

ARE03 Contract - Prebid Meeting (02) All Bidder Queries						
Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
1	Part-1, Section - III Evaluation and Qualification Criteria (EQC)	Notes for the Bidder (iii)	However, in case of consortium/JV between companies and their subsidiaries where either the parent or the subsidiary or both is/are (an) Indian company/ companies registered in India, parent company shall be eligible to bid on the basis of credentials of their owned subsidiaries. Subsidiaries shall be eligible to bid on the basis of credentials of their parent company. Here it will be mandatory that the bidders must enter into a consortium/JV agreement with a token participation of such parent/ subsidiary whose credentials are being sought to be used. This consortium/JV agreement should clearly stipulate that the individual companies (i.e. the parent and the JV) shall be jointly and severally responsible and liable for the timely execution of the contract and failure to do so will make all of the them liable to the penal conditions of the contract. In such case there will be no requirement of the minimum threshold of 15% participation by each member of the consortium/JV	However, in case of consortium/JV between companies and their subsidiaries or group company under common control where either the parent or the subsidiary/group company under common control or both is/are (an) Indian Company/companies registered in India, parent company shall be eligible to bid on the basis of credentials of their owned subsidiaries. Subsidiaries or group company shall be eligible to bid on the basis of credentials of their parent company or other group company under common control. Here it will be mandatory that the bidders must enter into a consortium/JV agreement with a token participation of such parent/subsidiary/group company whose credentials are being sought to be used. This consortium/JV agreement should clearly stipulate that the individual companies (i.e., the parent and the JV) shall be jointly and severally responsible and liable for the timely execution of the contract and failure to do so will make all of them liable to the penal conditions of the contract. In such case there will be no requirement of the minimum threshold of 15% participation by each member of the consortium / JV.	Tender condition Prevails	N
2	Part-1, Section - III Evaluation and Qualification Criteria (EQC)	2.8 Purchase preference	2.8 Purchase preference The requirements of stipulations pertaining to Public Procurement Order, 2017 dated 16.09.2020 issued by Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (Public Procurement Section) shall apply. Minimum Local Content (MLC) for Class-1 local supplier shall be 60% as per the order No.K-14011/08/2017/MRTS-Coord dated 14th October 2020 issued by Ministry of Housing and Urban Affairs.	We understand that during the project execution phase if any raw material / components or sub-assemblies, etc. are sourced from foreign countries, the services associated with such components or raw material or sub-assemblies, etc. such as Transportation, insurance, installation and commissioning and after sales services shall be considered as Local supply and accordingly supplier can claim the same for declaring them as Class -1 local supplier  Kindly confirm.	Please refer to the definition of 'Local Content' in the said PPP-MII order which is self explanatory. The latest order of DPIIT No. P-45021/102/2019-BE-II-Part(1) (E- 50310) dated 04.03.2021 may also be referred.	N
3	Part-1, Section – IV Bidding Forms  Addendum 1	Part-1, Section – IV Bidding Forms  Addendum 1 Schedules 4.1 Preamble  Sl. 8	4.1.9 Wherever the Bidder comprises a JV/Consortium and the Bidder desires separate payments to each Member of the Consortium, the Bidder shall clearly lay down the Milestones / Currencies allocated to the different Members of the JV/Consortium, which shall be in agreement with the intended percentage share of the Members as indicated in the Consortium agreement for this Contract. In case the successful bidder being a JV/Consortium, payment will be made only to the Bank account of JV/consortium and not to the Bank account of individual	We request CMRL to allow Bidder comprising of JV/Consortium, if desired, can raise separate invoice and receive separate payments to each Member of the Consortium. In this case, Bidder shall clearly lay down the Milestones / Currencies allocated to the different Members of the JV/Consortium, which shall be in agreement with the intended percentage share of the Members as indicated in the Consortium agreement for this Contract.  Kindly confirm	Tender condition Prevails	N
4	Part-1, Section – IV Instructions for completing the pricing document	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.	We understand that – 1.Contract Price is including output GST. 2.In case of supplies by one of consortium member whose scope is not for supplying of Rolling Stock but for provision of services or supplying spares, in such case contractor will apply GST rate as applicable on components & services as per HS code / Service Accounting Code. Please confirm our understanding.	For point No. 2,the applicable GST considering it as a works contract shall be applicable.	N
5	Part-1, Section – IV Instructions for completing the pricing document:  Revised Bid Condition in Addendum 1	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 Urban Development (MoUD) / 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.	We understand that  Employer will issue required documents for claiming benefit of concessional duty under chapter 98.01 in the name of contractor and sub-contractor for imports of raw material / components by contractors & sub-contractors.  Bidder requests to modify the clause as below 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 and its sub-contractor for obtaining sponsoring / recommendation letter from the Ministry of Urban Development (MoUD) / 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.	Employer shall facilitate only for the main Contractor/JV member only.	N
6	Part -1, Section - IV Bidding forms  Revised Bid Condition in Addendum 1	4.1.9	In case the successful bidder being a JV/Consortium, payment will be made only to the Bank account of JV/consortium and not to the Bank account of individual member of JV/Consortium.	In previous replies to the queries, CMRL confirmed to allow individual invoicing and payments to consortium members. However, the addendum did not reflect the change.  Bidder requests to modify the clause In case bidding by consortium, 1.Each consortium member can raise separate invoices	In case the successful bidder being a JV/Consortium, payment will be made only to the Bank account of JV/consortium and not to the Bank account of individual member of JV/Consortium.	N
7	Part-3, Section - VIII Particular Conditions (Part	SL No. 11 of PARTA : Contract Data	The Performance Security shall be in the form of a Bank guarantee, in the amounts of 10% of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount.	In line with Ministry of Finance, Govt. of India, Department of Expenditure, Procurement Policy Division, office memorandum no. F.9/4/2020-PPD dated 12 Nov 2020, we request Chennai Metro to reduce the performance security amount from the existing 10% to 3%. Kindly consider the same	Tender condition Prevails	N

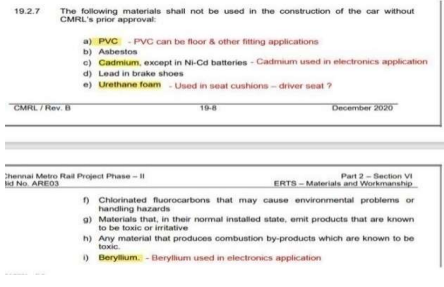
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8	Part 3: SCC	SCC Sl. No. 18; GCC 4.1	4.1.3 'Car Shell Structural Qualification Testing' Payment Security and 'First Article Inspections' Payment Security: The Contractor shall at the time of the submission of the invoice for payment of Car Shell Structural Qualification Testing and First Article Inspections provide a security in an amount equal to the payment for these price centers (milestones) (calculated in accordance with Price Schedule to the Contract Agreement, and in the same currency or currencies.	Considering that the Bidder has already submitted the performance Bank Guarantee and there is also provision of Retention amount to be deducted from each of milestones. Further the payment for each of these price centre will be released after the requisite activities have been performed with documentary evidence submitted. We request CMRL to delete the Car Shell Structural Qualification Testing' Payment Security and 'First Article Inspections' Payment Security as adequate security is already submitted as an assurance	Tender condition Prevails	N
9	Part 3: GCC & SCC	SCC Sl. No. 39; GCC clause 11.3	Replace sub-clause 11.3 with the following: .....If the Works or a Section cannot be used by reason of such defect and/or making good of such defect, the Defect Notification Period of the Works or a Section, as the case may be, shall be extended by a period equal to the period during which the Works or a Section cannot be used by the Employer because of any of the aforesaid reasons or until the reliability targets set in ERTS clause 18.6 is met, whichever is later	Request CMRL to reinstate the GCC clause 11.3 below line "....the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after the Defects Notification Period for the Plant and/or Materials would otherwise have expired" Deleting the above requested clause would make Contractor Defect liability unlimited which would not be possible for any bidder to account for any such liability	Tender condition Prevails	N
10	Part 3 Section VII Particular conditions Special provision	14.2	The Employer shall make an interest free advance payment for mobilization when the Contractor submits..... Mobilization advance shall be paid in two equal instalments as mentioned below: The First instalment of the Advance Payment may be paid after: (i) the Contract Agreement is signed; and (ii) the required Bank Guarantee in the specified format from banks as mentioned above is submitted. The Second & final instalment of the Advance Payment may be paid after: (i) the required Bank Guarantee in the specified format from banks as mentioned above is submitted (ii) the evidence for satisfactory utilization of the First instalment of mobilization is submitted; and (iii) provision of 3D virtual models.	Bidder request that for Second installment should be considered based on utilization of first advance payment. In the current tender conditions, second installment of advance is linked to a deliverable (3D virtual model due in 12 months) and hence it becomes a milestone payment. For such small quantity of cars, mobilizing the team and sub-contractors is sizeable expenditure to be incurred in the initial phase of the project.  Bidder request to modify the clause  .....The Second & final instalment of the Advance Payment may be paid after: (i) the required Bank Guarantee in the specified format from banks as mentioned above is submitted (ii) the evidence for satisfactory utilization of the First instalment of mobilization is submitted; <del>and (iii) provision of 3D virtual models.</del>	Tender condition Prevails	N
11	Part-1, Section – IV, Bidding Forms	9, BF-115	UNDERTAKING FOR MINIMUM LOCAL CONTENT..... 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.....	Obtaining the local content certification from the Statutory Auditor requires divulging sensitive price related information which would compromise the confidentiality of the bidding process. We would therefore request that bidders be permitted to submit the <b>local content certificate</b> within <b>30 days of bid submission</b> while at bid submission an undertaking with the minimum percentage of local content can be submitted. This practice is followed in tenders of various metro authorities such as DMRC, UPMRCL, BMRCL etc.	Noted.	Y
12	Addendum-1, S.No 10 Part 1 Section IV Bidding Forms	4.2	Pricing Summary (BID TOTAL) S. No Description -Apportionment %age 4) Price centre A – 8% 5) Price centre CST – 3% 6) Price centre FAI – 7% 7) Price centre CPT – 3% 8) Price centre B – 0% 9) Price centre C – 64% 10) Price centre D – 0% 11) Price centre E – 8% 12) Price centre F – 7%	Considering the Contractor will have submitted advance security, performance security and CMRL will also deduct retention money (5% of contract price) for each of milestone payments. Further money is needed during the manufacturing of the train and hence bidder request the with above level of security available with CMRL, price centre E, F (for T&C) can be made 5% each.  Bidder request to modify the apportionment as below: Pricing Summary (BID TOTAL) S. No Description -Apportionment %age 4)Price centre A – 8% 5)Price centre CST – 3% 6)Price centre FAI – 7% 7)Price centre CPT – 3% 8)Price centre B – 0% 9)Price centre C – 69% 10)Price centre D – 0% 11)Price centre E – 5% 12)Price centre F – 5% In all the metro contracts in India, the testing and commissioning center is allocated with 10% apportionment and same is requested for Chennai tender .	Tender condition Prevails	N
13	Part 1 Section IV Bidding Forms	3.3.2	Contract Price of each 3-car train-set to be supplied against quantity variation shall be derived from the contracted cost of the original tendered quantity, against Price Centers 'B', 'D', and 'F'(in case of offshore supply) or 'C', 'E' and 'F' (in case of indigenous supply).	Contract price formula for additional 3-car train is different from other rolling stock contracts in India. Further allocation of 3% to price Centre CST, 7% to price center FAI and 3% to price center FAI is milestone linked payment but doesn't reflect the actual weight of costs in these activities. Hence bidder request to modify the quantity variation clause as in practice with other metro contracts in India like DMRC.  We request to modify this clause as below  Contract Price of each 3-car train set to be supplied against quantity variation shall be 90% of the overall contract price ((A+CST+FAI+CPT+B+C+D+E+F)) of the original tendered quantity <b>Price of one 3- car train = ((A+CST+FAI+CPT+B+C+D+E+F)) x 90% / 26</b>	Tender condition Prevails	N

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14	Part 1 Section IV	Schedule of Adjustment Data	Table A (Indian Currency) & Table B (Foreign currency) index Description - Weightage Non-adjustable – 0.33 Labor – 0.10 Stainless Steel/ Aluminum: 0.2 Carbon Steel: 0.3 Copper: 0.07	We request CMRL to review the Contract price adjustment clause as existing price adjustment weightages are not in line with Rolling Stock supply cost structure. The allocation of 0.10 to labor scope and 0.3 to carbon steel scope doesn't reflect the actual costs for these elements in a Rolling stock supply contract.  Bidder request to modify the weightages as below  Index Description - Weightage Non-adjustable – 0.33 Labor – 0.25 Stainless Steel/ Aluminum: 0.2 Carbon Steel: 0.15 Copper: 0.07	Tender condition Prevails	N
15	Part 2, Section - VI (ERTS)	6.2.3	The passenger door pitch shall be approximately equally spaced over the length of the rake. The Contractor shall submit the door layout design for approval. (CDRL 6-1)	We understand from the clause that Door Pitch shall be equally spaced at the car level but may vary between two adjacent cars. The same inter spacing among doors will be followed by PSD supplier as well.  Bidder request to modify the clause as follows : The passenger door pitch shall be approximately equally spaced over the length of the <b>rake</b> Car. The Contractor shall submit the door layout design for approval.	Tender condition Prevails	N
16	Part 2, Section - VI (ERTS)	2.7.3	The typical width of the passenger seat spacing shall be 450mm and the depth, including leg room, shall be 670 mm.	Keeping in mind Passenger comfort possibilities & standard solution available for Passenger seats, Bidder propose to modify the clause as follows : "The typical width of the passenger seat spacing shall be 450mm and the depth, including leg room, shall be minimum 670 mm."	Tender condition Prevails	N
17	Part 2, Section - VI (ERTS)	14.2.2	Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5	Bidder Understand that Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) is not applicable as CMRL doesn't intend to run the train in multiple unit operation during normal revenue service. In addition, Rescue mode features can be implemented without ETB provision.  <u>Bidder request to delete this clause</u>	Noted.	Y
18	Part 2, Section - VI (ERTS)	14.2.3	Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. The ECN shall maintain redundant communication links to the ETB.	Bidder Understand that Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) is not applicable as CMRL doesn't intend to run the train in multiple unit operation during normal revenue service. In addition Rescue mode features can be implemented without ETB provision.  Bidder request to modify this clause as below Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. <del>The ECN shall maintain redundant communication links to the ETB.</del>	Noted.	Y
19	Part 2, Section - VI (ERTS)	14.5.8	CCTV Display Redundancy Full redundancy shall be available between DDU of TCMS and CCTV. In case of failure of TCMS DDU, full functionality of TCMS DDU shall be available in CCTV DDU and vice-versa. CCTV images can be displayed on the TCMS DDU on demand or event generated. The TCMS DDU shall have provision of displaying multiple screens as per the requirements.	As Trains shall operate in GOA4/UTO mode since beginning and DDU feature will be used only in extreme scenarios So Bidder request to remove the requirement of redundant DDU screen. This shall be helpful for overall reliability & space availability in front end of the car.	Refer Addendum 1 for revised clause.	N
20	Part 2, Section - VI (ERTS)	17.5.2.3.3 (b)	The test car shell shall be supported on bogies and shall be loaded to have the equivalent total weight of the complete ready-to-run car (AWO) minus the weight of the bogies.	Bidder proposes to follow EN standard. Test car shell shall not be supported on the bogie. However, the load of the bogie shall be simulated. It is assured that the test result shall not be impacted this way.	Tender condition Prevails	N
21	Part 2, Section - VI (ERTS)	10.3.2	The pantograph for the 25 KV current collection system shall be suitable for flexible auto-tensioned OHE consisting of catenary and contact wire as well as low height rigid catenary system provided in the tunnel system or in other locations of CMRL network. Three car unit shall have minimum two pantographs. Only one pantograph shall be used in all conditions. The feed from the pantographs is connected to the main transformer.	Please confirm the minimum and maximum contact wire heights in all operating conditions.	Please refer to SOD.	N
22	Part 2, Section - VI (ERTS)	10.3.5	Contractor shall provide component manifold type control panel for pantograph control.	We propose to Consider control panel that has all the components mounted on a plate in accordance with 10.3.9 inline with CMRL Phase 1 Bidder propose to delete the requirement "Contractor shall provide component manifold type control panel for pantograph control"	Tender condition Prevails	N
23	Part 2, Section - VI (ERTS)	10.3.6	Two pantographs shall be placed on the Trailer car roof. At a given time, single pantograph shall be working. Other Pantograph shall be used for redundancy purposes and shall be in lock-down position level. Any one specific pantograph shall be operated in a default manner always. Provision shall be made to select any pantograph to operate in case OCC/DCC/Train Operator wish to use the other pantograph. The pantographs shall be provided with insulated horns	Inline with CMRL phase 1 solution pantograph shall have panhead width of 1570 mm with no insulated horns. Insulated horns are not recommended with the experience of other Metro Networks usage. Also we shall maintain sufficient insulation/straight line distance to live part as per Clause 10.3.12. Bidder request to modify the clause as follows : Two pantographs shall be placed on the Trailer car roof. At a given time, single pantograph shall be working. Other Pantograph shall be used for redundancy purposes and shall be in lock-down position level. Any one specific pantograph shall be operated in a default manner always. Provision shall be made to select any pantograph to operate in case OCC/DCC/Train Operator wish to use the other pantograph. <del>The pantographs shall be provided with insulated horns.</del>	Tender condition Prevails	N
24	Part 2, Section - VI (ERTS)	10.3.12	The Straight-line distance from platform to any live part on the roof or roof edge shall be more than 3.5 meters and the clearances shall be in accordance with EN 50122- 1. The live pantograph which is in lock-down state shall also cater to this requirement. Hence insulated horns shall be proposed for both pantographs.	Inline with CMRL phase 1 solution pantograph shall have panhead width of 1570 mm with no insulated horns. Insulated horns are not recommended with the experience of other Metro Networks usage. Also we shall maintain sufficient insulation/straight line distance to live part as per Clause 10.3.12. Bidder request to delete the requirement of Insulated horn.	Tender condition Prevails	N

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25	Part 2, Section - VI (ERTS)	6.3.15(a)	Passenger Door Opening and Closing Times: Opening and closing time of the passenger doors shall be adjustable in the range of 1.5 to 4.5 seconds	We recommend the adjustable range of 2 to 4.5 s. It can impact the force and noise requirements as per EN 14752. Please confirm.	Tender condition Prevails	N
26	Part 2, Section - VI (ERTS)	6.4.5	The device to detect and prove that passenger doors are fully closed and latched shall be capable of detecting any obstruction causing a minimum gap of 5 mm per doorway and prevent the door proving indication from being achieved, in accordance with EN-14752. This detection obstacle function shall be acheivable for a minimum gap of 5 mm per doorway all along the height of the door.	We recommended to follow EN 14752 for Obstacle detection size. Please confirm	Sentence corrected in Addendum 1.	N
27	Part 2, Section - VI (ERTS)	6.9.1	Detrainment doors shall be provided in the first and last car for emergency egress of passengers. The detrainment door shall be aesthetically designed ensuring clear view of the track from driving car. The door shall aesthetically harmonize with front and side lookout glasses of the emergency operator's desk, shall not block the front view and shall give a look of single glass. The material of front-end detrainment Door glass shall meet the specifications in ERTS Section 3.4.9.4 and ERTS Section 5.3. The visibility of the joint between the detrainment door and windshield look out glass shall be bare minimum. The detrainment door system shall be SIL2 compliant and shall be provided with a sealed cover door actuating mechanism. The clear width of the detrainment doorway and width of the ramp when operated shall be minimum 700mm with a headroom not less than 1900mm.	Bidder Propose to modify the clause as follows inline with other latest Metro projects in Country: Detrainment doors shall be provided in the first and last car for emergency egress of passengers. The detrainment door shall be aesthetically designed ensuring clear view of the track from driving car. The door shall aesthetically harmonize with front and side lookout glasses of the emergency operator's desk, shall not block the front view and shall give a look of single glass. The material of front end detrainment Door glass shall meet the specifications in ERTS Section 3.4.9.4 and ERTS Section 5.3. The visibility of the joint between the detrainment door and windshield look out glass shall be bare minimum. The detrainment door system shall be SIL2 compliant and shall be provided with a sealed cover door actuating mechanism. The clear width of the detrainment doorway and width of the ramp when operated shall be minimum <b>700mm 600mm</b> with a headroom not less than 1900mm.	Tender condition Prevails	N
28	Part 2, Section - VI (ERTS)	2.14.3.2	For a normal operation of service brake (nominal 1 m/s <sup>2</sup> ) on level track from maximum speed, the rake shall brake to a standstill from 80km/h in 247m (+0, - 10%) under any Loading Conditions up to AW4 The Contractor shall demonstrate by calculations the minimum adhesion level, required to achieve the stopping distance. Reaction times (dead times of control electronics) are excluded in the measurement of the stopping distance. Reaction time should be less than 300 ms.	AT understanding is as follows:  The requested deceleration of 1/ms <sup>2</sup> in service braking - shall be assumed as instantaneous deceleration rate. All the requested deceleration rates shall be assumed to be instantaneous deceleration rate - unless specified. Please confirm.	Sentence corrected in Addendum 1.	N
29	Part 2, Section - VI (ERTS)	11.4.13	Derailment Safety  The design of the bogie, including the wheel profile, shall prevent the generation of high Lateral to Vertical force (L/V) ratios on any wheel that could result in derailment under all track conditions defined in ERTS section 2, and at all permitted car speeds over the CMRL alignment, up to 10% above the maximum speed permitted, the L/V ratio shall not exceed 1.0 under railhead coefficient of friction conditions up to and including 0.5. Yard operation and deflated secondary suspension conditions shall also be considered	AT request to modify the clause as follows:  The design of the bogie, including the wheel profile, shall prevent the generation of high Lateral to Vertical force (L/V) ratios on any wheel that could result in derailment under all track conditions defined in ERTS section 2, and at all permitted car speeds over the CMRL alignment, up to 10% above the maximum speed permitted, the L/V ratio shall not exceed 1.0 under railhead coefficient of friction conditions up to <b>and including 0.5</b> 0.4. Yard operation and deflated secondary suspension conditions shall also be considered.  Please confirm.	Tender condition Prevails	N
30	Part 2, Section - VI (ERTS)	11.4.13.2	Contradicting statements were observed :  11.4.13.2 The Sperling ride index of the rake at 80 km/h shall not exceed 2.50 in both vertical and horizontal directions in inflated condition of secondary suspension and 3.0 in 21deflated condition. 11.4.13.5 Updated from Addendum : The contractor shall submit calculations to confirm that ride index lateral and vertical shall not exceed 2.75 under all normal operating conditions for worn-out cars operated on rundown track conditions.	AT understands this as follows:  The R.I. limit specified in the ERTS clause 11.4.13.2 is for new track condition and limit specified in addendum no. 11.4.13.5 is for worn out track condition.  Please confirm our understanding.  Also, We propose RI values for deflated condition limit for worn out Wheel & track to be 3.25 in clause 11.4.13.5.	Sentence corrected in Addendum 1.	N
31	Part 2, Section - VI (ERTS)	11.4.18.1	The bogie suspension, in conjunction with the car body, shall be designed to enable cars to operate satisfactorily on track with the maximum specified track twist. The maximum off-loading of wheels 'DQ/Q' shall not exceed 50% of nominal wheel load in inflated up to maximum permissible speeds and shall not exceed 60% of nominal wheel in deflated conditions up to maximum permissible speeds. Test shall be shall conducted in accordance with ERTS clause 17.5.2.10.9	Bidder request to modify the clause as follows:  The bogie suspension, in conjunction with the car body, shall be designed to enable cars to operate satisfactorily on track with the maximum specified track twist. The maximum off-loading of wheels '□Q/Q' shall not exceed <b>50%</b> 60% of nominal wheel load in inflated up to maximum permissible speeds and shall not exceed <b>60%</b> 70% of nominal wheel in deflated conditions up to maximum permissible speeds. Test shall be shall conducted in accordance with ERTS clause 17.5.2.10.9. Calculations shall be in accordance with EN14363 Method 3): Railway applications - Testing for the acceptance of running characteristics of railway vehicles	Tender condition Prevails	N
32	Part 2, Section - VI (ERTS)	11.6.2.2	Fabricated frame material shall be of low-alloy, high-tensile steel and shall conform to <b>EN 10025 - 1 to 5</b> . The use of equivalent materials shall require CMRL's approval.	AT proposal as follows:  The bogie frames shall be of fabricated, robust construction, using high tensile carbon steel to EN10025/ JIS G3114 or an approved international standard, capable of withstanding heavy duty load, the design incorporating adequate safety margins.  Please confirm.	Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
33	Part 2, Section - VI (ERTS)	11.8.1	Journal bearings shall be tapered or spherical roller bearings, grease lubricated, and sealed such that field lubrication is not required. The journal bearings shall be of size and configuration typically available in India, where possible. They shall have not less than a 90 percent probability of an expected life of at least the equivalent of 3,000,000 km at the AW4 car weight.	AT Proposal is as follows:  axle bearings shall be of a proven type. The roller bearings shall have a minimum life rating of 3 million kilometers when computed in accordance with the method given in ISO 281/1.  Please confirm.	Tender condition Prevails	N

