

### **General instruction for Schedule A**

- (1) For trenching, cable laying, Provision of RCC/DWC/GI/RCC hume pipe/HDD method for track/road/ platform/ culvert/ bridge etc. to be followed as specified in Technical Circular No: 2 of 1988 & correction slip No. S/318/1748 dt 15.03.2000 issued by CSTE/ SE Railway & Guidelines on Signalling cable Laying Issued by Signal Directorate, RDSO, Version-1.0, Effective from dt 31.10.2011 and comply to S&T compendium 2.0 2025.
- (2) All the surfaces shall be repaired and brought back to its original condition, as the case may be. All nut, bolts, washers etc to be of SS.
- (3) The standard ratio of cement, sand, 25mm stone chip shall be 1:3:6 respectively, wherever concreting & foundation of signal, location, etc is involved.
- (4) All the sundry materials will be provided by the contractor at site like : cement, sands, bricks, 25 mm or 1" stone chips for concreting, bolts, nuts, washers (all SS), hylem sheet of thickness 12 mm, ferrules, anti-corrosive/Red oxide/Weather proof/Acid proof paint, MS plates/angels/flats, anchor (foundation) bolts, MS clamps, screws, eyelets, pvc bunching tape, buttons, condenser, resistance, varnish, fevicol, soldering/ welding material, copper lug, charcoal, salt, salmomiatic, 6 SWG GI- wire, speed board, screen with MS frame, MS pin, boss pin, 6 mm rivet, split pin, angle cleats to drg. no- 22859/T/SE, 1" dia GI pipe, 6/8-SWG soft bond wire, flexible wire, channel pin, heat shrinkable tape, suitable compound for fixing lead wire, 1.5 " GI/HDPE pipe for point machine/axle counter, 18 mm Hylum sheet for location box/composite rack shelf and 12 mm for cable termination in location box/ CT Rack/Composite rack, etc, transparent sheet for box, lock for box make Godrej or similar, insulated strip, sulfuric acid, distilled water, cupboard, sunmica, cable fixing clamps. etc. so as to complete the the individual job as per schedule description.
- (5) All the materials of 'Supply' Schedule will be got issued by the contractor from stores and transported to the site as per the requirement. Rest all sundry materials will be supplied by contractor at site to complete the execution of work.
- (6) The contractor has to conduct detailed site survey of the cable route, prepare a plan to get approval of the Railway, putting white lime powder marking before excavation of earth under supervision of railways authorized representative.

### **General instruction for Schedule A1**

- (1) All the sundry materials will be provided by the contractor at site like : cement, sands, bricks, 25 mm or 1" stone chips for concreting, bolts, nuts, washers, (all SS), hylem sheet of thickness 12 mm, ferrules, anti- corrosive/Red oxide/Weather proof/Acid proof paint, MS plates/angels/flats, anchor (foundation) bolts, MS clamps, screws, eyelets, pvc bunching tape, buttons, condenser, resistance, varnish, fevicol, soldering/ welding material, copper lug, charcoal, salt, salmomiatic, 6 SWG GI- wire, speed board, screen with MS frame, MS pin, boss pin, 6 mm rivet, split pin, angle cleats to drg. no- 22859/T/SE, 1" dia GI pipe, 6/8-SWG soft bond wire, flexible wire, channel pin, heat shrinkable tape, suitable compound for fixing lead wire, 1.5 " GI/HDPE pipe for point machine/axle counter, 18 mm Hylum sheet for location box/composite rack self and 12 mm for cable termination in location box/ CT Rack/Composite rack, etc, transparent sheet for box, lock for box make Godrej or similar, insulated strip, sulfuric acid, distilled water, cupboard, sunmica, cable fixing clamps. etc. so as to complete the individual job as per schedule description and comply to S&T compendium 2.0 2025.
- (2) All the materials of 'Supply' Schedule will be got issued by the contractor from stores and transported to the site as per the requirement. Rest all sundry materials will be supplied by contractor at site to complete the execution of work.

