

**Name of work:** - Provision for segregation of 110V DC +VE & -VE cables at all levels and provision of cage clamp Terminals with Glass Fuses for enhanced fire safety in LHB EOG AC Coaches as per CAI no. ED/CAI/033 dated 02.04.2024" in LHB AC coaches. for 12 month. (PB. Item no. 767/2024-25 (379/2025-26) and WB Item no. 720/2024-25 (546/2025-26)

**Schedule of Rates & Quantities**

| S.N | Description of item  | Qty | Unit | Unit Rate (in Rupees) | Total Amount (in Rupees) |
|-----|--|-----|------|-----------------------|--------------------------|
| 1   | Modification related to electrical and mechanical work for segregation of 110 V DC +ve & -ve at all levels and provision of cage clamp Terminals with Glass fuses for enhanced Fire Safety in LHB EOG AC 2 tier coaches as per CAI no. ED/CAI/033 Dtd. 02.04.2024, (Material required for modification in One coach, Supply, installation, testing and commissioning of-<br>(i) Set of Cage Clamp Terminals with Glass fuses for 2 tier as per EDML 230 rev-Nil Tab-2 or latest.<br>(ii) Tube Clamp-PG16 as per RDSO/PE/SPEC/AC/0138-2009 or latest.<br>(iii) Cable tray as per drawing no. LW44174 Item no.4<br>(iv) Heat shrinkable, polyolefin, high performance cable sleeve of size 6.4 mm dia, 2-inch length of required colour.<br>(v) 4 Way Socketed couplers as per Drawing no. SKED-947<br>(vi) Cable Jacket, Item-5 as per Spec EDTS-138, Corr-2 or latest.<br>(vii) Cable Jacket, Item-8 as per spec EDTS-138, Corr-2 or latest.<br>(viii) Printed ferrules for each end Terminal point for segregated wires.) As per Scope of work. | 50  | Job  | 118300.00             | 5915000.00               |
| 2   | Modification related to electrical and mechanical work for segregation of 110 V DC +ve & -ve at all levels and provision of cage clamp Terminals with Glass fuses for enhanced Fire Safety in LHB EOG AC 3 tier coaches as per CAI no. ED/CAI/033 Dtd. 02.04.2024, (Material required for modification in One coach, Supply, installation, testing and   | 100 | Job  | 115200.00             | 11520000.00              |

|  |  |  |  |  |                    |
|--|--|--|--|--|--------------------|
|  | commissioning of –<br>(i) Set of Cage Clamp Terminals with Glass fuses for 3 tier as per EDML 230 rev-Nil Tab-1 or latest.<br>(ii) Tube Clamp-PG16 as per RDSO/PE/SPEC/AC/0138-2009 or latest.<br>(iii) Cable tray as per drawing no. LW44174 Item no.4<br>(iv) Heat shrinkable, polyolefin, high performance cable sleeve of size 6.4 mm dia, 2-inch length of required colour.<br>(v) 4 Way Socketed couplers as per Drawing no. SKED-947<br>(vi) Cable Jacket, Item-5 as per Spec EDTS-138, Corr-2 or latest.<br>(vii) Cable Jacket, Item-8 as per spec EDTS-138, Corr-2 or latest.<br>(viii) printed ferrules for each end Terminal point for segregated wires.) As per Scope of work. |  |  |  |                    |
|  | <b>Total in Rs.</b>  |  |  |  | <b>17435000.00</b> |

(Total in Rs.: One Crore Sevent Four Lac Thirty Five Thousand only)




### Scope of work


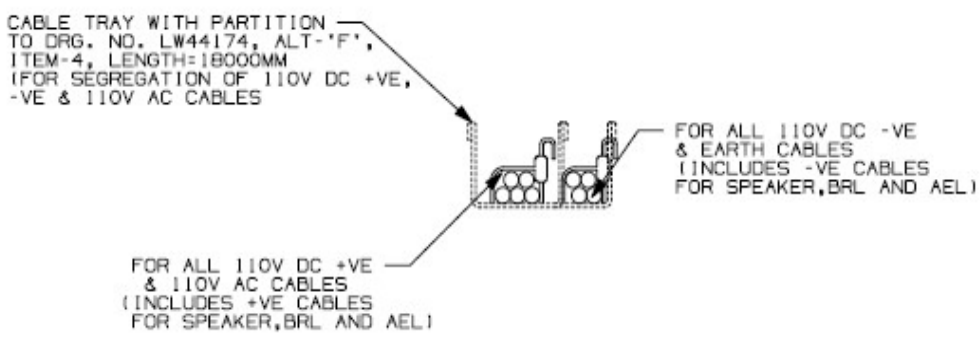
At present, 110V DC +VE & -VE wires are run through 5 nos. rigid conduit pipes (cabin side) fixed on ceiling, 2 rigid conduit pipes fixed on side wall and one cable tray (corridor side) fixed on ceiling in mixed condition.

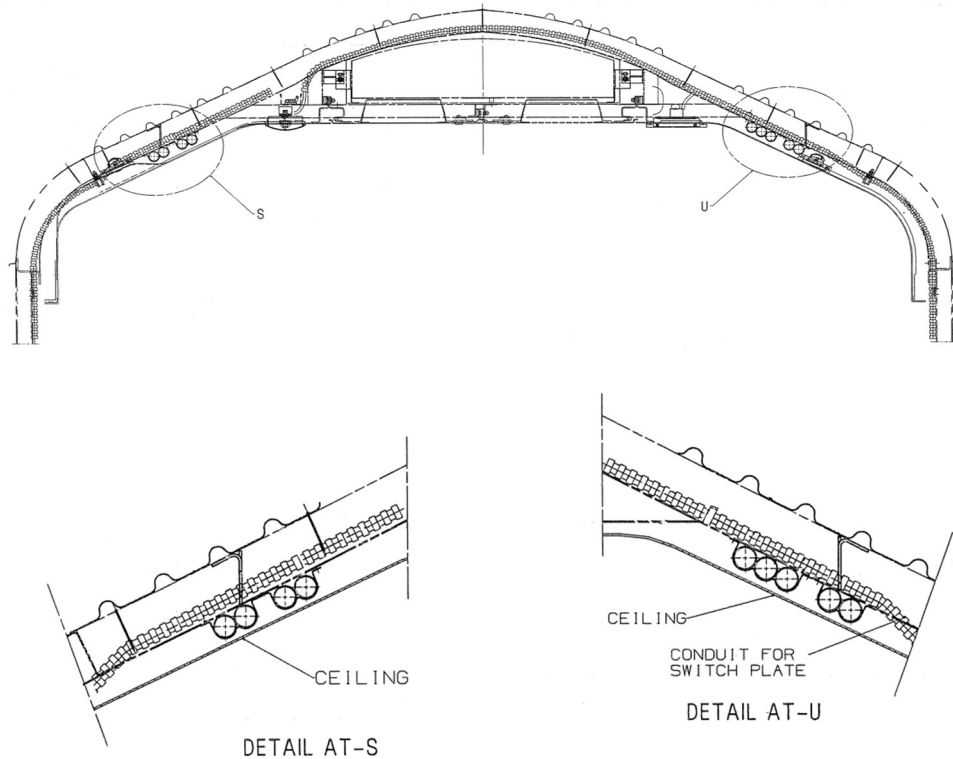
To separate the +VE & -VE wires, same need to be removed from these conduits pipes and cable tray and separated then rewiring is to be done.

