

Chennai Metro Rail Limited
Tender Description: Design, Manufacture, Supply, Testing, Commissioning of Standard Gauge Metro Rolling Stock (78 cars) and Training of Personnel
Tender No. CMRL/PHASE II/SYS/ARE03A/2021
Tender ID: 2021_CMRL_662041_1

Reply to Bidder Queries

Sl no	Part/ Section No	Clause No.	Original Bid Condition	Bidder's queries	CMRL Response published in eportal	Further queries from Bidders	CMRL Response	Addendum
1	Part-2, Section - VI - (ERTS)	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. Please mention relevant clause as per EN or UIC standard.			Tender condition prevails.	N
2	Part-2, Section - VI - (ERTS)	3.4.7.5	The floor covering service life of 18 years shall be provided.	Request CMRL to review the floor covering service life and update as 15 years.			Tender condition prevails.	N
3	Part-2, Section - VI - (ERTS)	3.4.7.9	The fire barrier standard is mentioned as BS 6853	BS 6853 is obsolete. To be changed to EN 45545-3 in line with clause 2.26.1 (iv)			As mentioend in ERTS 1.2.3 & 1.2.4, other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
4	Part-2, Section - VI - (ERTS)	3.4.9.1.1	All glazing shall be of toughened glass and shall comply with DIN 52306 and EN 1288	Requirement to be changed to IS 2553 part 1 & 2, the standards for safety glass specification for transportation & general use.			As mentioend in ERTS 1.2.3 & 1.2.4, other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
5	Part-2, Section - VI - (ERTS)	3.4.9.3.1	Windows shall be of the same construction as the body side windows.	Body side windows are fixed windows. CMRL to clarify for cab window whether fixed window or openable window to be considered.			ERTS requirement is clear. Tender conditions prevail.	N
6	Part-2, Section - VI - (ERTS)	3.4.9.4.1	Glazing material shall be laminated glass and it shall comply to IS 2552 or any International Standard..	The standard IS 2552 to be corrected as IS 2553			Please refer to Addendum (02) SI. No. 1	Y
7	Part-2, Section - VI - (ERTS)	3.9.2	<u>Equipment shall not separate from the car under the collision scenarios defined in ERTS 3.14.10.2.</u>	EN 15227 calls only to check the consequences at a collision speed of 25 kmph and not beyond. EN 15227 as standard calls to consider only AW0+50% seated passengers. clause may be rephrased Crashworthiness analysis will be as per EN 15227			Tender condition prevails.	N
8	Part-2, Section - VI - (ERTS)	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.	EN 15227 as standard calls to consider only AW0+50% seated passengers. clause may be rephrased Crashworthiness analysis will be as per EN 15227.			Tender condition prevails.	N

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9	Part-2, Section - VI - (ERTS)	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.	EN 15227 as standard calls to consider only AW0+50% seated passengers. clause may be rephrased Crashworthiness analysis will be as per EN 15227.			Tender condition prevails.	N
10	Part-2, Section - VI - (ERTS)	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.	As per 3.14.5.3, the coupler be shall able to absorb energy within recoverable stroke (without permanent damage) upto 10kmph with AW2 loaded condition. But, as per ERTS 3.14.5.4, the coupler shall absorb the energy within its sacrificial elements(means non-recoverable stroke) from 10km/h to 25km/h. CMRL to clarify whether coupler has to be designed to withstand energy without permanent deformation upto 10kmph or upto 25kmph, under AW2 loading condition. Also, CMRL is requested to rephrase the sentence as below: "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 and then bring 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".			Your understanding is correct. However, there is no necessary for changing the ERTS requirements. So Tender condition prevails.	N
11	Part-2, Section - VI - (ERTS)	3.14.6.1	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].	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
12	Part-2, Section - VI - (ERTS)	3.14.6.2	Stress analyses for supports for items weighing less than 150 Kg may be requested for review at the discretion of CMRL.	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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13	Part-2, Section - VI - (ERTS)	3.14.6.4	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
14	Part-2, Section - VI - (ERTS)	3.14.8.5	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 needs specific software tools, please clarify whether software tools are needed for this?			Your understanding is correct.	N
15	Part-2, Section - VI - (ERTS)	3.14.8.6	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.			Tender condition prevails.	N
16	Part-2, Section - VI - (ERTS)	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.			Noted. ERTS requirements to be complied.	N
17	Part-2, Section - VI - (ERTS)	3.14.10	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 & AW2 condition is not found in the standard & 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
18	Part-2, Section - VI - (ERTS)	3.14.10.3	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

