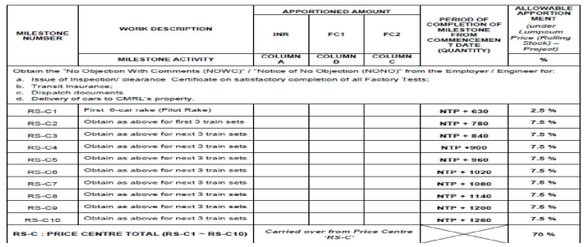
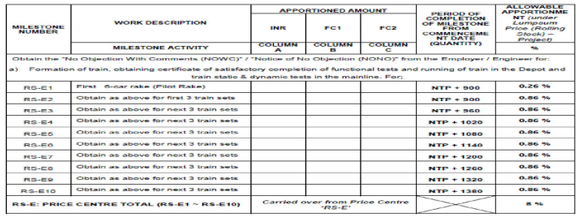
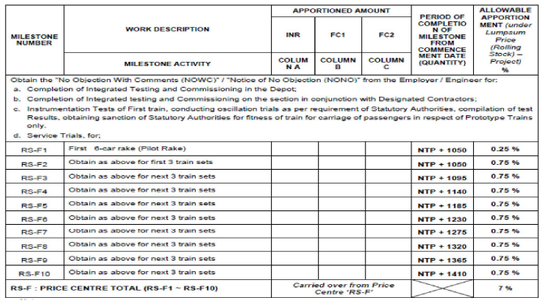
**Response to Bidder Queries**
**Tender No. CMRL / PHASE 1 / SYS / ARE05 / 2025**
**Design, Manufacture, Supply, Testing, Commissioning of Standard Guage Metro Rolling Stock (Electrical Multiple Units) and Depot Machinery & Plant and Training of Personnel**

| Sl. No. | As per the Submission of Bidder(s) | | | | CMRL Response |
|---|---|---|---|---|---|
| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 1 | Part-1, Section - III Evaluation and Qualification Criteria (EQC) | 2.5 | Subcontractors / Manufacturers Item Nos. 1 to 10 | Please clarify whether consortium model is permitted for the subject items and/or their individual components (Let us say, ex. Item No. 2, Propulsion system and/or its individual components etc.) | Refer Addendum No.1, S.No. 5 |
| 2 | Part-1, Section - III Evaluation and Qualification Criteria (EQC) | 2.5 | Subcontractors / Manufacturers Item Nos. 1 to 10 | It is our understanding that consortium model is permitted for the items and/or their components and that the conditions stipulated under "Notes for the Bidder (Clauses i,ii,iii,iv,v,vi)" at Page Nos. EQC -7 and EQC-8 shall be applicable mutatis mutandis in such cases.<br><br>Please confirm the above understanding.<br>Alternatively, please stipulate the clauses governing the consortium arrangement for the items and/or its components. | Refer Addendum No.1, S.No. 5 |
| 3 | Part-1, Section - III Evaluation and Qualification Criteria (EQC) | 2.5<br>item Nos. 1 to 10 except No. 2 | <table><tr><th>Item No.</th><th>Description of Item</th><th>Minimum Criteria to be met</th></tr><tr><td>3</td><td>Passenger Doors</td><td>The proposed system shall be in satisfactory revenue operation for at least three (3) years of the bid submission deadline, in a country other than the country of origin of manufacturer or in India, at the time of bid submission</td></tr></table> | There appears to be some discrepency in the clauses due to repetition of phrases resulting in confusion.<br>It is recommended to delete the first highlighted portion of the clause (the second highlighted portion may be retained) to enhance clarity.<br><br>The same issue persist for all the items (S L no. 1 to 10, except SL No. 2). Hence it is requested to amend all the clauses accordingly. | Refer Addendum No.1, S.No. 6 to 14 |
| 4 | Part-1, Section - IV Bidding Forms | Format 5.15 | **5.15 CERTIFICATE CONFIRMING MINIMUM LOCAL CONTENT**<br><br>We hereby jointly and severally certify in accordance with clause '9.a' of the Order no. P- 45021 / 2 / 2017 - PP (BE-II) - Part (4) Vol. II of Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (DPIIT) (formerly Department of Industrial Policy and Promotion (DIPP)), Government of India dated 19 July 2024 that the item(s) offered meets the Minimum Local Content (MLC) of<br>(i) 60% (For Class I Local Supplier)<br>(ii) 20% (For Class II Local Suppliers) } Strike off whichever is not applicable.<br>(iii) < 20% (For Non-Local Suppliers)<br>(60% MLC for Rolling Stock as specified in MoHUA Order No. K - 14011 / 08 / 2017 / MRTS - Coord dated 14th October 2020). The details including name of vendor, location at which the local value addition is made, and percentage of local content will be provided within 15 days of issue of LoA. | The Clause 2.7 of the Section - III, EQC stipulates that the MLC is derived on total contract price (*not Rolling Stock alone* ) as below:<br><br>**2.7 Purchase Preference**<br>The requirements of stipulations pertaining to Public Procurement Order, 2017 dated 16th September 2020 issued by Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (Public Procurement Section) shall apply.<br>Minimum Local Content (MLC) for Class – I local supplier shall be 60% (Derived on Total Contract Price) as per the order No.K – 14011 / 08 / 2017 / MRTS – Coord dated 14th October 2020 issued by Ministry of Housing and Urban Affairs (MoHUA).<br>The Undertaking / Confirmation shall be submitted by the Bidder as per the prescribed Form 5.15 'CERTIFICATE CONFIRMING MINIMUM LOCAL CONTENT' in Section IV - Bidding Forms.<br><br>In alignment with the above, please amend the Format 5.15 (highlighted portion) as below:<br>Existing:<br>60% MLC for Rolling Stock<br>Read as:<br>60% MLC for total contract price | Refer Addendum No.1, S.No. 27 |
| 5 | Part-1, Section - IV Bidding Forms | 3.1.1 | The quoted lumpsum price by the bidder is inclusive of all taxes, levies, duties, cess as per GST / Custom tariff act etc., royalty, insurance, freight and fees required to be paid by him under the Contract. | For the purpose of reference only, we request Chennai Metro to menion the taxes, levies, duties, cess (other than GST) levied under its past rolling stock contracts. | Tender conditions prevail. |
| 6 | Part-1, Section - IV Bidding Forms | 4.1.8 | The lump sum price for Rolling Stock (28 trainsets of 6-car each) shall be apportioned by the Bidder among the Price Centre 'RS-A', 'RS-CST', 'RS-FAI', 'RS-CPT', 'RS-C', 'RS-E' and `RS-F'. The details of the Price Centre and the apportioned amount for each Price Centre will be further distributed among various Milestones based on the currency or currencies in which the Bid Price is expressed in the Bid of the successful Bidder. | The clause 1.4.3 of the Part 2 – Section VI A: ERTS – RS stipulates that:<br>"During the initial phase of the operational requirement, rakes have to be operated in GoA2 (ATO) / GoA1 (ATP). However, the Phase 1 project is planned for the upgradation of the Signalling System to GoA3 & GoA4 operations."<br>In the event of any delay or non upgradation of the Signaling System to GoA3 & GoA4 operations, please clarify whether any deduction shall be applicable to the lumpsum price of the Rolling Stock (28 trainsets of 6-car each) apportioned across the Price Centres, namely, 'RS-A', 'RS-CST', 'RS-FAI', 'RS-CPT', 'RS-C', 'RS-E' and `RS-F'. If so, kindly indicate the quantum of such deduction and the specific price centre(s) to which it would apply.<br>Our understanding is that no deduction to the Contract price should be applicable, as any delay or non upgrade of the signalling system is beyond the control of the Contractor. Please confirm. | Refer Addendum No.1, S.No. 17 |
| 7 | Part-1, Section - IV Bidding Forms | 4.1.28 | ….....<br>Without prejudice individual Price Centers which explicitly define NOWC status as the requirement;<br>The Engineer / Employer may consider release of 80% payment (based on the actual work completed)…..... | We request to not define the specific percentage for payment with NoWC status.<br>We request to amend the clause as below:<br>….....<br>Without prejudice individual Price Centers which explicitly define NOWC status as the requirement;<br>The Engineer / Employer may consider release of payment commensurate with the work completed.....<br><br>Please amend. | Tender conditions prevail. |

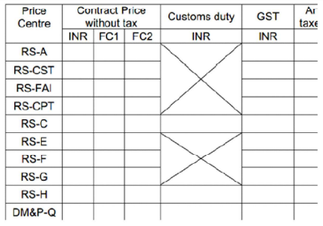
| Sl. No. | As per the Submission of Bidder(s) | | | | CMRL Response |
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| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 8 | Part-1, Section – IV Bidding Forms | 4.4.6 | PRICE CENTRE 'RS-C' – INDIGENOUS MANUFACTURE, TESTING, INSPECTION, TRANSPORTATION AND DELIVERY TO CMRL DEPOT<br>  | Although the Milestones are defined comprising multiple trainsets under each mile stone, please confirm that the payment is released on trainset wise basis. | Refer Addendum No.1, S.No. 22 |
| 9 | Part-1, Section – IV Bidding Forms | 4.4.8 | PRICE CENTRE 'RS-E' – FORMATION, TESTING IN THE DEPOT FOR INDIGENOUSLY MANUFACTURED TRAINS<br>  | Although the Milestones are defined comprising multiple trainsets under each mile stone, please confirm that the payment is released on trainset wise basis. | Tender conditions prevail. |
| 10 | Part-1, Section – IV Bidding Forms | 4.4.9 | PRICE CENTRE 'RS-F' – INTEGRATED TESTING AND COMMISSIONING OF TRAINS AND SERVICE TRIALS<br>  | Although the Milestones are defined comprising multiple trainsets under each mile stone, please confirm that the payment is released on trainset wise basis. | Refer Addendum No.1, S.No. 24 |
| 11 | Part-1, Section - IV Bidding Forms | 4.4.10, Note 7 & 8 | *7) Contractor shall indicate the annual percentage that will be applicable for increase or decrease of the unit cost of each item/spare listed in Annexures GA1 to GA6 for procurement by Employer for a period of up to ten years after the date of issue of the Performance Certificate.*<br>*8) Employer may exercise the option to procure individual Spares listed in Annexures GA1 to GA6 by the bidder at any time within ten years of the date of issue of Performance Certificate. Procurement Price in such case shall be calculated by considering the percentage of increase/decrease per annum (with minimum duration as one month) as quoted by the Contractor in Annexures GA1 to GA6.* | We could not find the provision in the tender formats to quote the annual percentage as mentioned in the clauses.<br>Please amend the clause / tender formats. | Refer Addendum No.1, S.No. 25 |
| 12 | Part-1, Section - IV Bidding Forms | 4.4.10.6 | RS-G6 – Intermediate Overhauling Spares | Please confirm the number of trainsets for which the Overhauling Spares are to quoted | Refer Addendum No.1, S.No. 26 |

| Sl. No. | As per the Submission of Bidder(s) | | | | CMRL Response |
|---|---|---|---|---|---|
| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 13 | Part-1, Section - III Evaluation and Qualification Criteria (EQC) | 2.5 , Item No. 2, Propulsion (Traction converter, Auxiliary converter and Traction motors) | Propulsion (Traction converter, Auxiliary converter and Traction motors) — The designer of the Traction Converter-Inverter shall be considered as the integrator of the Propulsion System and shall individually have a minimum of ten (10) years of experience in the design and manufacturing of Traction Converter-Inverters for Metro Rolling Stock. Additionally, the system supplied shall have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars, comprising both powered and non-powered cars, supplied against at least three (3) different contracts in Metro Railway. The integrator of the propulsion system shall have full responsibility for any warranty obligations and design modifications of the propulsion system during the contract period, for which adequate past experience is required. Furthermore, other suppliers must qualify for their respective scope of work against the eligibility criteria as mentioned in the respective tenders of the Metro Railway. | Please clarify the terms, (a) Metro Rolling Stock (b) Metro Railways.<br><br>The extracts from Metro Rail Policy 2017 regarding the classification of Metro Rail, is reproduced below for reference:<br><br>**Metro Rail:** Metro rail is a fully segregated rail based mass transit system, which could be at grade, elevated or underground. Due to its physical segregation and system technology, metro rail can have a very high capacity of 40,000 – 80,000 passengers per hour per direction (PPHPD). Metro systems also include monorails, which, however, has lower capacities and higher maintenance cost.<br>Based on the above definition, it is our understanding that Suburban railways / 3-phase EMUs also fall within the category of Metro Rail, as they are rail based mass transit systems with high passenger carrying capacity.<br><br>Accordingly, please confirm that the experience of Sub urban Railways / EMUs shall also be considered as meeting the experience requirements under this clause. | Refer Addendum No.1, S.No. 15 |
| 14 | Part-1, Section - III Evaluation and Qualification Criteria (EQC) | 2.5 , Item No. 2, Propulsion (Traction converter, Auxiliary converter and Traction motors) | Propulsion (Traction converter, Auxiliary converter and Traction motors) — The designer of the Traction Converter-Inverter shall be considered as the integrator of the Propulsion System and shall individually have a minimum of ten (10) years of experience in the design and manufacturing of Traction Converter-Inverters for Metro Rolling Stock. Additionally, the system supplied shall have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars, comprising both powered and non-powered cars, supplied against at least three (3) different contracts in Metro Railway. The integrator of the propulsion system shall have full responsibility for any warranty obligations and design modifications of the propulsion system during the contract period, for which adequate past experience is required. Furthermore, other suppliers must qualify for their respective scope of work against the eligibility criteria as mentioned in the respective tenders of the Metro Railway.<br><br>(or)<br><br>The manufacturer of the propulsion equipment (Traction Converter-Inverter, Auxiliary Converter-Inverter, and Traction Motor) proposed by the bidder as a sub-contractor for the supply of propulsion equipment against this bid shall have a minimum of ten (10) years of experience in the field of design and manufacturing of the propulsion equipment. The propulsion equipment designed, manufactured, and supplied by the said manufacturer must have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars comprising both powered and non-powered cars, supplied against at least three (3) different contracts in the Metro Railway. | In earlier tenders issued by CMRL (ARE03A, ARE02A, ARE04A), the term "Metros" was clearly elaborated to include MRT, Metro-lite, LRT, LRV, Tramway, Suburban Railways, EMU or high speed railways.<br><br>However, in the present tender, the term is not elaborated. In the interest of clarity, transparency and wider participation, we request CMRL to elaborate the term, consistent with the approach adopted in earlier tenders.<br><br>In the absence of the elaboration, we convey that the qualification criteria becomes unduly restricitive favouring certain bidder.<br><br>Accordingly, we request that the term be elaborated to enable us proceed with the bid and to ensure fair, open and competitive tendering process. | Refer Addendum No.1, S.No. 15 |

| Sl. No. | As per the Submission of Bidder(s) | | | | CMRL Response |
|---|---|---|---|---|---|
| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 15 | Part-1, Section - III Evaluation and Qualification Criteria (EQC) | 2.5 Subcontractors / Manufacturers | 2.5 Subcontractors / Manufacturers<br>Subcontractors / Manufacturers for the following major items of supply or services must meet the following minimum criteria, herein listed for that item:<br><br>Item No. 2 Propulsion (Traction converter, Auxiliary converter and Traction motors)<br>The designer of the Traction Converter-Inverter shall be considered as the integrator of the Propulsion System and shall individually have a minimum of ten (10) years of experience in the design and manufacturing of Traction Converter-Inverters for Metro Rolling Stock. Additionally, the system supplied shall have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars, comprising both powered and nonpowered cars, supplied against at least three (3) different contracts in Metro Railway. The integrator of the propulsion system shall have full responsibility for any warranty obligations and design modifications of the propulsion system during the contract period, for which adequate past experience is required. Furthermore, other suppliers must qualify for their respective scope of work against the eligibility criteria as mentioned in the respective tenders of the Metro Railway.<br>(or)<br>The manufacturer of the propulsion equipment (Traction Converter-Inverter, Auxiliary Converter-Inverter, and Traction Motor) proposed by the bidder as a sub-contractor for the supply of propulsion equipment against this bid shall have a minimum of ten (10) years of experience in the field of design and manufacturing of the propulsion equipment. The propulsion equipment designed, manufactured, and supplied by the said manufacturer must have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars comprising both powered and non-powered cars, supplied against at least three (3) different contracts in the Metro Railway. | 2.5 Subcontractors / Manufacturers<br>Subcontractors / Manufacturers **(including it's Associate)** for the following major items of supply or services must meet the following minimum criteria, herein listed for that item:<br>***Associate:*** *For the purpose of this Clause, Associate shall mean, in relation to the Sub-contractor, a person who controls, is controlled by, or is under the common control with such Sub-contractor (the "Associate"). As used in this definition, the expression "control" means, with respect to a person which is a company or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person by operation of law.*<br><br>Item No. 2 Propulsion (Traction converter, Auxiliary converter and Traction motors)<br>The designer of the Traction Converter-Inverter shall be considered as the integrator of the Propulsion System and shall individually have a minimum of ten (10) years of experience in the design and manufacturing of Traction Converter-Inverters for Metro Rolling Stock. Additionally, the system supplied shall have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars, comprising both powered and nonpowered cars, supplied against at least three (3) different contracts in Metro Railway. The integrator of the propulsion system shall have full responsibility for any warranty obligations and design modifications of the propulsion system during the contract period, for which adequate past experience is required. Furthermore, other suppliers must qualify for their respective scope of work against the eligibility criteria as mentioned in the respective tenders of the Metro Railway.<br>(or) | Refer Addendum No.1, S.No. 15 |
| | | | Item No. 5 Train Control and Monitoring System (TCMS)<br>The proposed system shall be in satisfactory revenue operation in GoA4 for at least three (3) years of the bid submission deadline, in a country other than the country of origin of manufacturer or in India, at the time of bid submission. | The manufacturer of the propulsion equipment (Traction Converter-Inverter, Auxiliary Converter-Inverter, and Traction Motor) proposed by the bidder as a sub-contractor for the supply of propulsion equipment against this bid **(including it's Associate)** shall have a minimum of ten (10) years of experience in the field of design and manufacturing of the propulsion equipment. The propulsion equipment designed, manufactured, and supplied by the said manufacturer must have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars comprising both powered and non-powered cars, supplied against at least three (3) different contracts in the Metro Railway.<br>**The sub-contractor (including its Associates) shall meet the Eligibility and Qualification Criteria (EQC) specified in Clause 2.5 Item no. 2.**<br><br>Item No. 5 Train Control and Monitoring System (TCMS)<br>The proposed system shall be in satisfactory revenue operation in GoA4 for at least three (3) years of the bid submission deadline, in a country other than the country of origin of manufacturer or in India, at the time of bid submission.<br>**The sub-contractor (including its Associates) shall meet the Eligibility and Qualification Criteria (EQC) specified in Clause 2.5 Item no. 5.**<br><br>We request you to please include **"Associate"** clause as mentioned above into 2.5 Subcontractors / Manufacturers for item nos. 2 and 5. | Refer Addendum No.1, S.No. 15 |

<table>
<tr><th rowspan="2">Sl. No.</th><th colspan="3">As per the Submission of Bidder(s)</th><th rowspan="2">CMRL Response</th></tr>
<tr><th>Part/ Section No</th><th>Clause No.</th><th>Original Bid Condition</th><th>Bidder’s queries</th></tr>
<tr><td>16</td><td>Part 1 , Secrion III</td><td>2.5 , Item No. 2, Propulsion (Traction converter, Auxiliary converter and Traction motors)</td><td>The designer of the Traction Converter-Inverter shall beconsidered as the integrator of the Propulsion System and shall individually have a minimum of ten (10) years of experience in the design and manufacturing of Traction Converter-Inverters for Metro Rolling Stock. Additionally, the system supplied shall have been in satisfactory revenueoperation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars, comprising both powered and nonpowered cars, supplied against at least three (3) different contracts in Metro Railway. The integrator of the propulsionsystem shall have full responsibility for any warranty obligations and design modifications of the propulsion system during the contract period, for which adequate past experience is required. Furthermore, other suppliers must qualify for their respective scope of work against the eligibilitycriteria as mentioned in the respective tenders of the MetroRailway<br>(or)<br>The manufacturer of the propulsion equipment (TractionConverter-Inverter, Auxiliary Converter-Inverter, and Traction Motor) proposed by the bidder as a sub-contractor for thesupply of propulsion equipment against this bid shall have aminimum of ten (10) years of experience in the field of design and manufacturing of the propulsion equipment. Thepropulsion equipment designed, manufactured, and supplied by the said manufacturer must have been in satisfactoryrevenue operation for at least five (5) years in a country otherthan the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars comprising both poweredand non-powered cars, supplied against at least three (3) different contracts in the Metro Railway</td><td>We request CMRL to elaborate definition of “Metro Rolling Stock” to include MRT, Metro Lite, LRT, LRV, Tramway, Suburban Railways, EMU, and High-Speed Railways. Similar to previous tender of ARE02A, ARE03A and ARE04A. ,in this regard we request to modify the condition as following<br><br>"The designer of the Traction Converter-Inverter shall beconsidered as the integrator of the Propulsion System and shall individually have a minimum of ten (10) years of experience in the design and manufacturing of Traction Converter-Inverters for Metros ( i.e.MRT, Metro-lite, LRT, LRV,Tramway, Suburban Railways,EMU or high speed railways). Additionally, the system supplied shall have been in satisfactory revenueoperation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars, comprising both powered and nonpowered cars, supplied against at least three (3) different contracts in Metros ( i.e.MRT, Metro-lite, LRT, LRV,Tramway, Suburban Railways,EMU or high speed railways). The integrator of the propulsionsystem shall have full responsibility for any warranty obligations and design modifications of the propulsion system during the contract period, for which adequate past experience is required. Furthermore, other suppliers must qualify for their respective scope of work against the eligibilitycriteria as mentioned in the respective tenders of the MetroRailway<br>(or)<br>The manufacturer of the propulsion equipment (TractionConverter-Inverter, Auxiliary Converter-Inverter, and Traction Motor) proposed by the bidder as a sub-contractor for thesupply of propulsion equipment against this bid shall have aminimum of ten (10) years of experience in the field of design and manufacturing of the propulsion equipment. Thepropulsion equipment designed, manufactured, and supplied by the said manufacturer must have been in satisfactoryrevenue operation for at least five (5) years in a country otherthan the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars comprising both poweredand non-powered cars, supplied against at least three (3) different contracts in the Metros ( i.e.MRT, Metro-lite, LRT, LRV,Tramway, Suburban Railways,EMU or high speed railways)</td><td>Refer Addendum No.1, S.No. 15</td></tr>
<tr><td>17</td><td>Part-1, Section – IV, Bidding Forms (BF)</td><td>3.3.2</td><td>The Price of each 6-car train-set to be supplied against Quantity Variation shall be derived from the contracted cost of the original tendered quantity, against ‘RS-C’, ‘RS-E’ and ‘RS-F’.</td><td>This item was highlighted during the pre-bid meeting.<br><br>As per the clause, the price for Option Quantity Variation shall be 85% of the original quantity price due to non consideration of Price Centres ‘RS-A’, ‘RS-CST’, ‘RS-FAI’, ‘RS-CPT’.<br><br>The price centres percentages are mere ammortization percentages serving as payment milestone stones and does not reflect the cost structure of the Contractors. The actual non recurring costs of the Contrcator are much smaller.<br><br>We request CMRL to not deduct more than an amount of 5% for the optional quantities.<br>Please consider.</td><td>Tender conditions prevail.</td></tr>
<tr><td>18</td><td>Part-1, Section – IV, Bidding Forms (BF)</td><td>3.3.1</td><td>The Employer may at its entire discretion advise the Contractor in writing of its intention to increase the total quantity by up to 60 cars (10 Trainsets of 6 Car configuration).</td><td>Please clarify any linkages between DLP/DNP completion of option quantity trainsets and original quantity trainsets. We understand DLP/DNP of 730 days is trainset wise, Please confirm.</td><td>Refer Addendum No.1, S.No. 432</td></tr>
<tr><td>19</td><td>Part-1, Section – IV, Bidding Forms</td><td>Clause 3.1.1</td><td>The quoted lumpsum price by the bidder is inclusive of all taxes, levies, duties, cess as per GST / Custom tariff act etc., royalty, insurance, freight and fees required to be paid by him under the Contract.<br>….....</td><td>In line with the RS contracts of other major metro corporations, we recommend the lumpsum price shall be exclusive of GST and Custom duties. GST & Custom duties shall be reimbursed at actuals as extra.<br>Please consider/modify.</td><td>Tender conditions prevail.</td></tr>
<tr><td>20</td><td>Part-1, Section – IV, Bidding Forms</td><td>4.2</td><td><table><tr><th rowspan="2">S. No</th><th rowspan="2">Description</th><th colspan="3">Total Amount with taxes</th><th rowspan="2">Allowable apportionment</th></tr><tr><th>INR</th><th>FC1</th><th>FC2</th></tr><tr><td>1.1.6</td><td>Price Centre RS-E:<br>Formation of Indigenous manufactured trains, satisfactory completion of tests and running of train in the depot.</td><td></td><td></td><td></td><td>8.0%</td></tr><tr><td>1.1.7</td><td>Price Centre RS-F:<br>Integrated testing and commissioning of trains and service trials.</td><td></td><td></td><td></td><td>7.0%</td></tr></table></td><td>We request to amend the payment percentaged of Price Centre No. E and F as below:<table><tr><th>Mile stone</th><th>Allowable apportionment</th><th>Amendment request for Allowable apportionment</th></tr><tr><td>RS-E<br>Formation of Indigenous manufactured trains, satisfactory completion of tests and running of train in the depot</td><td>8%</td><td>13%</td></tr><tr><td>RS-F<br>Integrated testing and commissioning of trains and service trials</td><td>7%</td><td>2%</td></tr></table></td><td>Tender conditions prevail.</td></tr>
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| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 21 | Part 1: Section - III Evaluation and Qualification Criteria (EQC) | 2.5 Subcontractors / Manufacturers<br><br>2 Propulsion (Traction converter, Auxiliary converter and Traction motors) | (or)<br>The manufacturer of the propulsion equipment (Traction Converter-Inverter, Auxiliary Converter-Inverter, and Traction Motor) proposed by the bidder as a sub-contractor for the supply of propulsion equipment against this bid shall have a minimum of ten (10) years of experience in the field of design and manufacturing of the propulsion equipment. The propulsion equipment designed, manufactured, and supplied by the said manufacturer must have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars comprising both powered and non-powered cars, supplied against at least three (3) different contracts in the Metro Railway. | There is an ambiguity to understand the definition, as per clause 2.4.2 (a), 2.4.2 (b), 2.4.2 (c), the number of cars include (Metro, LRT, Suburban EMUs, Train sets).<br><br>As per the extract of clause 2.5 Subcontractors / Manufacturer (2 Propulsion) of ARE05 tender as reproduced below:<br>"300 cars comprising both powered and non-powered cars, supplied against at least three (3) different contracts in the Metro Railway."<br><br>CMRL is requested to confirm our understanding that Metro Railway means (MRT, Metrolite, LRT, LRV, Tramway, Sub-urban Railways, EMU or high speed railways).<br>This understanding is based on definition included in previous Chennai Metro Rolling Stock tenders (ARE02A, ARE04A, ARE03A). | Refer Addendum No.1, S.No. 15 |
| 22 | Part 1: Section - II Bid Data Sheet (BDS) | ITB 7.1 | The last date for seeking clarification shall be as per the date mentioned in CPP portal and the Employer shall not be obligated to respond to query received after the due date. | Due to Christmas festival and year end holiday, we request additional time for tender document review. Thus, we request CMRL to extend last date for seeking clarification until 31st January 2026. | Tender conditions prevail. |
| 23 | Part 1: Section - II Bid Data Sheet (BDS) | ITB 1.1 | DESIGN, MANUFACTURE, SUPPLY, TESTING, COMMISSIONING OF STANDARD GAUGE METRO ROLLING STOCK (ELECTRICAL MULTIPLE UNITS) AND DEPOT MACHINERY & PLANT AND TRAINING OF PERSONNEL. | We request to include CMC scope. Outsourcing the maintenance of metro trains allows CMRL to meet the high standards of efficiency, safety, and reliability required for modern metro operations. With access to specialized expertise, reduced costs, and improved asset longevity, outsourcing is a strategic move that enables CMRL to manage resources more effectively, reduce downtime, and keep up with technological advancements. By focusing on core operations and allowing RS OEM to handle the technical complexities, CMRL can ensure that its fleet reliability and availability remains at highest level, supporting the growing passenger demand in Phase-I network.<br>Same methodology also adopted by CMRL in ARE04A tender. | Tender conditions prevail. |
| 24 | Part 1: Section - II Bid Data Sheet (BDS) | ITB 1.1 | DESIGN, MANUFACTURE, SUPPLY, TESTING, COMMISSIONING OF STANDARD GAUGE METRO ROLLING STOCK (ELECTRICAL MULTIPLE UNITS) AND DEPOT MACHINERY & PLANT AND TRAINING OF PERSONNEL. | Rolling Stock suppliers doesn't add any value addition in supply of Depot M&P's, making it only a tradable item in the scope. Hence, to optimize overall project cost, bidder requests to remove DM&P from the scope of this bid in line with the CMRL ARE04A tender where Depot M&P's are procured by CMRL under seperate DM250 contract. | Tender conditions prevail. |
| 25 | Part I - Section IV - Bidding Forms | 4.1.28 | The Contractor shall only be entitled to receive full payment for each milestone specified in respective BOQ / Price Centers upon 100% completion of the activity and issuance of a Notice of No Objection (NONO) by the Engineer. The Contractor while submitting IPA (Interim Payment Application) towards any milestone(s), shall submit all necessary documents and evidences associated to the completion of respective milestone(s) to the Engineer for processing of IPC (Interim Payment Certificate) appropriately. | We understand that in case any milestone consist of multiple activities, contractor shall be entitled to receive the payment for activities completed for that milestone on prorata basis.<br>As an example: For Milestone RS-C2; contractor shall be entitled to receive the payment on prorata basis on completing the milestone activity on per train basis also, instead of wating for "No Objection With Comments (NOWC)" / "Notice of No Objection (NONO)from the Employer / Engineer for all the 3 trainsets. | Refer Addendum No.1, S.No. 22 |
| 26 | Part-1, Section – IV, Bidding Forms | 4.2 Pricing Summary (BID TOTAL) | Allowable Apportionment:<br>Price Centre RS-C: 70%<br>Price Centre RS-E: 8%<br>Price Centre RS-F: 7% | As the bidder would incur most of its costs upon delivery of the train sets. Actual cost incurred for T&C (CC: E) and ITC (CC: F) are significantly lower than the allowable apportionment mentioned in bid document and would impact bidders cash flow. Hence we request for deletion of Price Center F inline with other metro rolling stock tenders such as DMRC and BMRCL (as annex-1 to this list) and reduction in apportionment % of Price Centre RS-E to support bidder's cash flow.<br><br>Bidder proposes changes to allowable apportionment to following price centres as below:<br>Price Centre RS-C: 80%<br>Price Centre RS-E: 35%<br>Price Centre RS-F: 7% | Tender conditions prevail. |
| 27 | Part-1, Section – IV Instructions for completing the pricing document | Clause 3.1.1 , Clause 4.1.4 Clause 4.2 | 3.1.1. The quoted lumpsum price by the bidder is inclusive of all taxes, levies, duties, cess as per GST / Custom tariff act etc., royalty, insurance, freight and fees required to be paid by him under the Contract.<br>The Bidder shall be required to provide the breakdown of the tax components considered in their lumpsum price in 'Table 4.3.1 and 4.3.2' of the Pricing Schedule and in compliance with the notes specified therein.<br><br>4.1.4 This is lumpsum price Contract for "Design, Manufacture, Supply, Testing, Commissioning of Standard Gauge Metro Rolling Stock (Electrical Multiple Units) And Depot Machinery & Plant and Training of Personnel." Bidder shall quote its lumpsum price inclusive of all taxes, levies, duties and other charges, including taxes to be deducted at source, leviable and payable to the authorities | Bidder request Customer to remove output GST from Bid Evaluation crieteria. Total lumpsum price to be considered shall be inclusive of all applicable taxes/duties and any other charges leviable except output GST. The output GST shall be payable by CMRL as applicable per law. | Tender conditions prevail. |

| Sl. No. | As per the Submission of Bidder(s) | | | | CMRL Response |
|---|---|---|---|---|---|
| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 28 | Part-1, Section – IV Instructions for completing the pricing document | Clause 3.1.1,<br><br>Clause 4.1.4 | The quoted lumpsum price by the bidder is inclusive of all taxes, levies, duties, cess as per GST / Custom tariff act etc., royalty, insurance, freight and fees required to be paid by him under the Contract.<br><br>The Bidder shall be required to provide the breakdown of the tax components considered in their lumpsum price in 'Table 4.3.1 and 4.3.2' of the Pricing Schedule and in compliance with the notes specified therein.<br><br>This is lumpsum price Contract for "Design, Manufacture, Supply, Testing, Commissioning of Standard Gauge Metro Rolling Stock (Electrical Multiple Units) And Depot Machinery & Plant and Training of Personnel." Bidder shall quote its lumpsum price inclusive of all taxes, levies, duties and other charges, including taxes to be deducted at source, leviable and payable to the authorities. | Output GST levied by Government of India / State as per prevailing law, hence we request to remove output GST from Bid Evaluation crieteria. This is also inline with other recent past Metro bids / contracts. Accordingly request you to amend clause as follow:<br><br>"The quoted lumpsum price by the bidder is inclusive of all taxes, levies, duties, cess as per ~~GST /~~ Custom tariff act etc., royalty, insurance, freight and fees required to be paid by him under the Contract **except outout GST which will be paid at actuals on submission of evidence."**<br><br>The Bidder shall be required to provide the breakdown of the tax components considered in their lumpsum price in 'Table 4.3.1 and 4.3.2' of the Pricing Schedule and in compliance with the notes specified therein. **However output GST will be treated for an information only and will not be part of bid evaluation.**<br><br>This is lumpsum price Contract for "Design, Manufacture, Supply, Testing, Commissioning of Standard Gauge Metro Rolling Stock (Electrical Multiple Units) And Depot Machinery & Plant and Training of Personnel." Bidder shall quote its lumpsum price inclusive of all taxes, levies, duties and other charges, including taxes to be deducted at source, leviable and payable to the authorities **except outout GST which will be paid at actuals on submission of evidence."** | Tender conditions prevail. |
| 29 | Part-1, Section – IV | 4.3 DETAILS OF TAXES / DUTIES / LEVIES ETC. INCLUDED IN THE LUMPSUM PRICE (PRICE CENTRE WISE | **Table 4.3.1: Taxes, Duties, Levies, etc.**<br>**Note :**<br>1. Bidder Shall Specify the values in the above table (Details of taxes/duties/levies etc.,) in INR only. **Cost towards currency Hedging if any shall be included in the Lumpsum Price**. | **Table 4.3.1: Taxes, Duties, Levies, etc.**<br>**Note :**<br>Bidder Shall Specify the values in the above table (Details of taxes/duties/levies etc.,) in INR only. ~~Cost towards currency Hedging if any shall be included in the Lumpsum Price.~~ | Tender conditions prevail. |
| 30 | Part I - Section IV - Bidding Forms | Table 4.3.2 | Wherever Customs Duty has been blocked out as "Not Applicable" within the pricing table it is clarified that the Contractor will not be eligible to claim any reimbursement, nor can the Contractor make any adjustment claims whatsoever in the event of any future changes in law / legislation (GCC 13.7) which may affect Customs Duty rates | future change in law—particularly customs duties—is inherently unpredictable. Courts widely recognize that legislative or tariff adjustments are external to contractor control, so requiring contractors to bear such risks is unreasonable and contrary to fundamental contract law principles that equitable risk allocation requires external, unforeseeable events to be accommodated.<br><br>Also, this rule will be made applicable for Option Quantity Trainsets.<br><br>Please allow change in law for any change in custom duties which is a direct cost to Contractor for which all adequate evidences can be furnished by the Contractor. | Tender conditions prevail. |
| 31 | Part-1, Section – IV Bidding Forms | Table 4.3.2: Overview of Contract Price |  | We understand that deletion of CD for Price Center G is typo error. Request you to please ammend the same. | Refer Addendum No.1, S.No. 21 |
| 32 | Part I - Section IV - Bidding Forms | Table 9.3.2 Note 4 | **Note on Taxes / Duties / Levies**<br>4. Wherever Customs Duty has been blocked out as "Not Applicable" within the pricing table it is clarified that the Contractor will not be eligible to claim any reimbursement, nor can the Contractor make any adjustment claims whatsoever in the event of any future changes in law / legislation (GCC 13.7) which may affect Customs Duty rates. | A future change in law—particularly customs duties—is inherently unpredictable. Courts widely recognize that legislative or tariff adjustments are external to contractor control, so requiring contractors to bear such risks is unreasonable and contrary to fundamental contract law principles that equitable risk allocation requires external, unforeseeable events to be accommodated.<br><br>Also, this rule will be made applicable for Option Quantity Trainsets.<br><br>Please allow change in law for any change in custom duties which is a direct cost to Contractor for which all adequate evidences can be furnished by the Contractor. | Tender conditions prevail. |
| 33 | Part-1, Section – IV Bidding Forms | Table 4.3.2: Overview of Contract Price | Table Filling Instructions:5. All Customs Duty, GST, levies, etc. indicated in the above table are considered to be included in the lumpsum price (Price centre wise) i.e. Bid Total in INR currency. Reimbursement of Customs Duty, GST, levies, etc. indicated in the above table by the Employer shall be in INR only, upon submission of proof of discharge of Contractor's liability subject to the ceiling of the amounts indicated in the above table. | Bidder request modification on the ceiling limit as under:Any increase/ decrease incurred due to currency fluctuations shall be paid to the Contractor. Ceiling limits shall be adjusted on this account to reflect the currency movement | Tender conditions prevail. |

<table>
<tr><th rowspan="2">Sl. No.</th><th colspan="3">As per the Submission of Bidder(s)</th><th rowspan="2">CMRL Response</th></tr>
<tr><th>Part/ Section No</th><th>Clause No.</th><th>Original Bid Condition</th><th>Bidder's queries</th></tr>
<tr><td>34</td><td>Part-1, Section – IV Bidding Forms</td><td>Table 4.3.2: Overview of Contract Price</td><td>Table Filling Instructions:<br>5. All Customs Duty, GST, levies, etc. indicated in the above table are considered to be included in the lumpsum price (Price centre wise) i.e. Bid Total in INR currency. Reimbursement of Customs Duty, GST, levies, etc. indicated in the above table by the Employer shall be in INR only, upon submission of proof of discharge of Contractor's liability subject to the ceiling of the amounts indicated in the above table.</td><td>Please add Sl. No. 5A under "Notes on Taxes / Duties / Levies" as below:<br>5A. Any increase/ decrease in GST amount due to currency fluctuations shall be paid to the Contractor, upon submission of proof of discharge of Contractor's liability. Ceiling limits referred in Sl. 5 above shall be adjusted on this account to reflect the currency movement.</td><td>Tender conditions prevail.</td></tr>
<tr><td>35</td><td>2. SCHEDULE OF ADJUSTMENT DATA</td><td>-</td><td><table>
<tr><th>(a)<br>Index Code</th><th>(b)<br>Index Description</th><th>(c)<br>Source of Index</th><th>(d)<br>Base value and date</th><th>(e)<br>Currency of Index</th><th>(f)<br>Weightage</th><th>(g)<br>Weightage to be filled by Bidder</th></tr>
<tr><td></td><td>Non-adjustable (Fixed)</td><td>–</td><td>–</td><td></td><td>0.33</td><td>0.33</td></tr>
<tr><td>$L_n$<br>$L_0$</td><td>Labour</td><td>All India Consumer Price Index for Industrial Workers Published by RBI Bulletin<br>(base year 2016)</td><td></td><td></td><td>0.10 ~ 0.25</td><td></td></tr>
<tr><td>$S_n$<br>$S_0$<br>$A_n$<br>$A_0$</td><td>Stainless steel<br>(Or)<br>Aluminium</td><td>CRU<br><br>ALCOA</td><td></td><td></td><td>0.15 ~ 0.25</td><td></td></tr>
<tr><td>$F_n$<br>$F_0$</td><td>Carbon Steel</td><td>CRUspi</td><td></td><td></td><td>0.10 ~ 0.30</td><td></td></tr>
<tr><td>$C_n$<br>$C_0$</td><td>Copper</td><td>LME</td><td></td><td></td><td>0.04 ~ 0.10</td><td></td></tr>
<tr><td colspan="5">Total</td><td>1.00</td><td>1.00</td></tr>
</table></td><td>The Referred Price Variation clause is not representative of the overall cost structure of the bid. Also as you would be well aware about the fluctuation dynamics in the commodity prices & indices, it would be hard for the bidder to predict the trend during the course of the contract. Thereby request you to consider the below price variation formulae:<br>CPI All India Industrial Workers : 15%<br>WPI Manufacture of Basic Metals, Stainless Steel : 12%<br>WPI Manufacture of Fabricated Metal Product : 6%<br>WPI Manufacture of Electronics/Computer Items : 12%<br>WPI Manufacture of All Commodities : 20%<br>WPI Electrical : 20%<br>Non Adjustable : 15%<br>Refer enclosed Annex-2</td><td>Tender conditions prevail.</td></tr>
<tr><td>36</td><td>Part 1: Section - II Bid Data Sheet (BDS)</td><td>ITB 1.1 (BDS)</td><td>The name of the Open Competitive Bidding (OCB) is: " DESIGN, MANUFACTURE, SUPPLY, TESTING, COMMISSIONING OF STANDARD GAUGE METRO ROLLING STOCK (ELECTRICAL MULTIPLE UNITS) AND DEPOT MACHINERY & PLANT AND TRAINING OF PERSONNEL."<br>The identification number of the OCB is: ARE05</td><td rowspan="2">We understand that this tender comes under International Competitive Bidding (ICB) as the same is mentioned in ITB Clause 1.1 last line. Please confirm if understanding is correct.</td><td>Refer Addendum No.1, S.No. 1</td></tr>
<tr><td>37</td><td>Part 1: Section - II Bid Data Sheet (BDS)</td><td>ITB 1.1</td><td>In connection with the Invitation for Bids specified in the Bid Data Sheet (BDS), the Employer, as specified in the BDS, issues these Bidding Documents (hereinafter referred to as "Bidding Documents") for the procurement of Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor as specified in Section VI, Employer's Requirements. The name, identification and number of the lot(s) (contract(s)) comprising this International Competitive Bidding (ICB) are specified in the BDS.</td><td>Tender conditions prevail.</td></tr>
<tr><td>38</td><td>Part-1, Section – IV</td><td>4.3 DETAILS OF TAXES / DUTIES / LEVIES ETC. INCLUDED IN THE LUMPSUM PRICE (PRICE CENTRE WISE</td><td>Table 4.3.2: Overview of Contract Price<br>Table Filling Instructions:<br>3. Customs Duty is only applicable for Price Centres RS-C, RS-G, DM&P-Q, DM&P-R, DM&P-S and DM&P-T.<br>a) The Contractor shall fill the data based on their own estimation of the quantity of goods that will be imported to fulfil the Works and shall serve as the ceiling amounts considered for reimbursement.<br>b) The successful bidder shall then submit a detailed breakdown list (in a format that is approved by the Engineer & the Employer) by NTP + 330 days showing values for all Equipment / Sub-assemblies / Components that will be imported.<br>Reimbursement of Customs Duty by CMRL shall be in accordance with the detailed breakdown list (supported by evidence of actual duties incurred and utilisation during manufacturing) but will be capped at the ceiling amounts declared in accordance with 3(a).</td><td>You will kindly appreciate that during finalization of list of items to be imported in project phase, contractor will make their best efforts to increase the localization due to which the list of imported items may differ from the initial phase of the project. Since capping of CD has already been defined therefore, bidder should be provided the flexibility to change the list of imported items during the project phase provided the overall capping of custom duty is not exceeded.</td><td>Tender conditions prevail.</td></tr>
<tr><td>39</td><td>Part I - Section II - Bid Data Sheet (BDS)</td><td>8.1.9.1</td><td>For any increase in quantity, the Employer may exercise this option at anytime prior to the date that is twelve (12) months' before the scheduled date for delivery of the last trainset. The Contractor shall be required to supply the requested additional quantities in accordance with the existing contract terms and conditions and determined prices as detailed in Cl. 3.3.2 and Cl. 3.3.3 below and no additional amount on account of quantity variation or any other account whatsoever shall be payable to the Contractor.</td><td>The BDS Clause says that Employer can exercise the option any time prior to "scheduled date of delivery of last trainset".<br><br>Please note that the progress of the works may be delayed for any reasons not solely attributable to the contractor such as force majeure etc. Therefore, Right to Vary must be restricted to <u>original scheduled date of delivery of last trainset</u> and not extended date of delivery in such cases.<br><br>Considering above, we request you to modify the clause as follow:<br>For any increase in quantity, the Employer may exercise this option at anytime prior to the date that is twelve (12) months' before the original scheduled date for delivery of the last trainset. The Contractor shall be required to supply the requested additional quantities in accordance with the existing contract terms and conditions and determined prices as detailed in Cl. 3.3.2 and Cl. 3.3.3 below and no additional amount on account of quantity variation or any other account whatsoever shall be payable to the Contractor.</td><td>Tender conditions prevail.</td></tr>
</table>

| Sl. No. | As per the Submission of Bidder(s) | | | | CMRL Response |
|---|---|---|---|---|---|
| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 40 | Part-1, Section – IV, Bidding Forms | 4.2 Pricing Summary (BID TOTAL) | Price Centre RS-C:<br>Indigenous Manufacture, Factory Testing, Inspection and Dispatch, transit insurance from factory to Depot Site. Inland Transportation of Indigenous manufactured trains within India including handling charges at depot or at any other place, and all other incidental costs, receipt of cars in depot. | We request to amend the clause as under:<br>Price Centre RS-C:<br>Indigenous Manufacture, Factory Testing, Inspection at Factory And Ex-works readiness. | Tender conditions prevail. |
| 41 | Part 1 Section IV | Clause 3.1.3 | As single rate of custom duty is available under project imports scheme under heading 98.01 of Custom Tariff Act 1975 for import of capital goods, the advantage of the same may be considered under project import scheme. After award of the Contract, Employer at the written request of a Contractor shall facilitate the Contractor for obtaining sponsoring / recommendation letter from the Ministry of Housing and Urban Affairs (MoHUA) / GOI for getting themselves registered for availing Project Import benefits. However, the responsibility to avail the concessional benefits under Project Import or otherwise as extended in accordance with the law of the land shall solely rest with the Contractor. | As single rate of custom duty is available under project imports scheme under heading 98.01 of Custom Tariff Act 1975 **for goods to be imported for the Project** ~~of capital goods,~~ the advantage of the same may be considered under project import scheme. After award of the Contract, Employer at the written request of a Contractor shall facilitate the Contractor **and its Sub Contractors** for obtaining sponsoring / recommendation letter from the Ministry of Housing and Urban Affairs (MoHUA) / GOI for getting themselves registered for availing Project Import benefits. However, the responsibility to avail the concessional benefits under Project Import or otherwise as extended in accordance with the law of the land shall solely rest with the Contractor. | Tender conditions prevail. |
| 42 | Part 1: Section - III Evaluation and Qualification Criteria (EQC) | 2.7 Purchase Preference | The requirements of stipulations pertaining to Public Procurement Order, 2017 dated 16th September 2020 issued by Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (Public Procurement Section) shall apply.<br>Minimum Local Content (MLC) for Class – 1 local supplier shall be 60% (Derived on Total Contract Price) as per the order No.K – 14011 / 08 / 2017 / MRTS – Coord dated 14th October 2020 issued by Ministry of Housing and Urban Affairs (MoHUA).<br>The Undertaking / Confirmation shall be submitted by the Bidder as per the prescribed Form 5.15 'CERTIFICATE CONFIRMING MINIMUM LOCAL CONTENT' in Section IV - Bidding Forms. | We request you to please confirm the Minimum Local Content (MLC) requirement for this tender. Please confirm if Class-II Local supplier is eligible to bid in this tender. | Tender conditions prevail. Please refer GoI Order No. P-45021/2/2017-PP (BE-II)-Part(4)Vol.II dated 19 July, 2024 |
| 43 | Part-1, Section – IV Bidding Forms | 6.13 | Form Minimum Local Content (Applicable only for Class-I local supplier) | We request for deletion of this form at bid stage in line with previous CMRL ARE04A tender. | Refer Addendum No.1, S.No. 28 |
| 44 | Part-1, Section – IV Bidding Forms | 5.15 | CERTIFICATE CONFIRMING MINIMUM LOCAL CONTENT<br>...**The details including name of vendor, location at which the local value addition is made, and percentage of local content will be provided within 15 days of issue of LoA.**<br>We acknowledge that false declaration by the tenderer regarding local value addition including payments to be made to their vendors for local value addition shall be treated as a fraudulent practice under this tender for which the tenderer or its successor can be debarred for a period up to three years along with such other actions as may be permissible under the law.<br>In case of procurement for a value in excess of Rs. 10 crores, we also undertake to submit a certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content, in accordance with clause '9.b' of the Order no. P – 45021 / 2 / 2017 - PP (BE – II) of Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade (DPIIT) {formerly Department of Industrial Policy and Promotion (DIPP)}, Government of India dated 16th September 2020 or latest order, **after completion of works** to the Engineer. | We request for deletion of submissions within 15 days of LOA as the same in line with previous **CMRL ARE04A tender**. Same has to be submitted after completion of works as mentioned in last line. Therefore, the clause may be modifed as below:<br>"...~~The details including name of vendor, location at which the local value addition is made, and percentage of local content will be provided within 15 days of issue of LoA~~.<br>We acknowledge that false declaration by the tenderer regarding local value addition including payments to be made to their vendors for local value addition shall be treated as a fraudulent practice under this tender for which the tenderer or its successor can be debarred for a period up to three years along with such other actions as may be permissible under the law..." | Tender conditions prevail. |
| 45 | Part-1, Section – IV Bidding Forms | 11 | Form POA – Power of Attorney for Signing the BID<br>Know all men by these presents, we (name of the firm and address of the Registered Office) do hereby irrevocably constitute, nominate, appoint and authorize Mr. / Ms. (name), son / daughter / wife of (name) and presently residing at (Address), who is presently employed with us / the Lead Member of our Consortium and holding the position of (Designation), as our true and lawful Attorney (hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our bid for the award of the license for "TENDER FOR DESIGN, MANUFACTURE, SUPPLY, TESTING, COMMISSIONING, TRAINING OF PERSONNEL AND COMPREHENSIVE MAINTENANCE CONTRACT FOR FIFTEEN (15) YEARS OF STANDARD GAUGE METRO ROLLING STOCK (ELECTRICAL MULTIPLE UNITS)" for which proposals are invited by Chennai Metro Rail Limited | Name of work in POA is not correct. We understand that this should be replaced with the name of work given in BDS Clause 1.1. Please confirm | Refer Addendum No.1, S.No. 29 |
| 46 | Part-1: Section IV/Bidding Forms | 11. Form POA – Power of Attorney for Signing the BID (Pg-181) | In POA Form it is mentioned that "TENDER FOR DESIGN, MANUFACTURE, SUPPLY, TESTING, COMMISSIONING, TRAINING OF PERSONNEL AND COMPREHENSIVE MAINTENANCE CONTRACT FOR FIFTEEN (15) YEARS OF STANDARD GAUGE METRO ROLLING STOCK (ELECTRICAL MULTIPLE UNITS)" | As per Bid Data sheet (ITB 1.1) The name of the Open Competitive Bidding (OCB) is: " DESIGN, MANUFACTURE, SUPPLY, TESTING, COMMISSIONING OF STANDARD GAUGE METRO ROLLING STOCK (ELECTRICAL MULTIPLE UNITS) AND DEPOT MACHINERY & PLANT AND TRAINING OF PERSONNEL." Hence, We would like to request CMRL to kindly clarify the same or modify the POA as per the OCB name of BDS. | Refer Addendum No.1, S.No. 29 |

| Sl. No. | As per the Submission of Bidder(s) | | | | CMRL Response |
|---|---|---|---|---|---|
| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 47 | Part-1, Section III | EQC 2.5 (Pg-59) | Subcontractors / Manufacturers | It is noted that minimum criteria have been specified for Subcontractors/ Manufacturers of 10 Major items. Further, it is requirement of the tender conditions that the Bidder is required to submit End Customer experience certificates for the above said items. For your kind information, with such requirements for getting the Certificates from End Customers is not feasible at Bid stage and may require so many times. In view of above constraints, it is proposed that as included in the tender conditions of DMRC/RS17 & BMRCL/5RSDM tenders, this requirement shall be limited for only Propulsion System (Traction Converter, Auxiliary Converter and Traction Motors). Further, it is proposed that experience certificates including end customer certificates can be provided by the Contractor during Design approval stage. | Tender conditions prevail. |
| 48 | Part 1: Section - III | EQC 2.5 (Pg-60) | **TCMS:**<br>The proposed system shall be in satisfactory revenue operation in GoA4 for at least three (3) years of the bid submission deadline, in a country other than the country of origin of manufacturer or in India, at the time of bid submission. | We would request CMRL to kindly modify the clause as follows:<br>The proposed system shall be in satisfactory revenue operation in GoA2/GoA4 for at least three (3) years of the bid submission deadline, in a country other than the country of origin of manufacturer or in India, at the time of bid submission. | Tender conditions prevail. |
| 49 | Part 1: Section - II | ITB 4.1 (Pg-28) | A Bidder may be a firm that is a single entity or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. | We would request CMRL to kindly modify the clause as follows:<br>A Bidder may be a firm that is a single entity with its associates or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent.<br><br>In accordance with the "Make in India" and "ATMANIRBHAR BHARAT" initiatives of the Government of India, allowing the associates could influence the bidder's credentials. | Tender conditions prevail. |
| 50 | Part 1: Section-1 ITB | ITB 17.2 | For major items of the Works as listed by the Employer in Section III, Evaluation and Qualification Criteria, which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including manufacturers, for each of those items. | We would request CMRL to clarify whether in case a proposed subcontractor/manufacturer is found unacceptable during evaluation, kindly confirm whether substitution will be permitted without impacting the bid price or bid responsiveness. | Tender conditions prevail. |
| 51 | Part 1: Section-III EQC | 2.4.2 (a) | A minimum number of 114 cars (Metro, LRT, Suburban EMUs, Train sets) must have been manufactured as a prime Contractor (single entity or JV member) during the last TEN (10) years of the bid submission deadline. | We would request CMRL to kindly modify the clause as below:<br>A minimum number of 114 cars (Metro, LRT, Suburban EMUs, **MEMU's**, Train sets) must have been manufactured as a prime Contractor (single entity or JV member) during the last TEN (10) years of the bid submission deadline. | Tender conditions prevail. |
| 52 | Part 1: Section V-B (ESC) | (vi) | The successful bidder shall not be allowed to Subcontract works to any Contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. | We would request CMRL to kindly confirm whether sourcing of critical subsystems/components from countries not listed in Section V (Eligible Source Countries) is permitted, provided final manufacturing and assembly is carried out in the Bidder's premises who is an eligible source country. | Tender conditions prevail. |
| 53 | Part 1 | (vi) | NA | We request you to kindly include the "**Localization**" clause to facilitate ease in maintenance and easy availability of spares, and further increase the % Local Content as part of Make in India policy.<br>We request you to kindly permit the Propulsion (TiC , APS & TM) sub contractor to choose its Subsidiary / Affiliate in India to manufacture its global Propulsion equipment in its existing Indian facility. | Tender conditions prevail. |

