

North Central Railway

उत्तर मध्य रेलवे

Signal & Telecom

SCHEDULE OF RATES

2021

(Corrected upto correction Slip No. 1)

Signal and Telecom Department

सिगनल एवं दूर संचार विभाग

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Arun Kumar

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bat hf u; j
PRINCIPAL CHIEF SIGNAL & TELECOM ENGINEER

mRrj e/; jsyos
NORTH CENTRAL RAILWAY



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Preface

A lot of work like quadrupling/tripling/doubling of line, automatic signaling, replacement works of mechanical signaling and EI etc. are being done by S&T open line, PU and Construction units. So preparation of estimate quickly and prepare tender schedule and award of contracts expeditiously is the need of the hour. Time taken for preparation of estimate and tender schedule also affect the project time line. Availability of Schedule of Rate (SOR) helps to prepare estimate and tender schedule expeditiously. Therefore need was felt to prepare and issue a SOR of S&T items for NCR.

S&T SOR has been prepared by a committee of three JAG level officers (Dy.CSTE/HQ technical member, Dy.CSTE/P-I technical member and Dy.FA&CAO/F&B as finance member) under overall guidance of one SAG officer (CSTE/Pr-IV) as nodal officer.

This is a first time that SOR has been prepared by S&T Department in NCR. All efforts have been made to make SOR comprehensive, exhaustive and precise yet some errors might have occurred. Suggestion for improvement or inclusion or correction of any item may be intimated to CSTE/Works/NCR.

The SOR will be applicable for all S&T works in construction, Project unit as well as open line in NCR.

Prayagraj

Date : 30 June, 2021

(Arun Kumar)



NORTH CENTRAL RAILWAY

**Headquarters Office (S&T Deptt.)
1st Floor Ganga Complex,
Subedarganj, Prayagraj- 211015**

Dated: 25/05/2021

No. NCR/Policy/SOR

**CSTE/Con, CSTE/Proj/Co,
CSTE/Proj-II, CSTE/Proj-III
Sr. DSTE/Co/PRYJ, AGC & JHS
North Central Railway**

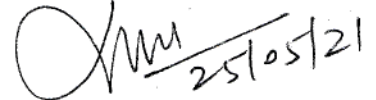
Sub: Schedule of Rates (SOR) for S&T Works in NCR.

Competent authority has approved the Schedule of Rates (SOR) for S&T works. This SOR shall be adopted by all the divisions and field units on NCR with immediate effect.

The directives/guidelines of RDSO, Railway Board & HQ issued from time to time with regard to drawings & specifications will be adhered to by divisions and field units without any deviation.

Although SOR has been prepared with due care, any discrepancies with respect to specifications, descriptions etc. shall be brought to the notice of undersigned immediately for correction/modification.

SOR is available on website also. www.ncr.indianrailway.gov.in (About us → Department → S&T → Schedule of Rates).


(Sanjeev Dixit)

CSTE/works

Copy to:

1. PCSTE/NCR, PFA/NCR- For kind information please.
2. FA&CAO/F&B/NCR- For kind information and necessary action.
3. Sr. DFM- PRYJ, AGC & JHS- For information please.
4. Dy. FA&CAO/C-I & C-II/PRYJ/NCR- For information please.

उत्तर मध्य रेलवे
North Central Railway



प्रधान कार्यालय (सि. एवं दू. स. विभाग)
गंगा परिसर, सूबेदारगंज
प्रयागराज- 211015
HQ's Office (S&T Branch)
Ganga Parisar, Subedarganj
Prayagraj - 211 015

No. NCR/Policy/SOR

Date: 19/05/2021

Sr. DSTEs/All, PRYJ, AGC & JHS divisions
Dy. CSTE/C/All, PRYJ, AGC & JHS divisions
Dy. CSTE/Project/All, PRYJ, AGC & JHS divisions
North Central Railway

Sub: S&T Schedule of Rates (SOR) for North Central Railway.

The Schedule of Rates (SOR) of Signalling and Telecommunication (S&T) items for North Central Railway has been approved. This SOR shall be adopted by all the divisions and field units with immediate effect.

Digitally signed by PRAFULL
CHANDRA PANDEY

Date: 2021.05.19 16:14:03 +05'30'

(P.C. Pandey)
CSTE/P-II

Copy to:

1. PCSTE/NCR, PFA&CAO/NCR- For kind information please.
2. CSTE/C/NCR, CSTE/Co/PU, CSTE/P-II, CSTE/P-III, FA&CAO/F&B/NCR- For kind information and necessary action.
3. Sr. DFM/All, PRYJ, AGC & JHS- For information please.
4. Dy. FA&CAO/C-I & C-II/PRYJ/NCR- For information please.

DOCUMENTATION CONTROL

SOR Committee Members :

S.N	Name	Organization	Designation	Level
01.	Prafull Chandra Pandey	S&T/NCR	CSTE/P-IV/PRYJ	Nodal Officer
02.	Shailendra Kumar Singh	Finance/NCR	Dy.FA &CAO/ F&B/PRYJ	Finance Member
03.	Pradeep Kumar Pal	S&T/NCR	Dy.CSTE/HQ/ PRYJ	Technical Member-I
04.	Kush Gupta	S&T/NCR	Dy.CSTE/P-1/PRYJ	Technical Member-II

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Chapter-1
Electronic Interlocking, Drawings

Item No.	Item Descriptions	Unit	Rate
01001	Design, Manufacture & Supply of Electronic Interlocking (EI) System (with centralized/distributed arrangement) as per attached tentative Signal Interlocking Plan in 'Hot Standby architecture' as per RDSO Specification No. RDSO/SPN/192/2019 Ver. 2.0 or latest from RDSO approved source only. EI system shall be provided to operate with dual VDU Control Terminal. It shall mainly consist of:		
	(1) EI Microprocessor Equipments/Electronic PCB cards etc.		
	(2) All type of Interfacing relays, proposed to be wired inside the EI Equipment and Relay room, i.e. Q Series neutral line/special type ACI/ Non ACI relays etc. In case of OEM specific relays with Non-RDSO approved contact configuration, if any, being supplied, the cost of such relays shall be included in the cost of EI (Electronic Interlocking) system. However, the number and type of such relays shall be indicated separately.(All types of outdoor relays like QTA2 etc. relays should Not be included as a part of EI breakup).		
	(3) EI Equipment racks and EI Relay racks. Cable termination rack to be supplied separately in Schedule and not as a part of EI breakup.		
	(4) In-built Event logger, Power Supply Equipments (DC-DC Converters shall be provided in N+1 configuration)		
	(5) Indoor cables, Wires, Fuses, Fixtures, Mounting arrangements, Communication arrangements etc. along with all accessories required to make complete EI system functional		
	(6) Surge and lightning protection devices compatible to RDSO standards and as recommended by OEM		
	(7) All the documents as proposed in the para 10.2 of the RDSO spec. No. RDSO/SPN/192/2019 Ver. 2.0 or latest		
	(8) Operation VDU console, 02 (Two No.). The embedded fan less industrial grade PCs to be supplied as Operation terminals shall comply with the specifications as described in RDSO TAN/3007, Version 1.0, dated 02.11.12 or better. The size of the VDU shall be clearly specified by the Railways.		
(A)	For a 3 line/road station	Per Station	14312914.38
(B)	For a 4 line/road station	Per Station	15256489.11
(C)	For a 5 line/road station	Per Station	14546701.28
(D)	For a 6 line/road station	Per Station	19640902.95

Item No.	Item Descriptions	Unit	Rate
01002	Modification/Alteration in existing EI (Electronic Interlocking) as per latest RDSO guidelines/TAN. It includes: Design and modification in existing Interface and Interlocking circuits and logic of EI system including modification in the VDU(Video Display Unit)/ LCP(Local Control panel)/ CCIP (Control cum Indication Panel), Maintenance terminal (MPC), Data Logger, Relay rack wiring. The complete work should comply with the latest RDSO specifications and guidelines and as per approved SIP and circuit diagrams. All the material (Interface cards / relays / wiring material / connectors / fuses / communication devices etc.) shall be provided by the contractor. The work also includes the supply of modified Selection table, Interface Circuits, VDU/ LCP/CCIP diagram etc. to suit the modified SIP. It also includes the carrying out of FAT, SAT (as applicable) jointly with Railways and satisfactory commissioning. All plans/drawings/circuits etc. should be prepared on AUTO CAD, soft copy to be supplied on Pen Drive and 06 sets of hard copies also to be supplied.		
(A)	Alteration involving modification in up to 10 routes.	Per Alteration	1716057.91
(B)	Alteration involving modification from 11 up to 20 routes.	Per Alteration	2656348.30
(C)	Alteration more than 20 routes	Per Route	265634.83
01003	<p>(a) Design, preparation and supply of the following Technical documents:</p> <p>(i) Installation, Testing, Commissioning and Maintenance manuals</p> <p>(ii) Functioning and System overview manuals</p> <p>(b) Design, preparation and supply of the following the following completion documents:</p> <p>(i) Application Logic circuits</p> <p>(ii) VDU/CCIP/LCP diagram</p> <p>(iii) Interface Circuit/Wiring diagrams consisting of Relay contact analysis chart, Relay disposition chart, Relay contact to contact wire list chart, LCP/VDU/CCIP cable termination chart, Power supply diagram, Electronic signalling equipment and Power supply layout diagram, Relay rack and Cable termination rack layout diagram, Relay rack and Cable termination rack particulars, Fuse, Resistors, Condensers etc. particulars, Details of Analog and digital inputs to be supplied to Data logger, Block wiring diagram (if applicable), Wiring diagrams for SSDAC or HASSDAC or MSDAC or BPAC (if applicable)</p> <p>(iv) Cable Route plan with overlaid Location Boxes placement (As per NCR HQ Drg. No. TYP/14/0017 issued vide letter No. S&T/NCR/DRG/TYP dtd 29.12.2014)</p> <p>(v) Cable Core plan with overlaid Location box placement</p> <p>(vi) Location huts/Goomties wiring diagrams (if applicable)</p>	Per station	177255.96

Item No.	Item Descriptions	Unit	Rate
	(vii) Location boxes wiring diagrams		
	(viii) Track circuit bonding plan		
	(ix) Earthing particulars plan		
	(x) Signal Interlocking plan (SIP)		
	(xi) Station working rule diagram (SWRD)		
	(xii) Station working rule (SWR)		
	(xiii) Selection table/ Route control chart		
	All the above completion documents should be supplied as follows: (i) Two sets initially for approval and commencement of work (ii) One set in soft copy (in editable AUTO CAD format) in Pen drive. (iii) One set of Original tracings (iv) Six sets of final 'As Made' completion plans/diagrams in proper bounded form		
01004	Supply of embedded fanless PC based Maintenance terminal/Datalogger terminal as per RDSO spec. No. RDSO/SPN/192/2019 Ver. 2.0 or latest & RDSO TAN No. - STS/E/TAN/3007 version 1 dated:02.11.12 . The size of VDU shall be minimum 42 inch, LED 4K resolution. Note: One table of suitable size along with revolving chair should be supplied with Maintenance terminal (make Godrej/Methodex or similar of reputed make)	No.	388599.47
01005	Installation, wiring, testing and commissioning of embedded fanless PC based Maintenance terminal/Datalogger terminal as per RDSO spec. No. RDSO/SPN/192/2019 Ver. 2.0 or latest & RDSO TAN No. - STS/E/TAN/3007 version 1 dated:02.11.12 supplied vide SOR item 01004.	No.	97149.87
01006	Design, Supply, installation,wiring and commisioning of housing as per systematic arrangement given by work incharge for both the operating consoles AC cabinet with PC ,VDU display, mouse and keyboard with suitable work space and sitting arrangement for operator as per Drg No. TYP/16/0007. Final layout of the VDU table shall be as per the size of the VDU and should be customised as per ASM room's space. Wooden block counter made of teak wood frame and 3 mm thick waterproof plywood with formica finish on top on all four sides, having two compartments inside and two doors on opposite sides.	No.	12271.93
01007	Installation, Wiring, Testing & Commissioning of complete Electronic Interlocking system as per RDSO specification No. RDSO/SPN/192/2019 ver. 2.0 or latest with Hot Standby arrangement for functioning of EI system, supplied vide Item No. 01001 of SOR, including transportation of required materials from consignee's depot to site, erection and grouting of EI Relay Racks, fixing and wiring of all the interfacing relays (Vital & Non-Vital), installation and wiring of Microprocessor equipments, interface equipments, power supply equipments and all other associated accessories to make complete EI system		

Item No.	Item Descriptions	Unit	Rate
	to be functional, FAT and SAT, Technical Advisory Notes (TAN) issued by RDSO time to time on installation practices of EI are to be complied.		
(A)	For a 3 line/road station	Per Station	629289.28
(B)	For a 4 line/road station	Per Station	629289.28
(C)	For a 5 line/road station	Per Station	629289.28
(D)	For a 6 line/road station	Per Station	629289.28
01008	Provision of Ring Earth for EI system, consisting of 06(six) number of maintenance free earths, which includes supply of all components of earthing & bonding system like earth electrode, earth enhancement materials, earth pit, equi-potential earth bus bar, connecting cables and tape/strips and other associated accessories in accordance with RDSO Spec. No. RDSO/SPN/197 Ver.1.0 or latest and provision of earth pits to be connected in a ring to achieve less than 01(One) ohm earth resistance for connecting EI equipments, relay racks, panel, power equipments as per RDSO TAN No. STS/E/TAN/3006 dated 02.11.2012. Diagram of ring earth should be supplied to Railway for approval before execution. All related materials as recommended by RDSO in Spec. No. RDSO/SPN/197 Ver. 1.0 or latest, will be supplied by the contractor. Note: If due to site condition (high soil resistivity, larger size of EI room etc.) more than six maintenance free earths are required then the rate of payment for each such extra individual earth shall be done as per the rates of SOR items 13002 and 13003 (Earthing Items SOR). No other payment for any other material/accessory/fixture etc. shall be admissible for such extra maintenance free earths.	Lot	322418.49
Important Note for Item No. 01001 above			
Note-(1) Data Logger, as per RDSO spec. No. IRS: S-99/2006 (Amndt-3) or better, shall be supplied separately in the contract and not as a part of the EI breakup. The number of analog and digital inputs requirement shall be clearly specified by Railway executive. No separate PC to be supplied for Data logger.			
Note-(2) The size of the VDU for Operating Console has been considered as 42" for cost calculation. In case if a larger size VDU is required due to larger yard, Railway executive is advised to do a rate analysis for the difference in the cost of the 42" and larger VDU while justifying rates in Estimate/TC etc.			
Note-(3) The necessary furniture for Video terminal i.e. Video table model Companion C3D or similar and revolving chair PCH-5002T of GODREJ make or similar shall be supplied by the contractor at his own cost. It should be supplied after the approval of the Railway Site supervisor incharge.			
Note-(4) The incremental cost of supply of hardware and design payable to the contractor, upon change in the tentative SIP, shall be as per (4)(A) and (4)(B) below:			
(4)(A) Hardware cost: (a) For an increase in number of Vital input and output bits up to 10% over and above the tentative SIP's Vital input and output bits, any additional hardware cost, if required, shall not be payable and the cost shall be borne by the contractor (b) Any additional hardware required due to increase of Vital Input and Output bits by more than 10% of the tentative SIP's Vital input and output bits shall be payable to the contractor. Additional equipment cost shall be paid as per rates of various			

equipment/cards of EI quoted by contractor in the EI breakup.

(4)(B) Design cost:(a) For an increase in number of Vital Input and Output bits up to 25% over and above the tentative SIP's Vital input and output bits, no additional design cost shall be payable (b) For an increase in number of Vital Input and Output bits more than 25% and upto 50% over and above the tentative SIP's Vital input and output bits, 10% additional design cost shall be payable (c) For an increase in number of Vital Input and Output bits more than 50% and upto 75% over and above the tentative SIP's Vital input and output bits, another 10% additional design cost shall be payable and so on.