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34	Part 2, Section - VI (ERTS)	11.9.19	The Contractor shall carry out bearing life calculations to demonstrate that the selected size of bearing is adequate for L10 bearing life of 3,000,000 km under AW4 car loading (including dynamic force effects) in accordance with the method given in ISO 281/1	AT Proposal is as follows:  The Contractor shall carry out bearing life calculations to demonstrate that the selected size of bearing is adequate for L10 bearing life of 3,000,000 km under AW4 car loading (including dynamic force effects) in accordance with the method given in ISO 281/1.  Please confirm.	Tender condition Prevails	N												
35	Part 2, Section - VI (ERTS)	11.12.1	At both the outer ends of the Driving Motor Car, an obstruction deflection & detection device and derailment detection device (ODDD) shall be installed to detect the obstacles and push away obstacles on track to avoid derailment. All other bogies shall have derailment detection device.	AT proposal is as follows:  At the front of the DM car, an obstruction deflection detection & derailment detection device shall be installed. The actuation of the obstruction detection & derailment detection device due to impact of the object, shall initiate the emergency brake and shall be recorded by the TCMS.  Bidder request to modify the clause as follows : At both the outer ends of the Driving Motor Car, an obstruction deflection & detection device and derailment detection device (ODDD) shall be installed to detect the obstacles and push away obstacles on track to avoid derailment. <b>All other bogies shall have derailment detection device.</b>  Please confirm.	Tender condition Prevails	N												
36	Part 2, Section - VI (ERTS)	12.6.8.8	The Contractor shall furnish the maximum braking distance from a speed of 80kmph to stop, under emergency brake application. The guaranteed maximum braking distance shall satisfy the requirements specified in ERTS Clause 2.14.3.2 & 2.14.3.3 for Braking performance.	AT request to modify clause as follow:  The Contractor shall furnish the maximum braking distance from a speed of 80kmph to stop, under emergency brake application The guaranteed maximum braking distance shall satisfy the requirements specified in ERTS Clause 2.14.3.2 & 2.14.3.3 for emergency Braking performance.  The Contractor shall provide the guaranteed emergency brake de-acceleration rate to signaling Contractor during interface.	Tender condition Prevails	N												
37	Part 2, Section - VI (ERTS)	12.6.7.12	In case of train immobilization due to application of Parking brakes, it shall be possible to mechanically release the lever from inside the Coach for release of Parking brakes without the necessity to access train under frame during train operation in mainline/depot.	In case of train immobilization due to application of Parking brakes, We Propose to release individual parking brake actuators manually from track or from platform level as it is preferred for GoA4 Operation. Please modify the clause accordingly.	Sentence corrected as  In case of train immobilization due to application of Parking brakes, it shall be possible to mechanically release the lever from Platform level for release of Parking brakes without the necessity to access train under frame during train operation in mainline/depot.	Y												
38	Part 2, Section - VI (ERTS)	2.17.1.i	EN ISO 3381 (2005): "Acoustics – Measurement of noise inside rail bound Vehicles" and	EN ISO 3381 <b>latest revision is 2011</b> "EN ISO 3381 (2011): "Acoustics – Measurement of noise inside rail bound Vehicles" and  Please update with latest revision	It is already mentioned that "Standards used shall be latest issued version".	N												
39	Part 2, Section - VI (ERTS)	2.17.1.ii	EN ISO 3095 (2005): "Acoustics – Measurement of noise emitted by rail bound Vehicles".	EN ISO 3095 <b>latest revision is 2013</b> "EN ISO 3381 (2013): "Acoustics – Measurement of noise inside rail bound Vehicles" and.  Please update with latest revision.	It is already mentioned that "Standards used shall be latest issued version".	N												
40	Part 2, Section - VI (ERTS)	2.17.3.4.a	<b>2.17.3 Interior and Exterior Noise Control and Criteria</b> During Stationary condition the specified limits shall be met with all auxiliary equipment operating simultaneously at maximum capacity.	We propose to follow ISO 3381:2011, Section 6.3.4 defines the auxiliary equipment operating conditions defines as follows : "Auxiliary equipment on the test vehicle that normally operates during the run shall be in action"  Bidder request to modify the clause as follows :  "During Stationary condition the specified limits shall be met with all auxiliary equipment operating simultaneously on the test vehicle that normally operates during the run shall be in action "  We propose to follow ISO 3095:2011, Section 5.4.2 defines the auxiliary equipment operating conditions as follows : "All equipment that operates continuously when the unit is stationary shall be operating at normal load, which is the performance at an external temperature of 20°C"  Bidder request to modify the clause as follows : "During Stationary condition the specified limits shall be met with all auxiliary equipment operating simultaneously at	Modified as 2.17.3.4 a. During Stationary condition, the specified limits shall be met with all auxiliary equipment loads operating simultaneously and shall be considered during test for noise measurement.	Y												
41	Part 2, Section - VI (ERTS)	2.17.3.5.b	During Stationary condition the specified limits shall be met with all auxiliary equipment operating simultaneously at maximum capacity.		Tender condition Prevails	N												
42	Part 2 – Part- 2: Section VI ERTS	2.17.4.2, Table 2-77	<table><tr><th colspan="2">Table 2-11: Maximum Wayside Noise Levels</th></tr><tr><th>Condition</th><th>Avg. Noise Level</th></tr><tr><td>All systems operating simultaneously, including air conditioning and propulsion cooling system, rake stationary</td><td>65 dBA at 15 m</td></tr><tr><td>Each auxiliary system operating alone, car stationary</td><td>68 dBA at 5 m</td></tr><tr><td>Rake at any speed up to 30 km/h, maximum acceleration or maximum full service brake with all auxiliaries operating under normal conditions.</td><td>81 dBA at 15 m</td></tr><tr><td>Rake between 30 km/h and 80 km/h, maximum acceleration or maximum full service brake with all auxiliaries operating under normal conditions.</td><td>82 dBA at 15 m</td></tr></table>	Table 2-11: Maximum Wayside Noise Levels		Condition	Avg. Noise Level	All systems operating simultaneously, including air conditioning and propulsion cooling system, rake stationary	65 dBA at 15 m	Each auxiliary system operating alone, car stationary	68 dBA at 5 m	Rake at any speed up to 30 km/h, maximum acceleration or maximum full service brake with all auxiliaries operating under normal conditions.	81 dBA at 15 m	Rake between 30 km/h and 80 km/h, maximum acceleration or maximum full service brake with all auxiliaries operating under normal conditions.	82 dBA at 15 m	We understand that highlighted requirement at 5 m is typo error as requirement requirement defined at 7.5 m in table 2.10. Please clarify.	Noted.	Y
Table 2-11: Maximum Wayside Noise Levels																		
Condition	Avg. Noise Level																	
All systems operating simultaneously, including air conditioning and propulsion cooling system, rake stationary	65 dBA at 15 m																	
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Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
43	Part 2, Section - VI (ERTS)	19.2.7	The following materials shall not be used in the construction of the car without CMRL's prior approval: a) PVC b) Asbestos c) Cadmium, except in Ni-Cd batteries d) Lead in brake shoes e) Urethane foam f) Chlorinated fluorocarbons that may cause environmental problems or handling hazards g) Materials that, in their normal installed state, emit products that are known to be toxic or irritative	The restriction of below highlighted materials will have impact on functional aspects of components and solution to their alternatives are a technological challenge for now  	Tender condition Prevails	N
44	Part 2, SEC VI ERTS, Section 9	2.4.1.11 & 2.14.2.5	2.4.1.11 The round trip running time, under All-out Mode, for AW4 train loaded condition for 3-car train with one bogie of one motor coach (for 3-car train) & one motor coach (for 6-car train) cut-out, shall not be more than the scheduled round trip time as declared by the Contractor vide ERTS 1.4.5. In such case the operation may be high TE mode. Under such operation conditions the temperature rise of the propulsion equipment shall not exceed the respective thermal ratings and the train shall be able to start and move on a UP gradient of 4%.  2.14.2.5 The design of the traction control system and the associated traction motors shall ensure that in the event of an inverter (plus associated control equipment) or bogie failure, at AW4 condition, the rake shall continue to operate as far as its scheduled destination without incurring a delay of greater than five (5) minutes.	This two clauses are contradictory in requirement. Cl. 2.4.1.11 requires no time delay in one bogie/MC cutout condition. Cl. 2.14.2.5 provides relaxation of 5 minutes in bogie condition failure condition. Please Clarify	Tender condition Prevails	N
45	Part 2, SEC VI ERTS, Section 9	9.3.10	The auxiliary converter inverter AC output voltage of three-phase supply shall be regulated within $\pm 5\%$ of the nominal voltage and output frequency within 48 Hz to 52 Hz 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	AT propose to follow EN 50533:2011 Which allows 2% Voltage Imbalance. Please modify the clause accordingly to ensure standard design can be used.	Tender condition Prevails	N
46	Part 2, SEC VI ERTS, Section 10	10.12.6	All propulsion equipment shall be rated to ensure for operation of normally operating train for a further period of 2 hours or a round trip whichever is more with single traction propulsion unit in operation. It shall be possible to operate already working train for 2 hours or round trip, whichever is more, with one unit isolated in high tractive effort mode without exceeding the specified temperature limits.	Operation under high tractive effort mode and one unit isolated is 50% cutout case. As per cl. 2.14.1.12, one way journey is to be completed under this specified condition. Hence operation for 2 hours or round trip shall be changed to one way journey in this clause.	Tender condition Prevails	N
47	Part 2, SEC VI ERTS, Section 10	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.	It is asked to provide one converter-inverter per bogie and this will measure current for two motors. Kindly change the clause to suitably.  Bidder request to modify the clause as follows : 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.	Tender condition Prevails	N
48	Part 2, SEC VI ERTS, Section 19	19.58.2	The Software Design Description, in (b) above, shall comply with IEEE 1016.	We suggest to include EN50657 as an option for converter control software which is internationally accepted standard for it. Bidder request to modify the clause as follows : 'The Software Design Description, in (b) above, shall comply with IEEE 1016/EN50657.'	Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
49	Part 2, SEC VI ERTS, Section 19	19.58.3	The final Software Design Description shall include details required by ATA 102, through all levels to level 6.	We believe that ATA refers to 'Air Travel Association' and will not be applicable for train software design. We will follow EN50657 for propulsion control software. Kindly confirm the same.	Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
50	Part 2, SEC VI ERTS, Section 20	20.6.5	Hardware spare capacity 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. Resource Spare Capacity Memory 50% Disk Storage 50% Communication Links/Ports 50% Input/Output Capacity 20%	We understand that this requirement does not belongs to converter control, kindly confirm the same.	Please refer to Clause 20.2.2	N
51	Part 2, SEC VI ERTS, Section 9	9.3.4	The auxiliary converter shall be independently supplied from main transformer, with respect to the traction converter supply. The auxiliary converter shall receive its power from a separate winding in the Traction Transformer. The four output voltages of Auxiliary converter inverter system shall be as follows: Output 1: 415 V 50 Hz 3 ph. 3 wire Output 2 230 V 50 Hz 1 ph Output 3 110 V DC Output 4 48 V DC (shall be provided if required) Output 5 24 V DC (shall be provided if required)	To reduce train bus and jumpers we propose to remove Output 2: 230V 50Hz 1φ. Instead we suggest to state: " 230V 50Hz 1φ should be available in each car with galvanic isolation from 415 V ac. Further 48 V dc and 24 V dc supply is not standard output available from auxiliary converter. Other suitable solutions can be used if these supply voltages are required.	Noted.	Y
52	Part 2, SEC VI ERTS, Section 9	9.4.6	The box for auxiliary converter shall be such that to avoid any corrosion throughout the service life on any account the box shall last for the life time of the auxiliary converter unit without needing any attention. The box shall be of stainless steel material. The box cover which may have to be removed for maintenance shall be suitable secured against falling. All hinged doors of the box shall be openable from bottom to top direction. The usage of bolts, washers and fittings shall be such that they shall be retained on the panels when the panels are opened.	The converter box material should not be restricted to stainless steel only. Anodized aluminium is also corrosion proof material and widely used in these application. Hence requesting to open the requirement for anodized aluminium material also.	Sentence corrected in Addendum 1.	N

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SI no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
53	Part 2, SEC VI ERTS, Section 10	10.11.8	Traction inverters shall be housed in a stainless container, which is mounted under floor in each of the motorized cars. The container shall house the power electronics, the monitoring devices and the traction control unit. It is connected to the vehicle via high voltage power connections, control connections and 3-phase output to the traction motors.	The converter box material should not be restricted to stainless steel only. Anodized aluminium is also corrosion proof material and widely used in these application. Hence requesting to open the requirement for anodized aluminium material also.	Sentence corrected in Addendum 1.	N
54	Part 2, SEC VI ERTS, Section 9	9.2.2 & 9.3.14	9.2.2 The auxiliary power supply distribution scheme shall be so configured that each 3 cars unit (DMC + TC + DMC) has two sets of auxiliary power supply equipment in a single unit. When any rake operator's cab is activated, these two auxiliary converter inverter shall be operated and equally share the entire 100% auxiliary load of 3 car train. 9.3.14 No failure of the auxiliary converter inverter shall immobilize the train. The Contractor shall submit data on the redundancy level proposed for the auxiliary inverter/converter and shall explain the degraded modes operation philosophy of auxiliary converter inverter. (CDRL 9-5). Individual auxiliary converter inverter system shall connect to 50% of the auxiliary loads in each car so that in the event of a failure of one auxiliary converter inverter, at-least 50% auxiliary loads of each car of train shall still continue to operate in normal operation. This system shall be designed .....	As per the RFP two auxiliary converter is expected to operate in parallel equally sharing the entire 100% auxiliary load. In case of failure of one auxiliary converter failure all the Train load cannot be catered by healthy auxiliary converter.  We propose to consider alternate arrangement also where Only one auxiliary converter can be in operation taking entire 100% auxiliary load and In case of failure, redundant second auxiliary converter can take the 100% auxiliary load to achieve better redundancy.	Tender condition Prevails	N
55	Part 2, SEC VI ERTS, Section 18	18.6.4.1	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 2 Network.	We request to consider the delay time of 3min for service affecting failure in=line with other Metro project in India. Bidder request to modify the clause as follows.  Failures that result in service operational delay in the specific train for more than 2 3 minutes at any location of the mainline or during induction from depot/mainline in the CMRL Phase 2 Network.	Tender condition Prevails	N
56	Part 2, SEC VI ERTS, Section 18	18.6.6.1	Level2: Twelve (12) months period after passenger service induction date of first train – 125,000KM	We request to consider the Level 2 Target as 100,000 Km inline with latest DMRC Tender; Bidder request to modify the clause as follows.  Level2: Twelve (12) months period after passenger service induction date of first train – <b>125,000KM</b> 100,000KM	Tender condition Prevails	N
57	Part 2, SEC VI ERTS, Section 14	14.1.5	l) Wheel Sliding signal transmission to Signaling, Brakes and Traction systems,	We request you to kindly Delete the requirement as mentioned below;  WSP is at SIL2 at Brake level to manage Hazard. No need foreseen to transmit the safety information to signaling, brakes and traction system at SIL2	Tender condition Prevails	N
58	Part 2, SEC VI ERTS, Section 14	14.1.5	n) Holding Brake demand signal transmission,	We request you to kindly <b>Delete</b> the clause as mentioned below;  We understand, no need for Transmission of holding brake signal at SIL2 as demand for holding brake given at fixed effort.	Tender condition Prevails	N
59	Part 2, SEC VI ERTS, Section 14	14.1.5	r) Real time remote transmission of train data as defined in RTR-DMS of ERTS Section 14.11 & 14.13.	We request you to kindly <b>Delete</b> the requirement as it is not a Safety Function	Tender condition Prevails	N
60	Part 2, SEC VI ERTS, Section 11	11.9.15	The Contractor shall provide and install a wayside automatic wheel profile measuring system at a suitable location in CMRL maintenance depot, where the rakes are expected to be maintained. The cost of the system shall be deemed to be included in the quoted price. The equipment details shall be submitted to CMRL during Pre-final design stage, for approval. The Contractor shall provide and install a wayside Hot Axle measuring system in each corridor at a suitable location in consultation with CMRL. The cost of the system shall be deemed to be included in the quoted price. The equipment details shall be submitted to CMRL during Pre-final design stage for approval.	Bidder requests to clarify below 1.CMRL informed there are 2 depots in Phase2. Please inform at which depot the wayside automatic wheel profile measuring system has to be installed. 2.The hot axle box detection has to be installed which of corridors (Line3 , line 4 or Line5) of phase 2 On the designated corridor, does CMRL want the hot axle box detection systems on each of UP line and DOWN line or only one of two line (either UP line or DOWN line)	this shall be for both UP and DN lines in Line 4 of CMRL Phase 2.	N
61	Part 2 ERTS	12.15.1	Brake Pipe (BP) controlled back-up brake system including a separate pneumatic control unit shall be provided in order to take over the control function in case of failure of electronic or electric control elements in the brake system	Bidder propose to change the clause as follows –Brake Pipe (BP) controlled back-up brake system including a separate pneumatic control unit shall be provided in order to take over the control function in case of failure of electronic or electric control elements in the brake system, <b>Alternatively, Contractor may provide extension of EP brake and emergency brake lines from healthy train to defective train through a suitable jumper cable which can be connected manually during such eventualities</b>	Tender condition Prevails	N
62	PART – 2 : SECTION VI – ERTS Page 344 of 741	Clause 14.10.6.7	The method of downloading data from the event recorder shall be standard wireless means with adequate anti-hacking protection	Remote download data from the event recorder through wireless communication network of signalling system can meet the adequate anti-hacking protection. So it is suggested to delete this clause.	Tender condition Prevails	N
63	PART – 2 : SECTION VI – ERTS Page 458 of 741	Clause 18.6.6.1	Level1 Six (6) months period after passenger service induction date of first train Type 1 Failure Minimum MDBF 80000km	The requirement of the reliability calculation is too strict. It is suggested to change this clause to:" Six (6) months period after passenger service induction date of first train Type 1 Failure Minimum MDBF 60000km"	Tender condition Prevails	N
64	PART – 2 : SECTION VI – ERTS Page 459 of 741	Clause 18.6.6.1	Level2 Twelve (12) months period after passenger service induction date of first train Type 1 Failure Minimum MDBF 125000km	The requirement of the reliability calculation is too strict. It is suggested to change this clause to" Twelve (12) months period after passenger service induction date of first train Type 1 Failure Minimum MDBF 100000km"	Tender condition Prevails	N

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Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum																																
65	Part I Section -IV Bidding Forms Page 121 of 208	Annexure –GA1	Unit Exchange Spares: DETAILS NOT TO BE FILLED HERE. IT SHALL BE FILLED AND UPLOADED IN THE PRICE BID OF E-PROCUREMENT PORTAL ONLY	We understand that the Unit Exchange Spares need to be filled and uploaded in the price bid of e-procurement portal. So it is suggested to change this clause to" Unit Exchange Spares: IT SHALL BE FILLED AND UPLOADED IN THE PRICE BID OF E-PROCUREMENT PORTAL ONLY."	Tender condition Prevails	N																																
66	Part-1; Section - III; Evaluation and Qualification Criteria (EQC)	Cl. No. 1.1.1 Personnel	<div>The Bidder must demonstrate that it has the personnel for the key positions that meet the following requirements:</div> <table><tr><th>No.</th><th>Position</th><th>Total Work Experience (Minimum number of years)</th><th>Experience in Similar Works (Minimum number of years)</th></tr><tr><td>1</td><td>Project Manager (to be Contractor's Representative under GC 4.3)</td><td>20</td><td>10</td></tr><tr><td>2</td><td>Engineering Manager</td><td>20</td><td>10</td></tr><tr><td>3</td><td>Interface Manager</td><td>15</td><td>7</td></tr><tr><td>4</td><td>Chief Maintenance Engineer</td><td>12</td><td>7</td></tr><tr><td>5</td><td>Project Quality Manager</td><td>15</td><td>7</td></tr><tr><td>6</td><td>Project OHSE Manager</td><td>15</td><td>7</td></tr><tr><td>7</td><td>Testing and Commissioning Manager</td><td>10</td><td>5</td></tr></table> <div>The bidder must submit the names of the key personnel and their experience records in Forms PER-1 and PER-2 in Section IV, Bidding Forms.</div>	No.	Position	Total Work Experience (Minimum number of years)	Experience in Similar Works (Minimum number of years)	1	Project Manager (to be Contractor's Representative under GC 4.3)	20	10	2	Engineering Manager	20	10	3	Interface Manager	15	7	4	Chief Maintenance Engineer	12	7	5	Project Quality Manager	15	7	6	Project OHSE Manager	15	7	7	Testing and Commissioning Manager	10	5	We request CMRL to kindly consider and remove the Key Management Personnel requirement from Evaluation and Qualification Criteria. This may be submitted by the bidder under Technical Bid. This was discussed & agreed in the 1st pre-bid. However, subsequently not removed.	It is suggested to submit the details in EQC. The requirements are spelled out in ERTS. Tender Condition Prevails.	N
No.	Position	Total Work Experience (Minimum number of years)	Experience in Similar Works (Minimum number of years)																																			
1	Project Manager (to be Contractor's Representative under GC 4.3)	20	10																																			
2	Engineering Manager	20	10																																			
3	Interface Manager	15	7																																			
4	Chief Maintenance Engineer	12	7																																			
5	Project Quality Manager	15	7																																			
6	Project OHSE Manager	15	7																																			
7	Testing and Commissioning Manager	10	5																																			
67	Part-1, Section - III Evaluation and Qualification Criteria (EQC)	2.4.2 (b) Specific Experience	Note: For (B) and (C) the bidder should either have design experience or procure/subcontract design from experienced designer or form a JV with a company having design experience. The credential to this effect should be submitted with the bid.	Please confirm that procurement of design can also be done through TOT. Please confirm for the sake of the tender the 'Procurement of Design' and 'Transfer of Technology of Design' holds similar meaning. TOT is a more proven method than 'direct procure' or 'subcontract'. This was allowed in recent project of MMRDA MONORS3. We request CMRL to add TOT as well.	Tender condition Prevails	N																																
68			b. Also, Applicant in the capacity of a Parent Company as a single entity is not permitted to use the credential of its Subsidiary Company/ Companies unless the Applicant participates in bid as JV/Consortium with minimum 15% participation each for such member(s).	Parent Companies owning 100% of its subsidiary may freely use the design or manufacture credential of its subsidiary. And not necessarily have to take part in JV/ Consortium with token participation. Single entity bidder allows easy completion of contract.	Tender condition prevails.	N																																
69	Addendum No. 1; dated 30/03/2021; Part-1, Section – IV Bidding forms	12 (b)	New Clause included : UNDERTAKING REGARDING RESTRICTIONS ON PROCUREMENT FROM A BIDDER OF A COUNTRY WHICH SHARES A LAND BORDER WITH INDIA AND ON SUB-CONTRACTING "We have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; We (Include name of Company, Single bidder / JV Member) certify that our company and the Beneficial ownership of our organisation is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. Thereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]" STAMP & SIGN OF AUTHORIZED SIGNATORY	We understand that the tenderer has to submit a land border declaration. But we request CMRL to exempt Sub- contractors from submitting Land Border declaration. Therefore, we request CMRL to remove this form.	Tender condition prevails.	N																																
70	Part- 1; Section - IV: Bidding Forms	Sl. No. 4; Cl. No. 4.2 Pricing Summary (BID TOTAL)	Allowable apportionment to Price Centre A: 8%	We request CMRL for allowable apportionment to Price Centre A to be 10% and the remaining Price Centres may be apportioned accordingly.	Tender condition prevails.	N																																
71	Part-1; Section - IV Bidding Forms	9. UNDERTAKING FOR MINIMUM LOCAL CONTENT		Please confirm if the self- certificate of 60% of Minimum Local Content signed by the authorised signatory as per the tender document will be valid during the tendering stage and until 15 days of issue of LoA.	Please refer to revised clause in Addendum 2	Y																																
72	Part-1, Section – IV Bidding Forms	9. UNDERTAKING FOR MINIMUM LOCAL CONTENT	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 practising cost accountant or practising chartered accountant (in respect of suppliers other than companies) giving the percentage of local content	Please confirm that a certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant has to be submitted within 15 days/ 21 days from the Last Date stipulated for Bid Submission.	Please refer to revised clause in Addendum 2	Y																																
73	Part 2 – Section VI ERTS – System Requirements	2.26.5.1	Smoke & Heat detection system shall be used for fire detection in the passenger area of rolling Stock including emergency driver desk and all electrical cabinets.	Smoke & Heat detection system using the infrared or latest technology shall be used for fire detection in the passenger area of rolling Stock including emergency driver desk and all electrical cabinets.	Tender condition prevails.	N																																
74	Part-3, Section - VIII Particular Conditions (Part A: Contract Data)	Sl. No. 16; Sub Cl. No. 14.2 Total Advance Payment	10% of the Accepted Contract Amount (Excluding Provisional Sum) payable as Interest free Mobilization advance in the currencies and proportions in which the Accepted Contract Amount is payable. Mobilization advance shall be paid in two equal instalments.	We request CMRL to consider 20% as Advance Payment	Tender condition prevails.	N																																
75	Part-3, Section - VIII Particular Conditions (Part A: Contract Data)	Part B – Specific Provisions, PCC Clause No. 18, GCC Clause No. 4.1	<b>‘Car Shell Structural Qualification Testing’ Payment Security and ‘First Article Inspections’ Payment Security:</b> The Contractor shall at the time of the submission of the invoice for payment of Car Shell Structural Qualification Testing and First Article Inspections provide a security in an amount equal to the payment for these price centers (milestones) (calculated in accordance with Price Schedule to the Contract Agreement, and in the same currency or currencies. The security shall be in one of the forms of bank guarantee in the form provided in the bidding documents or in another form acceptable to the Employer. The security will become null and void when the first 35 trains are issued with the Taking-Over Certificate by the Employer.	We understand that the bifurcation of the bank guarantee for Car Shell Structural Qualification Testing is 3% and First Article Inspections is 7%. Please confirm.	Yes.	N																																



