apparatus case foundation as per practice of ECR & erection with contractors own Metal Sheet frame, cement, anchor bolts with nuts & washers and other materials. The items also include additional earth work if required as per instruction of Rly. Engineer at site for Qtr Location Box as per ECR Drg	Nos.	16.00	2,314.20	37,027.20



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
	Cable Laying				
79	Digging of cable pit (minimum inside size of 2m x 2m x 1m) and construction of brick wall in the pit, width of the wall shall not be less than 200mm as per instructions given by engineer in charge. It includes supply and filling of sand before and after coiling of cables, covering top of the cable pit by stones and brick masonry work for sides and thereafter plastering.	Nos.	4.00	16,958.95	67,835.80
80	Excavation of trenches at the depth of 1.0 Mtr. deep and 300 mm wide at the bottom of the trench including clearing of roots, bushes, or other obstruction etc. for all types of soils including Murrum, soft rock, hard soil mixed with boulders etc. as per cable route plan. This also includes complete back filling the trench after laying required quantity of cable, protection pipes/bricks, route marker etc and ramming and consolidation of soil as well as disposal of extra soil .	Km	26.00	65,771.55	17,10,060.30
81	Excavation of cable trench of 1 m. depth & 300 mm. wide across the track crossing, road crossing, level crossing, platform & refilling after laying DWC pipe with collars .This does not include provision of Tiles etc in case of Platform.. The work shall be done as per existant practice of East Central Railway & Instruction of Engineer.	Km	1.04	67,564.09	70,266.65
82	Horizontal direction drilling/boring without damage of surface of road /Track formation. It includes supply, transportation and insertion of self lubricated HDPE pipe (Inner dia 110 mm and outer dia 125mm) and laying of cables in boring under the track/road by using HDPE pipes.The depth of horizontal boring should be min. 1m from rail flange/road level	Mtr	2000.00	2,455.42	49,10,840.00



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
83	Preparation of cable Duct 150mm wideX300mm deep for laying of cable in rocky area and refilling the duct(after cable laying) with concrete mixture of proportion 1:3:6 and grouting the ends at either side of the rocky portion using concrete mixture with contractor's own materials and excavated earth to its original condition.	Mtr	400.00	620.91	2,48,364.00
84	Laying & Installation of 100 mm B Class perforated GI pipe for Cable Protection at culverts/Bridges or any other place as instructed by engineer including cutting, suitably concreting at both ends, GI clamps, flats etc. All material to be supplied by Contractor.The work shall be done as per instruction of Engineer.	Mtr	200.00	48.38	9,676.00
85	Laying of Signalling/Power/Telecom Cables of various cores in trench and meggering of main and tail cables. This includes loading/unloading & transportation of cables to site. Whenever several cables are to be laid separation of cables should be as advised by site engineer. This also includes unwinding of cable drum using proper jigs without causing damage to cable.	km	368.00	5,424.17	19,96,094.56
86	Transportation & Laying of DWC/RCC pipes along with collars in trenches at required locations as per the instruction of engineer at site.	mtr	735.00	39.57	29,083.95
87	Placing of half round (Split DWC) pipe over the laid cable in open trenches in yards between Home signal to Home signal and tying pipe with cable with loose armouring	km	18.00	3,518.83	63,338.94
	Painting				



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
88	Cleaning, scraping. Painting & lettering of all newly installed and existing gears by the contractor. including supply of all materials for the work by contractor.	Nos.	4.00	40,321.60	1,61,286.40
	MISC.				
89	Supply & Installation of Airconditioners (Capacity:1.5 Ton, Split type, 5 star) with stablizer of atleast 4 KVA, 10 Amps capacity for Relay room. Make of Airconditioner shall be O-General/Voltas/Hitachi or Similar make.	Set	16.00	46,889.04	7,50,224.64
90	Filling earth around location Boxes/Signal posts	per cum	400.00	109.40	43,760.00
91	Installation of Thermoshrink Jointing Kit as per DOT/ Technical specification with RDSO midification / Termination joints with/ without VF Transformer on 6-Quad/PIJF telecom cable..	Nos	37.00	2,161.59	79,978.83
92	Installation of EPDM Modular based Cable Sealing & Protection System Frame GOH 8+8x1 Galvanised, Roxylon Modules, Wedge, Stay Plates, Sealing Gasket, Mounting Hardware and lubricant for in/Out transit cables in Relay Room-CT Rack.	Nos.	16.00	7,503.60	1,20,057.60
93	Installation of EPDM Modular based Cable Sealing & Protection System Frame GOH 6+6x1 Galvanised, Roxylon Modules, Wedge, Stay Plates, Sealing Gasket, Mounting Hardware and lubricant for in/Out transit cables in Relay Room-(Relay Room to panel room & Maintenance Room to Panel Room	Nos.	24.00	5,964.24	1,43,141.76