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| 54 | Part-1, Section - III: Evaluation and Qualification Criteria (EQC) | 2.5 Subcontractors / Manufacturers | 2.5 Subcontractors / Manufacturers<br>Subcontractors / Manufacturers for the following major items of supply or services must meet the following minimum criteria, herein listed for that item:<br>Item No. 2 Propulsion (Traction converter, Auxiliary converter and Traction motors)<br>The designer of the Traction Converter-Inverter shall be considered as the integrator of the Propulsion System and shall individually have a minimum of ten (10) years of experience in the design and manufacturing of Traction Converter-Inverters for Metro Rolling Stock. Additionally, the system supplied shall have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars, comprising both powered and nonpowered cars, supplied against at least three (3) different contracts in Metro Railway. The integrator of the propulsion system shall have full responsibility for any warranty obligations and design modifications of the propulsion system during the contract period, for which adequate past experience is required. Furthermore, other suppliers must qualify for their respective scope of work against the eligibility criteria as mentioned in the respective tenders of the Metro Railway.<br>(or)<br>The manufacturer of the propulsion equipment (Traction Converter-Inverter, Auxiliary Converter-Inverter, and Traction Motor) proposed by the bidder as a sub-contractor for the supply of propulsion equipment against this bid shall have a minimum of ten (10) years of experience in the field of design and manufacturing of the propulsion equipment. The propulsion equipment designed, manufactured, and supplied by the said manufacturer must have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars comprising both powered and non-powered cars, supplied against at least three (3) different contracts in the Metro Railway.<br><br>Item No. 5 Train Control and Monitoring System (TCMS)<br>The proposed system shall be in satisfactory revenue operation in GoA4 for at least three (3) years of the bid submission deadline, in a country other than the country of origin of manufacturer or in India, at the time of bid submission. | 2.5 Subcontractors / Manufacturers<br>Subcontractors / Manufacturers **(including it's Associate)** for the following major items of supply or services must meet the following minimum criteria, herein listed for that item:<br>***Associate:*** *For the purpose of this Clause, Associate shall mean, in relation to the Sub-contractor, a person who controls, is controlled by, or is under the common control with such Sub-contractor (the "Associate"). As used in this definition, the expression "control" means, with respect to a person which is a company or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person by operation of law.*<br><br>Item No. 2 Propulsion (Traction converter, Auxiliary converter and Traction motors)<br>The designer of the Traction Converter-Inverter shall be considered as the integrator of the Propulsion System and shall individually have a minimum of ten (10) years of experience in the design and manufacturing of Traction Converter-Inverters for Metro Rolling Stock. Additionally, the system supplied shall have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars, comprising both powered and nonpowered cars, supplied against at least three (3) different contracts in Metro Railway. The integrator of the propulsion system shall have full responsibility for any warranty obligations and design modifications of the propulsion system during the contract period, for which adequate past experience is required. Furthermore, other suppliers must qualify for their respective scope of work against the eligibility criteria as mentioned in the respective tenders of the Metro Railway.<br>(or)<br>The manufacturer of the propulsion equipment (Traction Converter-Inverter, Auxiliary Converter-Inverter, and Traction Motor) proposed by the bidder as a sub-contractor for the supply of propulsion equipment against this bid **(including it's Associate)** shall have a minimum of ten (10) years of experience in the field of design and manufacturing of the propulsion equipment. The propulsion equipment designed, manufactured, and supplied by the said manufacturer must have been in satisfactory revenue operation for at least five (5) years in a country other than the country of origin of manufacturer or in India, in a minimum aggregate of 300 cars comprising both powered and non-powered cars, supplied against at least three (3)<br>different contracts in the Metro Railway.<br>**The sub-contractor (including its Associates) shall meet the Eligibility and Qualification Criteria (EQC) specified in Clause 2.5 Item no. 2.**<br><br>Item No. 5 Train Control and Monitoring System (TCMS)<br>The proposed system shall be in satisfactory revenue operation in GoA4 for at least three (3) years of the bid submission deadline, in a country other than the country of origin of manufacturer or in India, at the time of bid submission.<br>**The sub-contractor (including its Associates) shall meet the Eligibility and Qualification Criteria (EQC) specified in Clause 2.5 Item no. 5.**<br><br>We request you to please include **"Associate"** clause as mentioned above into 2.5 Subcontractors / Manufacturers for item nos. 2 and 5. | Refer Addendum No.1, S.No. 15 |

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| 55 | Part 2 – Section VI A: ERTS – RS | 16.5.3 | The Contractor shall use PMIS (described in clause 16.7) to obtain a document number for all formal communication and submittals. This will adopt a unique numbering system which has been assigned for this project. | Clauses on PMIS are not found. Please confirm if PMIS is applicable for the contract or not.<br>If PMIS is applicable, please confirm the deduction rate from the accepted contract amount.<br>PMIS is referred in a few other sections as well, hence, kindly revise all relevant clauses suitably. | Tender conditions prevail.<br>Also Refer Addendum No.1, S.No. 19 & 370 |
| 56 | Part 2 – Section VI A: ERTS – RS | 18.13.2.9 | The Contractor shall be responsible for making applications or requests to the concerned Authorities for availing of the above facilities. In the event that electricity or water supplies are arranged by another Designated Contractor in the Depot area, the Contractor may avail himself of those supplies from the Designated Contractor, either directly on agreed terms and conditions. The Contractor shall comply with all regulations of the utility companies and Government departments concerned | Please clarify if water supplies are made available free of cost to the Contractor? If no, please provide water supply charges details presently being paid by CMRL at similar depots for reference purpose to the bidders. | Tender conditions prevail. |
| 57 | Part 2 - Section VI A: ERTS - RS<br>\ | 18.13.2.1 | CMRL shall allocate approximately 100 square meter space to the Contractor at one of the Designated Depot(s) for erection of site the Contractor's Site Office. This land / space provision shall be provided to the Contractor on a free of cost basis without any rental charges. | Please clearly state, if the space provided is in the form of land or constructed building.<br>We prefer if space is provided in the form of constructed building by the Employer.<br>Please confirm/clarify. Accordingly modify the clauses. | Refer Addendum No.1, S.No. 395 |
| 58 | Part 2 – Section VI A: ERTS – RS | General | Designated Depot(s) | Please confirm the number of Designated Depots under the Contract and provide the relevant details. | Refer Addendum No.1, S.No. 67 |
| 59 | Part 2 – Section VI A: ERTS – Rolling Stock | Appendix E – Supply of Spare & Special Tools Sub Clause 1.1.1 (b) | Consumable spares for maintenance of all trains during commissioning, service trials and up to completion of Defect Notification Period / Warranty period | It is our understanding that the consumable spares for maintenance of trains is for a period of 730 days. Please confirm | Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 432 |
| 60 | Part 2 – Section VI A: ERTS – Rolling Stock | Appendix E - Supply of Spare & Special Tools, Clauses 1.10 and 1.11 | 1.10 PURCHASE OF SPARES FROM VENDORS<br>1.11 LIST OF SPARES | As per Clause 1.1.5, "The Contractor agrees to provide all necessary spares for a period of ten (10) years after the completion of Defect Notification Period (DNP), at the request of CMRL, the prices quoted in the tender documents, subject to the Price Adjustment as per sub-clause 13.8 of PCC.".<br><br>Since the Contractor already supply the spares for a period of 10 years, we do not see the necessity of Clauses 1.10 and 1.11.<br><br>Hence, we request CMRL to delete the clauses 1.10 and 1.11. | Tender conditions prevail. |
| 61 | Part 2 – Section VI A: ERTS – Rolling Stock | APPENDIX – I: TRAIN WITHDRAWAL SCENARIOS FOR 6 CAR TRAIN | In case of occurrence of below mentioned conditions during revenue operations, the specific train shall be withdrawn from service in ATO mode of operation (desired operation mode) or rescued by another train to clear the faulty train from passenger service. | BEML request the mentioned clause be modified as below:<br>In case of occurrence of below mentioned conditions during revenue operations, the specific train shall be withdrawn from service in ATP mode of operation (desired operation mode) or rescued by another train to clear the faulty train from passenger service.<br><br>Justification: In case of breakdown/stoppage of trainset the same to be brought to depot in ATP mode. Since the train can be run manually the clause to be modified to ATP. | Refer Addendum–1, S.No. 411 |
| 62 | Part 2 – Section VI A: ERTS – Rolling Stock Chapter 7 | 7.3.16 | Temperature Distribution: Temperature difference in horizontal and vertical planes spread over full car length shall be minimal. The instantaneous saloon interior temperature at 1.1 m above car loor level shall be 25°C ± 2°C at any given time. The mean saloon interior temperature at 1.1 m (taken over a round-trip period) shall not exceed 25°C. The saloon interior area includes Gangway and Emergency Driver desk areas. The Contractor shall submit details during PFDR. | Temperature Distribution: Temperature difference in horizontal and vertical planes spread over full car length shall be minimal. The instantaneous saloon interior temperature at 1.1 m above car floor level shall be 25°C ± 2°C at any given time. The mean saloon interior temperature at 1.1 m (taken over a round-trip period) shall not exceed 25°C ± 2°C as per the EN14750. The saloon interior area includes Gangway and Emergency Driver desk areas. The Contractor shall submit details during PFDR. | Tender conditions prevail. |

<table>
<tr><th rowspan="2">Sl. No.</th><th colspan="4">As per the Submission of Bidder(s)</th><th rowspan="2">CMRL Response</th></tr>
<tr><th>Part/ Section No</th><th>Clause No.</th><th>Original Bid Condition</th><th>Bidder’s queries</th></tr>
<tr><td>63</td><td>Part 2 – Section VI A: ERTS – Rolling Stock Chapter 7</td><td>7.6.8</td><td>Saloon Pressure: The VAC supply air blower fan shall pressurize the car passenger area. In car stationary with all doors closed and vestibules blocked condition, the value of interior static pressure shall be minimum 25 Pa.</td><td>Saloon Pressure: The VAC supply air blower fan shall pressurize the car passenger area. In car stationary with all doors closed and vestibules blocked condition, the value of interior static pressure shall be 10-15 Pa.</td><td>Tender conditions prevail.</td></tr>
<tr><td>64</td><td>Part 2 – Section VI A: ERTS – Rolling Stock Chapter 7</td><td>7.11.2</td><td>The Contractor shall ensure that the overall design of the VAC System; is able to tolerate the extremely dusty and humid environment which prevails in Chennai to the extent that there is no necessity to clean VAC filters before 12,500 kms or within fewer than 30 days train running; whichever is lower. Minimum expected life of filter shall be 100,000 km. The effectiveness of VAC filters shall be adequate enough to ensure that dust deposition in the air ducts is minimal and won’t create cause to need to clean the ducts between major overhauls</td><td>The Contractor shall ensure that the overall design of the VAC System; is able to tolerate the extremely dusty and humid environment which prevails in Chennai to the extent that there is no necessity to clean VAC filters before 5000 kms or within fewer than 15 days train running; whichever is lower. Minimum expected life of filter shall be 100,000 km. The effectiveness of VAC filters shall be adequate enough to ensure that dust deposition in the air ducts is minimal and won’t create cause to need to clean the ducts between major overhauls</td><td>Tender conditions prevail.</td></tr>
<tr><td>65</td><td>Part 2 – Section VI A: ERTS – Rolling Stock Chapter 2</td><td>2.16.2.6</td><td>Sub-system maintenance Simulator module for following major sub-systems shall be developed & supplied to provide training and virtual experience to maintenance personals:<br>a) HVAC<br>b) Doors including detrainment door<br>c) TCMS<br>d) HV system and Traction/propulsion system<br>e) Auxiliary power supply and battery<br>f) Brake and pneumatics system<br>g) Complete Bogie system<br>h) PA/PIS & PSSS<br>i) Vehicle Control Circuit<br>j) Couplers & Gangways</td><td>The maintenance simulators mentioned are to be supplied in accordance with PHASE 1 or ARE05A project?</td><td>Tender conditions prevail.<br>The specification provided is for ARE05 project.</td></tr>
<tr><td>66</td><td>Part 2 – Section VI A: ERTS – Rolling Stock Chapter 2</td><td>2.15.1</td><td>The Driver Desk Simulator (without motion system) shall be required to provide a realistic immersive experience for the trainee with accurate representation of the visual, audio and actual functionality of the train & associated systems for the lines being simulated. The simulator shall be multipurpose, and desk controls shall be designed for atleast 2 types of rolling stock (existing and new Rolling Stock), at CMRL phase-1 corridors/Lines.</td><td>Need more clarity on the multipurpose simulator requirement. Does this mean a single simulator to have access to both training environment of PHASE 1 project and ARE05A project with desk control designed accordingly to accommodate both but can train only one environment at a time.</td><td>Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 428</td></tr>
<tr><td>67</td><td>Part 2 – Section VI A: ERTS – Rolling Stock Chapter 2</td><td>2.7.3.iii.</td><td><table><tr><th></th><th>DM car</th><th>T car</th><th>M car</th></tr><tr><td>Seats</td><td>46</td><td>50</td><td>48</td></tr><tr><td>Wheelchair</td><td>-</td><td>-</td><td>1</td></tr><tr><td>Standees (AW3 condition)</td><td>213</td><td>208</td><td>208</td></tr><tr><td>Standees (AW4 condition)</td><td>284</td><td>278</td><td>278</td></tr><tr><td>Total capacity (6 car) AW3 condition</td><td colspan="3">{ (46+213) + (50+208) + (48+1+208) } x 2 = 1548 passengers + 1 Driver</td></tr><tr><td>Total capacity (6-car) AW4 condition</td><td colspan="3">{ (46+1+284) + (50+278) + (48+1+278) } x 2 = 1970 passengers + 1 Driver</td></tr></table></td><td>As per 2.7.3.iii. Table it is mentioned that one wheel chair in M car, However as per clause 3.8.2 One wheelchair parking area shall be available in each DM car. Contradicting of Two clauses.Requesting Table shall be updates as mentioned below.<table><tr><th></th><th>DM Car</th><th>T Car</th><th>M Car</th></tr><tr><td>Seats</td><td>42</td><td>50</td><td>50</td></tr><tr><td>Wheelchair</td><td>1</td><td>-</td><td>-</td></tr><tr><td>Standees (AW3 condition)</td><td>216</td><td>208</td><td>208</td></tr><tr><td>Standees (AW4 condition)</td><td>287</td><td>278</td><td>278</td></tr><tr><td>Total Capacity (6 car AW3 condition)</td><td colspan="3">(42+1+216)+(50+208)+(50+208)x2= 1550 passengers +1 Driver</td></tr><tr><td>Total Capacity (6 car AW4 condition)</td><td colspan="3">(42+1+287)+(50+278)+(50+278)x2= 1972 passengers +1 Driver</td></tr></table>Requesting to amend the clause accordingly.</td><td>Refer Addendum No.1, S.No. 65</td></tr>
<tr><td>68</td><td>Part 2 – Section VI A: ERTS – Rolling Stock Chapter 3</td><td>3.4.9.3.1</td><td>The cabs shall have watertight look-out glasses on both lateral sides of each Operator’s Desk area; look-out glasses shall be of the same construction as the body side windows. The minimum size of the look-out glass shall be 800 mm x 450 mm and locations of the cab side look-out glasses shall be approved by CMRL.</td><td>The size of the Window glass is 560x310mm (Fixed Glass). Space provision is required in the Operator Desk area To accommodate the PAPIS,Signalling,Train Radio Equipments.Requesting to amend the clause accordingly.</td><td>Tender conditions previal.</td></tr>
<tr><td>69</td><td>Part 2 – Section VI A: ERTS – Rolling Stock Chapter 3</td><td>3.4.9.3.4</td><td>the contractor shall ensure that during GoA2 or GoA1 or Degraded mode of operation, the Train Operator shall have the access to open the lookout glass. During GoA3 or GoA4 operation, the lookout glass shall be manually locked.</td><td>Look-out glasses shall be of the same construction as the body side windows as per clause 3.4.9.3.1. According to this clause fixed type of glass manually non openable type. Requesting to amend the clause accordingly.</td><td>Refer Addendum No.1, S.No. 105</td></tr>
<tr><td>70</td><td>Part 2 – Section VI A: ERTS – Rolling Stock Chapter 3</td><td>3.6.5.1</td><td>Longitudinal banks of bucket type anti slip finish stainless steel seats shall be provided along the body-side between the doorway draught screens. The Contractor shall provide as much seating space as possible between the side doors. The seat layout should be such that it will not obstruct the flow of passengers during rush hours while boarding or detraining. Draught screen shall be provided at each door and shall be an integral part of the stanchions at the doorways. Bump support / Lumber support arrangement shall be at suitable locations as decided by CMRL.</td><td>Longitudinal banks of bucket/Flat type anti slip finish stainless steel seats shall be provided along the body-side between the doorway draught screens.<br>Requesting to amend the clause accordingly.</td><td>Refer Addendum No.1, S.No. 111</td></tr>
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| 71 | Part 2 – Section VI A: ERTS – Rolling Stock Chapter 5 | 5.2.2 | Both sides of the cab shall be provided with a single leaf door (hinged or sliding) to permit access from station platforms and from track level. | Train operator to enter in the Cab there is no separate provision in the cab side area. Providing cab side door separately, Cab window can not be provide.**Train operator shall enter through saloon to cab door**. Requesting to amend the clause accordingly. | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 167 |
| 72 | Part 2 – Section VI A: ERTS – Rolling Stock Chapter 5 | 5.2.3 | The cab shall be ventilated from bleed off from the saloon air conditioning and be free from external draughts and ingress of dirt, water and noise. The Driving position shall be in the centre of the Cab. | The driver console will be on the Left side of the Cab as centre there is a Detrainment Door so **Driver position will be on the left side**. Requesting to amend the clause accordingly. | Refer Addendum No.1, S.No. 132 |
| 73 | Part 2 – Section VI A: ERTS – Rolling Stock Chapter 5 | 5.4.1.g.VII | An emergency equipment cupboard shall be provided at suitable location in the Operator's Desk area and shall be equipped with first Aid box, safety equipment including fire extinguishers (minimum 5 Kg capacity) etc. | Fire Extinguisher of 5Kg will be provided on the partition wall, during conversion from GoA 2 to GoA 4 partition wall be removed along with Fire extinguisher (5Kg) and placed in Depot. Alternate to this an Emergency fire extinguisher of 1 Kg will be provided in the Operator's desk Area due to space constraint and it will be permanent for GoA 2 & GoA 4 operation. Requesting to amend the clause accordingly. | Tender conditions prevail. |
| 74 | Part 2 – Section VI A: ERTS – Rolling Stock Chapter 6 – Passenger Doors | 6.10.2 | All necessary accessories including folding ramp for ensuring safe detrainment of passengers from saloon to the track plinth on elevated, at-grade and underground sections shall be provided in driving car. | Detrainment door provision will be at the centre of the DM car when operated door will be open saloon to the track plinth center | Tender conditions prevail. |
| 75 | Part 2 – Section VI A: ERTS – Rolling Stock Chapter 4 | 4.2.8 | To meet emergency requirements of clearing a disabled train by a healthy train, the couplers of ARE05 trainsets shall be totally compatible for providing safe mechanical and pneumatic coupling (only for rescue operation) with ARE01 trainsets. | We request CMRL to provide the details of Coupler Head used on ARE01 trainsets - such as make, model and part number - as an addendum. Not all type 330 automatic couplers and pneumatic valves match 1:1 as confirmed by OEMs and more information is required to assess and propose a compatible design. Further, we request permission to conduct physical measurements on Coupler. | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 115 to 131 |
| 76 | Part 2 – Section VI A: ERTS – Rolling Stock Chapter 4 | 4.2.9 | As trains shall operate in ATO mode (GoA2), the Contractor shall design the couplers in such a way that regardless of whether a train is in normal operating mode or in a degraded mode of operation no manual intervention at coupler shall be required to couple / uncouple the defective train with healthy train (and vice-versa). This condition shall be met throughout the complete alignment of CMRL Phase 1. | Manual alignment of Coupler Heads will be required in sharp curves for automatic coupling. This is a common aspect with Automatic Couplers used on Rolling Stock. We request CMRL to amend the clause accordingly. | Refer Addendum No.1, S.No. 120 |
| 77 | Part 2 – Section VI A: ERTS – Rolling Stock Chapter 4 | 4.2.11 | Trains procured under this tender will ply along with the existing trains of CMRL Phase 1. In order to meet the coupling and rescuing of a disabled train by a healthy train, the couplers in the proposed train shall be fully compatible with existing train's coupler for effecting safe mechanical and pneumatic coupling. Height and tolerance of the coupler shall be same as existing trains and in the same alignment of the under-frame structure. | We request CMRL to provide the details of Coupler Head used on ARE01 trainsets - such as make, model and part number - as an addendum. Not all type 330 automatic couplers and pneumatic valves match 1:1 as confirmed by OEMs and more information is required to assess and propose a compatible design. Further, we request permission to conduct physical measurements on Coupler. | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 115 to 131 |
| 78 | Part 2 – Section VI A: ERTS – RS Chapter 17 | 17.6.15 | Coupler Electric Pin Signal Verification Functional Acceptance Testing<br>The Contractor shall demonstrate that the car meets the functional coupler electric pin signal requirements of Chapter 2. | Electrical Head on Coupler is not applicable. **Please delete this ERTS-RS clause 17.6.15.** | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 115 to 131 |
| 79 | Part 2 – Section VI A ERTS – Rolling Stock chapter 2 | 2.14.1 (e) | Table 2-7: Rolling Stock Design Performance Requirements | Service braking rate from 80kmph to standstill for tare (AW0) train on level tangent track may please be defined. | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 69 |
| 80 | Part 2 – Section VI A ERTS – Rolling Stock chapter 2 | 2.14.3.2 | For a normal operation of service brake (nominal 1 m/s2) on level track from maximum speed, the rake shall brake to a standstill from 80kmmh in 247m (+0, -10%) under any Loading Conditions up to AW4. The Contractor shall demonstrate by providing calculations of the minimum adhesion level, required to achieve the stopping distance. **Upon receipt of signal to Brake Control Unit, the application of service brake time should be less than 300 msec.** | ERTS clause 12.18.1 (a) requires application of service brake maximum time to be 2 sec which is contracdictory to the requirement of this clause. Please clarify. | Tender conditions prevail. |
| 81 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.2.10 (h) | Under conditions of a dragging parking brake (occurring on no more than one bogie) for a minimum distance of 3 kilometres at a speed of 10 kmph, no damage shall be caused to the braking system or any bogie component, with the exception of abnormal shoe wear. Detailed figures to be provided during PFDR design stage. | Dragging requirement will limit the safety against rolling under worst case as per ERTS Clause 2.14.3.6, 2.14.3.7 & 12.8.1. Since the clause is contracdictory with above mentioned clauses, it is requested to remove push-out brake requirement. Otherwise it may be detremental to the rolling stock during operation which may result in wheel flat / track damage. In view of the above, requested to delete this ERTS clause 12.2.10 (h). | Tender conditions prevail. |

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| 82 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.3.6 | Flexible hoses shall be kept to a minimum and be proven in metro train operation. The Contractor shall submit proposals to increase the integrity of the air supply system against rupturing of inter-car flexible hoses. **Burst hose protection shall be provided for hoses**. Armored hoses or a double hose burst protection valve shall be provided in the flexible connections in the parking brake piping along with test reports in compliance with the latest international standard for acceptance by CMRL. | Conventionally burst hose protection will be provided for inter-car fliexible hose for MR line only. "Burst hose protection shall be provided for hoses" may be rephrased as "Burst hose protection shall be provided for **inter-car flexible** hoses" to provide more clarity. | Tender conditions prevail. |
| 83 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.3.13 | The air supply from the compressor(s) shall be controlled under all operating conditions by high and low-pressure governor switches. | This clasue is contradicting with clause 12.4.5 which says "TCMS shall control cut in and cut out of the compressors based on the feedback of a pressure transducer / governor fitted to the MR pipe." Please clarify and update the clause suitably. | Tender conditions prevail. |
| 84 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.4.12 | Correct functioning and running hours of compressors shall be monitored and recorded by TCMS. A maintenance alarm shall be generated in TCMS if the net air consumption exceeds a given criteria that will be agreed during design stage. The related parameter shall be adjustable. | Please note there is no such proven system of determining the air consumption of train in service. The clause may be reviewed and updated. | Refer Addendum No.1, S.No. 273 |
| 85 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.4.13.6 | A proven regenerative type of air dryer using desiccant and of a suitable capacity shall be provided between the air compressor and the main reservoir. **The air dryer shall be preceded by an automatic drain valve, which collects and discharges the bulk of the moisture in the compressed air, before it enters the air dryer.** The air dryer shall have IP65 protection. | For oil free compressors it is not required to provide an automatic drain valve before air dryer. The clause may be updated suitably. | Tender conditions prevail. |
| 86 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12. | 12.5.6 | All reservoirs shall have an associated automatic drain device and, where applicable, an additional manual device for venting / draining the contents of the reservoir. | As per standard parctice in Indian metros, only main reservoir will have provision of automatic drain valve and all other reservoirs will have manual drain cocks.<br>The clause may be reviewed and updated. | Tender conditions prevail. |
| 87 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.5.7 | All drain cocks that are fitted shall be easily accessible and the drain cock handles shall point downwards when in the **closed** position. | Generally, if the handle is inline with direction of flow, the cock condition is termed as open. And perpendicular to the flow is termed as closed.<br>In view of above, the clause may be rephrased as " All drain cocks that are fitted shall be easily accessible and the drain cock handles shall point downwards when in the **open** position." | Tender conditions prevail. |
| 88 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.6.5 | In the event of a failure of the dynamic brake, the friction brake shall be capable of carrying out **three (3)** consecutive emergency brake applications from maximum speed down to standstill of a rake in the Crush Loading condition. The rake shall be deemed to then accelerate at its maximum rate up to maximum speed after each stop. | Three consecutive emergency brake at maximum speed and crush loading will lead to temperatures beyond the acceptable limits. Therefore the requirement may please be changed as "In the event of a failure of the dynamic brake, the friction brake shall be capable of carrying out **two (2)** consecutive emergency brake applications from maximum speed down to standstill of a rake in the Crush Loading condition. The rake shall be deemed to then accelerate at its maximum rate up to maximum speed after each stop." | Tender conditions prevail. |
| 89 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.6.8.10 | All the pneumatic control equipment, safety valves, governors, switches, sensors etc. in the underframe shall be provided in IP53 or higher compliant lockable boxes for dust control. The enclosed lockable boxes shall be made of stainless steel. | Equipments like safety valves are be mounted in enclosed lockable boxes. Also equipments with IP rating of IP53 or better may be allowed to be installed in the line considering the space availablity.<br>Hence, this clause may be reviewed and updated to "**pneumatic control equipment and valves having electrical contact or switches shall be mounted in the enclosed lockable boxes……..."** | Tender conditions prevail. |
| 90 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.6.8.14 | A proven speed sensor having 2 channel mounted on the cover of each axle box shall be provided for Wheel slide protection, **Train speed measurement** and for any other function decided by CMRL during the design phase. | Speed sensor provided by brake system OEM will be used only for WSP application and may differ from actual trainspeed due to WSP function.<br>Clause may be reviewed and updated for removal of requirement of Train speed measurement from the scope of brake system.<br>Also, "for any other fucntion" is a very generic requirement. The clause may please be updated with specific requirement or may be deleted. | Tender conditions prevail. |
| 91 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.6.9.11 | Complete friction brake system shall be tested on Brake dynamo-meter and validated during field tests. | Brake dynamometer test is applicable for the following equipments/items only:<br>•brake disc or wheel<br>•brake pads or blocks<br>•brake caliper or tread brake unit<br><br>For requirement to be specific, ERTS clause may be updated. | Tender conditions prevail. |

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| 92 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.7.1 (d) | During braking, if the dynamic braking is operating and is providing all the required effort, the BCU shall maintain sufficient EP brake pressure to keep the brake block close to the wheel tread and/or disks but shall not contribute to any braking effort or cause wear to the pads. | It is not recommend to keep pre-pressure provision as this can lead to negative implications on brake pad wear or glazing effect which will reduce the friction coefficient. Since all the braking parameters are already defined, this requirement may lead to poor performance.<br>It is requested to delete this clause 12.7.1 (d). | Tender conditions prevail. |
| 93 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.9.2 | The below listed pressure information shall be shared to TCMS and the same shall be displayed<br>in RSC consoles of OCC, DCC & BCC.<br>a) The pressure in all suspension reservoirs<br>b) The pressure in all reservoirs of train<br>c) The pressure in all brake cylinders<br>d) The pressure in all parking brake units<br>e) The pressure in pantograph regulator<br>f) The pressure in all Vacuum Circuit breakers<br>g) The pressure of Air Generation unit at different stages<br>h) The pressure of Auxiliary compressor (used for raising pantograph) | These requirements may be optimized system for only critical systems pressure monitoring(Main Reservoir, Brake cylinders & Parking Brake). Other interlocks via Pressure switches will be monitored by TCMS in case of any failure.<br>Clause may be reviewed and updated accordingly. | Refer Addendum No.1, S.No. 284 |
| 94 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.15.5 | The Contractor shall interface with ARE01 contractor to ensure that full compatibility of train rescue functionality is achieved. The same shall be demonstrated during at type test stage | Since the requirement mentioned is to interface with ARE01 contractors, all interface control documents and design details shall be shared along with the tender document for understanding the design and financial assesment of the contract. | Refer Addendum No.1, S.No. 288 |
| 95 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.17.1 | The build-up of pneumatic brake force shall be jerk limited (for changes in brake demand) to increase passenger comfort. The jerk limitation shall not exceed 0.75 m/s3. This limit shall also be respected at the time of final stoppage also. | Stopping jerk ineeds to be controlled by the train operator and / or signaling supplier. Clause may be reviewed and updated accordingly. | Tender conditions prevail. |
| 96 | Part 2 – Section VI A ERTS – Rolling Stock chapter 12 | 12.19.1 | The brakes system shall comply with the following SIL levels:<br>Emergency Brakes → SIL 4;<br>Service Brake, **Train Speed information**, Wheel Slide Protection, Holding brake application & Feedback → SIL 2; | Device used for speed measurement is used by brake system OEM is for WSP application only. Clause may be reviewed and updated for removal of requirement of Train speed measurement from the scope of brake system. | Tender conditions prevail. |
| 97 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.2.4 | All the End Devices shall support dual-homing type or any latest technology type of Ethernet connections to ECN via physically independent ports to increase system reliability and availability. All digital and analogue Input / Output interfacing with TCMS (directly or via an interface unit) shall also be fully redundant. In any case, the Contractor shall maintain full system availability, in case of single point failure of any TCMS component or communication link, and the vehicle operation shall not be affected. | It is requested to modify the clause as below<br>"All the End Devices shall support dual-homing type or ~~any latest technology type of Ethernet connections~~ **defined protocol or standard** to ECN via physically independent ports or **by any alternate means** to increase system reliability and availability…....." | Tender conditions prevail. |
| 98 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.9.5 (b) | Single Point Upload of all software of the train<br><br>b) The overall time required for uploading the software for all subsystems shall not be more than **10 minutes** for each complete sub-system of train and the same shall be demonstrated. (Ex. In case of doors sub-system, the time requirement is collectively for all doors of one train) | Single point uploading of software can be done through network switch. Request to rephrase the clause as following:<br>b) The overall time required for uploading the software for all subsystems shall not be more than 30 minutes for each complete sub-system of train and the same shall be demonstrated. (Ex. In case of doors sub-system, the time requirement is collectively for all doors of one train) | Tender conditions prevail. |
| 99 | Part 2 – Section VI A ERTS – Rolling Stock chapter 17 | 17.5.3.4.3 | Brake System Environmental Qualification Test<br><br>A test setup in an approved environmental laboratory shall be made to simulate the worst-case climatic conditions to be encountered during revenue service and shall include conditions of rapid temperature and humidity fluctuations. Each cycle shall be completed within 30 seconds. During environmental testing, system function, ambient temperature, and humidity shall be recorded. | Generally, major components of brake system are tested for environmental qualification individually.<br>In view of the above, requested to update the ERTS clause suitably for critical component like brake electronics. | Tender conditions prevail. |
| 100 | Part 2 – Section VI A ERTS – Rolling Stock chapter 17 | 17.5.4.8.10 | Parking Brake Test<br>A parking brake system test shall be performed on one three car rake. Design compliance with Chapter 2 shall be demonstrated by measuring the force required to move the train with the parking brake applied. | Movement of train with parking brake applied is not recommended in a 3 car configuration or 6 car configuration . It may be detremental to the rolling stock operation which may result in wheel flat / track damage. In view of the above, requested to delete the ERTS clause. | Refer Addendum No.1, S.No. 377 |
| 101 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.54.3 (i) Electronic Equipments | Dry heat test: The dry heat test shall be conducted for class T3 and temperature shall be considered 80ºC against 70ºC specified in IEC/EN. An extra performance check at 95°C shall also be carried out for 10 minutes over temperature value. LCD / LED display units may be tested at 70ºC and an extra performance check at 85°C shall also be carried out for 10 minutes over temperature value | Brake electronic devices only comply EN standard. That means +70°C permanently and +85°C for max. 10 minutes according to the temperature profile defined in the norm. With a longer time at T>+70°C the functioning of the electronic equipment is not guaranteed.<br>Hence this requirement may be changed as **given for standard IEC clause without increasing the temperature** | Tender conditions prevail. |

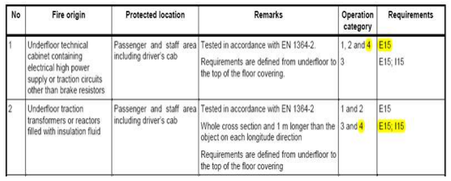
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| 102 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.55.6 | The Contractor shall furnish the following information in respect of printed circuit boards as part of contract:<br>a) Voltage and/or waveform expected at each critical test point.<br>b) Instructions for carrying out testing and troubleshooting and the function of each circuit block.<br>c) Block Diagram and functional descriptions of the PCBs.<br>d) Connection or interfacing diagrams for the printed circuit boards and assemblies. | Voltage/Wave form of electronic circuit is proprietary information and cannot be shared.<br><br>Based on prior experience, OEMs will only provide standard documents. Intellectual Property like flow charts, signal flows, logic, and interpretation of signal etc. will not be shared by sub-contractor/OEMs.<br><br>Clause may be deleted. | Tender conditions prevail. |
| 103 | Part 2 – Section VI A ERTS – Rolling Stock chapter 1 | 1.4.2 | Rakes will operate in revenue service in as 6 car trainsets initially and shall be increased to 6 car trainsets later in case of increased passenger patronage. Under normal operating conditions, trains may be coupled and uncoupled during maintenance and in rescue modes. | The requirement in unclear whether the train operates in 6 car rake formation only or if 12 (or more) car operation is required. "Shall be increased" implies that a larger number of cars than 6 would be coupled, but the number remains 6 in both paragraphs. | Refer Addendum No.1, S.No. 54 |
| 104 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.1.1.2 | All electrical and electronic components shall comply with the EMC and EMI requirements of EN 50121 (all parts), IEEE 16, EN 55011 and IEC 61000-4 standards or other equivalent international standards. The requirements of EMC EMI requirements referred in clause 10.19 & 2.18 shall be met. | Is it adequate to have the equipment type tested against EN 50121 and EN 61000-4 as per EN 50155 requirements? Or do the additionally mentioned IEEE 16 and EN 55011 have to be explicitly tested as well and mentioned in the type test certifications. | Tender conditions prevail. |
| 105 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.1.9 | All communication protocols, architecture and data acquisition concepts of TCMS shall be of the latest state of the art technology and compliant to international and railway industry standards.<br>The Contractor shall advise the proposed applicable standards for review and approval from CMRL. The Contractor shall take adequate measures to protect TCMS system from any cyberattack. | Does meeting the IEC 62443-4-2 SL2 count as "adequate measures" against cyber attacks? | Tender conditions prevail. |
| 106 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.2.1 d) | Network components and transceivers shall be available from multiple sources producers. | What level of compatibility is required between the multiple producers? Does it mean that every network component or transceiver must be possible to be replaced simply by substituting one component with a component produced by another producer? E.g. if a ECN switch fails, should be it be necessary to plug in a ECN switch of another producer in "plug-and-play" fashion? | Tender conditions prevail. |
| 107 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.2.1 e) | When cars of a train are coupled or uncoupled, the network shall automatically reconfigure itselffor the new train configuration. The configuration shall identify each car in the new train by its car number | It is assumed that the cars are only uncoupled and coupled at the depot and they will only run with the specified *DMC + TC + MC + MC + TC + DMC* car configuration. Therefore dynamic network configuration e.g. ETB is not required. Is this assumption correct? | Tender conditions prevail. |
| 108 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.10.6.3 | The event recording equipment shall comply with all applicable international standards. | Please define other standards than EN50155, BS EN 60529 and RGS GM/RT/2472 that the Event recorder must comply with. | Tender conditions prevail. |
| 109 | Part 2 – Section VI A ERTS – Rolling Stock chapter 2 | 2.14.1 (e) | Adhesion Limit of 20% | Request to increase Adhesion to 23% | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 69 |
| 110 | Part 2 – Section VI A ERTS – Rolling Stock chapter 2 | 2.14.1 (aa) | The Contractor shall handover one complete set of software(s) package and associated hardware employed by him for the above studies including assessment of energy conservation modes (Clause 2.14.1.Y) along with the requisite documentation, during design stage to CMRL. The software shall simulate Run Time performance of the train under varied loads, route profiles, headway, inter-station distances, train resistance, Train formation and Tractive Effort & Braking Effort characteristics, evaluation of energy conservation modes etc. The software shall not be restrictive to the above and shall be for general application with provision for CMRL to select parameters. Nominated staff shall be fully trained and made fully conversant by the Contractor for this purpose. The handed over set shall be fully functional during the contract period and post warranty period & shall require no inputs or facilities whatsoever from CMRL. | We do not foresee hardware for the purpose of carrying out simulation. Hence request to delete the clause. | Tender conditions prevail. |
| 111 | Part 2 – Section VI A ERTS – Rolling Stock chapter 2 | 2.15.4.2 | The main traction equipment of motor cars for 67% powering arrangement shall include two (2) independent power circuits for bogie control. | Since there will be 4 converters in a 6 car train, in the case of emergency/loss of power in one converter, the reamining converter will be able to compensate for the loss of power, and perform in degraded modes.<br>Hence, request CMRL to add Car control as an acceptable form of control | Tender conditions prevail. |
| 112 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.52.3 | Very low current relays (1 Amp and less) shall have gold-plated, silver-alloy contacts. | Request CMRL to include the option of using silver/copper plated contact | Tender conditions prevail. |

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| 113 | Part 2 – Section VI A ERTS – Rolling Stock chapter 10 | 10.3.16 | Train resistance formulae for elevated, at-grade and under-ground train operation applications<br>refer Part IVA, Section 2 Clause 2.14. Rolling Stock Contractor shall interface with Power supply Contractor for power load requirements specific to corridors of CMRL Phase 1 | Train resistance formulae is not specified in the tender & also in clause 2.14.<br>We request you to please provide the train resistance values/formulae for both elevated and under-ground train operation.<br>Train Resistance formula (like Davis/modified Davis etc) generally has a factor proportional to cross section area. | Tender conditions prevail.<br>Also, refer Part-2, Tender Clause 2.14.1 of Chapter VI A. |
| 114 | Part 2 – Section VI A ERTS – Rolling Stock chapter 9 | 9.4.10 | For maintenance purposes, there shall be additional by-pass ground switch in auxiliary converter inverter box duly interlocked with safety locks. The Contractor shall submit the detail document for CMRL review during design stage. | We request you to please remove this requirement or keep this requirement as an optional. The additional bypass switch is not required as per standard EN 50155 as the DC-Link voltage is less than 1000 VDC. | Tender conditions previal.<br>Also, Refer Addendum No.1, S.No. 234 |
| 115 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.2.7 | 14.2.7 Spares Provision<br>The TCMS components shall be modular in design at all levels (i.e. hardware, functional, communication etc.) with **minimum 15% spare capacity** in each car for expansion at the end of DLP. The spare provision shall exist for all different equipment's pins, terminals, connectors,ports, train lines, communication packets bits, digital I/O's and analogue I/O's etc. and the same shall be available for after DLP. The hardware spares shall be duly wired to the nearest terminal box. Considering that some changes / modifications would be required during DLP, at least 15% spares capacity shall be initially ensured by the Contractor. The Contractor shall submit a detailed proposal for CMRL review and approval during design stage.<br>20.6.5.2 Hardware spare capacity.<br>i. Spare capacity requirements shall apply to memory, disk storage, communication links/ports, input/output capacity. Minimum figures for spare capacity are given here below. | As per requirements **15% spare** as mentioned in 14.2.7 will be provided. However, we propose to keep 10% spare as per previous metro projects experience.<br><br>The requirement clause 20.6.5.2 Hardware spare capacity for **50% spares** in terms of memory, disk size and communication links & ports to be reconsidered. We propose as following:<br>Memory: 25%<br>Disk Storage: 25%<br>Links/Ports: 15% | Refer Addendum No.1, S.No. 399 |
| 116 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.54.3 (i) | 19.54.3 All Electronic equipment shall comply with IEC60571 and/or EN50155 and additionally type tested for,<br>(i) Dry heat test: The dry heat test shall be conducted for class T3 and temperature shall be considered 80oC against 70oC specified in IEC/EN. **An extra performance check at 95°C shall also be carried out for 10 minutes over temperature value.** LCD / LED display units may be tested at 70°C and an extra performance check at 85°C shall also be carried out for 10 minutes over temperature value. | 1. Subjecting any component to 95°C will reduce the life span of the component . **Is an Internal certification/testing report sufficient?**<br>2. As per standard EN 50155, all TCMS components conforms to 85 degree.<br><br>**We recommend to consider EN 50155 standard as all TCMS components conforms to 85 degree Celsius.**<br><br>**Can we submit already tested certificate for the same?**<br>**Please clarify / confirm.** | Tender conditions prevail. |
| 117 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.2.9 & 14.7.1.5 & 19.54.3 | 14.2.9 The hardware system shall conform to IEC 60571.<br>14.7.1.5 The electronics required for the control, diagnostics and monitoring facilities shall be designed and constructed in accordance with the requirements of IEC 60571 / EN 50155 or equivalent.<br>19.54.3 All Electronic equipment shall comply with IEC60571 and/or EN50155 and additionally type tested | Standards EN 50155, IEC 60571 are used interchangeably in tender clauses. Is compliance to either one of these standards sufficient?<br>In most of the places in the tender it is mentioned as EN50155/IEC 60571, but in 14.2.9 it is mentioned as IEC 60571 only.<br>Can we consider it as EN 50155/IEC 60571? | Tender conditions prevail. |
| 118 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.12.2 | Display on DDU: The cumulative energy values at pantograph, converter-inverter, auxiliaryconverter-inverter and VAC levels with both the components viz. motoring (including coasting) & regeneration, shall be displayed on DDU. It shall also be possible to apply time and trip filters to the energy values. | We recommand to put Time and Trip Filters in a separate offline tool. Cumulative energy values can be shown on DDU for a trip. | Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 357 |
| 119 | Part 2 – Section VI A ERTS – Rolling Stock chapter 17 | 17.5.4.8.22 | Validation of Multi-consist Train Operation shall be tested for conformance according to clause **2.2.31.** | As the clause 2.2.31 has not been incorporated into the tender document.<br>We request to clarify on this requirement. | Refer Addendum No.1, S.No. 379 |
| 120 | Part 2 – Section VI A ERTS – Rolling Stock chapter 2 | 2.5.10 | 2.5.10 In accordance with Part 2 – Section VI A: ERTS Clause 17.9.12, the RS Contractor shall work with the STC, Telecom and PSD Contractors to identify any additional Joint Integration Tests which may be required for the running of trainsets in **6-car Multi-Consist Mode**. These tests may need to be conducted separately from other Joint Integration Tests and shall be performed Contractor if and when requested by CMRL. | We understand there is no requirement of multi-consist operation. | Refer Addendum No.1, S.No. 408 |
| 121 | Part 2 – Section VI A ERTS – Rolling Stock chapter 1 | 1.4.2 | Rakes will operate in revenue service in as **6 car trainsets initially and shall be increased to 6 car train** sets later in case of increased passenger patronage. Under normal operating conditions, trains may be coupled and uncoupled during maintenance and in rescue modes. | We understand the train is designed in 6 car configuration- basic unit and no multi-consist is required. | Refer Addendum No.1, S.No. 54 |
| 122 | Part 2 – Section VI A ERTS – Rolling Stock chapter 1 | 1.3 &1.4 | 1.3.2 The rake configuration of 6-car Trainsets referred to throughout the tender documents are formed of *DMC + TC + MC + MC + TC + DMC* car configuration in order to achieve 67% propulsion. The rake consists of two units, Unit 1 : *DMC1 + TC1 + MC1 and Unit 2 : *DMC2 + TC2 + MC2. **The Trainset shall operate in Grade of Automation 2 (GoA2) / Automatic Train Operation (ATO).**<br><br>1.4.3 During the initial phase of the operational requirement, rakes have to be operated in GoA2 (ATO) / GoA1 (ATP). **However, the Phase 1 project is planned for the upgradation of the Signalling System to GoA3 & GoA4 operations.** | We understand the Grade of operation is GoA2 only and GoA4 is not applicable as the timeline for GoA4 is not defined in tender.<br>Request CMRL to inform GoA4 implementation timeline. | Refer Addendum No.1, S.No. 18 |