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Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
76	Part-3, Section - VIII Particular Conditions (Part A: Contract Data)	Summary of Sections (Key Date)	<p><b>1. Prototype Train:</b> KD-RS-1-3 : Manufacturing , Testing , Delivery (including shipment) and receipt of prototype train in Depot - Time for Completion 740 days</p> <p><b>2. Delivery of trains in nominated Depots:</b> KD-RS-2-1 : 6 Train Sets (excluding one prototype train) – 1st - Time for Completion - 832 days KD-RS-2-2 : 6 Train Sets – 2nd lot - Time for Completion - 892 days KD-RS-2-3 : 6 Train Sets – 3rd lot - Time for Completion 953 days KD-RS-2-4 : 7 Train Sets – 4th lot - Time for Completion 1025 days</p>	Delivering 7 Train Sets in a duration of 2.5 months from the previous lot is difficult. So, We request CMRL to consider the Time for Completion for "KD-RS-2-4 : 7 Train Sets - 4th lot to split that into two part or extend the completion period.	Tender condition prevails.	N
77	Part 2 – Section VI ERTS – System Requirements	2.25.1	Tenderers shall note that 'SPECIFIC ENERGY CONSUMPTION (SEC)' shall be verified in any one corridor of Phase 2 as agreed with CMRL under conditions detailed hereafter in this clause shall not exceed 48 Wh/GTKM, referred to as SECs. Also the Tenderer shall submit the simulation results for all corridors of Phase 2 in Pre-Final Design stage.	Please consider to revise the SEC limits as per MHOUD Metro standard requirements, as follows. However after simulation studies upon receipt of missing corridor line profile (especially Line 4), we will seek for further clarification, if any. Tenderers shall note that 'SPECIFIC ENERGY CONSUMPTION (SEC)' shall be verified in any one corridor of Phase 2 as agreed with CMRL under conditions detailed hereafter in this clause shall not exceed 50 Wh/GTKM, referred to as SECs. Also the Tenderer shall submit the simulation results for all corridors of Phase 2 in Pre-Final Design stage. Further, will a bidder offering a deviation from the weight either plus or minus from the above weight will be incentivised / penalised? if so, please confirm the methodology or calculation for the same.	Tender condition prevails.	N
78	Part 2 – Section VI ERTS – System Requirements	2.25.8	If the actual specific energy consumption exceeds the estimated specific energy consumption quoted by the Contractor by more than 3%, the Contractor shall carry out rectification work on the train, within a reasonable time as agreed with CMRL. In case the Contractor fails the penalty shall be applied as per Conditions of Contract.	We request CMRL to kindly reconsider the clause as "If the actual specific energy consumption exceeds the estimated specific energy consumption quoted by the Contractor by more than <b>5%</b> , the Contractor shall carry out rectification work on the train, within a reasonable time as agreed with the Engineer. In case the Contractor fails, the penalty shall be applied as per Conditions of Contract.	Tender condition prevails.	N
79	Part 2 – Section VI ERTS – Car Body	3.4.4.1 - Roof	The roof structure, including the sheathing, shall be capable of sustaining, without permanent deformation, loads from car-washing equipment and concentrated loads of 250 lbf [1,112 N] over a 0.5 ft2 [0.05 m2] area, as might be applied by a maintenance technician carrying tools during equipment repairs.	We propose the roof structure shall be designed to support the HVAC equipment, pantograph, VCB, surge arrester, ducts, conduit, lighting fixtures, headlining, stanchions and other equipment, and shall, in addition, have sufficient strength to support, without permanent deformation, concentrated loads of 1000N, applied by personnel working on the roof at increments of 750mm apart. The minimum thickness of roof sheet shall not be less than 1.0mm for stainless steel cars. Higher load will increase the car body weight. 1000N will be sufficient. This may be at discretion of the designer, complying to the specifications.	Tender condition prevails.	N
80	Part 2 – Section VI ERTS – Car Body	3.4.6.1; Gangway	An open gangway, split or one-piece, shall be provided between the ends of interconnecting Cars. Gangway doors are not desired.	We propose <b>double piece double skin with interior panels</b> shall be provided between the ends of interconnecting Cars. Gangway doors are not desired.	Tender condition prevails.	N
81	Part 2 – Section VI ERTS – Car Body	3.4.6.12 Gangway	The gangway and the Car structure, to which it is attached, shall withstand all operating loads without permanent deformation or damage.	We propose the coupler shall provide adequate support to the gangway with passengers. Alternative gangway support systems may be proposed. Full details shall be provided. This may be as per the vehicle design of the bidder and hence request not to specify.	Tender condition prevails.	N
82	Part 2 – Section VI ERTS – Car Body	3.4.8.2	The height of the side door threshold shall be 3.2 mm maximum above the top surface of the finished floor, with a maximum slope toward the outside of the car of 25 mm in 305 mm.	We request CMRL to remove this clause as it is a non-critical item and might not be specified.	Tender condition prevails.	N
83	Part 2 – Section VI ERTS – Car Body	3.4.8.3	The door threshold may extend beyond the nominal car width at floor height by not more than 38 mm. Beyond the doorway, on both sides of the doorway, the extension strip shall gradually slope towards the sidewall to form a horizontal ramp. The threshold extension shall be designed, constructed and installed to shear off if impacting any wayside structures without causing additional damage to the car structure.	The door threshold may extend beyond the nominal car width at floor height <b>Shall be permissible limit..</b> Beyond the doorway, on both sides of the doorway, the extension strip shall gradually slope towards the sidewall to form a horizontal ramp. The threshold extension shall be designed, constructed and installed to shear off if impacting any wayside structures without causing additional damage to the car structure.  This is a non-critical item and may not be specified.	Tender condition prevails.	N
84	Part 2 – Section VI ERTS – Car Body	3.5.2.3	Overall carbody heat transfer shall not exceed 80 kJ/hr°C/m of car length and shall be verified through testing as specified in ERTS 17.	We propose, the Aluminum carbody shall be designed to have high thermal insulation to reduce the heat loss and heat transfer coefficient (K value) of the carbody excluding glazing/windows shall be kept within 1.6-2.5W/(m2K). As heat transfer may not be specified. Heat transfer coefficient range may be give, the bidder will comply.	Tender condition prevails.	N
85	Part 2 – Section VI ERTS – Car Body	3.6.5.5	The seats shall provide an adequate level of comfort, have a good appearance and be scuff and vandal resistant. The width of seats shall not be less than 450mm. The depth shall be a minimum of 670 mm, including leg room. The depth of the seat shall be minimized to provide maximum standing room and shall be approved by CMRL.	We propose the seats shall provide an adequate level of comfort, have a good appearance and be scuff and vandal resistant. The width of seats shall follow Indian Anthropometric Dimension including leg room. The depth of the seat shall be minimized to provide maximum standing room and shall be approved by CMRL. Specifying the bigger seats, will affect the standing in area in the coach and hence the capacity. It is more acceptable to follow IAD specification, which are standard.	Tender condition prevails.	N
86	Part 2 – Section VI ERTS – Car Body	3.14.5.3	The energy of a car loaded to AW2 loaded condition travelling at up to 10 km/h, colliding with a stationary Car (with brakes applied), shall all be absorbed within the recoverable stroke of the coupler resilient element and the motions of the Cars involved shall be stopped with no structural damage to any Car.	We request CMRL to reconsider this clause as The energy of a car loaded to AW2 loaded condition travelling <b>at up to 5 km/h</b> , colliding with a stationary Car (with brakes applied), shall all be absorbed within the recoverable stroke of the coupler resilient element and the motions of the Cars involved shall be stopped with no structural damage to any Car.	Tender condition prevails.	N

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87	Part 2 – Section VI ERTS – Car Body	3.14.5.4	At closing speeds of 10 km/h to 25 km/h, the coupler shall absorb the additional energy within its sacrificial elements for AW2 loading condition. The couplers shall progressively collapse bringing into play the anti-climb protection which shall remain fully engaged and operational under the action of vertical shear loads (upwards and downwards) equivalent to half the Crush Loading Condition Car weight. For survival zone during collision scenario, the requirements of EN15227 Section 6.3 shall apply, or an equivalent analysis, if approved by CMRL.	Please clarify whether it is a closing speed or collision speed.	closing speed.	N																			
88	Part 2 – Section VI ERTS – Passenger Doors	6.2.2	The two door panels at each passenger doorway shall be synchronously controlled and shall provide a door clear opening width of equal spacing of not less than 1.4 m. Since platform screen doors (PSD) will be used at all stations with full height PSDs in underground stations and half height PSDs in elevated stations, the location, interdoor distance & size of the door panels are important for the PSD equipment supplier. Contractor shall coordinate with PSD contractor as part of interface.	We request CMRL to reconsider the clause as The two door panels at each passenger doorway shall be synchronously controlled <b>with anti drag feature and LED indicator strip</b> and shall provide a door clear opening width of equal spacing of not less than 1.4 m. Since platform screen doors (PSD) will be used at all stations with full height PSDs in underground stations and half height PSDs in elevated stations, the location, interdoor distance & size of the door panels are important for the PSD equipment supplier. Contractor shall coordinate with PSD contractor as part of interface.	with Anti drag feature to be included.	Y																			
89	Part 2 – Section VI ERTS – Passenger Doors	6.2.9	Limit switches used shall be of high reliability and with IP 65 protection. Life of the limit switches shall be at least 15 years. The Contactor shall furnish details during Pre-Final Design Stage.	We request CMRL to delete this clause as it is an Electrical item and these are easily removable items.	Tender condition prevails.	N																			
90	Addendum No. 1, Sr. No. 70, Part 2, Section - VI (ERTS)	6.3.7	During all door operations and under all power supply conditions, door movements shall be smooth, controlled and devoid of jerks or any violent motion. Linear motor drive shall be used for door operation in case of external Sliding Door.	Linear motor drive for doors is a new design and not proven. Thus should be left for the designer to decide based on provenness. Thus, we request CMRL to kindly consider this point.	Tender condition prevails.	N																			
91	Part 2 – Section VI ERTS – Section 10 HV & Propulsion System	10.13.10	The motor bearing maintenance inspection interval (excluding lubrication if required) shall exceed 1.2 million kilometres and the bearing shall have a design life of minimum 2.1 million kilometres.	We request CMRL to reconsider the motor bearing maintenance inspection interval (excluding lubrication if required) shall exceed <b>1.0 million kilometres</b> and the bearing shall have a design life of minimum 2.1 million kilometres.	Tender condition prevails.	N																			
92	Part 2 – Section VI ERTS – Bogie Assembly	11.4.2	Elastomeric springs are preferred by CMRL and shall have a minimum amount of "creep". Elastomeric springs shall be subject to an approved program of preloading or exercising at assembly of the bogie to compensate for the deflection caused by initial "creep" of the elastomer. Provision shall be made in the bogie design to compensate for "creep" and keep the bogie properly levelled and trammed.	We request CMRL to delete this clause as the condition of creep speed is limiting. The bidder will offer bogie as per bidder's design wherein will comply with comfort requirement.	Tender condition prevails.	N																			
93	Part 2 – Section VI ERTS – Train Control Management System	14.5.5	DDU Access Control Levels The level of access to distinct screens shall be controlled for the train operator and maintenance personnel. At least three levels shall be defined which shall be user name and password protected. The details shall be reviewed by CMRL.	Kindly reconsider it as "DDU Access Control Levels The level of access to distinct screens shall be controlled for the train operator and maintenance personnel. At least <b>two</b> levels shall be defined which shall be user name and password protected. The details shall be reviewed by CMRL."	Tender condition prevails.	N																			
94	Part 2 – Section VI ERTS – Train Control Management System	14.5.6	<b>Test Mode Extension of DDU</b> The TCMS DDU shall be connected to the Ethernet Train Bus and it shall be possible to simultaneously plug-in multiple laptops at any point on the train bus and replicate the TCMS DDU display. Suitable application software shall be developed to enable replication of TCMS DDU along with touch and/or mouse-based interaction. Such additional DDUs shall login as "Test Mode" that shall be provided in addition to the "Operator and "Maintainer" modes of the TCMS.	We request CMRL to remove this clause	Noted.	Y																			
95	Part 2 – Section VI ERTS – Train Control Management System	14.10.6.2	The Contractor shall supply one event recorder for each train, easily removable, mounted in a car in an approved location. a) Redundancy: Redundant event recorder compliant with GM/RT 2472:2002 shall be provided for the train. The event recorder shall be redundant to each other and shall be type tested to demonstrate the integrity of recorded data and ability to extract data following an incidence.	Wr request CMRL to reconsider the clause as "The Contractor shall supply one event recorder for each train, easily removable, mounted in a car in an approved location. a) Redundancy: Event recorder compliant with GM/RT 2472:2002 shall be provided for the train. The event recorder shall be type tested to demonstrate the integrity of recorded data and ability to extract data following an incidence."	Noted.	Y																			
96	Part 2 – Section VI ERTS – Train Control Management System	14.10.6.7	The method of downloading data from the event recorder shall be standard wireless means with adequate anti-hacking protection. Additionally, a HDMI or latest compatible interface shall be provided for downloading the data.	We request CMRL to modify the clause as: The method of downloading data from the event recorder shall be standard wireless means with adequate anti-hacking protection. Additionally, a latest compatible interface shall be provided for downloading the data.	Tender condition prevails.	N																			
97	Part 2 – Section VI ERTS – Section 17 Test Program	17.6.13	The Contractor shall subject each car to a complete test for water tightness. Water tightness shall comply with IP-65. All exterior appointments or car body seams that may affect water tightness of the car body—such as destination signs, indication lights, crew switches, Doors, VAC, windows, front & rear end cabins and all equipment—shall be installed at the time of this test. At a minimum, the test shall meet the following specifications:	We request CMRL to reconsider the clause as "The Contractor shall subject each car to a complete test for water tightness. All exterior appointments or car body seams that may affect water tightness of the car body—such as destination signs, indication lights, crew switches, Doors, VAC, windows, front & rear end cabins and all equipment—shall be installed at the time of this test. At a minimum, the test shall meet the following specifications:"	Tender condition prevails.	N																			
98	Part 2 – Section VI ERTS – Section 18 Systems Assurance	18.6.6.1	The Reliability calculation shall be as per the below requirements: <table><tr><td>Level</td><td>Fleet Reliability</td><td>Type 1 Failure Minimum MDBF</td></tr><tr><td>Level 1</td><td>Six (6) months period after passeng service induction date of first train</td><td>80,000 Km</td></tr><tr><td>Level 2</td><td>Twelve (12) months period after passenger service induction date of first train</td><td>1,25,000 Km</td></tr></table>	Level	Fleet Reliability	Type 1 Failure Minimum MDBF	Level 1	Six (6) months period after passeng service induction date of first train	80,000 Km	Level 2	Twelve (12) months period after passenger service induction date of first train	1,25,000 Km	We request the reliability calculation to be as follows: <table><tr><td>Duration</td><td>Minimum fleet average MDBF (3-car fleet)</td></tr><tr><td>After 12 months of start of revenue service</td><td>80000</td></tr><tr><td>After 18 months of start of revenue service</td><td>100000</td></tr><tr><td>Failure causing a delay greater than 60 minutes or requiring detrainment of passengers at a station or cancellation of train prior to passenger service</td><td>2,400,000</td></tr><tr><td>Critical failure (Withdrawal of train from passenger service causing detrainment of passengers on track)</td><td>8,000,000</td></tr></table>	Duration	Minimum fleet average MDBF (3-car fleet)	After 12 months of start of revenue service	80000	After 18 months of start of revenue service	100000	Failure causing a delay greater than 60 minutes or requiring detrainment of passengers at a station or cancellation of train prior to passenger service	2,400,000	Critical failure (Withdrawal of train from passenger service causing detrainment of passengers on track)	8,000,000	Tender condition prevails.	N
Level	Fleet Reliability	Type 1 Failure Minimum MDBF																							
Level 1	Six (6) months period after passeng service induction date of first train	80,000 Km																							
Level 2	Twelve (12) months period after passenger service induction date of first train	1,25,000 Km																							
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99	Part 2, Section - VI (ERTS)	2.2.26	This Rolling Stock contract shall operate in all three corridors of CMRL Phase 2 and there shall be multiple Rolling Stock Contractors for all the three corridors of Phase 2 along with its extensions. The Contractor as above shall ensure that all requirements of the Technical Specification and Compatibility between the Rolling Stock is ensured, for the system such as (but not limited to) Traction system, Coupler System, Pneumatic supply extension, Door pitch, etc., are properly satisfied.	<p>Coupled train operation for revenue service is not required as per ERTS. e.g.: (DM-T-DM)+(DM-T-DM) In addition, we believes that the Rake manufactured for Line 4 under the Phase 2 contract will not couple with the Rake manufactured for other Lines to make the connection between each TCMS Networks.</p> <p>Does this mean that rake manufactured for different lines by different Rolling Stock and different signalling contractor plan to couple ? According to the ERTS 9.10.3, there is no requirement to couple the TCMS network between trains during the rescue operation.</p> <p>ERTS 9.10.3 under the the power supply shall consist at-least the below mentioned functions.</p> <p>a) Equipment required for application &amp; release of all kinds of brake functions in sick train.</p> <p>b) Equipment required for Communication between two trains' (Healthy and Sick) operators</p> <p>c) External parking lights for the sick train</p> <p>d) Cabin lighting of the sick train</p> <p>e) External Head lamps of sick train in case of Push operation by Healthy train.</p> <p>f) Windshield wiper supply</p> <p>g) Pneumatic Horn supply</p>	<p>ERTS 9.10.3 only describes the electrical controls and power supplies requirements during train coupling.</p> <p>However, there are multiple other requirements of train coupling mentioned in ERTS. ERTS 4.2.13 clearly states that "The train's front &amp; rear end automatic couplers shall be used for coupling / uncoupling and for rescue operation with trains of other Rolling stock contracts of the CMRL phase 2 project. RS Contractor shall interface with other Rolling stock contractors of CMRL Phase 2 for the same."</p> <p>Revised ERTS 9.10.3 is mentioned in addendum 02</p>	N
100	Part 2, Section - VI (ERTS)	3.4.1.4.7	All equipment boxes and covers shall be made of stainless steel for stainless steel car body and shall be made of Aluminum for Aluminum car body.	<p>We do not think it is necessary to match the materials of the underfloor equipment and the car body. We propose the following modifications.</p> <p>"All equipment boxes and covers shall be made of stainless steel or Aluminum."</p>	Tender condition prevails.	N
101	Part 2, Section - VI (ERTS)	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.	<p>We understood that CMRL prefers lowest-maintenance equipment and it is being respected.</p> <p>Consumables like greasing, rubber gasket etc. are minor items and shall be implemented/ replaced on intervals before overhaul, to enhance the service-life of the equipment.</p> <p>Since, there is no clear definition of "Major maintenance"; and Consumables shall not be part of it.</p> <p>Please either confirm that consumables are not part of it, or revise the ERTS as follows:</p> <p>"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)."</p>	Tender condition prevails.	N
102	Part 2, Section - VI (ERTS)	10.11.8	Traction inverters shall be housed in a container, which is mounted under floor in each of the motorized cars. The mateiral of the container shall be in accordance to the Carbody material.	<p>We do not think it is necessary to match the materials of the underfloor equipment and the car body. We propose the following modifications.</p> <p>"Traction inverters shall be housed in a container, which is mounted under floor in each of the motorized cars. The material of the container shall be Al or SUS."</p>	Tender condition prevails.	N
103	Part 2, Section - VI (ERTS)	12.12.3	In the event of wheel slide, the traction equipment shall work in tandem with Brake electronics to manage the strategy to adopt, in implementing electric braking in axles of motor cars and pneumatic braking in axles of trailer cars, without having the blending in opposition.	<p>The brakes used to stop the vehicle are pneumatic braking and the final control of the brakes should be carried out by the brake electronics. We propose the following modifications.</p> <p>"In the event of wheel slide, the brake electronics shall work in tandem with the traction equipment to manage the strategy to adopt, in implementing electric braking in axles of motor cars and pneumatic braking in axles of trailer cars, without having the blending in opposition."</p>	Noted.	Y
104	Part 2, Section - VI (ERTS)	14.2.1	(e) When cars are coupled or uncoupled, the network shall automatically reconfigure itself for the new train configuration. The configuration shall identify each car in the new train by its car number.	<p>Revised Cluase as per Addendum No. 1, dt. 30/03/2021 : is same as the initial clause.</p> <p>We request CMRL to check &amp; confirm, TCMS network should be connected via Auto coupler other car? (We understand that coupled train operation is not required).</p>	<p>Please refer to Addendum 1, S.No 135 for revised clause for better understanding.</p> <p>This clause is only meant for cars within train.</p>	N
105	Part 2, Section - VI (ERTS)	14.2.2	<p>Ethernet Train Backbone (ETB) Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5. If required ETB network shall be adopted for Rescue operation.</p> <p>Ethernet Train Backbone (ETB) Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5. If required ETB network shall be adopted for Rescue operation.</p> <p>[CMRL Response] ETB shall be used only for Rescue operation ?</p>	<p>We understand that coupled train operation is not required. Please check if this clause can be deleted and include the 6 car extension in Clause 14.2.3 since 6 car operation can be achieved without the use of additional ETBN hardware.</p> <p>We understand coupled train configuration of TCMS Network is not required according to ERTS 9.10.3. Please check if this clause can be deleted?</p>	Deleted.	Y
106	Part 2, Section - VI (ERTS)	14.2.3	Ethernet Consist Network (ECN) Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. The ECN shall maintain redundant communication links to the ETB.	<p>The data transmission medium in Ethernet-based Train Bus shall be doubled to support redundancy. It shall be possible that number and type of connected consist networks in existing 3- car train can vary during operation by insertion of "MC+MC+TC" cars in the middle of the train to form a 6-car train in future as defined in ERTS Section 1"</p> <p>Data transmission with ECN shall be according to the latest technology. Regarding redundancy to be followed by ECN link with ETB , it is better to be deleted according to ERTS 9.10.3.</p> <p>We request CMRL to update the clause as "Ethernet Consist Network (ECN) Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted.</p>	Refer Addendum 2 for revised clause.	Y

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107	Part 2, Section - VI (ERTS)	19.58.1	The Contractor and/or supplier providing any microprocessor-based equipment shall submit a Software Quality Assurance Plan for CMRL approval [CDRL 19-35] complying with IEEE 730 and containing, as a minimum, the following documentation requirements: a. Software Requirements Specification b. Software Design Description c. Software Verification and Validation Plan d. Software Verification and Verification Report e. User Documentation. f. Source code shall be written in a high-level language such as "C and shall be provided to CMRL."	Please include the IEC 62279:2015.  The Contractor and/or supplier providing any microprocessor-based equipment shall submit a Software Quality Assurance Plan for CMRL approval [CDRL 19-35] complying with IEEE 730 or IEC 62279:2015 and containing, as a minimum, the following documentation requirements:	<b>As mentinoed in ERTS 1.2.3 &amp; 1.2.4</b> , Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
108	Part 2, Section - VI (ERTS)	19.58.2	The Software Design Description, in (b) above, shall comply with IEEE 1016.	Please include the IEC 62279:2015.  The Software Design Description, in (b) above, shall comply with IEEE 1016 or IEC 62279:2015	<b>As mentinoed in ERTS 1.2.3 &amp; 1.2.4</b> , Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
109	Part 2, Section - VI (ERTS)	20.4.6	Software life cycle: This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.	Please include the IEC 62279:2015.  This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128 or IEC 62279:2015	<b>As mentinoed in ERTS 1.2.3 &amp; 1.2.4</b> , Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
110	Part 2, Section - VI (ERTS)	20.5.1	Roles and responsibilities As far as the building and demonstration of the software safety of the Project is concerned, the Contractor shall produce the various Safety Cases of the technical systems (excluding O&M Procedures), according to the standard EN 50129,	Please include the IEC 62425:2007.  As far as the building and demonstration of the software safety of the Project is concerned, the Contractor shall produce the various Safety Cases of the technical systems (excluding O&M Procedures), according to the standard EN 50129 or IEC 62425:2007	<b>As mentinoed in ERTS 1.2.3 &amp; 1.2.4</b> , Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
111	Part 2, Section - VI (ERTS)	20.6.4	i. Systems configured by application data (Refer to EN 50128 § 17) ii. Software Languages (Refer to EN 50128 § 10).	We are unable to identify the standard. 1) EN 50128 <b>§ 17</b> 2) EN 50128 <b>§ 10</b> We request CMRL to check & confirm.	EN 50128 section 17 & section 10 are referred here	N
112	APPENDIX A1 : DETAILED SOFTWARE DEVELOPMENT V- CYCLE		The following Software Development V-cycle is proposed by the standard EN 50128:	Please include the IEC 62279:2015.  The following Software Development V-cycle is proposed by the standard EN 50128 or IEC 62279:2015	<b>As mentinoed in ERTS 1.2.3 &amp; 1.2.4</b> , Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
113	Part 1-Section IV	4.4.1 (BF-23)  Price Centre A	The bidder shall not fill the amounts here. The amounts for this Price centre inclusive of all milestone numbers is to be filled in Price  Summary sheet in e-procurement only.  <u>The amounts for the individual milestone under this price centre will be filled by the successful bidder only at the time of signing the</u> agreement; they will be based on the amounts filled in Bid Total sheet and the payment procedure described in Pricing Schedule and Part 2 of the tender document, subject to the ceiling of the values in the Tender total sheet for respective currencies.	As per the underlined portion of the clause, we understand that during tender stage as part of price bid, there is no need to provide break up of Price Centre - A.  Kindly confirm.	Yes.	N
114	Part 1-Section IV	4.4.6 (BF-29)  Price Centre C	The bidder shall not fill the amounts here. The amounts for this price centre inclusive of all milestone numbers is to be filled in Pricing Summary sheet only.  <u>The amounts for the individual milestone under this price centre will be filled by the successful bidder only at the time of signing the agreement;</u> they will be based on the amounts filled in Bid Total sheet and the payment procedure described in Pricing Schedule and Part 2 of the tender document, subject to the ceiling of the values in the Tender total sheet for respective currencies.	As per the underlined portion of the clause, we understand that during tender stage as part of price bid, there is no need to provide break up of Price Centre - C.  Kindly confirm.	Yes.	N
115	Part 1-Section IV	4.4.8 (BF-31)  Price Centre E	The bidder shall not fill the amounts here. The amounts for this price centre inclusive of all milestone numbers is to be filled in Pricing Summary sheet only.  <u>The amounts for the individual milestone under this price centre will be filled by the successful bidder only at the time of signing the agreement;</u> they will be based on the amounts filled in Bid Total sheet and the payment procedure described in Pricing Schedule and Part 2 of the tender document, subject to the ceiling of the values in the Tender total sheet for respective currencies.	As per the underlined portion of the clause, we understand that during tender stage as part of price bid, there is no need to provide break up of Price Centre - E.  Kindly confirm.	Yes.	N
116	Part 1-Section IV	4.4.9 (BF-32)  Price Centre F	The bidder shall not fill the amounts here. The amounts for this price centre inclusive of all milestone numbers is to be filled in Pricing Summary sheet only.  <u>The amounts for the individual milestone under this price centre will be filled by the successful bidder only at the time of signing the agreement;</u> they will be based on the amounts filled in Bid Total sheet and the payment procedure described in Pricing Schedule and Part 2 of the tender document, subject to the ceiling of the values in the Tender total sheet for respective currencies	As per the underlined portion of the clause, we understand that during tender stage as part of price bid, there is no need to provide break up of Price Centre - F.  Kindly confirm.	Yes.	N