The following work shall be executed by the contractor for segregation of +Ve and -Ve wires in the LHB AC coach.

|            |  |
|------------|--|
| <b>1</b>   | <b>Step-1: Removal/Dismantle of Electrical Accessories from Coach:</b>   |
|            | <b>Roof /Sidewall Arrangement:</b>   |
| 1.1        | Disconnect all the wiring circuits i.e. circuits for Light's, Night Light's, AEL's, BRL's (2T Coaches) from WAGO terminals provided in Switch Board Cabinet.   |
| 1.2        | Disconnect all the wiring circuits i.e. circuits for Light's, Night light's, AEL's, BRL's (2T Coaches) from the WAGO type connectors provided in each Cabin/Doorway/Corridor Area of the Coach.  |
| 1.3        | Dismantle the WAGO type strips provided for interconnections of wiring in each Cabin as well as in Door-way Area.  |
| 1.4        | Removal of 110V AC & DC wiring from the PVC conduits installed in the sidewall (Cabin Side) & the tray arrangement provided in the roof (Corridor Side) of the coach.  |
| 1.5        | Removal of 2 Nos. Dia. 20 mm PVC Rigid conduits from Side wall by removing the conduit clamps from side-wall.  |
| 1.6        | Disconnect all the Accident Emergency Light's (AEL) provided in Corridor & Doorway Area on both ends and Berth Reading Lights (2T Coaches).  |
| 1.7        | Dismantling of all the Berth Reading Lights provided in LHB AC 2T Coaches by removing the hardware.  |
| 1.8        | Removal of AC/DC wiring for Pantry and Lavatories Lights from the 40 mm PVC Rigid conduits provided on Cabin side.   |
| 1.9        | Removal of Cable Tray Arrangement including AC/DC wiring from the tray provided in Corridor Area.  |
| <b>2</b>   | <b>Modifications required in Under-frame/Roof /Sidewall Arrangement of LHB EOG AC 3-Tier Coaches:</b>  |
| <b>2.1</b> | <b>Modifications in Under frame Area:-</b>   |
| 2.1.1      | Segregation of 110V DC +VE & -VE Cables is already being done in existing LHB Coaches as the output cables from 4.5 KW RBC i.e. 110V DC +VE, +VE & -VE are routed to SBC, Battery Fuse Box (+VE) and Battery Fuse Box (-VE) respectively via. different polyamide conduits, hence no change is required in under-frame wiring. |
| <b>2.2</b> | <b>Modification in Side Wall Area :-</b>   |
| 2.2.1      | 01 no. additional hole of dia. 04 mm shall be made from the existing bottom side hole at C-C 88 mm for provision of the triple conduit clamp to Drawing No. LP76001, Alt-'c', Item-16  |

|            |   |            |   |            |  |            |   |
|------------|---|------------|---|------------|--|------------|---|
| 2.2.2      | <p>01 no. additional PVC Rigid Conduit shall be laid above the existing 02 nos. PVC Rigid Conduits on the sidewall for Jumper wiring and clamping of the same shall be done with the help of triple conduit clamp as shown below. Wiring shall be routed from SBC to Cage clamp terminals via. these 03 nos. PVC Rigid Conduits as per following details:-</p> <table border="1" data-bbox="289 352 1446 525"> <tr> <td>Conduit -1</td><td>All DC -VE &amp; Earthing Cables (i.e. 110V DC FLD-, FLS-, NL-, ALARM-, PE (Light))</td></tr> <tr> <td>Conduit -1</td><td>All DC +VE Cables (i.e. 110V DC FLD+, FLS+, NL+, ALARM-I+, ALARM-II+ (Loop))</td></tr> <tr> <td>Conduit -1</td><td>All MCS Cables (i.e. 110V AC Ph., Ph., Neutral, Earth).</td></tr> </table> <div data-bbox="495 588 1429 961">  </div> | Conduit -1 | All DC -VE & Earthing Cables (i.e. 110V DC FLD-, FLS-, NL-, ALARM-, PE (Light)) | Conduit -1 | All DC +VE Cables (i.e. 110V DC FLD+, FLS+, NL+, ALARM-I+, ALARM-II+ (Loop)) | Conduit -1 | All MCS Cables (i.e. 110V AC Ph., Ph., Neutral, Earth). |
| Conduit -1 | All DC -VE & Earthing Cables (i.e. 110V DC FLD-, FLS-, NL-, ALARM-, PE (Light))   |            |   |            |  |            |   |
| Conduit -1 | All DC +VE Cables (i.e. 110V DC FLD+, FLS+, NL+, ALARM-I+, ALARM-II+ (Loop))  |            |   |            |  |            |   |
| Conduit -1 | All MCS Cables (i.e. 110V AC Ph., Ph., Neutral, Earth).   |            |   |            |  |            |   |
| 2.2.3      | <p>Due to increase in size of Cage Clamp Terminals provided, the length of PVC Conduit for Jumper wiring shall be reduced by 250 mm (approx). i.e. from 1700 mm to 1450 mm (08 Nos.) &amp; 1000 mm to 800 mm (02 Nos.).</p>   |            |   |            |  |            |   |
| 2.2.4      | <p>4-Way socketed couplers on the PVC conduits as per Drawing no. <b>SKED-947</b> shall be provided in each cabin area for passing of MCS and DC +VE wiring at locations for cables exit to switches.</p>   |            |   |            |  |            |   |
| 2.2.5      | <p>Provision of Cage Clamp Terminals with Glass Fuses similar to LHB Non AC Coaches as per <b>EDML-230, Table-1</b> in place of 4-conductor Terminal Blocks shall be as follows :-</p> <div data-bbox="565 1234 1328 1495">  </div>   |            |   |            |  |            |   |
| 2.2.6      | <p>Din Rail of length 300 mm shall be mounted at 15 mm below the existing terminal strip mounting location for accessibility on the same WAGO Bracket. Accordingly, connections shall be done.</p> <div data-bbox="365 1669 609 1890"> <p>Cage Clamp<br/>Terminals with<br/>connections<br/>(Cabin-5)</p> <p>Length of Din Rail<br/>= 300 mm</p> </div> <div data-bbox="738 1596 1307 1942">  </div>  |            |   |            |  |            |   |

|       |   |
|-------|---|
| 2.3   | <b>Modifications in Roof Area:</b>  |
| 2.3.1 | <p>Segregation of 110V DC +VE &amp; -VE shall be done in Branch Wiring by providing extra NW-12 flexible conduit, however due to only 01 No. Cable drop hole in Cant-rail for passing of NW-12 Conduit, branch wiring shall be done with Cable Jackets from the hole to Terminal Strip for easy routing of cables through 01 no. hole. These two Conduits shall be clamped with 02 nos. Tube clamps at the roof. Additional sleeve shall be used for routing of cables separately from conduit to equipment i.e. Limit Switch, Lights.</p> <div data-bbox="289 420 1453 871">  </div> |
| 2.3.2 | <p>The existing cable tray arrangement to Drawing No. LW44174, Item-6, Length = 18000 mm shall be replaced with Drawing No. LW44174, Item-4, Length = 18000mm with provision of partition between Cable tray for segregation of DC +VE &amp; -VE, AC cables in Roof.</p>  |
| 2.3.3 | <p>The segregation of 110V DC +VE &amp; -VE wiring shall be done for Speaker Circuit, AEL Circuit with AC Circuit Cables and 110V DC +VE Cables on one side and 110V DC -VE and Earth Cables on other side with the help of partition in Cable Tray being provided in the Corridor Area.</p> <div data-bbox="406 1155 1380 1491">  </div>   |
| 2.3.4 | <p>Lavatory wiring from PP end to NPP end shall also contemplated in dia. 40 mm PVC Rigid Conduits. The cables as provided in conduits dia. 40 mm in Roof is as under:</p> <ul style="list-style-type: none"> <li>• 02 conduits for RMPU wiring</li> <li>• One no. conduits with all DC +VE cables</li> <li>• One no. conduits with all DC -VE cables</li> <li>• One no. conduit with AC cables (including pantry wiring)</li> </ul>  |