Chapter - 2
Data Logger and RTU

Item No.	Item Descriptions	Unit	Rate
02001	Supply of Micro Processor based Remote Terminal Unit (RTU) with 64 digital input and 16 analog input as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from RTU to relay rack tag blocks, drawing/extension of power supply upto RTU. It includes supply of relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD (if installed), IPS, interlinking and networking of RTU. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	204554.49
02002	Installation, testing and commissioning of Micro Processor based Remote Terminal Unit (RTU) with 64 digital input and 16 analog input as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest . It includes supply of all the items required for complete indoor relay room wiring from RTU to relay rack tag blocks, drawing/extension of power supply upto RTU. It includes supply of relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD (if installed), IPS, interlinking and networking of RTU. It also includes installation of leased line MODEM and other interfacing cards, if required for networking of RTU. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	28484.51
02003	Supply of Micro Processor based Remote Terminal Unit (RTU) with 128 digital input & 16 analog input as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from RTU to relay rack tag blocks, drawing/extension of power supply upto RTU. It includes supply of relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD (if installed), IPS, interlinking and networking of RTU. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	246500.00
02004	Installation, testing and commissioning of Micro Processor based Remote Terminal Unit (RTU) with 128 digital input and 16 analog input as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest . It includes supply of all the items required for complete indoor relay room wiring from RTU to relay rack tag blocks, drawing/extension of power supply upto RTU. It includes supply of relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD (if installed), IPS, interlinking and networking of RTU. It also includes installation of leased line MODEM and other interfacing cards, if required for networking of RTU. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	38533.33

Item No.	Item Descriptions	Unit	Rate
02005	Supply of Micro Processor based Remote Terminal Unit (RTU) with 128 digital input & 32 analog input as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from RTU to relay rack tag blocks, drawing/extension of power supply upto RTU. It includes supply of relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD (if installed), IPS, interlinking and networking of RTU. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	268000.00
02006	Installation, testing and commissioning of Micro Processor based Remote Terminal Unit (RTU) with 128 digital input and 32 analog input as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest . It includes supply of all the items required for complete indoor relay room wiring from RTU to relay rack tag blocks, drawing/extension of power supply upto RTU. It includes supply of relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD (if installed) , IPS, interlinking and networking of RTU. It also includes installation of leased line MODEM and other interfacing cards, if required for networking of RTU. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/Data logger dtd.12.09.2011 or latest guidelines.	No.	35000.00
02007	Supply of Micro Processor based Data Logger System with 512 digital inputs and 32 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	323899.62
02008	Installation, testing and commissioning of Micro Processor based Data Logger System with 512 digital inputs and 32 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD , IPS, UFSBI, BI, interlinking and networking of Data logger. It also includes installation of leased line MODEM and other interfacing cards, if required for networking of Data Logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	66000

Item No.	Item Descriptions	Unit	Rate
02009	Supply of Micro Processor based Data Logger System with 1024 digital inputs and 32 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	521440.00
02010	Installation, testing and commissioning of Micro Processor based Data Logger System with 1024 digital inputs and 32 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. It also includes installation of leased line MODEM and other interfacing cards, if required for networking of Data Logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	98866.67
02011	Supply of Micro Processor based Data Logger System with 1024 digital inputs and 64 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	603937.58
02012	Installation, testing and commissioning of Micro Processor based Data Logger System with 1024 digital inputs and 64 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. It also includes installation of leased line MODEM and other interfacing cards, if required for networking of Data Logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	109866.67

Item No.	Item Descriptions	Unit	Rate
02013	Supply of Micro Processor based Data Logger System with 1536 digital inputs and 32 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	549210.00
02014	Installation, testing and commissioning of Micro Processor based Data Logger System with 1536 digital inputs and 32 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. It also includes installation of leased line MODEM and other interfacing cards, if required for networking of Data Logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	133500.00
02015	Supply of Micro Processor based Data Logger System with 2048 digital inputs and 32 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	649410.00
02016	Installation of Micro Processor based Data Logger System with 2048 digital inputs and 32 analog inputs with protocol converter as per RDSO Spec. No. IRS (S) 99/2006 (Amnd. 3) or latest. It includes supply of all the items required for complete indoor relay room wiring from data logger to relay rack tag blocks, drawing/extension of power supply upto Data Logger. It includes relay room door lock checking arrangement, commercial power supply monitoring arrangement & monitoring of DG sets, ELD, IPS, UFSBI, BI, interlinking and networking of Data logger. Note: Total numbers of relays and other signalling functions/gears required to be wired as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	No.	191000.00
02017	Supply of Multi port Front End Processor (8 port) as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest.	No.	207600.82
02018	Installation, testing and commissioning of Multi port Front end processor (8 port) as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest.	No.	32033.33
02019	Supply of RS232 Serial communication to Optical fibre media converters as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest.	No.	62760.00

Item No.	Item Descriptions	Unit	Rate
02020	Supply of Dual card E1 Converter as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest.	No.	61186.67
02021	Supply of External E1 to Serial Converter as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest.	No.	52400.00
02022	Supply of T-Networking Modem for connecting RTU with existing Data logger/RTU as per RDSO Spec. No. IRS (S) 99/2006 (Amdt. 3) or latest.	No.	22963.58
02023	Supply of Centralized monitoring data logger networking system as per RDSO Specification No. IRS: S-99/2006 (Amdt. 3) or latest for centralized acquisition of data from individual remote stations. This includes supply of Multi Front End Processor (FEP) and Dual Leased Line Modem required for data loggers networking as per technical specifications. The item also covers supply of PC based Failure Analysis System (FAS) as per technical specification. It includes supply of 27-inch LED monitor & Network Management Software (NMS), Supply of On Line UPS (of proper capacity with 1 hr back up,) Central Monitoring Unit (CMU) etc for on line system monitoring. Technical Specifications are as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	Set	365743.70
02024	Installation, testing and commissioning of Centralized monitoring data logger networking system as per RDSO Specification No. IRS: S-99/2006 (Amdt. 3) or latest for centralized acquisition of data from individual remote stations. This includes installation of Multi Front End Processor (FEP) and Dual Leased Line Modem required for data loggers networking as per technical specifications. The item also covers installation of PC based Failure Analysis System (FAS) as per technical specification. It includes installation of 27-inch LED monitor & Network Management Software (NMS), On Line UPS of proper capacity with 1 hr back up, Central Monitoring Unit etc for on line system monitoring. Technical Specifications are as per list circulated vide RDSO Letter No. STS/E/Data logger dtd.12.09.2011 or latest guidelines.	Set	91435.93
02025	Preparation of Station specific Train Arrival and Departure Logics for a six road station or less	No.	191940.87
02026	Preparation of Station specific Train Arrival and Departure Logics for a seven road station to ten road station	No.	260410.09
02027	Embedded software modification in Data Logger to communicate with the Data entry terminal of the ASM and pass the information through the Data Logger network.	No.	38653.47
02028	Embedded software modification in (1) FEP in test room and (2) CMU in test room, to accept and transfer the relevant station data to a client PC.	No.	119646.47
02029	Testing and Commissioning of the entire system	No.	56286.79
02030	Supply of USB to Serial converter, of reputed make as Efftronics, MOXA, ATEN or similar.	No.	3812.89
02031	Supply of Data Entry terminal for entry of train details by ASM/SM and communicating the same to the CMU via Data logger at station, with latest configuration as follows: Minimum 21.5 inch monitor, Processor i7 (Minimum 12 MB cache, up to 4.7 GHz), Windows 10, 64 bit Operating system, Minimum 512 MB SSD Boot drive, Minimum 1 TB Hard drive(Storage drive), Minimum 8GB DDR4 RAM, Serial, Ethernet, USB, HDMI ports and SD card reader port.	No.	198014.56

Chapter-3

Relays (Indoor and Outdoor)

Item No.	Item Descriptions	Unit	Rate
03001	Q-Series LED ECR (Universal Type i.e.QECX-61), 4F/4B complete with plug board(base plate), connectors, retaining clips etc and conforming to BRS:941A STS/E/RELAYS/AC LIT LED SIGNAL/09-2002, Amdt.-1 or latest and RDSO Spec.No.IRS:S-34, S-23 or latest, as applicable. The interlocking code for this unit shall be "ABDHK".	No.	6816.49
03002	Q-Series Neutral Line Relay, Non-AC immunised, (QN1 Type), 8F/8B, 24V DC complete with plug board(base plate), connectors and retaining clips etc and conforming to BRS- 930 and RDSO Specn.No.IRS:S-34 ,S-23, S-60 or latest, as applicable. The interlocking code for this unit shall be "ABCDF".	No.	4066.67
03003	Q-Series Neutral Line Relay, Non-AC immunised, (QN1 Type), 12F/4B, 24V DC complete with plug board(base plate), connectors and retaining clips etc and conforming to BRS- 930 and RDSO Specn.No.IRS:S-34, S-23, S-60 or latest, as applicable. The interlocking code for this unit shall be "ABCDE".	No.	3950.57
03004	Q-Series Line Relay (QNA1 Type),AC immunized, 8F/8B, 24 V DC along with plug board (base plate), connectors, retaining clips etc and conforming to BRS-931A and RDSO Specn.No.IRS:S-34, S-23 , S-60 or latest, as applicable. The interlocking code for this unit shall be "ABDGH".	No.	4456.85
03005	Q-Series Line Relay (QNA1 Type), AC immunized, 12F/4B, 24 V DC along with plug board (base plate), connectors, retaining clips etc and conforming to BRS-931A and RDSO Specn.No.IRS:S-34, S-23, S-60 or latest, as applicable. The interlocking code for this unit shall be "ABDFH".	No.	3926.78
03006	DC neutral line relay QNA1K, AC immunised, DC neutral line 24V, 6F/6B contacts, complete with plug board, retaining clip and connectors. Conforming to BRS:931A & RDSO letter No. STS/E/Relays/UEA/PI dated 30.05.97 Annexure II and IRS:S34, IRS:S23 , IRS:S-60 or latest, as applicable. The interlocking code for this unit shall be "CDEKY".	No.	4261.46
03007	Q-Series Track Relay (QTA2 Type), AC immunized, 9 Ohms, 2F/1B along with plug board (base plate), connectors, retaining clips etc and conforming to BRS:939A & 966(Appendix F2) or latest and RDSO Specn.No.IRS:S-34, S-23 , S-60 or latest, as applicable. The interlocking code for this unit shall be "FGHKX".	No.	3804.98
03008	Q-Series Neutral Line Relay(QSPA1 Type), AC immunised, 24V DC,8F/4B along with plug board (base plate), connectors, retaining clips etc and conforming to BRS-933A and RDSO Specn.No.IRS:S-34, S-23, S 60 or latest, as applicable. The interlocking code for this unit shall be "ABDEJ".	No.	6059.16
03009	Contacto Unit (QBCA1 Type), 24 V DC, 2HF/4B complete with plug board(base plate), connectors, retaining clips etc and conforming to BRS- 943 and RDSO Specn.No.IRS:S-34, S-23 , S-60 or latest, as applicable. The interlocking code for this unit shall be "BCEJK".	No.	6825.47

Item No.	Item Descriptions	Unit	Rate
03010	Q-Series Twin Neutral Line Relay(QNNA1 Type), AC immunised, 6F/2B, 24V DC complete with plug board(base plate), connectors and retaining clips etc and conforming to BRS-960 and RDSO Specn.No.IRS:S-34, S-23, S-60 or latest as applicable. The interlocking code for this unit shall be "CDEHX".	No.	4877.12
03011	Q-Series Twin Neutral Line Relay(QNNA1 Type), AC immunised, 4F/4B, 24V DC complete with plug board(base plate), connectors and retaining clips etc and conforming to BRS-960 and RDSO Specn.No.IRS:S-34, S-23, S-60 or latest, as applicable. The interlocking code for this unit shall be "ACDHJ".	No.	5582.47
03012	Q-Series Magnetically Latched Neutral Line Relay (QL1 Type), 11F/4B,24V DC complete with plug board(base plate), connectors and retaining clips and conforming to BRS-935A and RDSO Specn.No.IRS:S-34, S-23 or latest, as applicable. The interlocking code for this unit shall be "ABDEG".	No.	5985.46
03013	Q-Series Magnetically Latched Neutral Line Relay (QL1 Type), 8F/6B, 24V DC complete with plug board(base plate), connectors and retaining clips and conforming to BRS-935A and RDSO letter No. SGW/R.102/Q Relay dated 08.12.2016 of S&T Wksp/PTJ and RDSO Specn.No.IRS:S-34, S-23 or latest, as applicable. The interlocking code for this unit shall be "ABCEG".	No.	5806.83
03014	Q-Series Twin Neutral Line Relay(QNN1 Type), 6F/2B, 24V DC complete with plug board(base plate), connectors and retaining clips etc and conforming to BRS-960 and RDSO Specn.No.IRS:S-34, S-23 or latest, as applicable. The interlocking code for this unit shall be "ACDEK".	No.	5556.23
03015	Supply of Key Lock Checking Relay (KLCR) working on 24V DC, AC Immunized, metal to metal, with different ward combinations and contact configuration 4F/4B with 2 extra ward plates, RDSO spec No. RDSO/SPN/219/2016 Ver 1.0 with Amendment-1 or latest.	No.	8026.84
03016	Supply and installation of prewired KLCR Box, wooden crank handle lock inside box, with 8 way terminal strips, LEDs of approved type, for fixing of EKT on wooden board inside box form installing KLCRs/EKTs up to 06 No., including supply of all material like board, handle, hinges, glass sheet etc.	No.	13636.52
03017	Supply and Installation of Glass fronted Key box for Crank handle etc. it should be done as per site supervisor instructions.	No.	2459.11
03018	Q-Series Twin Neutral Line Relay(QNN1 Type), 4F/4B, 24V DC complete with plug board(base plate), connectors and retaining clips etc and conforming to BRS-960 and RDSO Specn.No.IRS:S-34 & S-23 or latest, as applicable. The interlocking code for this unit shall be "ACEHJ".	No.	5664.75
03019	Fail Safe Electronic Flasher device, 24V DC or 60 V DC, as per RDSO spec. No. RDSO/SPN/173/2002, Amdt.2 or latest	No.	11254.77

Chapter - 4

Relay rack, CT Rack items

Item No.	Item Descriptions	Unit	Rate
04001	Supply of 16/0.2 mm (0.5 sq mm) PVC insulated multi strand, single core, tinned copper conductor, as per RDSO Specn.No.IRS:S-76/89 (Amnd-3) or latest. Each coil should be of 100/200/500 Meters length. Colour of the wire will be specified by the Engineer incharge.	Mtr.	10.88
04002	Supply of PVC Insulated, Indoor cable, single core, 1.0 mm, flexible, as per IRS-S-76/89 (Amndt.-3) or latest. Coil should be of different colours, each in 100 m length.	Mtr.	7.06
04003	Supply of 1 x 6 Sq mm (Red/Black/Green) multi strand copper power wire , 85 conductor each dia 0.30 +/- 0.01 with insulation thickness of 0.8 mm and nominal conductor resistance of 3.3 ohms/km and test paraMtr.s as per RDSO Specn. No.IRS:S-76/89 (Amnd.3) or latest. Colour of the wire will be specified by the Engineer incharge.	Mtr.	47.97
04004	Supply of 1 x 10 Sqmm (Red/Black/Green) multi strand copper power wire, 101 conductor each dia 0.45 +/- 0.01 with insulation thickness of 1.2 mm and nominal conductor resistance of 1.127 ohms/km and test parameters as per RDSO Specn.No.IRS:S-76/89(Amnd.3) or latest. Colour of the wire which is required will be specified by the Engineer incharge.	Mtr.	125.58
04005	Supply of 1 x 16 Sqmm (Red/Black/Green) multi strand copper power wire as per IS: 2465/1984 and IS:694:2010 or latest, 101 conductor each dia 0.45 +/- 0.01 with insulation thickness of 1.2 mm and nominal conductor resistance of 1.127 ohms/km and test parameters as per RDSO Specn.No.IRS:S-76/89(Amnd.3) or latest. Colour of the wire which is required will be specified by the Engineer incharge.	Mtr.	147.77
04006	Supply of 1 x 25 Sqmm (Red/Black/Green) multi strand copper power wire, Colour of the wire which is required will be specified by the Engineer incharge.	Mtr.	398.17
04007	Supply and installation of Cable Termination(CT) rack as per drawing of NC Railway, complete along with fitting arrangements, wall supports, scaffolding and suitable grouting arrangements and also with arrangement for fixing four 8-way terminal strips/ Screw less terminals/ ARA terminals. The CT rack shall be covered with hylum sheet of minimum 10 mm thickness for fixing of 8-way terminal strips/ Screw less terminals/ ARA terminals. Supply of 8 way terminal strips/ Screw less terminals / ARA terminals Not covered under this item. Cable termination rack shall be corrosive resistant and powder coated.	No.	48325.51
04008	Supply of Fuse auto changeover system for Railway Signaling System as per RDSO/SPN/209/2012 Rev.2 or latest for Relay room fuses up to 10 Ampere capacity for 12V/24V/60V/110V DC and 110V AC systems. The units shall be mounted on DIN rail in adequate size enclosure as per instructions of Railway site engineer. Two No. of NO+NC contacts shall be provided for remote monitoring. The changeover time shall be less than 1 msec. The audio visual alarm for main and standby fuses shall be provided. One set means set of each fuse.	Set	2248.17

Item No.	Item Descriptions	Unit	Rate
04009	Installation wiring testing and commissioning of Fuse auto change over system. This includes provision of common Buzzer & indication at ASM Room & ESM Duty Room and painting of fuse details. This also includes fabrication of frame for installation of FACS at Station/ LC gate where installation of relay racks not feasible. One set means set of each fuse.	Set	159.77
04010	Supply of Tag blocks 120/160/200 way with Polycarbonate cover as per IRS: S-77/2006 (Rev. 1) or latest, as per drawing No. SA-24751, SA-24752, SA-24753 respectively. Requirement of the type shall be specified by Railway site Incharge.	No.	1414.88
04011	Supply of PPTC fuse GP 60-185, UL-94 certification (1.6 Amps) for internal/ external current. Make Fuzetec, Tyco, Raychem, Littlefuse or similar.	No.	10.14
04012	Supply of PPTC fuse GP 60-400, UL-94 certification (12 V/4 Amp) for TE/TR circuit. Make Fuzetec, Tyco, Raychem, Littlefuse or similar.	No.	8.56
04013	Supply of PPTC fuse GP 30-100, UL-94 certification (24 V/ 1.4 Amp) for TPR circuit. Make Fuzetec, Tyco, Raychem, Littlefuse or similar.	No.	8.56
04014	Supply of PPTC fuse GP 250-185, UL-94 certification (24 V/ 4 Amp) 110V AC for Track Chargers. Make Fuzetec, Tyco, Raychem, Littlefuse or similar.	No.	8.56
04015	Supply of Indicative type of fuse inserts with holder, 0.6 Amp, as per IRS S: 78/92 or latest, make Rapid, Malnad, L&T or similar of reputed make	No.	69.37
04016	Supply of Indicative type of fuse inserts with holder, 1.6 Amp, as per IRS S: 78/92 or latest, make Rapid, Malnad, L&T or similar of reputed make	No.	72.40
04017	Supply of Indicative type of fuse inserts with holder, 6/10 Amp, as per IRS S: 78/92 or latest, make Rapid, Malnad, L&T or similar of reputed make	No.	270.59
04018	Supply of Indicative type of fuse inserts without holder, 0.6 Amp, as per IRS S: 78/92 or latest, make Rapid, Malnad, L&T or similar of reputed make	No.	21.70
04019	Supply of Indicative type of fuse inserts without holder, 1.6 Amp, as per IRS S: 78/92 or latest, make Rapid, Malnad, L&T or similar of reputed make	No.	20.69
04020	Supply of Indicative type of fuse inserts without holder, 6/10 Amp, as per IRS S: 78/92 or latest, make Rapid, Malnad, L&T or similar of reputed make	No.	95.70