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117	Part 1-Section IV	4.4.10 (BF-33)  Price Centre G	The bidder shall not fill the amounts here. The amounts for this price centre inclusive of all milestone numbers is to be filled in Pricing Summary sheet only.  <u>The amounts for the individual milestone under this price centre will be filled by the successful bidder only at the time of signing the agreement;</u> they will be based on the amounts filled in Bid Total sheet and the payment procedure described in Pricing Schedule and Part 2 of the tender document, subject to the ceiling of the values in the Tender total sheet for respective currencies	As per the underlined portion of the clause, we understand that during tender stage as part of price bid, there is no need to provide break up of Price Centre - G and the underlying itemized spares prices as well.  Kindly confirm.	Please refer to revised clause in Addendum 2	Y
118	Part 1-Section IV	BF-115	UNDERTAKING FOR MINIMUM LOCAL CONTENT.....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 practising cost accountant or practising chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.....	CMRL in its responses to 1st pre-bid meeting has clarified that the statutory auditor or cost auditor certificate should be provided during bid submission itself.  We request to permit submission of the certificate within 21 days after the submission of the bid. This is being followed by other metro corporations as well.	Please refer to revised clause in Addendum 2	Y
119	Part 1-Section IV	2.5 Subcontractors/manuf acturers	Form Sys-1 (Bogie)	The information in Form Sys-1 has not been sought in earlier tenders. Existing Clients have their own formats and do not accept customized formats. Hence, it is requested to accept the certificate / document proof from the existing clients capturing the requirements as per Evaluation and Qualification Criteria (EQC) and not insist on the formats. Kindly accept.	The form shall be submitted in any format, It is bidder's responsibility to ensure that all the necessary information sought by CMRL are captured	N
120	Part-1, Section IV	2.5 Subcontractors/manuf acturers	Form Sys – 2 (Propulsion)	The information in Form Sys-2 has not been sought in earlier tenders. Existing Clients have their own formats and do not accept customized formats. Hence, it is requested to accept the certificate / document proof from the existing clients capturing the requirements as per Evaluation and Qualification Criteria (EQC) and not insist on the formats. Kindly accept.	The form shall be submitted in any format, It is bidder's responsibility to ensure that all the necessary information sought by CMRL are captured	N
121	PART- 2 : SECTION VI	11.1	Cited References: AAR M114-90 Specification for Helical Springs, heat treated steel.	ERTS clause 11.1 calls for specification of helical/steel springs. This clause is contradicting with ERTS clauses 11.4.2 and 11.4.5.1.	Please refer to Addendum 1 S.No 111.	N
122		11.4.2	"Elastomeric springs are preferred by CMRL..."	It is noted from CMRCL responses to bidder's pre-bid query dated 30.03.2021 that CMRCL opines that ERTS allows usage of other equivalent standards subject to approval from CMRL. However, it might be noted that equivalent standard to helical/steel springs will point to another similar component but not Elastomeric springs.	Please refer to Addendum 1 S.No 111.	N
123		11.4.5.1	The primary suspension shall consist of elastomeric elements, such as chevrons or conical rubber springs.	In view of the above, clarity may please be provided if CMRL prefers Elastomeric springs only or helical/steel springs based designs are also acceptable and relevant ERTS clauses may be revised suitably with relevant standards.	CMRL preference is only Elastomeric springs.	N
124	PART- 2 : SECTION VI	2.13.2.2	"... any position on the car or bogie shall not cause vibration on any portion of the car floor, side-walls... or holding components in excess of 2.0 mm peak-to-peak amplitude for the frequency range from 1.4Hz to 20Hz, and in excess of 0.8 mm per second peak vibration velocity for the frequency range above 20Hz.  ...withstanding shock and vibrations of the rolling stock satisfactorily such that they do not fail prematurely on this account earlier to the designed life..."	ISO 2631-1/2 standard referred in ERTS clause 2.13.2.1 is relevant for human exposure to whole-body vibration and shock in residential buildings (civil structures). Hence, requested to clarify the relevance of limiting values specified with the shock and vibrations of the rolling stock and its design life.  In view of the above, it is requested to update ERTS clause suitably with relevant standard from which the limiting values are referred or the clause may be deleted.	2.13.2.1 is revised as ISO 2631-4	Y
125	PART- 2 : SECTION VI	11.2.7	The bogie systems shall safely function at all speeds up to and including the safe design speed as defined in ERTS clause 2.14.1 without any loss of stability, under all conditions of track and <b>car wear</b> on the system as defined in ERTS Section 2."	The clause may please be updated as below:  "The bogie systems shall safely function at all speeds up to and including the safe design speed as defined in ERTS clause 2.14.1 without any loss of stability, under all conditions of track and <b>wheel wear</b> on the system as defined in ERTS Section 2."	Noted.	Y
126	PART- 2 : SECTION VI	11.2.13	<b>There shall be sufficient clearance (but not less than 25 mm between the bogie and car body</b> to allow the car to operate with a deflated secondary suspension system such that damage does not occur at maximum operating speeds under conditions of maximum loading and maximum wheel and suspension system component wear, including creeping or settling.	The clause may please be modified as " <b>There shall be sufficient clearance between the bogie and car body</b> ..."	Tender condition prevails.	N
127	PART- 2 : SECTION VI	11.2.20	Fire properties of the materials used shall comply with EN 45545 part 1 to part 7 latest editions (Category 4-A, Hazard level HL3) as a minimum or better international standard applicable for similar Metro applications. Requirements of ERTS section 2.26 shall be met	The clause may please be modified " <b>Except for the bogie mounted rubber bonded metal components</b> ", since the natural rubbers cannot comply to EN 45545 in order to achieve desired suspension characteristics.	Noted.	Y
128	PART- 2 : SECTION VI	11.2.18.3.9	"Under conditions of a dragging parking brake for a minimum distance of 3 kilometers at a speed of 10Km/h, 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 preliminary design stage."	Repercussions of the ERTS clause requirement is not practical. Bogie mounted braking system, wheels and tracks may be subjected to severe damage. The clause may please be updated suitably with relevant standard or the clause may please be deleted.	Tender condition prevails.	N
129	PART- 2 : SECTION VI	11.4.13.6	"Bogie swing tests shall be conducted in accordance with ERTS clause 17.5.2.12 between interface of motor car and trailer car to verify the required degree of rotation (horizontally and vertically) and that cables and hoses are clear from any pinching, chafing and stretching,"	The clause may please be updated suitably covering relevant standard and methodology.	Tender condition prevails.	N



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Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
130	PART- 2 : SECTION VI	11.3.3	b. The Contractor shall demonstrate that the bogie assembly design is compatible with the collision requirements of these Technical Specifications.	The clause may please be deleted since collision requirements talks only about carbody which is tested and proved with crashworthiness.  (Or)  The clause may please be updated with the relevant standard.	Tender condition prevails.	N
131	PART- 2 : SECTION VI	11.3.3	c. CMRL reserves the right to request a new stress analysis and static and dynamic tests should previous tests be deemed inappropriate.	The clause may please be elaborated and relevant standard may please be included.	Tender condition prevails.	N
132	PART- 2 : SECTION VI	11.4.2	Elastomeric springs are preferred by CMRL and shall have a minimum amount of "creep". Elastomeric springs shall be subject to an approved program of preloading or exercising at assembly of the bogie to compensate for the deflection caused by initial "creep" of the elastomer.	The clause may please be modified by including a reference standard	Tender condition prevails.  JIS E 4206 : Spring Rigging for Railway rolling Stock can be adopted or any other International Standard. Generally Creep is defined by OEM.	N
133	PART- 2 : SECTION VI	11.4.13.2 11.4.13.5	11.4.13.2: The Sperling ride index of the rake at 80 km/h shall not exceed <b>2.50</b> in both vertical and horizontal directions in inflated condition of secondary suspension and <b>3.0</b> in deflated condition. 11.4.13.5: The contractor shall submit calculations to confirm that ride index lateral and vertical shall not exceed <b>2.75</b> under all normal operating conditions for new cars and new track, and shall not exceed <b>3</b> under all normal operating conditions for worn-out cars operated on rundown track conditions	The ride index mentioned in both the clauses is contradicting. The clauses may please be modified accordingly.	Please refer S.No 112 of Addendum 01.	N
134	PART- 2 : SECTION VI	11.4.14	The Contractor shall submit a detailed dynamic model to demonstrate the running behavior and performance characteristics of the proposed service proven bogie design. (CDRL11-8)	Usually a vehicle dynamic analysis report will be submitted. The clause may please be elaborated with regard to the dynamic model and a reference standard may please be provided	Tender condition prevails.	N
135	PART- 2 : SECTION VI	11.5.1.1.1	"Bogies shall be attached to the carbody with positive mechanical connections so that the bogies remain attached when the car is raised. Connections shall be accessible and detachable with conventional hand tools to disassemble bogie. <b>Provision shall be made for de-bogieing in areas of limited headroom, such as under bridges."</b>	Para 2 of the ERTS clause seems impractical and technically incomplete. In view of the above, requested to revise the clause with tentative values of the limited headroom/provide reference with respect to SOD or delete para 2 of the clause	Sentence deleted. "Provision shall be made for de-bogieing in areas of limited headroom, such as under bridges"	Y
136	PART- 2 : SECTION VI	11.6.4.1	"In addition to the bogie loading identified in this section, the contractor shall ensure that the bogies are capable of surviving the collision scenarios specified in ERTS clause 3.5.8 without detaching from the car or deforming in a manner that will penetrate the passenger compartment. <b>Equipment supports shall also be designed to prevent equipment from becoming projectiles."</b>	Highlighted portion of the ERTS clause is open without any reference to standards, methodology and criteria, in general for bogie system and especially for equipment supports. In view of the above, ERTS may please be updated providing the reference to standard or by deleting the highlighted portion of the clause. The ERTS clause 3.5.8 referred is not available. Hence the clause may please be corrected suitably.	Refer Addendum 2 for revised clause.	Y
137	PART- 2 : SECTION VI	11.6.6	Trammeling and Axle Parallelism	The clause may please be elaborated and please provide the reference to standard	It is described in detail under clause 11.6.6.1	N
138	PART- 2 : SECTION VI	11.9.4	"The wheel and suspension shall be optimized to minimize squealing in curves, track curves are 120m on mainline and 100m on depot. <b>This must be confirmed by test."</b>	Highlighted portion of the ERTS clause is open without any reference to standards, methodology and criteria. In view of the above, ERTS may please be updated providing the reference to standard or by deleting the highlighted portion of the clause.	It is performed in Oscillation test.	N
139	PART- 2 : SECTION VI	11.9.23.1	""The measured load per axle shall not exceed the above mentioned figure by more than <b>2% according to IEC 61133</b> . Under AW0 load condition of car, weight shall comply to IEC 61133 standard. The following requirements of <b>IEC 61133 Clause 5.3.6</b> are acceptable for the vehicle: a) Measured load on the line of wheels on one side does not differ by more than +/- <b>4%</b> from the average of the measured loads on both sides of the wheels. b) For a given axle, the measured load per wheel does not differ by more than +/- <b>4%</b> from the average load per wheel on this axle."	Clause 5.3.6 not found in Standard IEC 61133. ERTS clause may suitably be updated with relevant standard and criteria.	Refer Addendum 2 for revised clause.	N
140	PART- 2 : SECTION VI	11.12.1	"At both the outer ends of the Driving Motor Car, an obstruction deflection & detection device and derailment detection device (ODDD) shall be installed to detect the obstacles and push away obstacles on track to avoid derailment. <b>All other bogies shall have derailment detection device."</b>	ERTS clause may suitably be updated clarifying the requirement of the derailment detection device in all bogies i.e., rear bogies of Driving Motor Car and bogies of intermediate cars. Usual practice is providing a Obstacle deflection and derailment detection device on the front bogie of DM car. Also, the location of detection device i.e., front, rear or either ends of all bogies may please be explicitly defined. The mentioned requirement will also add up to the cost of the project and hence the clause may please be suitably modified.	Tender condition prevails.	N
141	Part 2, Section - VI (ERTS)	3.4.9.1.4	Body-side windows shall comprise two panes of glass with outer laminated glass and inner non-shattering toughened glass separated by an air gap hermetically sealed against ingress of moisture and internal misting.	<b>Non shattering</b> condition on the toughened glass to be deleted. When pointed object hits the toughened glass, the glass will break into fragments which is the inherent requirement of the toughened glass and BIS & international standards specifies the same.	Tender condition prevails.	N
142	Part 2, Section - VI (ERTS)	4.6.1.7	New clause: Connector, Closing mechanism of Electrical Head of the Rake's Front and rear end Coupler shall be rated for at-least IP 65 in accordance with EN 60529	Connectors shall be rated IP 65.  IP 65 cannot be achieved for closing mechanism of E-head, due to condensation issue inside electric head, Hole has to be provided in the E-head to avoid condensation . CMRL requested to change, closing mechanism to <b>IP 55</b> .	Noted.	Y
143	Part 2, Section - VI (ERTS)	6.2.3	The passenger Door pitch shall be approximately equally spaced over the length of the rake. The contractor shall submit the door layout design for approval. (CDRL 6-1)	If the Door pitch is equally spaced over the length of the rake the passenger seating capacity will be reduced. The original bid condition holds good by maintaining the passenger door pitch equally spaced over the length of each car of the rake.	Tender condition prevails.	N

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144	Part 2, Section - VI (ERTS)	6.3.7	During all door operations and under all power supply conditions, door movements shall be smooth, controlled and devoid of jerks or any violent motion. Linear motor drive shall be used for door operation in case of external Sliding Door.	Re-consider the amendment in qualifying both the motor drive technologies and allow suppliers to use PMDC brush motors or linear drive motor technology.	Tender condition prevails.	N
145	Part 2, Section - VI (ERTS)	7.3.10	Tender condition prevails.	HVAC filter elements are required to be cleaned every month. It will be convenient to replace the fresh and return air filter from inside the car. As HVAC units are mounted on car roof, it will be a cumbersome job to get on top of the car and open the HVAC covers to replace the filters. Hence it is requested to change the clause as "Air filter elements shall be changeable from Inside/outside the car"	While cleaning / changing the filters it makes messy around the surroundings. So it is required from Outside only. Tender condition prevails.	N
146	Part 2, Section - VI (ERTS)	7.4.8.1	Tender condition prevails.	As per the HVAC supplier's experience, closing the damper in 5 seconds is not achievable. This is because of limited availability from actuator motor suppliers complying to HL3 requirement. Hence, it is requested to change closing time to 10 seconds	Noted.	Y
147	Part 2, Section - VI (ERTS)	7.10.1	Tender condition prevails.	Due to tilted angle of front mask of DM car, usually the length of DM car roof will be smaller and hence the size of the DM car length will be less than T/M car. Hence it is requested to change the clause as "Conditioned air from each unit shall be directly introduced into a duct running the full length of the car and be discharged into the car through ceiling outlets. <del>The supply air duct design shall be uniform in all cars</del> "	Tender condition prevails.	N
148	Part 2, Section - VI (ERTS)	7.11.12	Tender condition prevails.	Considering the extremely dusty conditions, It is proposed to clean filters before 5000 kms or 15 days of train run whichever is lower. The same interval is followed in most of metro projects. Clogged filters may lead to lower airflow & water leakage issue.	Tender condition prevails.	N
149	2	2.14.1.5	The following performance requirements shall be achievable with any degree of wheel wear including rail adhesion level no greater than 20%, any track conditions within the design criteria, any passenger Loading Condition (up to AW4) on level tangent track: (CDRL 2-8)	In actual, rail wheel adhesion cannot be controlled but typically will be 16%. Hence, 20% limit is high as it is not practical. In actual if the adhesion is lower, required stopping distance may not be able to achieve. <b>We recommend to keep 18% maximum value.</b>	Tender condition prevails.	N
150	2	2.15.9.3	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. Alternatively, the contractor must demonstrate fail safe proven design to CMRL	Watch dog time of 3 sec is too low as in 3 s the system is not always able to compensate sliding fully. This will lead to flat wheels and do not realise the effectiveness of the WSP performance. <b>As per UIC 541-05 requirement, it is 10 sec. and hence it is highly recommended to follow UIC requirement to get the best WSP performance.</b> For better train performance at low adhesion, it is strongly recommended to follow UIC requirement	Refer Addendum 2 for revised clause.	Y
151	11	11.2.18.3.9	Under conditions of a dragging parking brake for a minimum distance of 3 kilometers at a speed of 10Km/h, 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 preliminary design stage.	Parking brake is released when pulling the train unless not possible due to train stopped inside tunnel / bridge. Dragging requirement will limit the safety against rolling under worst case. It is advisable to remove dragging brake requirement or allow wheel flat.	Tender condition prevails.	N
152	11	11.2.18.3.10	The parking brake shall be an integral part of the friction brake actuation system. Brake actuators shall be sufficient to permit push-through without any wheel damage.		Tender condition prevails.	N
153	12	12.6.5	In the event of a failure of the dynamic brake, the friction brake shall be capable of carrying out three 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 brake application will increase the wheel temperature upto 380° C which is not advisable. CMRL may please to modify the requirement to <b>two consecutive emergency brake applications</b> as in other Metro applications.	Refer Addendum 2 for revised clause.	Y
154	16	16.12.1.5	The Contractor shall submit all documentation as required elsewhere in this contract. Without limitation, the Contractor shall also provide additional information or documentation related to the design and production of the cars if requested to do so by CMRL. In the event that the Contractor deems specific documents to be proprietary, the Contractor must demonstrate to CMRL's satisfaction that the documents are proprietary, and shall enter into a suitable confidentiality agreement that is acceptable to CMRL. For the purpose of this paragraph, confidentiality agreements related to proprietary documentation shall provide CMRL with sufficient access to readily verify compliance with contract requirements and shall provide the Contractor with appropriate commercial protection for sensitive information.	<b>Sensitive / proprietary documents shall be auditable at contractor's premises and allowed to put under ESCROW account.</b> CMRL to please consider this point and clarify the allowing to put under ESCROW as done by other Metro corporations.	Tender condition prevails.	N
155	17	17.5.3.4.1	A braking tread brake block and/or disc pad, if used, and caliper assembly shall be tested on a dynamometer to verify the brake-system capacity with both cold and hot tread brake block and/or disc initial conditions. The block and/or disc and shoe surface temperature shall be measured and recorded throughout the test. At the completion of this test, the tread brake unit and/or brake disc and caliper assembly shall remain in an undamaged, fully operable condition. If brake components other than the block and/or disk brake components are used, such components shall be subject to equivalent thermal capacity testing.	Please clarify - "Brake components other than the block and/or disk" means Tread Brake unit ?	Refer Addendum 2 for revised clause.	Y
156	2	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 80km/h 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	As per Cl. 12.18.2, "In case of single point failure in brake control system, which can be automatically isolated and fully compensated without affecting the train performance". The Emergency brake rate will continue to keep the stopping distance as primary requirement and not deceleration rate. <b>Hence EB deceleration rate requirement should be removed or keep 1.1</b> to avoid conflict with other clauses.	Tender condition prevails.	N

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SI no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
157	2	2.15.10.5	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 pads / brake block close to the disks / wheel treads, but shall not contribute to any braking effort or cause wear to the brake pads / brake blocks.	Wabtec do not recommend 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. Hence, we strongly recommend to <b>remove this clause to avoid any negative impact</b> of brake system	Tender condition prevails.	N
158	12	12.6.8.5	Wheel slide protection shall be available during emergency braking (Except when the command is initiated by the Operator's Emergency Pushbutton available on the Operator Emergency Driver desk or by RSC consoles of OCC, BCC & DCCs in case of UTO mode of operation.)	Irrespective of the mode of Emergency Brake application, <b>WSP should be made available in all braking modes</b> to avoid wheel flat. This clause needs to be changed to delete the requirement "(Except when the command is initiated by the Operator's Emergency Pushbutton available on the Operator Emergency Driver desk or by RSC consoles of OCC, BCC & DCCs in case of UTO mode of operation.)"	Tender condition prevails. This requirement is needed in exceptional cases when stopping of train is the essential criteria than damage to the wheel.	N
159	12	12.7.2	The associated EP brake unit shall be of the energize-to-release type and shall contain all the pneumatic items necessary to control all applications of the friction service brakes and emergency brakes on that car.	All the pneumatic brake application release will work on de-energize to release philosophy. Only Emergency Brake will be energize to release and hence, the clause may please be modified "The associated EP brake unit shall be of the energize-to-release <b>type during Emergency Brake</b> and shall contain all the pneumatic items necessary to control all applications <b>and release</b> of the friction service brakes and emergency brakes on that car	Refer Addendum 2 for revised clause.	Y
160	2	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 IP 65 in accordance with EN 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 IP 66	"Connectors fitted externally to the Car body shall achieve a seal rated to <b>at least IP 65</b> " as adopted in all the Metro applications.	Noted.	Y
161	Part 2- Section VI (ERTS)	12.6.7.12	In case of train immobilization due to application of Parking brakes, it shall be possible to mechanically release the lever from inside the Coach for release of Parking brakes without the necessity to access train under frame during train operation in mainline/depot.	There is no proven solution available for mechanical release of parking brake from inside coach in the absence of compressed air supply. Proven Parking Brake manual release mechanism is available at Platform Level or track level. Parking Brake Manual release arrangement is operated by Bowden cable which has limitation of keeping minimum number of bends and should have shorter length to minimize the effort required to pull it manually by hand. Provision of providing manual release from coach will have a long Bowden cable with several bends, for which manual effort required to pull the cable by hand will not be practically possible. Keeping above points in consideration you are requested to update the ERTS clause by not specifying the location and may be updated as "it shall be possible to mechanically release the lever from inside the Coach / platform level for release of Parking brakes"	Sentence corrected as  In case of train immobilization due to application of Parking brakes, it shall be possible to mechanically release the lever from Platform level for release of Parking brakes without the necessity to access train under frame during train operation in mainline/depot.	Y
162	Part 2- Section VI (ERTS)	17.5.4.8.10	A parking brake system test shall be performed on one three car rake. Design compliance with ERTS section 2 shall be demonstrated by measuring the force required to move the train with the parking brake applied. The test shall be performed with bedded-in brake shoes. Push out test shall be performed in dry condition to prove ERTS section 12.8.5. During this test, all wheels should rotate and shall not slide.	This requirement will limit the safety against rolling under worst case. It is advisable to remove this requirement or allow wheel flat. Kindly requested to update the clause accordingly.	Tender condition prevails.	N
163	Part 2/Section VI	3.4.1.5.5	Hoisting lugs and jacking pads shall be capable of supporting, without permanent deformation, 2 times the appropriate proportion of vertical load from an AW0 car, including bogies, plus 10 percent of this load applied horizontally in any direction.	Only the vertical loads due to tare weight of cars comes into picture, while hoisting and jacking. There will be no horizontal loads during hoisting and jacking. In view of that clause to be reworded or rephrased.	Tender condition prevails.	N
164	Part 2/Section VI	3.9.2	Equipment shall not separate from the car under the collision scenarios defined in ERTS 3.14.10.2	This depends on the velocity at which the car collides. EN 15227 calls only to check the consequences at a collision speed of 25 kmph and not beyond. ERTS clause 3.14.10.2 is deviation from of EN 15227 as standard calls to consider only AW0+50% seated passengers. Therefore clause may be removed and generalized statement "Crashworthiness analysis will be as per EN 15227 may be kept. Otherwise permission may be granted by CMRL to deviate EN 15227	Tender condition prevails.	N
165	Part 2/Section VI	3.14.5.3	The energy of a car loaded to AW2 loaded condition travelling at up to 10 km/h, colliding with a stationary Car (with brakes applied), shall all be absorbed within the recoverable stroke of the coupler resilient element and the motions of the Cars involved shall be stopped with no structural damage to any Car.	The clause to be rephrased. The AW2 condition is a deviation from EN 15227, the standard calls to consider only AW0+ 50% of seated passengers. CMRL to clarify.	Tender condition prevails.	N
166	Part 2/Section VI	3.14.5.4	At closing speeds of 10 km/h to 25 km/h, the coupler shall absorb the additional energy within its sacrificial elements for AW2 loading condition. The couplers shall progressively collapse bringing into play the anti-climb protection which shall remain fully engaged and operational under the action of vertical shear loads (upwards and downwards) equivalent to half the Crush Loading Condition Car weight. For survival zone during collision scenario, the requirements of EN15227 Section 6.3 shall apply, or an equivalent analysis, if approved by CMRL.	The clause to be rephrased. The AW2 condition is a deviation from EN 15227, the standard calls to consider only AW0+ 50% of seated passengers. CMRL to clarify.	Tender condition prevails.	N
167	Part 2/Section VI	13.14.6.1	The Contractor shall perform and submit a stress analysis report of the carbody structure and equipment supports for equipment weighing over 150 Kg prior to commencing manufacture of any carbody structural parts [CDRL 3-14].	There are many equipments weighing 150 kg, the analysis will be carried out for the brackets carrying load more than 500 kg as equipments weighing less than 500 kg doesn't cause any significant implications on structural integrity of metro cars.	Tender condition prevails.	N
168	Part 2/Section VI	13.14.6.2	Stress analyses for supports for items weighing less than 150 Kg may be requested for review at the discretion of CMRL.	There are many equipments weighing 150 kg, the analysis will be carried out for the brackets carrying load more than 500 kg as equipments weighing less than 500 kg doesn't cause any significant implications on structural integrity of metro cars.	Tender condition prevails.	N