### **General instruction for Schedule NS1**

- (1) Execution to be made by the contractor in AutoCAD as per following: -
  - (a). SEC Railway Practice in conformity with GR, SR & SEM.
  - (b) . As per latest typical circuit diagram and guidelines of SEC railway.
- (2) After design, development & Preparation of RCC, FPD, SWRD & Miniature Diagram, contractor has to submit initially two (02) sets of paper print for checking in the Rly office. Thereafter, contractor will collect one (01) set of checked copy for necessary correction/modification/alteration, if any in the RCC, FPD, SWRD and miniature diagram.
- (3) Only minor corrections, if any will be incorporated in the original tracing paper will be done by the Railways.
- (4) If there are major corrections/mistakes found during checking on paper print by Railways, then the same one (01) set of the original prints tracing papers & two (02) sets of paper prints has to be re-submitted for checking & approval.
- (5) After approval contractor will collect approved copies and submit 3 sets of RCC, FPD & Miniature Diagram paper print along with, original tracing paper.
- (6) All Soft copies of drawing must be made in at least AutoCAD 2000 or latest version (drg file format) & all the CD's must be scanned with proper updated antivirus application before submitting to Design & Drawing Section. The CDs will be scanned in Design & Drawing Section where if any virus is found, new CDs containing soft copies must be submitted by the contractor.
- (7) After commissioning of the work, contractor shall prepare all the completion drawings in 2 sets and put up it to approval of Rlys. Within one week and subsequently after their approval submit the original prints on tracing papers. After approval on the original tracing all drawings in 3 sets except SIP in 06 nos. of hard copy/ blue print along with the original tracing complete in all respects and two sets of soft copies in CDROM to be handed over to the railways.
- (8) In course of execution of the work, any future development, additions and alterations etc. also to be incorporated in the circuit diagram as well as soft copy by the contractor at the completion stage.
- (9) Each mistake in RCC /FPD or WD will deduct penalty of Rs.250/-.
- (10) All the drawing should be provided on good quality plotter paper.
- (11) The alteration/modification in drawings due to changes in approved SIP/ESP will be paid separately.

### **General instruction for Schedule B, B2 & B3**

- (1) The Materials which is to be inspected by RDSO should be supplied from RDSO approved vendors. Following critical items will continue to be inspected by RDSO as per instruction contained in Board's letter 74/RS(G)/379/2Pt Dt. 04.03.1991 and 18.06.1991: -
  - i. All types of signalling relays;
  - ii. Block instruments;
  - iii. Axle counter equipment's;
  - iv. Signal machines;
  - v. Point machines;
  - vi. Colour light signal transformers
  - vii. Electrical signal lamps;
  - viii. Voltage stabilizers and other power supply equipment.
  - ix. Electric signal reversers;
  - x. Signal roundels and lenses;
  - xi. Electric lever lock and circuit controller.
  - xii. Circuit controller;

- xiii. Electric key transmitter;
  - xiv. Fuses, Fuse Block & Terminal blocks (PBT Type);
  - xv. Electric Point and lock detector.
- (2) Signalling item having RDSO specification will be inspected by RDSO provided the order value is more than Rs. Five Lakh as mentioned vide Railway Board's letter No. 2000/RG(G)/379/2 Dt. 06.09.2017.
  - (3) Before placing order for all the materials to the firms concerned, Prior approval to be obtained from Railway 's Engineer.