SN	Description of Item	Unit	Qty	Rate without GST (Rs.)	Amount (Without GST) (Rs.)
94	Installation of EPDM Modular based Cable Sealing & Protection System Customized Openable Aluminium frame-1 nos/ComSeal 16- one nos along with base plate, Roxylon Modules, Stay plates, Sealing Gasket, Mounting Hardware and Lubricant for UFSBI	Nos.	12.00	1,342.58	16,110.96
	Dismantling work				
95	Loading, unloading and transportation of additional/balance Signal and telecom materials after completion of work or during execution of work, to and from Railway/Ircon other stores depot to and from the site of work. Note: This does not include transportation of material from nominated depot to site and back or from site to site, which is to be done by contractor free of cost.	Per 100 Ton Km	2000.00	529.38	10,58,760.00
	TOTAL AMOUNT without GST in Rs.				35,12,66,556.00
	OFFERED RATE @4.90% BELOW				33,40,54,494.76
	GST @18% (in Rs.)				6,01,29,809.00
	GRAND TOTAL (INCLUSIVE OF GST) in Rs.				39,41,84,303.76
	TOTAL VALUE OF CONTRACT (Say) in Rs.				39,41,84,304



LIST OF ITEMS REQUIRED IN TOOL KIT				
S.No.	DESCRIPTION	MAKE	SIZE	QTY
1	Non-insulated flat plier.	(Taparia /Jhalani)	200 mm.	1
2	Insulated flat plier.		125 mm.	1
3	Insulated side cutting plier.	-do-	6 inch.	6
4	Combination plier.		200 mm	2
5	Insulated stripping plier.		150 mm	3
6	Insulated nose plier.		150 mm	3
7	Monkey plier.		10 inch.	1
8	Screw Driver (Insulated).	-do-	150 x 3 mm	1
9	Screw Driver (Insulated).	-do-	150 x 4 mm	1
10	Screw Driver (Insulated).	-do-	150 x 5 mm.	1
11	Screw Driver (Insulated).	-do-	150 x 6 mm	1
12	Screw Driver (Insulated).	-do-	150 x 8 mm	1
13	Screw Driver (Insulated).	-do-	250 x 8 mm	1
14	Screw Driver (Insulated).	-do-	250 x 10 mm	1
15	Flat coarse file with handle.		150 mm	1
16	Round fine file with handle.		150 mm	1
17	Hammer with handle.		500 Cms.	1
18	Brass Brush.			2
19	Spanner double ended.	(Taparia Jhalani)	6 x 7 mm	2
20	Spanner double ended.	-do-	8 x 9 mm	2
21	Spanner double ended.	-do-	10 x 11 mm	2
22	Spanner double ended.	-do-	12 x 13 mm	2
23	Spanner double ended.	-do-	14 x 15 mm	2
24	Spanner double ended.	-do-	16 x 17 mm	2
25	Spanner double ended.	-do-	18 x 19 mm	2
26	Spanner double ended.	-do-	20 x 22 mm	2
27	Spanner double ended.	-do-	21 x 23 mm	2
28	Spanner double ended.	-do-	24 x 26 mm	2
29	Spanner double ended.	-do-	25 x 28 mm	2
30	Spanner double ended.	-do-	27 x 32 mm	2
31	Spanner double ended.	-do-	30 x 32 mm	2
32	Hack saw frame.		6 inch.	2
33	Hack saw frame.		12 inch.	2
34	Hack saw blade.	(Miranda Make)	12 x 1/2 inch.	6
35	Hack saw blade.		6 x 1/4 inch.	6
36	Steel measuring tape.	(Frumen Make)	3 Mt.	2
37	Adjustable screw wrench.	-do-	6 inch.	2
38	Adjustable screw wrench.	-do-	12 inch.	2
39	Adjustable screw wrench.	-do-	15 inch	2
40	Bench vice, size.			2
41	Level bottle.			2
42	Soldering Iron 230V, 100W.	(Keertone Make)		1
43	Soldering Iron 230V, 65 W.	-do-		4
44	Soldering Iron 230V, 25W.			2
45	Box spanner.		5mm.	2
46	Box spanner.		6mm	2
47	Box spanner.		7mm	2
48	Box spanner.		8 mm	2
49	Box spanner.		9 mm	2
50	Box spanner.		10 mm	2
51	Box spanner for OBA Terminals with plastic handle			4
52	Tap set.		3 mm	1
53	Tap set.		4 mm	1
54	Handle for tap.			1
55	Multimeter 3 and half digit	Fluke 76 or latest		4
56	Megger 500 V. DC	MOTWANE MAKE		2
57	Tool box of GI sheet 185			1
	WC with Naval Lock.			1
58	Crimping Tool.	3D make (CAT No. 3D-3) OR		1
59	Digital Tong meter.	MECHO MAKE 2727 OR EQUIVALENT		2
Note	If any make as mentioned above is not available in the market then the equivalent model of the item of available make may be supplied with the prior approval of Engineer-in-charge.			