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169	Part 2/Section VI	13.14.6.4	The initial stress analysis requires some assumptions as to configuration and weights; also manufacturing and other considerations may require some design changes. And submitted for CMRL review. The final submitted and approved stress analysis shall be for the car as built. As these changes are made, the stress analysis shall be revised.	The analysis may be carried out considering a 5% extra weights considering changes at later date. With that requirement of new set analysis can be avoided. In view of that phrase may suitably amended.	Tender condition prevails.	N
170	Part 2/Section VI	13.14.6.5	Submittal of the input file is required with the model and shall be included as part of the preliminary submittal, and again as part of the complete analysis. Criteria for final approval of the stress analysis shall include the Contractor's submittal of the fully configured input data files as required by this paragraph.	Complete analysis information will be provided in the final report. The inputs file will be in binary format and it will not readable. The clause may remove.	Tender condition prevails.	N
171	Part 2/Section VI	13.14.6.6	Tables shall be prepared comparing the stresses computed in the analysis with stresses computed from the strain gauge readings of the structural tests of TS17. These tables shall be prepared for each test. A minimum of 100 strain gauges shall be used for comparison in each table. The tables shall be annotated to explain differences between the predicted and test values. Analysis and test results shall agree within 15% for at least 80% of the strain gauges and none less accurate than 30%. These tables shall be submitted with the test report as per TS17.	EN 12663:2014 defines that simulation is only for the estimation, after the physical type test the test values holds good. The clause may be rephrased.	Tender condition prevails.	N
172	Part 2/Section VI	3.14.9.1	The car structure shall be designed to sustain collisions with other cars, without unnecessary risk of injury to passengers.	The crashworthiness analysis will be as per EN 15227 & EN 15227 doesn't have any reference for injury related study. The clause may be rephrased	Tender condition prevails.	N
173	Part 2/Section VI	3.14.9.10	A crash energy absorption ("large deflection") analysis of the car shall be made and submitted to assess the energy absorbing properties of the structure. The Contractors shall submit a detailed report showing all the results of the analysis for CMRL's review and approval. [CDRL 3-16] This analysis is required to show that the car crushes in from the end and does not affect the occupied volume. The analysis shall be based on the assumption that one 6 car train in AW2-loading condition, traveling at 25 km/h, impacts another train similarly loaded, which is standing still with friction brakes applied on level, tangent track so that the anti-climbing mechanisms engage.	EN 15227 calls to carry out the analysis in a unbraked condition. Reference for braked condition is not found in the standard & the AW2 condition is a deviation from EN 15227, the standard calls to consider only AW0+ 50% of seated passengers. CMRL to clarify and the clause to rephrased.	Tender condition prevails.	N
174	Part 2/Section VI		At a minimum, the Contractor shall demonstrate by test that the main collision energy absorption elements of the structure achieve the desired Characteristics. The test results shall be correlated with the analyses within an accuracy to be agreed upon with CMRL. A report showing the results of the collision scenarios shall be submitted to CMRL for review and approval. (CDRL 3-17)	Test may be avoided as most sophisticated software tools are available to simulate the same and the testing is time consuming and highly expensive	Tender condition prevails.	N
175	Part 2 – Section VI ERTS Chapter 8	8.4.1.4	Replacement of individual Head light cluster and tail light/Marker light shall be possible in depot without disturbing the functioning or position adjustment of the light. All exterior Lights of train shall be replaceable and re-fitted without disturbing the weather seal.	EN15153-1 is followed, Complete headlight unit will be replaced at once. Changing individual cluster is not possible.	Tender condition prevails.	N
176	Part 2 – Section VI ERTS Chapter 8	8.4.1.5	Individual power LED clusters used as exterior lights shall be able to be replaced easily from track level. Access for cleaning, to replace lights and orientation adjustment shall be done from the car exterior. Replacement of individual cluster shall be possible in depot without disturbing the functioning of the light fixture or wiring.	EN15153-1 is followed, Complete headlight unit will be replaced at once. Changing individual cluster is not possible. The readjustment has to be done at Light vendor factory only.	Noted.	N
177	Part 2 – Section VI ERTS Chapter 8	8.3.1.8	Luminaire efficiency inclusive of LEDs/control gears & optics etc. shall not be less than 100 lm/W at the working junction temperature; higher values of lm/W shall be preferred. LED(s) shall have lumen rating as 100 lumen/W or above.	For LEDs only this would be ok. Diffuser should not be included in this requirement, Meeting this requirement is always a compromise. If High uniformity for diffuser is requested less transparent diffuser must be used which will impact on lumens/watt efficiency.	Noted.	N
178	Part 2 – Section VI ERTS Chapter 8	8.3.1.20	In case of LED lights failure, it shall be possible to easily replace new lights from outside portion of the fixture and shall be maintenance friendly.	LED Strips can be replaceable in Light unit and not LED	Noted.	N
179	Part 2 – Section VI ERTS Chapter 8	8.3.1.18	The Contractor shall replace all the LED lighting with a newly improved LED lighting in fleet of trains if (a) The total cumulative failure rate of the LED luminaries or control gears within Defect Notification Period (DNP) exceeds 5% of the total units, with 20% of LEDs failed in a LED luminaire unit is constituted as a failure of the LED luminaire unit; or (b) The illumination level at floor level of any five trains drops below 90% of the initial values at the end of two-year operation of each train, by assuming maximum of 18 hours daily operation and 365 days of operations.	(b) LED luminance maintain could be complied. There is so many environmental variable which will have influence on illumination level at floor level. E.g. Dust, wall panel aging etc. For example if diffuser is never cleaned it will definitely have effect on illumination level. Thus only LED's can be complied.	Tender condition prevails.	N
180	Part 2 – Section VI ERTS Chapter 8	8.3.1.6	The saloon interior lighting intensity shall be uniformly distributed and shall not be less than 300 lux at any point in the saloon measured 1.5 m above floor level. Lighting intensity requirements inside coaches shall also comply with EN13272.	Generally in all projects it is 300lux from 1m, hence please clarify.	Sentence corrected as level of illumination shall be atleast 200 lux at the floor level of the Coach and not less than 300 lux at seating positions.	Y

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181	Part 2-Section VI	10.11.20	Power system fluctuations within the specified voltage range or feed extensions shall not cause propulsion system shutdown leading to jerks in the train. Adequate capacity shall be built in the DC link and control parameters shall be selected and fine-tuned suitably so that in no case, system stability is adversely affected. The design shall permit to operate trains at minimum 90 seconds headway with normal feeding zone of 15km and extended feeding zone of not less than 30km without any restriction	As per the tender, the RS contractor has to supply 26 trainsets of 3 car each.  Please clarify the following:- a)Whether 'Power System Analysis Design study' should be carried out for all the three corridors? b)Whether the study should be carried out considering only 26 trainsets of 3-car each? c)What is the load distribution i.e., 26 trainsets for each line? d)What is the role of Rolling stock contractor? e)What should be done in case the report of consultant (hired by RS contractor) varies with Traction Contractor? f)What should be the credentials of the consultant?	Entire network is provided, Total Rolling Stock running in the section is mentioned. Based on these information, the simulation shall be made. Further, if any additional information is required, it shall be requested with Interface contractors.  a) to be done for all three corridors	N
182	Part 2-Section VI	10.11.21	Contractor shall hire a reputed Power system analysis Design Consultant with the approval of CMRL and provision shall be made for arranging minimum three presentations by design Consultant to CMRL.	Query same as against Cl.No. 10.11.20	b) to consider 414 cars for all three corridors c) load distribution will be confirmed during design stage.	N
183	Part 2-Section VI	10.11.22	Based on the operational requirements as above, Contractor shall furnish detail report on the minimum sub-station capacity required for adequate harmony with the all-out mode operation of trains within the feeding zone, low frequency control stability to ensure no operational or reliability issue even if the specified headway and large number of trains in the same feeding zone, number of trains parked on the end depot with extended feed and resonance stability of the complete system.	Query same as against Cl.No. 10.11.20	d) Tender condition prevails. e) It shall meet the Interface requirements. f) Shall be according to International standard practice.	N
184	Part 2 – Section VI ERTS	10.11.15	Two trains on each line shall be instrumented with separate Power Quality measuring instruments, data acquisition systems and power analyzer (with provision for permanent installation and shall have necessary in-built software/analysis tool) to measure, record and analyze 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 analyze 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.	1)There is difficulty in finding proven power analyser with the said requirements suitable for Railway applications i.e., meeting Shock and vibration; Ingress Protection, meeting EMI/EMC on one side and some of the supplies meets the above but are only energy meters. Hence, we request you to review your requirement.  2)Further, please clarify the following:-  a)We understand that accuracy of 0.1% is applicable to reading of inputs by the power quality measurement tool. b)The voltage data from secondary of PT (protection class) can be accessed. c)For current data, a rogowski coil is permitted. d)No extra instrument transformer is required to be mounted in roof for this purpose since provisions in all trains leads to high cost.  3)Memory storage can be provided with 48 hours storage with FIFO method in lieu of storage data of 15 days.	1) Tender condition prevails. 2a) Yes. 2b) Separate measuring PT shall be instrumented for the test. 2c) Separate measuring CT shall be instrumented for the test. 2d) Instruments shall be as suggested by Tester / OEM. 3) Tender condition prevails.	N
185	PART- 2 : SECTION VI (ERTS)	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.	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 or international standards like EN 50264(Part 1 to 3) and EN 50306(Part 1 to 4) or Equivalent standards	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
186	PART- 2 : SECTION VI (ERTS)	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.	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 EN 50305 or Equivalent international standards.	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
187	PART- 2 : SECTION VI (ERTS)	19.39.3	16 mm2 and larger shall pass the test specified in IEEE 383, Section 2.5.	16 mm2 and larger shall pass the test specified in IEEE 383, Section 2.5.or EN 50305 or Equivalent international standards.	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
188	PART- 2 : SECTION VI (ERTS)	19.43	HIGH-TEMPERATURE WIRE AND CABLE Insulation for all wires in high-temperature applications, such as those connecting with Heaters and resistors shall conform to the following: 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.	Insulation for all wires in high-temperature applications, such as those connecting with Heaters and resistors shall conform to the following: 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. or EN 50382 or Equivalent international standards	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
189	PART- 2 : SECTION VI (ERTS)	19.44.1	COMMUNICATIONS WIRE AND CABLE 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.	Communications wire and cable shall consist of twisted pairs of not less than 0.5 mm2 Cross sectional area of conductor soft annealed, tinned copper.	Tender condition prevails.	N
190	PART- 2 : SECTION VI (ERTS)	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	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 Equivalent international standards.. 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 or Equivalent international standards.. Class K for flexible wire between the Car body and electric coupler or bogie-mounted equipment	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N



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191	Part-1, Section - III BID No. ARE03 Evaluation and Qualification Criteria (EQC)	2.5 Subcontractors/manufacturers	Form Sys - 2	The information in FORM SYS 2 has not been sought in earlier tenders. Existing Clients have their own formats and do not accept customized formats. Hence, it is requested to accept the certificate / document proof from the existing clients capturing the requirements as per Evaluation and Qualification Criteria (EQC) and not insist on the formats. Kindly accept.	The form shall be submitted in any format, It is bidder's responsibility to ensure that all the necessary information sought by CMRL are captured	N
192	Part-2, ERTS, Addendum No.1 S. No. 25	2.2 GENERAL REQUIREMENTS	2.2.26 This Rolling Stock contract shall operate in all three corridors of CMRL Phase 2 and there shall be multiple Rolling Stock Contractors for all the three corridors of Phase 2 along with its extensions. The Contractor as above shall ensure that all requirements of the Technical Specification and Compatibility between the Rolling Stock is ensured, for the system such as (but not limited to) Traction system, Coupler System, Pneumatic supply extension, Door pitch, etc., are properly satisfied.	We understand equipment wise compatibility (e.g. Traction System) is not required, i.e. interfaces, size, and weight etc. between contracts.	The applicable interface requirements for the systems listed shall be compatible. Tender condition prevails.	N
193	Part-2, ERTS	2.7 CAR GENERAL CHARACTERISTICS	2.7.1 The Contractor shall take this configuration into consideration in the design and manufacture of the 3-Car rakes so that they will be convertible to the CMRL desired 6-car rakes of the future.	We consider this requirement only applied for the scope of Train Control Management System in this Contract.	It is applicable for all sub-systems and all networks	N
194	Part-2, ERTS	ERTS 2.11 ENVIRONMENTAL CRITERIA	ENVIRONMENTAL CRITERIA Table 2-6: Environmental Conditions of Chennai Area Ambient temperature	In case of the tunnel section, max. temp. is also 45°C? Please clarify.	Yes.	N
195	Part-2, ERTS	2.11 ENVIRONMENTAL CRITERIA	2.11.3 With maximum allowable wheel and rail wear, the rakes shall be able to operate in water 100 mm above top of rail, and to creep at up to 8 km/h for a distance of 120 m.	Please clarify meaning and concerned situation of "creep at ... for a distance of 120 m."	Slow speed Movement of train in water	N
196	Part-2, ERTS	ERTS 2.13 SHOCK AND VIBRATION	2.13.1.8 Where acceptable results from prior testing are not available for any item of equipment, tests shall be performed in accordance with IEC 61373 or EN 12663.	Please clarify the definition of "acceptable results from prior testing". We understand that the test in accordance with IEC61373 or EN12663 can be waived if the design of equipment is similar to that of proven equipment which was tested in accordance with IEC61373 in other projects.	Yes.	N
197	Part-2, ERTS	ERTS 2.15 TRACTION AND BRAKING	2.15.3 Traction Motors	Some clause of ERTS 2.15.3 and ERTS 10.13 are duplicated. Therefore, ERTS 2.15.3 may be integrated with ERTS 10.13.	Old: 2.15.3.8 The traction motors shall be designed for a life of thirty-five years with no need for major overhaul before 1 Million Kms.  New: 2.15.3.8 The traction motors shall be designed for a life of thirty-five years with no need for major overhaul before 1.2 Million Kms.	Y
198	Part-2, ERTS	ERTS 2.15 TRACTION AND BRAKING	2.15.3.3 Each motor design shall utilize standard sealed roller bearings for railway applications.	Please confirm that not only rolling bearing but also ball bearing can be used	Tender condition prevails.	N
199	Part-2, ERTS	ERTS 2.26 FIRE PERFORMANCE	FIRE PERFORMANCE	We would like to request that the test in accordance with EN45545 can be waived if the design of equipment is similar to that of proven equipment which was tested in accordance with EN45545 in other projects. Please confirm.	Please refer to clause 2.1 regarding waiver.	N
200	Part-2, ERTS	ERTS 2.26 FIRE PERFORMANCE ERTS 17.5.1.1 ERTS 18.5.6 FIRE AND LIFE SAFETY ERTS 19.61 FLAMMABILITY AND SMOKE EMISSION	FIRE PERFORMANCE	Not applicable regarding these clauses. We suppose that equipments mounted under floor such as inverters, converters and motors should be excluded based on our past experiences.	Tender condition prevails.	N
201	Part-2, ERTS	2.25 SPECIFIC ENERGY CONSUMPTION	2.25.8 The verification of the declared energy consumption and regeneration shall be done during combined system test. Any reduction of either component of energy as above shall be corrected at the test bed till the declared values are achieved. The Contractor shall carry out demonstration tests to establish achievement of the declared Specific Energy Consumption figures. If the actual specific energy consumption exceeds the estimated specific energy consumption quoted by the Contractor by more than 3%, the Contractor shall carry out rectification work on the train, within a reasonable time as agreed with CMRL. In case the Contractor fails, the penalty shall be applied as per Conditions of Contract.	Please clarify the definition/calculation of the penalty.	There is no penalty clause.	N
202	Part-2, ERTS	ERTS 10.6	25 KV Potential Transformer	Please clarify whether single PT shall be installed after two Pantographs, or two PT shall be installed after each Pantograph (Total 2 PT/Trainset?).	Tender condition prevails.	N
203	Part-2, ERTS	ERTS 10.7	AC CURRENT TRANSFORMER	Please clarify the purpose that individual CT is required for measurement. One CT is sufficient for both operation and measurement depending on the purpose.	Tender condition prevails.	N
204	Part-2, ERTS	ERTS 10.7	AC CURRENT TRANSFORMER	Please clarify it is acceptable to install CT in saloon cubicle considering roof space	No.	N
205	Part-2, ERTS, Addendum No.1 S. No. 102	ERTS 10.8 MAIN TRANSFORMER	10.8.8 The KVA rating of the transformer shall be designed to deliver the power to meet the continuous load including the emergency operational requirements specified and 10% extra over maximum load for 30 minutes. The overloading of transformer for typical run shall be specified and type tested. Short time ratings shall be submitted along with the justification. <del>The temperature rise limit for the transformer winding shall be maximum temperature index of insulation minus 65°C.</del>	We think the specified 10% extra over maximum load for 30 minutes is over design. Please reconsider.	Tender condition prevails.	N

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206	Part-2, ERTS	ERTS 10.8 MAIN TRANSFORMER	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.	Maximum Transformer efficiency test will be conducted only Main Transformer type test.	Noted.	N
207	Part-2, ERTS	ERTS 17.5 DESIGN CONFORMANCE TESTING	17.5.2.14 Traction Motor Qualification Testing: The first motor and two others selected at random by CMRL shall be given an IEEE Standard 11 and Standard 112 or IEC 349 "type" test by the manufacturer, including a heat run, to demonstrate the motor capability and power rating. One motor shall be tested for acoustic noise, under load and at various speeds as well as sweep through speeds. Overall noise level and pure tone noise shall be measured.	IEC 349 has already withdrawn, therefore we apply IEC 60349 instead of IEC 349. We will conduct the type test only one time for the first motor. IEC 60349 includes provisions regarding noise, therefore following sentences are not necessary.  "One motor shall be tested for acoustic noise, under load and at various speeds as well as sweep through speeds. Overall noise level and pure tone noise shall be measured."  Please confirm.	IEC 349 is old number and new number is IEC 60349.	N
208	Part-2, ERTS	ERTS 17.5 DESIGN CONFORMANCE TESTING	17.5.2.18 Equipment Noise Tests Noise tests conducted on equipment prior to its installation shall be performed early in the production phase. The test data shall be used by the Contractor to predict and mitigate, as necessary, the assembled car noise emissions during static and dynamic conditions, in order to comply with the requirements of ERTS Section 2.17.	In practice, it is difficult to perform motor noise tests early in production. Therefore, it will be taken place as part of the motor type test. Please confirm.	Noted.	N
209	Part-2, ERTS	ERTS 17.6 PRODUCTION CONFORMANCE TESTING	17.6.4.1 Each motor shall be given a "routine" test by the manufacturer in accordance with IEC Publication 349. Motor balance shall be dynamically tested in accordance with NEMA MG 1-12.06.	IEC 349 has already withdrawn, therefore we apply IEC 60349 instead of IEC 349. IEC 60349 includes provisions regarding motor balance, therefore NEMA MG 1-12.06 is not necessary. Please confirm.	Tender condition Prevails. Please note that IEC 349 is superseded by IEC 60349. Further, IEC 60349-2 does not refer to Motor Balancing and vibration criteria. Hence NEMA MG 1 12.06 shall also be used as specified.	N
210	Part-2, ERTS	ERTS 18.11 CALIBRATION	18.11.1 The Contractor shall establish and implement approved control measures to ensure that tools, gauges, instruments, and other measuring and test equipment used on this Contract are calibrated in accordance with the Quality Assurance Program. The Contractor shall use MI-STD-45662 or equivalent standard as a guide to establish the procedure and control measures. Calibration standards shall be traceable to the National Bureau of Standards or the equivalent. Each devise requiring certification of calibration shall bear a marking indicating current certification status and date	We understand that this clause is not applicable. Please confirm.	It is applicable.	N
211	Part-2, ERTS	ERTS 19 MATERIALS AND WORKMANSHIP	MATERIALS AND WORKMANSHIP 19.25.4.2 Bolts and Nuts Carbon steel bolts shall comply with ASTM A325. Alloy steel bolts shall comply with ASTM A354 or ASTM A490, as applicable. 19.25.4.3 Bolts and Nuts Nuts shall comply with ASTM A194. 19.25.6.1 Plating 19.29 WELDING 19.52 RELAYS AND CONTACTORS	Regarding ERTS Section 19 MATERIALS AND WORKMANSHIP, we normally apply JIS standard. Therefore, could you specify also Japanese standards for each clauses? Or, could you please accept JIS standards for materials, welding, blazing and others without CMRL's approval? We have no plan to submit MSDS, the material matrix, and test reports of materials. Because, we usually don't submit it to customer	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL.  Tender condition prevails.	N
212	Part-2, ERTS	ERTS 19 MATERIALS AND WORKMANSHIP	19.24.1 The Contractor shall ensure that any fastening or joining to structural members does not result in moisture accumulation within any structural member. 19.24.2 To this end, fastenings to structural members shall not be accomplished using drilled holes in the structural member.	We are not able to understand what this clause means. Please clarify	If contractor follows, Huck bolt method then it is applicable.	N
213	Part-2, ERTS	APPENDIX D2.1 2.2 2.3-C4a Alignment (Light House to Meenakshi College).dwg	Track data of Line C4a	Gradient (Up/Down information), and some points of curve conditions are missing.	Revised alignment data of complete corridor is attached.	Y
214	Part 2, Section - VI	Part 2, Section - VI (ERTS) 2.2.26	This Rolling Stock contract shall operate in all three corridors of CMRL Phase 2 and there shall be multiple Rolling Stock Contractors for all the three corridors of Phase 2 along with its extensions. The Contractor as above shall ensure that all requirements of the Technical Specification and Compatibility between the Rolling Stock is ensured, for the system such as (but not limited to) Traction system, Coupler System, Pneumatic supply extension, Door pitch, etc., are properly satisfied	[Initial Query] Coupled train operation for revenue service is not required as per ERTS. e.g.: (DM-T-DM)+(DM-T-DM) In addition, We believe that the Rake manufactured for Line 4 under the Phase 2 contract will not couple with the Rake manufactured for other Lines to make the connection between each TCMS Networks. [CMRL Response] No [Query - 2] Does this mean that rake manufactured for different lines by different Rolling Stock and different signalling contractor plan to couple ? According to the ERTS 9.10.3, there is no requirement to couple the TCMS network between trains during the rescue operation.  ERTS 9.10.3 under the the power supply shall consist at-least the below mentioned functions. a) Equipment required for application & release of all kinds of brake functions in sick train. b) Equipment required for Communication between two trains' (Healthy and Sick) operators c) External parking lights for the sick train d) Cabin lighting of the sick train e) External Head lamps of sick train in case of Push operation by Healthy train. f) Windshield wiper supply g) Pneumatic Horn supply	ERTS 9.10.3 only describes the electrical controls and power supplies requirements during train coupling.  However, there are multiple other requirements of train coupling mentioned in ERTS. ERTS 4.2.13 clearly states that "The train's front & rear end automatic couplers shall be used for coupling / uncoupling and for rescue operation with trains of other Rolling stock contracts of the CMRL phase 2 project. RS Contractor shall interface with other Rolling stock contractors of CMRL Phase 2 for the same."  Revised ERTS 9.10.3 is mentioned in addendum 02	N