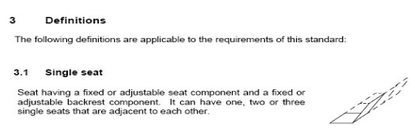
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| 123 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.1.7 | TCMS shall have adequate facility and interfaces to communicate (using MVB networking type) with wayside and train-borne signalling for UTO, ATO and non-ATO modes. | Does the signalling system support GoA2and GoA4 or a new signalling system planned for new upgrade?<br>Request CMRL to inform GoA4 implementation timeline. | Refer Addendum No.1, S.No. 322 |
| 124 | Part 2 – Section VI A ERTS – Rolling Stock chapter 9 | 9.10.3 | During rescue operation, the sick train electrical controls and power supply shall be provided by healthy train. The controls shall consist of minimum the below mentioned operations,<br>a) Application & release of all kinds of brake functions in sick train<br>b) Communication between two trains' (Healthy and Sick) operators<br>c) External parking lights for the sick train<br>d) Cabin lighting of the sick train<br>e) External Head lamps of sick train in case of Push operation by Healthy train.<br>f) Windshield wiper supply<br>g) Pneumatic Horn supply<br>**All networks and TCMS which are required to achieve these above functions shall be available during rescue mode operation between two trains.** | We understand this requirement is fulfilled by trainlines and jumper cables.<br><br>We understand that No Multiconsist is considered in this project, hence ETB(Ethernet interface between healthy train and Sick train) is not considered. | Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 115 to 131 |
| 125 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.1.8 | The Contractor shall submit the complete TCMS configuration details including but not limited to **Application Software Logic, Data Acquisition Routines, Control logic, Fault Detection Algorithms, Data Storage Logic** etc. **Graphical interface for editing and configuring** the same shall be provided and submitted for CMRL approval during design stage. The Contractor shall provide **necessary training** and associated hardware / software tools to make CMRL engineers competent to implement software changes as required within the scope of this contract. The Contractor shall ensure full association and support of the Contractor / Sub-Contractor's design team with CMRL team throughout the project or as the case may be. | We request to kindly check if these requirements regarding the configuration details , logics and editing the SW are applicable as these are properitery information and cannot be shared.<br>Training for editing the software cannot be provided. Request to make this clause optional. | Tender conditions prevail. |
| 126 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.1.10 | Conceptual Approval Only<br>Design approval of proposed TCMS shall imply only conceptual approval. Further changes as required by Other Designated Contractors and Rolling Stock Sub-systems during DLP, shall be discussed during the contract execution stage and solution shall be implemented by the Contractor to the satisfaction of CMRL without any additional cost. This will include **finalization of event list, fault priorities, diagnostics, RTR-DMS data transfer, details to be transmitted to AMMS central server for operational, fault diagnosis requirements and other requirements** defined under the clauses related to TCMS functionalities. If in case the requirements not stipulated in this contract, variation can be raised by the Contractor, subject to approval by CMRL. | We request to finalise this during the pre design stage . | Refer Addendum No.1, S.No. 323 |
| 127 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.2.8 | Expandability Provision<br>The Contractor shall also provide 15% expandability provision (i.e., expansion of capacity by adding of additional hardware) for pins, connectors, network ports, **PCB cards**, train lines etc. The Contractor shall demonstrate to CMRL that adequate space has been reserved inside the cabinets of train to exercise this option. | We request ot confirm if PCB level expansion is required as it requires configuration of PCBs and the controller. | Tender conditions prevail. |
| 128 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.3.4 | Signal List Modification<br>It shall be possible for authorized maintenance personnel to update and modify the list of data acquisition signals and its associated parameters like periodicity, task cycle, data acquisition routine etc. Suitable graphical configuration editors shall be provided for this purpose. | We request to clarify on these requirement as the modification of the signals are not possible as software is proprietary. | Tender conditions prevail. |
| 129 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.10.2 | Event / Fault Information Log<br>Adequate redundancy shall be built into TCMS. The size of On-Board Database memory for fault records shall be sufficient to hold all car level and train level events (at least 30,000 events) between normal downloading intervals of 30 days through hardware download. In case of overwriting, 'Level 3' events / faults only may be overwritten. | Ensuring that the memory capacity is optimally utilized while all fault levels are treated consistently, implementing a selective overwriting mechanism only for level 3 faults would require a custom solution, we kindly request to only consider FIFO based overwriting.<br>We request you to please consider above. | Tender conditions prevail. |
| 130 | Part 2 – Section VI A ERTS – Rolling Stock chapter 18 | 18.5.4.5 | Sneak Circuit Analysis<br>The Contractor shall perform a Sneak Circuit Analysis (SCA) to detect functional and/or Category I / Category II safety problems that could arise from wiring faults or errors and shall submit the analysis for approval. The SCA shall ensure that there are no unintended circuit paths that will result in functions other than those intended. The SCA shall be performed for the overall car and shall consider interfaces with subcontractor-supplied equipment and coupler-pin assignments. | Safety functions are analyzed using FMECAs and FTAs, covering both electronic and electrical components. SIL 3/4 functions are assessed with regard to single-point of failures. For electronic control units that are involved in safety functions with a safety impact greater than BI, corresponding certificates according to EN 50129 are provided. Sneak Circuit Analysis (SCA) of control units are not performed. | Tender conditions prevail. |
| 131 | Part 2 – Section VI A: ERTS – RS Appendix C – Interface | 2.13.2 | Division of Responsibility table: Sr No. 22<br>22 \| Detailed Interface document (DID) \| STC Contractor shall provide the necessary information as requested by RS Contractor. \| RS Contractor shall prepare DID and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance, etc., | On board Signalling system shall be provided by STC Contractor , so STC Contractor shall prepare DID and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance, etc., and RS contractor shall provide the necessary interface information to update.<br>Hence, request CMRL to update Sr No.22. | Refer Addendum No.1, S.No. 408 |

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| 132 | | 9.2.2 | The auxiliary power supply distribution scheme shall be so configured that One Unit of 3 cars (DMC + TC + MC) has two sets of auxiliary power supply equipment. When either operator's cab is activated, complete Rake auxiliary converter inverters shall be operated and equally share the entire 100% auxiliary load of a 6 car train. All the auxiliary power supply equipment in the train shall operate parallel with synchronised control. In the event of failure of any One auxiliary power supply equipment in 6 car train, the remaining three Auxiliary power supply system shall share the entire loads of 6 car train. In the event of failure of Two auxiliary power supply equipment in 6 car train, the Two auxiliary power supply equipment must be capable of supplying all auxiliary loads to complete 6-car train except for VAC load which shall work at 50% of the rated capacity. | The auxiliary power supply distribution scheme shall be so configured that One Unit of 3 cars (DMC + TC + MC) has **atleast One** set of auxiliary power supply equipment. When either operator's cab is activated, complete Rake auxiliary converter inverters shall be operated and equally share the entire 100% auxiliary load of a 6 car train. ~~All the auxiliary power supply equipment in the train shall operate parallel with synchronised control. In the event of failure of any One auxiliary power supply equipment in 6 car train, the remaining three Auxiliary power supply system shall share the entire loads of 6 car train.~~ In the event of failure of **One** auxiliary power supply equipment in 6 car train, the **Healthy** auxiliary power supply equipment must be capable of supplying all auxiliary loads to complete 6-car train except for VAC load which shall work at 50% of the rated capacity.<br><br>Requesting to amend the clause accordingly. | Tender conditions prevail. |
| 133 | Part 2 – Section VI A ERTS – Rolling Stock chapter 14 | 14.14.1 | The Contractor shall establish a TCMS test lab at the site of the Rolling Stock Factory (or elsewhere subject to CMRL approval). The lab shall be fully established at least 3 months' prior to the start of integration type test activities.<br><br>14.14.2 The intended purpose of the lab is to replicate the actual TCMS architecture of the fleet (including train subsystems and interfaces with other designated Contractors) in order to mature the design development of software and hardware interfaces.<br><br>14.14.3 The Contractor shall ensure that its supply chain agreements (SLA) with all major train Subsystem supplier's shall contractually oblige on-time delivery of Subsystem hardware to complete the installation of a fully functional test lab. The SLA's shall also include deployment of the supplier's engineering staff / resources to participate in lab based development tests and activities. | In this context, the requirement specified under clause 14.14.1, 14.14.2 and 14.14.3 shall be fully complied by implementation at the TCMS OEM location or RS contractor prefered location. Please confirm whether same is accpetable . | Tender conditions prevail. |
| 134 | Part 2 – Section VI A ERTS – Rolling Stock chapter 10 | 10.14.1 | The logic of automatic VCB operation at neutral sections shall be possible in ATO and all non-ATO modes including those of degraded modes and degraded / failed TCMS without the supervision of signalling system. | In recent metro projects, Neutral section management is carried out based on Signalling Information during Signalling mode and distance based by TCMS during non-signalling mode. In case of TCMS failure, it is managed by Train Operator through SOP (VCB Open/Close through Push buttons).<br><br>Request to delete the TCMS failed case and also update the ERTS clause based on above. | Refer Addendum No.1, S.No. 260 |
| 135 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.36.13 | Fire resistant cables shall be proposed for circuits, which should survive for long periods during fire, as per applicable international standards. As a minimum, the cables and wires for Battery Circuit, Public Address System, CCTV system, emergency lighting, door system, any other circuit related to Passenger Safety and warning systems shall be fire resistant in compliant to EN 50200 PH120. | Fire resistant cables shall be proposed for circuits, which should survive for long periods during fire, as per applicable international standards. As a minimum, the cables and wires for Public Address System, emergency lighting, door opening and warning systems shall be fire resistant in compliant to **EN 50200 PH15 & EN 50200 PH90.** | Tender conditions prevail. |
| 136 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.37.8 | Electrical circuits and associated cabling shall be designed with clearance and creepage distance between voltage potentials and Car body ground in accordance with the environmental conditions to which the circuits and cabling will be subjected, and in accordance with NFPA 130, Chapter 4. | Requesting to update ERTS clause as below,<br><br>Electrical circuits and associated cabling shall be designed with clearance and creepage distance between voltage potentials and Car body ground in accordance with the environmental conditions to which the circuits and cabling will be subjected, and in accordance with NFPA 130 **or relevant IEC standards**, Chapter 4. | Tender conditions prevail. |
| 137 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.51.5 | Breaker current rating shall be clearly visible after installation and shall comply with NEMA AB1, ANSI C37.13, C37.14, or C37.16. | Requesting to update ERTS clause as below,<br><br>Breaker current rating shall be clearly visible after installation and shall comply with NEMA AB1, ANSI C37.13, C37.14, or C37.16 **or relevant IEC standards** | Tender conditions prevail. |
| 138 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.52.4 | Low-current and very low-current relays that have not been proven in rail service shall comply with MIL-R-5757. | Requesting to update ERTS clause as below,<br><br>Low-current and very low-current relays that have not been proven in rail service shall comply with MIL-R-5757 **or relevant IEC standards** | Tender conditions prevail. |
| 139 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.52.5 | Higher-current relays and contactors that have not been proven in rail service shall comply with MIL-R-6106. | Higher-current relays and contactors that have not been proven in rail service shall comply with MIL-R-6106 **or relevant IEC standards** | Tender conditions prevail. |
| 140 | Part 2 – Section VI A ERTS – Rolling Stock chapter 19 | 19.57.12 | Microprocessor system hardware block diagrams shall be provided. | Microprocessor system hardware block diagrams is proprietary information and cannot be shared. Based on prior experience, OEMs will only provide standard documents. Intellectual Property will not be shared by sub-contractor/OEMs.<br><br>Clause may be deleted. | Tender conditions prevail. |

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| 141 | Part 2 – Section VI A ERTS – Rolling Stock | All | General Observation | In many clauses, only ATP&ATO operations are mentioned, same need to reviewed and updated for the UTO/Signalling requirements.<br><br>CMRL need to share the exisiting interface requirements and DID which need to be cosidered for ARE05. | Refer Addendum No.1 |
| 142 | Part 2/Section VI A ERTS – Rolling Stock chapter 2 | 2.26.1 (iv) | The vehicle floor shall provide a fire barrier of 30 minutes duration tested in accordance with EN45545 Part 1 to 7 (**Category 4-A**, Hazard level HL3) latest editions | As per EN 45545-3 for Category 4 the fire barrier duration is 15 minutes. Extract from the standard is shown below.<br><br>**Floor Fire barrier duration to be updated as 15 minutes.** | Tender conditions previal. Also, Refer Addendum No.1, S.No. 93 |
| 143 | Part 2/Section VI A ERTS – Rolling Stock chapter 3 | 3.3.1 | Fire resistance as required by either NFPA 130, BS 6853, EN 45545 or the Japanese Fire Standards, and Chapter 19 | Fire resistance requirement to be as per **EN 45545** standard for railway application. Other standards refered by CMRCL to be deleted. | Tender conditions prevail. |
| 144 | Part 2/Section VI A ERTS – Rolling Stock chapter 3 | 3.4.7.9 | The total floor structure shall provide an effective fire barrier for a minimum of 30 minutes as per BS 6853, or equivalent | As per the standard EN 45545-3, the fire barrier criteria is E15 & I15 for operation category 4. hence, the fire barrier duration 30 minutes to be revised as 15 minutes. | Tender conditions prevail. |
| 145 | Part 2/Section VI A ERTS – Rolling Stock chapter 3 | 3.6.3.2 | Stanchions shall be arranged in two rows. They shall be placed in longitudinal rows. Stanchions shall not be placed in the centre isle of the passenger compartments. Stanchions in the middle may be replaced by handrails | The requirement of two rows of stanchions in longitudinal row is not clear. Provide sketch of the stanchion and handrail arrangement expected by CMRCL. | Tender conditions prevail. |
| 146 | Part 2/Section VI A ERTS – Rolling Stock chapter 3 | 3.6.3.3 | Stanchions and handrails shall be stainless steel | CMRCL to specify the finish whether mirror finish or Satin brush finish is required. | Tender conditions prevail. |
| 147 | Part 2/Section VI A ERTS – Rolling Stock chapter 3 | 3.6.3.6 | Two longitudinal rows or three of grab straps shall be installed | Requirement is not clear. CMRL to provide the grab pole, grab rail and grab straps arrangement sketch for the requirement. | Refer Addendum No.1, S.No. 110 |
| 148 | Part 2/Section VI A ERTS – Rolling Stock chapter 3 | 3.6.5.14.3 | Seats shall meet the requirements of UIC 564-2 or equivalent | UIC 564-2 is test method for determining the fire resistance of rigid non-thermoplastic materials and shall not be applicable for stainless steel seats. | Tender conditions prevail. |
| 149 | Part 2/Section VI A ERTS – Rolling Stock chapter 3 | 3.6.5.15.4 | Behaviour of seats at static, fatigue, vibrations, impact stress shall be design, tested as per NFF 31-119 and indentation test shall be design, tested as per ISO 2439. The indentation hardness shall be similar to industry standards. The indentation hardness and depth shall be measured first be tested initially and then at 80,000 cycle intervals | The load criteria is already specified by CMRCL at clause no. 3.6.5.8 as " Each bank of seats shall be mounted on a totally enclosed plinth, capable of carrying an evenly distributed load equivalent to the number of seated passengers per seat bank times the weight of a passenger times a load factor of two (2) without damage or permanent deformation". Hence, the clause 3.6.5.15.4 to be deleted.<br><br>Further, the NFF 31-119 standard is applicable for the transverse seating arrangement with a maximum of 3 single seats adjacent to each other. The extract of the standard for single seat is as shown below:<br><br>The seating arrangement in this tender is longitudinal with 7 single seats adjacent to each other. As per the standard definition for the single seat, the NFF 31-119 is applicable for maximum 3 seats. Hence, the NFF 31-119 is not applicable. Hence, UIC566 shall be followed. | Tender conditions prevail. |
| 150 | Part 2/Section VI A ERTS – Rolling Stock chapter 19 | 19.20.5 | The rubber flooring material shall comply with FS-SS-T-312 and the flame and smoke test requirements of clause 19.61. | Flame and smoke test requirements shall be as per EN 45545 as per clause 2.26 | Tender conditions prevail. |



| No | Fire origin | Protected location | Remarks | Operation category | Requirements |
|---|---|---|---|---|---|
| 1 | Underfloor technical cabinet containing electrical high power supply or traction circuits other than brake resistors | Passenger and staff area including driver's cab | Tested in accordance with EN 1364-2.<br>Requirements are defined from underfloor to the top of the floor covering. | 1, 2 and 4<br>3 | E15<br>E15; I15 |
| 2 | Underfloor traction transformers or reactors filled with insulation fluid | Passenger and staff area including driver's cab | Tested in accordance with EN 1364-2<br>Whole cross section and 1 m longer than the object on each longitude direction<br>Requirements are defined from underfloor to the top of the floor covering | 1 and 2<br>3 and 4 | E15<br>E15; I15 |



**3 Definitions**

The following definitions are applicable to the requirements of this standard:

**3.1 Single seat**

Seat having a fixed or adjustable seat component and a fixed or adjustable backrest component. It can have one, two or three single seats that are adjacent to each other.

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| 151 | Part 2/Section VI A ERTS – Rolling Stock chapter 19 | 19.20.9 | The floor covering shall be permanently secured to the plymetal sub-floor with a CMRL approved adhesive and as recommended by the flooring manufacturer | Plymetal floor board is not specified in the floor structure clause no. 3.4.7.3 (Floor boards material is mentioned as aluminium honeycomb sandwiched type or Composite floor boards). CMRL to update this clause accordingly. | Tender conditions prevail. |
| 152 | Part 2/Section VI A ERTS – Rolling Stock chapter 19 | 19.61 | Flammability and smoke emission | The complete clause to be corrected as per the fire safety standard EN 45545 inline with clause no. 2.26 | Tender conditions prevail. |
| 153 | Part 2 – Section VI B: ERTS – DM&P General Requirements and Scope | 1.19 - Subcontractors / Manufacturers Item No. 2. Automatic Train Wash Plant (ATWP) | The Sub-contractor/ Manufacturer should have executed at least two **similar** Works of Design, manufacture, Supply, Installation, Testing and Commissioning of Automatic Train Wash Plant (ATWP) to any Metro Rail Projects / LRT / High Speed Rail Network / Railways system in India or Abroad or both during the last 10 years of ending date of bid submission. | Could you please clarify whether 'similar design' means that experience with the same specifications and materials is required, or is experience with any ATWP sufficient? | Tender conditions prevail. |
| 154 | Part 2 – Section VI B: ERTS – DM&P General Requirements and Scope | 1.19 - Subcontractors / Manufacturers Item No. 2. Automatic Train Wash Plant (ATWP) | The Sub-contractor/ Manufacturer should have executed at least two Works of Design, manufacture, Supply, Installation, Testing and Commissioning of Rail Cum Road Bogie operated (8 wheeler) vehicles to any Metro Rail Projects / LRT / High Speed Rail Network / Railways system/ other infrastructure project in India or Abroad or both during the last 10 years of ending date of bid submission. | We note that for other major machines, experience in **similar type machines** has been requested. However, in this clause, experience in **any type of Rail Cum Road Bogie operated (8-wheeler) vehicle** is mandated. Currently, **no Indian manufacturer exists** who has manufactured TTCVs to these specifications. Expecting a local manufacturer to develop such vehicles involves significant risk, as reputed and experienced manufacturers for this type of vehicle are **primarily foreign**.<br>In line with Indian Government regulations, we request that foreign manufacturers be allowed to participate, provided minimum 20% local value addition is ensured. Therefore, we request that the clause be reconsidered to: The Sub-contractor/ Manufacturer should have executed at least two Similar Works of Design, manufacture, Supply, Installation, Testing and Commissioning of Tunnel & Track Cleaning Vehicle (TTCV) to any Metro Rail Projects / LRT / High Speed Rail Network / Railways system/ other infrastructure project in India or Abroad or both during the last 10 years of ending date of bid submission. | Tender conditions prevail. |
| 155 | Part 2 – Section VI B: ERTS – DM&P | 2.8 RELIEF AND RESCUE VEHICLE (RRV), Clause No. 2.8.2.4 | The Contractor shall get the Registration of Rail-cum-Road Vehicle with Regional Transport Office in the name of CMRL. Also Speed Certification of Rail-cum-Road Vehicle from statutory authority / RDSO is in scope of Contractor. Necessary support shall be provided by CMRL. | We would like to clarify that the Vehicle Supplier cannot carry out the registration process, as the vehicle will be registered in CMRL's name. Registration can only be done either by CMRL itself or by the Rolling Stock Contractor and it involves periodic renewals, which makes it impractical for the Vehicle Supplier to manage. Similarly, obtaining the Speed Certification also falls under the scope of CMRL or the Rolling Stock Contractor and cannot be undertaken by the Vehicle Supplier. However, the Vehicle Supplier will provide all necessary technical documents, drawings, and details required to facilitate the registration and speed certification process. | Tender conditions prevail. |
| 156 | Part 2 – Section VI B: ERTS – DM&P | 2.8 RELIEF AND RESCUE VEHICLE (RRV), Clause No. 2.8.2.5 | The Contractor shall get the vehicle registered in the name of CMRL in the applicable RTO (Regional Transport Office) of Tamil Nadu. | We would like to clarify that the Vehicle Supplier cannot carry out the registration process, as the vehicle will be registered in CMRL's name. Registration can only be done either by CMRL itself or by the Rolling Stock Contractor. Since vehicle registration involves periodic renewals, it is not feasible for the Vehicle Supplier to manage this process. The Vehicle Supplier will, however, provide all necessary technical documents, drawings, and details required to facilitate the registration process. | Tender conditions prevail. |
| 157 | Part 2 – Section VI B: ERTS – DM&P | 2.8 RELIEF AND RESCUE VEHICLE (RRV), Clause No. 2.8.2.8 | The Vehicle shall be designed and manufactured in India. | We would like to highlight that, no Indian manufacturer currently exists who has manufactured a vehicle meeting these specifications. All similar vehicles currently in use in metro projects have been imported. Therefore, we request that this requirement be reconsidered, either by modifying the clause to allow imported vehicles meeting the specification or by deleting this restriction. | Tender conditions prevail. |
| 158 | Part 2 – Section VI B: ERTS – DM&P | 2.8 RELIEF AND RESCUE VEHICLE (RRV), Clause No. 2.8.3.6 | Driver's Cab & Personnel Compartment: Cab / Personnel compartment for accommodating 6 persons including the vehicle driver. | It is advised that seating arrangement for all 6 persons, including the driver, should be provided within the driver's cabin itself for better safety and comfort. Providing seating in any other compartment for rescue crew members is not recommended, as such compartments may not have adequate safety features and comfort amenities similar to the cabin. | Tender conditions prevail. |
| 159 | Part 2 – Section VI B: ERTS – DM&P | 2.14 Tunnel & Track Cleaning Vehicle, Clause No. 2.14.2.3 | The Contractor shall provide all necessary support to allow CMRL to obtain Speed Certification for the TTCV from any relevant statutory authority / RDSO. | We understand that obtaining the Speed Certification is the responsibility of CMRL and cannot be undertaken by the Vehicle Supplier. The Vehicle Supplier will, however, provide all necessary support, including technical documents, drawings, and other relevant details required to facilitate the speed certification process. Please confirm if our understanding is correct. | Tender conditions prevail. |
| 160 | Part 2 – Section VI B: ERTS – DM&P | 2.14 Tunnel & Track Cleaning Vehicle, Clause No. 2.14.2.4 | The Contractor shall get the TTCV vehicle registered in the name of CMRL in the applicable RTO (Regional Transport Office) of Tamil Nadu. Cost of registration of vehicle shall be borne by the Contractor. | We would like to clarify that the TTCV Vehicle Supplier cannot carry out the registration process, as the vehicle will be registered in CMRL's name. Registration can only be done either by CMRL itself or by the Rolling Stock Contractor. Since vehicle registration involves periodic renewals, it is not feasible for the Vehicle Supplier to manage this process. The Vehicle Supplier will, however, provide all necessary technical documents, drawings, and details required to facilitate the registration process. | Tender conditions prevail. |

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| 161 | Part 2 – Section VI B: ERTS – DM&P | 2.14 Tunnel & Track Cleaning Vehicle, Clause No. 2.14.2.7 | The TTCV shall be designed and manufactured in India. | We would like to highlight that currently, **no Indian manufacturer exists** who has designed and manufactured a TTCV meeting these specifications. Asking any local manufacturer to develop it involves significant risk, as experienced and reputed manufacturers for this type of vehicle are **primarily foreign**.<br>In line with Indian Government regulations, we request that foreign manufacturers be allowed to participate, provided minimum 20% local value addition is ensured. Therefore, we request that this requirement be reconsidered, either by modifying the clause to allow imported vehicles meeting the specifications or by deleting this restriction. | Tender conditions prevail. |
| 162 | Part 2 – Section VI B: ERTS – DM&P | 1.19 - Subcontractors / Manufacturers | Tack & Tunnel Cleaning Vehicle | Is it **Track** & Tunnel Cleaning Vehicle ? | Refer Addendum No.1, S.No. 416 |
| 163 | Part 2 – Section VI B: ERTS – DM&P | 1.19 - Subcontractors / Manufacturers | The Sub-contractor/ Manufacturer should have executed at least two Works of Design, manufacture, Supply, Installation, Testing and Commissioning of **Rail Cum Road Bogie operated (8 wheeler) vehicles** to any Metro Rail Projects / LRT / High Speed Rail Network / Railways system/ other infrastructure project in India or Abroad or both during the last 10 years of ending date of bid submission. | Equipment mentioned in EQC is Rail Cum Road Bogie operated (8 wheeler) vehicles in place of Track & Tunnel Cleaning Vehicle. Is this an error or Specific requirement? | Tender conditions prevail. |
| 164 | Part 1 , Secrion III | 2.5 TCMS | The proposed system shall be in satisfactory revenue operation in GoA4 for atleastr three (3) years of the Bid , submisson deadline , in a countyr other than country of origin of manufacturer or in India , at the time of bid | We would like to inform that Train operation in GoA3/4 mode is only now being introduced in India. The TCMS does not itself perform GoA functions; it mainly requires standard interfaces and integration with the signalling system. These integrations such as door control, safety interlocks, automatic operation commands, and diagnostic exchanges are established TCMS capabilities anddo not require GoA-4-specific experience.To enable GoA3/4 operation, the existing TCMS requires only an interface with the signalling equipment, which is not a technically complex task for any established TCMS supplier<br><br>Therefore we request to please modify the TCMS Eligibility as below:<br><br>"The TCMS supplier shall have supplied TCMS hardware and software in functioning since last more than two years and shall be compliantwith international norms. TheContractor shall submit basic system architecture with hardware for approval at the concept design approval stage and establish 'proven design' asspecified." | Tender conditions prevail. |
| 165 | Part 2/Section VI A ERTS – Rolling Stock chapter 10 | 10.11.15 | Four (4) trains shall be instrumented (in accordance with EN 50463) with separate Power Quality measuring instruments, data acquisition systems and power analyser (with provision for permanent installation and shall have necessary in-built software / analysis tool) to measure record and analyse the power quality parameters. This instrument shall also have memory storage for minimum 15 days of testing data. The measurement with these instruments shall include but not limited to Time, kW, kVAR, kVA, THD, TDD, Total pf and Displacement pf. The instruments supplied shall have the adequate capability of measuring and data acquisition to analyse higher order harmonics (up to 50th) and measure power quality parameters mentioned above with minimum accuracy of 0.1% and sampling rate of 100 kHz. Details of instruments shall be finalized during design stage. Other trains shall also have necessary provisions (suitable space, wiring etc.) for installation and recording power quality parameters as per above. | Bidder submits power quality measurement requires that the measurements have to be performed for periods of 24 hours to 1 week and the THD and TDD are to be arrived at statistically. The standard also specifies that the measurements must be made at the point of common coupling of the power system, instead of at the terminals of the distorting equipment. Harmonics measurements require special CTs and PTs, which will need to be calibrated periodically. Hence the measurements for power quality must be performed at the sub-station, and not on the train. Emission tests will be performed as type test and results will be shared. Energy Metering will be performed by TCMS.<br><br>Hence, bidder submits to amend/update the requirement as follows: Prototype Rakes Bidder shall be instrumented with provide separate PowerQuality measuring instruments, data acquisition systems and power analyser (with provision for permanent installation and necessary software/analysis tool) to measure, record and analyse the power quality for the traction and regenerated energy including its harmonic analysis at all mode of operation at different loads at the sub-station with fleet of identical trains. The measurement with these instruments shall include but not limited to Time, kW, Kavar, kVA, THD, TDD, Total Power Factor and Displacement Power Factor. | Tender conditions prevail. |
| 166 | Part 2/Section VI A ERTS – Rolling Stock chapter 10 | 10.8.13 | Maximum Transformer efficiency shall be achieved at AW2 load and Normal Mode as per IEC60310 and shall not be less than 97% at 22.5kV. The transformer efficiency shall also be validated in system test bed and line tests. | For high power transformer and with weight constraints peak efficiency of 96% can be achieved | Tender conditions prevail. |
| 167 | Part 2/Section VI A ERTS – Rolling Stock chapter 14 | 14.1.1.5 | TCMS shall be a completely integrated system equipped with data acquisition, monitoring, control,record, display, self-diagnostic, fault diagnostic, remote diagnostic, transmission of data to AMMS server, configuration editing, troubleshooting-guidance, etc., features / functions for the train, its systems and subsystems. The Contractor shall submit a comprehensive list of capabilities for each of the above listed features. | Transmission of data to be done to AMMS Server , OCC Server | Refer Addendum No.1, S.No. 319 |
| 168 | Part 2/Section VI A ERTS – Rolling Stock chapter 2 | 2.12.3 | The rake shall not exceed an axle loading of 16 tonnes under AW4 conditions. The measured load per axle shall not exceed as mentioned in ERTS – RS (clause 11.9.23). | The performance condition and configuration of train is similar to Metro. Also normal performance is defined for passenger loading of AW4 which is again same as that of Metro. So we request to increase the axle loading to 17 tons. | Tender conditions prevail. |

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| 169 | Part 2/Section VI A ERTS – Rolling Stock chapter 2 | 2.25.1 | The Contractor shall note that 'SPECIFIC ENERGY CONSUMPTION (SEC)' shall be verified in any one corridor of Phase 1 (which can be selected by the Contractor) under conditions detailed hereafter in this clause shall not exceed 50 Wh / GTKM (watt hours per gross tonne kilometre) referred to as SECs. The Contractor shall submit detailed simulation results for all corridors of Phase 1 during the Pre-Final Design stage. | Please provide route data for evaluation of SEC | Tender conditions prevail. Also, Refer Tender Clause Appendix D |
| 170 | Part 2/Section VI A ERTS – Rolling Stock chapter 11 | 11.4.18.2 | The bogies rotational resistance (X factor) test under inflated and deflated air spring conditions would be carried out at the manufacturer's works under tare conditions, the value of which should not exceed 0.08 at rotational speed of 0.8 degrees / second. The rotational resistance shall neither cause excessive flange wear nor cause any possibility of flange climbing but shall be adequate to avoid bogie hunting on straight track. The Contractor shall show by analysis that no flange climbing occurs on any curve and moving at all possible speeds. Test shall be conducted in accordance with clause 17.5.2.10.11. | The bogies rotational resistance (X factor) test under inflated and deflated air spring conditions would be carried out at the manufacturer's works under tare conditions, the value of which should not exceed 0.1 at rotational speed of 0.8 degrees / second. The rotational resistance shall neither cause excessive flange wear nor cause any possibility of flange climbing but shall be adequate to avoid bogie hunting on straight track. The Contractor shall show by analysis that no flange climbing occurs on any curve and moving at all possible speeds. Test shall be conducted in accordance with clause 17.5.2.10.11. | Tender conditions prevail. |
| 171 | Part-2, Section VIII. General Conditions | 4.2 | …..The Employer shall return the Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate…. | In line with standard practice, we request to incorporate the below:<br><br>Upon issuance of the Taking-Over Certificate by the Employer in accordance with the Contract, fifty percent (50%) of the Performance Security shall be released and returned to the Contractor. The balance fifty percent (50%) of the Performance Security shall be released upon issuance of the Performance Certificate (or upon expiry of the Defects Liability Period, as applicable), subject to the Contractor having duly fulfilled the contractual obligations. | Tender conditions prevail. |
| 172 | Part-2, Section VIII. Particular Conditions (Part B: Specific Provisions) | 4.1.1 | The Contractor agrees to provide all necessary spares for a period of ten (10) years, at the request of CMRL, at the prices quoted in the tender documents, subject to the Price Adjustment as per sub-clause 13.8 of PCC. | It is not possible to maintain the prices of the Spares for a period of 10 years subject to the Price Adjustment as per sub-clause 13.8 of PCC. Instead, we request the bidders be permitted to quote the annual percentage of increase/decrease (in Price Centre G formats of the Pricing document) which shall be applicable for the period of 10 years.<br>Please consider. | Tender conditions prevail. |
| 173 | Part 2 – Section VI A: ERTS – RS | 2.15.4 Traction Equipment (2.15.4.2) | The main traction equipment of motor cars for 67% powering arrangement shall include two (2) independent power circuits for bogie control. | We request amendment to the existing condition as the Car control Traction Converter Inverters are best suited for a 6 car trainsets and can satisfy the 67% traction power requirement of CMRL.<br>We understand that 3 car trainsets with 67% traction needs bogie-controlled Traction CIs (4 motor bogie controls out of 6 bogies). However, for the ARE05 contract, the requirement is for 6 car trainsets with 67% traction which can be fulfilled by using Car controlled Traction CIs (4 motor cars out of 6 cars).<br>The rationale to propose car control traction converter inverter is multiple advantages for 6 car configuration:<br>Advantages are listed as below:<br>1. Rate of failure: Lesser in car-controlled Traction Converter Inverter<br>2. Weight: Lesser in car-controlled Traction Converter Inverter<br>3. Dimensions: Lesser in car-controlled Traction Converter Inverter<br>4. Fire load: Lesser in car-controlled Traction Converter Inverter<br>5. Interface: Lesser in car-controlled Traction Converter Inverter<br>6. Ease of Maintenance: Lesser in car-controlled Traction Converter Inverter<br>Motor car control can be achieved provided performance requirements are met exclusively under motor car cutout conditions, excluding bogie-level cutout scenarios. | Tender conditions prevail. |
| 174 | Part 2 – Section VI A: ERTS – RS | 10.11 POWER CONVERTER-INVERTER (10.11.1) | There shall be one Converter-Inverter per bogie in each motor car. The Converter-Inverter shall be of proven design, four quadrant IGBT or any other latest metro rail proven technology-based unit, with VVVF control. The equipment shall conform to IEC 61287-1. Natural or forced (air / water) cooling shall be adopted. However, if forced (air / water) cooling is offered, complete details of the arrangement including the method of dust filtration (if applicable) shall be furnished. The Contractor shall provide the details of variation of power factor with power and variation of power with catenary voltage. | We request amendment to the existing condition as the Car control Traction Converter Inverters are best suited for a 6 car trainsets and can satisfy the 67% traction power requirement of CMRL.<br>We understand that 3 car trainsets with 67% traction needs bogie-controlled Traction CIs (4 motor bogie controls out of 6 bogies ). However, for the ARE05 contract, the requirement is for 6 car trainsets with 67% traction which can be fulfilled by using Car controlled Traction CIs (4 motor cars out of 6 cars). The cooling system shall be decided after the analysying the line profile and environmental conditions. | Tender conditions prevail. |
| 175 | Part 2 – Section VI A: ERTS – RS | 2.14.2 Traction Performance (2.14.2.1) | During a conventional train rescue operation (E.g. release of both parking and service brakes is achieved on the failed train) a healthy assisting train (in AW4 load condition) shall be capable of rescuing a failed train (also in AW4 load condition). The coupled AW4~AW4 consists shall be capable of starting and accelerating up a worst-case gradient of 4 % and be able to reach a speed of 20 kmph in restricted manual mode. This is to enable the defective rake to be removed from service. | We understand that the car control Traction converter Inverters can satisfy the failure contingency plan of CMRL in case of any train failed during revenue service. Thus, the rescue operation requirement can be met by car control traction converter inverter. Hence, we request CMRL to amend the clause 10.11.1 and 2.15.4.2. The rescue operation is posible with car control configuration, however, analysis of line profile and environmental conditions to be analysed. | Tender conditions prevail. |
| 176 | Part 2 – Section VI A: ERTS – RS | 2.14.2 Traction Performance (2.14.2.2) | During the rescue operation of a train with a burst MR pipe; a healthy assisting train (in AW0 load condition) shall be capable of rescuing a failed train (in AW4 load condition). The coupled AW0 ~ AW4 consists shall be capable of starting and accelerating up a worst case gradient of 4% and be able to reach a speed of 20 kmph in restricted manual mode.<br>This coupled rake of healthy and defective consists shall be able to ascend any combination of gradient and/or curve as may be necessary to reach the next station to allow passengers to deboard. The healthy train shall thereafter be able to push or pull the defective train (with its load now reduced to AW0) over a distance of up to 10km in order to reach the nearest pocket rack or siding track.<br>To facilitate recovery of failed trainsets back to the Depot during non-revenue hours, an AW0 healthy consist shall also be capable of recovering an AW0 failed train from any point of the Phase I network to the Designated Depot(s). The Contractor shall demonstrate that this can be accomplished this without exceeding any thermal limits. | We understand that the car control Traction converter Inverters can satisfy the failure contingency plan of CMRL in case of any train failed during revenue service. Thus, the rescue operation requirement can be met by car control traction converter inverter. Hence, we request CMRL to amend the clause 10.11.1 and 2.15.4.2. The rescue operation is posible with car control configuration, however, for the thermal limit analysis line profile and environmental conditions to be analysed. | Tender conditions prevail. |

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<tr><th rowspan="2">Sl. No.</th><th colspan="4">As per the Submission of Bidder(s)</th><th rowspan="2">CMRL Response</th></tr>
<tr><th>Part/ Section No</th><th>Clause No.</th><th>Original Bid Condition</th><th>Bidder’s queries</th></tr>
<tr><td>177</td><td>Part 2 / Section VI A</td><td>2.8</td><td>CLEARANCE REQUIREMENTS 2.8.5 The Contractor shall ensure that the cars conform to the latest version of Schedule of Dimension (SOD) without any addition cost to CMRL APPENDIX D – GUIDELINES AND DRAWINGS D1 - Schedule of Dimensions (SOD) for Standard Guage 1435mmCMRL Phase 1 Project (R12</td><td>Justification: It is observed the SOD provided in Appendix D is old version which has inconsistencies in platform KE. The platform KE (pg 33 of 44) is not taking advantage of the platform distance from track center which is of magnitude 1505mm, whereas KE is constrained at 1477mm approximately at floor level. Subsequently the allowances for inside and outside curve has to follow the KE in latest SOD.<br><br>Accordingly, bidder requests to use latest approved SoD (SOD_A15_Approved) of ARE04A for ARE05 contract.</td><td>Tender conditions prevail.<br><br>It is clarified that the platform KE (pg 33 of 44) at point no. 12 may be read as X-1505 & Y-1001 approximately at floor level.</td></tr>
<tr><td>178</td><td>Part 2 / Section VI A</td><td>2.2.11</td><td>Prototype Train Program:<br>Following the successful completion of all design review activities the Contractor shall begin production of a Prototype Train, which shall consist of the manufacture of two Diving Motor Cars, two Trailer Cars and two Motor Cars, which will make up a 6-car trainset. Upon delivery, these 6 cars shall then constitute the Prototype Train.....<br><br>(iii) Phase 3 - When the on-site delivery testing requirements have been satisfied, the three Prototype cars shall be united to form a Prototype Train. The Prototype Train shall then undergo operational testing as required in Chapter 17 followed by proof of performance testing as 6 car trainsets. This shall include all specified system interface testing on CMRL’s property.</td><td>Concern: Prototype train is 6car train but in Clause 2.2.11(iii) requesting three prototype cars to form a prototype train, means first 3car basic unit to be tested successfully then another 3car basic unit to be produced and shipped respectively to validate 6car train under Phase-3.<br><br>Clarification required: Bidder request to clarify the clause 2.2.11 under Phase-3 regarding 6 car trainset testing and commissioning.</td><td>Refer Addendum No.1, S.No. 59</td></tr>
<tr><td>179</td><td>Part 2 / Section VI A</td><td>2.14.3.2, 2.14.3.3</td><td>2.14.3.2: For a normal operation of service brake (nominal 1 m/s2) on level track from maximum speed, the rake shall brake to a standstill from 80kmmh in 247m (+0, -10%) under any Loading Conditions up to AW4. The Contractor shall demonstrate by providing calculations of the minimum adhesion level, required to achieve the stopping distance. Upon receipt of signal to Brake Control Unit, the application of service brake time should be less than 300 msec.<br><br>2.14.3.3: For an emergency brake application in good adhesion conditions (i.e. dry uncontaminated wheel rail interface) on level track from maximum speed, the rake shall brake to a standstill from 80 kmph within a distance of 223m under any Loading Conditions up to AW4. The minimum average emergency brake rate following any single point failure shall not be less than 1.3 m/s2.</td><td>Concern: Stopping distance from 80km/h to 0kmph upto AW4 loadings must be maximum 247m under normal operating conditions as stated in Cl.2.14.3.2 and maximum 223m under emergency operating conditions as stated in Cl.2.14.3.3.<br><br>Clarification required: Bidder request to modify the clause 2.14.3.2 without stating minimum tolerance under normal conditions as:<br><br>2.14.3.2: For a normal operation of service brake (nominal 1 m/s2) on level track from maximum speed, the rake shall brake to a standstill from 80kmph in 247m under any Loading Conditions up to AW4. The Contractor shall demonstrate by providing calculations of the minimum adhesion level, required to achieve the stopping distance. Upon receipt of signal to Brake Control Unit, the application of service brake time should be less than 300 msec.</td><td>Tender conditions prevail.</td></tr>
<tr><td>180</td><td>Part 2 / Section VI A</td><td>2.7.3(ii), (iii)</td><td>2.7.3(ii): For a Driving Motor Car, there shall be a 1 Wheelchair provision and minimum of 44 seats longitudinally arranged along each side of the interior of the car. Seat shall be standard type bench seats with no individual / single seat mouldings. The typical width of the passenger seat spacing shall be 450 mm and the depth, including leg room (as per EN 15663), shall be 670 mm. The remaining floor space shall maximize standing room for passengers for each of the loading conditions described in Chapter 2.12.2.<br><br>2.7.3(iii): For Trailer cars & Motor cars, there shall be a minimum of 50 seats longitudinally arranged along each side of the car. Seat shall be standard type bench seats with no individual / single seat mouldings. The proposed width, height, depth, and leg room (as per EN 15663) of the seats shall be optimised to ensure maximum standing room for passengers for each of the loading conditions described in Chapter 2.12.2. The proposed design shall be subjected to CMRL approval.<br><br><table><tr><th></th><th>DM car</th><th>T car</th><th>M car</th></tr><tr><td>Seats</td><td>46</td><td>50</td><td>48</td></tr><tr><td>Wheelchair</td><td>-</td><td>-</td><td>1</td></tr><tr><td>Standees (AW3 condition)</td><td>213</td><td>208</td><td>208</td></tr><tr><td>Standees (AW4 condition)</td><td>284</td><td>278</td><td>278</td></tr><tr><td>Total capacity (6 car) AW3 condition</td><td colspan="3">{ (46+213) + (50+208) + (48+1+208) } x 2 = 1548 passengers + 1 Driver</td></tr><tr><td>Total capacity (6-car) AW4 condition</td><td colspan="3">{ (46+1+284) + (50+278) + (48+1+278) } x 2 = 1970 passengers + 1 Driver</td></tr></table></td><td>Concern: 1 wheelchair required in DM car as per cl. 2.7.3(ii) along with 44seats and 50seats in intermediate cars as per clause 2.7.3(iii). But in Clause 2.7.3(iii) table, wheelchair distribution in MC car is contradicting with clause 2.7.3(ii). and another thing, overall pax capacity having no impact with wheelchair positioning either in driving or intermediate car including view of no operational constraint. Please refer below table:<br><br><table><tr><th></th><th>DM</th><th>TC</th><th>MC</th><th>@3car</th><th>@6car</th><th>Total Seated + Standing w/o driver</th></tr><tr><td></td><td>1WC</td><td>0</td><td>0</td><td>1</td><td>2</td><td></td></tr><tr><td></td><td>44</td><td>50</td><td>50</td><td>144</td><td>288</td><td></td></tr><tr><td>AW3(6pax/sqm) standing</td><td>213</td><td>208</td><td>208</td><td>629</td><td>1258</td><td>1548</td></tr><tr><td>AW4(8pax/sqm) standing</td><td>284</td><td>278</td><td>278</td><td>840</td><td>1680</td><td>1970</td></tr></table><br>Clarification required: Bidder request to keep clause 2.7.3 as stated in sub clause (ii), (iii) without any contradicting table for passenger capacity calculation.</td><td>Refer Addendum No.1, S.No. 65</td></tr>
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| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 181 | Part 2 / Section VI A | 2.25.2, 2.25.10(a)(viii) | This Specific Energy Consumption shall be total of two components viz. SEC for 6 car train (with VAC switched off) i.e. 'SECP' value and SEC of VAC for 6 car train i.e. 'SECH' value and 'SECAUX' value of Auxiliary load. These three values shall be declared by the Contractor (SECP-declared + SECH-declared + SECAUX-declared) during Preliminary Design stage and the same shall be validated in pre-final design stage and verified in combine testing and mainline testing. The total declared SEC value i.e. SECdeclared for 6 car train as declared by the Contractor i.e. SECP-declared + SECH declared shall not exceed the SECS i.e. 50 Wh/GTKM as mentioned above. The Contractor shall note that no adjustments shall be permitted on the 'SEC' values obtained during validation. Changes to SECP-A (Achieved value of SECP) and SECH-A (Achieved value of SECH) will be permissible on account of any of the following:<br>(i) Increase in length of the network in any corridors by up to 5% of the total length of the section including change in alignment (horizontal curve, vertical curve, etc.,).<br>(ii) Increase in number of stations by 2 (two) stations in each Corridor.<br>(iii) Any changes in station locations with consequent changes in inter station distances /rationalization of curves & gradients.<br><br>2.25.10(a) (viii): .....The Contractor shall submit the Average Equivalent Auxiliary load (DAux) in kW at pantograph level for a round trip detailed above. The Contractor shall also consider the DAux value while declaring the value of SECP-declared during Preliminary design stage. (DAux) calculations shall consider the following factors: ..... | Concern: This Specific Energy Consumption shall be total of two components viz. SEC for 6 car train (with VAC switched off) i.e. 'SECP' value and SEC of VAC for 6 car train i.e. 'SECH' value and 'SECAUX' value of Auxiliary load. In easy way, SEC will have two components for an energy consumption one is for propulsion including auxiliary without HVAC and another HVAC. In equation: SECP consist of Traction + Auxiliaries load and SECH for HVAC load. This is also in line of Clause 2.25.10(a) (viii).<br><br>Clarification required: Bidder request to modify the clause 2.25.2 as:<br><br>This Specific Energy Consumption shall be total of two components viz. SEC for 6 car train (with VAC switched off) i.e. 'SECP' value including auxiliary load and SEC of VAC for 6 car train i.e. 'SECH' value. These three values shall be declared by the Contractor (SECP-declared + SECH-declared + SECAUX-declared) during Preliminary Design stage and the same shall be validated in pre-final design stage and verified in combine testing and mainline testing. The total declared SEC value i.e. SEC declared for 6 car train as declared by the Contractor i.e. SECP-declared + SECH declared shall not exceed the SECS i.e. 50 Wh/GTKM as mentioned above. The Contractor shall note that no adjustments shall be permitted on the 'SEC' values obtained during validation. Changes to SECP-A (Achieved value of SECP) and SECH-A (Achieved value of SECH) will be permissible on account of any of the following: ..... | Refer Addendum No.1, S.No. 89 |
| 182 | Part 2 / Section VI A | 11.4.15(a) | All dampers (Vertical & Horizontal) including Air Spring orifice (non-adjustable damping devices), shall be provided on each bogie. | Concern: orifice at air spring damper, as bogie dynamics shall have no impact on its performance irrespective of orifice or no orifice available at air spring.<br><br>Clarification required: Bidder request to modify the clause 11.4.15(a) as below:<br><br>All dampers (Vertical & Horizontal) including Air Spring with or without orifice (non-adjustable damping devices), shall be provided on each bogie. | Tender conditions prevail. |
| 183 | Part 2 / Section VI A | Appendix D | Appendix D - GUIDELINES AND DRAWINGS:<br>https://cmrlindiamy.sharepoint.com/:f:/g/personal/bhavya_s_cmrl_in/IgD_Qta1bISRazPOb0StligAVBPjdaQEeq0espE3VaDSLo?e=lxhXxe | Concern: SharePoint link is not accessible.<br><br>Clarification required: Bidder request to provide track data for corridor 1 & 2 along with extension. | Tender conditions prevail. |
| 184 | Part 2 / Section VI A | 9.2.4, 9.5.1, 9.3.14 | 9.2.4: The costs for all interface design and testing works shall be deemed to be included in the Contract sum regardless of the actual extent of effort required or expended by the Contractor.<br><br>9.5.1: ……VAC units of each car of the train and shall maintain proper comfort of passengers in the train as mentioned in clause 9.3.14.<br><br>**9.3.14: Not used** | **Concern:** Typo error as clause no. 9.3.14 deleted/not used.<br><br>**Clarification required:** Bidder request to update the clause 9.2.4 & 9.5.1 respectively. | Refer Addendum No.1, S.No. 227 |
| 185 | Part 2 / Section VI A | 9.3.10 | The auxiliary converter inverter AC output voltage of 3ϕ supply shall be regulated within ±5% of the nominal voltage and output frequency within 48~52Hz over the full load range. At individual Auxiliary converter inverter output level, **Total Harmonic Distortion (THD-V) in voltage shall be limited to 3%** under all operating conditions for the individual Auxiliary Converter Inverter. Phase to phase imbalance shall not exceed more than 1% between phases. The converter shall be designed and constructed in accordance with the requirements of IEC 61287 and IEC 60146. | **Concern:** Total harmonic distortion in Voltage of 3% which may be possible at DC link fed auxiliary converter not directly from Main transformer. As per EN50533, 8% of THD is generally to meet.<br><br>**Clarification required:** Bidder request to modify the clause as below:<br><br>"The auxiliary converter inverter AC output voltage of 3ϕ supply shall be regulated within ±5% of the nominal voltage and output frequency within 48~52Hz over the full load range. At individual Auxiliary converter inverter output level, **Total Harmonic Distortion (THD-V) in voltage shall be limited to 8%** under all operating conditions for the individual Auxiliary Converter Inverter. Phase to phase imbalance shall not exceed more than 1% between phases. The converter shall be designed and constructed in accordance with the requirements of IEC 61287 and IEC 60146." | Tender conditions prevail. |
| 186 | Part 2 / Section VI A | 12.5.1, 12.5.9 | 12.5.1: All Reservoirs shall be manufactured using Stainless steel / Aluminium complying with **EN 286-3:1994** or any other relevant international standards.<br><br>12.5.9: Reservoirs shall be designed, tested, and stamped in accordance with **ASME Section VIII, Division I Boiler and Pressure Vessels Code** for unfired pressure vessels or in accordance with the UIC or EN codes. | **Concern:** For railway application, reservoirs follow EN 286-3 or EN 286-4 for manufacturing, design, tested and stamped. But Clause12.5.9 is requesting for reservoir to comply ASME section VIII, Division I Boiler and Pressure Vessels code, which is difficult to suppliers to follow.<br><br>**Clarification required:** Bidder request to delete the clause 12.5.9. | Tender conditions prevail.<br>Refer Addendum No.1, S.No. 275 |
| 187 | Part 2 / Section VI A | 12.6.8.6 | Brake system design shall ensure that in the event of isolation of **33% bogie brakes**, train can safely work up to maximum speed of 60 kmph. This shall be enforced as automatic speed restriction and shall be communicated to TCMS. | **Concern:** 33% bogie brakes isolation which lead to approx. 4 bogie means 2 car isolation in 6car train leading friction brake isolation only and electrodynamic brake available. if understanding is correct then no change required else 16% bogie brake isolation would be required.<br><br>**Clarification required:** Bidder request to modify the clause as below:<br><br>Brake system design shall ensure that in the event of isolation of **16%** bogie brakes, train can safely work up to maximum speed of 60 kmph. This shall be enforced as automatic speed restriction and shall be communicated to TCMS. | Refer Addendum No.1, S.No. 277 |