Chapter - 5
Power Supply Items

Item No.	Item Descriptions	Unit	Rate
05001	Supply of uncharged Low Maintenance Lead Acid (LMLA) secondary cell, 2V, 80 AH, in dry condition, shelf mounting type, conforming to RDSO Specn. No. IRS: S-88/2004 or latest, with inter cell connectors, nuts and bolts, washers, microporous vent plug, float etc.	No.	3111.75
05002	Charging of Lead Acid Batteries, 2V, 80 AH, with contractors own battery grade sulphuric acid and distilled water with minimum two charge - discharge cycles, installation of charged batteries in groups & their connection & wiring. The work shall be done as per the procedure prescribed by the OEM and extant practice of N.C.Rly and instruction of Engineer-in-charge. Detailed measurements of initial charging shall be recorded jointly by contractor & Rly's site-in-charge.	No.	247.27
05003	Supply, installation, testing and commissioning of SMPS based Integrated Power Supply (IPS) System as per RDSO Spec. No. RDSO/SPN/165/2012 (Ver. -3.0) or latest along with surge protection device, status monitoring panel, spares, tool kit, LMLA battery consisting of 55 plus 5 cells (cells as per RDSO spec. IRS: S-88/2004 or latest) along with battery stand. The configuration of IPS should be as per NCR/HQ drawing No. TYP/2017/0002-06 for EI station up to 4 lines with Block panel and LC gate. This includes transportation to consignee depot, from consignee depot to site, installation and commissioning of Integrated Power Supply System after duly filling precommissioning check list jointly by RDSO approved vendor and Railway representative. (Item shall be procured through Store)	No.	1500367.48
05004	Supply, installation, testing and commissioning of SMPS based Integrated Power Supply (IPS) System as per RDSO Spec. No. RDSO/SPN/165/2012 (Ver. -3.0) or latest along with surge protection device, status monitoring panel, spares, tool kit, LMLA battery consisting of 55 plus 5 cells (cells as per RDSO spec. IRS: S-88/2004 or latest) along with battery stand. The configuration of IPS should be as per NCR/HQ drawing No. TYP/2017/0002-11 for Relay Hut/LSC with AFTC, Axle Counter and LC gate. This includes transportation to consignee depot, from consignee depot to site, installation and commissioning of Integrated Power Supply System after duly filling pre commissioning check list jointly by RDSO approved vendor and Railway representative. (Item shall be procured through Store)	No.	1434308.51
05005	Supply, installation, testing and commissioning of SMPS based Integrated Power Supply (IPS) System as per RDSO Spec. No. RDSO/SPN/165/2012 (Ver. -3.0) or latest along with surge protection device, status monitoring panel, spares, tool kit, LMLA battery consisting of 55 plus 5 cells (cells as per RDSO spec. IRS: S-88/2004 or latest) along with battery stand. The configuration of IPS should be as per NCR/HQ drawing No. TYP/2017/0002-08 for EI station up to 6 lines with Block panel and LC gate.	No.	1714937.75

Item No.	Item Descriptions	Unit	Rate
	This includes transportation to consignee depot, from consignee depot to site, installation and commissioning of Integrated Power Supply System after duly filling pre commissioning check list jointly by RDSO approved vendor and Railway representative. (Item shall be procured through Store)		
05006	Supply, installation, testing and commissioning of SMPS based Integrated Power Supply (IPS) System as per RDSO Spec. No. RDSO/SPN/165/2012 (Ver. -3.0) or latest along with surge protection device, status monitoring panel, spares, tool kit, LMLA battery consisting of 55 plus 5 cells (cells as per RDSO spec. IRS: S-88/2004 or latest) along with battery stand. The configuration of IPS should be as per NCR/HQ drawing No. TYP/2017/0002-10 for IBS with LC gate. This includes transportation to consignee depot, from consignee depot to site, installation and commissioning of Integrated Power Supply System after duly filling pre commissioning check list jointly by RDSO approved vendor and Railway representative. (Item shall be procured through Store)	No.	1417488.33
05007	Supply, installation, testing and commissioning of SMPS based Integrated Power Supply (IPS) System as per RDSO Spec. No. RDSO/SPN/165/2012 (Ver. -3.0 or latest along with surge protection device, status monitoring panel, spares, tool kit, LMLA battery consisting of 55 plus 5 cells (cells as per RDSO spec. IRS: S-88/2004 or latest) along with battery stand. The configuration of IPS should be as per NCR/HQ drawing No. TYP/2017/0002-07 for EI station up to 6 lines with Block Instrument and LC gate. This includes transportation to consignee depot, from consignee depot to site, installation and commissioning of Integrated Power Supply System after duly filling pre commissioning check list jointly by RDSO approved vendor and Railway representative. (Item shall be procured through Store)	No.	1722681.96
05008	Supply, installation, testing and commissioning of SMPS based Integrated Power Supply (IPS) System as per RDSO Spec. No. RDSO/SPN/165/2012 (Ver. -3.0 or latest along with surge protection device, status monitoring panel, spares, tool kit, LMLA battery consisting of 55 plus 5 cells (cells as per RDSO spec. IRS: S-88/2004 or latest) along with battery stand. The configuration of IPS should be as per NCR/HQ drawing No. TYP/2017/0002-05 for EI station up to 4 lines with Block Instrument and LC gate. This includes transportation to consignee depot, from consignee depot to site, installation and commissioning of Integrated Power Supply System after duly filling pre commissioning check list jointly by RDSO approved vendor and Railway representative. (Item shall be procured through Store)	No.	1685879.22
05009	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 60V DC, 10 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	55704.22
05010	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 60V DC, 20 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	52992.67

Item No.	Item Descriptions	Unit	Rate
05011	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 60V DC, 40 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	130799.67
05012	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 110V DC, 20 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	93423.46
05013	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 110V DC, 40 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	97379.39
05014	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 24V DC, 10 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	29079.73
05015	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 24V DC, 20 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	33903.34
05016	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 24V DC, 30 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	38176.10
05017	Supply of Battery Charger, self regulating, floor mounting type, with 230V AC single phase input and output 12V DC, 10 A as per RDSO spec. IRS: S-86/2000 (Amd.4) or latest.	No.	20623.33
05018	Supply of Single Phase Transformer, 230V AC/(110-130)V AC, 1 KVA as per RDSO Specn.No.IRS:S-72/88 (Amnd. 2) or latest.	No.	7350.66
05019	Supply of Single Phase Transformer, 230V AC/(110-130)V AC, 2 KVA as per RDSO Specn.No.IRS:S-72/88 (Amnd. 2) or latest.	No.	10343.42
05020	Supply of Low Tension Auto changeover Power Panel suitable to change over between three incoming Three phase 230V supplies with signaling supply distribution arrangement, voltage sensing relays, MCB's, fuses & contactor Unit as per Drawing supplied by Engineer - in - charge NOTE:- i). Item include supply of 10 spare fuses of each type, 1 contactor relay of each type & 1 MCB of each type used in panel. ii). Program switches & wire to be supplied based on current requirement. iii).The cabinet of Auto changeover shall be powder coated & compact in size as possible.	No.	488186.06
05021	Supply of Auto changeover Power Panel suitable to change over between three incoming single phase 230V supplies with signaling supply distribution arrangement, voltage sensing relays, MCB's, fuses & contactor Unit as per drawing supplied by Engineer -in- charge i). Item include supply of 10 spare fuses of each type, 1 contactor relay of each type & 1 MCB of each type used in panel. ii). Program switches & wire to be supplied based on current requirement.	No.	86137.29

Item No.	Item Descriptions	Unit	Rate
	iii).The cabinet of Auto changeover shall be powder coated & compact in size as possible.		
05022	Installation of LT Power Panel/ Power distribution panel/ Auto Changeover Panel, power supply equipments such as Rectifiers Transformers, Battery chargers etc including mounting on wooden planks/Hylam Sheet and complete wiring for automatic change over arrangement, mounting of Program switches on Bakelite sheet of size 300 mm x 300 mm x 8 mm fitted to MS angle (size 25mm x 25mm x 5mm) brackets, wiring as per requirements. Necessary wires, lugs & glands to be supplied by Contractor.	No.	23578.33
05023	Supply of Isolation transformer 10 KVA, input and output 230V AC 50 Hz Sine Wave Single phase.	No.	76678.50
05024	Installation of Isolation transformer 10 KVA, input and output 230V AC 50 Hz Sine Wave Single phase.	No.	3313.34
05025	Supply of maintenance free, VRLA battery/Cell 2V, 200 AH as per RDSO spec. No. IRS: S-93/96(B) (Amnd. 1) or latest.	No.	3062.70
05026	Supply of maintenance free, VRLA battery/Cell 2V, 300 AH as per RDSO spec. No. IRS: S-93/96(B) (Amnd. 1) or latest.	No.	5243.19
05027	Supply of uncharged Low Maintenance Lead Acid (LMLA) secondary cell, 2V, 200 AH, shelf mounting type conforming to RDSO Specn.No. IRS:S-88/2004 or latest with inter cell connectors, nuts and bolts etc.	No.	5706.95
05028	Supply of uncharged Low Maintenance Lead Acid (LMLA) secondary cell, 2V, 300AH, shelf mounting type conforming to RDSO Specn.No. IRS:S-88/2004 or latest with inter cell connectors, nuts and bolts etc.	No.	7111.26
05029	Supply of uncharged Low Maintenance Lead Acid (LMLA) secondary cells of 2V each, 55 cells(110V), 200AH, shelf mounting type conforming to RDSO Specn. No. IRS:S-88/2004 or latest with inter cell connectors, nuts and bolts and all accessories etc.	No.	321458.48

Chapter - 6

Point Machine

Item No.	Item Descriptions	Unit	Rate
06001	<p>Supply of Electric Point Machine 143 mm stroke, AC Immunity 160V AC, complete with lock detector and slides for lock detector, non-trailable, to operate on 110V DC, rotary locking with crank handle universal type as per RDSO Spec. No. IRS:S-24/2002 (Amnd. 1) or latest, RDSO DRG. No. S-10800 (ALT.5 WITH JUNCTION BOX TELESCOPIC. THE MOTOR WILL BE AS PER RDSO SPECN. No. IRS: S-37/82 (AMND. 3) WITH RDSO DRG. No. S-10910. This includes supply of Set of tools as per para 20.1 & 20.2 of RDSO SPECN. No. IRS:S-24/2002 (AMND 1)</p> <p>The following set of tools in a suitable tool box shall be supplied along with every set of eight point machines or less.</p> <p>i). Hand operated square drive socket wrenches of 12.5 mm driving square (short type) as per IS: 7381 for M8, M10, M12 & M18 threads. (One 250 mm long 12.5 mm square extension bar as per IS: 7991 along with compatible Tee handle Square drive as per IS: 7975 suitable for above socket wrenches shall also be provided.)</p> <p>ii). Open jaw wrenches (spanners) for M10, M12, M20, M24 & M33 threads as per IS: 2028.</p> <p>iii). Adjustable wrench.</p> <p>iv). Screw driver 300 mm long.</p> <p>Junction box and two numbers of telescopic pipes of approved type shall be supplied as an integral part of the point machine.</p>	No.	100448.25
06002	<p>Fixing, wiring, testing and commissioning of Electrical Point Machine on the Wooden/PRC sleepers at points as per standard practice and as per section of rails used. Item includes fixing switch extension bracket, providing insulation for switch extension bracket, fixing ground connection, adjusting opening of the switches and adjusting the point machine with crank handle. The item also includes :</p> <p>(i) Complete material for installation like ground-connections, switch extension brackets, point insulation material, I pipes, wiring materials, various fixing nuts & bolts including castle nuts, spring washers.</p> <p>(ii) All smithy & fitting works required at site for complete installation.</p> <p>(iii) Installation of gauge tie plate & providing insulation for gauge tie plate (Insulation in William Stretcher Bar will be provided by Railways).</p> <p>(iv) Wiring inside the point machine, insertion and termination of tail cable in point machine and junction boxes / location box / cable hut as per extent practice on NCR and the instruction of Railway Engineer at site.</p> <p>(v) Supply and fixing of bend pipes with welded frame for cable entry to machine</p> <p>(vi) Supply and filling of industrial grade/good quality lubricant/grease/oil for smooth operation of point machine.</p> <p>Note : The ground connections shall be suitable to the Point Machines as</p>	No.	14054.20

Item No.	Item Descriptions	Unit	Rate
	specified by Engineer-in-charge and shall be suitable to the point lay out i.e. 60 Kg. / 52 Kg / 90R as per yard layout. Electrical Point Machine and M-6 / Screw less terminals will be supplied by Railways / covered in Schedule separately		
06003	Supply of stretcher bar insulation complete set consisting of the following:- Plate-T-10367-1 No., Bush T- 10368- 3 Nos. and washer-T- 10371 -6 Nos.	Set	363.84
06004	Supply of gauge tie plate insulation complete set each set consisting plate T-10372 = 1No., Bush T-10368=3 Nos. and washer - T-10371 = 6 Nos.	Set	364.27
06005	Supply of IRS Type point machine `D`/'P' bracket insulation complete set consisting of the following:- Plate LH - S-3266-1 No., RH - S-3265-1 No., Plate S-8804- 1 No., Bush - S- 3199 - 4 Nos, Bush S-8813- 2 Nos.	Set	462.11
06006	Fabrication and supply of point rodding (Ground Connection) set for electric point machine (RDSO Type) as per RDSO Drg. NosA-8800-01, 20-21, 9151-52,9000-01, 03-04, 9065-66, 9101, as applicable.	Set	14771.08
06007	Supply and fixing of GI bend pipe 50 mm dia., 'B' class, for cable entry into Point machine with all accessories. Note: This item to be operated independently for those points where Point machines are functional but GI bend pipe is not provided. For all other new installation of Point machines, item 06002 of the SOR includes the provision of GI bend pipe.	No.	3115.73
06008	Refixing of electrical point machine, ground connection during phase working (Non interlocked working) after removing the existing fitting if any, adjustment if necessary, cable termination, wiring, testing and commissioning of electrically operated point, fixing and connecting point indicator on derail switch if necessary. The work shall be done as per extant practice on NCR and the instruction of Railway Engineer at site.	PER T/Out	3568.56
06009	Removal of existing mechanical point fittings and FPL assembly from points, fixing of electrical point machine, ground connection, adjustment and testing with Crank handle for operation. Removal of ground connection, point machine after testing, and refixing the mechanical point fittings. This will include fabrication and fixing of bent pipes with welded frame for cable entry to the point machine and termination of tail cable in the point machine, servicing and supply of SAE 30 lubricating oil. This will also include supply of all necessary fixing material and adjustments to make the mechanical point functional again. The work shall be done as per extant practice on NCR and the instruction of Railway Engineer at site.	PER T/Out	5512.63
06010	Maintenance of Signalling gears required for execution of BCM/TTM/FRM or any other signalling work which includes: (1) Proper dressing of track lead jumpers as required by the Railways before and after BCM/TTM/FRM machine working. (2) All cables attended during work to be meggared and all damaged cables due to work to be replaced as per requirement of Railways (3) Preparatory work required for the work of Point renewal, removing, fixing, installation and testing of rodding set for point machine including all associated gears of mechanical/electrical points as per direction of Railway representative at site. (4) Any other decided by Railways. The team to be provided for this work should comprise of: Fitter-1 No., Blacksmith- 1 No., Carpenter/Mason- 1 No. and Helpers- 5 No. (Day = per day per team).	Day	3248.33

Chapter - 7

Track Circuit (DC TC, Axle counter, BPAC, UFSBI)

Item No.	Item Descriptions	Unit	Rate
07001	Supply of Track feed Battery Charger as per RDSO Specn. No. IRS: S-89/2013 Ver.1.0 or latest. Charging capacity rating should be suitable for charging 80 AH Battery.	No.	5903.25
07002	Supply of Adjustable Track Feed Resistance 30 Ohms (Disc Type), Phenolic moulded base, as per RDSO Drg. No. SA-20161-66/M or latest.	No.	2280.82
07003	Supply of B Type Choke as per RDSO Specn.No.IRS:S-65/83 (Amnd. 3) or latest.	No.	5911.82
07004	Supply of Hydrometer, Exide make or similar for measuring specific gravity of Battery Graded acid with mounting stand in location Boxes.	No.	355.74
07005	Supply of Channel pins, single groove, 7 mm, galvanised, suitable for 4 mm dia bonding wire for Track Circuit rail bonding, as per RDSO spec.No. IRS: S 17-75	No.	3.87
07006	Supply of 8 SWG GI wire (4 mm dia) suitable for Track circuit rail bonding as per RDSO spec.No. IRS: S 13-62.	Kg	76.66
07007	Supply of PVC insulated, jacketed wire rope for Track lead connections. The wire rope should be of galvanised steel, 6 mm dia, (6x19 stranded wire with steel core of 6 mm) sheathed with PVC.	Mtr.	44.08
07008	Supply, Installation, Testing and Commissioning of High Availability Single Section digital axle counter (HASSDAC) with Dual sensor system as per RDSO/SPN/177/2012 (Version 3) or latest. This includes the supply of High frequency web mounting type Tx coil/Rx coil, VR/PR Box duly wired, Vital relays, PR Relays, Clamp with deflector plates & hardware, Dual display reset box/monitoring console with auto resetting facility, Surge voltage protection devices and filter card to be mounted on DIN rail etc as per OEM for complete installation & testing & commissioning of (HASSDAC) system. This include fixing of track device, relays, wiring, lacing /dressing, cable termination with lug eyelet, drilling holes in rails, Installation of track devices and make it functional along with existing UFSBI/block instrument. Material required other then supply item of HASSDAC shall be arranged by contactor to make it functional. Note: One set of HASSDAC system will include equipment required to monitor One Up line or One Dn line of a full Block Section between two stations.	Set	849030.99
07009	Installation of DC track circuits (Straight Portion) including supply of materials as per directive of site Engineer. Note : (i) This includes drilling 9/32" holes on rails, provision of double continuity GI wire bonding, provision of Block Joints 60 Kg/52 Kg/90R with machined fish plates, installation of Track lead junction box (separately for (+) and (-) rails), provision of track lead jumper wires/cables, fixing of track circuit equipment i.e. track charger, resistance, fuses, batteries, chokes, relays, anti-titling arrangement and painting, lettering and numbering of DC track circuit equipments etc., (ii) [a] Un-machined fish plates shall be supplied by the Railway's, but machining of fish plates shall be done by the Tenderer. In case of provision of Glued Joints by Engineering Department in lieu	No.	7718.48