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215	Part 2, Section - VI	Part 2, Section - VI (ERTS) 3.4.1.4.7	All equipment boxes and covers shall be made of stainless steel for stainless steel car body and shall be made of Aluminum for Aluminum car body.	We do not think it is necessary to match the materials of the underfloor equipment and the car body. We propose the following modifications. "All equipment boxes and covers shall be made of stainless steel or Aluminum."	Tender condition prevails.	N
216	Part 2, Section - VI	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 <b>without major maintenance</b> .	We understood that CMRL prefers lowest-maintenance equipment and it is being respected. Consumables like greasing, rubber gasket etc. are minor items and shall be implemented/ replaced on intervals before overhaul, to enhance the service-life of the equipment. Since, there is no clear definition of "Major maintenance"; and Consumables shall not be part of it.  Please either confirm that consumables are not part of it, or revise the ERTS as follows: "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 <b>without major maintenance (excluding consumables)</b> ."	Noted.	Y
217	Part 2, Section - VI	Part 2, Section - VI (ERTS) 10.11.8	Traction inverters shall be housed in a container, which is mounted under floor in each of the motorized cars. The material of the container shall be in accordance to the Carbody material.	We do not think it is necessary to match the materials of the underfloor equipment and the car body. We propose the following modifications. "Traction inverters shall be housed in a container, which is mounted under floor in each of the motorized cars. The material of the container shall be Al or SUS."	Tender condition prevails.	N
218	Part 2, Section - VI	12.12.3	In the event of wheel slide, the traction equipment shall work in tandem with Brake electronics to manage the strategy to adopt, in implementing electric braking in axles of motor cars and pneumatic braking in axles of trailer cars, without having the blending in opposition.	The brakes used to stop the vehicle are pneumatic braking and the final control of the brakes should be carried out by the brake electronics. We propose the following modifications. "In the event of wheel slide, the brake electronics shall work in tandem with the traction equipment to manage the strategy to adopt, in implementing electric braking in axles of motor cars and pneumatic braking in axles of trailer cars, without having the blending in opposition."	Noted.	Y
219	Part 2, Section - VI	Part 2, Section - VI (ERTS) 14.2.1	(e) When cars are coupled or uncoupled, the network shall automatically reconfigure itself for the new train configuration. The configuration shall identify each car in the new train by its car number.	[Initial Query] 1. TCMS network should be connected via Auto coupler other car?(We understand that coupled train operation is not required)Please check if this clause can be deleted.  [CMRL Response] Revised Clause  [Query - 2] Revised Clause is same as the initial clause. Please do check again.	Please refer to Addendum 1, for revised clause for better understanding. This clause is only meant for cars within train. Also refer to modified ERTS 9.3.10	N
220	Part 2, Section - VI	14.2.2	Ethernet Train Backbone (ETB) Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5. If required ETB network shall be adopted for Rescue operation. Ethernet Train Backbone (ETB) Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5. If required ETB network shall be adopted for Rescue operation.	[Initial Query] We understand that coupled train operation is not required. Please check if this clause can be deleted and include the 6 car extension in Clause 14.2.3 since 6 car operation can be achieved without the use of additional ETBN hardware.  [CMRL Response] ETB shall be used only for Rescue operation ?  [Query - 2] We understand coupled train configuration of TCMS Network is not required according to ERTS 9.10.3. Please check if this clause can be deleted?	ERTS 9.10.3 only describes the electrical controls and power supplies requirements during train coupling.  However, there are multiple other requirements of train coupling mentioned in ERTS. ERTS 4.2.13 clearly states that "The train's front & rear end automatic couplers shall be used for coupling / uncoupling and for rescue operation with trains of other Rolling stock contracts of the CMRL phase 2 project. RS Contractor shall interface with other Rolling stock contractors of CMRL Phase 2 for the same."  Revised ERTS 9.10.3 is mentioned in addendum 02	Y
221	Part 2, Section - VI	Part 2, Section - VI (ERTS) 14.2.3	Ethernet Consist Network (ECN) Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. The ECN shall maintain redundant communication links to the ETB.	[Initial Query] The data transmission medium in Ethernet-based Train Bus shall be doubled to support redundancy. It shall be possible that number and type of connected consist networks in existing 3- car train can vary during operation by insertion of "MC+MC+TC" cars in the middle of the train to form a 6-car train in future as defined in ERTS Section 1"  [CMRL Response] No Change  [Query - 2] Data transmission with ECN shall be according to the latest technology. Regarding redundancy to be followed by ECN link with ETB , it is better to be deleted according to ERTS 9.10.3. Please do update the clause as "Ethernet Consist Network (ECN) Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. <del>The ECN shall maintain redundant communication links to the ETB.</del> "	Noted.	Y

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SI no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
222	Part 2, Section - VI	19.58.1	The Contractor and/or supplier providing any microprocessor-based equipment shall submit a Software Quality Assurance Plan for CMRL approval [CDRL 19-35] complying with IEEE 730 and containing, as a minimum, the following documentation requirements: a. Software Requirements Specification b. Software Design Description c. Software Verification and Validation Plan d. Software Verification and Verification Report e. User Documentation. f. Source code shall be written in a high-level language such as "C and shall be provided to CMRL."	Please include the IEC 62279:2015.  The Contractor and/or supplier providing any microprocessor-based equipment shall submit a Software Quality Assurance Plan for CMRL approval [CDRL 19-35] complying with IEEE 730 or <b>IEC 62279:2015</b> and containing, as a minimum, the following documentation requirements:	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
223	Part 2, Section - VI	19.58.2	The Software Design Description, in (b) above, shall comply with IEEE 1016.	Please include the IEC 62279:2015.  The Software Design Description, in (b) above, shall comply with IEEE 1016 or <b>IEC 62279:2015</b>	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
224	Part 2, Section - VI	Part 2, Section - VI (ERTS) 20.4.6	Software life cycle: This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.	Please include the IEC 62279:2015.  This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128 or IEC 62279:2015	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
225	Part 2, Section - VI	Part 2, Section - VI (ERTS) 20.4.6	Development V-cycle This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.	Please include the IEC 62279:2015.  This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128 or <b>IEC 62279:2015</b>	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
226	Part 2, Section - VI	Part 2, Section - VI (ERTS) 20.5.1	Roles and responsibilities As far as the building and demonstration of the software safety of the Project is concerned, the Contractor shall produce the various Safety Cases of the technical systems (excluding O&M Procedures), according to the standard EN 50129,	Please include the IEC 62425:2007.  As far as the building and demonstration of the software safety of the Project is concerned, the Contractor shall produce the various Safety Cases of the technical systems (excluding O&M Procedures), according to the standard EN 50129 or <b>IEC 62425:2007</b>	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
227	Part 2, Section - VI	Part 2, Section - VI (ERTS) 20.6.4	i) Systems configured by application data (Refer to EN 50128 § 17) ii) Software Languages (Refer to EN 50128 § 10).	We are unable to identify the standard. 1) EN 50128 § 17 2) EN 50128 § 10 Please double check.	Please refer to 2001 version.  EN 50128 section 17 & section 10 are referred here	N
228	Part 2, Section - VI	APPENDIX A1 : DETAILED SOFTWARE DEVELOPMENT V- CYCLE	The following Software Development V-cycle is proposed by the standard EN 50128:	Please include the IEC 62279:2015.  The following Software Development V-cycle is proposed by the standard EN 50128 or IEC 62279:2015	As per ERTS 1.2.3 & 1.2.4, Other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
229	Part 2 – Section VI ERTS	7.6.2	d) AW4 passenger loading in all cars.	Passenger loading for heat load In clauses 7.4.1, 7.4.3 & 7.4.6.2, as per addendum 1, It is mentioned that fresh air flow shall be 2.5 litres per sec per passenger at AW3 load. Whereas in clause 7.6.2.d, it is mentioned that passenger loading of AW4 to be considered for head loads. This will increase the fresh air flow and heat load emitted by passengers. Pease update the clause 7.6.2.d with AW3 passenger loading in all cars. This will avoid over-sizing of the unit (acquiring cost ) and overall power consumption (running cost).	Tender conditions prevail.	N
230	Part 2 – Section VI ERTS	7.3.13	The air conditioning units shall be sized to cater for fully laden load of AW4 condition with all equipment being operated. The Contractor shall take into consideration to allow the effects of door opening and closing at stations and the piston and infiltration effects for the rake moving in tunnel as specified in standards.	Passenger loading for heat load In clauses 7.4.1, 7.4.3 & 7.4.6.2, as per addendum 1, It is mentioned that fresh air flow shall be 2.5 litres per sec per passenger at AW3 load. Whereas in clause 7.3.13, it is mentioned that VAC sizing shall be done for AW4. This will increase the fresh air flow and heat load emitted by passengers. Pease update the clause 7.3.13 with AW3 passenger loading in all cars. This will avoid over-sizing of the unit (acquiring cost ) and overall power consumption (running cost).	Tender conditions prevail.	N
231	Part 2 – Section VI ERTS	7.6.11	The fresh air intake shall be taken as minimum 2.5 litres/sec per passenger for AW4 condition in cooling mode.	Fresh air flow in cooling mode In clauses 7.4.1, 7.4.3 & 7.4.6.2, as per addendum 1, It is mentioned that fresh air flow shall be 2.5 litres per sec per passenger at AW3 load. Whereas in 7.6.11, fresh air flow is mentioned as minimum 2.5 litres/sec per passenger for AW4 condition. Please update the requirement as : "The fresh air intake shall be taken as minimum 2.5 litres/sec per passenger for <b>AW3 condition in cooling mode.</b> "	Noted.  7.6.11 The fresh air intake shall be taken as minimum 2.5 litre/sec per passenger for AW3 condition in cooling mode.	Y
232	Part 2 – Section VI ERTS	7.6.2	f) Pre-cooling cycles	Pre-cooling is not a heat gain. It is a default mode provided in VAC software. Request to delete this clause from Heat gain clause.	Tender condition prevails.	N
233	Part 2 – Section VI ERTS	7.6.2	h) Air leakages during door operation at stations with minimum 30 Seconds dwell time.	Challenges persist to determine & calculate door opening air ingress loads theoretically, hence these should be avoided for consideration as a design parameter i.e., heat load.  Since these parameters are dynamic in nature with respect to car location (elevated vs tunnel) during door opening, wind speed, it will not be realistic to determine these parameters.	Tender condition prevails.	N

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234	Part 2 – Section VI ERTS	7.4.5.3	In the event of the system failure or power supply failure of any individual VAC unit, an emergency ventilation system (1 hour operation with battery supply) shall operate automatically to admit fresh air directly into car to maintain the required oxygen level in the fully laden car, in accordance with EN 14750. In this emergency ventilation condition, the outside fresh air shall be admitted into car at a minimum rate of 5 liters / sec /passenger (@ AW3 load). The ventilation fan shall be fed from the 110V DC supply with its dedicated inverter per each VAC unit during these conditions.	Fresh air flow in Emergency mode: Fresh Air flow requirement of 5.0 l/sec/passenger (18m3/hr./passenger) is higher than the requirements mentioned in EN 14750-1, Cat B (8m3/hr./passenger). This will lead to oversizing of Battery (Car builder's scope) and Emergency inverter. We request to update the fresh air flow requirement as 8m3/hr./passenger as per to EN 14750-1, Cat. B in Emergency mode also.	Tender condition prevails.	N
235	Part 2 – Section VI ERTS	7.4.5.5	At the end of the emergency ventilation period, the airflow shall be not less than 5 liters / sec / passenger @ AW3 load for the saloon, including the emergency operator's desk.		Tender condition prevails.	N
236	Part 2 – Section VI ERTS	7.4.8.1	In the event of smoke or fire existing outside the train being detected, the system shall shut off the fresh air intake to prevent the product of combustion materials being drawn into the saloon and provide a full (100%) re-circulation of return air within the saloon. Provision shall be made to automatically shut off the fresh air intake and recirculate the internal air of the saloon, during an emergency condition, such as fire outside the train causing excessive heat and smoke to be drawn into the vehicle. Operation of such provision shall be made automatically in UTO mode & non-UTO modes of operation. The closing time of all the fresh air dampers shall preferably be less than 5 seconds from the receipt of smoke signal to avoid ingress of large quantity of smoke coming inside the car. The status of smoke activation, dampers condition shall be displayed on the DDU T CMS. These details shall also be displayed in RSC consoles of OCC, BCC & DCCs.	Fresh air damper closing time  We request to update the Fresh air damper closing time of ≤10 seconds from the receipt of smoke signal. This is because of limited availability from actuator motor suppliers complying to HL3 requirement.  Below are the references in India 1. Lucknow Metro 2. Kochi Metro	Noted. To be revised as damper closing time of ≤10 seconds	Y
237	Part 2 – Section VI ERTS	7.11.2	Even in the extremely dusty and humid environment prevailing in Chennai, the cleaning of all the VAC filters shall not be required before 12,500 kms or 30 days of train run whichever is lower. All the VAC filters shall have sufficient effectiveness to ensure that dust deposition in the air duct is bare minimum and cleaning of duct is not required in between major overhauls.	Dust concentration for filter design:  Dust concentration of "Total Suspended Particles Matter in atmosphere (TSPM) of 150 to 320 micro g/m3" as per Table 2.6 for filter cleaning interval calculations. Please confirm.	The succssfull bidder shall analyse the environmental conditions and duly get certified by the Environmental agency.	N
238	Part 2 – Section VI ERTS	17.5.3.1	The VAC unit shall be tested according to EN14750-2 Standard and to meet the requirements specified in ERTS section-07 (Ventilation and Air conditioning). Noise and vibration levels shall be measured for all operating modes of VAC unit.	Testing method & instruments: "EN 14750-2 is train level standard. this is not applicable to HVAC unit testing. VAC unit rating shall be tested as per ANSI/ASHRAE Standard 37 in Laboratory. This update requested is inline with Chennai Metro Phase 1 specification Conditioned air delivery test shall be done with Nozzle airflow measuring apparatus (code tester) as per 6.2 section of ASHRAE 37 and with automated measurement. Request to add this measurement method in this requirement 17.5.3.1 Request to update the requirement as "Noise and vibration levels shall be measured in most significant mode (all components running)". Please clarify if Coach level Climatic chamber testing is foreseen for CMRL Phase 2 order.  As per discussion, where we suggested to keep ASHRAE 37 as the VAC unit testing reference. Please find the relevant portion details from the standard in the next slide where air flow measurement method is specified with Nozzle airflow measuring apparatus (code tester).	Tender condition prevails.	N
239	Part 2 – Section VI ERTS	17.5.3.1	The VAC unit shall be tested according to EN14750-2 Standard and to meet the requirements specified in ERTS section-07 (Ventilation and Air conditioning). Noise and vibration levels shall be measured for all operating modes of VAC unit.	The VAC unit shall be tested according to ANSI/ASHRAE Standard 37 and to meet the requirements specified in ERTS section-07 (Ventilation and Air conditioning). During cooling capacity testing, conditioned air delivery measurement shall be done with Nozzle airflow measuring apparatus (code tester) as per 6.2 section of ASHRAE 37 and with automated measurement (no manual readings allowed for conditioned air delivery measurement).  Noise and vibration levels shall be measured in most significant mode (all components running).	Tender condition prevails.	N
240	Part 2 – Section VI ERTS	7.9.1	The condenser and evaporator coils shall be made of copper and having copper fins. Cleaning of condenser and evaporator coils should not be required earlier than 6 months.	Copper/Aluminium fin: Since there are coatings available to Aluminium fins to protect against corrosion, we request to provide an option to use either Copper fins or Aluminium fins. We propose to update the requirement as "The condenser and evaporator coils shall be made of copper and having copper fins or pre-coated Aluminium fins". Aluminum fins with coating are being used and running successfully in Lucknow metro, Kochi metro in India. Some references where Aluminium fins are being used in Coastal cities like Chennai with overhaul time in years: Shanghai Metro(20Y), Guangzhou Metro (15Y), Kuala Lumpur(15Y), Kaohsiung Metro (15Y) etc.,	Tender condition prevails.	N

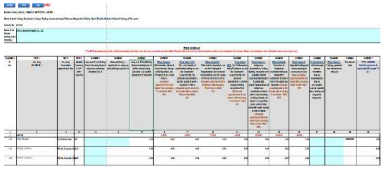





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SI no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum																					
241	Part 2 – Section VI ERTS	7.9.2	The condenser and evaporator fan motors shall work on 415V, 3 phase, 50Hz supply. However, in case of auxiliary supply failure, the evaporator fan motors shall be fed from the inverter. Dual speed motor may be used. The fan motors shall be minimum of IP 56 protection. There shall be separate MCBs for each evaporator fan motor and each condenser fan motor.	Supply air fan motor IP rating: There are limited options with supply air fans meeting IP56 + EN 45545 HL3 requirement. For Supply air fan motor alone, we propose to update the requirement as “minimum IP54” since Supply air fan motor will be in enclosed in AHU chamber and previous project experience. IP54 certified Supply air fans are being successfully used in Riyadh Metro Siemens Velaro MS Stadler FLIT 3/ FLIT 4 BLS London LUL.	Tender Condition Prevails	N																					
242	Part 2 – Section VI ERTS	17.5.3.1	Fresh Air Quantity Measurements	We propose that this measurement shall be with Air capturing hood with pressure balance air flow measurement (For example: Accubalance from TSI).  Please add the measurement method also in the requirement 17.5.3.1.o.  Request to update this requirement as “Fresh Air Quantity Measurements: Shall be done with Air capturing hood with pressure balance air flow measurement, no manual readings allowed”. Fresh Air flow rate shall be measured as per Clause 10.5 - Airflow rate: The airflow shall be determined using a system of measurement which enables the recording of results with a minimum accuracy of 10%. Or as per ANSI/ASHRAE Standard 111-2008 (latest).	Noted.	Y																					
243	Part 2 – Section VI ERTS	7.1.1	Environmental conditions for the equipment on board the train shall conform to EN 50125-1.	Solar load and contaminants level: There are various classes of Solar radiation as per EN 50125-1. We propose that Solar radiation class shall be R1(700W/m2) as per EN 50125-1 in Summer condition. 1120W/m2 is unrealistic in Chennai and it will lead to over-sizing of the HVAC unit.  For pollutants, EN 50125-1 Chapter:4.11- Pollution cross refers to EN 60721-3-5. As per EN 60721-1, it was mentioned that " presence of mould, fungus, etc.," for biological conditions. Please share more details of biological contamination to be considered for design for example type of mould, fungus etc.,	Tender condition prevails.	N																					
244				<table border="1"><caption>Table 2 — Classification of biological conditions</caption><thead><tr><th rowspan="2">Environmental parameter</th><th rowspan="2">Unit</th><th colspan="3">Class</th></tr><tr><th>5B1</th><th>5B2</th><th>5B3</th></tr></thead><tbody><tr><td>a) Flora</td><td>None</td><td>No</td><td colspan="2">Presence of mould, fungus, etc.</td></tr><tr><td>b) Fauna</td><td>None</td><td>No</td><td colspan="2">Presence of rodents or other animals harmful to products excluding termites      including termites</td></tr></tbody></table> "Solar radiation class as per section ""4.9. Solar radiation"" from EN 50125-1 standard. <table border="1"><caption>Table 4 — Solar radiation</caption><thead><tr><th>Classes</th><th>Solar radiation W/m²</th></tr></thead><tbody><tr><td>R1 (low)</td><td>700</td></tr><tr><td>R2 (high)</td><td>1 120</td></tr></tbody></table>	Environmental parameter	Unit	Class			5B1	5B2	5B3	a) Flora	None	No	Presence of mould, fungus, etc.		b) Fauna	None	No	Presence of rodents or other animals harmful to products excluding termites      including termites		Classes	Solar radiation W/m²	R1 (low)	700	R2 (high)
Environmental parameter	Unit	Class																									
		5B1	5B2	5B3																							
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R1 (low)	700																										
R2 (high)	1 120																										
245	Part 2 – Section VI ERTS	6.3.7	During all door operations and under all power supply conditions, door movements shall be smooth, controlled and devoid of jerks or any violent motion. Linear motor drive shall be used for door operation in case of external Sliding Door.	The linear motor drive technology is not available with many of the door suppliers across the globe and currently only one supplier with Linear motor drive technology is active in Indian Metro rail market. Current Tender condition mandating the use of Linear motor drive technology literally means, that many Door system suppliers in India and across globe including Faiveley Transport – a Wabtec group company cannot technically qualify to meet this requirement. This requirement is leading towards monopoly and blocking fair market competition.	Tender condition prevails.	N																					
246	Part 2 – Section VI ERTS			As you are aware, majority of Metro project operators in India & across the globe use PMDC brush motors in Door systems owing to its high reliability and proven technology. Wabtec has supplied more than 18,000 door systems with PMDC brush motors to various Indian metro projects and the performance is very satisfactory and reliable with more than 10 years of operation in various cities of India including New Delhi, Bangalore, Hyderabad, Chennai, Kochi, Lucknow etc. We have supplied similar drive motor for around 350,000 door systems across the globe and the systems are working well for more than 20 years now. For CMRL Phase I project, we have supplied the door system with PMDC brush motor type. It is to be noted that the performance of our door systems is very reliable and working satisfactorily for more than 5 years now with absolutely no issues. Further, we would like to highlight the fact that our company Faiveley Transport from the Wabtec group is an industry leading rolling stock and rail equipment supplier today. We continue to execute both local and global orders for various sub systems with high local content from our manufacturing unit located in Hosur town of Tamilnadu, India. We have made significant investments in our plants in India in support of " Make in India " initiative of the Central Government. We have already localized the door leaves production for Delhi Metro RS10 project and actively working on increasing our local content offering.	Tender condition prevails.	N																					

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247	Part 2 – Section VI ERTS			With the above backdrop, we request you to re-consider the amendment in tender specifications qualifying both the motor drive technologies and allow suppliers to use PMDC brush motors or linear drive motor technology. We request you to keep the specification neutral/open to the drive motor technology and insist on reliability and performance requirements to suppliers. This will allow the sub system suppliers to decide the suitable type of drive motor technology and at the same time encourages fair and open competition among suppliers. We trust you will consider our above request positively and look forward to your amendment of tender condition as requested above.	Tender condition prevails.	N
248	Part 2 – Section VI ERTS	New Clause	New Clause	Noise emission during door movements should not be more than LpAF max = 75dB(A)	Not acceptable.	N
249	Part 2 – Section VI ERTS	New Clause	New Clause	Door operator overall length should be shorter than the car-body door aperture	Not acceptable.	N
250	Part 2 – Section VI ERTS	New Clause	New Clause	Belt driven mechanism is preferred & system must be robust and non-sensitive to dusty environments	Not acceptable.	N
251	Part 2 – Section VI ERTS	New Clause	New Clause	Expected life time of belt should be 15 years	Not acceptable.	N
252	Part 2 – Section VI ERTS	New Clause	New Clause	Door leaves suspension should be made with linear ball bearings with steel rails	Not acceptable.	N
253	Part 2 – Section VI ERTS	New Clause	New Clause	Total weight of the door system should not be more than 165 kgs including threshold & without threshold the door system weight must not exceed 160 kgs.	Not acceptable.	N
254	Part 2 – Section VI ERTS	New Clause	New Clause	Minimum major over hauling period must be 15 years	Not acceptable.	N
255	Part 2 – Section VI ERTS	New Clause	New Clause	Only one actuator must be used for Sliding, Plug / Unplug, Lock / Unlocking	Not acceptable.	N
256	Part 2 – Section VI ERTS	New Clause	New Clause	Both door leaves must be locked independently, any damage in one lock shall not affect other lock	Not acceptable.	N
257	Part 2 – Section VI ERTS	New Clause	New Clause	Damage in driving screw / driving belt shall not prevent manual movement and locking. The system must allow the door leaves slide and lock manually even in case of damaged driving belt or driving screw	Not acceptable.	N
258	Part 2 ERTS	3.13.11	The carbody shall be constructed with a positive camber and such camber shall remain positive with the car at AW4 load. Alternatively, the camber of coach body under AW4 condition shall be such that the structure does not sag below the horizontal plane throughout the vehicle life. Detailed calculations shall be submitted by the Contractor for expected deflection so as to confirm that the camber is positive or at least neutral under all conditions throughout the vehicle life. All equipment including side doors, shall operate without binding due to deflection caused by load variations between AW0 and AW4. The maximum difference between the camber of each side sill, measured at the location of maximum deflection, shall not exceed 3.2 mm.	Bidder recommends this clause to be inline with various other Indian Metro contracts such as Delhi Metro RS10, Mumbai L2/7 & Agra/Kanpur etc.  Bidder requests to modify the clause as below: For a welded construction, the camber on coach body under loaded condition with 10 persons/m <sup>2</sup> shall be such that the structure shall not sag below the horizontal plane throughout the vehicle's 35 years life. However, for shells fabricated with modular elements, the coach shall be built with a suitable camber under tare condition. It shall be ensured that the downward deflection of the coach in fully loaded condition (with 10 person/m <sup>2</sup> ) shall be within the permitted deflection throughout the service life of thirty five years to ensure proper operation of doors under all loading conditions. Detailed calculations shall be submitted by the contractor for the expected deflection so as to confirm that the deflection is within permissible limits under all conditions throughout the life of the coach. Tests for stresses etc. as well as other tests as per relevant standard for the method of construction deployed shall be carried out under specified loads.  Project References : Delhi Metro RS2/5/7/11	Please refer to revised clause in Addendum 2	Y
259	Part 2 ERTS	14.2.1	Data Communication Link and network communication technology shall have the below features: a) The network communication technology to be adopted for all TCMS data communication links and subsystem communication interfaces shall be based on Ethernet (100 Base TX or better) or latest better network technology.	Bidder recommends to have the option of providing alternate better technologies for time-critical and deterministic data communication that are well-proven in service.  Bidder requests to modify the clause as below:  Data Communication Link and network communication technology shall have the below features: a) The network communication technology to be adopted for all TCMS data communication links and subsystem communication interfaces shall be based on Ethernet (100 Base TX or better) or latest better service-proven network technology.  Project References: Talent 3 trains in Europe (STN, VBG), Aventra trains in London Overground train, East Anglia UK, Zefiro Trains (Vestafik) in Europe	Please refer to revised clause in Addendum 2	Y