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<tr><th>Part/ Section No</th><th>Clause No.</th><th>Original Bid Condition</th><th>Bidder’s queries</th></tr>
<tr><td>188</td><td>Part 2 / Section VI A</td><td>3.6.1.22</td><td>All internal panels (side panels, ceiling panels, end-ceiling panels, inspection cover panels, door coving panels, ceiling coving panels, etc) shall be of aluminium material with proven record in Metro / EMU application. Coating system shall be proposed by the Contractor shall be proven and conform to the requirements in clause 3.6.1.21, subjected to CMRL approval.<br><br>Flatness of Aluminium side panels shall be controlled within 0.5 mm per 1m length.<br><br>The Contractor shall ensure adequate measure have been taken to prevent and mitigate the risk of bi-metallic corrosion and rattling. Suitable damping and Insulation shall also be provided to reduce noise and thermal conductivity especially at metal-to-metal contact points.</td><td>Concern: All interior panels shall be Aluminium. FRP panels should also allow to give weight savings, let's bidder to decide materials for panels for offering optimal solution in terms of maintainability, durability, insulation, weight, cost.<br><br>Clarification required: Bidder request to modify the clause as below:<br><br>All internal panels (side panels, ceiling panels, end-ceiling panels, inspection cover panels, door coving panels, ceiling coving panels, etc) shall be of aluminium or FRP material with proven record in Metro / EMU application. Coating system shall be proposed by the Contractor shall be proven and conform to the requirements in clause 3.6.1.21, subjected to CMRL approval.<br><br>Flatness of Aluminium side panels shall be controlled within 0.5 mm per 1m length.<br><br>The Contractor shall ensure adequate measure have been taken to prevent and mitigate the risk of bi-metallic corrosion and rattling. Suitable damping and Insulation shall also be provided to reduce noise and thermal conductivity especially at metal-to-metal contact points.</td><td>Tender conditions prevail.</td></tr>
<tr><td>189</td><td>Part 2 / Section VI A</td><td>1.9.2</td><td>The warranty period of unit exchange, mandatory and overhauling spares, special tools, testing and diagnostic equipment, special jigs, fixtures and gauges, simulator or any other item / equipment delivered shall be: (i) either 24 months from the date of acceptance; or<br>(ii) up to expiry of the defect liability period of all trains, including the option trains, whichever is later.</td><td>Concern: Defect liability period or defect notification period for point(ii).<br><br>Clarification required: Bidder request to modify the clause as below:<br><br>The warranty period of unit exchange, mandatory and overhauling spares, special tools, testing and diagnostic equipment, special jigs, fixtures and gauges, simulator or any other item / equipment delivered shall be 24 months from the date of acceptance.</td><td>Tender conditions prevail.</td></tr>
<tr><td>190</td><td>Part 2 / Section VI A</td><td>17.10.2, 18.6.5.2</td><td>17.10.2: Service Trials for all three-car rake other than the Prototype Train shall be carried out for 2000Kms for each train. Service trials/Burn In trials for Prototype Train shall be conducted for a minimum of 10,000 Kms. All Service trials/Burn In trials shall be conducted in GoA2 ATO mode only.<br><br>18.6.5.2: Each 6-car rake shall be included in the reliability test once it has been conditionally accepted for induction into the revenue service.</td><td>Concern: three car rake, but a rake in this contract stands for 6car rake or train.<br><br>Clarification required: Bidder request to confirm the understandings and modify the clause accordingly.</td><td>Refer Addendum No.1, S.No. 387</td></tr>
<tr><td>191</td><td>Part 2 / Section VI A</td><td>17.10.2, 18.6.6.1</td><td>17.10.2: Service Trials for all three-car rake other than the Prototype Train shall be carried out for 2000Kms for each train. Service trials/Burn In trials for Prototype Train shall be conducted for a minimum of 10,000 Kms. All Service trials/Burn In trials shall be conducted in GoA2 ATO mode only.<br>18.6.6.1: The following table sets out the requirements for fleet Reliability Demonstration (RD). It defines the calculation methodology, reporting requirements and Target Thresholds. Stated periods are derived from the Revenue Introduction Date (RID) of the 1st Trainset:</td><td>Concern: Burn in/service trails of 2000kms. Will 2000kms accountable into Reliability demonstration MDBF?<br><br>Clarification required: Bidder request to confirm the understandings.<br><br>Table 18-2: Requirements for Reliability Demonstration (RD):<table><tr><th rowspan="2">RD Period</th><th colspan="3">Criteria for Evaluation of Fleet Reliability Demonstration</th><th rowspan="2">MDBF Target (For Type-1 Failures)</th><th rowspan="2">Duration of Rolling Evaluation Period</th></tr><tr><th>RD Evaluation Period Starts</th><th>Reporting Submission Start Date</th><th>Criteria to Complete RD Period</th></tr><tr><td>Stabilisation</td><td>1st Train RID</td><td>1st Train RID +1 Month (Informal Reporting Only)</td><td>1st Train RID + 6 Months</td><td>No Target / Reporting Only</td><td>1 Month</td></tr><tr><td>Level 1</td><td>1st Train RID + 6 Months</td><td>1st Train RID +13 Months</td><td>MDBF Target met for 18 Reporting Months (accumulated)</td><td>80,000 Km</td><td>6 Months</td></tr><tr><td>Level 2</td><td>1st Train RID + 6 Months</td><td>1st Train RID +19 Months</td><td>MDBF Target met for 12 Reporting Months (accumulated)</td><td>1,25,000 Km</td><td>12 Months</td></tr></table></td><td>Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 387 & 394</td></tr>
<tr><td>192</td><td>Part 2 / Section VI A</td><td>1.4.1</td><td>CMRL plans to operate 365 days a year, from approximately 4.00 Hrs to 00.00 Hrs Monday through Sunday during the complete fleet operation conditions.</td><td>Concern: No concern on operating times but for testing and commissioning even service trail/burn in to run for 2000km and 10000km at least as per clause 17.10.2 shall require more run time than 4hrs. Request to CMRL to provide timeplan/schedule for 2000km and 10000km run to complete in days/months.<br><br>Clarification required: Bidder request to clarify the clause.</td><td>Tender conditions prevail.</td></tr>
<tr><td>193</td><td>Part 2 / Section VI A</td><td>8.2.3</td><td>All the 100% of interior and exterior lighting of train shall be powered directly from train’s batteries. Train battery shall be of sufficient capacity to maintain the all the train lights for one-hour duration in case of failure of auxiliary supply. This function shall be achievable in parallel working with other essential loads of train as defined in Section VI A ERTS (RS) Clause 9.4.2.</td><td>Concern: 100% battery powered external light is ok but internal lights is having no purpose to feed fully in the absence of main auxiliary supply which is raising unnecessary battery capacity high & maintainable cost also. in line of other Metro corporation, 50% interior/saloon lights can be put with battery back up to save battery capacity, packaging, maintenance also.<br><br>Clarification required: Bidder request to modify the clause as below:<br><br>All the 50% of interior and 100% of exterior lighting of train shall be powered directly from train’s batteries. Train battery shall be of sufficient capacity to maintain the all the train lights for one-hour duration in case of failure of auxiliary supply. This function shall be achievable in parallel working with other essential loads of train as defined in Section VI A ERTS (RS) Clause 9.4.2.</td><td>Tender conditions prevail.</td></tr>
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| | Part/ Section No | Clause No. | Original Bid Condition | Bidder's queries | |
| 194 | Part 2 / Section VI A | 8.3.1.5 | The Colour **Rendering Index $R_a$ of all interior LED lights shall not be less than 90**. | **Concern:** As colour rendering index >90 is not a problem technically but economically costlier than lights with colour rendering index of or more than 80. as other metro corporation having tunnel operation implies internal lights with rendering index >80 only.<br><br>**Clarification required:** Bidder request to modify the clause as below:<br><br>The Colour Rendering Index Ra of all interior LED lights shall not be less than 80. | Tender conditions prevail. |
| 195 | Part 2 / Section VI A | 8.3.1.6 | The saloon interior lighting intensity shall be uniformly distributed. The level of illumination shall be at least 300 lux at the floor level of the Coach and **not less than 500 lux at seating positions.**<br>Lighting intensity requirements inside coaches shall also comply with EN13272. | **Concern:** As per EN 13272, the typical required illumination levels for passenger saloons are lower and do not explicitly mandate 500 lux at seating areas. In EN 13272 it do not ask to maintain 500 lux at seat level as per EN 13272-1 : 2019 Table 2 it will only ask to maintain 150 lux at seating area.<br><br>BS EN 13272-1:2019<br>**EN 13272-1:2019 (E)**<br><br>**Table 2 — Minimum values of average illuminance and target uniformity for other units**<br><br>\| Location \| Illuminance[a] $E_m$ in lx \| Uniformity[b] \|<br>\| --- \| --- \| --- \|<br>\| Seating areas \| ≥ 150 \| 0,7 to 1,3 \|<br>\| Standing areas, open gangways \| ≥ 50 \| 0,5 to 2,5 \|<br>\| Aisles at floor level \| ≥ 50 \| 0,5 to 2,5 \|<br>\| Aisles at 0, 8 m above floor level \| ≥ 75 \| 0,5 to 2,5 \|<br>\| Vestibules[c] \| ≥ 75 \| 0,8 to 1,2 \|<br>\| Vehicle access steps[d] \| ≥ 75 \| not applicable \|<br><br>**Clarification required:** Bidder request to confirm and modify the clause as below:<br>The saloon interior lighting intensity shall be uniformly distributed. The level of illumination shall be at least 300 lux at the floor level of the Coach and **not less than 150 lux at seating positions.** Lighting intensity requirements inside coaches shall also comply with EN13272. | Tender conditions prevail. |
| 196 | Part 2 / Section VI A | 11.12.1, 11.12.2 | **11.12.2: All other intermediate bogies shall be equipped with a Derailment Detection (DD) device**; providing the same functionality as Clause 11.12.1 but without deflection / detection of obstacles. The design of Obstruction Deflection Device and its mounting arrangement shall be proven and should be use in similar metro applications.<br>**11.12.1:** An Obstacle Deflector Derailment Detection (ODDD) device shall be installed on the lead bogie of each car Driving Motor Car.<br>In addition to physically deflecting (pushing away) obstacles on the track to avoid risk of derailment, the ODDD device shall also detect either of the following hazardous conditions:<br>a) An obstacle strikes the ODDD<br>b) Derailment of the bogie<br><br>Either condition shall trigger an emergency brake application. TCMS shall differentiate between each condition and trigger an alarm in OCC. | **Concern:** Clause 11.12.1 is OK. But in clause 11.12.2 is asking for derailment detection at all intermediate bogies that is again challenging for operation of train in mainline because if any derailment detection occurred due to sensor issue or wheel wear issue then emergency brake will be always triggered and scenario of withdrawal or service delay to be faced. to resolve it many round of iteration will be required at rolling stock as well as signalling side too. this is real issue faced in multiple unit operation outside of India and lastly, we removed intermediate sensor/deactivated for the operation in multiple units.<br><br>**Clarification required:** Bidder request to modify the clause 11.12.2 as below:<br><br>**11.12.2: Intermediate bogie at the end of a basic unit may be equipped with a Derailment Detection (DD) device;** providing the same functionality as Clause 11.12.1 but without deflection / detection of obstacles. The design of Obstruction Deflection Device and its mounting arrangement shall be proven and should be use in similar metro applications. | Tender conditions prevail. |
| 197 | Part 2 / Section VI A | 5.10.5 | **All front windshields shall have electrically operated wiper system with water spray.** The wind shield wipers shall withstand air pressures equivalent to 90 kmph of two trains which are running in opposite directions. Wiper system shall also be operated from TCMS. | **Concern:** Does it mean detrainment door also require with wiper system?<br>**Clarification required:** Bidder request to confirm the understanding. | Refer Addendum No.1, S.No. 161 |
| 198 | Part 2 – Section VI A: ERTS | 16.12.1.1 | The design submissions include Design Calculations, Design Reports and Design Drawings. All design submissions shall include a 'clause by clause' compliance status to all this Contract. | According to the TRSL interpretation, it is necessary to submit CBC solely for ERTS- Section VI A: Rolling stock, and not for ERTS- Section VI C: CMC. We would request CMRL to kindly confirm the same.<br><br>According to the TRSL interpretation, it is necessary to submit CBC only for ERTS- Section VI A: Rolling stock, and not for Part-1: Bidding Procedure and Part 3: Conditions of Contract and Contract Forms. We would request CMRL to kindly confirm the same. | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 430 |

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| 199 | Part 2 / Section VI A | 1.3.8 & 1.4.3 | During the initial phase of the project the trains are planned to be operated in Automatic Train Operation (ATO) shall be the predominant mode of train operation. In case if CMRL does not engage ATO for any reason, at any stage of passenger operation or non-passenger operation, the Train Operator will deploy staff to drive the train under Manual Mode (under ATP). After the upgradation made by Signalling Contractor the trains will be operated in GoA3 & GoA4. \|Vs\|During the initial phase of the operational requirement, rakes have to be operated in GoA2 (ATO) / GoA1 (ATP). However, the Phase 1 project is planned for the upgradation of the Signalling system to GoA3 & GoA4 operations | Bidder seeks clarification on the contradictory statement on the mode of operation. Also bidder seeks clarity on Signaling Upgradation Plan as it is not specified. | Tender conditions prevail. Refer Addendum No.1 |
| 200 | Part 2 / Section VI A | 12.15.4 | The healthy train shall be able to release the SAPBs / holding brakes of the defective train after successful mechanical and pneumatic connection coupling has been achieved. | Justification: To guarantee safe and controlled holding brake release, electrical connection must be established along with mechanical and pneumatic connections before proceeding.<br><br>Amendment requested: The healthy train shall be able to release the SAPBs / holding brakes of the defective train only after successful mechanical, pneumatic, and electrical connection has been achieved | Tender conditions prevail. |
| 201 | Part 2 / Section VI A | 6.1 | 6.10.1 Detrainment doors shall be provided in the first and last car for emergency egress of passengers + other clauses pertaining to detrainment door. | Justification: Since front detrainment door is not required due to availability of side evacuation walkway in infrastructure, it is requested to please remove the same from RFP (mentioned at several other clauses) | Refer Addendum No.1, S.No. 190 |
| 202 | Part 2 / Section VI A | 6.2.13 | The Contractor shall provide Passenger Door button or Local Door Control button in compliance with EN 14752 (Cl. 4.3.1). This button function (On, Off, Reset, Isolation, etc.,) shall be fully controlled by TCMS. | Justification: As passenger door buttons are not available in existing Ph1 trains hence any such feature may create confusion among the passengers and will impact operation. Also, such features are more desirable in regional / mainline operations where passenger footfall at some stations are expected to be extremely low.<br><br>Accordingly, bidder request to remove this requirement. | Refer Addendum No.1, S.No. 169 |
| 203 | Part 2 / Section VI A | 2.7.3 | Passenger Capacity(ii) For a Driving Motor Car, there shall be a 1 Wheelchair provision and minimum of 44 seats longitudinally arranged along each side of the interior of the car. Seat shall be standard type bench seats with no individual / single seat mouldings. The typical width of the passenger seat spacing shall be 450 mm and the depth, including leg room (as per EN 15663), shall be 670 mm. The remaining floor space shall maximize standing room for passengers for each of the loading conditions described in Chapter 2.12.2. | According to the RFP ARE05 (Part-2) clause 2.7.3 (ii), wheelchair provision is requested in DMC however, clause 2.7.3 (iii) table shows wheelchair in M car.<br><br>Accordingly, bidder requests to align the wheelchair requirement with maximum two per train. | Refer Addendum No.1, S.No. 65 |
| 204 | Part 2 / Section VI A | 13.7.1.16.1 | 18 no's of LCD with LED backlit displays (or superior technology) shall be provided inside each coach. Screens shall be at least 27" corner to corner and 16:9 aspect ratio. | Justification: 6 no's of LCD with LED backlit displays are sufficient for the passengers seated/ standing to read the display board inside the train. Also, It is not possible to accommodate 18 nos. of 27" inch advertisement displays in the interior due to lack of sufficient space.<br><br>**Accordingly, bidder requests to keep it 06nos. in line with ARE04A.** | Tender conditions prevail. |
| 205 | Part 2 / Section VI A | 2.15.6.3 | The friction brake system shall be proven and capable of achieving all performance requirements without the aid of electric regenerative braking for a Round trip. | Justification: All ED cut out case is a degraded scenario and achieving brake performance in Aw4 for complete trip may be an issue due to increase in pad temperature for the complete trip. However, same can be performed for AW3 load.<br><br>Accordingly, bidder request to delete this requirement in line with ARE04A. | Tender conditions prevail. |
| 206 | Part 2 / Section VI A | 10.8.9 (g) | Transformer bushings shall be provided with heat-detectors / LHD unit | **Justification:**Transformer bushings are not equipped with LHD, however we have separate LHD cables mounted in ono the enclosure housing the bushing .<br><br>**Accordingly, bidder request to remove this requirement in line with ARE04A.** | Tender conditions prevail. |
| 207 | Part 2 / Section VI A | 9.6.3 | The battery shall supply Emergency load (also called as Safety loads or Essential loads) for at least **90 minutes** (with ALL doors open and close every two minutes) in case of failure of battery charger or its supply with battery charged to a level as expected during service but not better than 80% of its full capacity. | **Justification:** The intended objective of 90 min back-up time is not clear and not common. 90 min of battery back-up with 15 years of battery life will lead to over-sizing, very high capacity of batteries and huge battery box which will be difficult to accommodate in underframe. Also it will lead to considerable increase in weight of the car.<br><br>**Accordingly, bidder request to keep it 60min in line with ARE04A.**. | Refer Addendum No.1, S.No. 236 |
| 208 | Part 2 / Section VI A | 3.4.1.4.3 | The carbody and attached equipment shall be designed to provide necessary clearances for the bogie and bogie profiles. Under normal conditions, the design must allow for 40 mm minimum clearance between carbody mounted parts and all bogie mounted parts, including wiring, hoses, cable, wheels and chains, under the worst combination of wear, except for any stops attached to the carbody for limiting bogie movement or for bogie lifting during maintenance. Worst case conditions may result from horizontal and vertical curves, track super elevation, worn wheels, maximum passenger load, roll, yaw, lateral motion, and suspension system failures. | **Justification:** As per standard practices 40mm is not an optimized clearance between carbody mounted parts and bogie mounted parts and it affects rolling stock sizing hence bidder requests to amend the clause as below.<br><br>**Amendment Requested:**:- The carbody and attached equipment shall be designed to provide necessary clearances for the bogie and bogie profiles. Under normal conditions, the design must allow for >20mm minimum clearance between carbody mounted parts and all bogie mounted parts, including wiring, hoses, cable, wheels and chains. And clearance should be >10mm under the worst combination of wear, except for any stops attached to the carbody for limiting bogie movement or for bogie lifting during maintenance where worst case conditions may result from horizontal and vertical curves, track super elevation, worn wheels, maximum passenger load, roll, yaw, lateral motion, and suspension system failures. | Tender conditions prevail. |

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| 209 | Part 2 / Section VI A | 4.4.2.2 | The Contractor shall prove CMRL that automatic coupling between two rakes (mechanical, pneumatic and electrical) shall be possible without any manual intervention in the ruling curve (sharpest curve), ruling gradient (sharpest gradient) in mainline as well in depot (for all GoA2 operation network) based on the alignment drawing provided by CMRL. | **Justification:** Automatic coupling on all curve will not be feasible, manual intervention may be required when unidirectional coupling is considered. Hence bidder request to amend the clause as below:-<br><br>**Amendment Requested:** The Contractor shall prove CMRL that automatic coupling between two rakes (mechanical, pneumatic and electrical) shall be possible from either one side of the train without any manual intervention in the ruling curve (sharpest curve), ruling gradient (sharpest gradient) in mainline as well in depot (for all GoA2 operation network) based on the alignment drawing provided by CMRL. | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 125 |
| 210 | Part 2 / Section VI A | 12.5.7 | All drain cocks that are fitted shall be easily accessible and the drain cock handles shall point downwards when in the closed position. | **Justification :** All the drain cock valves can have feature to lock the handle once it is kept in position.<br><br>**Amendment Requested:** All drain cocks that are fitted shall be easily accessible and the drain cock handles shall not change it position by any unintended operation/objects. | Tender conditions prevail. |
| 211 | Part 2 / Section VI A | 12.15.5 | The Contractor shall interface with ARE01 Contractor to ensure that full compatibility of train rescue functionality is achieved. The same shall be demonstrated during at type test stage | **Clarification Requested:** In rescue scenario, Service Brake and Emergency brake can be applied in defective train by 25%, 50% and 100% FSB and EB trainline. However, considering compatibility with ARE01 train fleet is not possible as service brake trainline 25%, 50% and 100% FSB train lines was not requested in the contract for ARE01. | Refer Addendum No.1, S.No. 288 |
| 212 | Part 2 / Section VI A | 9.2.1 | Auxiliary power requirements are described for One Unit of 3 cars (DMC + TC + MC) considering 6 car rake consists of two identical 3 car units for the purpose of auxiliary power supply distribution scheme. The auxiliary power supply shall consist of two static converter & inverters, two back-up batteries & two battery chargers. | Considering the optimum auxiliary architecture based on the impact of weight, packaging and cost, for a 6 car train two Auxiliary converter inverter, Battery charger and Battery is proposed.<br><br>**Bidder request to rephrase the clause as follows:** Auxiliary power requirements are described **for 6-car Train set**. The auxiliary power supply shall consist of two static converter & inverters, two back-up batteries & two battery chargers. | Tender conditions prevail. |
| 213 | Part 2 / Section VI A | 9.2.2 | The auxiliary power supply distribution scheme shall be so configured that One Unit of 3 cars (DMC + TC + MC) has two sets of auxiliary power supply equipment. When either operator's cab is activated, complete Rake auxiliary converter inverters shall be operated and equally share the entire 100% auxiliary load of a 6 car train. All the auxiliary power supply equipment in the train shall operate parallel with synchronised control. In the event of failure of any One auxiliary power supply equipment in 6 car train, the remaining three Auxiliary power supply system shall share the entire loads of 6 car train. In the event of failure of Two auxiliary power supply equipment in 6 car train, the Two auxiliary power supply equipment must be capable of supplying all auxiliary loads to complete 6-car train except for VAC load which shall work at 50% of the rated capacity. | In line with the standard redundancy requirement for Metros, bidder request to rephrase the redundancy level within the auxiliary power system requirements similar to the other CMRL projects:<br><br>**Amendment Requested:** The auxiliary power supply distribution scheme shall be so configured that 6 cars unit has two sets of auxiliary power supply equipment. When either operator's cab is activated, complete Rake auxiliary converter inverters shall be operated and equally share the entire 100% auxiliary load of a 6 car train. All the auxiliary power supply equipment in the train shall operate parallel with synchronised control. **In the event of failure of any One auxiliary power supply equipment in 6 car train, at-least 50% auxiliary loads of each car of train shall continue to operate in normal operation.** | Tender conditions prevail. |
| 214 | Part 2 / Section VI A | 9.2.4 | The Auxiliary converter inverter system and associated equipment shall comply with the power circuit design. The redundancy level within the auxiliary power system shall be proposed by theContractor as per clause 9.3.14. | The clause 9.3.14 is marked as not used. **Hence, bidder request for clarification.** | Refer Addendum No.1, S.No. 227 |
| 215 | Part 2 / Section VI A | 9.4.14 | Provision for single point upload of all software for Auxiliary converter inverter shall be provided from the TCMS of the train. Auxiliary Converter Inverter System shall meet the requirements ofReal Time Remote Diagnostic Monitoring System (RTR-DMS) as mentioned in clause14.11 & 14.13 | The clause 14.13 is marked as not used. **Hence, bidder request for clarification.** | Refer Addendum No.1, S.No. 358 |
| 216 | Part 2 / Section VI A | 9.5.1 | In the event of failure of any auxiliary power supply equipment on one unit (DMC + TC + MC), the remaining auxiliary power supply equipment must be capable of supplying auxiliary power for 50% of all loads per each car in one unit (DMC + TC + MC), which includes categories of 3ϕ & 1ϕ supply. However, 100% DC power supply in all cars at 110 VDC loads, all emergency, safety and essential loads on the complete one unit (DMC + TC + MC) shall function in this condition. In this scenario, this healthy Auxiliary converter inverter shall supply a minimum of 50% of all the VAC units of each car of the train and shall maintain proper comfort of passengers in the train as mentioned in clause 9.3.14. | The clause 9.3.14 is marked as not used. **Hence, bidder request for clarification.** | Refer Addendum No.1, S.No. 227 |
| 217 | Part 2 / Section VI A | 9.4.5 c) | The auxiliary converter shall use a control scheme that contains extensive self- diagnostics logic, which shall be fully integrated with DMS. At a minimum, the diagnostics system shall identify a range of credible faults, identify whether a Least Responsible Unit (LRU) is responsible for the fault, and whether the LRUs (or non-LRUs) must be replaced or the system merely reset. The diagnostics system memory shall be retained for at least 1000 events and shall be controlled in FIFO methodology. The Contractor shall submit for CMRL's review a list of faults and functional description of fault logging. (CDRL 9-10) The Contractor shall also submit for CMRL's review a list of faults and functional description of trace recording system. (CDRL 9-11) | **Bidder request to rephrase the clause as follows:** The auxiliary converter shall use a control scheme that contains extensive self-diagnostics logic, which shall be fully integrated with DMS**(TCMS).** At a minimum, the diagnostics **Logic** shall identify a range of credible faults, identify whether a Least Responsible Unit (LRU) is responsible for the fault, and whether the LRUs (or non-LRUs) must be replaced or the system merely reset. The diagnostics system memory shall be retained for **500 events** and shall be controlled in FIFO methodology. The Contractor shall submit for CMRL's review a list of faults and functional description of fault logging. (CDRL 9-10) The Contractor shall also submit for CMRL's review a list of faults and functional description of trace recording system. (CDRL 9-11) | Tender conditions prevail. |

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| 218 | Part 2 / Section VI A | 14.2.4 | Dual-Homing End Devices (ED)All the End Devices shall support dual-homing type or any latest technology type of Ethernet connections to ECN via physically independent ports to increase system reliability and availability. All digital and analogue Input / Output interfacing with TCMS (directly or via an interface unit) shall also be fully redundant. In any case, the Contractor shall maintain full system availability, in case of single point failure of any TCMS component or communication link, and the vehicle operation shall not be affected | **Justification:** TCMS vehicle network is based on ring topology, in case of failure of one Switch or cable break, the TCMS network will remain operational because of the ring architecture. The GES Switch also supports Ethernet Ring Topology and implements fast ring recovery algorithm to provide high availability for the ethernet network. However, dual homing is considered for critical requirements and may not be required for OMS, BRIO, BCE, FSD, DRS & SIG.<br><br>**Accordingly, bidder requests to remove this requirement for all interface units. Bidder request to rephrase the clause as follows**<br><br>Dual-Homing End Devices (ED)**Critical** end Devices shall support dual-homing type or any latest technology type of Ethernet connections to ECN via physically independent ports to increase system reliability and availability. **Critical** digital and analogue Input / Output interfacing with TCMS (directly or via an interface unit) shall also be fully redundant. In any case, the Contractor shall maintain full system availability, in case of single point failure of any TCMS component or communication link, and the vehicle operation shall not be affected | Tender conditions prevail. |
| 219 | Part 2 / Section VI A | 14.3.2 | Hardwire InputsIn addition to above, TCMS will also acquire status data via hardwire from the various identified vehicle control circuit nodes, train lines, ATP, ATO or any other interface subsystems. This data acquisition shall be fully redundant, bus monitored and duly recorded in TCMS. The interface units provided for this purpose shall be dual homing compliant. | **Justification:** Trains can be operational even with only critical I/O redundancy and no need of 100% I/O redundancy for complete train. Bidder has successful projects as reference with only critical I/O redundancy considered.<br><br>**Accordingly, bidder request to remove this requirement.** | Refer Addendum No.1, S.No. 326 |
| 220 | Part 2 / Section VI A | 13.7.5.1 | 16 number of Interior speakers shall be evenly spaced longitudinally in passenger seating areas. | **Justification:** 8 Number of interior speakers are more than enough to meet the sound level requirement in passenger areas.<br><br>**Accordingly, bidder request to modify this requirement to 8 No's**. | Tender conditions prevail. |
| 221 | Part 2 / Section VI A | 1.4.2 | Rakes will operate in revenue service in as 6 car trainsets initially and shall be increased to 6 car trainsets later in case of increased passenger patronage. Under normal operating conditions, trains may be coupled and uncoupled during maintenance and in rescue modes. | Justification :-It is understood ARE05 will be for 6 car train set and interfaces of infra like platform is also compactible for 6 car train set .<br><br>**Accordingly, bidder request to modify this requirement.** | Refer Addendum No.1, S.No. 54 |
| 222 | Part 2 / Section VI A | 12.3.2 | All piping shall be of stainless-steel conforming to the requirements of JIS3459, ISO 9329-4 the pipe fittings shall conform to the requirements of DIN 2353. | **Justification:** EN10216-5 is an updated standard and widely used, ISO8434-1 is the primary standard which covers 24º Cone fittings.<br><br>**Accordingly, Bidder proposes to use Seamless Stainless Steel pipes AISI 316L as per EN10216-5 along with ISO8434-1 for fittings (24º Cone fittings)** | Tender conditions prevail. |
| 223 | Part 2 / Section VI A | 19.32.5 (iv) | Car body air lines, if required, shall be of stainless steel with suitable capacity. Stainless steel piping shall meet the requirements of ASTM A 312 with flared fittings. All pipe flares shall be for 37-degree fittings meeting the requirements of SAE J533b or any better method of fitting. | **Justification:** Requirement contradicting with 12.3.2.<br><br>**Accordingly, bidder proposes to delete this requirement, as this is already covered under 12.3.2.** | Tender conditions prevail. |
| 224 | Part 2 / Section VI A | 19.32.5 (vi) | Stainless steel or brass fittings shall be used with stainless steel piping and tubing. Forged steel fittings, zinc plated to ASTM B633, Type II, Yellow, SC3 / SC4, may be substituted upon CMRL approval. | **Justification:** Requirement contradicting with 12.3.2.<br><br>**Accordingly, bidder proposes to delete this requirement, as this is already covered under 12.3.2.** | Tender conditions prevail. |
| 225 | Part 2 / Section VI A | 19.32.5 (vii) | All piping, tubing, valves, fittings, installation and testing methods, shall comply with ASME B31.1. | **Bidder proposes to use installation level testing method as per IEC61133** | Tender conditions prevail. |
| 226 | Part 2 / Section VI A | 19.32.5 (xvii) | Following installation, piping systems shall be pressure tested in accordance with ASME B31.1or other approved method. | **Bidder proposes to use installation level testing method as per IEC61133** | Tender conditions prevail. |
| 227 | Part 2 / Section VI A | 19.32.5 (xviii) | All hoses used shall comply with AAR Manual of Standards and Recommended Practices,Section E: Brakes and Brake Equipment. Brake system hoses shall be in compliance with AARM-618. | **Bidder proposes as per ISO 12151-2 compliance to ISO8434-1 pipe fittings, inline with 12.3.2.** | Tender conditions prevail. |
| 228 | Part 2 / Section VI A | 19.32.5 (xix) | All hose fittings shall be of a reusable type, where practicable, and subject to CMRL approval. Air hose fittings shall be in compliance with AAR M-927. | **Bidder proposes as per ISO 12151-2 compliance to ISO8434-1 pipe fittings, inline with 12.3.2.** | Tender conditions prevail. |
| 229 | Part 2 / Section VI A | 19.32.5 (xx) | All piping shall be installed in accordance with AAR 2518 as incorporated in Standard S-400 (AAR Manual E) and in such a manner as to provide drainage to prevent freezing. | **Justification:** This requirement is not applicable since there are no drain pipes for pneumatic line and freezing temperatures not specified in ERTS.<br><br>**Accordingly , bidder request to remove this clause from ERTS.** | Tender conditions prevail. |

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| 230 | Part 2 / Section VI A | 12.3.8 | All pipes shall be installed by means of clamps with integral, moulded vibration damping inserts to prevent any rattling in service. Clamps shall not be welded to the pipe. Suitable colour coding shall be applied to all pipe-work for identification. The Contractor shall submit the color-coding scheme for pipe work. | **Justification:** Bidder request the specification of clamps to be opened as per DIN3015-1 as per all Indian metros.<br><br>**Amendment Requested:** –For colour coding bidder proposes to use Polyvinyl chloride adhesive tape on pipes to differentiate based on the function.All pipes shall be installed by means of clamps as per DIN 3015-1 to prevent any rattling in service. Clamps shall not be welded to the pipe. Suitable colour coding shall be applied to all pipe-work for identification. The Contractor shall submit the color-coding scheme for pipe work. | Tender conditions prevail. |
| 231 | Part 2 / Section VI A | 17.5.4.8.22 | Validation of Multi-consist Train Operation: Validation of Multi-consist Train Operation shall be tested for conformance according to clause 2.2.31. | Clause 2.2.31 could not be found in the Customer specification. Also bidder understands this is a 6 car train without multiunit operation . **Hence, bidder request for clarification.** | Refer Addendum No.1, S.No. 379 |
| 232 | Part 2 / Section VI A | 3.4.6.2 | The gangway shall have a minimum throughway height of 1900 mm and a width of 1400 mm. Carbody end wall flatness shall be less than 1.5 mm per each 500 mm conform to the requirements of EN 16286-1 for gangway mounting surface and including outside mounting surface. | **Justification :-** As per industry experience end wall flatness 3mm per each 500mm is achieved over stainless steel carbody.<br><br>**Amendment Requested:** The gangway shall have a minimum throughway height of 1900 mm and a width of 1400 mm. Carbody end wall be less than ~~1.5 mm~~ **3 mm** per each 500 mm conform to the requirements of EN 16286-1 for gangway mounting surface ~~and including outside mounting surface.~~ | Tender conditions prevail. |
| 233 | Part 2 / Section VI A | 3.2.7 | Design of carbody shall be such that sealants are not used as a primary protection for ingress of rainwater. The cars shall be completely watertight, without using any sealing compound If considered unavoidable, only weld-through sealants shall be provided. The external sealants shall not be exposed to direct sunlight. The life of the sealant shall be at least 12 years. Detailed literature / catalogues shall be submitted to the CMRL and approval obtained prior to undertaking manufacture of car body. Water tightness shall comply with clause 17.6.13. Metallic conduit, tubing, piping, and fittings shall not require replacement for the design life of the car. Additionally, the car body shall be designed with safety margins commonly used in the railroad industry or as detailed in this Specification. | **Justification :-** The typical sealant life expectancy is 8 years<br><br>**Accordingly bidder requests to amend the clause as below** Design of carbody shall be such that sealants are not used as a primary protection for ingress of rainwater. The cars shall be completely watertight, without using any sealing compound If considered unavoidable, only weld-through sealants shall be provided. The external sealants shall not be exposed to direct sunlight. The life of the sealant shall be at least ~~12 years~~ 8 years. Detailed literature / catalogues shall be submitted to the CMRL and approval obtained prior to undertaking manufacture of car body. Water tightness shall comply with clause 17.6.13. Metallic conduit, tubing, piping, and fittings shall not require replacement for the design life of the car. Additionally, the car body shall be designed with safety margins commonly used in the railroad industry or as detailed in this Specification. | Tender conditions prevail. |
| 234 | Part 2 / Section VI A | 3.13.9 | The lower and upper connections of the collision posts, corner posts, and any shear reinforcements shall be built into the structure by connecting to the top and bottom plates or flanges of the end structure and roof structure. Welding used for these connections shall be full penetration in accordance with AWS/EN. | **Justification :-** Collision design and performance will be according to EN15227.<br><br>**Amendment Requested:** –The lower and upper connections of the front end structure/collision posts/corner posts and any shear reinforcements shall be built into the carbody ~~structure~~ by connecting to the top and bottom plates or flanges of the end structure and roof structure. Welding/Bolting used for these connections shall be full penetration in accordance with AWS/EN. | Tender conditions prevail. |
| 235 | Part 2 / Section VI A | 3.13.20.3 | The appearance of the car exterior shall have a modern and aesthetically pleasing profile. Significant emphasis must be placed on the style of the car exterior as the metro passes through some of the most important parts of the city. The stainless steel finish shall not require paint for protection. However, CMRL may at its sole discretion opt for partial or complete painting in case of Aluminium carbody. The painting scheme for an aluminium carbody design shall be submitted by the Contractor for review and approval by CMRL. Excessive surface undulations shall not be permitted; to the extent that the Contractor must achieve a finish that is commensurate with industry best practices. Undulations on brightly polished / unpainted surfaces shall not be easily visible to the naked eye. **Surface undulation/variation shall not exceed 1.5 mm in any one square meter area, to ensure that the exterior stainless steel or aluminium appearance is smooth**. Smoothing shall be achieved without the use of filler, painting or other similar materials. The Contractor may propose alternative specifications for an improved aesthetic appearance to CMRL for review no later than at preliminary design stage. | **Justification:-** The Roof (including corrugated panels, HVAC supports, and roof rails), Sidewall Letter Board, Underframe, and Endwall are considered as non-visible zones and therefore to be excluded from the measurement criteria. Profile variation of 1.5 mm is requested to be restricted to the side wall surfaces which will be visible from the platform. Flatness Requirement of 1.5 mm per meter can be ensured for 95% of the visible area.<br><br>**Proposed portion of the clause pertaining to flatness:** –**Side wall** surface undulation/variation shall not exceed 1.5 mm in any one square meter area **and should be ensured for 95% of the visible area**, to ensure that the exterior stainless steel or aluminium appearance is smooth. | Tender conditions prevail. |
| 236 | Part 2 / Section VI A | 3.2.7 | Design of carbody shall be such that sealants are not used as a primary protection for ingress of rainwater. The cars shall be completely watertight, without using any sealing compound If considered unavoidable, only weld-through sealants shall be provided. The external sealants shall not be exposed to direct sunlight. The sealants life shall match with the 35-years of design life of the car body and detailed literature / catalogues shall be submitted to the CMRL and approval obtained prior to undertaking manufacture of car body. Water tightness shall comply with clause 17.6.13. Metallic conduit, tubing, piping, and fittings shall not require replacement for the design life of the car. Additionally, the car body shall be designed with safety margins commonly used in the railroad industry or as detailed in this Specification. | **Justification:** Bidder would like to inform that the use of glued window solutions, which are flush with the car body, tends to enhance the overall aesthetic appearance. In similar applications, sealants are commonly relied upon to achieve complete water tightness for the car body. Typically, saloon windows and windshields are bonded to the carbody structure and front mask using adhesives, and sealant is also applied at the interface between the front mask and car body to ensure water tightness. As a result, the sealant is likely to be exposed to direct sunlight. Nevertheless, the expected service life of such sealants is generally in the range of 8–10 years.<br><br>**Amendment Requested:** ~~–Design of carbody shall be such that sealants are not used as a primary protection for ingress of rainwater. The cars shall be completely watertight, without using any sealing compound If considered unavoidable, only weld-through sealants shall be provided. The external sealants shall not be exposed to direct sunlight.~~ The car body shall be watertight. The sealants life shall be 8 to 10 years ~~match with the 35-years~~ of design life ~~of the car body~~ and detailed literature / catalogues shall be submitted to the CMRL and approval obtained prior to undertaking manufacture of car body. Water tightness shall comply with clause 17.6.13. Metallic conduit, tubing, piping, and fittings shall not require replacement for the design life of the car. Additionally, the car body shall be designed with safety margins commonly used in the railroad industry or as detailed in this Specification. | Tender conditions prevail. |

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| 237 | Part 2 / Section VI A | 3.4.9.1.1 | All glazing shall be of toughened glass and shall comply with DIN 52306 (impact strength) and EN 1288 (bending strength). Structural requirements for rail vehicle structures shall be design and tested conforming with GM/RT2100, UIC 566, EN 12663-1. | **Justification:** Bidder recommends to have Impact test for toughened glass as per IS 2553 Part II – Instead of DIN 52306 because of the below listed reasons:1) IS 2553 standard being an Indian standard for glazing which is used in majority of the Indian Metro Projects like DMRC RS 17 Metro, Mumbai Line 3, AK, RRTS 2) DIN 52306 is German standard and Indian suppliers are not aware of this. With reference to other projects such as DMRC, Pune L3, ML3 and AK, Bending Strength test was not requested by Customers and not been conducted in any projects. There were no breakages or cracks reported. All glazing requirements to meet IS 2553 requirements. In alignment with the Government of India's Make-in-India initiative, the bidder respectfully requests that the specification adhere to IS standards to promote local sourcing and manufacturing without compromising safety or performance<br><br>**Amendment Requested:** All glazing shall be of toughened glass and shall comply with ~~DIN 52306~~ IS 2553 Part II (impact strength) ~~and EN 1288 (bending strength). Structural requirements for rail vehicle structures shall be design and tested conforming with GM/RT2100, UIC 566, EN 12663-1.~~ | Tender conditions prevail. |
| 238 | Part 2 / Section VI A | 3.4.9.4.1 | The windshield design shall be a single piece design with glazing and shall be clear in colour. The glazing material shall be laminated glass and it shall comply to IS 2553 or any International Standard. Structural requirements for rail vehicle structures shall be design, tested and conform with GM/RT2100, UIC 566, EN 12663-1, UIC 651, EN 15152. | **Justification**: Bidder confirms that windshield requirements are captured in IS 2553 and UIC 651 (Impact test). Structural requirements as per GM/RT2100, UIC 566, EN 12663-1 to be deleted since all requirements are as per IS 2553 for Windshield. Specification contradicts with the requirement of front detrainment door otherwise windshield design will meet requirements as per IS 2553 and Impact test as per UIC 651.<br><br>**Amendment Requested:** The windshield design shall be a **single piece** design with glazing and shall be clear in colour. The glazing material shall be laminated glass and it shall comply to IS 2553 ~~or any International Standard. Structural requirements for rail vehicle structures shall be design, tested and conform with GM/RT2100, UIC 566, EN 12663-1, UIC 651, EN 15152.~~ | Tender conditions previal. |
| 239 | Part 2 / Section VI A | 19.13.1 (i) | Float glass shall be in accordance with FS-DD-G-451. Float glass shall be in accordance with ASTM C 1036, Type 1, Class 1, Quality q3 glazing select. | **Justification:** 1) FS-DD-F-G 451 : The Standard is obsolete issued in 1977 and this standard is used to evaluate the float glass surface defects , thickness tolerance , size tolerances etc.2) ASTM is for Defense use and the standard defines Float glass requirement for surface defects, thickness, tolerance, distortion test etc. Bidder propose to follow IS 2553 for Glazing which suppliers in India follow.<br><br>**Accordingly , bidder request to remove this clause from ERTS.** | Tender conditions prevail. |
| 240 | Part 2 / Section VI A | 19.13.1 (ii) | Glass shall be fully tempered in accordance with MIL-G-25667. If tempered glass is used in the laminate, it shall be fully tempered in accordance with SAE-AMS-G-25667 | **Justification:** 1) MIL-G-25667– This standard is applicable for Aircraft glazing and not for rolling stock. 2) SAE-AMS-G-25667 - This standard is applicable for Aircraft glazing and not for rolling stock. Bidder proposal is to follow IS 2553 for glazing which suppliers in India follow.<br><br>**Accordingly , bidder request to remove this clause from ERTS as IS 2553 covers all design testing aspects applicable for India** | Tender conditions prevail. |
| 241 | Part 2 / Section VI A | 18.7.5.3Table 18-3 | Table 18-3: Component Change-Out | **Justification:** Since Windshield and Side windows are bonded, change-out time will be 5 hours with 2 persons. Windshield and Side windows are bonded to Front mask and Carbody structure respectively. Change-out time will be 5 hours with 2 Persons.\|\|**Amendment Requested:** Table 18-3: Component Change-Out | Tender conditions prevail. |
| 242 | Part 2 / Section VI A | 3.4.7.12 | Flooring shall remain colour fast under the following BS 1006:1990 conditions (like Light, Shampoo, Dry cleaning, Water spotting, Acid spotting, Alkali spotting, Rubbing, etc.,). Flooring with minimum colour fastness according to EN ISO 4892-2 is also acceptable. | **Justification:** Bidder would like to inform that BS 1006: 1990 is **superseded** by EN ISO 105-B02 which is for textiles which we follow generally for floor covering colour fastness under light. EN ISO 4892-2 standard is applicable only for Plastics which is not applicable. Flooring colour fastness to meet as per EN ISO 105-B02.<br><br>**Amendment Requested:** Flooring shall remain colour fast under the following EN ISO 105-B02(Light fastness) ~~BS 1006:1990 conditions (like Light, Shampoo, Dry cleaning, Water spotting, Acid spotting, Alkali spotting, Rubbing, etc.,). Flooring with minimum colour fastness according to EN ISO 4892-2 is also acceptable.~~ | Tender conditions prevail. |

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| 243 | Part 2 / Section VI A | 3.12.3 | The Contractor shall submit all the signage's and stickers/logo including under frame for CMRL review and approval. All interior /exterior stickers/ signages strips / logo etc used in any location shall conform to BS EN 5499 part 5 & 6 or international norms and must be in use in more than 3 different metros worldwide. The safety related signages shall be fluorescent. The signage used for marking wheelchair shall be placed on floor as per the standard signage. The Adhesion value of the signages after 24 hours of application shall be 560-600 gm / cm. The Contractor shall prepare detail plan for signages, and stickers / labels as followed in the metros worldwide for CMRL's approval. The signage's for emergencies shall be fluorescent types. Signages, and stickers/ labels shall have better fire, smoke, and toxicity characteristics. | **Justification:** Bidder proposes to use Photo-luminescent for Safety signs as it is better in visibility and have glow in dark properties. The Adhesion value of signages is more than the requirement, so it is better. All Signages adhering to ISO-3864-1. For Safety related signages and Signages for Emergencies, instead of fluorescent, proposed to use Photo-luminescent. Adhesion value of signages is 611gm/cm to 1019gm/cm as per Method-3 of ISO 29862-2018.<br><br>**Amendment Requested:** The Contractor shall submit all the signage's and stickers/logo including under frame for CMRL review and approval. All interior /exterior stickers/ signages strips / logo etc used in any location shall conform to BS EN 5499 part 5 & 6 or international norms and must be in use in more than 3 different metros worldwide. The safety related signages shall be fluorescent / photo-luminescent. The signage used for marking wheelchair shall be placed on floor as per the standard signage. The Adhesion value of the signages after 24 hours of application shall be minimum **560** ~~600~~ gm / cm. The Contractor shall prepare detail plan for signages, and stickers / labels as followed in the metros worldwide for CMRL's approval. The signage's for emergencies shall be fluorescent / photo-luminescent types. Signages, and stickers/ labels shall have better fire, smoke, and toxicity characteristics. | Refer Addendum No.1, S.No. 112 |
| 244 | Part 2 / Section VI A | 3.4.6.1 | An open split type of double skin gangway shall be provided between the ends of inter-connecting cars. Gangway doors are not desired. Gangway shall be design and tested conforming to the requirements of EN 16286-1 & EN 16286-2 or equivalent. | **Bidder proposal:** Bidder propose to give Single skin gangway same as CMRL P2 contracts<br><br>**Amendment Requested:** An open split type of double skin/ Single Skin gangway, shall be provided between the ends of inter-connecting cars. Gangway doors are not desired. Gangway shall be design and tested conforming to the requirements of EN 16286-1 & EN 16286-2 or equivalent. | Tender conditions prevail. |
| 245 | Part 2 / Section VI A | 3.4.6.21 | Gangway Strength:The gangway floor shall be designed to meet the same strength requirements as the rest of car floor.The gangway shall withstand without permanent deformation the following loads:a) A differential pressure between inside and outside of the gangway of ± 2.5 kN/m2.b) A concentrated perpendicular load, acting from within the gangway as per EN 16286 part 1 shall be applied on the surface of the side walls.c) Gangway lifting mechanism shall have sufficient strength to bear its weight throughout the lifetime of the gangway.d) There shall be no sagging in the gangway under desired operating conditions throughout the lifetime of the gangway. | **Justification:** Since, Gangway is provided with drain Hole at the bottom, differential pressure test between inside and outside cannot be performed. Requesting to delete this clause.<br><br>**Amendment Requested:** Gangway Strength: The gangway floor shall be designed to meet the same strength requirements as the rest of car floor.The gangway shall withstand without permanent deformation the following loads:~~a) A differential pressure between inside and outside of the gangway of ± 2.5 kN/m2.~~b) A concentrated perpendicular load, acting from within the gangway as per EN 16286 part 1 shall be applied on the surface of the side walls.c) Gangway lifting mechanism shall have sufficient strength to bear its weight throughout the lifetime of the gangway.d) There shall be no sagging in the gangway under desired operating conditions throughout the lifetime of the gangway. | Tender conditions prevail. |
| 246 | Part 2 / Section VI A | 3.4.6.23 | Vertical gaps between the hinged moving tread-plates of the inter-car gangway and the general floor level of the car shall not exceed 5mm. A means shall be provided to minimise wear of the floor by the sliding action of each moving tread plate. The wear pads provided for this purpose shall have a robust design which prevents risk of detachment from the assembly and it shall be possible to replace the wear pad during scheduled maintenance. | **Justification:** The maximum vertical gap has been considered as 15mm only during the curve negotiation at 100m. The vertical gaps of 15mm is seen in many service proven gangways and does not pose any problem. However, actual gaps and the location will be obtained after performing a detailed simulation during detailed design stage. The bidder also confirms that Vertical gaps between the hinged moving tread-plates of the gangway and the general floor level of the car will be covered by the tapering / slope on the threshold plate to avoid any trip hazard.<br><br>**Amendment Requested:** Vertical gaps between the hinged moving tread-plates of the inter-car gangway and the general floor level of the car shall not exceed ~~5mm~~ 15mm. A means shall be provided to minimize wear of the floor by the sliding action of each moving tread plate. The wear pads provided for this purpose shall have a robust design which prevents risk of detachment from the assembly and it shall be possible to replace the wear pad during scheduled maintenance. | Tender conditions prevail. |
| 247 | Part 2 / Section VI A | 6.8.9 | In the event of a failure of the door monitoring circuit that causes loss of continuity in the train in UTO operation, then it shall be possible to remotely isolate the door monitoring circuit from RSC consoles of OCC, BCC & DCCs to enable further rake movement in UTO operation. Train movement in this condition shall be authorized from OCC/BCC after due verification of CCTV footages that all doorways are closed in the particular train. Indication of the exterior door indicator lamp shall continue to show the correct status of the doors on that car as per ERTS section 8.4.4; consequently, the exterior lamp of the respective offending car where the fault occurs shall remain illuminated as per ERTS Section 8.4.3. | Feasibility to remotely bypass Door loop is not provided. As per ERTS, 2.4.64, EB shall be requested by SIG to stop the train. However, as per Bidder RAMS PHA, train shall have to be allowed to be moved till next station in the event of door loop loss (as stopping train in mid track is more hazardous because people would get down). If train is allowed to reach next station, door can be bypassed. Driver can board the train and take it out of service.<br><br>**Accordingly bidder requests to amend the clause.** | Refer Addendum No.1, S.No. 189 |
| 248 | Part 2 / Section VI A | 6.3.14 | It shall be possible for CMRL to modify or change the door system parameters, modify or change open-close logic of the door circuits and implement the same as required by CMRL based on their operational and maintenance requirements. Full access to the software for the purpose above shall be provided. Any hardware software tool required for this purpose shall also be provided. The documentation including but not restricted to flow charts (for complete software), signal flows, and interpretation of signal etc. shall be provided. CMRL personnel shall be fully trained and made fully conversant by the Contractor for this purpose. | **Justification:**Full access to the software shall not be provided. Parameters that are essential to be changed for Operation and Maintenance requirements shall be available for modification by CMRL.<br><br>**Amendment Requested:** It shall be possible for CMRL to modify or change the door system parameters, modify or change open-close logic of the door circuits and implement the same as required by CMRL based on their operational and maintenance requirements. ~~Full access to the software for the purpose above shall be provided.~~ Parameters that are essential to be changed for Operation and Maintenance requirements shall be available for modification by CMRL. Any hardware software tool required for this purpose shall also be provided. ~~The documentation including but not restricted to flow charts (for complete software), signal flows, and interpretation of signal etc. shall be provided.~~ CMRL personnel shall be fully trained and made fully conversant by the Contractor for this purpose. | Refer Addendum No.1, S.No. 171 |