Item No.	Item Descriptions	Unit	Rate
	of RDSO Block joint, the cost of machining of fish plates@ 100/- per straight track circuit and @ 500/- per point zone track circuit will be deducted. [b] This includes insulation of gauge tie plates, Crossing plates, rod in siding points if required or any other place as instructed by Railway Site Engineer, by Tenderer's insulation materials. Railway will supply Track Charger, B-type choke, Resistance, Un-charged battery, TLJB and relays through a separate schedule/from the stores of railway consignee. These are to be transported to site of work at contractor's cost. Tenderer/Contractor shall supply any other materials that are required for the work.		
07010	Installation of DC track circuits (Point zone) including supply of materials as per directive of site Engineer. Note : (i) This includes drilling 9/32" holes on rails, provision of double continuity GI wire bonding, provision of Block Joints 60 Kg/52 Kg/90R with machined fish plates, installation of Track lead junction box (separately for (+) and (-) rails), provision of track lead jumper wires/cables, fixing of track circuit equipment i.e. track charger, resistance, fuses, batteries, chokes, relays, anti-titling arrangement and painting, lettering and numbering of DC track circuit equipments etc., (ii) [a] Un-machined fish plates shall be supplied by the Railway's, but machining of fish plates shall be done by the Tenderer. In case of provision of Glued Joints by Engineering Department in lieu of RDSO Block joint, the cost of machining of fish plates@ 100/- per straight track circuit and @ 500/- per point zone track circuit will be deducted. [b] This includes insulation of gauge tie plates, Crossing plates, rod in siding points if required or any other place as instructed by Railway Site Engineer, by Tenderer's insulation materials. Railway will supply Track Charger, B-type choke, Resistance, Un-charged battery, TLJB and relays through a separate schedule/from the stores of railway consignee. These are to be transported to site of work at contractor's cost. Tenderer/Contractor shall supply any other materials that are required for the work.	No.	12472.13
07011	Supply, Installation, testing and commissioning of Block Panel BPAC (Block Providing with digital axle counter) using UFSBI as per specification IRS:S-105/2012 (Ver.0) with latest amendment for single line operation. Note: One set will include all equipments viz. SM panel, block telephone-2 No., pre-wired relay rack-2 No., all types of required relays, surge and lightning protection, technical manuals etc. required for one complete Single line Block Section (except DAC).	No.	959857.49
07012	Supply of Track Lead Junction Box (TLJB), 4 way, 250 mm x 255 mm x120 mm made from FRP, as per Drg.No. 20101/M(IRS) or latest, including brass bolts and hylam board sheet with terminals etc. The FRP material shall be as per RDSO spec.No. RDSO/SPN/151/1997 or latest. The technical specifications are as follows: (a) TLJB complete with cover to be in black/red/grey with all the holes required for mounting on FRP stump (vertical two for each FRP angle) HDPE pipe, cable etc. (b) Each TLJB shall have two bakelite terminal block fitted horizontally, each	No.	5339.82

Item No.	Item Descriptions	Unit	Rate
	bakelite terminal block shall have two nickel chrome plate with brass terminal. Alongwith each TLJB, nickel chrome plated brass links(two nos. of adequate strength for vertical linking of the terminals to be supplied. (c) HDPE pipe along with two nuts for fixing on the TLJB hole. (d) The FRP stump for mounting the TLJB.		
07013	Supply, installation, testing and commissioning of Multi Section Digital Axle Counter (MSDAC), complete system including central evaluators, processors, final track clearance relay for each track section, Reset boxes, Monitoring consoles, Diagnostic PC/Laptop of suitable configuration, LV boxes, detection points, mushroom housing for track side electronic, deflector plates and all other accessories, as per RDSO specification No. RDSO /SPN/176/2013 (Ver. 3) or latest and OEM/Manufacturer's specification. (Per Detection point/DP)	No.	444787.18
07014	Supply of Tools Kit for Digital Axle Counter (Multi section/Single section). (MS-DAC comply to the RDSO spec.No. RDSO/SPN/176/2013/Ver.3 or latest and manufacturer's specification and SSDAC comply to the RDSO/SPN/177/2012, Ver.3 or latest respectively). The tool kit shall be minimum equipped with the following equipments: (i) All mechanical tools shall be of reputed make like Taparia/Bosch etc. (ii) Digital multimeter true RMS type of make Fluke 189 or similar reputed make with probe set - 1 No. (iii) Adjustable torque wrenches 25-135 N/mtr with 13 mm and 19 mm inserts- 1 set (iv) Set of spanners screw drivers and soldering iron - 1 set (v) Dummy wheel - 1 No. (vi) Marking Jig - 1 No. (vii) Adapter card - 1 No. (viii) Extended wired socket to interface with diag No. stic plug - 1 No. (ix) Selector switch on panel base - 1 No. (ix) DAC EC card puller etc.	Set	122070.68
07015	Supply, installation, testing and commissioning of Track Feed battery charger alarm system as per RDSO spec.No. IRS: S-89/2013 Ver.1.0 or latest, to work on 110 V AC system, having terminals for connecting all 3 supplies and indications for mains and charger failure and drive potential free contacts all with contractor's own material.(per track)	No.	3731.76
07016	Supply of Modem for UFSBI for use with secondary media OFC/Quad/VF Channel etc. The modem shall be complete with existing system as per RDSO spec.No. IRS:S-105/2012 (Ver.0) with latest amendment.	Pair	77822.30
	AFTC Items (Siemens make)		
07017	Repair of the Transmitter board B30 (Siemens make AFTC) as per RDSO spec. No. RDSO/SPN/146/2001 or latest	No.	13031.95
07018	Repair of the Filter and Amplifier board B40 (B1 to B8) (Siemens make AFTC) as per RDSO spec.No. RDSO/SPN/146/2001 or latest	No.	11860.96
07019	Repair of the Receiver-1 board B33 (B1 to B12) (Siemens make AFTC) as per RDSO spec.No. RDSO/SPN/146/2001 or latest	No.	25581.89
07020	Repair of the Demodulator board B35 (Siemens make AFTC) as per RDSO spec.No. RDSO/SPN/146/2001 or latest	No.	5518.31
07021	Repair of the Relay board B36 (Siemens make AFTC) as per RDSO spec.No. RDSO/SPN/146/2001 or latest	No.	8527.06

Item No.	Item Descriptions	Unit	Rate
07022	Repair of the Tuning unit D10 type (Siemens make AFTC) as per RDSO spec. No. RDSO/SPN/146/2001 or latest	No.	37598.98
07023	Repair of the Tuning unit D13 type (Siemens make AFTC) as per RDSO spec. No. RDSO/SPN/146/2001 or latest	No.	37598.98
07024	Repair of the Tuning unit D14 type (Siemens make AFTC) as per RDSO spec. No. RDSO/SPN/146/2001 or latest	No.	41697.78
07025	Supply of Siemens make AFTC equipment, End Fed, (Coded) complete with Transmitter (Tx), Receiver (Rx), Demodulator filter AMP, Relay P.S. Unit Track side equipment, Copper lead connections (25 sq mm) from TU to rail, Lugs, Vertical stand for TU etc. (Frequency of set to be decided by the Railway) as per RDSO spec.No. RDSO/SPN/146/2001 or latest	No.	463794.27
07026	Supply of Siemens make AFTC equipment, Centre Fed, (Coded) complete with Transmitter (Tx), Receiver (Rx), Demodulator filter AMP, Relay P.S. Unit Track side equipment, Copper lead connections (25 sq mm) from TU to rail, Lugs, Vertical stand for TU etc. (Frequency of set to be decided by the Railway) as per RDSO spec.No. RDSO/SPN/146/2001 or latest	No.	636865.70
07027	Supply of 25 sq mm Cu (Copper) cable for TU (Tuning Unit) of Siemens AFTC	Mtr.	261.25
07028	Supply of End / Terminal Bonds for Siemens make Audio Frequency track circuit of size 9 Meter suitable for track circuit FTGS 46 /917. Terminal bond should be made of PVC coated wire rope of cross section approximately to 240 sq. mm. PVC coated wire should be as per IS:2266 of 1978 or latest and PVC sheathing should be of compound type 6 as per IS:5831 of 1970 with latest amendment if any. Reclaimed or recycled material shall not be used. Brass lug should be brazed at both ends of Terminal bond and brass terminal in centre of Terminal bond as per sample and drawing. Terminal bonds are to be fixed along the foot of rail in form of 'Alpha' and both ends of brass lug are to be riveted or fixed with nut bolts with web of rail by copper rivets or nut -bolts after drilling holes.	No.	12459.23
07029	Supply of End / Terminal Bonds for Siemens make Audio Frequency track circuit of size 18 meter suitable for track circuit FTGS 46 /917. Terminal bond should be made of PVC coated wire rope of cross section approximately to 240 sq. mm. PVC coated wire should be as per IS:2266 of 1978 or latest and PVC sheathing should be of compound type 6 as per IS:5831 of 1970 with latest amendment if any. Reclaimed or recycled material shall not be used. Brass lug should be brazed at both ends of Terminal bond and brass terminal in centre of Terminal bond as per sample and drawing. Terminal bonds are to be fixed along the foot of rail in form of 'Alpha' and both ends of brass lug are to be riveted or fixed with nut bolts with web of rail by copper rivets or nut -bolts after drilling holes.	No.	19408.13
07030	Supply of S- Bonds of size 11 meter long for Siemens make Audio Frequency Track Circuits (FTGS 917-917). Bond should be made of PVC coated wire rope of cross section approximately 240 sq. mm. PVC coated wire should be as per IS:2266 of 1978 and PVC sheathing should be of compound type 6 as per IS:5831 of 1970 with latest amendment if any. Reclaimed or recycled material shall not be used. Brass lug should be brazed at both end of S bond and brass	No.	15490.60

Item No.	Item Descriptions	Unit	Rate
	terminal in centre of S bond as per sample and drawing. S bonds are to be fixed along the foot of rail in form of S and both ends of bracing are to be riveted with web of rail by copper rivets after drilling holes.		
07031	Supply of S- Bonds of size 16 meter long for Siemens make Audio Frequency track circuit (FTGS 917-46). Bond should be made of PVC coated wire rope of cross section approximately to 240 sq. mm. PVC coated wire should be as per IS: 2266 of 1978 and PVC sheathing should be of compound type 6 as per IS: 5831 of 1970 with latest amendment if any Reclaimed or recycled material shall not be used. Brass lug should be brazed at both ends of S bond are to be fixed along the foot of rail in form of 'S' and both ends of brass lug are to be riveted with web of rail by copper rivets after drilling holes.	No.	19355.34
07032	Supply of S- Bonds of size 20.5 meter long for Siemens make Audio Frequency track circuit (FTGS 46-46). Bond should be made of PVC coated wire rope of cross section approximately to 240 sq. mm. PVC coated wire should be as per IS:2266 of 1978 and PVC sheathing should be of compound type 6 as per IS:5831 of 1970 with latest amendment if any Reclaimed or recycled material shall not be used. brass lug should be brazed at both ends of S bond are to be fixed along the foot of rail in form of 'S' and both ends of brass lug are to be riveted with web of rail by copper rivets after drilling holes.	No.	22829.37
07033	Supply of Equipotential Bonds for Siemens make Audio Frequency track circuit of size 21.5 meter suitable for track circuit FTGS 46 /917. Terminal bond should be made of PVC coated wire rope of cross section approximately to 240 sq. mm. PVC coated wire should be as per IS:2266 of 1978 or latest and PVC sheathing should be of compound type 6 as per IS:5831 of 1970 with latest amendment if any. Reclaimed or recycled material shall Not be used. Brass lug should be brazed at both ends of Equipotential bond and brass terminal in centre of Equipotential bond as per sample and drawing. Equipotential bonds are to be fixed along the foot of rail and both ends of brass lug are to be riveted or fixed with nut bolts with web of rail by copper rivets or nut -bolts after drilling holes.	No.	22111.33
07034	Supply of Digital frequency Selective meter to measure all frequencies of values as 4.75KHz, 4.75KHz, 5.25KHz, 5.75KHz, 6.25KHz, 9.5KHz, 10.5KHz, 11.5KHz, 12.5KHz, 13.5KHz, 14.5KHz, 15.5KHz, 16.5KHz. The meter shall detect the voltage level at these frequencies and reject all other frequencies while doing measurement. Make Fluke/Meco/Motwane or of similar reputed make.	No.	199086.31
	AFTC Items (UM-71 make)		
07035	Supply of AFTC bond 3.2 meter suitable for UM 71 system, AL 185 sq mm., IP65 protection class, one side bimetallic arrangement suitable for GRB 19/14L or similar and other side TMU suitable bimetallic arrangement, cover with high class insulation as per site condition.	No.	5471.37
07036	Supply of AFTC bond 5.2 meter suitable for UM 71 system, AL 185 sq mm., IP65 protection class, one side bimetallic arrangement suitable for GRB 19/14L or similar and other side TMU suitable bimetallic arrangement, cover with high class insulation as per site condition.	No.	6599.49

Item No.	Item Descriptions	Unit	Rate
07037	Supply of AFTC looping bond approximate 450 mm suitable for UM 71 system, AL 185 sq mm., IP65 protection class, both side bimetallic arrangement suitable for ACI cover with high class insulation as per site condition.	No.	2910.06
07038	Supply, installation, commissioning of SS nut bolt as per drawing No. NCR/S&T/CNB/Drg/Rail Connector/2013 Dt 09.10.13.	No.	2251.01
07039	Hydraulic tool- GRB-MOHT or similar, For bush installation. Weight: 3~4 Kg, Pulling Capacity: 60 KN, Operating pressure: 700 bar, Including Steel carrying case and 2 tension bolts.	No.	216598.68
07040	Ratchet Torque adjuster tool and Spanner	No.	10604.31
07041	Countersink tool	No.	4625.28
07042	Hole Dia checking gauge (GO-NO GO)	No.	4174.04
07043	Hydraulic crimping tool GRB-M3H or similar, Crimping range: 16-300 mm ² , Crimping force: 120KN, Crimping type: Hexagon, Crimping stroke: 32 mm, Length: 545 mm, Weight: approx. 6.5 kg, Package: Steel carrying case, Standard accessories: 35,50,70,95,120,150,185, 240, 300 mm ² .	No.	158666.32
07044	Supply of 13 mm HSS Core drill (Cutting depth 35 mm suitable for HM 36) RD13HSSD35.	No.	2721.22
07045	Supply of 19 mm TCT Core drill (Cutting depth 35 mm suitable for HM 36) RD19TCTD35	No.	4663.12
07046	Bush removal kit including steel carrying case.	No.	22033.34
07047	Hole cleaning Tool kit rechargeable battery operated.	No.	23904.10
07048	Supply of 185 sq mm cable, insulated single core, unarmoured sheathed multi strand aluminum conductor, cable insulation thickness 2.0 mm, minimum size of conductor 2.44 mm, minimum no. of strands 37 no. and minimum high voltage rating of 3 KV AC.	Mtr	278.20
07049	Supply of Copper lug for 185 sq mm Aluminum cable. Copper tube terminal length 98 mm, heavy duty long barrel 40 mm.	No.	485.28
07050	Preparation of jumper by crimping of 180 sq mm Aluminum cable in 185 sq mm Copper lug. All the required suitable tools for crimping to be arranged by contractor.	No.	577.85
07051	Supply of Compact portable Gasoline/Petrol/Diesel operated Rail drilling machine, with belt cover, drilling capacity 6 mm to 36 mm, suitable for 52 kg, 60 kg rail, point machine base plate etc., Machine size approx. 500 mm x 350 mm x 260 mm, Barrel dia 52 mm + 1 mm, with 2 stroke engine.	No.	723563.54

Chapter - 8
Signal Outdoor

Item No.	Item Descriptions	Unit	Rate
08001	Supply of main LED signal lamps (RED Aspect) for Main colour light Signal, as per RDSO spec.No. RDSO/SPN/199/2010 Rev 1.1 or latest, 110V AC retro-fittable in existing CLS housing and compatible with AC LED ECR with inbuilt current regulator. (Items to be procured through Stores)	No.	8717.98
08002	Supply of main LED signal lamps (YELLOW Aspect) for Main colour light Signal, as per RDSO spec.No. RDSO/SPN/199/2010 Rev 1.1 or latest, 110V AC retrofittable in existing CLS housing and compatible with AC LED ECR with inbuilt current regulator.(Items to be procured through Stores)	No.	8722.55
08003	Supply of main LED signal lamps (GREEN Aspect) for Main colour light Signal, as per RDSO spec.No. RDSO/SPN/199/2010 Rev 1.1 or latest, 110V AC retro-fittable in existing CLS housing and compatible with AC LED ECR with inbuilt current regulator. (Items to be procured through Stores)	No.	9892.79
08004	Supply of LED signal (ROUTE Aspect), 110V AC retrofittable in existing CLS housing and compatible with AC LED ECR as per RDSO Specn.No. RDSO/SPN/153/2011 (Rev.4.1) or latest. (items to be procured through stores)	No.	6026.29
08005	Supply of LED signal (SHUNT Aspect), 110V AC retrofittable in existing CLS housing and compatible with AC LED ECR as per RDSO Specn.No. RDSO/SPN/153/2011 (Rev.4.1) or latest. (items to be procured through stores)	No.	6057.72
08006	Supply of LED signal (CALLING ON Aspect), 110V AC retrofittable in existing CLS housing and compatible with AC LED ECR as per RDSO Specn.No. RDSO/SPN/153/2011 (Rev.4.1) or latest.(items to be procured through stores)	No.	7386.50
08007	Supply of "A" marker LED signal lighting unit retrofittable in existing CLS housing and compatible with AC LED ECR, (as per spec.No. RDSO/SPN/199/2010 Rev 1.1 or latest)	No.	5981.92
08008	Supply of "AG" marker LED signal lighting unit retrofittable in existing CLS housing and compatible with AC LED ECR, (as per spec.No. RDSO/SPN/199/2010 Rev 1.1 or latest)	No.	5981.92
08009	Supply of Calling ON Signal Unit, Non metallic, with Brackets, clamps and fixing accessories, suitable to LED signal lighting unit and as per RDSO spec. No. RDSO/SPN/194/2006 (Rev. 2.0) or latest. The FRP material shall conform to RDSO/SPN/151/1997 or latest. Calling On Signal Unit shall conform to RDSO Drg No. SA-24351(Adv) Alt1 or latest without lamp, lamp-holder and lens.	No.	11667.37
08010	Supply of Offset brackets for Main Signal, made of Mild Steel, outer diameter 140 mm (5.5 inch), thickness of pipe 4.5 mm with fixing arrangement on Main Signal post as per Drawing No. SA-23080/Adv. along with fixing U bolts, nut and clamps.	No.	1207.14
08011	Supply of Offset brackets for Shunt Signal, made of Mild steel, outer diameter 89 mm (3.5 inch), thickness of pipe 4.5 mm with fixing arrangement on Shunt Signal post as per Drawing No. SA-23080/Adv. along with fixing U bolts, nuts and clamps.	No.	1898.74