**Details for 04 Nos. Conduits:-**

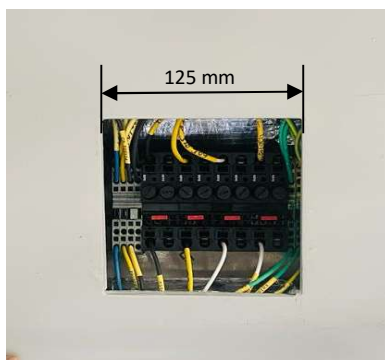
02 Nos. for RMPU Cables  
01 No. for UIC Cable  
01 No. for Temperature Sensor Cables

**Details for 05 Nos. Conduits:-**

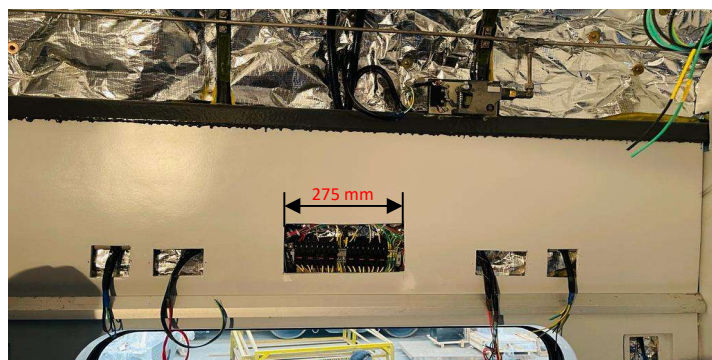
02 Nos. for RMPU Cables  
01 No. for Pantry Equipments Cable (3-Ø, 415V AC + 3Ø, 110V AC (if req.))  
01 No. for Lav. Wiring (110V DC +VE)  
01 No. for Lav. Wiring (110V DC -VE)

**2.4 Modifications in FRP Panels :**

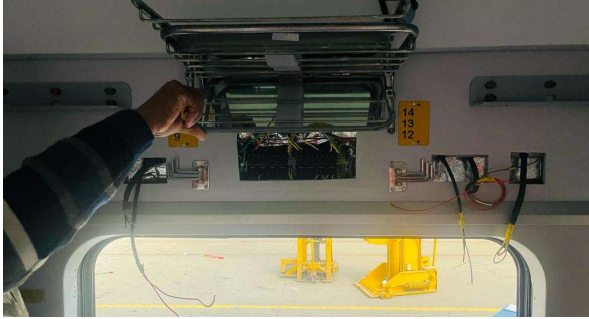
**2.4.1** As the length of the Cage Clamp Terminals is 270 mm approximately, the cut-out on the FRP panel behind mirror shall be modified to 275 mm (lengthwise) in-place of existing 125 mm to accommodate the Cage Clamp Terminals keeping the center at the same of the cutout at the same location. The FRP Panel shall be fixed on the sidewall and Mirror along with Luggage rake with no infringement shall occur.



Existing Cut out



Extended cutout

|         |  <p>Behind Mirror View</p>   |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
|---------|--|------------------|------------------|-------------|---|--|------------------|---|---|------------------|---|--|------------------|---|--|------------------|--|
| 2.5     | <b>Modifications in Lav. Wiring :</b>  |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 2.5.1   | 110V DC +VE & -VE branch cables in Lavatory Area shall also be segregated with the provision of cable jackets wherever required.   |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 2.6     | For further reference, sketch no. SKED-938 & SKED-942 has been prepared and is enclosed.   |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 2.7     | <b>Additional Modifications required in LHB EOG AC 2T Coaches :</b><br>For Segregation of 110V DC +VE and -VE Cables in LHB EOG AC 2T Coaches, same modifications as advised above are to be followed and in addition to above, following are also required:-  |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 2.7.1   | For BRL Lights, Jumper wiring is done through Cable tray in the Roof Area of the Corridor Side which will be replaced by cable tray arrangement with partition to drawing no. LW44174, Item-4 for segregation of DC +VE & -VE Cables. Jumper wiring shall be terminated at the same terminals used in existing coaches.  |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 2.7.2   | Branch wiring for the BRL shall be segregated in the different conduits with the provision of Glass fuse integrated in the Berth Reading Light itself. The Drawings for Berth Reading Lights are as per following details :-   |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
|         | <table border="1"> <thead> <tr> <th>Sl. No.</th><th>Item description</th><th>Drawing no.</th></tr> </thead> <tbody> <tr> <td>1</td><td>Berth Reading Light with USB Charging Socket Type A &amp; C with inbuilt 1.0 Amp Glass Fuse (For Longitudinal)</td><td>LW76419, Alt-'a'</td></tr> <tr> <td>2</td><td>Berth Reading Light with USB Charging Socket Type A &amp; C with inbuilt 1.0 Amp Glass Fuse (For Upper Berth)</td><td>LW76420, Alt-'a'</td></tr> <tr> <td>3</td><td>Berth Reading Light with USB Charging Socket Type A &amp; C with inbuilt 1.0 Amp Glass Fuse (For Transverse LHS Berth)</td><td>LW76421, Alt-'a'</td></tr> <tr> <td>4</td><td>Berth Reading Light with USB Charging Socket Type A &amp; C with inbuilt 1.0 Amp Glass Fuse (For Transverse RHS Berth)</td><td>LW76422, Alt-'a'</td></tr> </tbody> </table> | Sl. No.          | Item description | Drawing no. | 1 | Berth Reading Light with USB Charging Socket Type A & C with inbuilt 1.0 Amp Glass Fuse (For Longitudinal) | LW76419, Alt-'a' | 2 | Berth Reading Light with USB Charging Socket Type A & C with inbuilt 1.0 Amp Glass Fuse (For Upper Berth) | LW76420, Alt-'a' | 3 | Berth Reading Light with USB Charging Socket Type A & C with inbuilt 1.0 Amp Glass Fuse (For Transverse LHS Berth) | LW76421, Alt-'a' | 4 | Berth Reading Light with USB Charging Socket Type A & C with inbuilt 1.0 Amp Glass Fuse (For Transverse RHS Berth) | LW76422, Alt-'a' |  |
| Sl. No. | Item description   | Drawing no.      |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 1       | Berth Reading Light with USB Charging Socket Type A & C with inbuilt 1.0 Amp Glass Fuse (For Longitudinal)   | LW76419, Alt-'a' |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 2       | Berth Reading Light with USB Charging Socket Type A & C with inbuilt 1.0 Amp Glass Fuse (For Upper Berth)  | LW76420, Alt-'a' |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 3       | Berth Reading Light with USB Charging Socket Type A & C with inbuilt 1.0 Amp Glass Fuse (For Transverse LHS Berth)   | LW76421, Alt-'a' |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 4       | Berth Reading Light with USB Charging Socket Type A & C with inbuilt 1.0 Amp Glass Fuse (For Transverse RHS Berth)   | LW76422, Alt-'a' |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
|         | <b>Step-3:</b> For other wiring details, Please refer schematic details for the coach as follows:-   |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
|         | <table border="1"> <thead> <tr> <th>Sl. No.</th><th>Item description</th><th>Drawing no.</th></tr> </thead> <tbody> <tr> <td>1</td><td>Schematic Diagram of Roof for AC 3-Tier EOG LHB type Coaches</td><td>LE70202, Alt-'c'</td></tr> <tr> <td>2</td><td>Schematic Diagram of Roof for AC 2-Tier EOG LHB type Coaches</td><td>LW70212, Alt-'c'</td></tr> </tbody> </table>  | Sl. No.          | Item description | Drawing no. | 1 | Schematic Diagram of Roof for AC 3-Tier EOG LHB type Coaches   | LE70202, Alt-'c' | 2 | Schematic Diagram of Roof for AC 2-Tier EOG LHB type Coaches  | LW70212, Alt-'c' |   |  |                  |   |  |                  |  |
| Sl. No. | Item description   | Drawing no.      |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 1       | Schematic Diagram of Roof for AC 3-Tier EOG LHB type Coaches   | LE70202, Alt-'c' |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 2       | Schematic Diagram of Roof for AC 2-Tier EOG LHB type Coaches   | LW70212, Alt-'c' |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |
| 3       | Supply of material with following conditions:<br>(a) RDSO/ICF/MCF/RCF any specific Items should be as per technical parameters of respective specification.<br>(b) All the RDSO/ICF/MCF/RCF controlled Materials should be procured from RDSO/ICF/MCF/RCF firms only as per the applicable latest vendor directory.  |                  |                  |             |   |  |                  |   |   |                  |   |  |                  |   |  |                  |  |