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| 249 | Part 2 / Section VI A | 6.3.15 a) | Passenger Door Opening and Closing Timesa)Opening and closing time of the passenger doors shall be adjustable in the range of 1.5 to 4.5 seconds. | **Justification:** In line with the closing open timing requirement bidder request to rephrase the opening/closing adjustable range to 2 to 4.5 sec<br><br>**Amendment Requested:** Passenger Door Opening and Closing Timesa) Opening and closing time of the passenger doors shall be adjustable in the range of ~~1.5 to 4.5~~ **2 to 4.5** seconds.1.5 sec is very less for door opening and closing. | Tender conditions prevail. |
| 250 | Part 2 / Section VI A | 6.3.15 c) | All doors on the rake shall fully open within 2.0 to 2.5 seconds from initiation of the open-door command. | **Justification:** Door opening time depends on the door width and kinetic energy permissible as per EN 14752. For similar door operations in other CMRL projects door opening time is 2 to 2.5sec from the physical movement of the door to complete opening.<br><br>**Amendment Requested:** Passenger Door Opening and Closing TimesOpening **2.3+0.2/-0.3s (adjustable 2s-4.5s)** which is from the initiation of door open movement. | Tender conditions prevail. |
| 251 | Part 2 / Section VI A | 6.3.15 d) | All doors on the rake shall fully close within 2.5 to 3.5 seconds from the initiation of the "Close Door" command. | **Justification:** As per EN 14752, section 5.2.1.3.2.2 Door closing signal sequence: The audible signal shall sound for at least 2 s before the door starts to close and continue to sound while the door is closing.Hence bidder requests to consider the closing time from physical movement of the door to complete closing of door.<br><br>**Amendment:** Passenger Door Opening and Closing Timesd) Closing **3.2+/-0.2 s** which is from the initiation of door closing movement | Tender conditions prevail. |
| 252 | Part 2 / Section VI A | 17.5.2.10.9 | A load equalization test shall be performed on one motor bogie and one trailer bogie installed on the first completed married pair at AW0 and AW4 load conditions. For this test, one wheel of the bogie shall be raised and then lowered 63.5 mm with respect to the plane formed by the other three wheels of the same bogie as they rest on level track, and additionally wheel unloading testing method & test condition with track twist values of bogie and vehicle body test twist shall conform to method 3 of EN 14363. An alternative design and service proven load equalization test may be presented to CMRL for approval during design review. During the test, the other three-wheel treads shall maintain contact with the rails. **Additionally, with one wheel raised and lowered 51mm with respect to the plane formed by the other three wheels, the neutral wheel load of the other three wheels shall not change by more than 50%.** | **Justification:** The reference for the limit is adopted as per the Section 4.2 of APTA PR-M-S-014-06 "Wheel Load Equalization of Passenger Railroad Rolling Stock" which specifies that the maximum allowable limit for any individual wheel lift is 67% for a Wheel load equalisation test. Hence bidder requests to amend the clause as below<br><br>**Amendment Requested:** Additionally, with one wheel raised and lowered 51mm with respect to the plane formed by the other three wheels, the neutral wheel load of the other three wheels shall not change by more than ~~50%~~ 67%. | Tender conditions prevail. |
| 253 | Part 2 / Section VI A | 18.5.4.5 | Sneak Circuit AnalysisThe Contractor shall perform a Sneak Circuit Analysis (SCA) to detect functional and/or Category I/ Category II safety problems that could arise from wiring faults or errors and shall submit the analysis for approval. The SCA shall ensure that there are no unintended circuit paths that will result in functions other than those intended. The SCA shall be performed for the overall car and shall consider interfaces with subcontractor-supplied equipment and coupler-pin assignments. | **Clarification and Amendment request:** Bidder requests to remove the Sneak Circuit Analysis requirement as the common cause failure is identified vide FMECA, safety failures are captured through FTA and reliability related failure is captured through RBD hence this requirement is redundant with existing analysis . | Tender conditions prevail. |
| 254 | Part 2 / Section VI A | 18.6.4.1 (a) | Failures that result in service operational delay in the specific train for more than 2 minutes at any location of the mainline or during induction from depot/mainline in the CMRL Phase 1 Network. These failures also include the list of scenarios for which the train shall be withdrawn from revenue service | Bidder request to consider the delay time of 3 min for service affecting failure in-line with other Metro projects in India.In a withdrawal scenario of a train before entering revenue service (i.e. during induction from depot to mainline); in which, a healthy train is replacing a faulty train without impacting the timetable should not be considered as a service affecting failure.<br><br>Thus, **Bidder requests to modify the clause as follows:**Failures that result in a service operational delay of a specific train for more than ~~2~~ 3 minutes at any location of the mainline ~~or during induction from depot to the mainline~~ of CMRL Phase 1 Network. This category of failures also includes an unscheduled withdrawal of a trainset from revenue service | Tender conditions prevail. |
| 255 | Part 2 / Section VI A | 18.6.4.1 (a) | The train withdrawal scenarios are described in Appendix I. It includes possible anticipated failure scenarios which can affect safety, punctuality and passenger comfort. This list shall be further developed during DNP/ DLP. It is clarified that when such failures occur, the incident will not be categorised as a Type-1 / Service Failure if the train had continued running until the end of servicewithout affecting punctuality. | **Bidder understands the clause information in following manner and requests to clarify the understanding:** A failure will not be considered as Service Affecting failure in case the failure does not affects the punctuality/performance and requires intervention only at: End of tripEnd of day | Tender conditions prevail. |

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| 256 | Part 2 / Section VI A | 2.13.3.(e)&11.4.18.1 | The Sperling ride index of the rake at 80 kmph shall not exceed 2.50 in both vertical and horizontal directions in inflated condition of secondary suspension and 3.0 in deflated condition for both vertical and horizontal directions. | **Justification:** Global method shall be used to achieve the target as proposed for ARE03A. Ride Index values to be achieved with target track tolerances. For isolated and threshold track tolerances, ride index to be achieved with speed restrictions as safety has more priority over comfort.Bidder proposes to be compliant to statutory requirement of RDSO comfort tests as per RDSO test procedure/s and acceptance target. Further, values to be modified in line with RDSO manual Annexure-F2 5.1 – "Ride index, as per ORE C-116 using FFT method, shall not be greater than 3.00 in inflated and deflated condition in both vertical and lateral directions." Linked to clause 11.4.18.4.<br><br>**Amendment Requested:** The Sperling ride index of the rake at 80 kmph shall not exceed 2.5 in both vertical and horizontal directions in inflated condition of secondary suspension and 3.0 in deflated condition for both vertical and horizontal directions. **Speed restrictions are allowed for deflated conditions.** | Tender conditions prevail. |
| 257 | Part 2 / Section VI A | 3.15.1 | The natural frequency of the complete car shall be fully de-coupled from all potentially damaging excitation frequencies such as those from bogies, track and equipment. The natural frequency of the first body bending mode shall **be at least 1.5 times that of the** bounce frequency of the bogie frame and primary suspension system, unless the Contractor proves through testing, or by comparison of existing test data, that resonance will not occur under any operating conditions and that the ride quality requirements of Chapter 2 are met. This requirement shall be met at all car speeds, up to and including maximum design speed, and all occupancy levels. | **Justification:** Based on the bidder's experience, ensuring that the natural frequency of the first body bending mode is at least 1.5 times the bogie frame bounce frequency is not a mandatory criterion to demonstrate that resonance will not occur under any operating conditions while ensuring ride quality requirements are also met.<br><br>**Amendment Requested:** The natural frequency of the complete car shall be fully de-coupled from all potentially damaging excitation frequencies such as those from bogies, track and equipment. The natural frequency of the first body bending mode shall be **optimum with respect to the** ~~at least 1.5 times that of the~~ bounce frequency of the bogie frame and primary suspension system, to avoid resonance, unless the Contractor proves through testing, or by comparison of existing test data, that resonance will not occur under any operating conditions and that the ride quality requirements of Chapter 2 are met. This requirement shall be met at all car speeds, up to and including maximum design speed, and all occupancy levels. | Tender conditions prevail. |
| 258 | Part 2 / Section VI A | 11.2.9 | All bogies shall have components that are interchangeable to the largest extent possible. **Bogie frames shall be identical for all bogies**. All similar bogies must be interchangeable without modification to the bogie assembly. | **Justification:** The bidder proposes allowing minor design variations in trailer frames compared to motor frames by elimination of redundancies.<br><br>**Amendment Requested:** All bogies shall have components that are interchangeable to the largest extent possible. Bogie frames shall be identical for ~~**all**~~ **similar** bogies. All similar bogies must be interchangeable without modification to the bogie assembly. | Refer Addendum No.1, S.No. 269 |
| 259 | Part 2 / Section VI A | 11.5.3(d) | The gearbox shall be subjected to a test based on the actual duty cycle on a specified corridor with the specified torque and speed conditions. Testing shall start with gearbox at temperature of at least 45 ºC ambient + 10 ºC proximity effect and temperature shall be continuously monitored.The temperature shall not exceed the manufacturer's recommendations consistent with life between oil changes. Test shall be carried out in both the directions. Noise and vibration test shall also be performed along with this test. The Contractor shall submit a Test Procedure based on international practice for approval by the CMRL. | **Justification:** It is an internationally accepted practice to substitute the actual duty cycle with accelerated rig duty cycle. Performance on this rig duty cycle (fatigue testing) ensures the performance on specified corridor, as rig duty cycle shall be selected with worst conditions of loads on gearbox. Gearbox is tested, separately, for high temperature operation test at an ambient of 56deg C . With the combination of high temperature operation test at 56°c & fatigue test at an ambient temperature of 20°c can confirm the suitability of gearbox for the application. Noise test & vibration testing is done in a third party setup, for various nodes of torque and speed as per bidder's internal Guidelines in accordance with various international standards<br><br>**Amendment Requested:** The gearbox shall be subjected to a test based on the **duty cycle equivalent to or stringent than** the actual duty cycle on a specified corridor with the specified torque and speed conditions. **Temperature rise test** shall start with gearbox at temperature of at least 45 ºC ambient + 10 ºC proximity effect and temperature shall be continuously monitored. The temperature shall not exceed the manufacturer's recommendations consistent with life between oil changes. Test shall be carried out in both the directions Noise and vibration test shall also be performed. ~~**along with this test**~~**.** The Contractor shall submit test Procedures based on international practice for approval by the CMRL. | Tender conditions prevail. |
| 260 | Part 2 / Section VI A | 11.8.2 | Journal bearings shall be numbered in accordance with **AAR** requirements. | **Amendment Requested:** Journal bearings shall be numbered in accordance with AAR **/ EN12080** requirements. | Tender conditions prevail. |
| 261 | Part 2 / Section VI A | 11.9.5 | Wheel hubs shall incorporate a bore hole / port for connection of hydraulic special tooling used to aid the removal of wheels during maintenance. Wheels shall also be balanced according to UIC requirements. | **Amendment Requested:** Wheel hubs shall incorporate a bore hole / port for connection of hydraulic special tooling used to aid the removal of wheels during maintenance. Wheels shall also be balanced according to UIC / **EN13262** requirements. | Tender conditions prevail. |
| 262 | Part 2 / Section VI A | 11.9.29 | Wheels, axles, gears, etc., shall be mounted using cold pressure and fits specified in the standard. Axle roller bearing may be mounted in the journal by induction heating. A wheel and axle mounting procedure, complying with standards shall be submitted for CMRL approval. | **Justification**: Wheel and axle mounting procedures comply with EN 13260:2020. Axle roller bearings are mounted on the journal using cold pressing rather than induction heating. Induction heating is avoided due to potential risks to bearing integrity, lubrication quality, and increased process complexity. Cold pressing offers a more reliable, effective, and standard-compliant solution. Gear wheels, however, shall be installed using controlled heating, as permitted by EN standards, and not by cold pressing.<br><br>**Amendment Request:** Wheels, axles, gears, etc., ~~**shall**~~ **may** be mounted using cold pressure and fits specified in the standard. Axle roller bearing may be mounted in the journal by induction heating. A wheel and axle mounting procedure, complying with standards shall be submitted for CMRL approval. | Tender conditions prevail. |

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| 263 | Part 2 / Section VI A | 11.9.30 | Axles shall be of hot-rolled steel, normalized and tempered after rough machining, shall provide suitable strength, and shall have a design fatigue life of at least 35 years. | **Justification:** Axle strength will be calculated and verified in accordance with EN 13103-1. Axles will be manufactured from hot-rolled steel grade in accordance with EN 13261:2020.<br>**Amendment Request:** Axles shall ~~**be of hot-rolled steel, normalized and tempered after rough machining**~~ **be manufactured as per EN13261**, shall provide suitable strength, and shall have a design fatigue life ~~**of at least 35 years**~~ **as per EN 13103-1.** | Tender conditions prevail. |
| 264 | Part 2 / Section VI A | 11.3.5(a) | Bogie Strength:The mechanical strength of the bogie frame shall comply with the requirements of UIC 615-4, UIC 515-4, EN 13749 or JIS E 4207 for static test under exceptional loads and fatigue tests. The maximum stress developed **under static load** shall not exceed 85% of the yield strength of the material. The dynamic effects due to the inertia of the motors and transmission shall also be simulated along with traction and braking forces. | **Justification:** Maximum stress developed under static load (only vertical load case), without any dynamic or external factor will not exceed to 85% of the yield strength of material.<br><br>**Amendment Requested:** The mechanical strength of the bogie frame shall comply with the requirements of UIC 615-4, UIC 515-4, EN 13749 or JIS E 4207 for static test under exceptional loads and fatigue tests. The maximum stress developed under **only** static **vertical** load shall not exceed 85% of the yield strength of the material. The dynamic effects due to the inertia of the motors and transmission shall also be simulated along with traction and braking forces. | Tender conditions prevail. |
| 265 | Part 2 / Section VI A | 11.5.1(f) | Longitudinal forces between car body and bogies shall be considered according to the rules in UIC 615-1, clause 4.2, **or JIS E 4207.** The bogie frames including vehicle body-bogie connecting gear shall be able to withstand a longitudinal shock load of 3g for Motor Bogie & 5g for the Trailer Bogie as per EN13749 without failure, implies Ultimate Strength as acceptance criteria. This shall be taken as occurring simultaneously with the fully laden vertical load. The Contractor shall validate these requirements by test. | **Amendment Requested:** Longitudinal forces between car body and bogies shall be considered according to the rules in UIC 615-1, clause 4.2, or JIS E 4207 **or EN 13749**. The bogie frames including vehicle body-bogie connecting gear shall be able to withstand a longitudinal shock load of 3g for Motor Bogie & 5g for the Trailer Bogie as per EN13749 without failure, implies Ultimate Strength as acceptance criteria. This shall be taken as occurring simultaneously with the fully laden vertical load. The Contractor shall validate these requirements by test. | Tender conditions prevail. |
| 266 | Part 2 / Section VI A | 11.5.2(c) | **Calculations** indicating the natural frequency of the motor suspension system shall be submitted and shall clearly indicate that resonance with the bogie frame is avoided. | **Justification:** As there are different mounting arrangement feasible for mounting bidder requests to amend the clause as below.<br><br>**Amendment Requested: If applicable,** calculations indicating the natural frequency of the motor suspension system shall be submitted and shall clearly indicate that resonance with the bogie frame is avoided. | Tender conditions prevail. |
| 267 | Part 2 / Section VI A | 11.6.1(c) & (d) | (c) Appropriate heat treatment or stress relief shall be done after fabrication to ensure strength requirements are met, unless otherwise approved by CMRL.(d) All welding on the bogie including application of brackets, pads and other attachments shall be entirely completed **prior to stress relieving**. Drilling, tapping and machining of finished surfaces shall be accomplished **only after stress relief.** | **Justification:** The bogie frames shall be designed per DVS 1612 methodology, with induced stresses lower than that allowed for frames without heat treatment. Hence stress relieving is not necessary in all designs. Bidder requests to delete/modify the clause accordingly. Additionally, this approach allows, with due evaluation, any in-service weld-ons or repairs in any such eventuality.<br><br>**Amendment Requested:**(c) **Optionally,** appropriate heat treatment or stress relief ~~**shall**~~ **may** be done after fabrication to ensure strength requirements are met, unless otherwise approved by CMRL.(d) All welding on the bogie including application of brackets, pads and other attachments shall be entirely completed prior to stress relieving**, if performed**. Drilling, tapping and machining of finished surfaces shall be accomplished only after stress relief**, if performed**. | Tender conditions prevail. |
| 268 | Part 2 / Section VI A | 11.6.5 (b) | **Radiographic** inspection tests shall be done on an agreed upon minimum number of bogie frames and traction bar arrangements as per an approved inspection plan. All inspection results shall be submitted to CMRL. | **Justification:** The bidder proposes to perform ultrasonic inspection instead of radiographic inspection as defined in table:4 of EN 15085-3 for Volumetric Test, based on the weld performance class during serial production.<br><br>**Amendment Requested:**~~**Radiographic**~~ **Ultrasonic** inspection tests shall be done on an agreed upon minimum number of bogie frames and traction bar arrangements as per an approved inspection plan. All inspection results shall be submitted to CMRL. | Tender conditions prevail. |
| 269 | Part 2 / Section VI A | 11.12.1 | An Obstacle Deflector Derailment Detection (ODDD) device shall be installed on the lead bogie of each car Driving Motor Car.**In addition to physically deflecting (pushing away) obstacles on the track to avoid risk of derailment,** the ODDD device shall also detect either of the following hazardous conditions:a) An obstacle strikes the ODDDb) Derailment of the bogieEither condition shall trigger an emergency brake application. TCMS shall differentiate between each condition and trigger an alarm in OCC. | **Request Clarification:** The obstacles may be pushed along the track but not necessarily away off the track subject to the vehicle speed and mass of the object. The bidder requests clarification on whether this understanding aligns with the intended requirement. | Tender conditions prevail. |

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| 270 | Part 2 / Section VI A | 11.12.4 | The Contractor shall submit the methodology of detection, detailed calculation of design proof load, installation arrangement, safety against derailment, energy absorbing capabilities etc. conforming to Table 3 — Obstacle deflector performance requirements of **EN 15227** and EN 13749 during detailed design for CMRL review and approval. Provisions shall be made to avoid false detection. The Contractor shall submit the detailed calculation of design proof load, installation arrangement, safety against derailment, energy absorbing capabilities etc. during PFDR stage. | **Justification:** Obstacle detectors are electro-mechanical devices designed to identify obstacles on the track and signal the TCMS to apply an emergency brake in real time, preventing derailment.In contrast, the purpose of an obstacle deflector is to be large and strong enough to clear obstacles from the path of the train's running gear at its leading end.Additionally, as per Table 3 of EN 15227, for C-II class vehicles such as metro trains, obstacle deflectors are marked as 'N/A'. Considering this, bidder kindly requests the removal of the clause pertaining to EN 15227 requirements.<br><br>**Amendment Requested:** The Contractor shall submit the methodology of detection, detailed calculation of design proof load, installation arrangement, safety against derailment, energy absorbing capabilities etc. conforming to ~~**Table 3 — Obstacle deflector performance requirements of EN 15227 and**~~ EN 13749 during detailed design for CMRL review and approval. Provisions shall be made to avoid false detection. The Contractor shall submit the detailed calculation of design proof load, installation arrangement, safety against derailment, energy absorbing capabilities etc. during PFDR stage. | Tender conditions prevail. |
| 271 | Part 2 / Section VI A | 11.4.18.3 | **c.** ΔQ / Q for track twist (Testing method & test condition with track twist values shall be in accordance with EN14363 Method 3) | **Justification:** Track twist values for the ΔQ / Q test shall be adopted from the real track conditions since the track twist values provided in EN 14363 is relevant for the track conditions of European Rail network for regional trains.<br><br>**Amendment Requested: c.** ΔQ / Q for track twist (Testing method ~~**& test condition with track twist values**~~ shall be in accordance with EN14363 Method 3 **with CMRL track twist values)** | Tender conditions prevail. |
| 272 | Part 2 / Section VI A | 11.4.19 | **Dynamic Modelling**The Contractor shall submit a detailed dynamic model to demonstrate the running behaviour and performance characteristics of the proposed service proven bogie design. | **Justification:** The design data used for the calculations will be provided. Dynamic model built using the analysis software is proprietary to the bidder.Linked to clause 11.4.18.4.<br><br>**Amendment Requested:** The Contractor shall submit **all the design details used in the creation of** the detailed dynamic model to demonstrate the running behaviour and performance characteristics of the proposed service proven bogie design. | Tender conditions prevail. |
| 273 | Part 2 / Section VI A | 11.4.23 | **Equalizationb)** Test method & test condition requirements assessment for Safety against derailment on twisted track, with track twist values of bogie and vehicle body test twist shall be in accordance with EN14363 Method 3 (Railway applications - Testing for the acceptance of running characteristics of railway vehicles) with above acceptance criteria. | **Justification:** Track twist values for the ΔQ / Q test shall be adopted from the real track conditions since the track twist values provided in EN 14363 is relevant for the track conditions of European Rail network.<br><br>**Amendment Requested: b)** Test method & test condition requirements assessment for Safety against derailment on twisted track, with **CMRL** track twist values of bogie and vehicle body test twist **and test methodology** shall be in accordance with EN14363 Method 3 (Railway applications - Testing for the acceptance of running characteristics of railway vehicles) with above acceptance criteria. | Tender conditions prevail. |
| 274 | Part 2 / Section VI A | 17.5.2.10.9 | A load equalization test shall be performed on one motor bogie and one trailer bogie installed on the first completed married pair at AW0 and AW4 load conditions. For this test, one wheel of the bogie shall be raised and then lowered 63.5 mm with respect to the plane formed by the other three wheels of the same bogie as they rest on level track, and additionally wheel unloading testing method & test condition with track twist values of bogie and vehicle body test twist shall conform to method 3 of EN 14363. An alternative design and service proven load equalization test may be presented to CMRL for approval during design review. During the test, the other three-wheel treads shall maintain contact with the rails. Additionally, with one wheel raised and lowered 51mm with respect to the plane formed by the other three wheels, the neutral wheel load of the other three wheels shall **not change by more than 50%.** | **Justification:** Bidder requests that the criteria be based on the APTA standard.<br><br>**Amendment Requested:** Additionally, with one wheel raised and lowered 51mm with respect to the plane formed by the other three wheels, the neutral wheel load of the other three wheels shall not change by more than ~~**50%**~~ **67%.** | Tender conditions prevail. |
| 275 | Part 2 / Section VI A | 17.5.2.16(a) | Traction Gear Unit Qualification Testing:The traction gear unit qualification test shall be a 100-hour test on two gear units, selected at random by CMRL, and shall be mounted with torque load simulation. The test shall subject the unit to conditions that are RMS torque load +20 percent of the RMS speed of the standard load cycle with sinusoidal supply. | **Justification:** Gearbox is tested in both clockwise and counterclockwise directions, for a duration of 208 hours against 100- hour test requirement in ERTS.It is an internationally accepted practice to substitute the actual duty cycle with accelerated rig duty cycle. Performance on this rig duty cycle ensures the performance on specified corridor, as rig duty cycle shall be selected with worst conditions of loads on gearbox.<br><br>**Amendment Requested:** The traction gear unit qualification test shall be a 100-hour test on ~~**two**~~ one gear unit, selected at random by CMRL, and shall be mounted with torque load simulation. The test shall subject the unit to conditions that are RMS Maximum torque load +20 percent of the RMS and speed of the standard load cycle with sinusoidal supply **or higher torque loads**. | Tender conditions prevail. |
| 276 | Part 2 / Section VI A | 17.5.2.16(b) | The test shall be started with the unit at room temperature 55°C. A fan or other device may be provided so that in-service airflow conditions are simulated. The temperature rise measured in the oil sump shall not exceed the gear oil supplier's recommendations for maximum temperature consistent with the life between oil changes, as called out in the Contractor's maintenance manuals. The direction of rotation shall be reversed every 8 hours, until the 100-hour test is completed. | **Justification:** Temperature rise test is conducted on a dedicated set up.<br><br>**Amendment Requested:** b) **Temperature rise** test shall be started with the unit at room temperature 55°C. A fan or other device may be provided so that in-service airflow conditions are simulated. The temperature rise measured in the oil sump shall not exceed the gear oil supplier's recommendations for maximum temperature consistent with the life between oil changes, as called out in the Contractor's maintenance manuals. The direction of rotation shall be reversed at **regular intervals** ~~**every 8 hours,**~~ until the ~~**100-hour**~~ test is completed. | Tender conditions prevail. |

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| 277 | Part 2 / Section VI A | 17.5.2.16(c) | c) During the test, the gear units shall display no signs of exceeding the manufacturer's established limits for the oil temperature and shall remain within the noise and vibration limits established by the manufacturer. After completion of the test, the gear units shall be disassembled, and all parts examined. | **Justification:** Noise test & vibration test is done in a different setup.Additionally, Noise and Vibration test is extensively performed for various nodes of Torque and speed as per bidder's internal Guidelines in accordance with Various international standards.<br><br>**Amendment Requested:** c) During the **temperature rise** test, the gear units shall display no signs of exceeding the manufacturer's established limits for the oil temperature and ~~**shall remain within the noise and vibration limits established by the manufacturer**~~. After completion of the test, the gear units shall be disassembled, and all parts examined. | Tender conditions prevail. |
| 278 | Part 2 / Section VI A | 17.5.2.16(d) | Gear tooth mesh shall be checked and recorded before and after the creep speed test (20 kmph). Any sign of deterioration of any part shall be investigated jointly with CMRL. | **Justification:** We perform endurance at highest torque from motor, and the gearbox is already tested and proven. Testing condition in our endurance are worse than the creep test parameters at 20kmph.Bidder will submit existing type test reports.<br><br>**Amendment Requested:** d) Gear tooth mesh shall be checked and recorded before and after the ~~**creep speed**~~ **endurance test** ~~**(20 kmph)**~~**.** Any sign of deterioration of any part shall be investigated jointly with CMRL. | Tender conditions prevail. |
| 279 | Part 2 / Section VI A | 17.5.2.16(e) | The test report shall include test records of running time, oil temperatures, and vibration and sound-level readings taken at such intervals as required to verify compliance with these Technical Provisions. | **Clarification Requested** Sound and Vibration test is performed independently with more detailed measurements. Bidder will submit a consolidated test report with all the different tests performed and the results.<br><br>**Bidder request confirmation on the above proposal .** | Tender conditions prevail. |
| 280 | Part 2 / Section VI A | 12.2.10 (h) | Under conditions of a dragging parking brake (occurring on no more than one bogie) for a minimum distance of 3 kilometres at a speed of 10 kmph, no damage shall be caused to the braking system or any bogie component, with the exception of abnormal shoe wear. Detailed figures to be providedduring PFDR design stage. | **Justification:** To restrict the temperature from exceeding acceptable limits, bidder proposes allow for intermittent cooling periods at least 30 mins.<br><br>**Amendment Requested:** Under conditions of a dragging parking brake (occurring on no more than one bogie) for a minimum distance of 3 kilometres at a speed of 10 kmph **with intermittent cooling periods,** no damage shall be caused to the braking system or any bogie component, with the exception of abnormal shoe wear. Detailed figures to be provided during PFDR design stage. | Tender conditions prevail. |
| 281 | Part 2 / Section VI A | 2.14.3.2&2.14.1Table 2-7 | For a normal operation of service brake (nominal 1 m/s2) on level track from maximum speed, the rake shall brake to a standstill from 80kmmh in 247m (+0, -10%) under any Loading Conditions up to AW4. The Contractor shall demonstrate by providing calculations of the minimum adhesion level, required to achieve the stopping distance. Upon receipt of signal to Brake Control Unit, the application of service brake time should be less than 300 msec | **Justification:** In line with the approach adopted for ARE01, ARE03A,and ARE04, the bidder requests that the deceleration for service braking under all loading conditions be set at 1.05 $m/s^2$. This will ensure compliance with the stopping distance requirement (247m), including the -10% (223m) tolerance specified in ERTS clause 2.14.3.2 | Tender conditions prevail. |
| 282 | Part 2 / Section VI A | 2.14.3.3 | For an emergency brake application in good adhesion conditions (i.e. dry uncontaminated wheel rail interface) on level track from maximum speed, the rake shall brake to a standstill from 80kmph within a distance of 223 m under any Loading Conditions up to AW4. The minimum average emergency brake rate following any single point failure shall not be less than 1.3 m/s2. | **Justification:** Minimum average emergency brake rate is same in both without failure as per Table 2-7 and with single point failure as per this clause, which is not practical. Linked to clause 12.6.9.8 as well.<br><br>**Amendment Requested:** For an emergency brake application in good adhesion conditions (i.e. dry uncontaminated wheel rail interface) on level track from maximum speed, the rake shall brake to a standstill from 80kmmh within a distance of 223 m under any Loading Conditions up to AW4. The minimum average emergency brake rate following any single point failure shall not be ~~**less**~~ **more** than 1.3 m/s2. | Tender conditions prevail. |
| 283 | Part 2 / Section VI A | 17.5.2.10.5 | **All** bogie frames, and other primary structural members, shall be qualified by **radiographic** inspection of all critical welds. | **Justification:** The bidder proposes to perform ultrasonic inspection instead of radiographic inspection as defined in table:4 of EN 15085-3 for Volumetric Test, based on the weld performance class during serial production.<br><br>**Amendment Requested:** ~~**All**~~ Bogie frames, and other primary structural members, shall be qualified by ~~**radiographic**~~ **ultrasonic** inspection of all critical welds. **Frequency of test as per EN15085-3.** | Tender conditions prevail. |
| 284 | Part 2 / Section VI A | 17.5.2.10.6 | A fatigue test shall be performed to verify the design will meet the requirements defined in clause 11.6.3. The proposed test arrangement and table of loads and cycle frequency shall be submitted to CMRL for review and approval. The test shall be run for a suitable number of cycles of fatigueload test which ensures a 35 year service life as per **the JIS standards** and the results shall be submitted to CMRL. Damage equivalence of 10,000,000 cycles must be demonstrated by the results of this test. | **Justification:** Bidder request to open the requirements for both JIS or EN 13749 standards as per clause 11.6.3 b.<br><br>**Amendment Requested:** A fatigue test shall be performed to verify the design will meet the requirements defined in clause11.6.3. The proposed test arrangement and table of loads and cycle frequency shall be submittedto CMRL for review and approval. The test shall be run for a suitable number of cycles of fatigueload test which ensures a 35-year service life as per the JIS **or EN** standards and the results shall besubmitted to CMRL. Damage equivalence of 10,000,000 cycles must be demonstrated by theresults of this test | Tender conditions prevail. |

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| 285 | Part 2 / Section VI A | 17.5.3.4 | Dynamometer test runs shall be made for simulated car weight AW0, AW2, and AW3 & AW4 from each of the entry speeds of 16, 24, 48, 80, 90 km/h). For each entry speed, input signals calling for 25, 50, 75, and 100 percent of full service braking effort and for emergency braking effort shall be used. | **Justification:** The bidder recommends performing tests only for the worst-case scenarios:-AW4 with 100% SB effort (all ED out) under speed restriction-AW4 nominal mode (100% ED + EP available) at 80 km/h.However, the linearity test will be conducted at different speeds (40, 60, 80, and 90 km/h) with loadings AW0, AW3, and AW4. The bidder requests confirmation from the customer if this approach is acceptable, in line with other CMRL projects. | Tender conditions prevail. |
| 286 | Part 2 / Section VI A | 17.5.3.4 (d) | Each test shall be run starting with both cold and hot initial tread and (disc, if used) conditions. | **Justification:** The bidder proposes that applicability be limited to linearity and parking brake tests. All other tests will be conducted in accordance with the dynamometer test specifications .<br><br>**Amendment Requested:** ~~Each~~ **Linearity and parking brake** tests test shall be run starting with both cold and hot initial tread and (disc, if used) conditions. | Tender conditions prevail. |
| 287 | Part 2 / Section VI A | 17.6.16.1 | All production bogie welds including the frame and any other primary structural members shall be subjected to magnetic particle or dye penetrant inspection, except critical welds, which shall be inspected by radiography, Magnetic particle inspection shall be in accordance with ASTM E 709. Dye penetrant inspection shall be in accordance with ASTM E165. Cast bogie frames shall be 100% magnetic particle inspected. Radiographic inspection shall be continued at a rate of one bogie frame for each ten bogies produced. If defects are found during sampling inspection, the Contractor shall positively locate the beginning of such defects in previous bogie frames and apply appropriate corrective action. | **Justification:** All Frames shall be visually inspected.Magnetic particle inspection shall be performed as per the NDT work instruction prepared with guidelines of EN15085-3 considering the weld performance class.<br><br>**Amendment Request:** ~~All~~ Production bogie welds including the frame and any other primary structural members shall be subjected to magnetic particle or dye penetrant inspection, except critical welds, which shall be inspected by ~~radiography~~ **ultrasonic testing**, Magnetic particle inspection shall be in accordance with ASTM E 709 / **EN ISO 17638** . Dye penetrant inspection shall be in accordance with ASTM E165 / **EN571-1 (ISO 3452-1).** Cast bogie frames shall be 100% magnetic particle inspected. ~~Radiographic~~ **Ultrasonic** inspection shall be continued at a rate of one bogie frame for each ten bogies produced. If defects are found during sampling inspection, the Contractor shall positively locate the beginning of such defects in previous bogie frames and apply appropriate corrective action. | Tender conditions prevail. |
| 288 | Part 2 / Section VI A | 19.33.13 | All lubricants shall conform to **applicable ANSI and ASTM specifications**. | **Justification:** The bidder proposes to provide options in international standards.<br><br>**Amendment Request:** All lubricants shall conform to applicable ANSI and ASTM **/ EN** specifications. | Tender conditions prevail. |
| 289 | Part 2 / Section VI A | 11.4.11(f) | The design life of **secondary suspension air bags** (all inclusive) shall not be less than **12 years**. The air bags and associated components shall not crack, shear, balloon, bulge, burst or deteriorate in performance during the specified design life. In case of failure of meeting the requirement, the Contractor shall propose alternative which meets the criteria and replace in entire fleet. | **Justification:** To comply with EN45545-2 fire safety requirements, the currently achievable design life of air springs across all suppliers is 8 years. However, after the 8th year, the life can be successively extended to 10th and 12th years upon successful completion of intermediate qualification tests.<br><br>**Amendment Request:** The design life of secondary suspension air bags (all inclusive) shall not be less than ~~12~~ **8 years, extendable to 12 years upon successful completion of intermediate fitness qualification to confirm the extension**. The air bags and associated components shall not crack, shear, balloon, bulge, burst or deteriorate in performance during the specified design life. In case of failure of meeting the requirement, the Contractor shall propose alternative which meets the criteria and replace in entire fleet. | Tender conditions prevail. |
| 290 | Part 2 / Section VI A | 19.32.2 | All rubber hoses, connecting pipes etc. used in pneumatic circuit shall not be required to be re-placed be-fore 5 years or major overhaul which ever later. **The rubber/ rubber- metal components used in suspensions** shall not be replaced before **12 years** or during major overhaul of the equipment, whichever is later. All rubber hoses shall be steel reinforced for better life and reliability. | **Justification:** Primary Suspension : The service life of rubber bonded metal components / rubber of spring type primary suspension shall be OEM rated for not less than 8 years complies with the requirement of ERTS Clause 11.4.10. **Bidder requests to address this ambiguity.**Secondary Suspension Air Spring : To comply with EN45545-2 fire safety requirements, the currently achievable design life of air springs is 8 years. However, after the 8th year, the life can be successively extended to 10th and 12th years upon successful completion of intermediate qualification tests.Secondary Suspension Rubber to Metal Components : The life of secondary suspension rubber-metal components like the lateral and longitudinal buffer is also 8 years.<br><br>**Amendment Request:** All rubber hoses, connecting pipes etc. used in pneumatic circuit shall not be required to be re-placed be-fore 5 years or major overhaul which ever later. The rubber/ rubber- metal components used in suspensions shall not be replaced before ~~12~~ **8** years or during major overhaul of the equipment, whichever ~~**is later**~~ **comes earlier**. All rubber hoses shall be steel reinforced for better life and reliability. | Tender conditions prevail. |
| 291 | Part 2 / Section VI A | 19.12.4 | Elastomeric materials shall be tested to verify compliance with performance requirements as given **below**. The Contractor shall submit certificates stating compliance with the requirements of the standards. | **Justification:** Bidder requests to permit EN13913 testing of all rubber to metal components and EN13597 for testing of air bellow. All relevant certificates will be submitted, complying to requirements of the standards.<br><br>**Amendment Request:** Elastomeric materials shall be tested to verify compliance with performance requirements as given below or **EN 13913, EN 13597 and EN45545-2**. The Contractor shall submit certificates stating compliance with the requirements of the standards. | Tender conditions prevail. |

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| 292 | Part 2 / Section VI A | 19.12.5 | Elastomers shall pass tests indicated in **Table 19-1** and the smoke/flame tests specified in **TS19.61**. | **Justification:** Elastomeric components shall be tested for the said parameters. However, test method and test values/limits shall be as per equivalent international standards. "Table 19-1" refers to elastomer tests as per ASTM standards however all indicated tests are performed as per equivalent ISO standards as given in EN13913. All elastomeric components part of suspension system is tested for fire & smoke compliance as per EN45545-2.<br><br>**Amendment Request:** Elastomers shall pass tests indicated in Table 19-1 **or EN13913** and the smoke/flame tests specified in TS19.61 **or EN45545-2.** | Tender conditions prevail. |
| 293 | Part 2 / Section VI A | Table 19-1 | Table 19-1: **Testing For Elastomers** | **Justification:** Elastomeric components shall be tested for the said parameters. However, test method and test values/limits shall be as per equivalent international standards. "Table 19-1" refers to elastomer tests as per ASTM standards however all indicated tests are performed as per equivalent ISO standards as given in EN13913.<br><br>**Amendment Request:** Table 19-1~~:~~ Testing For Elastomers ASTM **or equivalent standard** Test Method | Tender conditions prevail. |
| 294 | Part 2 / Section VI A | 2.14.3.1 | The Contractor shall submit design calculations for the safe braking distances and Emergency braking distances for both dry and wet conditions as per UIC 544-1, EN 14531-1, EN 13452-1 &EN 13452 -2 and design basis for wet condition. | **Justification:** Compliant to EN 13452-1 & EN 13452-2; Not compliant to UIC 544-1.As per UIC 544-1 braking performance can be expressed via braked weights. The assessment in the shape of braked weight. As per the contract, the braking performances are mentioned in terms of deceleration and not braked weight percentages, therefore, EN 13452-1 is the correct standard as per our contract.<br><br>**Amendment Requested:** The contractor shall submit design calculations for the safe braking distances and Emergency braking distances for both dry and wet conditions as per ~~UIC 544-1~~, EN 14531-1, EN 13452-1 &EN 13452 -2 and design basis for wet condition. | Tender conditions prevail. |
| 295 | Part 2 / Section VI A | 12.2.7 | The brake system shall comply to UIC 544-1, EN 13452-1 & EN 13452-2. | **Justification::**Compliant to EN 13452-1 & EN 13452-2; Not compliant to UIC 544-1.As per UIC 544-1 braking performance can be expressed via braked weights. The assessment in the shape of braked weight. As per the contract, the braking performances are mentioned in terms of deceleration and not braked weight percentages, therefore, EN 13452-1 is the correct standard as per our contract.<br><br>**Amendment Requested:** The brake system shall comply to ~~UIC 544-1~~, EN 13452-1 & EN 13452-2. | Tender conditions prevail. |
| 296 | Part 2 / Section VI A | 2.15.10.2 | BCU shall be of a failsafe design such that a fatal error shall result in an emergency brake application. | **Justification:** Emergency Brake is managed at train level and BCE health signal is being monitored by the TCMS (life sign signal in incremental order) Due to any failure the communication is frozen for two seconds means none of the BCE is alive then TCMS can initiate the Service brake application as the train can be operated in self-rescue mode by following the trainlines. | Tender conditions prevail. |
| 297 | Part 2 / Section VI A | 9.6.9 | The proposed design of the battery (including the selected chemistry, capacity and control functions) shall ensure the battery will always have sufficient charge remaining to successfully wake-up the train and raise either of the pantographs immediately after either of the following two (2) scenarios. i) The train was put into Sleep-Mode #ii) The train is being restarted from OFF condition after a shutdown was ordered due to low battery voltage detection # Note: 24hrs is the minimum duration of Sleep Mode condition which must be achieved (and demonstrated by the Contractor) before the battery charge depletes to the level where the voltagesupervision orders a full shutdown of the train. Battery voltage supervision shall always be available when the train is in Sleep Mode. | **Justification:** Considering the precedent set in the previous Indian project, where a sleep mode feature was mandated, and aligning with CMRL Phase 2 specifications, a 16-hour sleep mode was implemented across 78 cars. This requirement ensures optimized power consumption during extended idle periods, enhancing system efficiency and reducing operational costs without compromising performance.<br><br>**Amendment requested:** The proposed design of the battery (including the selected chemistry, capacity and control functions) shall ensure the battery will always have sufficient charge remaining to successfully wake-up the train and raise either of the pantographs immediately after either of the following two (2) scenarios.i) The train was put into Sleep-Mode #ii) The train is being restarted from OFF condition after a shutdown was ordered due to low battery voltage detection# Note: ~~24hrs~~ **16hrs** is the minimum duration of Sleep Mode condition which must be achieved (and demonstrated by the Contractor) before the battery charge depletes to the level where the voltagesupervision orders a full shutdown of the train. Battery voltage supervision shall always be available when the train is in Sleep Mode... | Tender conditions prevail. |
| 298 | Part 2 / Section VI A | 12.3.13 | The air supply from the compressor(s) shall be controlled under all operating conditions by high and low-pressure governor switches. | **Justification:** Pressure governors are only used in Rescue mode to control the compressor ON/Off. In normal mode, TCMS governs the compressor operating conditions through pressure transducer**.**<br><br>**Amendment requested:** The air supply from the compressor(s) shall be controlled under all operating conditions by pressure transducers ~~high and low-pressure governor switches.~~ | Tender conditions prevail. |
| 299 | Part 2 / Section VI A | 10.13.31 | Traction motor power cables shall be connected with mistake-proofing terminal connections at motor end and train end. It shall not be possible to improperly connect the phase sequence of the traction motor cables. In all cases of terminal connections, all the motors shall run in the direction of selection of train. | **Justification:** Clear Labels are provided on terminals to identify and connect the cables.<br><br>**Amendment requested:** Traction motor power cables shall be connected with mistake-proofing terminal connections (labels indication) at motor end and train end. It shall not be possible to improperly connect the phase sequence of the traction motor cables. In all cases of terminal connections, all the motors shall run in the direction of selection of train. | Tender conditions prevail. |

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| 300 | Part 2 / Section VI A | 10.13.5 | Evaluation of the insulation system for sealing against moisture shall be made in accordance with IEEE 429. The insulation system shall be evaluated for thermal endurance in accordance with the requirements of IEC 60505:2004 (or latest) and its draft supplement. | **Justification:** Insulation system is evaluated according to the IEC 60034-18-31 which is quite similar to the IEEE 429 required standard IEC 60505 is an old standard used before the apparition of the IEC 60034-18-31. So, theoretically no more used. The IEEE429 is now cancelled so no more applicable.<br><br>**Amendment requested:** Evaluation of the insulation system for sealing against moisture shall be made in accordance with ~~IEEE 429/~~IEC 60034-18-31. ~~The insulation system shall be evaluated for thermal endurance in accordance with the requirements of IEC 60505:2004 (or latest) and its draft supplement.~~ | Tender conditions prevail. |
| 301 | Part 2 / Section VI A | 10.8.4 | The main transformer design shall be "Hermetically Sealed" type forced cooled or naturally cooled design is proposed. Components shall be modular in construction, complete with oil pump, oil pump motor, radiator with blower fans (if adopted), conservator (if adopted) and protection equipment (e.g. over pressure, over temperature, Buchholz Relay, etc.) all assembled as a single module. | **Bidder requests to amend the clause as per latest contract ARE04A :**The main transformer design shall be "~~Hermetically Sealed~~" type forced cooled or naturally cooled design is proposed. Components shall be modular in construction, complete with oil pump, oil pump motor, radiator with blower fans (if adopted), conservator (if adopted) and protection equipment (e.g. over pressure, over temperature, Buchholz Relay, etc.) all assembled as a single module. | Tender conditions prevail. |
| 302 | Part 2 / Section VI A | 10.5.4 | The arrestor shall consist of a non-linear metal oxide varistor fitted in a porcelain housing, which is sealed off by a flange. This contains a pressure relief device with gas diverter. | **Bidder request to amend the requirement to have an alternate better solution for the said clause :-** The arrestor shall consist of a non-linear metal oxide varistor fitted in a silicon / porcelain housing, which is sealed off by a flange. ~~This contains a pressure relief device with gas diverter.~~ | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 251 |
| 303 | Part 2 / Section VI A | 10.5.5 | The arrestors shall be maintenance-free. Only checking for any damage is supposed to be done. A means of indication shall be provided for easy identification by visual inspection of a failed surge arrestor without dismantling it. | **Justification:** Given the maintenance-free design philosophy and proven reliability of the surge arrestors, an additional indication feature for failure is not required. The absence of such a feature does not compromise safety or performance, as the arrestors are engineered for long-term durability. Furthermore, any physical damage can be easily identified through simple visual inspection, ensuring effective condition monitoring without added complexity.<br><br>**Amendment requested:**The arrestors shall be maintenance-free. ~~Only checking for any damage is supposed to be done~~. A means of ~~indication~~ easy identification shall be provided ~~for easy identification~~ by visual inspection of a failed surge arrestor without dismantling it. | Tender conditions prevail. |
| 304 | Part 2 / Section VI A | 10.12.8 | The train operator from the cab shall be able to isolate any power converter / inverter. Current drawn by each motor shall be measured and recorded. | **Justification:** The traction product proposed by the bidder measures current at inverter output level(bogie level) and utilizes the same for control and protection. This is a service proven solution and bidder proposes the same for CMRL Phase 1 Extension. The scenario for continuous recording of inverter current doesn't come up in service. The bidder proposes utilization of the variable logging tools provided with the bidders product, for logging the motor current as and when necessary for investigative purposes during revenue and maintenance.<br><br>**Amendment requested:**The train operator from the cab shall be able to isolate any power converter / inverter. Current drawn by each Inverter ~~motor~~ shall be measured and recorded. | Tender conditions prevail. |
| 305 | Part 2 / Section VI A | 10.12.9 | Redundant Temperature / Heat sensor / LHD location shall be in proximity of IGBTs and shall be linked to TCMS / Fire Detection & Control Unit (refer clause 2.26) so that their status is monitored. | **Justification:** Internal thermal sensors of IGBT are Primary temperature monitoring sensors. Redundant to those sensors are LHD monitored by FDCU.<br><br>**Accordingly, Bidder requests that the proposed redundancy, based on the thermal sensors integrated within the IGBT, be taken into consideration.** | Tender conditions prevail. |
| 306 | Part 2 / Section VI A | 10.13.7 | The temperature rise limit for the stator winding shall be the maximum temperature index of the insulation minus 70°C when the traction motor undergoes the temperatures rise test, which is specified by IEC 60349-2. The temperature rise shall be verified in system type test bed and the lines (as available) with 25% ventilation blocked. The Contractor shall consider the temperature rise on account of different factors including proximity impact (not less than 10 °C) in the under frame and specified wheel diameter difference in the bogie(s) as indicated in clause 10.11.19 above. The type test procedure and validation of temperature rise is described in Chapter 17. | **Justification:** Bidder understands that 25% ventilation blocked is not the ventilation arranged in service, these temperature rise tests are defined as special tests performed to obtain additional information so it is considered as investigative tests. This will be verified in system type test bed. During these investigative tests, the temperature rise limit for the stator winding will be the thermal classes which is class 200 of insulation systems according to "Table 2 - Limits of temperature rise for continuous and other ratings of the IEC 60349-2"<br><br>**Amendment requested:**Bidder requests the acceptance of the understanding of the requirement provided in the justification. | Tender conditions prevail. |
| 307 | Part 2 / Section VI A | 10.13.13 | The grease used for the traction motor bearings shall be selected so as to ensure the expected maintenance interval considering the maximum temperature estimated to be reached in the bearings, under the worst conditions. It should be possible to replenish the grease periodically in situ and overflow arrangement should be provided to avoid the possibility of the over greasing. | **Justification:** No arrangement to avoid over greasing, must respect maintenance manual for greasing steps and quantity O2263<br><br>**Amendment requested:**The grease used for the traction motor bearings shall be selected so as to ensure the expected maintenance interval considering the maximum temperature estimated to be reached in the bearings, under the worst conditions. It should be possible to replenish the grease periodically in situ ~~and overflow arrangement should be provided to avoid the possibility of the over greasing,~~ and must respect maintenance manual for greasing steps and quantity O2263. | Tender conditions prevail. |

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| 308 | Part 2 / Section VI A | 10.13.27 | Each traction motor shall be provided with redundant thermistor for determination of temperature of stator winding. It should be possible to replace the thermistors in the depot without lifting the car. Traction motor terminal boxes shall be provided with heat-detectors / LHD linked to TCMS / fire detection & control unit (refer clause 2.26) so that their status is monitored. | **Justification:**Bidder proposes a redundant PT 100 temperature sensor mounted on stator frame not in stator winding.<br><br>**Amendment requested:**Each traction motor shall be provided with redundant thermistor for determination of temperature of stator ~~winding~~ frame. It should be possible to replace the thermistors in the depot without lifting the car. Traction motor terminal boxes shall be provided with heat-detectors / LHD linked to TCMS / fire detection & control unit (refer clause 2.26) so that their status is monitored. | Tender conditions prevail. |
| 309 | Part 2 / Section VI A | 10.18.4 | Diagnostic: The HV system shall incorporate fault data recording feature. This feature shall have sufficient data storage capacity to record all necessary information of faults occurring in the HV system. The fault data shall be easily retrievable with the system remaining in-situ through a portable test unit or notebook computer interface. Both hardware and software required for data retrieval shall be provided. Fault data shall be displayed on the driving console as per the requirements of DMS and RTR-DMS in clause 14.11 & 14.13. | **Justification:** Propulsion will send diagnostic data to TCMS. TCMS shall store data.Accordingly bidder requests to amend the clause | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 353 |
| 310 | Part 2 / Section VI A | 12.5.6 | All reservoirs shall have an associated automatic drain device and, where applicable, an additional manual device for venting / draining the contents of the reservoir. | **Justification :**All reservoir are mounted in series w.r.t Main reservoir, therefore the contaminants, water etc. are collected in main reservoir first. So automatic drain valve is provided only in main reservoir and for others manual drain valve is proposed.<br><br>**Amendment requested:**All reservoirs shall have an associated manual drain device, and an automatic drain device for main reservoir for venting / draining the contents of the reservoir | Tender conditions prevail. |
| 311 | Part 2 / Section VI A | 12.13.2 | Provision shall be available to activate all the above isolating valves and switches to isolate the defective equipment from TCMS. | **Justification:** Isolation cocks are considered for all the parts of pneumatic system to isolate in case of any problem. Isolation valve is considered for Service Brake.Not all the isolation valves are possible to isolate remotely; only the service brake isolation is considered remotely.<br><br>**Amendment requested:** Provision shall be available to activate some isolating valves / cocks and switches to isolate the defective equipment from TCMS | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 286 |
| 312 | Part 2 / Section VI A | 12.9.2 | The below listed pressure information shall be shared to TCMS.a) The pressure in all suspension reservoirsb) The pressure in all reservoirs of trainh) The pressure of Auxiliary compressor (used for raising pantograph) | **Justification:**BCE don't share suspension pressure it shared the load to TCMS which is equivalent to pressure.b) BCE shares MR pressure and not reservoir pressureh) Pressure switch is used to start up the Aux compressor whose status is known to TCMS but not the pressure value<br><br>**Accordingly bidder request removal of these clauses .** | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 284 |
| 313 | Part 2 / Section VI A | 12.3.12 | The drive motor shall conform to the requirement of IEC 60349-2 and the temperature rise of thewindings of the motor shall be limited to temperature index of the insulation minus 70 ºC. Themotor shall have at least IP65 protection. | **Bidder request to amend the clause as CMRL Phase 2 drive motor performs fairly with IP 55 protection** | Tender conditions prevail. |
| 314 | Part 2 / Section VI A | 12.8.4 | The SAPB shall be an integral part of the friction brake actuation system. Parking brake application indication should be available on the brake actuators and on the driving motor car. | **Justification:** No indication of parking brake application available in brake actuators<br><br>**Amendment requested:** The SAPB shall be an integral part of the friction brake actuation system. ~~Parking brake application indication should be available on the brake actuators and on the driving motor car~~. | Tender conditions prevail. |
| 315 | Part 2 / Section VI A | 12.5.10 | The inside surfaces of pressurized structures shall be properly cleaned to remove all chips, burrs,mill scale, weld slag, and any other debris which could potentially foul height-control devices.Inside surfaces of pressurized structures shall be coated with a corrosion-inhibiting paint system. | **Justification:** No need to paint stainless steel reservoirs , it will be passivated Please amend the clause | Tender conditions prevail. |
| 316 | Part 2 / Section VI A | 12.4.7 | The compressor shall be designed to achieve a minimum of 12,000 running hours betweenoverhauls. Routine maintenance shall not be required at a frequency more than once per year. | **Justification:** The compressor is specified to achieve a minimum of 12,000 running hours between overhauls, or 8 years, whichever occurs earlier.<br><br>**Amendment requested:** The compressor shall be designed to achieve a minimum of 12,000 running hours between overhauls or 8 years, whichever occurs earlier. Routine maintenance shall not be required at a frequency more than once per year. | Tender conditions prevail. |