Item No.	Item Descriptions	Unit	Rate
08012	Supply of hand cuff lock of Godrej/Navtal or reputed make with key and as approved by site engineer.	No.	460.52
08013	Supply of Colour Light Signal Post, Tubular Mild steel, 4.5 meter length, 140 mm Dia, as per RDSO spec. No. IRS: S-6/81 or latest and Supply of cast iron Main signal surface base (As per RDSO Drg. No. 2011/M or latest), with CLS ladder assembly suitable for colour light signal 4.5 meter long, as per RDSO drg. No. SA 23153 and signal front staging complete assembly and complete signal back staging for CLS unit.	No.	25285.20
08014	Casting, concreting and curing of foundation for Main Signal Post in the ratio of 1:3:6 as per NCR drg.No. TYP/013/14/SIG FOUND. dtd 12.11.2014 (total 2 sheets of drawing) issued vide NCR Letter No. S&T/NCR/DRG/TYP dated 13.11.2014, using standard size of foundation/galvanized anchor bolts complete, required for erection of colour light signal post. Anchor bolts complete should comply with the RDSO drg. No. SA 116 A/M. Item includes excavation, ramming of CC using vibrator, curing and plastering with 1:4 cement-sand mixture (aggregate will not exceed 3.8 cm). Aggregate, cement, sand and holding down bolts will be supplied by contractor. Any machines & tools, if required for execution of this item, will be arranged/provided by contractor.	No.	13512.43
08015	Casting, concreting and curing of foundation for Position Light Shunt Signal as per Drg. No. NR/S&T/Const/2.2/97 using standard size of foundation/galvanized anchor bolts complete, required for erection of shunt signal post. Anchor bolts complete should comply with the RDSO drg. No. SA 116 A/M. Item includes excavation, ramming of CC using vibrator, curing and plastering with 1:4 cement sand mixture. Aggregate cement, sand and holding down bolts, will be supplied by contractor. Any machines and tools, if required for execution of this item, will be arranged/provided by contractor.	No.	3670.33
08016	Erection of CLS Post with base and signal unit on top or on Offset Bracket including erection of auxiliary signals like calling on, shunt signal if any. It includes fixing of all LEDs and wiring of complete signal including route and auxiliary signals, if any. It includes fixing of front and back staging, ladder and guards, signal name plates / boards, with contractor's own brackets and fixing materials. The work shall be done as per instructions of Railway engineer at site. It also includes provision & fixing of maintenance platform as per design given by Engineer -In-Charge at site. The Item includes cutting of Signal post if required by Site In charge.	No.	5881.42
08017	Erection of Position Light Shunt signal with Base, Post, Signal unit, complete fixing of LEDs and wiring of full signal. It includes fixing of Number Plates. The work shall be done as per instructions of Rly engineer at site.	No.	951.48
08018	Supply of Position Light Shunt Signal Unit Complete, Metallic, Independent type, along with base and post, hood, Cover etc as per Drg. No. SA-23840 (Adv.) suitable for LED Signal Lighting Unit. (Supply of LED Unit is not covered in this item)	No.	4080.74
08019	Fixing of Junction type Route Indicator on top of signal post and complete wiring, 1-Way/2-Way/3-Way/4-Way/5-Way/6-Way/theater type.	No.	1112.51

Item No.	Item Descriptions	Unit	Rate
08020	Supply, fabrication and fixing of retro-reflective marker/boards/plates as per the following: 'P' marker-Non illuminated as per Drg. No.SA-23456 (Adv), 'AG' marker-Non illuminated as per Drg. No. SA-23459-60 (Adv), 'A' marker - Illuminated as per Drg. No.SA-23461(Adv), 'G' marker -Non illuminated as per Drg. No.SA-23477(Adv) or as applicable and provided by Railways.	No.	887.77
08021	Supply, fabrication and fixing of the Calling On board/BSLB board as per RDSO Drg. No. SA 2373 (Adv)/Stop/Warning board as per drg. No. SA-2380 (Adv), or as applicable, on concrete foundation and painting with Retro reflective paint. All work to be carried out as per Railway site engineer instructions.	No.	8112.48
08022	Supply, fabrication and fixing of Retro-reflective Signal number plates as per NCR drg. No. TYP/14/0014 dtd 28.11.2014 issued vide NCR letter No. S&T/NCR/DRG/TYP dated 28.11.2014, on signal post with contractor's own material like clamp, U bolts, nuts etc.	No.	744.84
08023	Supply of Junction route indicator unit 1 way, made of FRP, (Without Lenses & Holder) as per Drg. No. SA 23401 -06 (Adv.) (as applicable) suitable for LED Signal Lighting Unit and as per RDSO spec.No. IRS: S-66/84 Amd.-1 or latest and RDSO/SPN/194/2006 Rev.2 or latest, (Supply of LED Unit is not covered in this item)	No.	44476.26
08024	Supply of Junction route indicator unit 2 way, made of FRP, (Without Lenses & Holder) as per Drg. No. SA 23401-06 (Adv.) (as applicable) suitable for LED Signal Lighting Unit and as per RDSO spec.No. IRS: S-66/84 Amd.-1 or latest and RDSO/SPN/194/2006 Rev.2 or latest.(Supply of LED Unit is not covered in this item)	No.	54127.25
08025	Supply of Junction route indicator unit 3 way, made of FRP, (Without Lenses & Holder) as per Drg. No. SA 23401-06 (Adv.) (as applicable)suitable for LED Signal Lighting Unit and as per RDSO spec.No. IRS: S-66/84 Amd.-1 or latest and RDSO/SPN/194/2006 Rev.2 or latest.(Supply of LED Unit is not covered in this item)	No.	46778.93
08026	Supply of Junction route indicator unit 4 way, made of FRP, (Without Lenses & Holder) as per Drg. No. SA 23401-06 (Adv.) (as applicable) suitable for LED Signal Lighting Unit and as per RDSO spec.No. IRS: S-66/84 Amd.-1 or latest and RDSO/SPN/194/2006 Rev.2 or latest.(Supply of LED Unit is not covered in this item)	No.	49751.27
08027	Supply of Non Metallic (FRP) colour light signal housing multi unit type for railway signalling suitable for RE area FOUR Aspects, complete without lenses, lamps and signal transformer as per RDSO Drg. No. SA 23001 A/M (Adv.) and as per RDSO spec. No. RDSO/SPN/194/2006 (Rev 2.0) or latest and FRP material as per RDSO SPEC. No. RDSO/SPN/151/1997 or latest.	No.	42250.07
08028	Supply of Non Metallic (FRP) colour light signal housing multi unit type for railway signaling suitable for RE area THREE Aspects, complete without lenses, lamps and signal transformer as per RDSO DRG. No. SA 23002 A/M (Adv.) and as per RDSO spec. No. RDSO/SPN/194/2006 (Rev 2.0) or latest and FRP material as per RDSO SPEC. No. RDSO/SPN/151/1997 or latest.	No.	35753.65

Item No.	Item Descriptions	Unit	Rate
08029	Supply of Non Metallic (FRP) colour light signal housing multi unit type for railway signaling suitable for RE area TWO Aspects, complete without lenses, lamps and signal transformer as per RDSO Drg. No. SA 23003 A/M (Adv.) and as per RDSO spec. No. RDSO/SPN/194/2006 (Rev 2.0) or latest and FRP material as per RDSO SPEC. No. RDSO/SPN/151/1997 or latest.	No.	31322.35
08030	Supply of Position Light Shunt Signal Unit Complete, Non-Metallic, made of FRP as per Drg. No. SA-23840 (Adv.) suitable for LED Signal Lighting Unit. (Supply of LED Unit is not covered in this item)	No.	14796.92
08031	Supply of Metallic colour light signal housing multi unit type for railway signaling suitable for RE area TWO Aspects, complete without lenses, lamps and signal transformer as per RDSO DRG. No. SA 23003 A/M (Adv.) and as per RDSO spec. No. IRS:S-26/64 or latest.	No.	26176.53
08032	Supply of Metallic colour light signal housing multi unit type for railway signaling suitable for RE area THREE Aspects, complete without lenses, lamps and signal transformer as per RDSO DRG. No. SA 23002 A/M (Adv.) and as per RDSO spec. No. IRS:S-26/64 or latest.	No.	31626.25
08033	Supply of Position Light Shunt Signal Unit Complete, Metallic, Post type, along with Offset bracket, Hood, Cover, mounting socket etc as per Drg. No. SA-23840 (Adv.) or latest, suitable for LED Signal Lighting Unit.(Supply of LED Unit is not covered in this item)	No.	8856.29
08034	Supply of Multi Lamp Route Indicator (LED double digit) for 1 to 19 (double digit) with white LED along with housing as per specification IRS: S 66/84 Amd. 1 or latest and drawing No. SA 23761 (Adv.) or latest. Lamp proving compatible with Normal bulb type multi lamp route indicators. Retrofits the existing conventional multi lamp type route indicators housing. Input operating voltage 110V AC +25%. Uniform intensity over entire operating range.	No.	56163.44
08035	Supply and fixing of protective screen of expanded metal 12 SWG of size 1200 x 1500 mm on signals as per std. practice in RE Area and earthing the screen with MS flat of 2"x 1/4" using GI nut bolts and washer.	No.	3513.52

Chapter - 9

LC Gate Items

Item No.	Item Descriptions	Unit	Rate
09001	Supply of Electrically Operated Lifting Barrier complete set suitable for 110 VDC / 24V DC supply, without hand generator back up, and motorized boom locking arrangements as per RDSO Spec.No. SPN/208/2012 Ver. 2.0 or latest. The 02 Nos of Barriers of length 09.76 meter should be supplied along with stop boards and light. The spares & tool kit mentioned in RDSO Spec. No. RDSO/SPN/208/2012 Ver. 2.0 and Amndt. 1 or latest, clause 10.1 & 10.2 reproduced as below should be supplied along with each full set :- i) GI boom - 1 No. complete. ii) Belt - 1 No. iii) Crank handle - 1 No. iv) Motor Contactor - 1 No. v) Motor protection MCB- 1 No. vi) Push button complete- 2 Nos. vii) Limit switch - 3 Nos. (1 lever type and 2 top roller type) viii) Fuses used - 2 sets Tool kit consisting of standard sizes of wrinch/ spanner and Allen keys should also be supplied with each set (02 Nos.) of Electric Lifting barrier."	Set	362897.65
09002	Installation, testing and commissioning of electrically operated lifting barrier, complete with casting of cement concrete foundation for pedestal and boom rest post, cabling, power supply connection, earthing of barriers & wiring with complete outdoor work as per approved drawing, wiring etc.	Set	55688.62
09003	Supply of Electrical lifting barrier booms of 9.76 meter (32 feet) long, in four section of 8 feet each, as per RDSO spec.No. RDSO/SPN/208/2012 Ver.2.0 or latest and as per RDSO drawing No. RDSO/S/11600 or latest.	No.	17202.61
09004	Supply, Installation, testing and commissioning of Sliding type mechanical Boom barrier (SBB) assembly, 11 to 12 meter Long, movement drive mechanism, resetting & supporting stand suitable for Mechanical/Electrical level crossing gate as an emergency arrangements as per GZB Workshop drawing No. SA-SWG/GZB/E/01. The sliding boom assembly should be have the provision of 50mm x 50mm x 50mm angles for the entire length. Boom rest posts should be 10 No. per gate or more as per site requirement. Painting should be completely done of all the assemblies/parts of sliding LC gate.	Set	189475.96
09005	Supply, installation and commissioning of complete Electronic LC Gate telephone system, (both master and slave), in 1+6 configuration, with surge protection and power supply system and battery, as per RDSO spec.No. RDSO/SPN/TC/51/2021, Rev. 1.0 or latest. (with Voice logging facility).	No.	79108.97
09006	Supply of Dual Tone Bell /Buzzer with Flasher arrangement and 20 Watt horn working on 24 V DC/ 110 V AC for warning road users at LC gates.	No.	5861.84

Item No.	Item Descriptions	Unit	Rate
09007	Supply, installation, testing and commissioning of LED type control cum indication panel complete with pre wired Tag- Blocks, Wires MS angles etc. for LC gate , depicting the yard layout Signal, Point, Track circuit, Operating / emergency Push Button, counter with sealing arrangements, house in a Steel metal cabinet. This shall be consist 15 x 10 exchangeable Domino. Unit as per Spec. SPN/186/2004 Rev. 2.0 or latest. The indoor wiring inside panel shall be terminated on tag block as per instructions of Engineer-in-charge. The wiring on panel tag blocks shall be repeated on tag blocks located in relay room. This includes laying & termination of cable, if any from Panel Room to Relay Room in HDPE pipe.	No.	65778.96

Chapter - 10

Panel room equipments , VDUs(Video Display Units)

Item No.	Item Descriptions	Unit	Rate
10001	Supply of Panel Indication LED of White/Red/ yellow colour suitable for Domino Type Control Panel for Railway Signaling.	No.	36.69
10002	Supply of Domino units with cover plate as per approved panel diagram, each of size 54 mm x 34 mm, with all 15 contact terminals completely wired up, similar to Siemens or similar make.	No.	1264.90
10003	Supply of Top Plate with buttons as per requirement of Domino type of control panel suitable for domino size 54 x 34 mm, similar to Siemens or similar make.	No.	244.20
10004	Supply of professional LED VDU monitor of display size 42 inch, LED 4K resolution, HDMI/DVI connectivity, inbuilt speaker etc. (for this item prior approval of engineer incharge required in written)	No.	57873.29
10005	Supply of industrial grade operator VDU of size 55 inch, full HD, HDMI/DVI connectivity, inbuilt speaker etc. (for this item prior approval of engineer incharge required in written)	No.	307769.42
10006	Supply of professional large format smart 4K LED display unit size 65 inch, resolution 3840 X 2160, 450 nits (UHD) including all fixing accessories with installation, (port) USB/LAN/HDMI/VUA/Video out. Make 65XT800 ULTRA HD 4K UHD LED DISPLAY or similar. (for this item prior approval of engineer incharge required in written)	No.	161171.68
10007	Supply of professional LED VDU monitor of display size 75 inch, spec-diagonal size 75", Type 120Hz, slim direct LED blu, resolution 3840-2160, (4K UHD), pixel; pitch mm) 0.143 X 0.429mm, brightness type; 300 nit, RGB - DVI-D, display port 1.2, (i) (HDMI 2.0), stereo mini jack, DVL- HDMI, USB 2.0 X 2, RS232C (IN/OUT), RJ45, processor, CORETES A72, 1.7GHz, Quad core CPU, make samsung model No. QB75H, LG, Sony or similar. (for this item prior approval of engineer incharge required in written)	No.	307293.96

Chapter - 11
Apparatus Case

Item No.	Item Descriptions	Unit	Rate
11001	Supply of non deteriorating type, Round head type, low voltage cartridge fuse as per Spec No. IRS: S -78/92 with latest amendments, 2A/4A/6A/8A/10A rating capacity.	No.	123.20
11002	Supply of Cartridge Fuse block, made of PBT, as per RDSO spec. No. IRS: S-75/2006 (Rev.2) or latest and as per Drawing. No. SA- 23748 (Alt.-4) or latest.	No.	243.66
11003	Supply of ARA terminal block, made of PBT, as per RDSO spec. No. IRS: S-75/2006 (Rev.2) or latest and as per Drawing. No. SA- 23741A (Alt.-4) or latest.	No.	119.32
11004	Supply of Apparatus Case/Location Box Full as per RDSO drg. No. RD-SO/S-11500 or latest, with 'E' type lock and key ward No. 42,. The key and handle should be supplied at the rate of one no. per four Apparatus cases. The 'E' type key lock is as per RDSO Spec.No. IRS;S-30/64 or latest, RDSO drg. No. SA 3376/M or latest and Key is as per Drg. No. 3377/M or latest. Note: This item includes the supply of 2 Nos E Type Lock fitted on both doors, along with two Keys.	No.	27512.34
11005	Supply of Apparatus Case/Location Box Half as per RDSO drg. No. RDSO/S-11507 or latest, with 'E' type lock and key ward No. 42,. The key and handle should be supplied at the rate of one no. per four Apparatus cases. The 'E' type key lock is as per RDSO drg. No. SA3376/M or latest and Key is as per Drg. No. 3377/M or latest. Note: This item includes the supply of 2 Nos E Type Lock fitted on both doors, along with two Keys.	No.	19913.76
11006	Excavation, casting, curing of foundation and Installation and Erection of Apparatus case Full (Apparatus Case as per RDSO drg. No. RDSO/S-11500 or latest) with contractor's own frame, cement and other material in the ratio 1:3:6. 'E' type lock to be supplied and installed with Apparatus case. This includes filling of location foundations with river bed sand and plastering on top with a mixture of 1:4 of cement and sand. It covers fixing of lamp holder, switch and lamp etc. in Apparatus Case.	No.	12277.81
11007	Excavation, casting, curing of foundation and Installation and Erection of Apparatus case Half (Apparatus Case as per RDSO drg. No. RDSO/S-11507 or latest) with contractor's own frame, cement and other material in the ratio 1:3:6.'E' type lock to be supplied and installed with Apparatus case. This includes filling of location foundations with river bed sand and plastering on top with a mixture of 1:4 of cement and sand. It covers fixing of lamp holder, switch and lamp etc. in Apparatus Case.	No.	10332.22

Item No.	Item Descriptions	Unit	Rate
11008	Fixing of ARA(M-6) Terminals /Screw less connectors / modular disconnect terminal blocks and fuse blocks on phenolic laminated sheets and fixing by stainless steel/brass nuts & bolts. This includes provision of two additional holes on the board on either side for cable conductor entry. The work shall be carried out as per instructions of railway Engineer incharge. (Supply of all above terminals has been covered separately).	No.	18.11
11009	Supply of Disconnect Terminal block for four conductors with screwing cage /clamp type, sliding switch disconnect, as per RDSO spec.No. RDSO/SPN/189/2004 Ver. 3.0 or latest, for each conductor size up to 2.5 sq. mm, equivalent of M6 terminals. Each terminal block equipped with two markers, on top and bottom, an end plate, two end clamps and adequate length of rails for fitting terminal blocks.	No.	192.81
11010	Termination of Outdoor Cables (Main Cables /tail cables) at ARA/Disconnect type terminals provided in Apparatus Cases, Cable termination rack in relay room, station building, generator room etc. The item includes dressing of cables and wires with dressing threads as per standard practice. All material required for this item will be supplied by contractor. The outdoor cable shall be terminated in Relay Room, DG Room, ASM Room etc under supervision and instructions issued by Engineer incharge of the work.	Per Conductor	14.77
11011	Fabrication and fixing of phenolic laminated sheet of grade P3, minimum 10 mm thick, as per Apparatus case diagram/plan, in location box by providing all fixtures like ARA/Disconnect terminals, fuse blocks, fuses, relays on square bars etc. including fixing of PVC coated string rods at the back side for cable support with contractor's own material like iron angle, nuts, bolts etc. The iron angle for fixing shall be minimum 3 mm thick. This also includes fixing of teak wood shelf minimum 25 mm thick for holding track circuit equipments. The work shall be done as per instructions of Rly engineer at site. (Apparatus case Full)	No.	4478.48
11012	Fabrication and fixing of phenolic laminated sheet of grade P3, minimum 10 mm thick, as per Apparatus case diagram/plan, in location box by providing all fixtures like ARA/Disconnect terminals, fuse blocks, fuses, relays on square bars etc. including fixing of PVC coated string rods at the back side for cable support with contractor's own material like iron angle, nuts, bolts etc. The iron angle for fixing shall be minimum 3 mm thick. This also includes fixing of teak wood shelf minimum 25 mm thick for holding track circuit equipments. The work shall be done as per instructions of Rly engineer at site. (Apparatus case Half)	No.	2429.29
11013	Supply of phenolic laminated Sheet, resin bonded, grade P3 in standard size of 1220 X 1220 x 10 mm as per spec. No. IS 2036 of 1995 or latest. Test report of manufacture to be supplied.	No.	5756.14