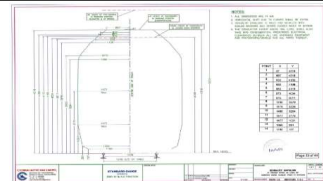
ARE03 Contract - Prebid Meeting (02) All Bidder Quries						
SI no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
260	Part 2 ERTS	14.2.2	Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5. The data transmission medium in Ethernet-based Train Backbone shall be doubled to support redundancy (If required by CMRL). It shall be possible that number and type of connected consist networks in existing 3-car train can vary during operation by insertion of "MC+MC+TC" cars in the middle of the train to form a 6-car train in future as defined in ERTS Section 1.	<p>Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) is not applicable as CMRL doesn't intend to run the train in multiple unit operation during normal revenue service</p> <p>Bidder request to delete the first two para and modify the last para as below :</p> <p><del>Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5.</del>  The data transmission medium in Ethernet-based Train Backbone shall be doubled to support redundancy (If required by CMRL). It shall be possible that number and type of connected consist networks in existing 3-car train can vary Contractor shall provide necessary TCMS networking capabilities to achieve interoperability between consists during operation by insertion of "MC+MC+TC" cars in the middle of the train to form a 6-car train in future as defined in ERTS Section 1.</p> <p>Project References: Talent 3 trains in Europe (STN, VBG), Aventura trains in London Overground train ,East Anglia UK, Zefiro Trains (Vestafik) in Europe</p>	Please refer to revised clause in Addendum 2	Y
261	Part 2 ERTS	14.2.3	Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. The ECN shall maintain redundant communication links to the ETB.	<p>Bidder recommends the option of having TCMS with ring type topology network architecture to meet reliability targets and system availability.</p> <p>Bidder request to modify this clause as below:  Ethernet Consist Network with dual-homing ladder-type topology or Ring-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. <del>The ECN shall maintain redundant communication links to the ETB.</del></p> <p>Project References: Talent 3 trains in Europe (STN, VBG), Aventura trains in London Overground train ,East Anglia UK, Zefiro Trains (Vestafik) in Europe</p>	Please refer to revised clause in Addendum 2	Y
262	Part 2 ERTS	14.2.4	Dual-Homing End Devices (ED) All the End Devices shall support dual-homing type Ethernet connections to ECN via physically independent ports to increase system reliability and availability. All digital and analog I/O's interfacing with TCMS (directly or via an interface unit) shall also be fully redundant.	<p>All safety critical digital and analog IOs interfacing with TCMS (directly or via an interface unit) shall also be fully redundant.</p> <p>Bidder requests to modify the clause:  All the End Devices shall support dual-homing type Ethernet connections to ECN via physically independent ports or there shall be redundant controller devices to increase system reliability and availability. All safety critical digital and analog IOs interfacing with TCMS (directly or via an interface unit) shall also be fully redundant." If two ports are not available in control electronics for Subsystems such as Doors and HVAC sub-System, having multiple control electronics communicating in Daisy Chain loop, may be connected on Ethernet with two end devices only. In any case, 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.</p> <p>Project References: Talent 3 trains in Europe (STN, VBG), Aventura trains in London Overground train ,East Anglia UK, Zefiro Trains (Vestafik) in Europe</p>	Please refer to revised clause in Addendum 2	Y
263	Part 2 ERTS	9.3.4	The auxiliary converter shall be independently supplied from main transformer, with respect to the traction converter supply. The auxiliary converter shall receive its power from a separate winding in the Traction Transformer. The four output voltages of Auxiliary converter inverter system shall be as follows: Output 1: 415 V 50 Hz 3 ph. 3 wire Output 2 230 V 50 Hz 1 ph Output 3 110 V DC Output 4 48 V DC (shall be provided if required) Output 5 24 V DC (shall be provided if required)	To reduce train bus and jumpers we propose to remove Output 2: 230V 50Hz 1φ. Instead we suggest to state: " 230V 50Hz 1φ should be available in each car with galvanic isolation from 415 V ac. Further 48 V dc and 24 V dc supply is not standard output available from auxiliary converter. Other suitable solutions can be used if these supply voltages are required.	It is not acceptable for Galvanic isolation. Please refer Addendum 2 for revised clause.	Y
264	Part 2 ERTS	9.4.6	The box for auxiliary converter shall be such that to avoid any corrosion throughout the service life on any account the box shall last for the life time of the auxiliary converter unit without needing any attention. The box shall be of stainless steel material. The box cover which may have to be removed for maintenance shall be suitable secured against falling. All hinged doors of the box shall be openable from bottom to top direction. The usage of bolts, washers and fittings shall be such that they shall be retained on the panels when the panels are opened.	The converter box material should not be restricted to stainless steel only. Anodized aluminium is also corrosion proof material and widely used in these application. Hence requesting to open the requirement for anodized aluminium material also.	Noted.	Y
265	Part 2 ERTS	9.4.6	A roof-mounted single Vacuum Circuit Breaker (VCB) of proven design shall be provided for the car 25 KV AC system and located close to the one pantograph. There shall be a 25 KV cable connection between two pantographs and shall be connected to single VCB. The VCB shall be of single bottle type having a short circuit rating of 400 MVA and confirming to IEC 60056, in conjunction with C3 category, type tested with 300,000 operations & with IEC 60077.	As per IEC 60077-4, only 200,000 operations are required to be tested as per C3 category and VCBs are type tested according to it. Further, there are no manufacturer's who can offer 300,000 operations compliant VCB as per IEC 60077-4. Please replace the 300000 with 200000 or take out the number of operation requirement as it is covered by the stipulated norm.	The testing shall be done in accordance with IEC 60077, however, the operations to be performed is 300000	Y
266	Part 2 ERTS	10.11.8	Traction inverters shall be housed in a stainless container, which is mounted under floor in each of the motorized cars. The container shall house the power electronics, the monitoring devices and the traction control unit. It is connected to the vehicle via high voltage power connections, control connections and 3-phase output to the traction motors.	The converter box material should not be restricted to stainless steel only. Anodized aluminium is also corrosion proof material and widely used in these application. Hence requesting to open the requirement for anodized aluminium material also.	Please refer to revised clause in Addendum 2	Y
267	Part 2 ERTS	10.13.18	Traction motor rotor design shall be of copper material.	This requirement is requested to be modified. Traction motor rotor design shall be either of copper or aluminium material.	Please refer to revised clause in Addendum 2	Y

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SI no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
268	Part 2 ERTS	2.2.26	This Rolling Stock contract shall operate in all three corridors of CMRL Phase 2 and there shall be multiple Rolling Stock Contractors for all the three corridors of Phase 2 along with its extensions. The Contractor as above shall ensure that all requirements of the Technical Specification and Compatibility between the Rolling Stock is ensured, for the system such as (but not limited to) Traction system, Coupler System, Pneumatic supply extension, Door pitch, etc., are properly satisfied.	<p>[MELCO Query] Coupled train operation for revenue service is not required as per ERTS. e.g.: (DM-T-DM)+(DM-TDM) In addition, Melco believes that the Rake manufactured for Line 4 under the Phase 2 contract will not couple with the Rake manufactured for other Lines to make the connection between each TCMS Networks.</p> <p>[CMRL Response] No</p> <p>[MELCO Query - 2] Does this mean that rake manufactured for different lines by different Rolling Stock and different signalling contractor plan to couple ? According to the ERTS 9.10.3, there is no requirement to couple the TCMS network between trains during the rescue operation. ERTS 9.10.3 under the the power supply shall consist at-least the below mentioned functions.</p> <p>a) Equipment required for application &amp; release of all kinds of brake functions in sick train. b) Equipment required for Communication between two trains' (Healthy and Sick) operators c) External parking lights for the sick train d) Cabin lighting of the sick train e) External Head lamps of sick train in case of Push operation by Healthy train. f) Windshield wiper supply g) Pneumatic Horn supply</p>	<p>ERTS 9.10.3 only describes the electrical controls and power supplies requirements during train coupling.</p> <p>However, there are multiple other requirements of train coupling mentioned in ERTS. ERTS 4.2.13 clearly states that "The train's front &amp; rear end automatic couplers shall be used for coupling / uncoupling and for rescue operation with trains of other Rolling stock contracts of the CMRL phase 2 project. RS Contractor shall interface with other Rolling stock contractors of CMRL Phase 2 for the same."</p> <p>Revised ERTS 9.10.3 is mentioned in addendum 02</p>	N
269	Part 2 ERTS	3.4.1.4.7	All equipment boxes and covers shall be made of stainless steel for stainless steel car body and shall be made of Aluminum for Aluminum car body.	We do not think it is necessary to match the materials of the underfloor equipment and the car body. We propose the following modifications. "All equipment boxes and covers shall be made of stainless steel or Aluminum."	Please refer to revised clause in Addendum 2	Y
270	Part 2 ERTS	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.	MELCO understood that CMRL prefers lowest-maintenance equipment and it is being respected. Consumables like greasing, rubber gasket etc. are minor items and shall be implemented/ replaced on intervals before overhaul, to enhance the service-life of the equipment. Since, there is no clear definition of "Major maintenance"; and Consumables shall not be part of it. Please either confirm that consumables are not part of it, or revise the ERTS as follows: "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)."	Please refer to revised clause in Addendum 2	Y
271	Part 2 ERTS	10.11.8	Traction inverters shall be housed in a container, which is mounted under floor in each of the motorized cars. The material of the container shall be in accordance to the Carbody material.	We do not think it is necessary to match the materials of the underfloor equipment and the car body. We propose the following modifications. "Traction inverters shall be housed in a container, which is mounted under floor in each of the motorized cars. The material of the container shall be Al or SUS."	Please refer to revised clause in Addendum 2	Y
272	Part 2 ERTS	12.12.3	In the event of wheel slide, the traction equipment shall work in tandem with Brake electronics to manage the strategy to adopt, in implementing electric braking in axles of motor cars and pneumatic braking in axles of trailer cars, without having the blending in opposition.	The brakes used to stop the vehicle are pneumatic braking and the final control of the brakes should be carried out by the brake electronics. We propose the following modifications. "In the event of wheel slide, the brake electronics shall work in tandem with the traction equipment to manage the strategy to adopt, in implementing electric braking in axles of motor cars and pneumatic braking in axles of trailer cars, without having the blending in opposition."	Please refer to revised clause in Addendum 2	Y
273	Part 2 ERTS	14.2.1	(e) When cars are coupled or uncoupled, the network shall automatically reconfigure itself for the new train configuration. The configuration shall identify each car in the new train by its car number.	<p>[MELCO Query] 1. TCMS network should be connected via Auto coupler other car?(We understand that coupled train operation is not required)Please check if this clause can be deleted.</p> <p>[CMRL Response] Revised Clause</p> <p>[MELCO Query - 2] Revised Clause is same as the initial clause. Please do check again.</p>	<p>Please refer to Addendum 1, S.No 135 for revised clause for better understanding.</p> <p>This clause is only meant for cars within train.</p>	N
274	Part 2 ERTS	14.2.2	Ethernet Train Backbone (ETB) Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5. If required ETB network shall be adopted for Rescue operation. Ethernet Train Backbone (ETB) Ethernet-based Train Backbone with redundant Train Backbone Nodes (TBNs) (at least two in each consist of network) shall be provided to achieve interoperability between consists when coupled in the train as per IEC 61375-2-5. If required ETB network shall be adopted for Rescue operation.	<p>MELCO Query] We understand that coupled train operation is not required. Please check if this clause can be deleted and include the 6 car extension in Clause 14.2.3 since 6 car operation can be achieved without the use of additional ETBN hardware.</p> <p>[CMRL Response] ETB shall be used only for Rescue operation ?</p> <p>[MELCO Query - 2] MELCO understand coupled train configuration of TCMS Network is not required according to ERTS 9.10.3. Please check if this clause can be deleted?</p>	Please refer to revised clause in Addendum 2	Y
275	Part 2 ERTS	14.2.3	Ethernet Consist Network (ECN) Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. The ECN shall maintain redundant communication links to the ETB.	<p>[MELCO Query] The data transmission medium in Ethernet-based Train Bus shall be doubled to support redundancy. It shall be possible that number and type of connected consist networks in existing 3- car train can vary during operation by insertion of "MC+MC+TC" cars in the middle of the train to form a 6-car train in future as defined in ERTS Section 1"</p> <p>[CMRL Response] No Change</p> <p>[MELCO Query - 2] Data transmission with ECN shall be according to the latest technology. Regarding redundancy to be followed by ECN link with ETB , it is better to be deleted according to ERTS 9.10.3. Please do update the clause as "Ethernet Consist Network (ECN) Ethernet Consist Network with dual-homing ladder-type topology or latest better technology (compliant with IEC 61375-3-4) shall be adopted. The ECN shall maintain redundant communication links to the ETB."</p>	Please refer to revised clause in Addendum 2	Y

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Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
276	Part 2 ERTS	19.58.1	The Contractor and/or supplier providing any microprocessor-based equipment shall submit a Software Quality Assurance Plan for CMRL approval [CDRL 19-35] complying with IEEE 730 and containing, as a minimum, the following documentation requirements: a. Software Requirements Specification b. Software Design Description c. Software Verification and Validation Plan d. Software Verification and Verification Report e. User Documentation. f. Source code shall be written in a high-level language such as "C and shall be provided to CMRL."	Please include the IEC 62279:2015. The Contractor and/or supplier providing any microprocessor-based equipment shall submit a Software Quality Assurance Plan for CMRL approval [CDRL 19-35] complying with IEEE 730 or IEC 62279:2015 and containing, as a minimum, the following documentation requirements:	ERTS allows for other equivalent standards subject to approval from CMRL. So tender condition prevails.	N
277	Part 2 ERTS	19.58.2	The Software Design Description, in (b) above, shall comply with IEEE 1016.	Please include the IEC 62279:2015. The Software Design Description, in (b) above, shall comply with IEEE 1016 or IEC 62279:2015	ERTS allows for other equivalent standards subject to approval from CMRL. So tender condition prevails.	N
278	Part 2 ERTS	20.4.6	Software life cycle: This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.	Please include the IEC 62279:2015. This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128 or IEC 62279:2015	ERTS allows for other equivalent standards subject to approval from CMRL. So tender condition prevails.	N
279	Part 2 ERTS	20.4.6	Development V-cycle This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.	Please include the IEC 62279:2015. This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128 or IEC 62279:2015	ERTS allows for other equivalent standards subject to approval from CMRL. So tender condition prevails.	N
280	Part 2 ERTS	20.5.1	Roles and responsibilities As far as the building and demonstration of the software safety of the Project is concerned, the Contractor shall produce the various Safety Cases of the technical systems (excluding O&M Procedures), according to the standard EN 50129.	Please include the IEC 62425:2007. As far as the building and demonstration of the software safety of the Project is concerned, the Contractor shall produce the various Safety Cases of the technical systems (excluding O&M Procedures), according to the standard EN 50129 or IEC 62425:2007	ERTS allows for other equivalent standards subject to approval from CMRL. So tender condition prevails.	N
281	Part 2 ERTS	20.6.4	i. Systems configured by application data (Refer to EN 50128 § 17) ii. Software Languages (Refer to EN 50128 § 10).	MELCO is unable to identify the standard. 1) EN 50128 § 17 2) EN 50128 § 10 Please double check.	EN 50128 section 17 & section 10 are referred here	N
282	Part 2 ERTS	APPENDIX A1 : DETAILED SOFTWARE DEVELOPMENT V-CYCLE	The following Software Development V-cycle is proposed by the standard EN 50128:	Please include the IEC 62279:2015. The following Software Development V-cycle is proposed by the standard EN 50128 or IEC 62279:2015	ERTS allows for other equivalent standards subject to approval from CMRL. So tender condition prevails.	N
283	BOQ 635941			Please provide the detailed BOQ document in excel format.	BOQ document in Excel format is already provided in CPP portal. Further, details mentioned in Bidding Forms Annex GA1 to GA6 and Sec 4.3 shall be filled by the bidder and submitted in Financial Packet.	N
284	Part I Section III Evaluation and Qualification Criteria Page 65 of 208 Addendum No.1	EQC 2.3.1	Single Entity : Must meet requirement All Parties Combined : Must meet requirement (i), (ii), (iii) & (iv) Each Member : N/A Lead Member : N/A	Considering a new established company which may have full capability to become a member of consortium but running less than 5 years, so please kindly change this clause to "Single Entity: Must meet requirement All Parties Combined: N/A Each Member: N/A Lead Member: Must meet requirement"	Tender condition prevails.	N
285	Part I Section -IV Bidding Forms Page 84 of 208	Form SOG: Schedule of Guarantee		Please clarify where is the identification of each performance/specific guarantee required in technical requirements?	Please refer to revised clause in Addendum 2	Y
286	Part I Section II Bid Data Sheet Page 46 of 208	ITB 37.1	The source of exchange rate shall be: Reserve Bank of India (RBI)/ Financial Benchmarks India Pvt. Ltd (FBIL) as delegated by the Reserve Bank of India vide their order no. RBI/2018-19/34DBR.Ret.BC.No.01/12.01.001/2018-19 dated August 02, 2018.	It is suggested to change this clause to "The source of exchange rate shall be: Reserve Bank of India (RBI)/ Financial Benchmarks India Pvt. Ltd (FBIL) as delegated by the Reserve Bank of India vide their order no. RBI/2018-19/34DBR.Ret.BC.No.01/12.01.001/2018-19 dated August 02, 2018. In case, the rate of exchange for a specific currency is not available on RBI web address, the exchange rates as available at the Web address: <a href="http://www.xe.com">http://www.xe.com</a> shall be followed." As some of the exchange rate is not available on RBI and FBIL web address.	Tender condition prevails.	N
287	Part I Section IV Bidding Forms Page 177 of 208	Form EXP-1: GENERAL EXPERIENCE		Please confirm the meaning of "ending year". Does it mean "end date of last car delivery" or "end date of the contract"?	End of the Contract.	N
288	CORRIGENDUM No. 3		Last date and time of submission/uploading of bid 24th May 2021 till 13:00 hrs	During the COVID-19 pandemic, the response from the subcontractor is very slow, so it is suggested to extend the last date of submission of bid to 24th June 2021 till 13:00 hrs.	Noted.	N
289	Part I Section -IV Bidding Forms Page 199 of 208	10.Form of Bid Security	(b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the Performance Security, in accordance with the Instructions to Bidders of the Beneficiary's bidding document.	In order to facilitate the claim from the customer, it is suggested to change this clause to: "(b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the Performance Security, in accordance with the Instructions to Bidders of the Beneficiary's bidding document. This Guarantee shall be valid up to _____. Any written claim/demand(s) is/are delivered to the Guarantor on or before the Expiry Date at the _____ located at _____."	Tender condition prevails.	N
290	Part I Section -IV Bidding Forms Page 104 of 208	4.3 DETAILS OF TAXES / DUTIES / LEVIES ETC. INCLUDED IN THE LUMP SUM PRICE (PRICE CENTRE WISE)	DETAILS NOT TO BE FILLED HERE. IT SHALL BE FILLED AND UPLOADED IN THE PRICE BID OF E-PROCUREMENT PORTAL ONLY. 	We understand that the table 4.3.1 need to be filled and uploaded in the price bid of e-procurement portal. Please confirm.	YES	N



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Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum
291	Part – 2 ERTS-System Requirements Page 59 of 741	2.25.1	Tenderers shall note that 'SPECIFIC ENERGY CONSUMPTION (SEC)' shall be verified in any one corridor of Phase 2 as agreed with CMRL under conditions detailed hereafter in this clause shall not exceed 48 Wh/GTKM.....	The SEC requirement of 48 Wh/GTKM is too strict. It is suggested change to this clause to" Tenderers shall note that 'SPECIFIC ENERGY CONSUMPTION (SEC)' shall be verified in any one corridor of Phase 2 as agreed with CMRL under conditions detailed hereafter in this clause shall not exceed 65 Wh/GTKM.....".	Tender condition prevails.	N
292	PART – 2 : SECTION VI – ERTS Page 61 of 741	2.26.1	The car interior shall have resistance to fire and conform to EN 45545 (Part 1 to 7), Category 4-A, Hazard level HL3 – 'Standard for Fixed Guide way – Transit and Passenger Rail Systems' and BS 6853 Code of practice for fire precautions in the design and construction of passenger carrying rakes or any other approved international standards.	Suggest to change "and " to "or". It is not reasonable for the car interior meeting both EN 45545 (Part 1 to 7), Category 4-A, Hazard level HL3 – 'Standard for Fixed Guide way – Transit and Passenger Rail Systems' and BS 6853 Code. So it is suggested to change this clause to "The car interior shall have resistance to fire and conform to EN 45545 (Part 1 to 7), Category 4-A, Hazard level HL3 – 'Standard for Fixed Guide way – Transit and Passenger Rail Systems' or BS 6853 Code of practice for fire precautions in the design and construction of passenger carrying rakes or any other approved international standards."	Tender condition prevails.	N
293	PART – 2 : SECTION VI – ERTS Page 61 of 741	Clause 2.26.1	(iv) Flammable materials shall be well contained with IP 65 protection.	Suggest to delete this clause. Because flammable materials cannot fully contained with IP65 Protection. The flammable materials will be tested according to EN45545-2 requirements.	Please refer to revised clause in Addendum 2	Y
294	PART – 2 : SECTION VI – ERTS Page 68 of 741	Clause 3.2.7	The car body shall have a 35-year design life and shall be watertight with the minimum use of sealant. Water tightness shall comply with IP-65.	Suggest to modify as follows: The car body shall have a 35-year design life and shall be watertight with the minimum use of sealant. Sealing of the car body shall be sufficient to satisfy the requirement of IEC 61133 or equivalent UIC standard. because IP degree is not applied for carbody standard. we will carry out rainfall test for watertightness according to IEC 61133.	Please refer to revised clause in Addendum 2	Y
295	PART – 2 : SECTION VI – ERTS Page 100 of 741	Clause 3.15.1	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,	For stainless steel carbody, it's hard to achieve 1.5 times. Vibration isolation or structure design will be adopted to avoid sympathetic vibration. It is suggested to delete this clause.	Tender condition prevails.	N
296	PART – 2 : SECTION VI – ERTS Page 116 of 741	Clause 5.4.1	.....This display shall provide Status (Working Status and Fault status) and Controls (Isolation, System controls, reset controls) as mentioned below: xiv. Train general parameters like vehicle Speed, traction voltage, battery voltage, distance travelled, energy readings, wheel slip, wheel slide, excessive jerk. xvi. Details of Digital Manometer Pressure Gauge indications of Main Pipe, Brake Pipe, Reservoir, Brake Cylinder, etc.	The air gauge can display the pressure of the main pipe, brake pipe and brake cylinder. As for the pressure of the Reservoir, because there are many types of reservoirs on each car, it is hard and unnecessary to display all of them on the pressure gauges. It is suggested to change this clause to" xvi. Details of Digital Manometer Pressure Gauge indications of Main Pipe, Brake Pipe ,Brake Cylinder, etc."	Tender condition prevails.	N
297	PART – 2 : SECTION VI – ERTS Page 137 of 741	Clause 6.3.23	The door position measurement and detection shall be accurate and real time measurement of the distance moved by each leaf.	According to the previous projects, real time measurement of the distance moved by each leaf is not necessary. Usually, the car manufacturer only detection the status of the door open and close. If we add this function, the false alarm rate of the door will be increased. It is suggested to delete this clause.	Tender condition prevails.	N
298	PART – 2 : SECTION VI – ERTS Page 147 of 741	Clause 6.9.2	The ramp angle shall not be more than 16.5 degrees.	Suggest to modify as below: ....The ramp angle shall not be more than 25 degrees. Because the degree of 16.5 will increase the length of ramp. What is more, it will increase the collection difficulty.	Tender condition prevails.	N
299	PART – 2 : SECTION VI – ERTS Page 157 of 741	Clause 7.6.2 & Clause 7.6.3 & Clause 7.6.11	d) AW4 passenger loading in all cars.  An average temperature of 25° C and relative humidity of 60% shall be automatically maintained within the saloon and emergency operator's desk with AW4 loading until an outside ambient design condition of 38°C and RH of 36.2% for summer, and 35°C and 70% RH in winter.  The fresh air intake shall be taken as minimum 2.5 litre/sec per passenger for AW4 condition in cooling mode.	Suggest to modify as follows: d) AW3 passenger loading in all cars.  An average temperature of 25° C and relative humidity of 60% shall be automatically maintained within the saloon and emergency operator's desk with AW3 loading until an outside ambient design condition of 38°C and RH of 36.2% for summer, and 35°C and 70% RH in winter.  The fresh air intake shall be taken as minimum 2.5 litre/sec per passenger for AW3 condition in cooling mode Because AW4 is the overload status, which is not normal working state, and the overload time in actual operation is short. Moreover, the air-conditioning system designed according to AW4 load has large air volume and cooling capacity, which is not energy saving and environmental protection, so it is recommended to use AW3 load.	Please refer to revised clause in Addendum 2	Y
300	PART – 2 : SECTION VI – ERTS Page 221 of 741	Clause 9.7.9	Battery Box access locks shall be interlocked with the isolation switch of the Battery Box. Battery terminals access shall only be available after the battery is isolated. Similarly, the Battery supply can be made Normalized only after Battery box is completely locked.	Battery Box access locks interlocked will lead to the isolation switch abnormal operation. What's more, the possibility of operating power outages will be increased. So It is suggested to delete this clause.	Tender condition prevails.	N
301	PART – 2 : SECTION VI – ERTS Page 289 of 741	Clause 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."	The reservoirs of brake system includes main reservoir, brake reservoir, suspension air reservoir, additional air chamber, etc. If automatic drain valve is set, the workload of equipment layout, installation and maintenance will increase greatly. In addition, the use of automatic drainage of brake reservoir may increase the braking failure possibility. So it is suggested to modify as follows: "All main reservoirs shall have an associated automatic drain device and, where applicable, an additional manual device for venting/draining the contents of the reservoir."	Tender condition prevails.	N
302	PART – 2 : SECTION VI – ERTS Page 261 of 741	Clause 11.2.20	Fire properties of the materials used shall comply with EN 45545 part 1 to part 7 latest editions (Category 4-A, Hazard level HL3) as a minimum or better international standard applicable for similar Metro applications. Requirements of ERTS section2.26 shall be met.	In order to ensure the mechanical properties of the rubber on the bogie, some of the materials used on the bogie can not comply with EN 45545 part 1 to part 7 latest editions (Category 4-A, Hazard level HL3). So it is suggested to change this clause to "Fire properties of the materials used on the bogie shall comply with EN 45545 part 1 to part 7 latest editions (Category 3-A, Hazard level HL2) as a minimum or better international standard applicable for similar Metro applications. "	Tender condition prevails.	N