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| 317 | Part 2 / Section VI A | 12.6.4 | Low speed shunting of a dead train may sometimes be undertaken by isolating the service brakes. In this scenario, the MR pipe of the dead train may intentionally be left in a charged state in order to avoid the application of parking brakes. The risk of this method of shunting shall be mitigated by an Emergency Parking Brake Application Cock (EPBAC).The Contractor shall provide an EPBAC in the cab area to allow an onboard shunter to rapidly vent the MR pressure to apply the parking brakes on the dead train in case of an emergency. The EPBAC handle shall be located behind a clearly labelled access flap. | **Justification:**Shunting of a Dead train:Aux. power is Off and no brakes available on the dead train.If required, healthy train can apply the service brake and parking brake can be applied on using PBIC available under the seat at each saloon car. Also, the time taken by applying parking brake using PBIC is shorter than vent the MR pressure to apply the parking rake.<br><br>**Amendment requested:** Bidder request to remove this requirement as we consider it as non-operational requirement. | Tender conditions prevail. |
| 318 | Part 2 / Section VI A | 19.35.12 | All cable shall be run in enclosed waterproof and dust-proof ducting. | **Justification:** Cables running in Under Frame will be in Waterproof and Dust proof closed cable trays and Flexible conduits. But cables inside saloon will be placed in closed and controlled environment without closed ducting.<br><br>**Amendment requested:** All cable running in Underframe/ external zone shall be enclosed in waterproof and dust-proof ducting. | Tender conditions prevail. |
| 319 | Part 2 / Section VI A | 19.36.3 | Current capacities of conductors between traction motors and traction power control equipment shall be per IEEE 835 or NFPA 130, section 4.3.3. Current capacities of all other primary power conductors shall be per NFPA 70, Chapter 3. | **Justification:** Bidder requests to add other international standards as well for compliance viz EN 50343,EN 50122,IEC60947, EN61810<br><br>**Amendment requested:** Current capacities of conductors between traction motors and traction power control equipment shall be per IEEE 835 or NFPA 130, section 4.3.3-or EN50343. Current capacities of all other primary power conductors shall be per NFPA 70, Chapter 3 or EN 50343,EN 50122,IEC60947, EN61810. | Tender conditions prevail. |
| 320 | Part 2 / Section VI A | 19.36.4 | Current capacities may be per ICEA 110° C ratings where cable type and construction are appropriate. | **Justification:** Bidder requests to add other international standards as well for compliance EN50343.<br><br>**Amendment requested:** Current capacities may be per ICEA 110° C ratings or EN50343, where cable type and construction are appropriate.. | Tender conditions prevail. |
| 321 | Part 2 / Section VI A | 19.36.5 | Low voltage control and auxiliary power circuits operating below 240 V shall use minimum 600 V cable. Propulsion power circuits operating at or above 240 V shall use minimum 2,000 V cable. | **Justification:** As per design guidelines of EN50343, complying to Industry best standards and with Bidder's Return of Experience on similar projects we will use cables of 300V,600V, 1800V or 3600V.<br><br>**Amendment requested:** Low voltage control and auxiliary power circuits operating below 240 V shall use either 300V/600 V cable based on the area/zone of application. Propulsion power circuits operating at or above 240 V shall use minimum 1800 V or 3600V cable as per EN50343 | Tender conditions prevail. |
| 322 | Part 2 / Section VI A | 19.36.6 | Minimum 4 mm2 Cross sectional area of conductor shall be used for wire pulled through conduits. Any changes in minimum wire size will be considered during design review. | **Justification:** Wire sizing compliance can be as per EN 50343: Railway applications - Rolling stock - Rules for installation of cabling.<br><br>**Amendment requested:** ~~Minimum 4 mm2~~ Cross sectional area of conductor ~~shall be~~ used for wire pulled through conduits shall be based on wire sizing followed as per EN 50343. Any changes in minimum wire size will be considered during design review. | Tender conditions prevail. |
| 323 | Part 2 / Section VI A | 19.36.7 | Wire for control and auxiliary circuits shall not be smaller than 4 mm2 Cross sectional area of conductor 4 mm2 Cross sectional area of conductor except for high temperature, public address, and intercom applications. . Any changes in minimum wire size will be considered during design review. | **Justification:** Wire sizing can be followed as per EN 50343: Railway applications - Rolling stock - Rules for installation of cabling.<br><br>**Amendment requested:** ~~Wire for control and auxiliary circuits shall not be smaller than 4 mm2~~ Cross sectional area of Wire for control and auxiliary circuits shall be sized based on wire sizing followed as per EN 50343. ~~conductor 4 mm2 Cross sectional area of conductor except for high temperature, public address, and intercom applications.~~ . Any changes in minimum wire size will be considered during design review. | Tender conditions prevail. |
| 324 | Part 2 / Section VI A | 19.36.9 | When bundled, 1.5 mm2 Cross sectional area of conductor wire may be used in circuits where the current is low and physical strength is not required, or when laid in wire troughs or its equivalent. | **Justification:** Wire sizing can be followed as per EN 50343: Railway applications - Rolling stock - Rules for installation of cabling.<br><br>**Amendment requested:** ~~When bundled, 1.5 mm2~~ Cross sectional area of conductor wire when bundled ~~may be~~ shall be based on wire sizing followed as per EN 50343, used in circuits where the current is low and physical strength is not required, or when laid in wire troughs or its equivalent. | Tender conditions prevail. |

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| 325 | Part 2 / Section VI A | 19.38.10 | Leakage between primary wiring and car body shall be measured in accordance with IEEE 11. The leakage shall be at least 10 mega ohms when measured with 1,000- volt mega ohmmeter. | **Justification:** Bidder requests to add other international standards as well for compliance viz IEC 61133<br><br>**Amendment requested:** Leakage between primary wiring and car body shall be measured in accordance with IEEE 11 or IEC 61133. ~~The leakage shall be at least 10 mega ohms when measured with 1,000- volt mega ohmmeter.~~The value of leakage shall be as defined in IEC 61133. | Tender conditions prevail. |
| 326 | Part 2 / Section VI A | **19.38.11** | Hi-Pot testing shall be accomplished on all power wiring operated at or above 240 V at 2,500 VAC for 1 minute per IEEE 11. | **Justification:** Bidder requests to add other international standards as well for compliance viz IEC 61133/ EN50343<br><br>**Amendment requested:** Hi-Pot testing shall be accomplished on all power wiring operated at or above 240 V ~~at 2,500 VAC for 1 minute~~ as per IEEE 11 or IEC 61133 or EN50343. | Tender conditions prevail. |
| 327 | Part 2 / Section VI A | 19.38.12 | General Car body wiring insulation shall be flame-retardant, halogen-free, extra- flexible, cross-linked polyolefin material, phosphorus, sulfur, and nitrogen combined to less than 1% by weights. | **Justification:** Bidder requests to add international standard specification viz EN45545 and EN50382,EN50306,EN50264<br><br>**Amendment requested:** General Car body wiring insulation shall be flame-retardant, halogen-free, extra- flexible, ~~cross-linked polyolefin material phosphorus, sulfur, and nitrogen combined to less than 1% by weights~~ and shall comply with EN50264, EN50382,EN50306 and EN45545 | Tender conditions prevail. |
| 328 | Part 2 / Section VI A | 19.38.2 | Rubber, thermosetting, irradiated, cross linked polyolefin and thermoplastic-insulated wire and cable shall comply with the electrical and physical requirements of NEMA WC3, NEMA WC5, and NEMA WC7. | **Justification:** Bidder requests to add other international standards as well for compliance viz EN50382-2, EN50306,EN50264-3-1<br><br>**Amendment requested:** ~~Rubber, thermosetting, irradiated, cross linked polyolefin and thermoplastic-insulated~~ wire and cable shall comply with the electrical and physical requirements of NEMA WC3, NEMA WC5, NEMA WC7 or EN50382-2,EN50306,EN50264-3-1 | Tender conditions prevail. |
| 329 | Part 2 / Section VI A | 19.39.2 | Wire and cables up to and including of 10mm2 Cross sectional area of conductor shall pass the test specified in of AAR S-501, Section 5.9.4. | **Justification:** Bidder requests to add other international standards as well for compliance viz EN50264<br><br>**Amendment requested:** Wire and cables up to and including of 10mm2 Cross sectional area of conductor shall pass the test specified in of AAR S-501 Section 5.9.4. or EN50264 | Tender conditions prevail. |
| 330 | Part 2 / Section VI A | 19.39.3 | 16 mm2 and larger shall pass the test specified in IEEE 383, Section 2.5. | **Justification:** IEEE 383 is applicable for Nuclear Power Generating Stations/ nuclear Facilities. Bidder proposes to add EN50382-2, EN 45545-2, EN 50306, EN50264-3-1 instead of IEEE383<br><br>**Amendment requested:** 16 mm2 and larger shall pass the test specified in IEEE 383 Section 2.5. or EN50382-2, EN 45545-2, EN 50306, EN50264-3-1 | Tender conditions prevail. |
| 331 | Part 2 / Section VI A | 19.40.2 | The cleats, as specified in ERTS19.47, shall be positioned at intervals no greater than 257 mm, and adequate clearance shall be maintained between cables and any structural members, components, or items of equipment. | **Justification:** As per EN50343 clause 4.15 intervals of 300mm for horizontal mounting and 500mm for vertical mounting will be followed<br><br>**Amendment requested:** The cleats, as specified in ERTS19.47, shall be positioned at intervals no greater than ~~257 mm,~~ 300mm for horizontal mounting and 500mm as per EN50343 and adequate clearance shall be maintained between cables and any structural members, components, or items of equipment. | Refer Addendum No.1, S.No. 397 |
| 332 | Part 2 / Section VI A | 19.41.1 | All cable connectors shall be of watertight design, unless enclosed in interior watertight cabinets and approved by CMRL, with removable crimp contacts of the correct size for the wire being terminated. | **Justification:** As, per Bidder's Return of Experience water tight connectors are provided in underframe and exposed locations but not required in cabinets inside car due to enclosed environment from all sides<br><br>**Amendment requested:** cable connectors in exposed locations or underframe shall be of watertight design, unless enclosed in interior watertight cabinets and approved by CMRL, with removable crimp contacts of the correct size for the wire being terminated. | Tender conditions prevail. |
| 333 | Part 2 / Section VI A | 19.41.2 | Cable connectors shall be equipped with sealing gaskets for both the front and back of the connector. Extension bodies shall be used if necessary to ensure that there is sufficient room to terminate the cable wires within the connector body. | **Justification:** As, per Bidder's Return of Experience water tight connectors are provided in underframe and exposed locations but not required in cabinets inside car due to enclosed environment from all sides.<br><br>**Amendment requested:** Cable connectors shall be equipped with sealing gaskets for both the front and back of the connector in exposed locations or underframe. Extension bodies shall be used if necessary to ensure that there is sufficient room to terminate the cable wires within the connector body. | Tender conditions prevail. |

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| 334 | Part 2 / Section VI A | 19.41.3 | The cable jacket shall extend within the body, shall be held by a clamp, and shall have a gasket seal at the entrance. | **Justification:** As, per Industry best standards and Bidder's Return of Experience Gasket is not used for all connectors. Gaskets are used only if necessary<br><br>**Amendment requested:** The cable jacket shall extend within the body, shall be held by a clamp, and shall have a gasket seal at the entrance, only if necessary | Tender conditions prevail. |
| 335 | Part 2 / Section VI A | 19.41.4 | Unused connector pin positions shall be sealed with either connector contacts or plastic sealing plugs designed for that purpose. | **Justification:** Unused connector pin positions which are exposed to environment will be sealed<br><br>**Amendment requested:** Unused connector pin positions which are exposed to environment shall be sealed with either connector contacts or plastic sealing plugs designed for that purpose. | Tender conditions prevail. |
| 336 | Part 2 / Section VI A | 19.41.6 | Connectors shall comply with MIL-C-5015 or approved equal. | **Justification:** Bidder proposes to add to EN50467<br><br>**Amendment requested:** Connectors shall comply with MIL-C-5015 or EN50467 or approved equal. | Tender conditions prevail. |
| 337 | Part 2 / Section VI A | 19.42.1 | Terminations and connections throughout the car shall be with insulated ring tongue connectors of the compression (crimp) type. | **Justification:** As per Bidder's Return of Experience and industry standard, all terminations up to 4 Sqmm are Insulated<br><br>**Amendment requested:** Terminations and connections upto 4sq.mm throughout the car shall be with insulated ring tongue connectors of the compression (crimp) type. | Tender conditions prevail. |
| 338 | Part 2 / Section VI A | 19.44.1 | Communications wire and cable shall consist of twisted pairs of not less than 0.75 mm2 Cross sectional area of conductor soft annealed, tinned copper. | **Justification:** For Communication cables, wire gauges will be followed as per Equipment data sheet/ suppliers recommendation.<br><br>**Amendment requested:** Communications wire and cable shall consist of twisted pairs of Cross sectional area selected based on equipment data sheet/ supplier's recommendation. The conductor shall be soft annealed, tinned copper. | Tender conditions prevail. |
| 339 | Part 2 / Section VI A | 19.61.17.1 | Electrical insulation on wire and cables shall meet the flammability requirements of IEEE 383. | **Justification:** IEEE 383 is applicable for Nuclear Power Generating Stations/ Nuclear Facilities. Bidder proposes to add EN50382-2, EN 45545-2, EN 50306, EN50264-3-1 instead of IEEE383.<br><br>**Amendment requested:** Electrical insulation on wire and cables shall meet the flammability requirements of IEEE 383 or EN50382-2, EN 45545-2, EN 50306, EN50264-3-1. | Tender conditions prevail. |
| 340 | Part 2 / Section VI A | 19.61.17.2 | Electrical insulation shall have a (DS) not greater than 50 within 4 minutes when tested in accordance with ASTM E662. | **Justification:** ASTM E662 is obsolete. Hence EN 45545 is proposed to added.<br><br>**Amendment requested:** Electrical insulation shall ~~have a (DS) not greater than 50 within 4 minutes when tested~~ be in accordance with ASTM E662 or EN45545. | Tender conditions prevail. |
| 341 | Part 2 / Section VI A | 19.43 a. | For wire sizes 1.5 mm2 Cross sectional area of conductor and larger, the insulation shall be silicone rubber in accordance with AAR S-503, 110oC irradiated cross-linked polyolefin, or abrasion-resistant extruded PTFE (polytetrafluoroethylene) Teflon meeting MIL-W-22759/6B. | **Justification:** EN 50382 covers cables operating at high temperature with standard wall thickness of insulation, both sheathed and unsheathed, based upon halogen free materials, for use in railway rolling stock. It is divided into 2 parts: – Part 1: General requirements; – Part 2: Single core silicone rubber insulated cables for 120 °C or 150 °C. Special test methods referred to in EN 50382 are given in EN 50305. In railway applications PTFE wires are NOT USED.<br><br>**Amendment requested:** For wire sizes 1.5 mm2 Cross sectional area of conductor and larger, the insulation shall be ~~silicone rubber in accordance with AAR S-503, 110oC irradiated cross-linked polyolefin, or abrasion-resistant extruded PTFE (polytetrafluoroethylene) Teflon meeting MIL-W-22759/6B~~ as per EN 50382 | Tender conditions prevail. |
| 342 | Part 2 / Section VI A | 19.43 b. | For wire sizes 0.75 mm2 and smaller, the insulation shall be abrasion resistant extruded PTFE Teflon meeting MIL-W-22759/6B. When used for interconnecting pieces of apparatus, this type of wire shall be bundled and shall have a protective covering. | **Justification:** EN 50382 covers cables operating at high temperature with standard wall thickness of insulation, both sheathed and unsheathed, based upon halogen free materials, for use in railway rolling stock. It is divided into 2 parts: – Part 1: General requirements; – Part 2: Single core silicone rubber insulated cables for 120 °C or 150 °C. Special test methods referred to in EN 50382 are given in EN 50305. In railway applications PTFE wires are NOT USED.<br><br>**Amendment requested:** For wire sizes 0.75 mm2 and smaller, the insulation shall be ~~abrasion resistant extruded PTFE Teflon meeting MIL-W-22759/6B~~ as per EN 50382. When used for interconnecting pieces of apparatus, this type of wire shall be bundled and shall have a protective covering. | Tender conditions prevail. |

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| 343 | Part 2 / Section VI A | 19.36.11 | Stranding and conductor construction for all wires and cables 0.75 mm2 Cross sectional area of conductor and larger shall comply with NEMA-WC7. Stranding and conductor construction for all wires and cables of 0.75 mm2 Cross sectional area of conductor and larger shall comply with AAR S-501 or ICEA S-66-524, as is appropriate for the application, Class I or equivalent for general-purpose Car body wire, and ASTM B174, Class K for flexible wire between the Car body and electric coupler or bogie-mounted equipment | **Justification:** Bidder requests to add other international standards as well for compliance viz EN50264<br><br>**Amendment requested:** Stranding and conductor construction for all wires and cables 0.75 mm2 Cross sectional area of conductor and larger shall comply with NEMA-WC7 or EN 50264. Stranding and conductor construction for all wires and cables of 0.75 mm2 Cross sectional area of conductor and larger shall comply with AAR S-501 or ICEA S-66-524 or EN 50264, as is appropriate for the application, Class I or equivalent for general-purpose Car body wire, and ASTM B174, Class K or Class 6 in accordance with EN 60228 for flexible wire between the Car body and electric coupler or bogie-mounted equipment | Tender conditions prevail. |
| 344 | Part 2 / Section VI A | 19.38.3 | Wires within enclosed equipment or suitably protected locations shall comply with MILW-81044, or as otherwise approved. | **Justification:** Bidder requests to add other international standards as well for compliance viz EN50306<br><br>**Amendment requested:** Wires within enclosed equipment or suitably protected locations shall comply with MILW-81044, or EN50306 or as otherwise approved. | Tender conditions prevail. |
| 345 | Part 2 / Section VI A | 19.38.11 | Di-electric test for all Control & Power cables shall comply with IEC 61133 & IEC 60077. | **Justification:** Bidder proposes only IEC 61133 instead of IEC 60077 for Dielectric Testing in Rolling stock application, as IEC 60077 is applicable only for electrical equipment<br><br>**Amendment requested:** Di-electric test for all Control & Power cables shall comply with IEC 61133 ~~& IEC 60077~~ | Tender conditions prevail. |
| 346 | Part 2 / Section VI A | 19.36.13 | The cables and wires for Battery Circuit, Public Address System, CCTV system, emergency lighting, door system, any other circuit related to Passenger Safety and warning systems shall be fire resistant in compliant to EN 50200 PH120. | **Justification:** Based on Bidder's Return of Experience in previous project, PH 90 cables are sufficient for circuits mentioned in the clause.<br><br>**Amendment requested:** The cables and wires for Battery Circuit, Public Address System, CCTV system, emergency lighting, door system, any other circuit related to Passenger Safety and warning systems shall be fire resistant in compliant to EN 50200 PH90 | Tender conditions prevail. |
| 347 | Part 2 / Section VI A | 2.1.13 | The Phase 1 Signalling system including the currently operated 4car trains are equipped with Siemens LZB 700M Train control System. | **Clarification Requested:** As per RFP Bidder has noted the Signalling system of existing Phase-1 requirements. However, please clarify that there is no change in the product w.r.t signalling system(viz, interfaces, antennas etc), changes due to upgradation or phasing out of product, change in supplier of solution etc. In case of any changes kindly provide the details for considerations accordingly. | Refer Addendum No.1 |
| 348 | Part 2 / Section VI A | 2.1.13 | ATO train borne unit: One ATO train borne unit is provided for each cab. | **Clarification Requested:** As per RFP clause Signalling cabinet is to be located in Cab zone. However is there is acceptance on proposal of keeping the Signalling cabinet is Trailer car | Tender conditions prevail. |
| 349 | Part 2 / Section VI A | 9.4.5 (b) | The output supply for AC 3ϕ loads, 1ϕ loads and for 110 VDC shall be protected with individual earth fault current leakage detection and protection system which are individual to car and also individual to the voltage level. | **Justification:** Earth fault current detection is provided at trainset level. Further Protection can be ensured by limiting the Fault current to safe levels by using suitable resistors<br><br>**Amendment requested:** The output supply for AC 3ϕ loads, 1ϕ loads and for 110 VDC shall be protected with individual earth fault current leakage detection and protection system ~~which are individual to car and also individual to the voltage level~~ at trainset level | Tender conditions prevail. |
| 350 | Part 2 / Section VI A | 19.52.9 | Contractor shall use Mors Smitt BK-400 relays for all Safety Functions (like, Cab active, Rear cab active, Zero velocity, Door System, Brake control, Emergency brake circuit, coupler, etc). | **Justification:** Bidder proposes to have Mors Smitt BK-400 relays for specific safety functions where frequency of operations are relatively higher.<br><br>**Amendment requested:** Contractor shall use Mors Smitt BK-400 relays for ~~all~~ specific Safety Functions ~~. (like, Cab active, Rear cab active, Zero velocity, Door System, Brake control, Emergency brake circuit, coupler, etc).~~ | Refer Addendum No.1, S.No. 398 |
| 351 | Part 2 / Section VI A | 9.4.9 d) | Sixteen number of High power USB-C PD sockets rated to at least 65W that are capable of charging laptops / mobile shall be provided in each cars. | **Justification:** 65W USB-C PD sockets are not standard product available in the market. Bidder can offer suitable rating USB Hi power sockets.<br><br>**Amendment requested:** Sixteen number of High power USB-C PD sockets ~~rated to at least~~ of suitable rating that are capable of charging laptops / mobile shall be provided in each cars. | Refer Addendum No.1, S.No. 231 to 233 |
| 352 | Part 2 / Section VI A | 9.6.11 | Battery electrolyte capacity shall be such that the batteries will not require topping up more than once in a year. Battery re-conditioning shall not be required before four years. Complete calculation of loss of water and float / boost charging shall be submitted. Batteries shall be designed with integrated topping up provisions. Suitable interconnection shall be provided so that topping up of all the cells can be carried out using from a single point on battery box. The design shall be submitted for review of CMRL. | **Justification:** 1. For the first year of service water topping is to be done at 6 months and after that it can be after 1 year.\|2. Battery system will have 2 circuit for water filling (single point entry for each tray)<br><br>**Amendment request:** Bidder request the customer's agreement to the battery supplier's proposal: water topping to be performed every 6 months during the first year, and subsequently once per year thereafter. | Tender conditions prevail. |

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| 353 | Part 2 / Section VI A | 9.7.8 | The box interior / the roll out trays shall be lined with a non-flammable, electrolyte proof, insulating material of suitable thickness. The box shall be ventilated to preclude the possibility of built-up of any gas. Vibration proof automatic lock shall be provided to ensure no relative movement of the batteries inside the tray. | **Justification:** Bottom insulating material is not recommended as it will block tracking of leakage current if any during operation, which may bypass electrical hazard. Also bidder requests clarification for the lock proposal to be automatic instead of manual or semi automatic.<br><br>**Amendment request:** The box interior / the roll out trays shall be lined with a non-flammable, electrolyte proof, insulating material of suitable thickness except in areas which may induce any functional hazard. The box shall be ventilated to preclude the possibility of built-up of any gas. Vibration proof ~~automatic~~ lock shall be provided to ensure no relative movement of the batteries inside the tray. | Tender conditions prevail. |
| 354 | Part 2 / Section VI A | 9.7.1 | The battery compartment shall be a separate enclosure suspended from the under-body of the car and mounted in a suitable sliding pullout arrangement to facilitate maintenance. The battery mounting tray when rolled outside the train shall be self-balanced and shall not require any external support or stand beneath to rest when it is removed / slide out for conducting any maintenance or testing work. The battery box shall be made of stainless-steel material. The roll out system shall be corrosion resistant and shall be provided with the necessary stops and locks to limit the travel of the battery box and retain it in both extreme positions. When rolled out, the entire top portion of the battery shall be exposed. All the battery terminals, including battery positive and negative main connections shall be easily accessible for maintenance work. All hinged doors of the box shall be openable from bottom to top direction and shall be provided with suitable supports. All hinged doors of the battery box shall have adequate earthing and grounding system. | **Justification:** Due to higher battery capacity and weight, a self-balanced sliding system is impractical and unsafe. Using an external extraction tool ensures safe handling, reliability, and easy maintenance without compromising accessibility.<br><br>**Accordingly bidder requests to amend the clause considering the above justification.** | Refer Addendum No.1, S.No. 238 |
| 355 | Part 2 / Section VI A | 2.18.9.1 | Rolling stock shall comply with following or equivalent Standards: EN 50121 part 1 to part 4. | **Justification:** Bidder would like to inform that EN 50121-2 and EN 50121-4 are not in scope of Rolling Stock. Rolling Stock shall comply with EN 50121-3. The complete vehicle will comply with EN 50121-3-1 and all the onboard systems will comply with EN 50121-3-2.<br><br>**Amendment Requested:**Rolling stock shall comply with following or equivalent Standards: ~~EN 50121 part 1 to part 4~~. EN 50121-3-1 & EN 50121-3-2 | Tender conditions prevail. |
| 356 | Part 2 / Section VI A | 10.19.1.2 | Electro- Magnetic Compatibility and Electro Magnetic Immunity of the equipment of HV and Propulsion system and related compatibility and immunity interface with the train external and train internal environment shall follow according to EN 50121-2, EN 50121-3-1, EN 50121-3-2and EN 50121-4. | **Justification:** Bidder would like to inform that EN 50121-2 and EN 50121-4 are not in scope of Rolling Stock. Rolling Stock shall comply with EN 50121-3. The complete vehicle will comply with EN 50121-3-1 and all the onboard systems will comply with EN 50121-3-2.<br><br>**Amendment Requested:**Electro- Magnetic Compatibility and Electro Magnetic Immunity of the equipment of HV and propulsion system and related compatibility and immunity interface with the train external and train internal environment shall follow according to ~~EN 50121-2~~, EN 50121-3-1 & EN 50121-3-2 ~~and EN 50121-4.~~ | Tender conditions prevail. |
| 357 | Part 2 / Section VI A | 10.19.2.4 | The maximum levels of radiated EMI of any individual item of equipment shall not exceed the levels specified in EN 50121 and EN 50392. | **Justification:** EN 50392 is obsolete and replaced with EN 62311. EN 62311 specifies about the human exposure requirements. Bidder proposes to follow EN 50500 instead of EN 62311. EN 50392 is a standard that defines the requirements related to Human Exposure to electromagnetic fields. But this standard is Obsolete. However, the requirements related to human exposure are considered at Traction system level as per European Directives.<br><br>**Amendment Requested:**The maximum levels of radiated EMI of any individual item of equipment shall not exceed the levels specified in EN 50121 and ~~EN 50392~~ EN 50500 | Tender conditions prevail. |
| 358 | Part 2 / Section VI A | 7.3.10 | Air filter elements shall be replaceable from outside the car. | **Justification:** Bidder would propose the filter replacement from inside the car as this avoids climbing on top of roof.<br><br>**Amendment Requested:**Air filter elements shall be replaceable from ~~outside~~ inside the car. | Tender conditions prevail. |
| 359 | Part 2 / Section VI A | 7.4.5.6 | In the event that there is a total loss of 110 Vdc power supply to the VAC modules the dampers shall default to the fully closed position. | **Justification:** Bidder would propose to make the position of the dampers in their last state since this will not impact any functionality of the VAC and this requirement conflicts with req 7.4.8.1 to close the damper within 10seconds. There is challenge in solution in the market to comply for both of these requirements.<br><br>**Amendment Requested:** In the event that there is a total loss of 110 Vdc power supply to the VAC modules the dampers shall ~~default to the fully closed position~~ remain in same position. | Tender conditions prevail. |
| 360 | Part 2 / Section VI A | 7.6.8 | Saloon Pressure: The VAC supply air blower fan shall pressurize the car passenger area. In car stationary with all doors closed and vestibules blocked condition, the value of interior static pressure shall be minimum 25 Pa. | **Justification:** Bidder request to change the minimum interior static pressure to 10 Pa considering the low passenger load<br><br>**Amendment Requested:**Saloon Pressure: The VAC supply air blower fan shall pressurize the car passenger area. In car stationary with all doors closed and vestibules blocked condition, the value of interior static pressure shall be minimum ~~25 Pa.~~ 10 Pa. | Tender conditions prevail. |

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| 361 | Part 2 / Section VI A | 7.11.2 | The Contractor shall ensure that the overall design of the VAC System; is able to tolerate the extremely dusty and humid environment which prevails in Chennai to the extent that there is no necessity to clean VAC filters before 12,500 kms or within fewer than 30 days train running; whichever is lower. Minimum expected life of filter shall be 100,000 km. The effectiveness of VAC filters shall be adequate enough to ensure that dust deposition in the air ducts is minimal and won't create cause to need to clean the ducts between major overhauls. | **Justification:** Bidder request to change the cleaning frequency of VAC filters to 15 days considering the dust concentration in Chennai.<br><br>**Amendment Requested:**The Contractor shall ensure that the overall design of the VAC System; is able to tolerate the extremely dusty and humid environment which prevails in Chennai to the extent that there is no necessity to clean VAC filters before ~~12,500 kms or within fewer than 30 days~~ 15 days train running; ~~whichever is lower.~~ Minimum expected life of filter shall be 100,000 km. The effectiveness of VAC filters shall be adequate enough to ensure that dust deposition in the air ducts is minimal and won't create cause to need to clean the ducts between major overhauls. | Tender conditions prevail. |
| 362 | Part 2 / Section VI A | 2.15.10.9 | The fault indications shall be electrically latched when the faults are detected and shall illuminate whenever the supply to the electronics is switched on. The information contained within the fault log shall be stored on non-volatile memory. | **Justification:** All the faults pertaining to BCE will be displayed on Driver Desk/ OCC with help of TCMS but there are no illuminations present on BCU.<br><br>**Amendment Requested:**The fault indications shall be electrically latched when the faults are ~~detected and shall illuminate whenever the supply to the electronics is switched on~~ . The information contained within the fault log shall be stored on non-volatile memory | Tender conditions prevail. |
| 363 | Part 2 / Section VI A | 19.55.6 | The Contractor shall furnish the following information in respect of printed circuit boards as part of contract :a) Voltage and/or waveform expected at each critical test point. b) Instructions for carrying out testing and troubleshooting and the function of each circuit block. c) Block Diagram and functional descriptions of the PCBs. d) Connection or interfacing diagrams for the printed circuit boards and assemblies. | Bidder would like to inform the details requested are IPR level information. Bidder request to delete this clause as these details are normally not needed by employer. The repair/testing/troubleshooting activity are done at LRU level only. | Tender conditions prevail. |
| 364 | Part 2 / Section VI A | 10.11.11 | The Contractor shall submit to CMRL the quality of the regenerated energy including its harmonics analysis according to Clause 10.3.1. The same shall be commensurate with the latest trends in Metro Transit System and shall be in compliance with an accepted international standard. Interlacing of between traction converter inverter units within the train and interlacing between traction converter inverter units between trains within the fleet shall be implemented to minimize the overall effect on the power system. The Contractor shall submit detail document on the interlacing strategy and harmonic reduction measures during design stage. | **Justification:** Interlacing between traction converter units shall be managed within the train.<br><br>**Amendment Requested:**The Contractor shall submit to CMRL the quality of the regenerated energy including its harmonics analysis according to Clause 10.3.1. The same shall be commensurate with the latest trends in Metro Transit System and shall be in compliance with an accepted international standard. Interlacing of between traction converter inverter units within the train ~~and interlacing between traction converter inverter units between trains within the fleet~~ shall be implemented to minimize the overall effect on the power system. The Contractor shall submit detail document on the interlacing strategy and harmonic reduction measures during design stage. | Tender conditions prevail. |
| 365 | Part 2 / Section VI A | 12.16.4 | Low speed shunting of a dead train may sometimes be undertaken by isolating the service brakes. In this scenario, the MR pipe of the dead train may intentionally be left in a charged state in order to avoid the application of parking brakes. The risk of this method of shunting shall be mitigated by an Emergency Parking Brake Application Cock (EPBAC).The Contractor shall provide an EPBAC in the cab area to allow an onboard shunter to rapidly vent the MR pressure to apply the parking brakes on the dead train in case of an emergency. The EPBAC handle shall be located behind a clearly labelled access flap. | **Clarification requested**Shunting of a Dead train: Aux. power is Off and no brakes available on the dead train. If required, healthy train can apply the service brake and parking brake can apply can be applied on using PBIC located under the seat at each saloon car. Also, the time taken by applying parking brake using PBIC is shorter than vent the MR pressure to apply the parking rake. EPBAC cock within the cab to vent MR pressure for applying Parking brake doesn't seems to be feasible solution. No tender reference found. | Tender conditions prevail. |
| 366 | Part 2 / Section VI A | 2.15.3.5 | The mounting arrangement of the traction motor shall be designed with a secondary mounting arrangement to prevent the motor from dropping onto the track should the primary mounting arrangement become disconnected. | **Justification:** The safety nose in motors will act as a retention feature for motors, preventing the motor from falling onto the track in the event of a primary mounting failure.<br><br>**Amendment Requested:** Bidder requests to amend this requirement for retention feature only. | Tender conditions prevail. |
| 367 | Part 2 / Section VI A | 2.15.4.7 | Over temperature monitoring and alarms shall be incorporated into Power Converter Inverter and Traction motors. | **Justification:**We proposed to use thermal model in the TCU for monitoring over temperature for motors.Same has been implemented and accepted in CMRL Phase 1 project.<br><br>**Accordingly, bidder requests to remove this requirement for motors.** | Tender conditions prevail. |
| 368 | Part 2 / Section VI A | 10.13.3 | The traction motor shall be self-ventilated and shall comply with the requirements of IEC 60349-2. An effective and efficient filtration system shall be provided to remove dirt and water from the self-ventilated traction motor cooling air. The air inlet openings shall include a protective screen designed in such a way as to preclude the accumulation of leaves and debris. If installed, filters shall require cleaning in accordance with the manufacturer's recommendations. Any sensor(s) if used shall be easily accessible for replacement and shall not necessitate removal of motor / its dis-assembly. Speed sensors if used shall not generally be placed on the gear case. | **Justification:**Customer has already removed this clause from traction motor section, refer clause number 2.15.3.2\|\|**Amendment Requested:**Accordingly, bidder requests to remove this clause as well. | Tender conditions prevail. |

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| 369 | Part 2 / Section VI A | **10.18.3.6** | A malfunction of a car's brake equipment shall activate the train's emergency brake and a mechanism shall be provided to remotely isolate, from the driver's cab, only the failed brake equipment on that car and enable release of the train's emergency brake. | **Justification: Justification:-** If there is any malfunction in car's brake equipment (major fault) BCU will isolate that bogie itself and the loss of braking effort for that bogie will be compensated at train level through brake blending with other BCU. However remote isolation of that particular brake equipment is possible by the driver.<br><br>**Bidder requests to amend or remove the requirement of emergency brake application on malfunction of car's brake equipment\|\|Amendment Requested:** ~~A malfunction of a car's brake equipment shall activate the train's emergency brake and~~ A mechanism shall be provided to remotely isolate, from the driver's cab, only the failed brake equipment on that ~~car and enable release of the train's emergency brake.~~ | Tender conditions prevail. |
| 370 | Part 2 / Section VI A | 10.13.6 | Various ageing parameters viz., thermal and electrical stresses, ambient temperature, humidity, dust and mechanical stresses, vibration etc., should be used in the evaluation and the temperature index of the insulation system corresponding to an extrapolated life of 20,000 hours shall be established. The Contractor shall submit the evaluation of the temperature index of the insulation system for review and approval. | **Clarification requested:** The evaluation of the insulation system will be carried out in accordance with IEC 60034-18-31 to determine the temperature index of the system. Bidder request concurrence for the proposal. | Tender conditions prevail. |
| 371 | Part 2 / Section VI A | 10.13.19 | Any inspection covers shall be robust and designed for quick and easy removal/replacement and have secondary retention to prevent loss. Inspection openings shall be as large as possible to facilitate inspection and maintenance. | **Justification:** Inspection openings are not provided in the motors. Practically it is not feasible to provide inspection cover as there is no internal component which requires inspection.<br><br>**Accordingly, bidder requests to remove this requirement for motors.** | Tender conditions prevail. |
| 372 | Part 2 / Section VI A | 11.2.18 | Bogie mounted equipment shall be designed to operate satisfactorily in the environment specified in clause 2.11.1. and shall conform to IEC 61373 in respect of shock and vibration, including the endurance limits for both fatigue and peak vibration levels. These shall be incorporated in the type test of the respective equipment. | **Justification:** No test is foreseen according to IEC 61373, FEA calculation based on EN13749 is proposed for motors.<br><br>**Bidder requests to amend the clause accordingly** | Tender conditions prevail. |
| 373 | Part 2 / Section VI A | 3.6.1.1 | All interior fittings and surfaces shall be designed, constructed and installed to meet or exceed standard industry requirements and shall be approved by CMRL. Structural requirements for rail vehicle structures shall be designed and tested conforming with GM/RT2100, UIC 566, EN 12663-1. | **Justification:** The bidder has requested that the requirement be amended to allow compliance with any one or more of the specified standards, rather than mandating compliance with all of them.<br><br>**Amendment Requested:**All interior fittings and surfaces shall be designed, constructed and installed to meet or exceed standard industry requirements and shall be approved by CMRL. Structural requirements for rail vehicle structures shall be designed and tested conforming with GM/RT2100 /UIC 566 / EN 12663-1. | Tender conditions prevail. |
| 374 | Part 2 / Section VI A | 3.6.1.20 | Nominal clear height inside the car between floor and roof ceiling shall be between 2050 mm ~2150 mm with mounting tolerance of ±5 mm for nominal clear height, additionally conforming to gaps and flush tolerances. | **Bidder request Modification from ±5mm to ±10mm** for nominal clear height as the cumulative stack up of tolerances from structure, camber etc impacts this parameter while it will be ensured to conform to gaps and flush tolerances. | Tender conditions prevail. |
| 375 | Part 2 / Section VI A | 3.6.1.22 | All internal panels (side panels, ceiling panels, end-ceiling panels, inspection cover panels, door coving panels, ceiling coving panels, etc) shall be of aluminium material with proven record in Metro / EMU application. Coating system shall be proposed by the Contractor shall be provenand conform to the requirements in clause 3.6.1.21, subjected to CMRL approval. Flatness of Aluminium side panels shall be controlled within 0.5 mm per 1m length. The Contractor shall ensure adequate measure have been taken to prevent and mitigate the riskof bi-metallic corrosion and rattling. Suitable damping and Insulation shall also be provided to reduce noise and thermal conductivity especially at metal-to-metal contact points. | **Amendment request:** :Modification of 1mm/meter in place of 0.5mm/meter flatness . | Tender conditions prevail. |
| 376 | Part 2 / Section VI A | 3.6.1.23 | The number of joints on all interior panels shall be minimised. The location of joints shall becarefully selected such that they are minimally visible throughout the entire vehicle includingsaloon interior. Where side panel joints cannot be eliminated, only one joint behind the saloonseat shall be permitted. No later than pre-final design stage, proposals for all internal panels shallbe submitted to CMRL for approval. CMRL's decision on the design selection shall be final andbinding on the Contractor. | **Justification:** Bidder proposes to have 2 joint behind the saloon seat and for aluminum recommend to have 2 joints at least for manufacturing feasibility<br><br>**Amendment request: :** Where side panel joints cannot be eliminated, only ~~one~~ two joint behind the saloon seat shall be permitted. | Refer Addendum No.1, S.No. 109 |
| 377 | Part 2 / Section VI A | 3.6.3.1 | Stanchions and handrails shall be provided to aid passengers when boarding, moving throughoutthe car, or standing throughout their journey. Structural requirements for rail vehicle structuresshall be design and tested conforming with GM/RT2100, UIC 566, EN 12663-1. | **Justification:** The bidder has requested that the requirement be amended to allow compliance with any one or more of the specified standards, rather than mandating compliance with all of them.<br><br>**Amendment Request:** Stanchions and handrails shall be provided to aid passengers when boarding, moving throughoutthe car, or standing throughout their journey. Structural requirements for rail vehicle structuresshall be design and tested conforming with GM/RT2100/ UIC 566/ EN 12663-1. | Tender conditions prevail. |

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| 378 | Part 2 / Section VI A | 3.6.5.1 | Longitudinal banks of bucket type anti slip finish stainless steel seats shall be provided along the body-side between the doorway draught screens. The Contractor shall provide as much seating space as possible between the side doors. The seat layout should be such that it will not obstruct the flow of passengers during rush hours while boarding or detraining. Draught screen shall be provided at each door and shall be an integral part of the stanchions at the doorways. Bumpsupport / Lumber support arrangement shall be at suitable locations as decided by CMRL. | **Justification:** Bidder request attention to the advantages of flat seat seats like ease of cleaning , flexibility for families, simpler design hence option of flat seats also can be added to the clause. As the ERTS does not call for any multi purpose space Bumpsupport / Lumber support can be removed from the clause.<br><br>**Clarification requested:-** 1-Bidder requests to keep the option open for bucket seat or flat seat. 2-Removal of Lumber support requirement from clause. | Refer Addendum No.1, S.No. 111 |
| 379 | Part 2 / Section VI A | 3.6.5.10 | The seats and their mountings shall be capable of withstanding the loads arising in service conditions. The seats shall be designed to have a service life compatible with the car. Structural requirements for rail vehicle structures shall be design and tested conforming with GM/RT2100,UIC 566, EN 12663-1. | **Justification:** The bidder has requested that the requirement be amended to allow compliance with any one or more of the specified standards, rather than mandating compliance with all of them<br><br>**Amendment Request:** The seats and their mountings shall be capable of withstanding the loads arising in service conditions. The seats shall be designed to have a service life compatible with the car. Structuralrequirements for rail vehicle structures shall be design and tested conforming with GM/RT2100/UIC 566/ EN 12663-1. | Tender conditions prevail. |
| 380 | Part 2 / Section VI A | 3.6.5.15.2 | Seat framing may be stainless steel or Aluminium with a satin or Anodized finish. Frame members shall be joined together using proper welding technique. Any seat frame tubing shall have theends plugged to prevent the entry of vermin. | **Clarfication: -** Bidder requests to keep all the material option open while meeting other later performance requirements**.** This allows for light weight design. . | Tender conditions prevail. |
| 381 | Part 2 / Section VI A | 3.6.5.15.4 | Behaviour of seats at static, fatigue, vibrations, impact stress shall be design, tested as per NFF31-119 and indentation test shall be design, tested as per ISO 2439. The indentation hardness shall be similar to industry standards. The indentation hardness and depth shall be measured firstbe tested initially and then at 80,000 cycle intervals. | **Justification:** This requirement not applicable for SS seat. ISO is only applicable to FRP seat.<br><br>**Bidder request** to delete ISO requirement from this clause. | Tender conditions prevail. |
| 382 | Part 2 – Section VI A: ERTS – RS | Chapter 17 – Test Program\|Chapter 18 – Systems Assurance\|Chapter 19 – Materials and Workmanship | Header of referred chapters are Chennai Metro Rail Project – Phase 1 Bid No. **ARE04A** | Bidder understands it is to be read as Chennai Metro Rail Project – Phase 1 Bid No. **ARE05**. | Refer Addendum No.1 |
| 383 | Part 2 – Section VI A: ERTS – RS, Chapter 1 | 1.3.8 | During the initial phase of the project the trains are planned to be operated in Automatic Train Operation (ATO) shall be the predominant mode of train operation. In case if CMRL does not engage ATO for any reason, at any stage of passenger operation or non-passenger operation, the Train Operator will deploy staff to drive the train under Manual Mode (under ATP). After the upgradation made by Signalling Contractor the trains will be operated in GoA3 & GoA4. | We understand that the initial commissioning will be at GoA2, with a planned upgrade to GoA4 at a later stage. Request you to please clarify the following points regarding your signalling strategy:<br><br>1) The signalling system architecture is designed to support GoA4, or will it be adapted during the upgrade phase?<br>2) Should initial deployment include GoA4-ready hardware, or will these be added later?<br>3) Will GoA2 software be scalable to GoA4, or require replacement?<br>4) We understand that upgrade will be done in phases. What is the expected timeline and approach for transitioning from GoA2 to GoA4? | Refer Addendum No.1 |
| 384 | Part 2 – Section VI A: ERTS – RS | 21 | ASSET MAINTENANCE MANAGEMENT SYSTEM (AMMS) | As Service/CAMC is not part of this tender and AMMS scope would aligned to maintainence strategy. Bidder requests customer to remove this requirement. | Refer Addendum No.1, S.No. 402 to 407 |
| 385 | Part 2 – Section VI A: ERTS – RS | 1.16 | PROJECT MANAGEMENT INFORMATION SYSTEM (PMIS)<br>The Contractor shall refer clause 16.17 of Part 2 Section VIA for details. | Clause 16.17 not available in tender documents. | Refer Addendum No.1, S.No. 370 |
| 386 | Part 2 / Section VI A | 13.13.8 | In case of activation of PEI in any of the car by passenger, the camera recording focusing the PEI shall be displayed on the CCTV DDU. The cameras shall have inbuild zoom function. It shall be possible to filter, zoom and select images in offline mode for investigation purpose. The images shall be with time stamping and it shall be possible to link them with respective location of train. | **Justification:** Offline zooming shall be possible with PACIS-CCTV software application, so inbuilt Zoom function maynot be required within Camera.<br><br>**Amendment requested**:<br>Bidder requests to remove inbuilt Zoom function in camera from requirement. | Refer Addendum No.1, S.No. 316 |

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| 387 | Part 2 / Section VI A | 5.4.1.f | Selector switches / Isolation switches / By-pass switches<br>A series of Selector / isolating / By-pass switches shall be provided in each Operator's Desk to ensure that the following systems, as a minimum, can be manually isolated by the operator:<br>i. ATO / ATP activation, isolation<br>ii. Door Proving Loop bypass<br>iii. Service Brake Loop bypass<br>iv. Emergency brake loop bypass<br>v. Pantograph Selector<br>vi. Holding Brake release<br>vii. Any Other Selector / Isolation / By-pass switches felt necessary by the Contractor for ATO and non-ATO operations.<br>viii. emergency egress switches<br>ix. miniature circuit breakers (MCB's) operation<br>The isolating switches shall be sealed with a breakable seal and incorporate a visually clear mechanical or illuminated indication visible in the panel when each switch is in the "Isolated" position. Once the seal has been broken, replacement of the seal shall not be achievable by the operator. | **Justification:** vi) Holding brake application and release operation is automatic, bidder suggests not to feature a physical holding brake control. It should remain a integrated function not a physical switch.<br>viii) EED by selector or bypass is not provided in driver cab rather physical device is provided near respective Door.<br>ix) MCB are part of cubicles and does not have a bypass.<br><br>**Amendment requested**:<br>Bidder request to keep the options of isolation switches open for review and discussion. | Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 143 to 144 |
| 388 | Part 2 / Section VI A | 13.2.10 | Each main communication system shall be operated and inhibited independently in case of failure.This inhibition shall be possible from TCMS. | **Justification:** Inhibition of displays (DRM, PID, IEDD, FDI-TNI) and PEI are provided from PACIS CCH and since it is provided from PACIS HMI, the functionality from TCMS DDU is not replicated.<br><br>**Amendment requested**:<br>Bidder request to replace "TCMS" by "PACIS HMI" in the mentioned requirement. | Refer Addendum No.1, S.No. 292 |
| 389 | Part 2 / Section VI A | 14.9.5 | The overall time required for uploading the software for all subsystems shall not be more than 10 minutes for each complete sub-system of train and the same shall be demonstrated. (Ex. In case of doors sub-system, the time requirement is collectively for all doors of one train) | **Justification:** The duratopn for software uploading for subsystems will be around 10 minutes.<br>**Amendment requested:**<br>Bidder request to keep the requirement open for review and approval during detail design. | Tender conditions prevail. |
| 390 | Part 2 / Section VI A | 2.2.20 | When fully mated, the connectors for internal use (i.e., fitted within the car body) shall achieve a seal rated to at least IP53 in accordance with IEC 60529 if the sealing is not provided by the cabinet or similar. Connectors fitted externally to the Car body shall achieve a seal rated to at least IP65. | **Justification:**.<br>Bidder proposes to use IP-2X cubicles which are located in a controlled environment inside the Saloon and duly covered from side wall lining and structures around the cubicle (i.e IP2X cubicles are considered in Saloon area) Cable entries from Underframe to Saloon and Roof to Saloon through cable transits which are fully IP68 protected. This avoids Dust, water, Noise and fire ingress into the cubicle and there by Electronic equipment mounted inside are protected. Hence IP-53 connectors are not compatible with mating connectors on the cubicles. Further Connectors fitted externally to the Car body shall achieve a seal rated to at least IP65. | Tender conditions prevail. |
| 391 | Part 2 / Section VI A | 4.8.2.1 | Electrical connections between the cars of a rake shall use highly flexible multi-conductor cables conforming to relevant international standards with quick-disconnect connectors on both ends. | **Justification:**.<br>Bidder proposes to use flexible multiconductor cable for Communication (class C) and flexible single core cables for Power and control cables (class A and B) | Tender conditions prevail. |
| 392 | Part 2 / Section VI A | 10.9.1 | High voltage Copper cable of adequate voltage rating and diameter shall connect the vacuum circuit breaker to the main transformer. The cable shall be laid in stainless steel pipe from end-to-end terminations from roof to under-frame. The cable insulation and sheathing shall be halogen free, flame retardant and having smoke emission in compliance with IEC 60502, BS 6853 and EN 45545 Part 1 to 7(Category 4-A, Hazard level HL3). The Bushing & Connector shall comply with EN 50180 and EN 50181. The details for roof-end and transformer-end terminations of 25 KV cable shall be provided for the CMRL's review. The cable shall not have any straight through joint / connector between HT bushing on the roof and transformer bushing in the transformer. | **Justification:.**<br>Bidder proposes to lay High voltage cables through stainless steel ducts to have a better accessibility and maintenance of cable. Further BS 6853 is withdrawn and its equivalent standard is EN45545.<br>**Amendment requested:**<br>High voltage Copper cable of adequate voltage rating and diameter shall connect the vacuum circuit breaker to the main transformer. The cable shall be laid in stainless steel pipe or duct from end-to-end terminations from roof to under-frame. The cable insulation and sheathing shall be halogen free, flame retardant and having smoke emission in compliance with IEC 60502, ~~BS 6853~~ and EN 45545 Part 1 to 7(Category 4-A, Hazard level HL3). The Bushing & Connector shall comply with EN 50180 and EN 50181. The details for roof-end and transformer-end terminations of 25 KV cable shall be provided for the CMRL's review. The cable shall not have any straight through joint / connector between HT bushing on the roof and transformer bushing in the transformer. | Tender conditions prevail. |
| 393 | Part 2 / Section VI A | 14.2.10 | Minimum IP level of all TCMS cubicles / equipment or the panel in which it is installed shall be IP53 or higher. | **Justification:.**<br>Bidder proposes to use IP-2X cubicles as cubicles are located in a controlled environment inside the Saloon and duly covered from side wall lining and structures around the cubicle (i.e IP2X cubicles are considered in Saloon area) Cable entries from Underframe to Saloon and Roof to Saloon through cable transits which are fully IP68 protected. This avoids Dust, water, Noise and fire ingress into the cubicle and there by Electronic equipment mounted inside are protected. Hence there may not be need of requirement with IP 53 cubicles/ panels | Tender conditions prevail. |