|    |  |
|----|--|
|    | <p>(c) If any specific Make mentioned in item, it should be as per make mentioned and prior approval must be taken for similar make before supply of material.</p> <p>(d) Inspection test report must be submitted for RITES inspected material.</p> <p>(e) Inspection test report must be required for those materials which have been purchased from RDSO/ICF/MCF/RCF approved sources. Inspection test report should be from recognized/authorized agencies.</p> <p>Tenderer must submit the documentary proof of item which have been purchased from or authorized dealer/agent of OEM. To ensure the genuineness of the material, the material shall either be supplied in original OEM packing or shall be supplied with original delivery challan /invoice copy along with certificate from OEM for material being originally theirs, necessary supporting documents and challan to be produced along with materials for inspection and acceptance by nominated supervisor from railways.</p> |
| 4  | Any other work not mentioned in the scope of work but essential for completion of the work shall be deemed to be included in this scope of work as per requirement of the site and shall be done by the contractor without any extra charges.  |
| 5  | Any Item / Items of the work should be done by the contractor as per the specifications mentioned in the Railway Manuals. However, for any modification / Alterations of the Items / Work as per site conditions / requirements should be done, as desired by the Railway representative.  |
| 6  | All wires/cables shall be ensured for proper clamping and dressing using cable ties, conduits, gourmet, copper thimble, wire ferrules etc when and where required, the material used for the same shall be supplied by the contractor.   |
| 7  | The contractor shall supply material as per specification/conditions given in scope of work.   |
| 8  | If any extra petty work required to complete the work awarded contractor has to complete with no extra cost.   |
| 9  | All type of consumable i.e. Hardeners, fasteners, nut bolts, washer, bush, T bolts, cable tie, cable jacket, crimping sockets, screw, etc. shall be arranged by the contractor.  |
| 10 | Proper earthing of electrical items must be ensured by the contractor as per existing practice.  |
| 11 | All tools and equipment's required for desired work shall be arranged by the contractor at his own cost  |
| 12 | In case of any modification of referred drawing in tender document the latest drawing shall be applicable and work shall be done accordingly.  |

#### Quantity Sheet for one LHB AC coach:

**Table-1: - for LHB EOG AC 3-Tier Coaches**

| Sl. No. | Item Description  | DRG. /SPEC NO.   | Unit | QTY. required per coach | Remarks   |
|---------|---|--|------|-------------------------|---|
| 01      | Set of Cage Clamp Terminals with Glass fuses (Layout as per SKED-938) | Steel Rail: Length=300mm<br>Cat. No. 210-112 (01 No.)<br>Screw less End Stop:<br>Cat. No. 282-122 (16 Nos.)<br>Glass Fuse: 5×20 mm, 1A<br>IEC127-74 (16 Nos.)<br>Adjacent Jumper Insulated:<br>Cat. No. 282-402 (08 Nos.)<br>Cat. No. 280-402 (01 No.)<br>Cat. No. 280-422 (02 Nos.)<br>4-conductor through terminal block:<br>Cat. No. 280-833 (05 Nos.)<br>4-conductor Ground terminal | No.  | 9                       | For compartment lighting/mobile charging points in transverse berths/chain pull alarm circuit |

|   |  |  |     |   |  |
|---|--|--|-----|---|--|
|   |  | block:<br>Cat. No. 280-837 (04 Nos.) of<br>M/s<br>WAGO/Phoenix/Weidmuller or<br>equivalent approved make |     |   |  |
| 2 | 4-Conductor<br>terminal strip 2.5<br>sq.mm. (3-pole)                 | Cat. No. 261-203 of M/s<br>WAGO/Phoenix/Weidmuller or<br>equivalent approved make                        | No. | 9 | For Mobile<br>Charging Points in<br>Longitudinal<br>Berths |
| 3 | Flat Connecting<br>Complete (with<br>bracket) to Drg.<br>No. CC72431 | CC72431  | No. | 2 | For PA System<br>(Vestibule Area)                          |

**Table-2: - For LHB EOG AC 2-Tier Coaches**

| Sl. No. | Item Description  | DRG. /SPEC NO.  | Unit | QTY. required per coach | Remarks  |
|---------|---|---|------|-------------------------|--|
| 01      | Set of Cage<br>Clamp Terminals<br>with Glass fuses<br>(Layout as per<br>SKED-938) | Steel Rail: Length=300mm<br>Cat. No. 210-112 (01 No.)<br>Screw less End Stop:<br>Cat. No. 249-117 (02 Nos.)<br>Cage Clamp Terminals:<br>Cat. No. 282-112 (16 Nos.)<br>Glass Fuse: 5×20 mm, 1A<br>IEC127-74 (16 Nos.)<br>Adjacent jumper Insulated:<br>Cat. No. 282-402 (08 Nos.)<br>Cat. No. 280-402 (01 No.)<br>Cat. No. 280-422 (02 Nos.)<br>End & Intermediate plate:<br>Cat. No. 282-311 (02 Nos.)<br>Cat. No. 280-334 (02 Nos.)<br>Cat. No. 280-315 (02 Nos.)<br>4-Conductor through<br>Terminal block:<br>Cat. No. 280-833 (05 Nos.)<br>Of M/s WAGO/Phoenix/<br>Weidmuller or equivalent<br>approved make | No.  | 9                       | For compartment<br>lighting/mobile<br>charging points in<br>transverse<br>berths/chain pull<br>alarm circuit |
| 2       | 4-Conductor<br>terminal strip 2.5<br>sq. mm (10-pole)                             | Cat. No. 261-210 of M/s<br>WAGO/Phoenix/Weidmuller or<br>equivalent approved make   | No.  | 9                       | For Berth Reading<br>Lights  |
| 3       | 4-Conductor<br>terminals strip 2.5<br>sq. mm (3-pole)                             | Cat. No. 261-203 of M/s<br>WAGO/Phoenix/Weidmuller or<br>equivalent approved make   | No.  | 9                       | For Mobile<br>Charging Points in<br>Longitudinal<br>Berths   |
| 4       | Flat Connecting<br>Complete (With<br>bracket to Drg.<br>No. CC72431)              | CC72428   | No.  | 2                       | For PA System<br>(Vestibule Area)  |