Chapter - 12
Cable (Supply and laying)

Item No.	Item Descriptions	Unit	Rate
12001	Supply of 12 Core x 1.5 square mm (copper conductor), PVC insulated, armoured, unscreened, underground railway signalling cable, as per RDSO spec.No. IRS: S-63/2014 (Rev. 4.0) or latest	Km	158811.02
12002	Supply of 06 Core x 1.5 square mm (copper conductor), PVC insulated, armoured, unscreened, underground railway signalling cable, as per RDSO spec.No. IRS: S-63/2014 (Rev. 4.0) or latest	Km	108378.52
12003	Supply of Double Walled Corrugated (DWC) Pipe/duct with associated collars etc. as per RDSO Specification No. RDSO/SPN/204/2011 or latest anti-rodent & anti-oxidant and Non flame propagating type in 6 meter straight length and of size 120 mm outer dia, & 103.5 mm inner dia. (The manufacturers, suppliers must produce valid IS license and should be certified under ISO 9000 and shall submit copy of certificate). One coupler with suitable rubber O-ring should be supplied with every 6m of pipe length. DWC pipe shall be marked at every 1 mtr length in such a way that manufacturer's name, vendor name and year of manufacture can be easily identified.	Mtr.	656.59
12004	Horizontal Boring/Manual moling without damage to surface road /track for laying/insertion of DWC/GI/HDPE pipe. The bore shall be done at the depth of minimum 1400 mm from the ground level. The ground level shall be considered ignoring the bank height of the bank of the road. Note:- DWC/HDPE/GI Pipe Supply is not covered under this item. Contactor shall provide all material required for work and adequate nos. of labours for proper laying of cables into the bore. Cable shall be laid cautiously so that it should not get damage due to rough handling & pressure on cable. Payment of boring shall be made only after DWC/HDPE/GI pipe is laid in the bore.	Mtr.	1083.29
12005	Horizontal direction drilling (HDD)/Trenchless digging/machine drilling without damage to surface road /track for laying/insertion of HDPE/GI/DWC pipe. The bore shall be done at the depth of minimum 1400 mm from the ground level. The ground level shall be considered ignoring the bank height of the bank of the road. Note:- DWC/HDPE/GI Pipe Supply is not covered under this item. Contactor shall provide all material required for work and adequate nos. of labours for proper laying of cables into the bore. Cable shall be laid cautiously so that it should not get damage due to rough handling & pressure on cable. Payment of boring shall be made only after DWC/HDPE/GI pipe is laid in the bore."	Mtr.	616.35
12006	Laying of S&T Cables of various cores/ pairs/ quads in trenches/ GI pipes/ RCC pipes/ DWC pipes etc. as per the site requirement and as per approved cable route plan. This also includes laying of cables in track crossings & road crossings. (Cables will be meggered before and after its laying by contractor under supervision of Railway Representative and he will submit the meggering report of each testing). Length of the cable laid includes the length of the cable coiled for termination purposes.	Mtr.	6.84

Item No.	Item Descriptions	Unit	Rate
12007	Supplying and placing of one layer of quality bricks of standard size and of 'B' grade of the local make and spreading on cables laid. (minimum size of brick 200mm X 100mm X 70mm)	No.	4.32
12008	Supply of Medium class GI pipes 100 mm dia (4.5 mm thickness) with thread collars as per IS 1239 (Part 1) 2004 or latest with coupling on culverts/bridges, perforated at a distance of 20 cm or less with 10 mm dia hole, or at any other locations as decided by Site Engineer. It includes supply of all material required for fixing arrangement. Contractor will also supply flexible/corrugated HDPE pipe at the end of GI pipe to protect the cables from sharp edges and sudden bends.	Mtr.	991.76
12009	Laying and fixing of Medium class GI pipes 100 mm dia (4.5 mm thickness) as per IS 1239 (Part 1) 2004 or latest with coupling on culverts/bridges, perforated at a distance of 20 cm or less with 10 mm dia hole, or at any other locations as decided by Site Engineer. The GI pipe is to be filled with chattered compound. It includes supply of all material required for fixing arrangement. Contractor will also supply flexible/corrugated HDPE pipe at the end of GI pipe to protect the cables from sharp edges and sudden bends. The laying and fixing to be done as per RDSO drawings No. SDO/cable laying/011 and SDO/cable laying/012, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014, or latest.	Mtr.	354.30
12010	Supply and fixing of RCC cable route marker, made with concrete in the ratio 1:3:6, engraved "NCR" "S&T" on top portion and painted on both sides, along the route at every 50 meter and at route diversion. The cable marker is to be fabricated as per RDSO drawing No. SDO/cable laying/020, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014, or latest. The fixing work is to be done as per extant practice of NC Railway and as per Railway site supervisor incharge.	No.	429.06
12011	Supply and laying of Polyolefin cable channel, size 240/340 mm, height 155/230 mm (internal/external), length 1 meter, with fire protection class K-1, in accordance with DIN 53438 part II for laying of signalling/telecom cables. The channels should be attachable to each other with male/female swallow tail connectors and having suitable detachable cover.	Mtr.	3437.32
12012	Excavation of cable trench as per cable route plan, 1.2 meter deep and of 0.3 meter to 0.6 meter wide at bottom as per RDSO sketch No. SDO/CABLE LAYING/003, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014 or latest, alongside the track in normal soil/strata (including soft rock), conforming to distances as per cable route plan and refilling and ramming of loose soil. This work includes clearing of route from bushes etc, covering of cable laid in trench by loose soil for a layer of 50mm thickness approximately before covering by bricks. The work shall be done as per the extant practice on North Central Railway and instructions of Railway Engineer at site. In case the full depth is Not available, there shall be no proportionate payment and after the approval of minimum JAG officer, the concreting shall be done as per the RDSO drawing No. SDO/Cable laying/008, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014 or latest.	Mtr.	64.60

Item No.	Item Descriptions	Unit	Rate
12013	Excavation of cable trench as per cable route plan, 1.2 meter deep and of 0.3 meter to 0.6 meter wide at bottom as per RDSO sketch No. SDO/CABLE LAYING/003, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014 or latest, alongside the track in Rocky soil, conforming to distances as per cable route plan and refilling and ramming of loose soil. This work includes clearing of route from bushes etc, covering of cable laid in trench by loose soil for a layer of 50mm thickness approximately before covering by bricks. The work shall be done as per the extant practice on North Central Railway and instructions of Railway Engineer at site. In case the full depth is not available, there shall be no proportionate payment and after the approval of minimum JAG officer, the concreting shall be done as per the RDSO drawing No. SDO/Cable laying/008, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014 or latest.	Mtr.	87.77
12014	Cutting of all types of platforms/road crossing and trenching and excavation to a width and depth of 300 mm x 300 mm, laying of DWC/HDPE/GI pipe in the trench and refilling and concreting it afterwards as per original condition. In hard rocky ground area, cables will be laid normally on layer of soft earth of 0.05 meter thickness previously deposited at bottom of the trench. The cutting to be filled and finished with cement/concrete, as per the RDSO drawing No. SDO/Cable laying/008, issued vide RDSO document No. RDSO/SI/G/2010 Version 1.1 dated 04.02.2014 or latest.	Mtr.	158.88
12015	Cross trench for identification of the route of existing signalling and telecom cables.	Cum	290.42
12016	Supply and testing of Integrated cable route tracer and RFID marker locator of reputed make, Stanley/3M or similar.	No.	523758.24
12017	Supply of Cable fault locator for metallic S&T cables of reputed make Aplab/Stanley/3M etc. Item to be supplied after successful demonstration and approval of Railways.	No.	301578.02
12018	Supply of Rechargeable remote area lighting system, USA make Pelican model 9430 RALS or similar	No.	100309.74

Chapter - 13
Earthing Items

Item No.	Item Descriptions	Unit	Rate
13001	Supply and installation of earth electrode as per standard practice and as per NCR Drawing No. S&T/CONST/6.4/97. It includes supply of GI pipe of 3 meter length. It includes connecting the earth electrode to the equipments which are required to be earthed including digging of earth pit 3 meter deep and fixing earth electrode pipe, casting of cement concrete enclosure with cover (cover as per drawing No. S&T/CONST/6.3/97. It includes installation of 7 strand GI wires as earth lead wires, supported on MS flat size 5mm x 40 mm, soldering and nut bolt both, one end of both earth lead wire and MS flat to earth electrode and other end to Location boxes, block equipments, power equipments, cable sheath, signals etc. as per site requirement and as per instructions given by engineer incharge.	No.	3450.96
13002	Supply of basic material to construct unit maintenance free earth as per RDSO Specs. No. RDSO/SPN/197 Ver. 1.0 or latest to achieve a resistance less than 1 ohm. It consist of following: (a) Copper bonded steel electrode of minimum 3.0 meter long, minimum 17.0 mm dia with copper bonding thickness of minimum 250 microns and UL listed and marked = 1 No. (b) Earth enhancement material supplied in sealed bags of minimum 10 kg = 3 Nos. (c) Copper strip of 150x25x6 mm, to terminate earth rod = 1 No. (d) Copper strip of 300x25x6 mm (MEEB) = 1 No. (e) Copper strip of 150x25x6mm (SEEB) = 1 No. (ii) Supply of 35 sq. mm multi strand single core PVC insulated copper cable as per IS: 694 for connecting main earth electrode to MEEB in the equipment room in duplicate.(minimum 10 meter.) (iii) Supply of 16 sq. mm multi strand single core PVC insulated copper cable as per IS: 694 for connecting MEEB to SEEB and SPD to MEEB (minimum 10 meter.) (iv) Supply of 10 sq. mm multi strand single core PVC insulated copper cable as per IS: 694 for connecting various equipments to SEEB (v) Supply of copper lug sleeve for 3/16 cable	Set	28402.80

Item No.	Item Descriptions	Unit	Rate
13003	<p>Installation of Unit Maintenance Free Earth to achieve a resistance less than 1 ohm as supplied under item no. 13002 of Chapter 13 of SOR. It includes</p> <p>(i) Digging the earth to the required depth. (ii) Insertion of electrode. (iii) Filling of earth enhancing compound (Approx.30 Kg) (iv) Provision of exothermic weld connections to copper tape of 25 mm x 6 mm x 150 mm to the earth electrodes. All material tools and features required for weld will be arranged by contractor. (v) This also includes CC cover 1.5 ft x 1.5 ft. 1 ft wall thickness 2 inch with cover 3 inch thickness.</p> <p>Cables 35 Sq mm/ 16 Sq mm/10 sq mm for connecting earth to busbar, busbar to busbar and busbars to various equipments. Earth electrode of 17.20 mm dia and 3.00 meter long high tensile low carbon steel circular rods molecularly bonded with copper and outer surface (minimum copper bonding thickness of 250 micrones to made requirement of under writer's laboratories (UL) 467-2007 or latest.</p> <p>Copper strips of 150 mm x 25 mm x 6 mm to be welded with each earth electrode, copper strips of 300 mm x 25 mm x 6 mm for main equip-potential busbar, copper strips of 150 mm x 25 mm x 6 mm sub equip-potential busbar in relay room, power room and panel room.</p> <p>GI strip 25 mm x 2 mm for ring formation of earth pits Earth enhancement material in bags for each Earth Electrode. Inspection chamber of site 300 mm x 300 mm x 300 mm (Inside dimension) of approximate 50 mm thick with pulling hooks to cover the earth pits.</p> <p>Note: The installation of this item shall be carried out by the contractor as per RDSO Specn. No. RDSO/SPN/ 197 Ver 1.0 or latest. Typical RDSO approved drawings referred in the RDSO specification document are : (i) SDO/RDSO/E&B/001 for typical installation of Earth, (ii) SDO/RDSO/E&B/002 for typical bonding and earthing connections, (iii) SDO/RDSO/E&B/003 for typical arrangement for earth resistance measurements.</p>	Set	9429.96
13004	<p>Supply, wiring, installation and commissioning of Earth Leakage Detector (ELD) having 6 digit counter, 12 Channel bus bar, voltage of 110V/60V/ 24V/12V in AC/DC measurement as per RDSO Spec.No. RDSO/SPN/256/ 2002 or latest. This includes supply of fuse terminal strip for incoming power supply wires. Installation to be done on 19 inch sub rack along with insulation resistance meter, remote indication and buzzer in ASM room.</p>	No.	175512.86

Chapter - 14

Miscellaneous Items, Fire Alarm and suppression items

Item No.	Item Descriptions	Unit	Rate
14001	Cement concrete work for miscellaneous, unscheduled items in ratio 1:3:6 of cement, coarse, sand and aggregate Item includes excavation, ramming of CC by using vibrator, curing and plastering with cement and sand mixture in ratio 1:4 (aggregate will not exceed beyond 3.8 cm). The aggregate cement and sand will be supplied by contractor.	Cum	5109.62
14002	Supply of portable Halon type fire extinguisher, 1 kg capacity, with squeeze grip, valve high pressure discharge, nozzle and fitted with pressure gauge and conforming to IS 111/08 of 1984 or latest and duly charged with halon 1211 (Chloride difluoro) in conforming to IS 111070.	No.	9660.13
14003	Supply of Digital AC/DC Leakage Clamp on meter, make/model ST-CL360, DCM 39A/Motwane or similar.	No.	58267.80
14004	Supply of Insulation resistance tester, 100 Mega ohms, 500V DC, hand generator type. Make Meco/Motwane/Waco or similar.	No.	17830.68
14005	Supply of Insulation resistance tester, 10 Mega ohms, 100V DC, hand generator type. Make Meco/Motwane/Waco or similar.	No.	15692.01
14006	Supply of Digital Clamp Earth tester/meter., with memory storage facility, make Motwane/Meco/Fluke or better.	No.	114941.23
14007	Lettering and Numbering of all S&T gears like Signals, Loc. Boxes, Pt. Machines, TLJBs, Block joints etc. Each item to be taken as one unit.	No.	85.58
14008	Fabrication, supply, installation and fixing of SWRD/cabin diagram on good quality waterproof board of size 1500 mm(min) x 700 mm(min), thickness of board shall be 12 mm (min). The work shall be done as per instructions of Railway site incharge.	No.	7088.89
14009	Painting of two coats of Enamel paint over one coat of Red Oxide primer after scrapping and cleaning of the surface. Paint to be of reputed make Asian/Dulux/Berger or similar. App. Cases inside and outside to be done by Silver colour. (Apparatus Case Full)	No.	681.95
14010	Supply of Office table, laminated top, size minimum 3 ft x 4 ft, make Godrej/Durian/Methodex/President or of similar reputed make.	No.	12583.91
14011	Supply of lateral filing cabinet of size minimum 900 mm x 900 mm (3 ft x 3 ft) to store circuit diagrams, make Godrej/Durian/Methodex/President or of similar reputed make.	No.	17772.00
14012	Supply of Chair model PCH-7001 of Godrej make or of similar reputed make.	No.	11174.55
14013	Supply of Steel stool, 1 ft by 1 ft size, 1.5 ft height, laminated top.	No.	1267.26
14014	Supply of Chair, superior quality, size 57D x 58W x 88H and seat height 45 mm, make CH-7(Godrej) or of similar reputed make.	No.	2993.92

Item No.	Item Descriptions	Unit	Rate
14015	Painting of two coats of Enamel paint over one coat of Red Oxide primer after scrapping and cleaning of the surface. Paint to be of reputed make Asian/Dulux/Berger or similar. Apparatus Cases inside and outside to be done by Silver colour. (Apparatus Case Half)	No.	620.18
14016	Painting of two coats of Enamel paint over one coat of Red Oxide primer after scrapping and cleaning of the surface. Paint to be of reputed make Asian/Dulux/Berger or similar. (Main Signal post, base, unit and complete fittings)	No.	914.46
14017	Painting of two coats of Enamel paint over one coat of Red Oxide primer after scrapping and cleaning of the surface. Paint to be of reputed make Asian/Dulux/Berger or similar. (Shunt Signal post, base, unit and complete fittings)	No.	389.95
14018	Painting of two coats of Enamel paint over one coat of Red Oxide primer after scrapping and cleaning of the surface. Paint to be of reputed make Asian/Dulux/Berger or similar. (Point machine and ground connections, Point machine by Black enamel and ground connection by Red oxide)	No.	288.51
14019	Dismantling and Releasing of existing Electrically operated LC gate/Mechanically operated LC gate and other associated S&T fittings. All the released material will be transported to the SSE/Consignee depot.	No.	8782.70
14020	Dismantling and Releasing of existing Location boxes/Apparatus cases/In boxes and other associated S&T fittings. All the released material will be transported to the SSE/Consignee depot.	No.	972.08
14021	Dismantling and Releasing of existing Points (both electrical and Mechanical) and other associated S&T fittings. All the released material will be transported to the SSE/Consignee depot.	No.	1529.70
14022	Dismantling and Releasing of existing Signals (both electrical and Mechanical) and other associated S&T fittings like wheel, pulleys, wires, stakes etc. All the released material will be transported to the SSE/Consignee depot.	No.	1529.70
14023	Supply of Resin core 60/40, 18 SWG (Philco/Khosla or similar reputed make)	Kg.	1395.59
	Fire Detection and Alarm System (FDAS) and Fire Suppression System (FSS)		
	(A) FDAS (As per RDSO spec. No. RDSO/SPN/217/2018 Ver. 2 or latest)		
14024	Supply, Installation, Testing & Commissioning of Networkable type Micro processor based Addressable, Fire Alarm Control Panel (FACP) complying to RDSO spec.No. RDSO/SPN/217/2018 Ver 2 or latest. The number of detector and devices per loop should be up to 159. The FACP shall include a backlit min 360-character liquid crystal display, individual, color coded system status LEDs, 2 Nos sounder circuit for audiovisual devices and alphanumeric keypad for the field programming and control of the fire alarm system. The FACP shall have provision for GSM based dialer to send automated SMS to at least 5 pre selected mobile numbers. The FACP shall also have provision to network on LAN & communicate to the graphical application on TCP/IP. The FACP shall have built in power supply, battery charger and battery back up for 24 hours normal operation. The panel shall be UL/LPCB/VDS approved and comply to NFPA-72/EN54 requirement.	No.	100285.73