### **General instruction for Schedule C**

- (1) For trenching, cable laying, Provision of RCC/DWC/GI/RCC hume pipe/HDD method for track/road/platform/culvert/bridge etc. to be followed as specified in Technical Circular No:2 of 1988 & correction slip No. S/318/1748 dt 15.03.2000 issued by CSTE/ S.E.Railway.
- (2) All the surfaces shall be repaired and brought back to its original condition, as the case may be.
- (3) The standard ratio of cement, sand, 25 mm stone chip shall be 1:2:4 respectively, wherever concreting is involved and curing of concreting to be done by the contractor at least for 15 days.
- (4) All the sundry materials will be provided by the contractor at site like:- cement, sands, bricks, 15-25 mm or 1" stone chips for concreting, bolts, nuts, washers, sal wood shelves planks, S.W. strips, hylem sheet of thickness 6 mm, ferrules, anti- corrosive/Red oxide/Weather proof/Acid proof paint, MS plates/angels/flats, anchor (foundation) bolts, MS clamps, screws, eyelets, pvc bunching tape, buttons, condenser, resistance, varnish, fevicol, soldering/ welding material, copper lug, charcoal, salt, salmionic, 6 SWG GI- wire, speed board, screen with MS frame, MS pin, Bross pin, 6 mm rivet, split pin, angle cleats to drg. no- 22859/T/SE, 1" dia GI pipe, 6/8-SWG soft bond wire, flexible wire, channel pin, heat shrinkable tape, suitable compound for fixing lead wire, 1.5 " GI/HDPE pipe, 3/4" thick wood boards, transparent sheet for box, lock for box make Godrej or similar, insulated strip, sulfuric acid, distilled water, cupboard, sunmica, cable fixing clamps, nylon rope, HDPE couplers , end caps, etc. so as to complete the the individual job as per schedule description.
- (5) All the materials of 'Supply' Schedule will be got issued by the contractor from stores and transported to the site as per the requirement. Rest all sundry materials wil be supplied by contractor at site to complete the execution of work.
- (6) The contractor has to conduct detailed site survey of the cable route, prepare a plan to get approval of the Railway, putting white lime powder marking before excavation of earth under supervision of railways authorised representative.
- (7) GI- Pipes to be supplied by the contractor must be as per specification IS- 1239, (grade medium).
- (8) Any charges required to be paid to site PWD/ Municipal authority to be borne by the contractor for cutting of public roads, etc.
- (9) RCC pipes along with collars to be supplied by the contractor must be as per specification no-IS- 458, class-NP2.
- (10) Guarding of cables/HDPE pipe, relaying of cables/HDPE pipe and rejoining of cable/HDPE pipe in case of thefts or otherwise to be borne by the contractors at his own cost till commissioning.

### **Annexure-VII for item Sl. No. 23 of Schedule-C**

#### **WIRING INSTRUCTIONS:**

The schematic layout of the equipment rack and the appropriate protection arrangement, cable terminations, U-link panels if any, etc. shall be submitted by the Tenderer. The detailed layout design of the equipment rack shall be got approved by the contractor from the purchaser's Engineer well in advance.

1. All the indoor cables/power supply wires/Patch cords/Pigtails etc. shall be taken through overhead aluminium ladder from equipment rack to the cable termination boxes. The width of this ladder shall not be less than 9 inches and aluminium angles (1.5"X1.5") and plates shall be approx. 3mm. thick.

2. The indoor wiring on wall shall be taken on suitable slotted PVC channels (min. 2"x 2") & flexible PVC conduit as per instructions of Railway's Engineer in charge.
3. 48V DC supply from charger to battery shall be extended using 16 Sq. mm. stranded PVC insulated copper cable. All the power cables shall be color coded as per standard practices.
4. 48V DC supply shall be extended to equipment rack using 4 Sq. mm. stranded PVC insulated copper cable with standard color coding as per standard practices. The voltage drop from the load point to equipment rack shall not be more than 500 mV.
5. All power cable termination shall be done using suitable size of lugs.
6. AC & DC power cable shall run through separate PVC conduits/channels.
7. The DTMF way station equipment's and 12 V power supply units shall be mounted on 16mm thick white laminated board fixed on the wall through 3mm thick mild steel angles as per instructions of Railway's engineer at site. The angles shall be painted in black.
8. Arrangements shall be made for mounting Fibre Distribution Frame and Fibre Termination Box at appropriate place on the rack so as to avoid exposure of pigtailed from rodent attacks.
9. Necessary mounting accessories for mounting of transformers and U-Link panels shall be provided by the contractor.
10. The protection against surge, transients and lightening should be graded and provided at 230V AC input to the battery charger ('X' Protection), 48V DC input to the equipment's ('y' Protection) and channel level output from the equipment for extending telephone circuits etc, ('Z' Protection) , Gas Discharge tubes in tandem with MOVs of appropriate capacity shall be provided.
11. The contractor shall do ring earthing as per enclosed drawing and specification. The recommended value of earth resistance is not more than one ohm. All the materials required for earthing i.e. earth electrode, bus-bar, interconnecting cable, charcoal, common salt etc. required for the work should be supplied by the contractor as per enclosed drawing and specifications.