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Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response	Addendum												
303	PART – 2 : SECTION VI – ERTS Page 262 of 741	Clause 11.3.5.2	The number of seated passengers shall be taken as one per seat, and standing passengers as 10/m2 (AW5) for all the above mentioned strength analyses.	The loading cycles shall be as specified in UIC615-4 and UIC515-4. So we suggested to change this clause to"11.3.5.2The number of seated passengers shall be taken as one per seat, and standing passengers as 10/m2 (AW5) for all the above-mentioned strength analyses except for fatigue test. The fatigue load shall be decided based on actual loading which shall correspond to AW2 loading conditions. There shall not be crack at the end of any stage of loading cycles. The passenger weight for this calculation shall be taken as 65kg/person."	Tender condition prevails.	N												
304	PART – 2 : SECTION VI – ERTS Page 267 of 741	Clause 11.4.13.3	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.	According to the requirement of EN 14363:2016, 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 1 degrees/second.	Tender condition prevails.	N												
305	Addendum No.1	Clause 11.4.13.5	The maximum values of acceleration measured at central pivot level are: a. Vertical acceleration 0.27g b. Lateral acceleration 0.27g The contractor shall submit calculations to confirm that ride index lateral and vertical shall not exceed 2.75 under all normal operating conditions for worn-out cars operated on rundown track conditions. (CDRL 11-7)	According to the requirement of UIC 518, The maximum values of acceleration measured at central pivot level are: a. Vertical acceleration 0.30g b. Lateral acceleration 0.30g The contractor shall submit calculations to confirm that ride index lateral and vertical shall not exceed 2.75 under all normal operating conditions for new cars and new track, and shall not exceed 3 under all normal operating conditions for worn-out cars operated on rundown track conditions. (CDRL 11-7)	Tender condition prevails.	N												
306	PART – 2 : SECTION VI – ERTS Page 268 of 741	Clause 11.4.14	Dynamic Modeling The Contractor shall submit a detailed dynamic model to demonstrate the running behavior and performance characteristics of the proposed service proven bogie design. (CDRL11-8)	It is suggested to change this clause to" The Contractor shall submit a detailed dynamic report(including the relevant parameter) to demonstrate the running behavior and performance characteristics of the proposed service proven bogie design. (CDRL11-8) "	Tender condition prevails.	N												
307	PART – 2 : SECTION VI – ERTS Page 269 of 741	Clause 11.4.18.1	The bogie suspension, in conjunction with the car body, shall be designed to enable cars to operate satisfactorily on track with the maximum specified track twist. The maximum off-loading of wheels 'ΔQ/Q' shall not exceed 50% of nominal wheel load in inflated up to maximum permissible speeds and shall not exceed 60% of nominal wheel in deflated conditions up to maximum permissible speeds. Test shall be shall conducted in accordance with ERTS clause 17.5.2.10.9	According to EN 14363:2016 standard , The maximum off-loading of wheels 'ΔQ/Q' shall not exceed 60% of nominal wheel in inflated &deflated conditions up to maximum permissible speeds.	Tender condition prevails.	N												
308	PART – 2 : SECTION VI – ERTS Page 270 of 741	Clause 11.5.1.3.3	The gears shall be splash oil lubricated and a sight glass shall be provided in the gear case for inspection. It shall not be necessary to change the oil earlier than 200,000km, except for the first change.	According to the communication among well-known suppliers and us, it is suggested to change this clause to" The gears shall be splash oil lubricated and a sight glass shall be provided in the gear case for inspection. It shall not be necessary to change the oil earlier than 150,000km, except for the first change."	Tender condition prevails.	N												
309	PART – 2 : SECTION VI – ERTS Page 277 of 741	Clause 11.9.17	Grease lubricated sealed cartridge bearings shall be used. The bearing shall be such that no attention is required between bogie overhauls.	According to the communication among well-known suppliers and us, it is suggested to change this clause to" Grease lubricated sealed cartridge bearings shall be used. The bearing shall be such that no attention is required earlier than 0.8 million km. "	Tender condition prevails.	N												
310	PART – 2 : SECTION VI – ERTS Page 416 of 741	Clause 17.5.2.11	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 0.08 at rotational speed of 0.8 degrees/second.	According to requirement of EN14363 : 2016, 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 1 degrees/second.	Tender condition prevails.	N												
311	PART – 2 : SECTION VI – ERTS Page 497 of 741	Clause 19.9.3	Structures of heat treated alloy steel shall be so designed that the principle stresses to which any part is subjected shall not exceed the following percentages of yield strength of the material used, under full dynamic conditions with a maximum load. <table><tr><td></td><td>Bogie Frame</td><td>All Other</td></tr><tr><td>Tension and Compression</td><td>39%</td><td>50%</td></tr><tr><td>Shear</td><td>25%</td><td>31%</td></tr><tr><td>Bearing</td><td>62%</td><td>62%</td></tr></table>		Bogie Frame	All Other	Tension and Compression	39%	50%	Shear	25%	31%	Bearing	62%	62%	The structural design of the vehicle is checked according to the yield strength, and the safety margin is considered according to the standard. The increase requirement of a certain percentage in the yield strength of the bidding documents will cause the vehicle to be over-designed and increase the material index requirements, which will greatly increase the weight of the vehicle, It is not conducive to the performance requirements of the vehicle, such as energy consumption and traction braking force. So it is suggested to delete this clause.	Tender condition prevails.	N
	Bogie Frame	All Other																
Tension and Compression	39%	50%																
Shear	25%	31%																
Bearing	62%	62%																
312	Part 2 APPENDIX – SOD Page 37 of 59			The bottom of KE is not closed. Please kindly check whether the KE of the vehicle only needs to meet the semi closed KE(solid line).	Please refer to drawing of SOD, where all details are clearly specified.	N												
313	Part 2, Section - VI (ERTS)	2.14.1.5	The following performance requirements shall be achievable with any degree of wheel wear including rail adhesion level no greater than 20%, any track conditions within the design criteria, any passenger Loading Condition (up to AW4) on level tangent track: (CDRL 2-8)	In actual, rail wheel adhesion cannot be controlled but typically will be 16%. Hence, 20% limit is high as it is not practical. In actual if the adhesion is lower, required stopping distance may not be able to achieve. We <b>recommend to keep 18% maximum value.</b>	Tender condition prevails.	N												
314	Part 2, Section - VI (ERTS)	2.15.9.3	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. Alternatively, the contractor must demonstrate fail safe proven design to CMRL	Watch dog time of 3 sec is too low as in 3 s the system is not always able to compensate sliding fully. This will lead to flat wheels and do not realise the effectiveness of the WSP performance. <b>As per UIC 541-05 requirement, it is 10 sec. and hence it is highly recommended to follow UIC requirement to get the best WSP performance.</b> For better train performance at low adhesion, it is strongly recommended to follow UIC requirement	Please refer to revised clause in Addendum 2	Y												
315	Part 2, Section - VI (ERTS)	11.2.18.3.9	Under conditions of a dragging parking brake for a minimum distance of 3 kilometers at a speed of 10Km/h, 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 preliminary design stage.	Parking brake is released when pulling the train unless not possible due to train stopped inside tunnel / bridge. <b>Dragging requirement will limit the safety against rolling under worst case.</b> It is advisable to remove dragging brake requirement or allow wheel flat.	Tender condition prevails.	N												
316	Part 2, Section - VI (ERTS)	11.2.18.3.10	The parking brake shall be an integral part of the friction brake actuation system. Brake actuators shall be sufficient to permit push-through without any wheel damage.		Tender condition prevails.	N												

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317	Part 2, Section - VI (ERTS)	12.6.5	In the event of a failure of the dynamic brake, the friction brake shall be capable of carrying out three 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 brake application will increase the wheel temperature upto 380° C which is not advisable. CMRL may please to modify the requirement to <b>two consecutive emergency brake applications</b> as in other Metro applications.	Please refer to revised clause in Addendum 2	Y
318	Part 2, Section - VI (ERTS)	16.12.1.5	The Contractor shall submit all documentation as required elsewhere in this contract. Without limitation, the Contractor shall also provide additional information or documentation related to the design and production of the cars if requested to do so by CMRL. In the event that the Contractor deems specific documents to be proprietary, the Contractor must demonstrate to CMRL's satisfaction that the documents are proprietary, and shall enter into a suitable confidentiality agreement that is acceptable to CMRL. For the purpose of this paragraph, confidentiality agreements related to proprietary documentation shall provide CMRL with sufficient access to readily verify compliance with contract requirements and shall provide the Contractor with appropriate commercial protection for sensitive information.	<b>Sensitive / proprietary documents shall be auditable at contractor's premises and allowed to put under ESCROW account.</b> CMRL to please consider this point and clarify the allowing to put under ESCROW as done by other Metro corporations.	Tender condition prevails.	N
319	Part 2, Section - VI (ERTS)	17.5.3.4.1	A braking tread brake block and/or disc pad, if used, and caliper assembly shall be tested on a dynamometer to verify the brake-system capacity with both cold and hot tread brake block and/or disc initial conditions. The block and/or disc and shoe surface temperature shall be measured and recorded throughout the test. At the completion of this test, the tread brake unit and/or brake disc and caliper assembly shall remain in an undamaged, fully operable condition. If brake components other than the block and/or disk brake components are used, such components shall be subject to equivalent thermal capacity testing.	Please clarify - "Brake components other than the block and/or disk" means Tread Brake unit ?	Please refer to revised clause in Addendum 2	Y
320	Part 2, Section - VI (ERTS)	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 80km/h 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	As per Cl. 12.18.2, "In case of single point failure in brake control system, which can be automatically isolated and fully compensated without affecting the train performance". The Emergency brake rate will continue to keep the stopping distance as primary requirement and not deceleration rate. Hence <b>EB deceleration rate requirement should be removed or keep 1.1</b> to avoid conflict with other clauses.	Tender condition prevails.	N
321	Part 2, Section - VI (ERTS)	2.15.10.5	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 pads / brake block close to the disks / wheel treads, but shall not contribute to any braking effort or cause wear to the brake pads / brake blocks.	Wabtec do not recommend 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. Hence, we strongly recommend to <b>remove this clause to avoid any negative impact</b> of brake system	Please refer to revised clause in Addendum 2	Y
322	Part 2, Section - VI (ERTS)	12.6.8.5	Wheel slide protection shall be available during emergency braking (Except when the command is initiated by the Operator's Emergency Pushbutton available on the Operator Emergency Driver desk or by RSC consoles of OCC, BCC & DCCs in case of UTO mode of operation.)	Irrespective of the mode of Emergency Brake application, <b>WSP should be made available in all braking modes</b> to avoid wheel flat. This clause needs to be changed to delete the requirement "(Except when the command is initiated by the Operator's Emergency Pushbutton available on the Operator Emergency Driver desk or by RSC consoles of OCC, BCC & DCCs in case of UTO mode of operation.)"	Tender condition prevails.	N
323	Part 2, Section - VI (ERTS)	12.7.2	The associated EP brake unit shall be of the energize-to-release type and shall contain all the pneumatic items necessary to control all applications of the friction service brakes and emergency brakes on that car.	All the pneumatic brake application release will work on de-energize to release philosophy. Only Emergency Brake will be energize to release and hence, the clause may please be modified "The associated EP brake unit shall be of the energize-to-release type <b>during Emergency Brake</b> and shall contain all the pneumatic items necessary to control all applications <b>and release</b> of the friction service brakes and emergency brakes on that car."	Please refer to revised clause in Addendum 2	Y
324	Part 2, Section - VI (ERTS)	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 IP 65 in accordance with EN 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 IP 66	"Connectors fitted externally to the Car body shall achieve a seal rated <b>to at least IP 65</b> " as adopted in all the Metro applications.	Please refer to revised clause in Addendum 2	Y
325	Part 2, Section - VI (ERTS)	2.26.5.2 & 3.6.4.2	Proven methodology in metro railways application shall be used for smoke detection (such as point smoke detector or aspiration based smoke detector). Same shall be submitted for CMRL review and approval (CDRL-20). The system shall be compliant with SIL2 requirements.	<b>The fire protection system must be SIL 2 compliant. Does this mean that CMRL wants the following activities:</b> -Hw and sw SIL 2 standard certification of the Central Unit -Mechanical drawing of the antifire elements -Electrical schematics, cables and connectors lists of the specific project -Type tests conformity list -Technical and functional descriptions of the specific project -Project specific Central Unit configuration -Laboratory test of the Central Unit configuration -Installation, user and maintenance manuals of the specific project -Fire detection and functionals test procedures -BOM, detailed weights and detailed consumption of each item -Quality plan of the specific project -For each antifire item, EN 45545 fire & smoke requirements and related report -Drawings of the layout of smoke & LHD sensors -Documentation, development, laboratory test of the specific project sw configuration.	This can be discussed in detail during Design Stage. So Tender condition prevails.	N

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326	Part 2, Section - VI (ERTS)	2.26.5.2 & 3.6.4.2 (Cont.)		<p>or that also the following activities are required?</p> <p>-For the specific project:</p> <ul style="list-style-type: none"> <li>oReliability Prediction</li> <li>oAvailability Analysis</li> <li>oFMECA</li> <li>oFault Tree Analysis (FTA) - Mission and Safety</li> <li>oPreventive and Corrective Maintenance Analysis</li> <li>oLCC</li> <li>oHazard Analysis (PHIA, SSHA, O&amp;SHA, IHA) and Hazard Log</li> <li>oList of safety critical items (SCIL)</li> <li>oRAMS Report</li> </ul> <p>-Documentation, development, laboratory test of the specific project sw configuration under SIL 2 rules</p> <p>-Complete documentation package for the NoBo SIL 2 certification of the Specific Application</p>	This can be discussed in detail during Design Stage. So Tender condition prevails.	N
327	Part 2, Section - VI (ERTS)	7.4.5.6	In the event of Smoke or fire being present outside the train, arrangements shall be made to prevent the products of combustion being introduced into the saloon and emergency operator's desk areas by shutting off the fresh air inlets and operate in a 100% re-circulation mode. Irrespective of any smoke, in the event of a total loss of even 110 V dc power supply to the air conditioning (therefore no emergency ventilation) the ducting devices shall default to this condition of 100% re-circulation.	<p>In this clause specific need for the capture of smoke outside of the train is present.</p> <p>In order to be compliant with this requirement, does CMRL require external smoke sensors in each car, or will accept two sensors per train?</p>	This can be discussed in detail during Design Stage. So Tender condition prevails.	N
328	Part 2, Section - VI (ERTS)	7.6.2	d) AW 4 passenger loading in all cars	<p>Passenger loading for heat load</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> In clauses 7.4.1, 7.4.3 &amp; 7.4.6.2, as per addendum 1, It is mentioned that fresh air flow shall be 2.5 litres per sec per passenger at AW3 load. Whereas in clause 7.6.2.d, it is mentioned that passenger loading of AW4 to be considered for head loads. This will increase the fresh air flow and heat load emitted by passengers.</li> <li><input type="checkbox"/> Please update the clause 7.6.2.d with AW3 passenger loading in all cars.</li> <li><input type="checkbox"/> This will avoid over sizing of the unit (acquiring cost ) and overall power consumption (running cost).</li> </ul>	Please refer to revised clause in Addendum 2	Y
329	Part 2, Section - VI (ERTS)	7.3.13	The air conditioning units shall be sized to cater for fully laden load of AW4 condition with all equipment being operated. The Contractor shall take into consideration to allow the effects of door opening and closing at stations and the piston and infiltration effects for the rake moving in tunnel as specified in standards.	<p>Passenger loading for heat load</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> In clauses 7.4.1, 7.4.3 &amp; 7.4.6.2, as per addendum 1, It is mentioned that fresh air flow shall be 2.5 litres per sec per passenger at AW3 load. Whereas in clause 7.6.2.d, it is mentioned that passenger loading of AW4 to be considered for head loads. This will increase the fresh air flow and heat load emitted by passengers.</li> <li><input type="checkbox"/> Please update the clause 7.6.2.d with AW3 passenger loading in all cars.</li> <li><input type="checkbox"/> This will avoid over sizing of the unit (acquiring cost ) and overall power consumption (running cost).</li> </ul>	Please refer to revised clause in Addendum 2	Y
330	Part 2, Section - VI (ERTS)	7.6.11	The fresh air intake shall be taken as minimum 2 5 litres/sec per passenger for AW 4 condition in cooling mode	<p>Fresh air flow in cooling mode</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> In clauses 7.4.1, 7.4.3 &amp; 7.4.6.2, as per addendum 1, It is mentioned that fresh air flow shall be 2.5 litres per sec per passenger at AW3 load. Whereas in 7.6.11, fresh air flow is mentioned as minimum 2.5 litres/sec per passenger for AW4 condition.</li> <li><input type="checkbox"/> Please update the requirement as : "The fresh air intake shall be taken as minimum 2.5 litres/sec per passenger for AW3 condition in cooling mode."</li> </ul>	Please refer to revised clause in Addendum 2	Y
331	Part 2, Section - VI (ERTS)	7.6.2	f) Pre cooling cycles	<ul style="list-style-type: none"> <li><input type="checkbox"/> Pre cooling is not a heat gain. It is a default mode provided in VAC software.</li> <li><input type="checkbox"/> Request to delete this clause from Heat gain clause.</li> </ul>	Tender Condition Prevails.	N
332	Part 2, Section - VI (ERTS)	7.6.2	h) Air leakages during door operation at stations with minimum 30 Seconds dwell time.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Challenges persist to determine &amp; calculate door opening air ingress loads theoretically, hence these should be avoided for consideration as a design parameter i.e., heat load.</li> <li><input type="checkbox"/> Since these parameters are dynamic in nature with respect to car location (elevated vs tunnel) during door opening, wind speed, it will not be realistic to determine these parameters.</li> </ul>	Tender Condition Prevails.	N
333	Part 2, Section - VI (ERTS)	7.4.5.3	In the event of the system failure or power supply failure of any individual VAC unit, an emergency ventilation system (1 hour operation with battery supply) shall operate automatically to admit fresh air directly into car to maintain the required oxygen level in the fully laden car, in accordance with EN 14750. In this emergency ventilation condition, the outside fresh air shall be admitted into car at a minimum rate of 5 liters / sec /passenger (@ AW3 load). The ventilation fan shall be fed from the 110V DC supply with its dedicated inverter per each VAC unit during these conditions.	<p>Fresh air flow in Emergency mode:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Fresh Air flow requirement of 5.0 l/sec/passenger 18m3/hr./passenger) is higher than the requirements mentioned in EN 14750 1, Cat B ( 8m3/hr./passenger ).</li> <li><input type="checkbox"/> This will lead to oversizing of Battery (Car builder's scope) and Emergency inverter.</li> <li><input type="checkbox"/> We request to update the fresh air flow requirement as 8m3/hr./passenger as per to EN 14750 1, Cat. B in Emergency mode also.</li> </ul>	Tender Condition Prevails.	N
334	Part 2, Section - VI (ERTS)	7.4.5.5	At the end of the emergency ventilation period, the airflow shall be not less than 5 liters / sec / passenger @ AW3 load for the saloon, including the emergency operator's desk.		Tender Condition Prevails.	N
335	Part 2, Section - VI (ERTS)	7.4.8.1	In the event of smoke or fire existing outside the train being detected, the system shall shut off the fresh air intake to prevent the product of combustion materials being drawn into the saloon and provide a full (100%) re-circulation of return air within the saloon. Provision shall be made to automatically shut off the fresh air intake and re-circulate the internal air of the saloon, during an emergency condition, such as fire outside the train causing excessive heat and smoke to be drawn into the vehicle. Operation of such provision shall be made automatically in UTO mode & non-UTO modes of operation. The closing time of all the fresh air dampers shall preferably be less than 5 seconds from the receipt of smoke signal to avoid ingress of large quantity of smoke coming inside the car. The status of smoke activation, dampers condition shall be displayed on the DDU TCMS. These details shall also be displayed in RSC consoles of OCC, BCC & DCCs.	<p>Fresh air damper closing time</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> We request to update the Fresh air damper closing time of ≤10 seconds from the receipt of smoke signal. This is because of limited availability from actuator motor suppliers complying to HL3 requirement.</li> <li><input type="checkbox"/> Below are the references in India</li> </ul> <ol style="list-style-type: none"> <li>1. Lucknow Metro</li> <li>2. Kochi Metro</li> </ol>	Please refer to revised clause in Addendum 2	Y

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336	Part 2, Section - VI (ERTS)	7.11.2	Even in the extremely dusty and humid environment prevailing in Chennai, the cleaning of all the VAC filters shall not be required before 12,500 kms or 30 days of train run whichever is lower . All the VAC filters shall have sufficient effectiveness to ensure that dust deposition in the air duct is bare minimum and cleaning of duct is not required in between major overhauls.	Dust concentration for filter design: <input type="checkbox"/> Dust concentration of "Total Suspended Particles Matter in atmosphere (TSPM) of 150 to 320 micro g/m3 " as per Table 2.6 for filter cleaning interval calculations. Please confirm.	Please refer to Clause 2.11.1 in Addendum 2.	N
337	Part 2, Section - VI (ERTS)	17.5.3.1	The VAC unit shall be tested according to EN14750 2 Standard and to meet the requirements specified in ERTS section 07 (Ventilation and Air conditioning). Noise and vibration levels shall be measured for all operating modes of VAC unit.	Testing method & instruments: <input type="checkbox"/> EN 14750 2 is train level standard . this is not applicable to HVAC unit <input type="checkbox"/> VAC unit rating shall be tested as per ANSI/ASHRAE Standard 37 in Laboratory. This update requested is inline with Chennai Metro Phase 1 specification <input type="checkbox"/> Conditioned air delivery test shall be done with Nozzle airflow measuring apparatus (code tester) as per 6.2 section of ASHRAE 37 and with automated measurement. Request to add this measurement method in this requirement 17.5.3.1 <input type="checkbox"/> Request to update the requirement as ""Noise and vibration levels shall be measured in most significant mode (all components <input type="checkbox"/> Please clarify if Coach level Climatic chamber testing is foreseen for CMRL Phase 2 order. <input type="checkbox"/> As per discussion, where we suggested to keep ASHRAE 37 as the VAC unit testing reference. <input type="checkbox"/> Please find the relevant portion details from the standard in the next slide where air flow measurement method is specified with Nozzle airflow measuring apparatus (code tester).	ERTS allows for other equivalent standards subject to approval from CMRL. So tender condition prevails.	N
338	Part 2, Section - VI (ERTS)	17.5.3.1	The VAC unit shall be tested according to EN14750 2 Standard and to meet the requirements specified in ERTS section 07 (Ventilation and Air conditioning). Noise and vibration levels shall be measured for all operating modes of VAC unit.	The VAC unit shall be tested according to ANSI/ASHRAE Standard 37 and to meet the requirements specified in ERTS section 07 (Ventilation and Air conditioning). During cooling capacity testing, conditioned air delivery measurement shall be done with Nozzle airflow measuring apparatus (code tester) as per 6.2 section of ASHRAE 37 and with automated measurement (no manual readings allowed for conditioned air delivery measurement). Noise and vibration levels shall be measured in most significant mode (all components running).	ERTS allows for other equivalent standards subject to approval from CMRL. So tender condition prevails.	N
339	Part 2, Section - VI (ERTS)	7.9.1	The condenser and evaporator coils shall be made of copper and having copper fins . Cleaning of condenser and evaporator coils should not be required earlier than 6 months.	Copper/Aluminium fin: <input type="checkbox"/> Since there are coatings available to Aluminium fins to protect against corrosion, we request to provide an option to use either Copper fins or Aluminium fins. <input type="checkbox"/> We propose to update the requirement as "The condenser and evaporator coils shall be made of copper and having copper fins or pre coated Aluminium fins". <input type="checkbox"/> Aluminum fins with coating are being used and running successfully in Lucknow metro, Kochi metro in India. <input type="checkbox"/> Some references where Aluminium fins are being used in Coastal cities like Chennai with overhaul time in years: Shanghai Metro(20Y), Guangzhou Metro (15Y), Kuala Lumpur(15Y), Kaohsiung Metro (15Y)	Tender Condition Prevails.	N
340	Part 2, Section - VI (ERTS)	7.9.2	The condenser and evaporator fan motors shall work on 415V, 3 phase, 50Hz supply. However, in case of auxiliary supply failure, the evaporator fan motors shall be fed from the inverter. Dual speed motor may be used. The fan motors shall be minimum of IP 56 protection . There shall be separate MCBs for each evaporator fan motor and each condenser fan motor.	Supply air fan motor IP rating: <input type="checkbox"/> There are limited options with supply air fans meeting IP56 + EN 45545 HL3 requirement. <input type="checkbox"/> For Supply air fan motor alone, we propose to update the requirement as " minimum IP54 " since Supply air fan motor will be in enclosed in AHU chamber and previous project experience. <input type="checkbox"/> IP54 certified Supply air fans are being successfully used in 1. Riyadh Metro 2. Siemens Velaro MS 3. Stadler FLIT 3/ FLIT 4 BLS 4. London LUL.	Tender Condition Prevails.	N
341	Part 2, Section - VI (ERTS)	17.5.3.1.o	Fresh Air Quantity Measurements	<input type="checkbox"/> We propose that this measurement shall be with Air capturing hood with pressure balance air flow measurement (For example: Accubalance from TSI). <input type="checkbox"/> Please add the measurement method also in the requirement 17.5.3.1.o. <input type="checkbox"/> Request to update this requirement as " Fresh Air Quantity Measurements: Shall be done with Air capturing hood with pressure balance air flow measurement, no manual readings allowed". <input type="checkbox"/> Fresh Air flow rate shall be measured as per Clause 10.5 Airflow rate: The airflow shall be determined using a system of measurement which enables the recording of results with a minimum accuracy of 10%. Or as per ANSI/ASHRAE Standard 111 2008 (latest).	Please refer to revised clause in Addendum 2	Y
342	Part 2, Section - VI (ERTS)	7.1.11	Environmental conditions for the equipment on board the train shall conform to EN 50125 1.	Solar load and contaminants level: <input type="checkbox"/> There are various classes of Solar radiation as per EN 50125 1. We propose that Solar radiation class shall be R1(700W/m2) as per EN 50125 1 in Summer condition. 1120W/m2 is unrealistic in Chennai and it will lead to over sizing of the HVAC unit. <input type="checkbox"/> For pollutants, EN 50125 1 Chapter:4.11 Pollution cross refers to EN 60721 3 5. As per EN 60721 1, it was mentioned that " presence of mould, fungus, etc.," for biological conditions. Please share more details of biological contamination to be considered for design for example type of mould, fungus etc.	Tender Condition Prevails.	N