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| 394 | Part 2 / Section VI A | 19.37.6 | Car wiring shall comply with EN 50343, and with the AAR Manual of Standards, Section F, S-538, "Wiring Practice and Rolling Stock Standard," except where otherwise specified. | **Justification:.**<br>Bidder proposes to keep the complaince open to equivalent standards.<br>**Amendment requested:**<br>Car wiring shall comply with EN 50343, ~~and~~ or with the AAR Manual of Standards, Section F, S-538, "Wiring Practice and Rolling Stock Standard," except where otherwise specified. | Tender conditions prevail. |
| 395 | Part 2 / Section VI A | 19.38.1 | Each conductor shall be separately covered with insulation. Flat cables are prohibited, except for specific data/communications applications where other arrangements are impractical. Shall comply with EN 50306, EN 50305, EN 50264, NFF 16101 & NFPA130. | **Justification:.**<br>Bidder proposes to keep the complaince open to equivalent standards.<br>**Amendment requested:**<br>Each conductor shall be separately covered with insulation. Flat cables are prohibited, except for specific data/communications applications where other arrangements are impractical. Shall comply with EN 50306, EN 50305, EN 50264, NFF 16101 & NFPA130 or equivalent. | Tender conditions prevail. |
| 396 | Part 2 / Section VI A | 19.46.13 | There shall be at-least 10% spare wires with connected terminals for each category of type of purpose inside each electrical conduit and 20% of spare wires for Trainlines. These categories of wires could be audio, Ethernet, trainlines, various train networks, other serial & parallel communications and all types of car lines or trainlines which are passing through the jumper conduits. It shall be possible for CMRL to utilize these free cables which are within the train conduits without impacting other functionalities of the train at a later stage. | **Justification:.**<br>Overall 10% of spare control cables shall be considered as per EN 50343. Based on Industry best standards and Return of Experience on similar projects 10% of spare control cables are sufficient for future usage.<br>**Amendment requested:**<br>There shall be at-least 10% spare wires with connected terminals for control cables ~~each category of type of purpose~~ inside ~~each~~ electrical conduit and ~~20%~~ 10% of spare wires for Trainlines. ~~These categories of wires could be audio, Ethernet, trainlines, various train networks, other serial & parallel communications and all types of car lines or trainlines~~ which are passing through the jumper conduits. It shall be possible for CMRL to utilize these free cables which are within the train conduits without impacting other functionalities of the train at a later stage. | Tender conditions prevail. |
| 397 | Part 2 / Section VI A | 19.42.8 | Except for electronic equipment, all cable terminations shall be of the crimped type in ac-cordance with BS 4579: Part 1: 1988, Compression Joints in Copper Conductors, or other service proven type. Soldered connections will not be accepted. | **Justification:.**<br>BS4579 is withdrawn. Hence proposes complaince to EN50343 instead of BS 4579<br>**Amendment requested:**<br>Except for electronic equipment, all cable terminations shall be of the crimped type in ac-cordance with ~~BS 4579: Part 1: 1988,~~ EN50343. Compression Joints in Copper Conductors, or other service proven type. Soldered connections will not be accepted. | Tender conditions prevail. |
| 398 | Part 2 / Section VI A | 19.42.9 | Low voltage cables up to 6.0 mm2 conductor cross sectional area shall preferably be fitted with terminals conforming to BS4579 Pt.1 or equivalent. Alternatives shall be submitted for CMRL review. | **Justification:.**<br>BS4579 is withdrawn. Hence proposes complaince to EN50343 instead of BS 4579<br>**Amendment requested:**<br>Low voltage cables up to 6.0 mm2 conductor cross sectional area shall preferably be fitted with terminals conforming to ~~BS4579 Pt.1~~ EN50343.or equivalent. Alternatives shall be submitted for CMRL review. | Tender conditions prevail. |
| 399 | Part 2 / Section VI A | 19.44.3 | Stranding shall be at least 26 strands. | **Justification:.**<br>Communication cables stranding shall be 19 strands cables selected as per standard IEC 61156 -3,EN50343. Bidder requests to amend the requirement as per standard. | Tender conditions prevail. |
| 400 | Part 2 / Section VI A | 19.46.5 | Conduits that contain three or more conductors shall be sized such that the sum of the cross-sectional area of the wires and cables does not exceed 40% of the cross sectional area of the conduit. For two conductors, a limit of 30% shall be used. For a single conductor, a limit of 53% shall be permitted. | **Amendment requested:**<br>Conduits that contain three or more conductors shall be sized such that the sum of the cross-sectional area of the wires and cables does not exceed 40% of the cross sectional area of the conduit. For two conductors, a limit of 30% shall be used. For a single conductor, a limit of 53% shall be permitted. Alternatively the conduits shall be sized as per EN 50343, Sec 4.12 | Tender conditions prevail. |
| 401 | Part 2 / Section VI A | 19.46.6 | Where conduits with a length not exceeding 610 mm, and without bends of more than 15 degrees, are used between enclosures, a maximum fill of 60% shall be permitted. | **Amendment requested:**<br>Where conduits with a length not exceeding 610 mm, and without bends of more than 15 degrees, are used between enclosures, a maximum fill of 60% shall be permitted.. Alternatively the conduits shall be sized as per EN 50343, Sec 4.12 | Tender conditions prevail. |
| 402 | Part 2 / Section VI A | 19.48.2 | Boxes, covers, and fittings of ferrous metal shall be galvanized inside and outside after fab-rication. | **Justification:.**<br>As SS304 is used for cabinets/ Juntion box, no Galvanisation is foreseen/considered. | Tender conditions prevail. |
| 403 | Part 2 / Section VI A | 19.48.5 | The interiors of all junction boxes shall be protected with insulating light colour paint. | **Justification:.**<br>Stainless steel material is used for Junction boxes, hence painting is not required. Further more creepage and clearance for all electrical terminations are considered in design to avoid any faults. | Tender conditions prevail. |

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| 404 | Part 2 / Section VI A | 19.51.5 | Breaker current rating shall be clearly visible after installation and shall comply with NEMA AB1, ANSI C37.13, C37.14, or C37.16. | **Justification:.**<br>Bidder proposes to keep the complaince open to equivalent standards. EN 60947-2 is equivalent to NEMA AB1, ANSI C37.13, C37.14, or C37.16.<br>**Amendment requested:**<br>Breaker current rating shall be clearly visible after installation and shall comply with NEMA AB1, ANSI C37.13, C37.14, or C37.16. OR EN60947 | Tender conditions prevail. |
| 405 | Part 2 / Section VI A | 19.52.10 | Relays used in safety-critical circuits shall comply with the AAR Signal Manual, Volume 2, Section 6, unless otherwise approved. | **Justification:.**<br>AAR Manuald referred is for Signaling and NA for Rolling stock. Hence Relays used in safety-critical circuits shall comply with IEC 61810-3<br>**Amendment requested:**<br>Relays used in safety-critical circuits shall comply with IEC 61810-3 ~~the AAR Signal Manual, Volume 2, Section 6~~, unless otherwise approved. | Tender conditions prevail. |
| 406 | Part 2 / Section VI A | 19.56.3 | All semiconductors shall be JEDEC registered and numbered and shall be available from at least two different manufacturers unless otherwise approved by CMRL. Non-JEDEC registered devices may be used, provided that the Contractor obtains CMRL's prior approval based on submission of appropriate justifications. These shall include, but not be limited to the complete procurement specifications, details of each semiconductor device, evidence of available alternative replacements as well as any applicable diagnostic connectors / capability that would otherwise be offered by JEDEC compliant devices. | **Justification:.**<br>IC (Integrated Circuit) details and internal PCB components are part of the OEM IPR and not separately serviceable. As per the proposed design, LRU units are non-repairable and will be directly replaced in case of failure. JEDEC registrations and sub-supplier details are OEM-owned. However, all LRUs are fully compliant with EN 50155 and will be replaced within agreed timelines as per maintainability documentation.<br>**Amendment requested:**<br>Bidder request to delete the requirement and replace the requirement to meet the EN 50155 compliance. | Tender conditions prevail. |
| 407 | Part 2 / Section VI A | 3.4.1.3.1 | The cab ends of the car shall have a collision structure that may include, but is not limited to, full- height corner posts, collision posts, structural shelf, and sheeting. The stress analysis for the collision posts and corner posts shall be submitted for approval. An analysis demonstrating that all joints comply with fatigue load requirements shall also be submitted for approval. | **Jstification:**<br>In lieu of corner posts and collision posts, a service proven collision buffer system will be installed that meets the requirements of EN 15227-2020. Buffer system also provide same impact as of Corner / Collision post.<br><br>**Amendment requested:**<br>The cab ends of the car shall have a collision structure that may include, but is not limited to, full- height corner posts, collision posts, structural shelf, sheeting or Collision Buffer system. The stress analysis for the collision posts, corner posts or buffer system shall be submitted for approval. An analysis demonstrating that all joints comply with fatigue load requirements shall also be submitted for approval. | Tender conditions prevail. |
| 408 | Part 2 / Section VI A | 18.6.4.1 (b) | Type 2 / Relevant Failure:<br>A relevant failure of an item is an independent failure which results in a loss of function of that item caused by a fault in an equipment / sub-system of the train while operating within its design and environmental specification limits or a maintenance error made by the Contractor in undertaking its obligations during DLP / DNP period. Improper operation, maintenance, or testing of the item as a result of the Contractor supplied documentation or Failures of transient nature<br>including those with post investigation status as 'No fault found', shall be considered as relevant failure if in the opinion of CMRL these are attributable to Rolling Stock. The decision of CMRL shall be final. The reliability data for extension of sub-system level DLP / DNP extension will be based on the targets set by the Contractor as in Clause 18.6. | **Justification:-**<br>The target for type 2 failures of sub systems is not part of this RFP .<br><br>**Amendmend Requested:-**<br>A relevant failure of an item is an independent failure which results in a loss of function of that item caused by a fault in an equipment / sub-system of the train while operating within its design and environmental specification limits or a maintenance error made by the Contractor in undertaking its obligations during DLP / DNP period. Improper operation, maintenance, or testing of the item as a result of the Contractor supplied documentation or Failures of transient nature<br>including those with post investigation status as 'No fault found', shall be considered as relevant failure if in the opinion of CMRL these are attributable to Rolling Stock. The decision of CMRL shall be final. The reliability data for extension of ~~sub-system~~ DLP / DNP extension will be limited to train level ~~based on the targets set by the Contractor as in Clause 18.6.~~ | Tender conditions prevail. |
| 409 | Part 2 / Section VI A | 18.6.5.6 | It is clarified that even if trainsets are not deployed to the network to the extent that is required to earn the design mileage (defined in Clause 1.4.5) the same MDBF targets and respective calculations taken for Reliability demonstration shall prevail. | Bidder seeks this requirement can be modified in the RFP.<br><br>Bidder understands that the above Targets are based mileage earning. For every 10% change in actual average annual kilometre earning with respect to specified values, the above Reliability Target shall be adjusted by 5%.<br>As an illustration, in case actual average annual kilometre earning is 1,34,999 KM then MDBF Target shall be 76,000 KM after 12 months of start of revenue service of first Train.<br><br>This approach for reliability target adjustment as per mileage accumulation was accepted in multiple Indian projects | Tender conditions prevail. |

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<tr><th rowspan="2">Sl. No.</th><th colspan="4">As per the Submission of Bidder(s)</th><th rowspan="2">CMRL Response</th></tr>
<tr><th>Part/ Section No</th><th>Clause No.</th><th>Original Bid Condition</th><th>Bidder’s queries</th></tr>
<tr><td>410</td><td>Part 2 / Section VI A</td><td>18.6.6.1</td><td>Table 18-2: Requirements for Reliability Demonstration (RD):<br><table><tr><th rowspan="2">RD Period</th><th colspan="3">Criteria for Evaluation of Fleet Reliability Demonstration</th><th>MDBF Target (For Type-1 Failures)</th><th>Duration of Rolling Evaluation Period</th></tr><tr><th>RD Evaluation Period Starts</th><th>Reporting Submission Start Date</th><th>Criteria to Complete RD Period</th></tr><tr><td>Stabilisation</td><td>1st Train RID</td><td>1st Train RID +1 Month (Informal Reporting Only)</td><td>1st Train RID + 6 Months</td><td>No Target / Reporting Only</td><td>1 Month</td></tr><tr><td>Level 1</td><td>1st Train RID + 6 Months</td><td>1st Train RID +13 Months</td><td>MDBF Target met for 18 Reporting Months (accumulated)</td><td>80,000 Km</td><td>6 Months</td></tr><tr><td>Level 2</td><td>1st Train RID + 6 Months</td><td>1st Train RID +19 Months</td><td>MDBF Target met for 12 Reporting Months (accumulated)</td><td>1,25,000 Km</td><td>12 Months</td></tr></table></td><td>Bidder understand that this requirement is as follows:<br><br>Level1: The AVERAGE MDBF of 80,000 km shall be reached at the end of twelve (12) month of introduction of first train into revenue service considering past six (06) months duration of rolling evaluation period for available trains.<br><br>Level 2: The AVERAGE MDBF of 1,25,000 km shall be reached at the end of eighteen (18) month of introduction of first train into revenue service considering past twelve (12) months duration of rolling evaluation period for available trains.<br><br>This approach for reliability demonstration for rolling evaluation period was accepted in multiple Indian projects.</td><td>Refer Addendum No.1, S.No. 394</td></tr>
<tr><td>411</td><td>Part 2 / Section VI A</td><td>4.4.4.2</td><td>The supporting device shall provide a suitable means for vertical height adjustment of the coupler head to compensate for wheel wear, operating levels of the primary suspension, failure of air suspension and coupler assembly wear.</td><td><u>Justification:</u><br>Primary suspension compresion, secondary deflation etc are operational variation during the run . A preadjustment may not be needed for these variations. Coupler supporting device is designed for slight adjustment to keep coupler horizontal,<br><br><u>Amendment requested:</u><br>Bidder requests to delete the clause.</td><td>Tender conditions prevail.</td></tr>
<tr><td>412</td><td>Part 2 / Section VI A</td><td>3.4.3.3</td><td>If a "plug-in" cab enclosure is used, the watertight seal between the main carbody and cab shell shall last for a minimum of 12 years under the loading and environmental conditions identified in these Technical Provisions. Joints formed primarily with caulking or scalant shall not bc uscd.</td><td><u>Justification:</u><br>Typical life expectancy of selant is 8 years.<br><br><u>Amendment requested:</u><br>If a "plug-in" cab enclosure is used, the watertight seal between the main carbody and cab shell shall last for a minimum of ~~12 years~~ 8 years under the loading and environmental conditions identified in these Technical Provisions. Joints formed primarily with caulking or sealant shall not be used.</td><td>Tender conditions prevail.</td></tr>
<tr><td>413</td><td>Part 2 / Section VI A</td><td>4.7.3</td><td>Each coupler shall include cut-out cocks for manual pneumatic isolation. The location of the cut- out cocks shall allow access to operate from both the exterior of the train (at platform level) as well the interior (near the Operator's Desk).</td><td><u>Justification:</u><br>There will not be an isolating cock on the coupler, as the coupler serves only as a mediator to transfer pneumatic connectivity from one car to another. Once the coupler is uncoupled, the pneumatic connection is automatically disconnected. However, cut-off cocks are provided to isolate the pneumatic system at the train level<br><br><u>Amendment requested:</u><br>~~Each coupler~~ Train shall include cut-out cocks for manual pneumatic isolation. ~~The location of the cut- out cocks shall allow access to operate from both the exterior of the train (at platform level) as well the interior (near the Operator's Desk).~~</td><td>Tender conditions prevail.</td></tr>
<tr><td>414</td><td>Part 2 / Section VI A</td><td>8.3.1.5</td><td>The Colour Rendering Index Ra of all interior LED lights shall not be less than 90.</td><td>Justification:<br>CRI≥90 is generally used where the colour calibration is most important (Ex: Colour Labs, Operation theatre, photography studio where minute colour differentiation matters a lot)<br>For metro rolling-stock applications, such stringent colour-rendering performance is not required, as passenger areas and vehicle interiors do not involve colour-critical tasks. Globally, CRI 90 lighting has not been established as a standard or proven requirement for metro applications, where CRI values in the 80–85 range are generally considered adequate for visual comfort and operational needs. CRI 80 is employed in other metro application like DMRC and Mumbai metros<br>Amendment requested:<br>The Colour Rendering Index Ra of all interior LED lights shall be ~~not be less than 90~~. between 80-90</td><td>Tender conditions prevail.</td></tr>
<tr><td>415</td><td>Part 2 / Section VI A</td><td>8.3.1.6</td><td>The saloon interior lighting intensity shall be uniformly distributed. The level of illumination shall be at least 300 lux at the floor level of the Coach and not less than 500 lux at seating positions.<br>Lighting intensity requirements inside coaches shall also comply with EN13272</td><td><u>Justification</u>:500 lux inevitably pushes UGR above 22, violating EN 13272-2, regardless of diffuser or luminaire design efficiency causing discomfort to passengers and driver. Required Glare rating UGR <=22 can be achieved with 200 lux at floor level and 300 lux at seating position. This proposal in line with other Indian metros like DMRC and mumbai metros.<br><br><u>Amendment requested</u>:The saloon interior lighting intensity shall be uniformly distributed. The level of illumination shall be at least ~~300 lux~~ 200 lux at the floor level of the Coach and ~~not less than 500 lux~~ 300 lux at seating positions.<br>Lighting intensity requirements inside coaches shall also comply with EN13272</td><td>Tender conditions prevail.</td></tr>
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| 416 | Part 2 / Section VI A | 17.5.2.5(b) | One of the jacks supporting the car section being tested shall be lowered until the load on that jack is 10% of its original load. | **Justification:**<br>EN 12663 specifies using a 10 mm offset for lifting and rerailing load cases, making the 10 mm displacement the more realistic and standard approach.<br><br>**Amendment requested:**<br>One of the jacks supporting the car section being tested **shall be lowered by 10mm**. | Tender conditions prevail. |
| 417 | Part 2 / Section VI A | 19.13.1 (iii) | Edges shall be seamed and ground smooth per SAE J673, Edge no. 4, and sealed with aluminium tape or equivalent. | **Justification:**<br>The manufacturable edge profile suggested is SAE J Edge No. 2. In the final assembly of windows, the peripheral edge of the glazing is fully concealed by the edge sealant making the functional relevance of the Edge No. 4 negligible.<br><br>**Amendment requested:**<br>Edges shall be seamed and ground smooth per SAE J673, Edge no.4 ~~or~~, Edge no.2 and sealed with aluminium tape or equivalent. | Tender conditions prevail. |
| 418 | Part 2 / Section VI A | 19.13.1 (iv) | Any overlap of one sheet of glass with respect to the other at an edge shall not exceed 0.78 mm | **Justification:**<br>The overlap does not meet the required 0.78 mm criterion. As per IS 2553 which is proposed by bidder, an exceedance of up to 2 mm over 1 m of glass length is permissible.<br><br>**Amendment Requested:**<br>Any overlap of one sheet of glass with respect to the other at an edge shall ~~not exceed 0.78 mm b~~e between 1 to 2mm | Tender conditions prevail. |
| 419 | Part 2 / Section VI A | 19.13.1 (vi) | When a sheet of glass is laid on a truly flat surface, the glass shall not exhibit a bow of more than 0.76 mm per linear foot. | **Justification:**<br>IS 2553 is being followed as the applicable standard. The specified bow tolerance is 2 mm per meter, applied at the overall product level rather than at the level of individual glass panes<br><br>**Amendment requested:**<br>When a sheet of glass is laid on a truly flat surface, the glass shall not exhibit a bow of more than ~~0.76 mm per linear foot~~ 2 mm per metre. | Tender conditions prevail. |
| 420 | Part 2 / Section VI A | 19.14.6 | Gelcoat additives, fillers, monomers, catalysts, activators, inhibitors, pigments, or flameproofing materials shall be added to resin mixes to obtain finished products with required characteristics. No FRP panels shall be painted. | **Justification:**<br>Although the resin mixture is created with the substances mentioned in the requirment, the HL3 gel coated panels have risk of water impregnation into panels, hence painting the parts gives protection against mositure. Due to painting asethetics of parts, life of the parts , UV resistance is improved<br>**Amendment requested:**<br>FRP shall be painted for additional part protection. | Tender conditions prevail. |
| 421 | Part 2 / Section VI A | 3.14.5.2 | The Car ends shall be designed in a manner that allows the absorption of collision energy in a progressive manner as follows. Collision Buffers may be proposed for the front end of the Driver cars in addition to the mechanical and semi-permanent couplers as a means of absorbing crash energy. Car end including cab end, collision buffers structural strength requirements shall conform with Table 7 & Table 8 of EN 12663-1 and shall be validated by test. | **Justification :**<br>In the simulation, we will verify the compressive forces corresponding to the Cantrail and Waist Rail heights for CBS (as defined in Tables 7 and 8 of EN 12663). These are design load cases specified in EN 12663; however, Tables 7 and 8 represent non-mandatory load cases for physical testing. Crash loading scenarios for vehicle bodies, which are covered under EN 15227. Therefore, these loads will not be tested but will instead be assessed solely within the simulation model.<br><br>**Amendment requested:**<br>The Car ends shall be designed in a manner that allows the absorption of collision energy in a progressive manner as follows. Collision Buffers may be proposed for the front end of the Driver cars in addition to the mechanical and semi-permanent couplers as a means of absorbing crash energy. Car end including cab end, structural strength requirements shall conform in simulation with Table 7 & Table 8 of EN 12663-1. | Tender conditions prevail. |
| 422 | Part 2 / Section VI A | 2.26.1(i) | The car interior shall have resistance to fire and conform to EN 45545 (Part 1 to Part 7), Category 4-A, Hazard level HL3 and BS 6853 Code of practice for fire precautions in the design and construction of passenger carrying rakes or any other approved international standards. | **Justification:**<br>The part-7 of the standard is not applicable since it is concerned with trains operating on IC engines. BS 6853 is superseded by EN 45545.<br><br>**Amendment requested:**<br>The car interior shall have resistance to fire and conform to EN 45545 (Part 1 to ~~Part 7~~ Part 6), Category 4-A, Hazard level HL3 and BS 6853 Code of practice for fire precautions in the design and construction of passenger carrying rakes or any other approved international standards. | Tender conditions prevail. |

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| 423 | Part 2 / Section VI A | 3.2.10 | Structural requirements for rail vehicle structures shall be design and tested conforming with GM RT 2100, UIC 566, EN 12663-1. | **Justification:**<br>Rail Veichle body complies to EN12663:2000 P-III category for all Carbody structural requirement.<br>EN12663:2000 P-III is an European standard and is equivalent to UIC 566. GM/RT 2100 requires following EN 12663 for carbody structural criteria. Furthermore, GM/RT 2100 Section 1.2.2.2 states that it applies to mainline railway systems, and therefore it is not applicable to metro vehicles.<br><br>**Amendment requested:**<br>Structural requirements for rail vehicle structures shall be design and tested conforming with GM/RT2100 / UIC 566 or EN 12663-1. | Tender conditions prevail. |
| 424 | Part 2 / Section VI A | 17.5.2.6.2 | The Contractor shall test the floor assembly in accordance with Clause 7 of BS 476: Part 21: 1987 to demonstrate a 30-minute endurance rating, and to meet the following criteria: | **Justification:**<br>BS 6853 refers BS 476 for fire barrier requirements; however, BS 6853 is withdrawn and EN 45545 supersedes BS 6853<br><br>**Amendment requested:**<br>The Contractor shall test the floor assembly in accordance with ~~Clause 7 of BS 476: Part 21: 1987~~ EN 45445 to demonstrate a 30-minute endurance rating, and to meet the following criteria | Tender conditions prevail. |
| 425 | Part 2 / Section VI A | 19.13.1(v) | The thickness tolerance of the individual sheets as supplied shall be held within 0.78 mm | **Justification:**<br>As per standards IS 2553 & IS 14900 which is suggested by Bidder, Following tolerances for the corresponding thickness will be followed, 3mm ± 0.2mm, 4mm ± 0.2mm, 5mm ± 0.3mm.<br><br>**Amendment requested:**<br>The thickness tolerance of the individual sheets as supplied shall be held within 0.78 mm shall be as per IS 2553. | Tender conditions prevail. |
| 426 | Part 2 / Section VI A | 19.13.1(vii) | The dimensional tolerance for the cut size dimensions of rectangular shapes, including squareness shall be according to ASTM C 1036 Table 1, but not to exceed (1.0mm). For other shapes, the cut size shall not exceed (1.6mm) of the dimension specified. Unspecified corners shall have a (1.6mm) radius. | **Justification:**<br>ASTM C1036 is primarily a U.S based flat-glass manufacturing standard. In India, manufacturers typically work according to locally adopted or internationally harmonized standards such as IS specifications, which are widely accepted across global projects. These standards are technically robust and cover similar quality and performance parameters. Therefore, we propose evaluating compliance based on the applicable IS standards that align closely with ASTM C1036 requirements<br><br>**Amendment requested:**<br>The dimensional tolerance for the cut size dimensions of rectangular shapes, including squareness shall be according to **IS 2553 Part 1 & Part 2**. ~~ASTM C 1036 Table 1, but not to exceed (1.0mm). For other shapes, the cut size shall not exceed (1.6mm) of the dimension F78specified. Unspecified corners shall have a (1.6mm) radius.~~ | Tender conditions prevail. |
| 427 | Part 2 / Section VI A | 19.61.11/<br>19.61.12/<br>19.61.13/<br>19.61.16/<br>19.61.18/<br>19.61.19 | **19.61.11**<br>a) All materials shall have a maximum flame propagation index (IS) of 35, when tested in accordance with ASTM E162, Radiant Panel Test, except as indicated otherwise.<br>b) All materials shall have a maximum (DS) of 100 at 90 seconds and 200 at 4 minutes, when tested in accordance with ASTM E662 in both flaming and non-flaming modes, except as indicated otherwise.<br>c) All materials shall have a maximum (DM) of 300 within 4 minutes, when tested in accordance with ASTM E662.<br>d) The following materials shall meet the requirements of this general paragraph for flame and smoke characteristics:<br>e) Specific materials shall meet the combustibility properties in Table 19-7.<br>**19.61.12**<br>a) Fabrics that may be machine washed or dry-cleaned shall also comply with the following, as applicable:<br>b) Woven upholstery fabrics for car seats shall meet the following requirements:<br>**19.61.13**<br>Floor Covering<br>**19.61.16**<br>VAC Ducting<br>**19.61.18**<br>All paint and coatings shall conform to the fire-retardation requirements of ASTM<br>**19.61.19**<br>Plastics | **Justification:**<br>For Material testing Bidder proposes EN 45545-2. EN 45545-2 will cover broad framework and multiple tests where as ASTM E662 is a specific test method for smoke.<br><br>**Amendment requested:**<br>Material testing as shall be as per EN 45545-2 as agreed in ERTS clause 2.26.1 (iii) | Tender conditions prevail. |

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| 428 | Part 2 / Section VI A | 19.25.1 (viii) | All exposed bolts and nuts shall be stainless steel, unless otherwise specified. | **Justification:**<br>Stainless steel fasteners will be used wherever possible. But based on the FEA calculation where there is a high stresses, High Tensile Fasteners will used.<br>**Amendment Requested:**<br>All exposed bolts and nuts shall be stainless steel, unless otherwise specified. But in the case where High strength is required other material sfasteners can be used. | Tender conditions prevail. |
| 429 | Part 2 / Section VI A | 19.25.4 (iv) | Stainless steel nuts and bolts shall be used for stainless-to-stainless joints. | **Justification:**<br>Stainless steel fasteners will be used up to ≤ M8, beyond that for structural assembly, High strength fasteners with adequate corrosion protection will be used.<br>**Amendment Requested:**<br>Stainless steel nuts and bolts shall be used for stainless-to-stainless joints. But in the case where High strength is required High strength fasteners with adequate corrosion protection can be used. | Tender conditions prevail. |
| 430 | Part 2 / Section VI A | 5.3.9 | The Windscreen shall be constructed of toughened, laminated safety glass, and shall comply with the requirements of IS 2553 (Part 1 and 2), ECE Regulaion-43, EN 15152, and UIC 566. The inner and outer surfaces of the windscreens shall be scratch resistant. This design shall comply with Chapter 3. | **Amendment Requested:**<br>The Windscreen including glass of the detrainment door shall be constructed of toughened, laminated safety glass, and shall comply with the requirements of IS 2553 (Part-1 and 2), ECE Regulaion-43, EN 15152, and UIC 566 and Impact test as per UIC 651. The inner and outer surfaces of the windscreens shall be scratch resistant. This design shall comply with Chapter 3. | Tender conditions prevail. |
| 431 | Part 2 / Section VI A | 17.11.10 | Crashworthy Simulation as per EN 15227 and GMRT 2100 (duly accepted and signed by Rolling Stock Head). | **Justification:**<br>The crash simulations will comply with EN15227-2020. However, GMRT 2100 Section 1.2.2.2 states that it is applicable for mainline railway system and therefore, it is not applicable for metros.<br>**Amendment Requested:**<br>Crashworthy Simulation as per EN 15227 ~~and GMRT 2100~~ (duly accepted and signed by Rolling Stock Head). | Tender conditions prevail. |
| 432 | Part 2 / Section VI A | 19.25.1 (v) | All threaded fasteners shall comply with ANSI B1.1 class 2 requirements, unless otherwise specified or approved. | **Justification:**<br>For all threaded fasteners, Bidder follows ISO and DIN standards based on best internal practice.<br>**Amendment Requested:**<br>All threaded fasteners shall comply with ANSI B1.1 class 2 ISO and DIN standards requirments unless otherwise specified or approved | Tender conditions prevail. |
| 433 | Part 2 / Section VI A | 19.25.2(iv) | Locknuts shall be of the nylon collar insert type. Previously installed and removed locknuts shall not be re-used. High temperature applications may use metallic distorted thread locknuts upon CMRL approval. Locknuts shall conform to Military Standard MS-21044 and Military Specification MIL-N-25027, or equivalent. | **Justification:**<br>As per Bidder standard design practice /solution , all metal self-locking hexagon nut with 2 slots will be used as per NF E 25-411 instead of military standard.<br>**Amendment Requested:**<br>Metal self-locking hexagon nut with 2 slots shall be used as per NF E25-411 of the nylon collar insert type. Previously installed and removed locknuts shall not be re-used. High temperature applications may use metallic distorted thread locknuts upon CMRL approval. Locknuts shall conform to Military Standard MS-21044 and Military Specification MIL-N-25027, or equivalent. | Tender conditions prevail. |
| 434 | Part 2 / Section VI A | 19.25.4 (ii) | Carbon steel bolts shall comply with ASTM A325. Alloy steel bolts shall comply with ASTM A354 or ASTM A490, as applicable. | **Justification:**<br>As per Bidder standard design practice /solution Hex Screws will be used as per ISO 4014 and ISO 4017<br>**Amendment Requested:**<br>Carbon steel bolts shall comply with ASTM A325. Alloy steel bolts shall comply with ASTM A354 or ASTM A490, as applicable or Hex screws shall be used as per ISO 4014 and ISO 4017 . | Tender conditions prevail. |
| 435 | Part 2 / Section VI A | 19.25.4 (iii) | Nuts shall comply with ASTM A194. | **Justification:**<br>As per Bidder standard design practice /solution Hex Nuts will be used as per ISO 4032.<br>**Amendment Required:**<br>Nuts shall comply with ASTM A194 or ISO 4032. | Tender conditions prevail. |
| 436 | Part 2 / Section VI A | 19.32.5 (viii) | Joints that serve the sole purpose of connecting pipe lengths shall not be used in a straight run of pipe. | **Justification:**<br>As per Bidder standard design practice, to join straight pipe length of more than 3 meter a joint will be added.<br>**Amendment Requested:**<br>Joints that serve the sole purpose of connecting pipe lengths shall not be used in a straight run of pipe except if length crosses 3 meter a joint can be added. | Tender conditions prevail. |

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| 437 | Part 2 / Section VI A | 13.4.8 | Automatic Touch screen calibration shall be incorporated within the in CCH display during train restart activity. The touch screen sensitivity shall be suitable for industrial applications and Rolling stock applications. Train operator or maintainers shall not feel discomfort in operating the touch screense. | **Justification:.**<br>The Communication Control Head is type tested and proven reliability in industrial settings in similar Metro operations application. There is no need for calibration of screen in capacitive touch-based displays (the calibration of screens were required in resistive touch based screen technology, As opposed to the resistive touchscreen (which relies on the mechanical pressure made by the finger or stylus), the capacitive touchscreen does not need to be re-calibrated and it makes use of the electrical properties of the human body). Nevertheless, as part of standard protocol for ensuring display integrity during startup, a checkered base test is conducted to ascertain the health status of the displays during usage.<br><br>**Amendment requested:**<br>Bidder requested to amend this clause as below :<br>Automatic Touch screen ~~calibration~~ shall be incorporated with measures to ensure health status of ~~within~~ ~~the~~ ~~in~~ CCH display during train restart activity. The touch screen sensitivity shall be suitable for industrial applications and Rolling stock applications. Train operator or maintainers shall not feel discomfort in operating the touch screense. | Tender conditions prevail. |
| 438 | Part 2 / Section VI A | 14.7.9 | Editing Fault Configuration Logic | **Justification:.**<br>As the requirement calls for IP related subjects of AT which is internal details of AT. Hence it is nor recommedned to share/handover its IPR subjects with customer rather Software shall be kept in escrow account.<br><br>**Amendment requested:**<br>Bidder requested to remove this clause which will be averse to share IPR subjects. | Tender conditions prevail. |
| 439 | Part 2 / Section VI A | 19.55.1 | Printed circuit boards (PCBs) shall be of glass epoxy construction, complying with ANSI/IPC-4101 and PCB's shall generally comply with IEC 60326-3: 1991 Printed Boards — Part 3: Design and Use of Printed Boards. | **Justification:.**<br>Bidder request to add standard EN 50155 which more specific to the requirement mentioned<br><br>**Amendment requested:**<br>Printed circuit boards (PCBs) shall be of glass epoxy construction, complying with ANSI/IPC-4101 and PCB's shall generally comply with IEC 60326-3: 1991/ EN 50155 Printed Boards — Part 3: Design and Use of Printed Boards. | Tender conditions prevail. |
| 440 | Part 2 / Section VI A | 19.55.5 | To the greatest extent practicable, component labelling shall be provided on PCBs. PCB's shall be connected to the case or rack wiring using multi-pin connectors, which shall have a successful service history in rail applications. Details shall be provided in any electronic rack system, the failure of any one module or individual circuit board shall neither cause loss of the electronics power supply within the rack, nor cause subsequent failure of circuits on other PCB's or modules. PCB's shall have mechanical polarisation to prevent insertion into a wrong socket. The use of PCB edge connectors in not permitted unless reviewed by CMRL, on a case by case basis. PCB's and modules shall be positively retained in the rack or case by a fastener or spring loaded locking pin. All PCBs shall be adequately lacquered to isolate from environment pollution | **Justification:.**<br>Bidder's TCMS electronics are part of product's Reasearch and Development which is not separately developed for each project. . Since the same products are provided in similar metros globally, Bidder requests to retain the standrad products which has followed industrial practices<br><br>**Amendment requested:**<br>Bidder requests to delete this clause | Tender conditions prevail. |
| 441 | Part 2 / Section VI A | 20.6.5.2 | Spare capacity requirements shall apply to memory, disk storage, communication links/ports, input/output capacity. Minimum figures for spare capacity are given here below. | **Justification:.**<br>For providing 50% spare ports, extra unused switches are to be provided in network. They will have to be just present in network ring in Powered On state. By design, it is not ok to have an unused device always powered on because of the reason, it will add to a failure which will break the network ring open, impacting scheduled operations. So, to enable future expansion, space is secured for two GES in each car for future, if required. Considering the reasoning mentioned above, network is provided with 15% future expansion provision.<br><br>**Amendment requested:**<br>Bidder requested to remove this clause and replace it with 15% future expansion provision inline with ERTS clause 14.2.7 & 14.2.8 | Refer Addendum No.1, S.No. 399 |
| 442 | Part 2 / Section VI A | 5.4.1 e) | Control Buttons | **Justification:.**<br>The requirements in clause;<br>xv. Unlock command to both the Detrainment door - Unlock of detrainment doors is managed at the respective detrainment door. As Detrainment door operation needs manual intervention in all modes of operation (GoA4, GoA3, GoA2), providing an additional unlock command from Driver desk is not necessary.<br>xviii. Lamp test control: It is Provided through TCMS DDU.<br>xix. Pantograph Up down Control is already part of Panto selector switch. In line with ARE03A design."<br><br>**Amendment requested:**<br>Bidder requested to update the clause by removing the specified sub clauses in the requirement. | Tender conditions prevail. |

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| 443 | Part 2 / Section VI A | 19.35.1 | Wire sizes, insulation requirements, materials, shielding methods, and identification of wire and cable used for primary, auxiliary, control, and communications applications shall be based on the current carrying capacity, voltage drop, mechanical strength, temperature, and flexibility requirements of AAR, ASTM, ICEA, NFPA, MIL, or NFPA 70 specifications. | **Justification:.**<br>Bidder requests to allow usage of equivalent international standards like EN 50343,EN 50122,IEC60947, EN61810.<br><br>**Amendment requested:**<br>Wire sizes, insulation requirements, materials, shielding methods, and identification of wire and cable used for primary, auxiliary, control, and communications applications shall be based on the current carrying capacity, voltage drop, mechanical strength, temperature, and flexibility requirements of AAR, ASTM, ICEA, NFPA, MIL, or NFPA 70 or EN 50343,EN 50122,IEC60947, EN61810 specifications. | Tender conditions prevail. |
| 444 | Part 2 / Section VI A | 19.37.8 | Electrical circuits and associated cabling shall be designed with clearance and creepage distance between voltage potentials and Car body ground in accordance with the environmental conditions to which the circuits and cabling will be subjected, and in accordance with NFPA 130, Chapter 4. | **Justification:.**<br>Bidder requests to allow usage of equivalent international standards like EN50124<br><br>**Amendment requested:**<br>Electrical circuits and associated cabling shall be designed with clearance and creepage distance between voltage potentials and Car body ground in accordance with the environmental conditions to which the circuits and cabling will be subjected, and in accordance with NFPA 130, Chapter 4 or EN50124 | Tender conditions prevail. |
| 445 | Part 2 / Section VI A | 2.13.1 | Under-body equipment shall not be supported by bolts under tension unless otherwise approved by the CMRL. | **Justification:** Bidder requests to keep the solution option open as the primary intention is to avoid equipment falling on the track during the operation. There are globally proven solutions employed across the rolling stock industry which ensures safety. Hence bidder requests to ammend the requirment as below.<br><br>**Amendment requested:**<br>~~Under-body equipment shall not be supported by bolts under tension unless otherwise approved by the CMRL.~~ Mounting arrangements shall ensure that under no circumstances the equipment would fall on line during operation. | Refer Addendum No.1, S.No. 68 |
| 446 | Part 2 / Section VI A | 2.2.27 | All electrical and electronic components shall comply with the EMC and EMI requirements of EN 50121 (all parts), IEEE 16, EN 55011 and IEC 61000 standards or other equivalent international standards. The requirements of EMC EMI requirements referred in clause 10.19 & clause 2.18 of the Rolling Stock shall be met. | **Justification:**Bidder would like to inform that EN 50121-2 and EN 50121-4 are not in scope of Rolling Stock. Rolling Stock shall comply with EN 50121-3. The complete vehicle will comply with EN 50121-3-1 and all the onboard systems will comply with EN 50121-3-2.<br><br>**Amendment Requested:**<br>All electrical and electronic components shall comply with the EMC and EMI requirements of EN 50121 (~~all parts~~ ), ~~IEEE 16, EN 55011~~ and IEC 61000 standards or other equivalent international standards. The requirements of EMC EMI requirements referred in clause 10.19 & clause 2.18 of the Rolling Stock shall be met. | Tender conditions prevail. |
| 447 | Part 2 / Section VI A | 2.15.9.2 | A system shall be provided to detect and control wheel slip / slide on all axles, to ensure that any reduction in requested tractive effort or brake retardation during wheel spin/slide is kept to a minimum. | **Justification:**<br>Detection of slip is axle based but correction is at bogie level. This is due to the fact that traction converter is bogie control.<br><br>**Amendment Requested:**<br>A system shall be provided to detect and control wheel ~~slip~~ /slide on all axles and detect slip at axle level with control at bogie level, to ensure that any reduction in requested tractive effort or brake retardation during wheel spin/slide is kept to a minimum. | Refer Addendum No.1, S.No. 78 |
| 448 | Part 2 / Section VI A | 3.3.6 | All welds on car exterior and interior (including spots weld marks) shall be passivated with an acceptable procedure to protect against any visible rusting/chemical deposits / blackening etc Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems shall be done as per ASTM A380 or equivalent. Procedure shall be submitted for CMRL's approval before ninety (90) days start of car manufacturing. | **Justification:** Considering that interfaces and discontinuous welding zones within interior areas present a significant risk of chemical ingress and spillage during chemical passivation—potentially resulting in corrosion—the bidder recommends that chemical passivation shall not be applied to interior welds. Alternatevely a surface protection can be employed for those areas. Accordingly, the bidder requests that the clause be amended to reflect this requirement<br><br>**Amendment requested:**<br>All welds on Car exterior ~~and interior~~ (including spots weld marks) shall be passivated with an acceptable procedure to protect against any visible rusting/chemical deposits / blackening etc Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems shall be done as per ASTM A380 or equivalent. For interior welds a suitable surface protection shall be employed and procedure shall be submitted for CMRL's approval before ninety (90) days start of car manufacturing. | Tender conditions prevail. |

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| 449 | Part 2 / Section VI A | 2.26.5.4 | Linear Heat Detectors (LHD) for Enclosures / Cubicles:<br>A linear heat detector, suitable for Rolling Stock applications shall be provided in all Enclosures /cubicles for review and approval by CMRL. The linear heat detector is to be actuated in case of any fire / overheating in the electrical cabinets. LHD system shall also be provided in Underframe and Roof Enclosures / cabinets as mentioned in different chapters of this document. However, final decision on use of LHD / Heat detector in Underframe Electrical enclosures will be taken during design stage. | **Justification:**<br>Better solutions like multi -detectors (Smoke + Heat) inside cubicles is feasible in Saloon/Cubicle area to ensure quick detection.<br><br>**Amendment Requested:**<br>Bidder request for usage of better solutions for application. | Refer Addendum No.1, S.No. 97 |
| 450 | Part 2 / Section VI A | 7.8.5 | A sight glass shall be fitted in the refrigerant liquid line to show the refrigerant flow. It shall be easily visible through an inspecstion hole; from the saloon area. | **Justification:**<br>HVAC design is such that refrigent line and sight glass is towards outside of the HVAC architecture. It is not advisable to provide inspection hole since it possess high risk of rainwater ingress.<br><br>**Amendment Requested:**<br>A sight glass shall be fitted in the refrigerant liquid line to show the refrigerant flow. It shall be easily visible ~~through an inspecstion hole;~~ from the ~~saloon area~~ outside | Tender conditions prevail. |
| 451 | Part 2 / Section VI A | 9.2.6 | The design life of the auxiliary converters shall be a minimum of 35 years and be capable of operation for a period of 18 years without major maintenance (excluding consumables). | **Justification:**<br>Windings and gaskets has to be overhauled every 10 years<br><br>**Amendment Requested:**<br>The design life of the auxiliary converters shall be a minimum of 35 years and be capable of operation for a period of ~~18~~ 10 years without major maintenance (excluding consumables). | Tender conditions prevail. |
| 452 | Part 2 / Section VI A | 10.13.17 | AC traction motors used for the traction drive shall comply with the requirements of Relevant standards are IEC 60349-1, 60349-2, IEC 60349-3 and shall, in particular, be fully compliant with the sections on motor characteristics, equipment marking, type and routine tests. Information on all the characteristics of the AC traction motor as stated in IEC 60349-2 shall be provided. | **Justification:**<br>IEC 60349-1: Rotating electrical machines for rail and road vehicles - Part 1: Machines other than electronic converter-fed alternating current motors. Hence not applicable.<br><br>**Amendment Requested:**<br>AC traction motors used for the traction drive shall comply with the requirements of Relevant standards are ~~IEC 60349-1~~, 60349-2, IEC 60349-3 and shall, in particular, be fully compliant with the sections on motor characteristics, equipment marking, type and routine tests. Information on all the characteristics of the AC traction motor as stated in IEC 60349-2 shall be provided. | Tender conditions prevail. |
| 453 | Part 2 / Section VI A | 3.4.9.2.1, 3.6.3.1, 3.6.5.10 | Structural requirements for rail vehicle structures shall be design and tested conforming with GM/RT2100, UIC 566, EN 12663-1. | **Justification:**<br>The bidder has requested that the requirement be amended to allow compliance with any one or more of the specified standards, rather than mandating compliance with all of them.<br><br>**Amendment Requested:** Structural requirements for rail vehicle structures shall be designed and tested conforming with GM/RT2100 /UIC 566 / EN 12663-1. | Tender conditions prevail. |
| 454 | Part 2 / Section VI A | 17.5.2.8 | Windshield and detrainment door glazing shall be impact tested according to EN 15152. Body side windows, cab windows and passenger door windows shall be impact tested according to DIN 52306 and fulfil bending according to EN 1288. One sample of each type of window, selected at random by CMRL, shall be tested. Structural requirements for rail vehicle structures shall be tested and conform with GM/RT2100, UIC 566, EN 12663-1, UIC 651, EN 15152. | **Justification:**<br>Bidder proposes below standars:<br>Windscreen is designed as per IS 2553 part1&2 and UIC 651 standard is followed for Impact test.<br>IS 2553 is used in place of and DIN 52306 and EN 15152 standard which is more applicable for European markets.EN 1288 standard is applicable only for the glass used in buildings and not applicable for the Rolling Stock glasses.<br>The bidder has requested that the structural requirement be amended to allow compliance with any one or more of the specified standards, rather than mandating compliance with all of them.<br>**Amendment required:**<br>Windshield and detrainment door glazing shall be ~~impact~~ tested according IS 2553 part1&2 and **impact tested as per** UIC 651 standard. ~~to EN 15152.~~ Body side windows, cab windows and passenger door windows shall be ~~impact~~ tested according to IS 2553 part1&2 ~~DIN 52306 and fulfil bending according to EN 1288~~. One sample of each type of window, selected at random by CMRL, shall be tested. Structural requirements for rail vehicle structures shall be tested and conform with GM/RT2100/UIC 566/EN 12663-1/ UIC 651/EN 15152. | Tender conditions previal.<br>Also, Refer Addendum No.1, S.No. 372 |
| 455 | Part 2 / Section VI A | 11.11.4 | Control of the WFL System shall be entirely TCMS based. Activation of the oil spray cycle shall be based on the train location. TCMS shall adjust the cycle duration / quantity of oil deployed based on the train approach speed and degree of curve at that location etc. | **Justification:**<br>TCMS will activate the WFL system, but the spray cycle time will be a parameter which will be controlled from WFL control unit.<br><br>**Amendment Requested:**<br>Control of the WFL System shall be entirely TCMS based. Activation of the oil spray cycle shall be based on the train location. ~~TCMS~~ WFl system shall adjust the cycle duration / quantity of oil deployed based on the train approach speed and degree of curve at that location etc. | Tender conditions prevail. |