**List of material required for one coach that is to be supplied by the Contractor:**

| Sl. No. | Item Description  | Specification/Drawing   | QPC | Unit  |
|---------|---|---|-----|-------|
| 1       | Set of Cage Clamp Terminals with Glass fuses (Layout as per SKED-938) | Steel Rail: Length=300mm Cat. No. 210-112 (01 No.)<br>Screw less End Stop: Cat. No. 249-117 (02 Nos.)<br>Cage Clamp Terminals: Cat. No. 282-112 (16 Nos.)<br>Glass Fuse: 5×20 mm, 1A IEC127-74 (16 Nos.)<br>Adjacent jumper Insulated: Cat. No. 282-402 (08 Nos.) Cat. No. 280-402 (01 No.) Cat. No. 280-422 (02 Nos.)<br>End & Intermediate plate: Cat. No. 282-311 (02 Nos.) Cat. No. 280-334 (02 Nos.) Cat. No. 280-315 (02 Nos.)<br>4-Conductor through Terminal block:<br>Cat. No. 280-833 (05 Nos.) of M/s WAGO/Phoenix/ Weidmuller or equivalent approved make | 9   | Nos.  |
| 2       | Set of Cage Clamp Terminals with Glass fuses (Layout as per SKED-938) | Steel Rail: Length=300mm Cat. No. 210-112 (01 No.)<br>Screw less End Stop: Cat. No. 249-117 (02 Nos.)<br>Cage Clamp Terminals: Cat. No. 282-112 (16 Nos.)<br>Glass Fuse: 5×20 mm, 1A IEC127-74 (16 Nos.)<br>Adjacent jumper Insulated: Cat. No. 282-402 (08 Nos.) Cat. No. 280-402 (01 No.) Cat. No. 280-422 (02 Nos.)<br>End & Intermediate plate: Cat. No. 282-311 (02 Nos.) Cat. No. 280-334 (02 Nos.) Cat. No. 280-315 (02 Nos.)<br>4-Conductor through Terminal block:<br>Cat. No. 280-833 (05 Nos.) of M/s WAGO/Phoenix/ Weidmuller or equivalent approved make | 9   | Nos.  |
| 3       | Tube Clamp-PG16   |   | 20  | Nos.  |
| 4       | 4-Conductor terminal strip 2.5 sq.mm. (3-pole)                        | Cat. No. 261-203 of M/s WAGO/Phoenix/Weidmuller or equivalent approved make   | 9   | No.   |
| 5       | Flat Connecting Complete (with bracket) to Drg. No. CC72431           | CC72428   | 2   | No.   |
| 6       | 4-Conductor terminal strip 2.5 sq. mm (10-pole)                       | Cat. No. 261-210 of M/s WAGO/Phoenix/Weidmuller or equivalent approved make   | 9   | No.   |
| 7       | Cable tray with partition.  | LW44174 Item no.4   | 18  | Meter |

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| 8  | Supply of heat shrinkable, polyolefin, high performance cable sleeve of size 6.4 mm dia, 2-inch length of required colour. |                  | 1  | Set  |
| 9  | 4 Way Socketed couplers as per Drawing no. SKED-947.   |                  | 8  | Nos. |
| 10 | Cable Jacket, Item-5   | EDTS-138, Corr-2 | 25 | Mtr  |
| 11 | Cable Jacket, Item-8   | EDTS-138, Corr-2 | 25 | Mtr  |
| 12 | Supply & Provision of printed ferrules for each end Terminal point for segregated wires.                                   |                  | 1  | Set  |

**Note:** Cable 1.5 sqmm, 20 mm Dia PVC rigid pipe and Polyamide Flexible Conduit NW-17 are supplied by Railway.

- The contractor to be done in this work if necessary required dismantling and reinstallation of all Electrical Fittings (Light's, Night Light's, AEL's, BRL's, switches and mobile charging socket etc.)
- The contractor to be done in this work if necessary required dismantling and reinstallation of the side panels, roof panels, seats, seat clamps/resting clamps, and the entire vertical frame behind the SBC panel with no Damage and scratches. if any damage found during inspection by mechanical supervisor the contractor should be repair/replace and painted same as.
- The mechanical work in this work should be inspected by mechanical supervisor of concern mechanical section.
- If any Electrical and Mechanical work required for successful completion of this work as per CAI no. ED/CAI/033 dated 02.04.2024 than the contractor's scope of work.
- All materials shall be supplied by the contractor and purchased exclusively as per the latest approved supplier list of RDSO, ICF, RCF, or MCF.
- **The contractor must complete the work within 7 working days of the date coach is offered by railways.**

### Special Terms and Conditions

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| 1  | <p><b>Eligibility Criteria - The contractor should have valid Electrical Contractor License issued by Govt. and submit along with tender document. If valid Electrical Contractor License is not submitted along with tender document, then offer will be summarily rejected.</b></p> <p><b>Note:</b>The submitted/uploaded license must be valid on the date of tender opening to consider as eligible offer.</p>  |
| 2  | All the work shall be carried out as per IE rules & regulation, Code of practice for Electrical Wiring Installation as per schedule of rate & specification.  |
| 3  | After completion of Electrical work, the contractor will undertake the Civil Engg. Work to re-patch the wall, ceiling, road, plaster and fill up the recesses etc. of the same  |
| 4  | Schedule of rates are only the brief idea of items, Quantity & Rates but work will be carried as per specification.   |
| 5  | <p><b>Standard Makes</b></p> <p>(i) All items endorsed by BEE under star rated labeling scheme should be of 5 star rated of BEE approved make.</p> <p>(ii) The contractor shall have to supply the material as per specifications of BIS, IEC, MNRE etc.</p> <p>(iii) Items not covered in above para should be ISI marked of reputed brand and as per technical specifications given in tender document.</p>   |
| 6  | <p>Before start the work, all items which is mentioned in work, will be inspected by Site supervisor and got approved by competent authority before execution of the work.</p> <p>Physical sample of NS items should be got approved by the contractor from Site supervisor and the competent authority before supply.</p>  |
| 7  | Transportation cost shall be borne by the contractor.   |
| 8  | Place of Work: The work will be carried out at <b>carriage workshop, Ajmer.</b>   |
| 9  | Completion Period – <b>12Months</b> from the date of issue of Letter of Acceptance.   |
| 10 | <b>Maintenance/Guarantee/Warranty Period:</b> The Maintenance/Guarantee/Warranty period for the above work is 12 Months from the certified date of completion against any defect of design / manufacture / commissioning / Maintenance / Servicing during the period of warranty for the work done by him and material provided by him. The firm should attend complaint and rectify problems during guarantee period free of cost promptly and satisfactorily. |
| 11 | In case of any dispute, the decision of Railway shall be final & binding to the contractor.   |
| 12 | <p><b>Supervisor In-charge for Work:</b> Senior Section Engineer, <b>SSE/RAC/Carriage workshop /Ajmer .</b></p> <p>The firm shall intimate the day-to-day progress to Dy.CEE/All/WS or authorized representative and shall keep liaison with <b>SSE/RAC/Carriage workshop /Ajmer.</b></p>   |