Item No.	Item Descriptions	Unit	Rate
14025	Supply, Installation, Testing & Commissioning of Analogue Addressable Multi-sensor Detector with inbuilt isolator/ isolator base having photo, fixed heat and ROR heat detection feature and 360 degree view LED and minimum 5 level of sensitivity setting, complying to RDSO/SPN/217/2019 Ver 3 or latest. Operating temperature -10 to 60 degree celsius, humidity up to 85%, As per latest UL/LPHB/VdS approved/Listed.	No.	3133.49
14026	Supply, Installation, Testing & Commissioning of Analogue Addressable type Break Glass Manual Call Point(Red colour) with inbuilt fault isolator or alternate arrangement which shall isolate the MCP in case of short circuit. The MCP should have visual indication for its operation, Approval-UL/LPCB/VDS Listed and shall comply to RDSO/SPN/217/2018 Ver 2.	No.	4303.72
14027	Supply, Installation, Testing & Commissioning of analog Addressable Type Isolator Modules which shall isolate the circuit in case of short circuit, The module should have visual indication for its operation Approval-UL/LPCB/VDS Listed and shall comply to RDSO/SPN/217/2018 Ver 2.	No.	3477.68
14028	Supply, Installation, Testing & Commissioning of Single Channel Laser Based Aspiration Detection Unit with area coverage of 5000 Sq. Feet with programmable 4 stage alarm generation & with 4 addressable modules. It should have Auto cleaning facility in optical chamber, electronic discrimination of particle size, ultrasonic airflow sensing Auto learn feature with TCP/IP network Capability, the aspiration system shall also include external power supply unit with battery backup. Approval-UL/LPCB/VDS Listed and shall comply to RDSO/SPN/217/2018 Ver 2.	No.	290878.16
14029	Supply, Installation, Testing & Commissioning of UL/LPCB/VDS listed CPVC Pipe 25 mm Dia & Pipe Accessories for the Aspiration detection. Approval-U Land shall comply to RDSO/SPN/217/2018 Ver 2.	Mtr.	1180.12
14030	Supply, Installation, Testing & Commissioning of Analog Addressable Type Input/Monitor Modules with inbuilt fault isolator or alternate arrangement which shall isolate the module in case of short circuit. The module should have programmable supervised & unsupervised output. The module should have visual indication for its operation, Approval-UL/LPCB/VDS Listed and shall comply to RDSO/SPN/217/2018 Ver 2.	No.	7238.50
14031	Supply, Installation, Testing & Commissioning of Analog Addressable Type Output / Control Modules with inbuilt fault isolator or alternate arrangement which shall isolate the module in case of short circuit. The module should have programmable supervised & unsupervised output. The module should have visual indication for its operation, Approval-UL/LPCB/VDS Listed and shall comply to RDSO/SPN/217/2018 Ver 2.	No.	7178.64
14032	Supply, Installation, Testing & Commissioning of Electronic hooter (Red colour) with min 85dB output Approval-UL/LPCB/VDS Listed and shall comply to RDSO/SPN/217/2018 Ver 2.	No.	2359.77
14033	Supply, Installation, Testing & Commissioning of Electronic Strobe, Approval-UL/LPCB/VDS Listed and shall comply to RDSO/SPN/217/2018 Ver 2.	No.	6615.59

Item No.	Item Descriptions	Unit	Rate
14034	Supply, Installation, Testing & Commissioning of 2X1.5 sqmm ATC Fire survival flexible/armoured cable with back box, glands & other accessories. Armoured & unarmoured (CI) cables should meet fire performance test under simultaneous action of Flame, water stress and impacts on single sample at 950°C for minimum 2 hours, certified by UL or FM or Vds or LPCB or BRE Global or any recognized lab by Government of India. complying to RDSO/SPN/217/2018 Ver 1.	Set	32188.54
14035	Supply, installation, testing and commissioning of resettable, analog type, Linear Heat Sensing (LHS) cable as per RDSO Specification No. RDSO/ SPN/ 217/ 2018 ver 2.0 or latest	Mtr.	1084.35
14036	Supply, installation, testing and commissioning of LHS interface module with all accessories, as per RDSO Specification No. RDSO/ SPN/ 217/ 2018 ver 2.0 or latest and UL/FM/Vds/LPCB certified/approved.	No.	82951.01
	(B) FSS (As per RDSO spec. No. RDSO/SPN/218/2016 Ver.1.0-d2 or latest		
14037	Supply of 120 Liter capacity Seamless cylinder as per RDSO/SPN/2018/2016 Version 1.0-d2, fitted with valve assembly and along with mounting straps suitable to operate at 25 bar Pressure complete with safety burst disc, safety cap and with UL/FM/LPCB listed CCOE approval. In case of other capacity cylinder, cylinder bank design should maintain 25 Bar pressure and require clean agent quantity as per design. Cylinder "litres" capacity should be same for across all locations in all the banks.	No.	143591.10
14038	Supply of FK-5-1-12 Fire Protection fluid compound of carbon, fluorine and oxygen (CF ₃ CF ₂ C(O)CF(CF ₃) ₂).	Kg.	4026.41
14039	Supply, Installation, Testing and commissioning Electric Control Head operated electrically from the Detection & Control System or locally with a manual lever on the control head.	No.	37749.41
14040	Supply, Installation, Testing and commissioning Pressure Operated Control Head which allows for pressure actuation slave cylinders and is mounted directly on top of the slave cylinders valve.	No.	7886.92
14041	Supply, Installation, Testing and commissioning Discharge nozzles are designed to provide the proper flow rate and distribution of FK-5-1-12/FM 200 gas to total flood a hazard area : 180 deg. / 360 deg.	No.	4628.13
14042	Supply of Master Cylinder Adapter Kit used to actuate the Slave Cylinder.	No.	1966.64
14043	Supply and Installation of Discharge Hose, 1-1/2" (use with 34, 80, 120 & 140 Ltr. Cylinders)	No.	15025.86
14044	Supply and Installation of 1-1/2" Manifold Check Valve installed at the discharge manifold to allow removal of any FK-5-1-12/FM 200 Gas cylinder from the manifold while still retaining a closed system.	No.	20465.10
14045	Supply and Installation of Flexible Actuation Hose (Pilot pressure is directed to a pressure operated control head on each cylinder valve using 1/4 inch actuation hose)	No.	4647.21

Item No.	Item Descriptions	Unit	Rate
14046	Supply and Installation of Manifold Supervisory Switch for indication of discharge of system	No.	16642.89
14047	Supply and Installation of Cylinder Strap for 120 & 140 Ltr. Cylinder	No.	1647.03
14048	Supply and Installation of Brass Male Elbow	No.	2193.11
14049	Supply and Installation of M.S. Seamless pipes as per ASTM A 106 Gr. B. Sch. 40 for the system	Lot	41192.59
14050	Supply and Installation of Cylinder rack support, Pipe support, Manifold & all other accessories required to complete the system	Lot	71987.91
14051	Supply, testing and commissioning of Auto Telephone Dialler (GSM) to send pre recorded message to multiple telephone nos which have been programmed earlier. This item is required to have the facility as per SOR item 14025 above.	No.	9303.49
14052	Supply of non-toxic, environment friendly, non-corrosive, clean gaseous agent at the atmospheric pressure, safe for Electronic/Electrical/Telecommunication Equipments/Computers, Human Friendly, non-residual, non-inflammable type agent Heptafluoropropane (C3F7H) (HFC 227ea) FM 200 GAS LPCB/FM/UL approved.	Kg	2304.40
14053	Supply of CO2 type fire extinguisher capacity 4.5 Kg capacity ISI marked, with all accessories, operating temperature (-30)° to (50)° for class 13 B type of fire with 1 meter long hose pipe fitted with PVC bend horn, with carrying handle and wall mounting bracket, complete in all respect. It should conform to IS 2878:2004. Extinguisher certificate has to be supplied along with the item.	No.	5179.81

Chapter - 15
Telecommunication

Item No.	Item Descriptions	Unit	Rate
15001	<p>Supply of managed STM-1, SDH (STM-1 Add/Drop MUX and upgradeable to STM-4) fully wired for 2 X 63 MB and equipped for 21 E1s and minimum 4 port of 10/100 base T electrical interface (with LCAS and GFP), including power supply, order wire, Ethernet card, sub rack, inbuilt DDF, installation material and all other accessories and other common cards, manuals etc. as per TEC GR No. TEC/GR/TX/SDH - 004/04. Jan 2011 or with latest amendment.</p> <p>It shall be equipped with redundant power supply card. The contractor will supply all other accessories as mentioned in the above said TEC Specifications and system will have provision of different redundancy cards as per the TEC Specifications. Each node shall support mapping of management function to E1 signal. The equipment shall be compatible to the existing SDH system (if any) and NMS system (if any) in the section. This includes connecting all pig tails, optical patch cords etc. to the SDH equipment.</p> <p>Note: It shall be possible to increase capacity from 21E1 to 63 E1s by adding / inserting tributary cards. This includes connecting all pig tails, optical patch cords etc. to the SDH equipment. This also includes connecting the SDH equipment with all cards to the 48V Bus including supply of wires and connectors. Termination of all E1s on DDF taking PVC cable over runway or a wall.</p>	No.	243504.58
15002	Installation, wiring, testing & commissioning of managed SDH (STM-1 Add/Drop MUX and upgradeable to STM-4) equipments, with all accessories and power supply connections, fixing of ladder etc. in OFC/Relay room.	No.	33553.87
15003	Supply, Installation, testing and commissioning of Network management System (NMS), full version for SDH and PDH Drop/Insert MUX network including associated application software as per technical requirement of Railways. It should be supplied with all accessories including power supply, for STM, ADM and both end primary drop/insert MUX. This will also include two no. of PCs/ Work stations of reputed make like Dell/IBM/HP or similar with UPS of APC/ Numeric make or similar and of sufficient capacity (min. 1 KVA) and 2 no. of printers as per technical specification in the tender document) and 2 nos of 8 port switch of Cisco/Nortel/HP make or similar. The second PC/work station should be capable of working in Hot standby mode. It also includes supply of furniture (Godrej or any repudiated make) i.e. PC/Printer table, revolving chair and one side rack as approved by site engineer. The objective is the patching, switching of equipments, power supplies and batteries from NMS.	No.	921884.62
15004	Supply of underground railway jelly filled 6 Quad cable. 0.9 mm dia copper conductor, as per RDSO spec.No. IRS: TC 30/2005 (Ver.-1) (Amnd. 1 to 5) or latest	Km	242691.65
15005	Supply of armoured, 24 Fibre, Optical Fibre cable, as per RDSO spec.No. IRS: TC:55/2006 Rev-1 (Amndt. 1.1, 2.0 and 3.0) or latest	Km	94758.41

Item No.	Item Descriptions	Unit	Rate
15006	Supply of 48 Volt/200 AH maintenance free VRLA Batteries duly charged as per IRS Spec. No. S-93/96(A) (Amd.1) or latest, with intercell connectors consisting of 24 cells of 2V each.	No.	88553.56
15007	Supply of 48 Volt/500 AH maintenance free VRLA Batteries duly charged as per IRS Spec. No. S-93/96(A) (Amd.1) or latest, with intercell connectors consisting of 24 cells of 2V each.	No.	259034.89
15008	Supply of VRLA Battery set, 12V/80AH, as per RDSO spec. No. S-93/96(A) with Amndt.-1 or latest, with suitable racks.	No.	15442.04
15009	Supply of Rechargeable Battery pack, DC 7.2 Volt, 200 mAH, type Ni-MH, suitable for 5W VHF set of model STC-700 or model STK 2107 or similar.	No.	1396.55
15010	Supply of SMPS based, FR-FC-BC Battery Charger, for Telecom use, 48 volts, 25 Amps, single phase, in N+2 configuration modules of 25 Amps, automatic switching between the modules, as per RDSO Spec No. RDSO/SPN/TC/23/99 (Ver- 4) (Amndt. 1) or latest along with two potential free contacts.	No.	88335.45
15011	Installation, wiring, testing and commissioning of SMPS based, FR-FC-BC Battery Charger, for Telecom use including ultra isolation transformers. It also includes the cost of DC bus bar of 48V DC/power wire and connection of power supply to the equipments with wire of suitable gauge as directed by site engineer including casing/capping. The work includes supply of battery rack, MCBs, battery cable and battery lugs and other accessories required for installation of power plant. All material required for commissioning to be arranged by contractor.	No.	5571.75
15012	Supply of VF Transformers, rack mounting type, 1120:470 Ohms as per RDSO Specn.No. IRS: TC-22/76 or latest.	No.	1276.12
15013	Supply of VF Transformers, rack mounting type, 600:470 Ohms as per RDSO Specn.No. IRS: TC-22/76 or latest.	No.	1501.88
15014	Supply of Desk type Electronic Magneto telephone as per spec. No. IRS TC: 79/2000 (Amn dt.4) or latest.	No.	3524.99
15015	Supply and installation of Solid state Amplifier model TZA-2000, TZA-4000EM make Ahuja or similar, along with one small stand.	No.	18742.74
15016	Supply of Microphone model 59XLR, make Ahuja or similar.	No.	2193.77
15017	Supply of Antistatic mats of size 1 meter x 0.75 meter and 3 mm thickness.	No.	2009.98
15018	Installation of Antistatic mats of size 1 meter x 0.75 meter and 3 mm thickness.	No.	148.10
15019	Supply of 24 fiber optical fiber cable straight joint enclosure (SJC) complete with all accessories along with enclosures with heat shrinkable splice protection sleeve as per RDSO spec. RDSO/SPN/TC68/2014 Revision 1.0, Amndt. 1.0 or latest. Splice losses in no case should be more than 0.1 dB.	No.	5506.71
15020	Supply of thermo shrink jointing kit as per RDSO Specn.No. IRS: TC 77-2012 (Rev.3.0) with (Amdt.-1 to 3) or latest, suitable for 6 Quad/jelly filled cables for straight through/derivation joints. It includes supply of all the accessories, without transformer.	No.	3361.92

Item No.	Item Descriptions	Unit	Rate
15021	Installation of thermo shrink jointing kit as per RDSO Specn.No. IRS: TC 77-2012 (Rev.3.0) with (Amtdt.-1 to 3) or latest, suitable for 6 Quad/jelly filled cables for straight through/derivation joints. It includes supply of all the accessories, without transformer.	No.	1682.87
15022	Supply of 25 Watt VHF synthesised transreceiver set, synthesised in frequency band 136 MHz to 174 MHz (full band), with DTMF microphone and cords, with GP antenna, 30 m of feeder cable and suitable BNC connectors, with 3m of power cord and 12V/13.5V 10Amp/15Amp power supply suitable for 25W VHF set, as per RDSO spec.No. RDSO/SPN/TC/107/2018, Rev. 0.0 Amndt 1 or latest.	No.	23056.53
15023	Installation, testing and commissioning of 25 Watt VHF synthesised transreceiver set, at Railway station, including all blacksmith and masonry work as per Railway Engineer at site. Required GI pipe shall be supplied by the contractor in size 6 meter/1500 mm length, 50 mm/40 mm dia as per requirement at site.	No.	4939.54
15024	Supply of Battery charger/Power supply unit, 230V AC/12V DC, 10 Amps, as per RDSO spec.No. IRS: S-93/96 9B) Amndt.-1 or latest for VRLA battery.	No.	17289.47
15025	Supply of Ultra Isolation transformer 230V AC/230V AC, 1.5 KVA, with MOVR protection on either side to provide cross protection	No.	17671.77
15026	Supply of 19" 42U composite rack, covered with front transparent doors. The rack shall be complete with all fittings for housing 2 SDH(STM-1/4/16) equipments, 2 PDMUX along with PDP, DDF, Krone MDF for 100/200 pairs, cooling fans and other accessories like cable and connectors, runway ladders, locking arrangement, completely wired and equipped with anti surge protection through fast acting fuses and GD tubes for all channels, of reputed make President/Rittal or similar.	No.	37681.28
15027	Supply of 2.048 Mbps, Managed SHDSL modems, as per RDSO spec. No. RDSO/SPN/TC/80/2020, Rev.2.0 or latest with suitable connector. A pair consists of V.35 and G.703 interfaces.	Pair	32937.55
15028	Supply of 2 Mbps Line termination unit/LAN extender 48V DC/230 V AC operated, as per RDSO spec. No. RDSO/SPN/TC/82/2020 Rev. 2.0 or latest, along with suitable connectors to extend line data over copper cable of 0.5mm/0.63mm/0.9mm dia. or CAT 5/6 cables.	Pair	24154.68
15029	Supply of 2 Mbps Router, 2 LAN/4 WAN port, 230V AC operated, as per RDSO spec.No. RDSO/SPN/TC/84/2008 Rev. 0 or latest, along with connecting cables, connectors etc. for connecting to the ethernet devices, of reputed make like Cisco/Dlink or better.	No.	83565.68
15030	Splicing of 24 core optic fibre cable and making the splicing joint with contractor's own machine and tools. Joint should be prepared in such a way that the top of the enclosure should be at a depth of minimum 1.2 meter and the enclosure should be covered with soft soil and bricks. Splice loss of each fibre should be less than 0.05 dB.	No.	12011.75