#### **General instruction for Schedule D**

- (1) Only those materials to be supplied by the Contractor under Schedule-D shall be issued by the Railway for execution of work. Any other material required for the work unless specifically mentioned shall be arranged by the Contractor at no extra cost.
- (2) Telecom item having RDSO specification will be inspected by RDSO provided the order value is more than Rs. Five Lakh as mentioned vide Railway Board's letter No. 2000/RG(G)/379/2 Dt. 06.09.2017.
- (3) The Materials which is to be inspected by RDSO should be supplied from RDSO approved vendors.

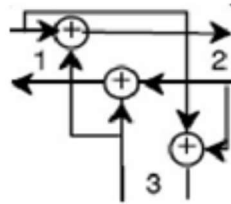
#### **Annexure-I for item Sl. No. 12 of Schedule-D**

##### **PRIMARY DIGITAL DROP INSERT MUX:**

The MUX shall be programmable drop insert MUX with conference facility and shall have the facility of Network Monitoring and control (Clause 6.7 IRS- TC-68-04) The PD MUX shall be equipped and completely wired for 30 channels or latest. The Primary digital MUX shall conform to RDSO specification IRS TC 68-04 and shall fulfil the following requirements:

1. The MUX Sub rack shall have minimum 16 slots to support up to minimum 60 Channels without additional Power supply unit and Ringer unit to give full flexibility for installation, channel programming and future expansion. The channel side interface cards shall be installed station wise as per the requirement. It shall also be possible to extend the services of one sub rack to another sub rack.
2. The offered Primary Multiplexer and channel unit should work on Distributed Power Supply i.e. each card including system cards and channel interfacing cards of the MUX shall have circuitry within built DC-DC converter.
3. All the cards shall be completely software programmable. There shall be no jumper or switch settings or other hardware settings. Software can be changed to realize above mentioned configurations. It shall be possible to configure the transmit levels and receive levels for the voice channels/circuits via software. The systems in the network shall be manageable through the central NMS as well as via LCT.

4. Channel units associated with primary multiplexer shall be hot replaceable without disturbing the operation of primary multiplexer. It shall be possible to remove and insert any card without the need of switching off the power supply. It shall also not interrupt the traffic anywhere else except for the affected card. Failure of any channel unit associated with Primary multiplexer, shall not affect the operation of primary multiplexer.
5. It shall be possible to increase the capacity by addition of the modules. All capacity expansion shall be non disruptive to existing traffic under all circumstances. Capacity expansion shall not need powering off of the equipment.
6. The configuration of the 2 Mbit/s Primary Multiplexer system shall be based on Loop-Protected system. The hardware of primary multiplexer offered shall support the following functionalities along with voiced and data channel units;
  - Terminal Multiplexer.
  - Protected terminal multiplexer.
  - Drop/Insert and Bypass multiplexer.
  - Loop-Protected multiplexer.
7. The offered Primary Multiplexer and various channel units shall be capable of functioning with Power Supply Range of -36 to -72 VDC.
8. Drop/Insert Primary Multiplexer shall support Omnibus operation of Voice (in digital format) and Data channel in following fashion:



9. Primary Multiplexer shall support thirty (30) three way omnibus channel configuration between tributary A & Tributary B and Drop timeslots, irrespective of timeslot content (either voice or SCADA/data).
10. Primary Multiplexer shall have cross-connection granularity of  $n \times 8$  Kbit/s.
11. Maintenance shall be possible on all aggregate and channel links through loop backs.
12. The input 2Mbps ports shall be for 120 Ohm, balanced input. The length of channel O/P cables shall be min. eight meters for flexibility of MDF mounting in Termination rack.