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| 13 | <b>Tool &amp; Plants</b>   |
| A  | No T&P will be supplied by Railway. All tools, equipments, machinery, material, and labour required for this work will be arranged by the contractor at his own cost.  |
| B  | Contractor shall arrange for all instruments for checking/inspection at his own cost as per direction of the Engineer-in-charge. He shall ensure that these are available when required.   |
| 14 | <b>Safety Measures</b>   |
| A  | The firm shall undertake all safety measure during the course of work and shall be responsible for any losses or deficiencies occurring during the course of execution of work.  |
| B  | It will be contractor's responsibility to ensure safety of all persons and his materials at site.  |
| 15 | The contractor and his/her representative shall be abiding by all Railway regulations in force.  |
| 16 | Rates are inclusive of materials, labours, loading charges, unloading charges, transporting charges, installing & commission charges.  |
| 17 | Necessary Photo identity cards shall be issued to the staff by the contractor which shall be signed jointly by contractor & Railway officer. These ID cards to be carried with by staff of contractor while performing work in the Workshop.   |
| 18 | Frequent changes of the service staff should not be done and service staff should wear proper uniform and should carry Authorized Identity Card in the Railway premises.   |
| 19 | Before appointing the service staff, contractor should check thoroughly their character and antecedents of the person.   |
| 20 | The contractor shall upkeep the daily record of workers & work.  |
| 21 | Proper dress code to be followed by contractor for their staff and supervisors so that easy identification can be made between Rly. & contractor's staff.  |
| 22 | A separate making entry of IN and OUT time will be maintained with RPF at entrance of Workshop.  |
| 23 | <b>Failure to attend the defects:</b>  |
| A  | All defects and deficiencies during guarantee period advised to the contractor shall be attended to by him promptly.   |
| B  | If contractor fails to respond and arrange repair/rectification within reasonable time, the Rly. shall be free to get the repairs done through departmental labour or through any other sources at contractor's expenses without prejudice to the other remedies available under the contract. |
| 24 | Any work/item not specially mentioned but required to be carried out for the satisfactory completion of work shall be considered as included in the scope of work.   |
| 25 | After successful completion of work, testing shall be carried out jointly by contractor & representative of Railway.   |
| 26 | In case of any kind of confusion/conflict/dispute regarding the lay out and any other matter, the decision of Railways will be final and binding on the contractor.  |
| 27 | Deduction of applicable taxes will be made as per prevailing rates and terms & conditions from the bill.   |

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| 28 | Competent Authority of Railway have the right to terminate the Contract if the work is not found satisfactory. The railway reserves the right to increase/decrease, delete any items of the schedule depending upon the actual working conditions.  |
| 29 | If any damage is caused as a result of execution of the work it shall be responsibility of the contractor to undertake repairs and make good the loss properly at his own cost to the satisfaction of the Railway administration/ representative.   |
| 30 | Any other work not mentioned specifically but essential for completeness of the work shall be deemed to be included in the scope of work as per requirement of site & shall be done by the contractor without any extra charges. Any other work required completing the work satisfactorily but not mentioned scope of work shall be done   |
| 31 | The contractor shall be fully responsible for his staff engaged for work. Police character verification of each staff shall be done by contractor and related documents will be submitted before execution of the work.   |
| 32 | All the work must be done in a way of good workmanship in all respect. Railway's representative shall have free access to inspect the progress of work at any time with or without prior intimation, at the contractor's premises or otherwise, to check the quality of work.   |
| 33 | All release material will have to handover to Railway.  |
| 34 | A joint record will be maintained by both site supervisor and Contractor.   |
| 35 | The contractor shall be responsible for any accident occur to his staff in Railway premises, so, he must ensure safety of their staff during the execution of work.   |
| 36 | Any clarification required regarding the subject work, AEE(WS)/Dy.CEE(WS) of Carriage Workshop, Ajmer or the undersigned may be contacted.  |
| 37 | Sufficient trained/experienced and qualified manpower shall be utilized for carrying out the work for best quality and with safety within prescribed time frame.  |
| 38 | Contractor shall also employ following Qualified Engineers during execution of the allotted work: <ul style="list-style-type: none"> <li>• One Qualified Graduate Engineer when cost of work to be executed is Rs 200 lakh and above.</li> <li>• One Qualified Diploma Holder Engineer when cost of work to be executed is more than Rs 25 lakh, but less than 200 lakh.</li> </ul> |
| 39 | Work permission to be obtained before commencement of the actual work.  |
| 40 | Any dispute regarding scope of work involved to carry out the work between contractor & Railway representative at the time of joint checking, the same shall be referred to Dy.CEE(W)/All whose decision will be final & binding.   |
| 41 | Contract will be governed as per latest GCC rules with all ACS.   |
| 42 | The contractor ensures payment of minimum wages etc. to labour engaged by him and follow the all labour rules. The contractor shall be responsible for employment of its labour and be liable for observance of all statutory provision of Government. No claim for employment of labour so engaged by the contractor in Railway whatsoever ground shall be entertained.            |

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| 43 | Offer Rates should be inclusive of all Labour, Material, Machinery, Transportation, expenses etc. and all applicable Taxes including GST.   |
| 44 | Contractor will be fully responsible for deposit of all applicable taxes as per extent rules and shall be mention in the bill produced for Payment.   |
| 45 | The Contractor shall depute a competent representative for the work, who shall be available at the site and authorized to receive instructions on behalf of the Contractor.   |
| 46 | <b>Penalty Condition:</b><br>(i) If the firm fails to complete the work within the stipulated time i.e within 07 days of the date coach is offered by railways (telephonically/through message) for the above work. Penalty of Rs.1,000/- (Rupees One Thousand) shall be imposed per day per coach by Railways for any delay in work. The said penalty is not applicable if the delay is caused due to Railways. (ii) If any item is damaged by contractor during the execution of the work, Penalty of an amount equivalent to Rate (as per Purchase Order) of that item will be imposed. (iii) During Maintenance/Guarantee/Warranty Period if complain is not attend by contractor within a period of two days then thereafter a penalty of Rs. 1000/- per complain per day will be imposed. |
| 47 | Security deposit (SD) will be released after certified Date of completion of Maintenance period.  |
| 48 | <b>Terms of payment:</b><br>Payment as Running Bills shall be made on completion of every 20 coaches or more or as mutually agreed.   |
| 49 | The work is to be done strictly as per the Indian Electricity Rules.<br>The terms and conditions of the contract will be as per the General Conditions of Contract and amendments issued by the Railway Board from time to time.<br>Before starting the work, inspection and checking of the material taken under various heads will be done by the railway representative.   |
| 50 | All the work will be done as per IE Rules & Regulation, RDSO letter no.MC/ACF/Fire Detection/AC dtd. 12.08.2024, code of practice for prevention of fire in ac coaches – RDSO/PE/0/008-2005 (rev. '0') or latest is to be ensured. Code of practice for wiring of 110 vdc - el/tl/48-2005 (rev. '1') or latest is to be ensured. Code of practice for train lighting maintenance and prevention of fire on 110 vdc - el/tl/56 -1992 or latest is to be ensured.   |