Item No.	Item Descriptions	Unit	Rate
15031	Supply of 2 Mb Programmable Primary Digital drop insert multiplexer (PD MUX) as per RDSO Specs.No. IRS TC- 68/2012 Rev.0 (Amnd.1) or latest with conference facility and fully wired for 30 channel complete with power supply card, remote control, supervision facility and all other accessories, installation material, manuals etc. It should have facilities to accommodate data interface card in multi drop mode and should be able to support cards needed for video conferencing and ISDN. It shall support NMS installed at Test Room and may operate local/remote location of entire section. It also includes supply of all miscellaneous items which will be required for final testing and commissioning of system. The above MUX should be equipped with following cards : - (i) 2 wire/ 4 wire E&M VF circuit Card - minimum 04 No. (ii) Subscriber loop circuit Card - minimum 02 No. (iii) Exchange loop interface circuit Card - minimum 01 No. (iv) Data Acquisition Card - minimum 01 No. (v) GDT(G.703) Card - minimum 01 No. (vi) Loop protection Card - minimum 1 No.	No.	198381.92
15032	Installation, programming, wiring and commissioning of Primary drop insert MUX (PD MUX) with all accessories. This also includes all power supply connections, surge and lightning protection arrangements, wiring inside the racks and indoor krone box, fitting of ladder, wiring up to Krone/CT box, connecting all pigtails, optical patch cords etc to the SDH equipments. This also includes connection of SDH and primary MUX equipment with all interface cards to the 48V Bus including supply of wires and connectors termination of all E1s on DDF taking PVC cable over runway or a wall and termination of VF interface circuit to the Krone type.	No.	18692.41
15033	Installation of PA system at Railway station as per instructions of railway site engineer incharge. The required cable, conduit, Amplifier and equipment shall be supplied by Railways. Cable shall be laid in proper conduit.	No.	5031.59
15034	Blowing/drawing of OFC cable in the HDPE pipe duct and protective work already provided in the trench. The cable shall be laid only after the successful completion of the DIT (Duct Integrity test). The DIT should be certified by the Railway engineer at site. All the equipments/machinery required shall be arranged by the contractor.	Km	17093.05
15035	Supply and fixing of 50 pair Krone termination DP duly fitted with disconnection type.	No.	6225.86
15036	Supply of permanently lubricated HDPE duct, 40 mm outer dia, as per RDSO spec. No. RDSO/SPN/TC/45/2013 Rev.2 Amndt.2 or latest, along with all accessories like end caps, collars, bends, couplers etc.	Km	76811.42
15037	Laying of HDPE duct as per the approved cable route plan in the excavated trenches/other protected works/RCC channel etc. including all accessories like end caps, collars, bends, couplers etc. The ends of the duct to be sealed with end plugs till OFC blowing is done. Important: The laying of OFC cable independently or along with Quad cable/PIJF cable in the same trench shall be	Km	8092.25

Item No.	Item Descriptions	Unit	Rate
	governed by the RDSO drawings No. RDSO/TCDO/COP-6(a) and RDSO/TCDO/COP-8 (a) respectively, issued vide Chapter-XIII of the Telecomm Manual.		
15038	Supply and installation of 20 pair CT box with disconnection facility, made of FRP.	No.	2212.41
15039	Supply of Multi telephone way side station equipment with necessary mounting arrangement on standard 19"rack. It should be 48V operated as per RDSO draft spec. No. RDSO/SPN/TC/66/2007 with amendments 1 and 2 or latest.	No.	69443.93
15040	Supply of surge suppressor for all the 30 circuits derived from the Primary MUX (Z protection)	No.	8148.86
15041	Supply and Installation of Fibre distribution management system as per RDSO spec.No. RDSO/SPN/TC/37/2020 Revision 4.0 or latest. It includes the supply of 19"42U rack with mounting arrangement. It will also include all installation material, splicing, termination, testing of all 2 x 24 fibres.	No.	77346.06
15042	Supply of cable termination rack panel fitted with 12 No. of 32 way U link feed panel along with complete U links and mounting arrangement for isolation transformer. Suitable size copper strip to be provided for earthing on the rack.	No.	12759.36
15043	Installation of cable termination rack panel fitted with 12 No. of 32 way U link feed panel, wiring of isolation transformer, termination of UTP/STP and underground cables on U link feed panel, earthing of panel. All wiring material to be supplied by contractor.	No.	9196.85
15044	Supply of Universal 2 wire/4 wire way station DTMF control Telephone, as per RDSO spec. No. IRS: TC:82-2005, (with Amd. 3 or latest.	No.	5199.64
15045	Installation, testing and commissioning of 4 wire way station equipment with necessary mounting arrangement on standard 19"rack. It includes the supply of all wiring material such as casing,capping,10/20 pair indoor cable and wiring between way station equipment and termination box etc.	No.	1188.81
15046	Installation, wiring, testing and commissioning of all UTS related equipments as per Railway site incharge. It also includes configuration, programming and interfacing with the existing UTS network at way side station as well as at Router end. All connecting material connectors etc. to be supplied by contractor. Software programming to be done by OEM/OEM certified engineer.	Station.	59240.21
15047	Supply of Power supply unit for 2W/4W way side control phone equipment along with 12V/7AH sealed maintenance free battery as per RDSO spec.No. TC 72-97 Amendment- 1 or latest.	No.	3972.26
15048	Supply of UTP CAT-6 cable of reputed make Siemens/Systemax/D-Link/ Tyco/ Krone/AMP or similar.	Mtr.	22.36
15049	Laying of UTP/STP CAT-6 cable/power cable in PVC casing capping of appropriate size. The work also includes supply and fixing of casing and capping, fixing and connection of patch panel, fixing of CAT-6 cable with RJ 45 connectors. Work to be done as per instructions of site incharge.	Mtr.	45.14

Item No.	Item Descriptions	Unit	Rate
15050	Supply of OFC patch cord/jumper cable, 10 meter long, with (1) FC/PC connectors on both sides or (2) One end FC/PC connector and other end compatible to work with STM-1	No.	1784.18
15051	Supply of FC/PC type connectors of 5/10/20 dB and multiple of 5 dB up to 20 dB.	No.	257.94
15052	Supply of 5 Watt VHF synthesised transreceiver set, synthesised in frequency band 136 MHz to 174 MHz (full band), with helical antenna, spring belt clip, 7.2 V 2550 mA Li-Ion Battery Charger, RDSO spec.No. RDSO/SPN/TC/107/2018, Rev. 0.0 Amndt. 1 or latest, make Kenwood/Motorola/Sanchar/HTC or similar, should be MIL standard compliant.	No.	15523.41
15053	Supply and Installation of PVC channel, with cover, of size 50 mm x 34 mm of 1 mm thickness. The installation to be done as per instructions of site incharge.	Mtr.	132.38
15054	Supply and Installation of PVC channel, with cover, of size 75 mm x 50 mm of 1.2 mm thickness. The installation to be done as per instructions of site incharge.	Mtr.	204.07
15055	Construction of OFC jointing pit of size 1mx1mx0.6m, using bricks, sand and cement in the ratio 1:3. The thickness of the wall shall be 120 mm. The top cover shall be of concrete of thickness 75 mm with two iron handles on top of it. The pit shall be covered with sand after putting the joint enclosure. All construction material to be supplied by contractor.	No.	6257.65
15056	Supply, Installation and commissioning of active lightning arrestor of Class 'A' for building protection as per standard NFC-17-102 :2011 or latest. It shall work on early streamer emission principle. It shall be made of stainless steel with an operating time of 60 microsecond or less. A Non-resettable counter shall be provided to count the number of lightning occurrence. The device shall be installed on top of the building on a GI mast and shall be connected to the earth pit through a copper tape of 25mm x 2mm or better. The copper tape shall Not touch the building throughout and shall be connected to the earth electrode by exothermic welding.	No.	111652.24
15057	Supply, Installation and commissioning of Class-D surge protector device for 24V DC/48V DC/110 V DC supply for each pair of conductor. The parameters shall be as per RDSO specification No. RDSO/SPN/TC/98/2011, Rev. 0, Amndt. 1, or latest, with visual indication and potential free contacts.	No.	4704.55
15058	Supply of Optical Time Domain Reflectometer (OTDR), operating at 1550 nm and 1310 nm for working on single mode optical fiber as per TEC spec. TEC/GR/TX/OTD - 001/05/SEP-19 or latest, of reputed make like Yokogawa/JDSU/Viavi or similar. Consignee shall approve the supply only after successful demonstration at site.	No.	436502.82
15059	Supply of Automatic Fusion Splicer for single mode Optical fibre cable, along with accessories as per TEC spec. TEC/GR/TX/OSM - 001/04/SEP-12 or latest of make Superior/Fujikura or similar. Consignee shall approve the supply only after successful demonstration at site.	No.	532864.64
15060	Supply of Optical Power Meter, type-B, as per TEC spec. GR/OPM-01/03 Feb. 2005 or latest.	No.	17742.61

Item No.	Item Descriptions	Unit	Rate
15061	Supply, Installation and commissioning of Class-B encapsulated type Lightning current arrester. The parameter shall be as per RDSO specification No. RDSO/SPN/TC/98/2011, Rev.0, Amndt. 1, or latest, with visual indication and potential free contacts.	No.	65715.56
15062	Supply, Installation and commissioning of Class-C surge protection system with inbuilt thermal isolating device. The parameter shall be as per RDSO specification No. RDSO/SPN/TC/98/2011, Rev.0, Amndt. 1, or latest, with visual indication and potential free contacts.	Set	5186.45
15063	Supply of Remote service terminal (portable) fully compatible with NMS software. Service terminal shall be workable from any location of the network. It should be possible to read the fault status of the STM, MUX, cross connect etc. in the network from the service terminal. Make and model to be approved by railways before supply.	No.	136166.71
15064	Supply of VRLA Battery set, 12V/100AH, as per RDSO spec. No. S-93/96(A) with Amndt.-1 or latest, with suitable racks.	No.	10671.13
15065	Supply of Subscribe loop interface cards, minimum 04 circuits per card.	No.	19110.22
15066	Supply of 2W/4W E&M interface cards, minimum 04 circuits per card.	No.	21194.97
15067	Supply of Exchange loop interface card, minimum 04 circuits per card.	No.	32802.86
15068	Supply of standard 19" rack mountable, -48V DC working, Add-Drop STM-4 SDH equipment conforming to GR No. TEC/GR/TX/SDH - 010/03. Jan 2011 (with latest amendment) complete with redundant power supply, 2 nos. STM 4 of aggregate L.4.2 Optical interface modules/Cards one each for East and west side, TX/RX and 2 nos. of STM-1 S 1.1 optical interface modules complete with 5 meters long optical fibre cords, 21 E1s with DDFs and cable assembly for termination to DDF and minimum 8 Nos. of 10/100 Base-T Ethernet ports, Fast Ethernet on SDH [EoS] 10/100 Base-I interface module/card supporting with LCAS and GEP, order wire subrack DDF installation material, manuals and other accessories. Complete Engineering order wire (EOW) arrangement. Necessary/Firmware for local/remote monitoring/configuration of the equipment through EMS and Software/Firmware interface to work all Network elements as Gateway Network Element [GNE], 2 Nos of MCBs of appropriate rating and necessary connecting cords and cables for power supply modules."	No.	333020.56
15069	Supply, Installation, testing and commissioning of 10 line True colour out-door Video cum train information display system as per RDSO/ SPN/ TC/ 67/ 2013, Rev. 3, Amndt-1 or latest. It also includes - Supply of Mechanical Structure for above items of size 5120 mm X 2560 mm +/- 10% [width X height] including required accessories of above true colour outdoor video cum train information display system including all required fixing accessories. The covering and all the connectors, power cables etc. should be water and dust proof. All the board, Mechanical structure of 10 line True colour out-door Video cum train information display system should with stand all environmental effects with proper grounding, concreting of iron structure to a minimum height of 11 feet above the ground level.	No.	2371859.34

Item No.	Item Descriptions	Unit	Rate
15070	Supply, Installation, testing and commissioning of 05 line True colour in-door Video cum train information display system as per RDSO/ SPN/ TC/ 67/ 2013, Rev. 3, Amndt-1 or latest. It also includes - Supply of Mechanical Structure for above items of size 5120 mm X 2560 mm +/- 10% [width X height] including required accessories of above true colour outdoor video cum train information display system including all required fixing accessories. The covering and all the connectors, power cables etc. should be water and dust proof. All the board, Mechanical structures of 10 line True colour out-door Video cum train information display system should with stand all environmental effects with proper grouting, concreting of iron structure to a minimum height of 11 feet above the ground level.	No.	1213725.26
15071	Supply, installation and commissioning of three line single face/At a Glance multi line Train Display Board as per RDSO spec.No. RDSO/SPN/TC/61/2015(Rev-4.0), Amndt 1 and 2 or latest.	No.	285435.46
15072	Supply, Installation, testing and commissioning of Single line double sided True colour in-door train information display system as per RDSO spec.No. RDSO/SPN/TC/61/2015(Rev-4.0), Amndt 1 and 2 or latest. It also includes - Supply of Mechanical Structure for above items of size 5120 mm X 2560 mm +/- 10% [width X height] including required accessories of above true colour outdoor video cum train information display system including all required fixing accessories. The covering and all the connectors, power cables etc. should be water and dust proof. All the board, Mechanical structure of 10 line True colour out-door Video cum train information display system should with stand all environmental effects with proper grouting, concreting of iron structure to a minimum height of 11 feet above the ground level.	No.	386166.98
15073	Supply, installation, testing and commissioning of Video display controller [VDC] as per RDSO specification No. RDSO/ SPN/ TC/ 67/ 2013 Rev. 3, Amndt-1 or latest.	No.	255680.76
15074	Supply, Installation, testing and Commissioning of Platform dual face, 4 digit, GPS synchronised digital clock as per RDSO spec.No. RDSO/SPN/TC/62/2008 Rev. 3, Amndt- 1 and Amndt.-2 or latest, with LED of Blue/Red/White colour and size approximately 762 x 381 x 228 mm It also includes all fitting arrangements. (Colour to be decided by Railways)	No.	43123.72
15075	Supply, Installation, testing and Commissioning of on line UPS 5 KVA, with battery back up of minimum 4 hours, with battery trolley, of reputed make as APC/Uniline etc. or similar.	No.	131519.14
15076	Supply, Installation, testing and commissioning of LED type double faced Coach Guidance Board with all accessories as per RDSO Spec. No. RDSO/ SPN/ TC-61/2015 Rev.4, Amndt-1 and Amndt-2 or latest. The contractor will supply all the materials [pole/ angle etc.] for fixing and installation. LED Type: Cool White colour chip type SMD LEDs of uniform intensity.	No.	51242.63

Item No.	Item Descriptions	Unit	Rate
15077	Supply, installation and commissioning of Central Data Controller [CDC] with fully redundant CPU units with relevant software, as per RDSO specification No. RDSO/SPN/TC/61/2015(Rev-4.0), Amndt 1 and 2 or latest, with supply and installation of 3 KVA online UPS for minimum 1 hour backup, to drive the various types of display boards installed.	No.	256641.45
15078	Supply, installation, testing and commissioning of Platform data controller [PDC] as per RDSO specification No. RDSO/SPN/TC/61/2015(Rev-4.0), Amndt 1 and 2 or latest.	No.	62911.94
15079	Supply, installation, testing and commissioning of Central Data Switch [CDS] as per RDSO specification No. RDSO/SPN/TC/61/2015(Rev-4.0), Amndt 1 and 2 or latest.	No.	50606.14
15080	Supply of power cable 3 core, 2.5 sq mm, multi strand (36/0.3 mm dia) cable as per IS 694:1990 reaffirmed 1995 or latest suitable for Railway electrification area, shall be of reputed make like Havells, Delton, LAPP, Finolex, or superior.	Mtr.	77.87
15081	Supply of screened 5 pair (10 core) color coded and twisted Data Communication Cable, each core made of Copper Conductor of 0.20 mm diameter (7/0.20mm) ABC (Annealed Bare Copper) & Polyethylene Insulated. Tolerance in dimensions should be within $\pm 10\%$.	Mtr.	65.67
15082	Supply, installation, testing and commissioning of 2 core screened/shielded multistrand PVC insulated wire (24/0.2 mm dia) for speaker load line.	Mtr.	48.65
15083	Supply, testing and commissioning of 24 port, Gigabit Ethernet switch, Layer-2, along with cable and all accessories of reputed make as Cisco/D-Link/HP or similar.	No.	46510.78
15084	Supply and fixing of PVC conduit pipe 25 mm with accessories such as bend, tee, coupling, elbow, saddle, clamp, screw, PVC/ wooden plugs etc. on walls, angle or on rail of platform shelter etc. MS clamp made of 3 mm MS flat to be manufactured and supplied and fixed to clamp the PVC pipe or angle/ rail run of platform shelter. The clamp should be painted with red oxide primer over which two coats of aluminum paint to be given. Where ever necessary jumper holes to be made in wall and above PVC pipe threaded and wall to be repaired to its original condition.	Mtr.	26.91
15085	Laying of Data cable/Communication cable/Power cable etc. in PVC conduit pipe with all fittings and accessories [As per site requirement].	Mtr.	18.71
15086	Supply and Installation of RJ-45 patch cord, seven feet long, of reputed make like Molex or similar, with 02 no. of RJ-45 connectors for every patch cord.	No.	173.98
15087	Loading, Transportation/Carriage and Unloading of various S&T material by a 9 MT truck, from/to the consignee depot to/from various locations, as decided by the Railways.	Km	54.65
15088	Supply of 15 watts Horn speaker with 10 watt tapping, matching transformer and driver unit, make reputed as UHC-15XT of Ahuja make or similar.	No.	1835.88
15089	Supply of 15 watts Column speaker, matching transformer and driver unit, make reputed as SCM-15T of Ahuja make or similar.	No.	1527.88

Item No.	Item Descriptions	Unit	Rate
15090	Supply of 20 watts Column speaker with 10 watt tapping, matching transformer and driver unit, make reputed as LBD 8373 of Philips make, SCM-30T of Ahuja make or similar.	No.	2851.05
15091	Supply of 25 watts Industrial Horn speaker with 5, 10, 15, 20 watt tapplings, matching transformer and driver unit, make reputed as LBD 8347, 8308 of Philips make, UHC-30XT of Ahuja make or similar.	No.	1769.41
15092	Supply of 30 watts Industrial Horn speaker with 5,10,15,20,25 watt tapplings, matching transformer and driver unit, make reputed as LBD 8347, 8308 of Philips make, UHC-30XT of Ahuja make or similar.	No.	2068.13
15093	Supply of 8 port Gigabit Lite Managed PoE Layer 2 Switch supports 8 Nos 10/ 100/1000BASE-T ports, along with 2 Gigabit SFP ports, green-saving technologies, make model DG-GS1510HPL DIGISOL / CISCO/JUNIPER or superior.	No.	18807.45