### General instruction for Schedule NS-2 & 3

<b>REQUIREMENTS OF ELECTRONIC INTERLOCKING SYSTEM</b>
<b>Before placing order for all the materials to the firms concerned, Prior approval to be obtained from Railway 's Engineer.</b>
1.The Electronic Interlocking System supplied shall have approval of RDSO as per specification no. RDSO/SPN/192/2019, Ver2.0 or with latest amendment.
2. The Electronic Interlocking System shall be complete with power supply arrangement.
3. The equipment shall be provided with all the necessary and recommended protection devices for lightening and surge protection.
4. Tenderer shall ensure that the installation of Electronic Interlocking System equipment shall be done by manufacturer of the equipment/their authorized technical staff.
5. OEM's designer name/Designation /Licence number with their initial on each sheets of application logic & interface circuits shall be ensured before submission to railway approval.

6. Necessary technical documents, installation & maintenance manuals, trouble shooting procedure details and any other required technical information regarding Electronic Interlocking System supplied shall be provided to ensure proper installation/ maintenance/repair of Electronic Interlocking System as per manufacturer's specifications/stipulations.
7. Tenderer shall provide training of Railway's officials in software and hardware to enable maintenance of supplied Electronic Interlocking System. The quality of training should be such that at the end of the training the Railway officials will be able to install/ commission and maintain the equipment. They shall be trained in all aspect of system design, engineering inspection, testing, execution, commissioning, fault diagnosis operation and maintenance of the system as whole and also all constituent equipment's. Training shall be imparted preferable at work site / Railway depot nominated by engineer in charge / manufacturer's premises. training material shall be supplied by contractor.
8. Tenderer should submit authorization from <b>Original Equipment Manufacturer</b> to supply of equipment against this tender, if awarded.
9. Tenderer should submit the commitment from <b>Original Equipment Manufacturer</b> for supply of spares if required, for next five years, if awarded.
10. All the design and drawing of EI shall be followed as per SECR practice. Design/Drawing prepared, checked and approved by the OEM engineers should be signed with name, designation, license no. as per SEM para no. 8.1.4(f).

### **General instruction for Fire Alarm System**

- (1) As per RDSO Guideline Automatic Fire Detection and Alarm System (AFDAS) power supply to be provided through IPS/UPS power supplies of Railways- any damages due to power Fluctuations/Surges will not be covered under warranty. Separate SMPS/Power be used for ASD-LHS/LHD Control Modules, UVIR & other such sensitive devices for smooth working. Onsite Support During Warranty & AMC/Extended warranty Period: All on site front end support to be provided by Contactor/SI. to minimize failure/maintain uptime of the system Preventive and Routine maintenance to be taken care by contractor.
- (2) During warranty/AMC period, Any material required to be repaired, need to be send to our factory, same will be returned duly repaired, both side courier charges to be borne by Contractor/SI During warranty/AMC period to maintain the system, necessary spares to be maintained by the end-user/Contractor/SI.
- (3) All installation work should be supervised by OEM or authorized representative of OEM. (4) Before installation of above fire alarm system, installation plan shall be prepared and got approved by the Railway and OEM jointly.

### **General:**

All signaling and Telecommunication works including Survey, design, supply, installation, testing and commissioning shall be executed in accordance with the provisions of the **Indian Railway Signal Engineering Manual**, Policies enclosed in **SECR Compendium 2.0 2025**, Latest **Railway Board policies and Circulars**, Latest **RDSO guidelines and TAN (Technical Advisory Notes)** approved drawings-SIP, RCC, RSP, IFC, ALC, CCP, CRP, LD and Outdoor circuits etc.