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| 456 | Part 2 / Section VI A | 12.3.10 | All necessary pneumatic sub-systems shall be supplied from the main reservoir pipeline. An isolating valve shall be fitted between the air compressor system and the main reservoir pipeline. | **Justification:**<br>Isolation of air compressor is generally used for maintenance activity and can be fulfilled with isolation cock instead of isolation valve<br><br>**Amendment Requested:**<br>All necessary pneumatic sub-systems shall be supplied from the main reservoir pipeline. An isolating ~~valve~~ cockshall be fitted between the air compressor system and the main reservoir pipeline. | Tender conditions prevail. |
| 457 | Part 2 / Section VI A | 12.5.2 | Main reservoir with a capacity adequate for the 6 car rake consist shall be provided on each car, which shall be supplied from the main reservoir pipeline. | **Justification:**<br>Reservoirs are provided in only two cars for the 6 car train set, not in each car. The AGTU and its main reservoir is added adjacently and sized to catering the train requirement. Additionally, we have provided Brake reservoir in every car.<br><br>**Amendment Requested:**<br>Main reservoir with a capacity adequate for the 6 car rake consist shall be provided ~~on each car~~, which shall be supplied from the main reservoir pipeline. | Tender conditions previal. |
| 458 | Part 2 / Section VI A | 12.12.2 | The system shall be designed to be Fail Safe to ensure that any failure of the system shall not render it ineffective for friction brake control. If a failure of the slide protection system occurs while braking, the system shall not reduce the level of braking below the commanded level for more than three (3) seconds. | **Justification:**<br>Bidder comply to 10 seconds instead of three seconds. The same requieremnt is provded in clause 2.15.9.3 with 10seconds.<br><br>**Amendment Requested:**<br>Bidder requests to delete the requirement | Refer Addendum No.1, S.No. 79 |
| 459 | Part 2 / Section VI A | 12.13.1 | Isolating valves (Main compressor isolation, Brake cylinder isolation, parking brake isolation, Air suspension isolation, etc.) and switches shall be provided to enable parts of the pneumatic system to be isolated. | **Justification:**<br>Isolation cocks are considered for all the parts of pneumatic system to isolate in case of any problem. Isolation valve is considered for Service Brake.Not all the isolation valves are possible to isolate remotely; only the service brake isolation is considered remotely.<br><br>**Amendment Requested:**<br>Provision shall be available to activate some isolating valves / cocks . | Tender conditions prevail. |
| 460 | Part 2 / Section VI A | 17.5.4.8.6 | **Wheel Slip and Wheel Slide Test**<br>All power and braking modes (Service braking including regenerative braking, friction braking) shall be tested to verify compliance with Chapter 2 and Chapter 10. Required data for the slip and slide test shall be monitored and recorded for all axles of all cars of the test trains. This test shall be conducted in ATP, ATO and ATO modes of operation. Wheel Slide Protection (WSP) test Complete train (AW0 & AW4) shall be subjected to Wheel slip-slide type test as per UIC 541- 05. The detailed type test specification | **Justification:**<br>Train performance is dependent on Traction and braking Systems . Test shall be conducted only in ATO cutout mode as signaling imposes a hard restriction due to PSR limits . Hence Test will not be possible under ATP , ATO , UTO modes .<br><br>**Amendment requested:**<br>All power and braking modes (Service braking including regenerative braking, friction braking) shall be tested to verify compliance with Chapter 2 and Chapter 10. Required data for the slip and slide test shall be monitored and recorded for all axles of all cars of the test trains. ~~This test shall be conducted in ATP, ATO and ATO modes of operation.~~ Wheel Slide Protection (WSP) test Complete train (AW0 & AW4) shall be subjected to Wheel slip-slide type test as per UIC 541- 05. The detailed type test specification | Refer Addendum No.1, S.No. 375 |
| 461 | Part 2 / Section VI A | 17.5.4.8.6 | c) WSP Tests will be done on Randomly selected 3 trains in Tare Load in speed range 60- 30kmph for Braking Modes as EB (Emergency Brake), FSB (Full-Service Brake with ED Dynamic Brake), FSB (Full-Service Brake without ED Dynamic Brake) for evaluation by CMRL. | **Justification:**<br>Following UIC 541-05 standards, the WSP test being a type test will be performed on a single train, as the system configuration will remain consistent.<br><br>**Amendment requested:**<br>c) WSP Tests will be done ~~on Randomly selected 3 trains~~ in Tare Load in speed range 60- 30kmphfor Braking Modes as EB (Emergency Brake), FSB (Full-Service Brake with ED Dynamic Brake), FSB (Full-Service Brake without ED Dynamic Brake) for evaluation by CMRL. | Tender conditions prevail. |
| 462 | Part 2 / Section VI A | 19.32.7<br>(iv) | Automatic Drain cocks along with manual operation shall be provided at the low points of all reservoirs. | **Justification:**<br>All reservoir are mounted in series w.r.t Main reservoir, therefore the contaminants, water etc. are collected in main reservoir first. So automatic drain valve is provided only in main reservoir and for others manual drain valve is proposed.<br><br>**Amendment requested:**<br>Automatic Drain cocks along with manual operation shall be provided at the low points of ~~all~~ Main reservoirs. | Tender conditions prevail. |

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| 463 | Part 2 / Section VI A | 14,1,5 | SIL Compliance | **Justification:.**<br>SIL2 solution shall be provided for DRS, DRV, TBS, BRK, FSD, TCN & ATO. The other functionalities specified in the clause are not saftly critical functionalities which will effect the normal train operations, hence it is not required to be in SIL2.<br><br>**Amendment requested:**<br>Bidder requested to ammend this clause with SIL compliance for DRS, DRV, TBS, BRK, FSD, TCN & ATO. | Tender conditions prevail. |
| 464 | Part 2 / Section VI A | 5.5.3 | The master control key switch shall be electrically & mechanically interlocked with the mode selector switch to ensure that removal of the master control key can only be achieved when the mode switch is in the "Off" position. | **Justification:.**<br>Only Mechnical interlock is applicable for the mode selection, electrical interlock is applicable to ensure the restiction of double cab activation, which is not required in this case.<br>As per bidder the key can be removed in standby condition and not in "off" condition. The reason behind this is to mainatain the same design in all CMRL trains.<br>**Amendment requested:**<br>Bidder requested to remove the electrical interlocking in the specified clasue and keep it only with mechanical interlocking adn "Off" to standby. | Refer Addendum No.1, S.No. 151 |
| 465 | Part 2 / Section VI A | 14.12.4 | Energy Saving Assist | **Justification:.**<br>The energy saving assist is usefull only when train is running in cut-out mode. In signalling condition whole speed of the train sahll be controlled and managed by ATO. Hence the energy saving assist will not be usefull because the train will always run in signalling mode condition, in case of driver mode the comaparrison of the profile will be done and reported in summary format. Hence no dedicated analytical tools required to screen and analyse the energy data.<br>**Amendment requested:**<br>Bidder requested to remove this clause as there is no need of dedicated analytical tools required to screen and analyse the energy data for this case. | Tender conditions prevail. |
| 466 | Part 2 – Section VI A: ERTS – Rolling Stock | Appendix-D | APPENDIX D – GUIDELINES AND DRAWINGS | During our review of tender drawings (Appendix-D) of Part-2/tender documents, we noticed that the speed restriction data is not available. Normally along with track data speed restriction also is provided. For traction simulation, we need the speed restriction data.<br><br>Further, the chainage of corridor 1 and its extension normally has to be continuous but the chainage seems broken in track layout provided .<br>Existing drawings chainage:<br>1. Washermanpet to Chennai Airport drawing: 0.00 to 22870.072<br>2. Washermanpet to Wimco Nagar drawing: 2006.806 to 8989.232<br><br>Therefore, we request you to please release appropriate track data with right chainage details and speed restrictions at the earliest possible. Copy of relevant drawings showing chainage break are enclosed for your ready reference. | Refer Addendum No.1, S.No. 409 |
| 467 | Part 2 – Section VI B: ERTS – DM&P General Requirements and Scope | 1.19 - Subcontractors / Manufacturers Item No. 2. Automatic Train Wash Plant (ATWP) | The Sub-contractor/ Manufacturer should have executed at least two **similar** Works of Design, manufacture, Supply, Installation, Testing and Commissioning of Automatic Train Wash Plant (ATWP) to any Metro Rail Projects / LRT / High Speed Rail Network / Railways system in India or Abroad or both during the last 10 years of ending date of bid submission. | Could you please clarify whether 'similar design' means that experience with the same specifications and materials is required, or is experience with any ATWP sufficient? | Tender conditions prevail. |
| 468 | Part 2 – Section VI B: ERTS – DM&P General Requirements and Scope | 1.19 - Subcontractors / Manufacturers Item No. 14. Tack & Tunnel cleaning vehicle | The Sub-contractor/ Manufacturer should have executed at least two Works of Design, manufacture, Supply, Installation, Testing and Commissioning of Rail Cum Road Bogie operated (8 wheeler) vehicles to any Metro Rail Projects / LRT / High Speed Rail Network / Railways system/ other infrastructure project in India or Abroad or both during the last 10 years of ending date of bid submission. | We note that for other major machines, experience in **similar type machines** has been requested. However, in this clause, experience in **any type of Rail Cum Road Bogie operated (8-wheeler) vehicle** is mandated. Currently, **no Indian manufacturer exists** who has manufactured TTCVs to these specifications. Expecting a local manufacturer to develop such vehicles involves significant risk, as reputed and experienced manufacturers for this type of vehicle are **primarily foreign**.<br><br>In line with Indian Government regulations, we request that foreign manufacturers be allowed to participate, provided minimum 20% local value addition is ensured. Therefore, we request that the clause be reconsidered to: The Sub-contractor/ Manufacturer should have executed at least two Similar Works of Design, manufacture, Supply, Installation, Testing and Commissioning of Tunnel & Track Cleaning Vehicle (TTCV) to any Metro Rail Projects / LRT / High Speed Rail Network / Railways system/ other infrastructure project in India or Abroad or both during the last 10 years of ending date of bid submission. | Tender conditions prevail. |

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| 469 | Part 2 – Section VI B: ERTS – DM&P | 2.8 RELIEF AND RESCUE VEHICLE (RRV), Clause No. 2.8.2.4 | The Contractor shall get the Registration of Rail-cum-Road Vehicle with Regional Transport Office in the name of CMRL. Also Speed Certification of Rail-cum-Road Vehicle from statutory authority / RDSO is in scope of Contractor. Necessary support shall be provided by CMRL. | We would like to clarify that the Vehicle Supplier cannot carry out the registration process, as the vehicle will be registered in CMRL's name. Registration can only be done either by CMRL itself or by the Rolling Stock Contractor and it involves periodic renewals, which makes it impractical for the Vehicle Supplier to manage. Similarly, obtaining the Speed Certification also falls under the scope of CMRL or the Rolling Stock Contractor and cannot be undertaken by the Vehicle Supplier. However, the Vehicle Supplier will provide all necessary technical documents, drawings, and details required to facilitate the registration and speed certification process. | Tender conditions prevail. |
| 470 | Part 2 – Section VI B: ERTS – DM&P | 2.8 RELIEF AND RESCUE VEHICLE (RRV), Clause No. 2.8.2.5 | The Contractor shall get the vehicle registered in the name of CMRL in the applicable RTO (Regional Transport Office) of Tamil Nadu. | We would like to clarify that the Vehicle Supplier cannot carry out the registration process, as the vehicle will be registered in CMRL's name. Registration can only be done either by CMRL itself or by the Rolling Stock Contractor. Since vehicle registration involves periodic renewals, it is not feasible for the Vehicle Supplier to manage this process. The Vehicle Supplier will, however, provide all necessary technical documents, drawings, and details required to facilitate the registration process. | Tender conditions prevail. |
| 471 | Part 2 – Section VI B: ERTS – DM&P | 2.8 RELIEF AND RESCUE VEHICLE (RRV), Clause No. 2.8.2.8 | The Vehicle shall be designed and manufactured in India. | We would like to highlight that, no Indian manufacturer currently exists who has manufactured a vehicle meeting these specifications. All similar vehicles currently in use in metro projects have been imported. Therefore, we request that this requirement be reconsidered, either by modifying the clause to allow imported vehicles meeting the specification or by deleting this restriction. | Tender conditions prevail. |
| 472 | Part 2 – Section VI B: ERTS – DM&P | 2.8 RELIEF AND RESCUE VEHICLE (RRV), Clause No. 2.8.3.6 | Driver's Cab & Personnel Compartment: Cab / Personnel compartment for accommodating 6 persons including the vehicle driver. | It is advised that seating arrangement for all 6 persons, including the driver, should be provided within the driver's cabin itself for better safety and comfort. Providing seating in any other compartment for rescue crew members is not recommended, as such compartments may not have adequate safety features and comfort amenities similar to the cabin. | Tender conditions prevail. |
| 473 | Part 2 – Section VI B: ERTS – DM&P | 2.14 Tunnel & Track Cleaning Vehicle, Clause No. 2.14.2.3 | The Contractor shall provide all necessary support to allow CMRL to obtain Speed Certification for the TTCV from any relevant statutory authority / RDSO. | We understand that obtaining the Speed Certification is the responsibility of CMRL and cannot be undertaken by the Vehicle Supplier. The Vehicle Supplier will, however, provide all necessary support, including technical documents, drawings, and other relevant details required to facilitate the speed certification process. Please confirm if our understanding is correct. | Tender conditions prevail. |
| 474 | Part 2 – Section VI B: ERTS – DM&P | 2.14 Tunnel & Track Cleaning Vehicle, Clause No. 2.14.2.4 | The Contractor shall get the TTCV vehicle registered in the name of CMRL in the applicable RTO (Regional Transport Office) of Tamil Nadu. Cost of registration of vehicle shall be borne by the Contractor. | We would like to clarify that the TTCV Vehicle Supplier cannot carry out the registration process, as the vehicle will be registered in CMRL's name. Registration can only be done either by CMRL itself or by the Rolling Stock Contractor. Since vehicle registration involves periodic renewals, it is not feasible for the Vehicle Supplier to manage this process. The Vehicle Supplier will, however, provide all necessary technical documents, drawings, and details required to facilitate the registration process. | Tender conditions prevail. |
| 475 | Part 2 – Section VI B: ERTS – DM&P | 2.14 Tunnel & Track Cleaning Vehicle, Clause No. 2.14.2.7 | The TTCV shall be designed and manufactured in India. | We would like to highlight that currently, **no Indian manufacturer exists** who has designed and manufactured a TTCV meeting these specifications. Asking any local manufacturer to develop it involves significant risk, as experienced and reputed manufacturers for this type of vehicle are **primarily foreign**. In line with Indian Government regulations, we request that foreign manufacturers be allowed to participate, provided minimum 20% local value addition is ensured. Therefore, we request that this requirement be reconsidered, either by modifying the clause to allow imported vehicles meeting the specifications or by deleting this restriction. | Tender conditions prevail. |
| 476 | Chapter 2 | 2.15.4.2 Traction equipment General | The main traction equipment of motor cars for 67% powering arrangement shall include two (2) independent power circuits for bogie control. | For a 6-car train with 67% motorisation means 4 cars shall be motorised. In case of failure of one motor car, there shall be still 3 motor cars available which means 75% traction available. Hence, for a 6-car configuration, we request to update this clause to car-control instead of bogie control.<br>In India for all metros, for a 3-car configuration bogie control is required and for 6-car configuration car-control is required. | Tender conditions prevail. |
| 477 | Chapter 10 | 10.13.27 | Each traction motor shall be provided with redundant thermistor for determination of temperature of stator winding. It should be possible to replace the thermistors in the depot without lifting the car. Traction motor terminal boxes shall be provided with heat-detectors / LHD linked to TCMS /<br>fire detection & control unit (refer clause 2.26) so that their status is monitored. | We propose to make requirement of temperature sensor optional if the supplier can demonstrate proven temperature sensorless control for Metro. | Tender conditions prevail. |
| 478 | Chapter 10 | 10.3.16 HV Power Collection | Train resistance formulae for elevated, at-grade and under-ground train operation applications<br>refer Part IVA, Section 2 Clause 2.14. Rolling Stock Contractor shall interface with Power supply Contractor for power load requirements specific to corridors of CMRL Phase 1 | Train resistance formulae is not specified in the tender & also in clause 2.14.<br>We request you to please provide the train resistance values/formulae for both elevated and under-ground train operation.<br>Train Resistance formula (like Davis etc) generally has a factor proportional to cross section area. | Tender conditions prevail.<br>Also, refer Part-2, Tender Clause 2.14.1 of Chapter VI A. |

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| 479 | Chapter 9 | 9.2.1 Supply voltage | The Auxiliary Converter shall be suitable for operation at 25 KV AC input supply at pantograph level with the input supply frequency variation from 47~52 Hz and voltage variation from 19~31kV. | The voltage variation requirement stated in Clause 9.2.1 appears to be in contradiction with Clause 2.14.1, where the occasional maximum voltage is specified as 30 kV. Kindly clarify the applicable input voltage rating that should be considered for design and compliance. | Tender conditions prevail. |
| 480 | Chapter 9.4 | 9.4.10 | For maintenance purposes, there shall be additional by-pass ground switch in auxiliary converter inverter box duly interlocked with safety locks. The Contractor shall submit the detail document for CMRL review during design stage. | We request you to please remove this requirement. The additional earthing bypass switch is not required as per standard EN 50153 as the DC-Link voltage of APS is less than 1000 VDC. | Refer Addendum No.1, S.No. 234 |
| 481 | Part-2 / Section VI A: ERTS – RS Chapter 14 – Train Control Management System (TCMS) | 14.2.7 Spares Provision and 20.6.5.2 Hardware spare capacity | 14.2.7 Spares Provision<br>The TCMS components shall be modular in design at all levels (i.e. hardware, functional, communication etc.) with **minimum 15% spare capacity** in each car for expansion at the end of DLP. The spare provision shall exist for all different equipment's pins, terminals, connectors,ports, train lines, communication packets bits, digital I/O's and analogue I/O's etc. and the same shall be available for after DLP. The hardware spares shall be duly wired to the nearest terminal box. Considering that some changes / modifications would be required during DLP, at least 15% spares capacity shall be initially ensured by the Contractor. The Contractor shall submit a detailed proposal for CMRL review and approval during design stage.<br>20.6.5.2 Hardware spare capacity.<br>i. Spare capacity requirements shall apply to memory, disk storage, communication links/ports, input/output capacity. Minimum figures for spare capacity are given here below. | As per requirements **15% spare** as mentioned in 14.2.7 will be provided. However, we propose to keep 10% spare as per previous metro projects experience.<br><br>The requirement clause 20.6.5.2 Hardware spare capacity for **50% spares** in terms of memory, disk size and communication links & ports to be reconsidered. We propose as following:<br>Memory: 25%<br>Disk Storage: 25%<br>Links/Ports: 15% | Refer Addendum No.1, S.No. 399 |
| 482 | Part 2 / Section VI A: ERTS – RS, Chapter 19 – Materials and Workmanship | 19.54.3 (i) Dry Heat Test | 19.54.3 All Electronic equipment shall comply with IEC60571 and/or EN50155 and additionally type tested for,<br>(i) Dry heat test: The dry heat test shall be conducted for class T3 and temperature shall be considered 80oC against 70oC specified in IEC/EN. **An extra performance check at 95°C shall also be carried out for 10 minutes over temperature value.** LCD / LED display units may be tested at 70°C and an extra performance check at 85°C shall also be carried out for 10 minutes over temperature value. | Rephrased Requirement:<br>19.54.3 All Electronic equipment shall comply with IEC60571 and/or EN50155 and additionally type tested for,<br>(i) Dry heat test: The dry heat test shall be conducted for class T3 and temperature shall be considered 70oC specified in IEC/EN. **An extra performance check at 85°C shall also be carried out for 10 minutes over temperature value**. LCD / LED display units may be tested at 70oC and an extra performance check at 85°C shall also be carried out for 10 minutes over temperature value.<br><br>Reason:<br>According to standard and requirements in similar Indian Metros like Mumbai 5&6, the dry heat test requirement is till 85°C. Hence, request to amend the clause from 95°C to 85°C | Tender conditions prevail. |
| 483 | Part 2 – Section VI A: ERTS – RS Chapter14/Chapter19 | | 14.2.9 The hardware system shall conform to IEC 60571.<br>14.7.1.5 The electronics required for the control, diagnostics and monitoring facilities shall be designed and constructed in accordance with the requirements of IEC 60571 / EN 50155 or equivalent.<br>19.54.3 All Electronic equipment shall comply with IEC60571 and/or EN50155 and additionally type tested | Standards EN 50155 and IEC 60571 are used interchangeably in tender clauses. Is compliance to either one of these standards sufficient?<br>In most of the places in the tender it is mentioned as EN50155/IEC 60571, but in 14.2.9 it is mentioned as IEC 60571 only.<br>Can we consider it as EN 50155/IEC 60571? | Tender conditions prevail. |
| 484 | Chapter 14 | 14.12.2 | Display on DDU: The cumulative energy values at pantograph, converter-inverter, auxiliaryconverter-inverter and VAC levels with both the components viz. motoring (including coasting) & regeneration, shall be displayed on DDU. **It shall also be possible to apply time and trip filters to the energy values.** | We recommand to put Time and Trip Filters in a separate offline tool.<br>Cumulative energy values can be shown on DDU for a trip. | Tender conditions prevail.<br>Refer Addendum No.1, S.No. 357 |
| 485 | Chapter 14 | 14.8 | For quick guidance of Train operator and Maintenance staff, a summarized menu driven, user friendly Trouble Shooting Directory (TSD) shall be made available in the train DDU. The TSD shall have separate login modes for operators and maintainers. Extensive use of graphics shall be made in TSD for better understanding of the controllers and operators. Details shall be decided during design & revenue service period. | A brief troubleshooting guide will be available in TCMS DDU. Comprehensive details—including environment information and step-by-step troubleshooting instructions is available on the webpage of diagnostic system. | Tender conditions prevail. |
| 486 | Chapter 2.29 | 2.29.2 | To ease the challenge of upholding Operator familiarity with multiple fleet types; the Contractor shall apply best endeavours to ensure the layout of Human Machine Interface (HMI) and Communications Control Head (CCH) are broadly similar to earlier introduced Chennai Phase I fleets. | Does the layout of Human Machine Interface (HMI) is applicable only for driver desk or applicable for TCMS DDU also? | Tender conditions prevail. |
| 487 | Part 2 / Section VI A: ERTS – RS Chapter 17 – Test Program | 17.5.4.8.22 Validation of Multi-consist Train Operation: | Validation of Multi-consist Train Operation shall be tested for conformance according to clause **2.2.31.** | As the clause 2.2.31 has not been incorporated into the tender document.<br>We request to clarify on this requirement. | Refer Addendum No.1, S.No. 379 |

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| 488 | Part 2 / Section VI A: ERTS – RS Appendix C – Interface | 2.5.10 6-car Multi-Consist Mode | 2.5.10 In accordance with Part 2 – Section VI A: ERTS Clause 17.9.12, the RS Contractor shall work with the STC, Telecom and PSD Contractors to identify any additional Joint Integration Tests which may be required for the running of trainsets in **6-car Multi-Consist Mode**. These tests may need to be conducted separately from other Joint Integration Tests and shall be performed Contractor if and when requested by CMRL. | **We understand there is no requirement of multi-consist operation.** | Refer Addendum No.1, S.No. 408 |
| 489 | Part 2 / Section VI A: ERTS – RS Chapter 1.4 OPERATIONS | 1.4.2 | Rakes will operate in revenue service in as **6 car trainsets initially and shall be increased to 6 car train** sets later in case of increased passenger patronage. Under normal operating conditions, trains may be coupled and uncoupled during maintenance and in rescue modes. | **We understand the train is designed in 6 car configuration- basic unit and no multi-consist is required.** | Refer Addendum No.1, S.No. 54 |
| 490 | Part 2 – Section VI A: ERTS – RS Chapter 1 – System Description | 1.3 GENERAL DESCRIPTION OF SYSTEM<br><br>1.4 OPERATIONS | 1.3.2 The rake configuration of 6-car Trainsets referred to throughout the tender documents are formed of *DMC + TC + MC + MC + TC + DMC* car configuration in order to achieve 67% propulsion. The rake consists of two units, Unit 1 : *DMC1 + TC1 + MC1 and Unit 2 : *DMC2 + TC2 + MC2. **The Trainset shall operate in Grade of Automation 2 (GoA2) / Automatic Train Operation (ATO).**<br><br>1.4.3 During the initial phase of the operational requirement, rakes have to be operated in GoA2 (ATO) / GoA1 (ATP). **However, the Phase 1 project is planned for the upgradation of the Signalling System to GoA3 & GoA4 operations.** | We understand the initial operation is in Grade of operation is GoA2 for a few trains and later to be updgraded to GoA4 .<br>Requesting CMRL to inform GoA4 implementation and testing timeline. | Refer Addendum No.1, S.No. 18 |
| 491 | Part 2 – Section VI A: ERTS – RS | 17.9.13 UTO Test | The Contractor shall carry out comprehensive testing of trains in UTO mode, including automatic train control, station stopping, door operations, emergency handling, and fail-safe functions. All testing shall be coordinated with CMRL to ensure uninterrupted passenger operations and all results shall be submitted for review. | Requesting CMRL to inform GoA4 implementation and testing timeline. If the initial trains are developed for GoA2 , testing is expected to be done to validate GoA2? | Refer Addendum No.1 |
| 492 | Part 2 – Section VI A: ERTS – RS Chapter14 | | TCMS shall have adequate facility and interfaces to communicate (using MVB networking type) with wayside and train-borne signalling for UTO, ATO and non-ATO modes. | Does the signalling system support GoA2and GoA4 or a new signalling system planned for new upgrade? Regarding signaling HW and interoperability , decision is still pending with CMRL [on if LZB 700 will be upgraded to GoA4 or another CBTC module will be used] Request CMRL to confirm on the details, this would help us to understand if additonal hardware (protocol converters) are required. | Refer Addendum No.1 |
| 493 | Chapter 9 | 9.10.3 | During rescue operation, the sick train electrical controls and power supply shall be provided by healthy train. The controls shall consist of minimum the below mentioned operations,<br>a) Application & release of all kinds of brake functions in sick train<br>b) Communication between two trains' (Healthy and Sick) operators<br>c) External parking lights for the sick train<br>d) Cabin lighting of the sick train<br>e) External Head lamps of sick train in case of Push operation by Healthy train.<br>f) Windshield wiper supply<br>g) Pneumatic Horn supply<br>**All networks and TCMS which are required to achieve these above functions shall be available during rescue mode operation between two trains.** | We understand this requirement is fulfilled by trainlines and jumper cables. Requesting CMRL to amend the clause as TCMS network is not required to achive the functionalities mentioned as as no Multiconsist is considered in this project, hence ETB (Ethernet interface between healthy train and Sick train) is not considered. | Tender conditions prevail. Also, Refer Addendum No.1, S.No. 115 to 131 |
| 494 | Chapter 10 | 10.11.16 | If Contractor proposes to measure the power quality parameters as mentioned in above Para,through TCMS (it is preferred). In such case, TCMS shall have the adequate capability of measuring and data acquisition to **analyse higher order harmonics (up to 50th**) and measure power quality parameters mentioned above with minimum accuracy of 0.1% and sampling rate of 100 kHz. Also, a suitable power analyser, software / analysis tool shall be built in. However, final approval will be provided by CMRL by comparing both proposals. | We request CMRL to procure power analyser separately and not in Rolling Stock Supplier scope for measuring the harmonics as higher order harmonics are normally not measured in TCMS. | Tender conditions prevail. |
| 495 | Chapter 10 | 14.1.8 | The Contractor shall submit the complete TCMS configuration details including but not limited to **Application Software Logic, Data Acquisition Routines, Control logic, Fault Detection Algorithms, Data Storage Logic** etc. **Graphical interface for editing and configuring** the same shall be provided and submitted for CMRL approval during design stage. The Contractor shall provide **necessary training** and associated hardware / software tools to make CMRL engineers competent to implement software changes as required within the scope of this contract. The Contractor shall ensure full association and support of the Contractor / Sub-Contractor's design team with CMRL team throughout the project or as the case may be. | We request to kindly check if these requirements regarding the configuration details , logics and editing the SW are applicable as these are properitery information and cannot be shared.<br>Training for editing the software cannot be provided. Request to make this clause optional.<br><br>Requesting to amend the requirement as :<br>14.1.8 TCMS Configuration Details<br>The Contractor shall submit the complete TCMS details **including the overall control logic, faults and its detection (IOS/ trouble shooting manual), overview of data acquisition and data storage**.<br>Interface for editing and configuring the necessary and pre-approved data shall be provided and submitted for CMRL approval during design stage. The Contractor shall provide necessarytraining and associated hardware / software tools to make CMRL engineers competent to implement necessary and pre-approved data changes as required within the scope of this contract. The Contractor shall ensure full association and support of the Contractor / Sub-Contractor's design team with CMRL team throughout the project or as the case may be. | Tender conditions prevail. |

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| 496 | Chapter 14 | 14.2.8 | Expandability Provision<br>The Contractor shall also provide 15% expandability provision (i.e., expansion of capacity by adding of additional hardware) for pins, connectors, network ports, **PCB cards**, train lines etc. The Contractor shall demonstrate to CMRL that adequate space has been reserved inside the cabinets of train to exercise this option. | We request to confirm if PCB level expansion is required as it requires configuration of PCBs and the controller.<br>Provision of extra PCB slots can be provided for components like RIOM and EVR , however, the requirement for PCB card is not necessary in Central Control Unit. Please confirm. | Tender conditions prevail. |
| 497 | Chapter 14 | 14.3.4 | Signal List Modification<br>It shall be possible for authorized maintenance personnel to update and modify the list of data acquisition signals and its associated parameters like periodicity, task cycle, data acquisition routine etc. Suitable graphical configuration editors shall be provided for this purpose. | We request to clarify on these requirement as the modification of the signals are not possible, as software is proprietary. | Tender conditions prevail. |
| 498 | Chapter 14 | 14.10.2 | Event / Fault Information Log<br>Adequate redundancy shall be built into TCMS. The size of On-Board Database memory for fault records shall be sufficient to hold all car level and train level events (at least 30,000 events) between normal downloading intervals of 30 days through hardware download. In case of overwriting, 'Level 3' events / faults only may be overwritten. | Ensuring that the memory capacity is optimally utilized while all fault levels are treated consistently, implementing a selective overwriting mechanism only for level 3 faults would require a custom solution and , we kindly request to only consider FIFO based overwriting.<br>We request you to please consider above. | Tender conditions prevail. |
| 499 | Chapter 14 | 14.7.2.1 | The DMS shall consist of monitoring and diagnostic logic and shall be accessible from within the vehicle and maintenance Yard. | Based on our interpretation, Siemens understands that the intent of the requirement is to ensure the availability of diagnostic data from onboard Diagnostic Server and can be downloaded via hardwired connection. | Refer Addendum No.1, S.No. 342 |
| 500 | Chapter 14 | 18.5.4.5 | Sneak Circuit Analysis<br>The Contractor shall perform a Sneak Circuit Analysis (SCA) to detect functional and/or Category I / Category II safety problems that could arise from wiring faults or errors and shall submit the analysis for approval. The SCA shall ensure that there are no unintended circuit paths that will result in functions other than those intended. The SCA shall be performed for the overall car and shall consider interfaces with subcontractor-supplied equipment and coupler-pin assignments. | Safety functions are analyzed using FMECAs and FTAs, covering both electronic and electrical components. SIL 3/4 functions are assessed with regard to single-point of failures. For electronic control units that are involved in safety functions with a safety impact greater than BI, corresponding certificates according to EN 50129 are provided. Sneak Circuit Analysis (SCA) of control units are not performed. | Tender conditions prevail. |
| 501 | Chapter 13 | 13.5 | The TETRA radio system shall be supplied by the Tele-Communications Contractor shall ensure Communications between train operator and control room. The TETRA radio is for operations,maintenance and voice communications and **data applications in connection with data of the TCMS systems.** | Kindly confirm whether the required communication bandwidth for RTR-DMS data transfer from Train to OCC can be provided and approved by CMRL Signaling and Telecom systems, and whether the RTR-DMS traffic is permitted to use the CBTC / wayside CCTV telecom network infrastructure.<br><br>Further, based on above, with reference to the clause on the TETRA radio system, kindly remove the statement "**data applications in connection with data of the TCMS systems**" and rephrase the clause accordingly. | Tender conditions prevail. |
| 502 | Chapter 14 | 14.11.2 | RS Contractor shall install the complete hardware and software for Rolling Stock Controller (RSC)'s console in the OCC, the PPIO Console in the depot and the Maintainer console in the depot. This console display shall provide the access for viewing of all train related real time remote fault diagnostic data & events as described in clause 14.11. The GUI of this RSC display shall be similar to the Train TCMS DDU. The size and information GUI of this RSC console shall be designed such that the OCC operator is able to access data and view the functions of the complete fleet of trains from this console. RS Contractor shall interface with Signalling & Telecommunication Contractors for the installation and network configuration for this RSC console in OCC. The display options required for PPIO or maintainer console will be finalised during execution stage | Kindly clarify whether the requirement for "RSC controller display equivalent to the Train TCMS DDU and visibility of all train fault conditions at RSC" is limited to monitoring (read-only) purpose only, and confirm that no train control or TCMS command functionality from RSC is required, since train control functions are handled by the CBTC system.<br><br>As per GoA4 architecture, all vital and safety-related TCMS–CBTC control remains on the CBTC radio.<br>However, transmission of non-vital TCMS data such as train status, alarms, events, logs and screenshots to the RSC console is permitted over the CCTV radio infrastructure. | Refer Addendum No.1, S.No. 354 |
| 503 | Chapter 14 | 14.11.4 | It shall be possible to receive the data using commercially available GPRS network or the remote downloading shall be possible within the range of all the depots using WLAN or any upgraded latest technology as proposed by the Contractor subject to approval of CMRL. All costs towards network, etc shall be borne by the Contractor | Please confirm if WLAN to be supplied by RS supplier or in Signaling supplier scope.<br>If it is in RS supplier scope, CMRL to share Layout of OCC and Acess points required. | Tender conditions prevail. |
| 504 | Chapter 14 | 14.11.6 | The facilities of the remote downloading shall be in addition to the hardwire downloading. Apart from normal downloading the system should also have intentional / forced download by authorized CMRL personnel. | In order to ensure data integrity and cybersecurity, the Bidder proposes that train data downloading shall be performed through hardwired download at depot, and that remote access shall be limited to remote fault diagnostics via the RTR-DMS server (instead of direct remote access to the onboard train systems).<br>Further, remote downloading, if required, shall be performed from the central server (RTR-DMS) and not directly from the train.<br>Kindly confirm CMRL's acceptance of this approach. | Tender conditions prevail. |

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| 505 | Chapter 15 | 15.12.6 (j) | Software system manaual: system support procedures to install / uninstall software, downloading of fault logs and other train data from DMS & RTR DMS system (as defined in Chapter 14), usage of trace files and any other required software trouble shooting details. | Clause 14.11.7 prohibits software updating through wireless systems.<br>In order to avoid contradiction between clauses and to ensure cybersecurity, the Bidder proposes that TCMS software updating shall be performed only through a physical service connection on the train.<br>Accordingly, the requirement for TCMS software update via RTR-DMS as stated in Clause 15.12.6(j) shall be deleted / made not applicable.<br>Kindly confirm and incorporate the same in the tender specification. | Tender conditions prevail. |
| 506 | Chapter 17 | 17.5.4.8.9 | Test Program<br>TCMS functionality test All the requirements of RTR-DMS, single point upload of software, single point download of all fault logs and other requirements mentioned in Chapter 14 shall be tested for conformity. | | |

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| 507 | Part 3 : Section VII General Conditions | 18.2 | Insurance for Works and Contractor's Equipment | Please confirm/clarify that the value of the insurance cover is excluding taxes & duties. | Refer Addendum No.1, S.No. 434 |
| 508 | Part 3 : Section VII General Conditions | 18.2 | Insurance for Works and Contractor's Equipment | Please confirm/clarify whether terrorism cover is required to be taken by the contractor or not | Tender conditions prevail. |
| 509 | Part 3 : Section VII General Conditions | 14.9 | Payment of Retention Money | We request to delete the requirement of retention money as defined in 1.1.4.11 of General Conditions. Already, the Contractor submit the Performance Security of 10%.<br><br>We opine this overspecification lead to inevitable price increase. We suggest to remove the retention monies, which is also in line with other metro RS tenders of silimar nature floated by DMRC / BMRCL.<br>Please consider/modify. | Tender conditions prevail. |
| 510 | Section - VIII Particular Conditions (Part A: Contract Data) | SL No. 17 | The interest free mobilization advance at the rate of 10% of the Accepted Contract Amount (Excluding Provisional Sum, Taxes & Duties) in the currencies and proportions is payable against production of Bank guarantee from a public sector bank. And the guarantee shall be in the form of a BG for 100% of the advance amount requested plus GST. (in parlance with CVC guidelines).<br>GST on the mobilization advance is not reimbursable.<br>Mobilization advance shall be paid in two equal instalments. | Since the accepted contract amount already includes GST, in the expression "100% of the advance amount requested plus GST", the repition of "plus GST" creates confusion.<br><br>The following modification is suggested:<br>100% of the advance amount requested ~~plus GST~~ | Tender conditions prevail. |
| 511 | Section - VIII Particular Conditions (Part A: Contract Data) | SL No. 17 | The interest free mobilization advance at the rate of 10% of the Accepted Contract Amount (Excluding Provisional Sum, Taxes & Duties) in the currencies and proportions is payable against production of Bank guarantee from a public sector bank. And the guarantee shall be in the form of a BG for 100% of the advance amount requested plus GST. (in parlance with CVC guidelines).<br>GST on the mobilization advance is not reimbursable.<br>Mobilization advance shall be paid in two equal instalments. | We understand GST on mobilization advance is not applicable since it is repayable.<br>In this context, we could not understand the following expression,<br>GST on the mobilization advance is not reimbursable.<br>Please clarify. | Tender conditions prevail. |
| 512 | Section - VIII Particular Conditions (Part A: Contract Data) | New Clause to be added | New Clause to be added | The clause 1.4.3 of the Part 2 – Section VI A: ERTS – RS stipulates that:<br>"During the initial phase of the operational requirement, rakes have to be operated in GoA2 (ATO) / GoA1 (ATP). However, the Phase 1 project is planned for the upgradation of the Signalling System to GoA3 & GoA4 operations."<br><br>In this reagrd, for contractual clarity and to avoid ambiguity in performance obligations, a clearly defined timeline for implementation of GoA3 and GoA4 operations is required.<br><br>Accordingly, we request the inclusion of a new item in the Contract Data specifying the key date applicable to Chennai Metroo for taking decision on GoA3 & GoA4 operations. Beyond this stipulate ddate, the Contractor shall stand relieved of GoA3/GoA4 implementation related repsonsibilities under the Contract, without any impact on the Contract Price.<br><br>Please amend the clause accordingly. | Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 18 |
| 513 | Section - VIII Particular Conditions (Part B: Specific Provisions) | 14.2 | The Employer shall make an interest free advance payment for mobilization when the Contractor submits a guarantee in accordance with this sub-clause. This guarantee shall be in the form of BG for 100% of the advance amount requested plus GST (in parlance with CVC guidelines) as per format given in the Annex to PC from a Public sector bank (PSB) of India or Scheduled Commercial Banks in India or as listed under Schedule of Commercial Banks by The Reserve Bank of India (RBI). GST on the mobilization advance is not reimbursable. The total advance payment and the applicable currencies and proportions shall be as stated in Contract Data. | Since the accepted contract amount already includes GST, in the expression "100% of the advance amount requested plus GST", the repition of "plus GST" creates confusion.<br><br>The following modification is suggested:<br>100% of the advance amount requested ~~plus GST~~ | Tender conditions prevail. |
| 514 | Part 3: Section - VIII Particular Conditions (Part A: Contract Data) | 1.1.3.7 | 4. Defects Notification Period \| 1.1.3.7 \| 730 days. | Please confirm that the Defect Notification Period applies separately to each trainset | Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 432 |

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<tr><th rowspan="2">Sl. No.</th><th colspan="4">As per the Submission of Bidder(s)</th><th rowspan="2">CMRL Response</th></tr>
<tr><th>Part/ Section No</th><th>Clause No.</th><th>Original Bid Condition</th><th>Bidder's queries</th></tr>
<tr><td>515</td><td>Section - VIII Particular Conditions (Part B: Specific Provisions)</td><td>4.1.1</td><td>…….<br>The Contractor shall carry sufficient inventories to ensure an ex- stock supply of consumable spares for the plant and equipment. Other spare parts and components shall be supplied as promptly as possible, but at the most within six (6) months of placing the order.....</td><td>It may not be feasible to supply all types of spare parts and components within 06 months since lead time for certain items is long. Hence, we request to modify the clause as below:<br><br>…….<br>The Contractor shall carry sufficient inventories to ensure an ex- stock supply of consumable spares for the plant and equipment. Other spare parts and components shall be supplied as promptly as possible, preferably within six (6) months from the placement of the order or within such other mutually agreed timeline .....</td><td>Tender conditions prevail.</td></tr>
<tr><td>516</td><td>Part 3, Section - VIII Part A Contract Data</td><td>Table 1.1</td><td>Key Date - Rolling Stock<br><br>Table 1.1: Summary of Sections: Key Date - Rolling Stock<br>A. Delay Damages for Non-achievement of Main Key Dates<br><table><tr><th>Key Date No.</th><th>Key Date Description (Sub-clause 1.1.5.6)</th><th>Time for Completion (Calendar days from NTP) (Sub-clause 1.1.3.3)</th><th colspan="2">Delay Damages (Sub-clause 8.7)</th></tr><tr><th></th><th></th><th></th><th>1 to 28 days</th><th>29th day onwards</th></tr><tr><td>2</td><td colspan="4">Delivery of trains in nominated Depots</td></tr><tr><td>KD-RS-2-1</td><td>3 Train Sets (excluding one prototype train) – 1st lot</td><td>780</td><td rowspan="5">0.1% of total value of the amount apportioned to the milestones relevant to the</td><td rowspan="5">0.2% of total value of the amount apportioned to the milestones relevant to the</td></tr><tr><td>KD-RS-2-2</td><td>3 Train Sets – 2nd lot</td><td>840</td></tr><tr><td>KD-RS-2-3</td><td>3 Train Sets – 3rd lot</td><td>900</td></tr><tr><td>KD-RS-2-4</td><td>3 Train Sets – 4th lot</td><td>960</td></tr><tr><td>KD-RS-2-5</td><td>3 Train Sets – 5th lot</td><td>1020</td></tr></table></td><td>Bidder request to allow individual train wise delivery so that transportation of the trains can be planned better and at regular intervals. Accordingly, we request you to kindly add a note below this table:<br><br>"Individual train wise delivery, Testing in depot & Mainline, and Integrated Testing are allowed"</td><td>Tender conditions prevail.</td></tr>
<tr><td>517</td><td>Part 3 : Section VII General Conditions<br><br>Part 3 : Section VIII Particular Conditions Part A: Contract Data</td><td>1.1.3.7<br><br>1.1.3.7</td><td>"Defects Notification Period" means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], as stated in the Contract Data (with any extension under Sub-Clause 11.3 [Extension of Defects Notification Period]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [Taking Over of the Works and Sections].<br><br>Defects Notification Period: 730 days</td><td rowspan="2">From the defination of 'DNP' and 'Section' we understand that start date and end date of DNP is defined for each lot (3 trains).<br><br>We request that DNP should be defined for each trains in line with CMRL 78 cars tender. Accordingly, we request you to please modify Clause 1.1.3.7 in PC as below:<br><br>"Defects Notification Period<br>Rolling Stock: 730 days from Taking over of each train.<br>Depot Machinery & Plant: 730 daysfrom Taking over of each equipment"</td><td>Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 432</td></tr>
<tr><td>518</td><td>Part 3 : Section VIII Particular Conditions Part A: Contract Data</td><td>1.1.5.6</td><td>Section: Refer to 'Table: Summary of Sections' below.</td><td>Tender conditions prevail.<br>Also, Refer Addendum No.1, S.No. 432</td></tr>
<tr><td>519</td><td>Part 3, Section - VIII Particular Conditions (Part B: Specific Provisions)</td><td>18</td><td>Repayment amortization rate of advance payment - 25%</td><td>For the previous CMRL ARE04A tender amortization was 17%. Higher amortization of 25% would impact the bidder's cash flow. Hence bidder requests CMRL to keep the amortization rate as 17% inline with ARE04A / ARE03 contract.</td><td>Refer Addendum No.1, S.No. 431</td></tr>
<tr><td>520</td><td>Part 3, Section - VIII Particular Conditions (Part B: Specific Provisions)</td><td>14.9</td><td>Retention money shall be deducted at the rate of 5% on each Interim payment certificate (IPC), excluding taxes & duties, in respective currencies and up to the cumulative value equal to 5% of the Accepted Contract Amount (excluding Provisional sum), excluding taxes & duties.<br>Upon the request of the Contractor, the Employer after issuance of Taking-Over certificate of each trainset / each Depot Machinery & Plant may release the withheld retention money specific to that trainset / Depot Machinery & Plant, on submission of Bank Guarantee for an equivalent amount in respective currencies from a Public sector bank (PSB) of India or Scheduled Commercial Banks in India as listed under Schedule of Commercial Banks by The Reserve Bank of India (RBI), in the format annexed to the Particular Conditions...</td><td>To support Bidder Cash flow, we request you to please waive off the deduction of retention money from each IPC provided the Bank Guarantee for an equivalent amount is submitted in respective currencies from a Public sector bank (PSB) of India or Scheduled Commercial Banks in India as listed under Schedule of Commercial Banks by The Reserve Bank of India (RBI), in the format annexed to the Particular Conditions.</td><td>Refer Addendum No.1, S.No. 433</td></tr>
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| 521 | Part 3, Section - VII General Conditions | 4.2 | ...The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied... | We request to limit the total BG valaue (Performance BG + Retention BG) available with the Employer during DLP period to 10%. Therefore, we request you to please add below after this third para of the clause:<br><br>" The Employer shall, however, permit the Contractor to reduce the Performance Security to 5% of Contract Amount (Excluding Provisional Sum) in the same currency(ies) after revenue service of last trainset. The initial validity of Performance Security submitted after award of LOA shall be upto revenue service of last trainset which shall be returned provided the Contractor has submitted a replacement Bank Guarantee (valid and enforceable until the end of defects liability) for the reduced value amount." | Tender conditions prevail. |
| 522 | Section VIII. Particular Conditions (Part-B: Specific Provisions) | 13.1 | "Variations may be initiated by the Engineer at any time during the performance of the Contract, either by an instruction or by a request for the Contractor to submit a proposal".<br>Reference shall be made to Part 1 - Section IV – Bidding Forms – 'Instructions for completing the Pricing document' – Cl. 3.3 for Quantity variation conditions. | Bidder request to please confirm that any Quantity Variation shall be restricted to 10 TS (6-car each) only as per Part 1 - Section IV – Bidding Forms – 'Instructions for completing the Pricing document' – Cl. 3.2 & 3.3 and **no additional quantity shall be ordered under general variation clause 13.1** | Tender conditions prevail. |
| 523 | Part 3 : Section VIII | SCC 14.7<br><br>GCC 14.7 | **Replace 1st Para of Sub-clause 14.6 with the following:**<br>No amount will be certified or paid until the Employer has received and approved the Performance Security. Thereafter, the Engineer shall, within 42 days after receiving a Statement and supporting documents, issue to the Employer an Interim Payment Certificate which shall state the amount which<br>the Engineer fairly determines to be due, with all supporting particulars for any reduction or withholding made by the Engineer on the Statement if any"<br><br>**Payment:** The Employer shall pay to the Contractor:<br>**.....**<br>(b) the amount certified in each Interim Payment Certificate within 56 days after the Engineer receives the Statement and supporting documents; and | Bidder request to release the payment within 28 days from the invoice which enable bidder to fulfil the obligation with project stakeholders. | Tender conditions prevail. |
| 524 | Part 3, Section - VIII Part A Contract Data | S.No. 23, Clause 18.2(d) | Maximum amount of deductibles for insurance of the Employer's risks : 18.2(d) : INR 1,00,000/- | We request customer to please remove the deductibles capping here. Insurance Deductibles shall be decided by the Insurer based on various factors/conditions/nature of project/duration. | Tender conditions prevail. |
| 525 | Section VII. General Conditions | 15.5 | **Employer's Entitlement to Termination for Convenience**<br>...<br>After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment] and **shall be paid in accordance with Sub-Clause 19.6 [Optional Termination, Payment and Release]**. | Sub-Clause 19.6 is replaced in PC which talks about only Force Meajure conditions and payments. Request you to link this clause with GC condition and accordingly, the clause may be modified as below:<br><br>"After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment] and ~~shall be paid in accordance with Sub-Clause 19.6 [Optional Termination, Payment and Release]~~ Upon such termination, the Engineer shall determine the value of the work done and issue a Payment Certificate which shall include:<br>(a) the amounts payable for any work carried out for which a price is stated in the Contract;<br>(b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal;<br>(c) any other Cost or liability which in the circumstances was necessarily, as well as reasonably, incurred by the Contractor in the expectation of completing the Works;<br>(d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and<br>(e) the Cost of repatriation of the Contractor's staff and labour employed wholly in connection with the Works at the date of termination." | Tender Conditions previal. |

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| 526 | Part-3, Particular Conditions (Part A: Contract Data) | Sl. No. 24 | 24. Minimum amount of third party insurance — 18.3 — In case of death, INR 1,00,00,000 per person in each case. In case of permanent disability, INR 50,00,000 per person in each case. In case of partial disability, INR 25,00,000 per person in each case.<br>In case damage to facility, the Contractor shall be responsible for full coverage of damages without limit of occurrences.<br>Hence, the amount shall be decided by the Contractor based on his experience. | We wish to state that the contractor can provide the Total TPL cover up to 25 crs per year (as part of EAR Policy) instead of having multiple splits for each disability. So, we request to please confirm and revise the clause accordingly. | Tender conditions prevail. |
| 527 | Part-3, Particular Conditions (Part A: Contract Data) | Sl. No. 23 | 23. Maximum amount of deductibles for insurance of the Employer's risks — 18.2(d) — INR 1,00,000 /- | Minimum deductibles in any insurance policy shall be decided by the Insurer based on the Insurance regulatory/tariff conditions, Insured's profile & based on various topics like Project scope, risk, Earthquake Zone, flood zone, claims ratio etc. So contractor can't promise the mentioned deductibles can be complied in the contract & basically, with 1 Lakh deductibles Insurer's doesn't agree to underwrite the policy. | Tender conditions prevail. |
| 528 | Part 3: Section VIII | 4.4 (Pg-110) | Where the Contractor had proposed more than One (1) Subcontractor the Employer / Engineer reserves the right to choose the vendor and/or Subcontractor from the proposed list. | We would request CMRL to revise this one-sided requirement and grant the contractor the flexibility to select and execute accordingly. Allowing the Engineer to choose subcontractors or manufacturers could significantly impact the performance of the RS and may result in additional costs for the entire project. | Tender conditions prevail. |
| 529 | Part 3: Section VIII | 14.2. Advance Payment (Pg-61) | The interest free mobilization advance at the rate of 10% of the Accepted Contract Amount (Excluding Provisional Sum, Taxes & Duties) in the currencies and proportions is payable against production of Bank guarantee from a public sector bank. And the guarantee shall be in the form of a BG for 100% of the advance amount requested plus GST. (in parlance with CVC guidelines). GST on the mobilization advance is not reimbursable. Mobilization advance shall be paid in two equal instalments. | We would request CMRL to consider the TOTAL ADVANCE PAYMENT clause as follows: -<br><br>The interest free mobilization advance at the rate of ~~10%~~ 15% of the Accepted Contract Amount (Excluding Provisional Sum, Taxes & Duties) in the currencies and proportions is payable against production of Bank guarantee from a public sector bank. And the guarantee shall be in the form of a BG for 100% of the advance amount requested plus GST. (in parlance with CVC guidelines).<br><br>GST on the mobilization advance is not reimbursable. Mobilization advance shall be paid in two equal instalments. First & Second tranches are **10 % & 5 %** respectively of the total contract price. | Tender conditions prevail. |
| 530 | Part 3: Section 1 | | BIDDING DOCUMENTS: Index Page No. 2 ARE05_Part 3. | In the index there is a reference to Section-VI C Employer's Requirements Comprehensive Maintenance Period (CMC) of Rolling Stock and Depot Plant and Machinery which is not found in the other ARE05_Part 1 and Part_2 tender documents. We would request CMRL to kindly provide clarification regarding the same. | Refer Addendum No.1, S.No. 430 |
| 531 | Part-3 / Section VII. General Conditions | 17 Risk and Responsibility 17.6 Limitation of Liability | The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer's Equipment and Free-Issue Material], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in the Contract Data, or (if such multiplier or other sum is not so stated), the Accepted Contract Amount. | Request customer to keep the cap on the liability on Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer's Equipment and Free-Issue Material], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights] | Tender conditions prevail. |
| 532 | PART - 3 : CONDITIONS OF CONTRACT AND CONTRACT FORMS Section VIII. General Conditions | 14.1 (b) | the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs, except as stated in Sub-Clause 13.7 [Adjustments for Changes in Legislation]; Notwithstanding the provisions of sub-paragraph (b), the Contractor's Equipment, including essential spare parts therefor, imported by the Contractor for the sole purpose of executing the Contract shall be exempt from the payment of import duties and taxes upon importation. | Please clarify under which section import exemption can be availed.<br><br>Please clarify list of documents required to avail this exemption. | Tender conditions prevail. Also, Refer Particular Conditions (Part B: Specific Provisions) 14.1 |

Signature Not Verified
Digitally signed by ANTONYRAJ SIMSON ANTONY
Date: 2026.04.16 18:11:06 IST
Location: eProcure-EPROC