**Note:** 1. All above required documents have to attached along with the tender document to consider as an eligible offer. (All documents should be clear and visible)

**REFERENCE LIST FOR MAKE OF PRODUCTS****Annexure-“C”**

| <b>S. N.</b> | <b>Item</b>  | <b>Relevant Standards/ specifications (Latest Ver.)</b>  | <b>Reference Makes</b>   |
|--------------|--|--|--|
| 1            | Power Transformer  | IS: 2026/1977 -2011 (Part- 1 to 10) and IS: 1180/1989 & IS: 2026/1977 for upto 100 KVA, 11 kV outdoor type transformer.  | Crompton Greaves, NGEF, Kirloskar, BHEL, Bharat Bijlee, Alstom (Areva), ABB, Siemens, GEC or Similar.                |
| 2            | 11 kV/HT Vacuum Circuit Breaker, SF-6/11kV gas filled Circuit Breaker  | IS: 3427/1997  | GEC, Siemens, Crompton Greave, Alstom (Areva), Jyoti, ABB, BHEL, L&T, Schneider or Similar.                          |
| 3            | ACB(11kV)  | IS: 13118/1991   | Siemens, L&T, Crompton Greave, Schneider, Jyoti, GEC, ABB, Legrand or Similar.                                       |
| 4            | PSS/CSS with HT/LT switch gear, transformer and connected accessories  | IS:11171/1985 for dry type Power transformer   | ABB, Siemens, L&T, Crompton Greave, BHEL, GEC, Kirloskar, Alstom (Areva), Schneider or Similar.                      |
| 5            | MCCBs, MCBs, ELCBS/ RCCBs, RCBO, DB, ICTPN, TP, HRC fuse, Changing over switch, Switch Fuse Unit                                 | IS: 8828/1996 for MCB<br>IS: 13947(Part-1)/1993 & part 5/Sec1)/2004 for MCCB<br>IS: 12640/2008(Part-1) for RCCB & (Part-2) for RCBO.<br>IS: 13703/1993 for LV HRC fuse<br>IS: 13947(Part-3)/1993 for SFU | L&T, Crompton Greave, Siemens, Legrand, Jyoti, GEC, BCH, Schneider, ABB or Similar.                                  |
| 6            | XLPE Cable 11/33kV grade   | IS:7098(Part-2)/2011   | Asian, NICCO, Universal, RPG, CCI, Fort Gloster, INCAB or Similar.   |
| 7            | PVC/XLPE Power Cables up to 1.1 kV grade   | IS: 694/2010 for PVC cable,<br>IS: 1554(Part-1&2)/1988 for heavy duty PVC cable,<br>IS:7098(Part-1)/1988 for XLPE cable  | CCI, Universal Cable, RPG, NICCO, Asian, Fort Gloster, Finolex, INCAB or Similar.                                    |
| 8            | Instrument Voltmeter, Ammeter, PF meter  | IS:1248/2003 for Analog,<br>IS:13875/2008 for digital  | Automatic Electric, Meco, Industrial Meter, Motwani, Toshniwal, L&T, Siemens or Similar.                             |
| 9            | 11kV Cable End Termination & Jointing kits   | IS: 13573/1992<br>Part-1,2&3/2011  | Raychem, M-Seal, Xicon brand of CCI, 3M, Densons (Yamuna) or Similar.  |
| 10           | Relays   | IS: 3231(Part-0&1)/1986 (Part-2&3)/1987  | Siemens, L&T, Alstom, ABB, BHEL, Jyoti, GE or Similar.   |
| 11           | Luminaries, MH, HPSV, T-5 fittings, CFL & related accessories  | IS: 9974(Part-1)/1981 for HPSV<br>IS:15111/2002 for CFL  | Phillips, Crompton, Bajaj, GE, Osram, Wipro or Similar.  |
| 12           | PVC insulated Elect. Wires Sheathed/ unsheathed, PVC flexible LT cable, multicore, single core, Flat cable for submersible pumps | IS: 694/2010 for PVC cable   | Finolex, Asian, Fort Gloster, CCI, NICCO, Universal, RPG, INCAB or Similar.  |
| 13           | Current Transformer  | IS: 2705/1992  | Automatic Electric, CGL, MECO, Siemens, L&T, Schneider or Similar.   |
| 14           | On line UPS, Servo Stabilizer, Inverter, CVT   | IS:13314/1992 for Inverter<br>IS:11260/1985 for voltage Stabilizer   | AEI, BHEL, Hind Rectifier, L&T, NGEF, Siemens, Autometer, Pyramid, APC, Luminous, Microtech, TATA Libert or Similar. |
| 15           | Rotary Switches. Selector Switches   | Relevant IS  | Kaycee, L&T, GE, ABB, Siemens, or Similar.   |
| 16           | Exhaust fan/Air Circulator/ Bracket & Pedestal fans/Ceiling fan  | IS: 374/1979 for ceiling fan<br>IS: 2312/1967 for Exhaust fan  | Crompton, GEC, Usha, Philips, Bajaj, Polar, Orient or Similar.   |
| 17           | Galvanized High Mast Tower / Tubular pole/ Octagonal pole for general purpose lighting   | IS:875(Part-3)/1987 for High mast Structure,<br>BSTN-10025/1993 for High Mast Shaft,<br>IS:2026 for other component<br>IS: 2629/1985,<br>BSEN ISO- 1461 for Galvanization                                | Bajaj, Philips, GE, CGL or Similar.  |
| 18           | Electronic Energy Meter  | IS:13779/1999<br>IEC:62053-21  | L&T, IMP, HPL, Secure, ABB, Enercon or Similar.  |
| 19           | Central Air Conditioning Plants &Package type plant  | IS: 8148/2003 for package type.<br>IS: 1391/1992 for Room Air Conditioners.  | Voltas, Blue Star, Carrier, Hitachi, O General, Mitsubishi or Similar.   |
| 20           | Capacitors- PF correction for Electrical General Services  | IS:13340/1993<br>IS:13341/1992   | ABB, BHEL, Unistar, WS Insulators, L&T, Hind Rectifier, Voltas, Siemens, Schneider, or Similar.                      |
| 21           | DG Sets- Portable  | IS: 13364(Part-1)/1992 for Alternator<br>IS:10001/1981 for Diesel Engine   | Birla Yamaha, CGL, Shriram Honda or Similar.   |

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| 22 | DG Engine  | IS:13364/1992 For Alternator   | Cummins, Kirloskar, Wartsila, Caterpillar, Ashok Leyland or Similar.   |
| 23 | Alternator for DG set  | IS:4722/2001<br>IS:4728/1975   | KEC, CGL, Stamford, Kirloskar-Green or Similar.  |
| 24 | Induction Motor  | IS:325/1996<br>IS:12615/2011   | Bharat Bijlee, BHEL, CGL, GE, Jyoti, Kirloskar, Siemens, ABB, ASHIKA, NGEF, Alstom or Similar.   |
| 25 | LT Switchgear & control gears- Contactors & motor starters, Energy Efficient Soft Starter panel/ Earthing Switch, Single phase preventer | IS:13947(Part1)/1993<br>IS:13947(Part4)/1993<br>IS:13947 (Part-5)/2004   | ABB, CGL, Jyoti, L&T, NGEF, Siemens, Legrand, BCH, Standard, GEC, BHEL, Schneider or Similar.  |
| 26 | Pumps- Submersible   | IS: 8034/2002 for submersible pump sets<br>IS: 9283/1995 for motors of submersible pump sets<br>IS: 14220/1994 for open well submersible pump sets | Calama, CGL, Jyoti, Kirloskar, KSB or Similar.   |
| 27 | Timers- electronic solid state   | IEC: 60947(2004)   | ABB, BHEL, GE, Jyoti, L&T, BCH, Siemens, Legrand or Similar.   |
| 28 | Water Coolers  | IS: 1475 Part-1/2001<br>IS:1475/2005   | Blue Star, Kelvinator, Shriram, Voltas or Similar.   |
| 29 | Electrical accessories (Piano switch, Plugs & sockets, ceiling rose, Angle holder, holders, Modular switch and socket)                   | IS: 3854/1997 for switches<br>IS: 1293/2005 for plugs & sockets<br>IS: 371/1999 for ceiling rose<br>IS: 1258/2005 for lamp holder Bakelite         | SSK (Top line), Anchor (Penta-ornet), Precision (Prime), CONA(Nice-Indian), Legrand, ABB or Similar.   |
| 30 | Bell Buzzer  | IS:2268/1994 or latest   | CONA, MAX, Anchor, SSK or Similar.   |
| 31 | Electronic fan regulator   | IS:11037/1984  | Anchor, Usha, ERIK, Leader or Similar.   |
| 32 | Solar cell/Module system   | IS: 12834/1989<br>IEC 61215/2005<br>IEC 60904-2006   | TATA BP, BEL, BHEL, REIL, MOSER BEAR, CEL or Similar.  |
| 33 | Solar Lighting system  | RDSO/PE/SPEC/PS/0093-2008, Rev. 'O' – Amendment '1'  | ----   |
| 34 | GI/MS Pipe   | IS: 1239(Part-1)/1990  | TATA, Jindal, Prakash, Surya or Similar.   |
| 35 | Geysers  | IS:2082/1993   | Bajaj, Usha, Crompton, Recold, Venus or Similar.   |
| 36 | Lifts & Escalators   | IS-14665/2000 for Lift<br>RDSO/2013/EM/SPEC/0016 Rev (0) for Lift (Elevator)<br>RDSO/PE/SPEC/TL/0095-2008 Rev (0) for Escalator                    | OTIS, ThyssenKrupp, Shindler, KONE, Mitsubishi or Similar.   |
| 37 | LEDs   | IS: 16101-2012, IS: 16102-2012 Part-1,2<br>IS: 16103-2012  | NICHIA, OSRAM, SEOUL SEMICONDUCTOR, PHILLIPS LUMILEDS, LEDNIUM or Similar.   |
| 38 | Solar Water Heaters  | RDSO/PE/SPEC/PS/0094-2008 Rev '0'  | As per MNRE approved sources.  |
| 39 | Solar Distilled Water Plants   | Relevant IS  | As per MNRE approved sources.  |
| 40 | Energy savers used for lighting loads  | RDSO/PE/SPEC/PS/0083-2008 Rev. '0'   | As per MNRE approved sources.  |
| 41 | Air Cooling Plants   | Relevant IS for its concern equipments   | Voltas, Blue Star, Carrier or Similar.   |
| 42 | Battery Charger for other than battery room for Train Lighting   | IS:2026/2011-power transformer<br>IS:3895/1966<br>IS:3136/1965<br>IS:4540/1968   | Hind Rectifier, Usha Rectifier, Suresh Electrical, Pyramid, Automatic Electric, Trinity Elect., Universal Ind. Products, Venus Engg., RS Power or Similar. |
| 43 | Battery Charger for battery room   | As per RDSO specification having re-generation facility  | Amar Raja, Exide, RS Power or Similar.   |
| 44 | PVC Conduit pipe & Casing capping for electrical wiring  | IS:9537/2000   | Precision, A.K.G., Polycab, Finolex, Prestoplast or Similar.   |
| 45 | Aluminium Ladders  | IS:4571/1977   | Sumer, Beatfire or Similar.  |
| 46 | LT Panels  | IS: 2147-1952 IS:2675-1966   |  |
| 47 | Air Curtain  | Relevant IS  | Aircon, ALMONARD, Technocrate, Thermadyne, Mitzwak or Similar.   |

In addition to standard reference of list for make of product of Annexure-A except S. No.-29 will be dealt as per S. No.48.

| S. N. | Item | Relevant Standards/ specifications (Latest Ver.) | Reference Makes |
|-------|------|--|-----------------|
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|----|--|--|---|
| 48 | Modular type switch and socket   | 1. IS:3854 for Switch<br>2. IS:1293 for Socket   | 1. ESS ESS KAY, MK (Honey well), Crabtree make as per para 3.7 of RDSO specification RDSO/PE /SPEC/TL /0142-2010 (Rev-0) similar for laptop/mobile charging points.<br>2. To be procured from any ICF/RCF approved sources. |
| 49 | Thin walled E-beam copper cable  | RDSO spec No. RDSO/ SPEC /ELC/0019 (Rev. 2) Feb 2011 or latest   | As per latest RDSO approved sources.  |
| 50 | Flexible polyamide conduit pipe  | RDSO spec. No. RDSO/PE/ SPEC/AC /0138-2009 (Rev-1) or latest   | As per latest RDSO approved sources.  |
| 51 | PVC saddles / Tube clamps  | RDSO spec. No. RDSO/PE/ SPEC/AC /0138-2009 (Rev-1) or latest   | As per latest RDSO approved sources.  |
| 52 | Lugs / Crimping sockets / Thimble  | EDTS-200, EDTS-201   | To be procured from any ICF/RCF approved sources.   |
| 52 | Fire retardant type cotton insulation tape for Electrical purpose to be used in TL & AC coaches                | ICF specification No. ICF/ELEC/921 corr. slip No. 1 (Rev- 0).  | To be procured from any ICF/RCF approved sources.   |
| 53 | Decorative thermosetting synthetic bonded resin laminated sheet  | RDSO STR No.CK-514 Rev-0, amendment slips No-4 of Oct-2013, Sample code NAC -SP-05 for Non AC coaches (Blue) | As per latest RDSO approved sources.  |
| 54 | Decorative thermosetting synthetic bonded resin laminated sheet  | RDSO STR No.CK-514 Rev-0, amendment slips No-4 of Oct-2013, Colour shade Star dust grey (White)              | As per latest RDSO approved sources.  |
| 55 | Decorative thermosetting synthetic bonded resin laminated sheet  | RDSO STR No.CK-514 Rev-0, amendment slips No-4 of Oct-2013, Sample code NAC -SP-02 for AC coaches (Yellow).  | As per latest RDSO approved sources.  |
| 56 | Natural Fibre Thermo set Composite (NFTC) sheet for Roof Panelling of Railway Passenger Coaches (Limpet sheet) | RDSO STR No. C-K511 Rev-0 of Oct. 2005 with amendment no. 02 of Jan. 2010.                                   | As per latest RDSO approved sources.  |

END OF DOCUMENT