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19	Part-2, Section - VI - (ERTS)	5.3.10	Look-out glass on both lateral sides of each emergency operator's desk.	To clarify if this look out glass is same as that of cab window of clause 3.4.9.3.			Your understanding is correct.	N
20	Part-2, Section - VI - (ERTS)	11.2.13	There shall be sufficient clearance (but not less than 25 mm between the bogie and car body 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 criteria for maintaining clearance of not less than 25mm between bogie and carbody is not established. In view of the above The clause may please be modified as by providing reference international standard Or The clause may please be modified as " There shall be sufficient clearance between the bogie and car body ...".	Tender condition prevails.	However no clarity is provided on the sought query.	The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N
21	Part-2, Section - VI - (ERTS)	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 "Except for the bogie mounted rubber bonded metal components", since the natural rubbers cannot comply to EN 45545 in order to achieve desired suspension characteristics.	Tender condition prevails.	However no clarity is provided on the sought query.	The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N
22	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."	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.	However no clarity is provided on the sought query.	The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N
23	Part-2, Section - VI - (ERTS)	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.	However no clarity is provided on the sought query.	The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N
24	Part-2, Section - VI - (ERTS)	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.	It is understood that the New stress analysis and static and dynamic tests infers that the simulations and tests are to be repeated and no waiver shall be provided should previous simulation / tests be deemed inappropriate. The clause may please be elaborated with respect to "new stress analysis and static and dynamic tests".	Tender condition prevails.	However no clarity is provided on the sought query.	The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N
25	Part-2, Section - VI - (ERTS)	11.4.14	The Contractor shall submit a detailed dynamic model to demonstrate the running behaviour 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.	However no clarity is provided on the sought query.	The clause is clear.	N

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26	Part-2, Section - VI - (ERTS)	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 3.14.9 without detaching from the car or deforming in a manner that will penetrate the passenger compartment. Equipment supports shall also be designed to prevent equipment from becoming projectiles.	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.	Tender condition prevails.	However no clarity is provided on the sought query.	The ERTS requirement is clear. The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N
27	Part-2, Section - VI - (ERTS)	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. This must be confirmed by test."	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.	Tender condition prevails.	However no clarity is provided on the sought query.	The squealing noise in the curves shall be minimised so that the overall noise level criteria is met. The overall noise level shall not exceed the limits specified in ERTS Clause 2.17.3	N
28	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."	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 derailment detection device i.e., front, rear or either ends of all bogies may please be explicitly defined. Details regarding the type of derailment detection and monitoring system such as condition monitoring/real time monitoring etc and the technology (Mechanical impact/ Radio frequency/Laser technology etc) may also please be clearly 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.	However no clarity is provided on the sought query.	The ERTS requirement is clear. The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N
29	Part-2, Section - VI - (ERTS)	17.5.2.10.1	One complete bogie frame, including the journal bearing housing, bearing / sliding pads and connecting elements such as traction rods shall be subjected to static and fatigue testing to demonstrate compliance with the loads in ERTS Section 11.6.	Common practice of carrying the static and fatigue tests of bogie frame is as per UIC 515-4 and UIC 615-4 where only bogie frame is subjected to static and fatigue testing. The requirement in the subject clause calls for testing of "bogie frame, including the journal bearing housing, bearing/sliding pads and connecting elements such as traction rods". The requirement may please be revised providing clarity if these additional items are to be mounted during the static and fatigue test of bogie frame?"	Tender condition prevails.	However no clarity is provided on the sought query.	The ERTS requirement is clear. The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N

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30	Part-2, Section - VI - (ERTS)	17.5.2.10.9	<p>A load equalization test shall be performed on one motor bogie and one trailer bogie installed on the first completed married pair at AW0 load conditions. For this test, one wheel of the bogie shall be raised and then lowered 63.5 mm with respect to the plane formed by the other three wheels of the same bogie as they rest on level track. An alternative design and service proven load equalization test may be presented to CMRL for approval during design review.</p> <p>During the test, the other three wheel treads shall maintain contact with the rails. Additionally, with one wheel raised and lowered 51mm with respect to the plane formed by the other three wheels, the neutral wheel load of the other three wheels shall not change by more than 50 percent.</p>	<p>The procedure detailed in the ERTS requirement and the criteria is not proven/established.</p> <p>The clause may please be updated for procedure and criteria by providing reference to a relevant international standard.</p>	Tender condition prevails.	However no clarity is provided on the sought query.	The ERTS requirement is clear. The modification suggested is not acceptable to CMRL. Hence Tender condition prevails.	N
31	Part-2, Section - VI - (ERTS)	19.13	Glass specification standard	Glass specification to be as per IS 2553 standard.			As mentioend in ERTS 1.2.3 & 1.2.4, other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
32	Part-2, Section - VI - (ERTS)	19.20.5	Fire safety	This clause is contradicting with clause 2.26.1			It is understood that the bidder is having query on the Standards that are mentioned in the ERTS clause 2.26.1. The bidder is free to follow as per ERTS Clause 1.2.3.	N
33	Part-2, Section - VI - (ERTS)	19.34.6	Thermal insulation material shall have a thermal conductivity of not greater than (13 kJ/hr-m2-Co/cm) when tested in accordance with ANSI Z98.1.	ANSI Z98.1 is not related to thermal conductivity. CMRL to review.			Please refer to Addendum (02) Sl. No. 2 & 3	Y
34	Part-2, Section - VI - (ERTS)	19.18.8 19.25.2.4 19.13	NEMA LD-3 ML-C-7438 MS-21044 MIL-N-25027 FS-DD-G-451 MIL-G-25667 SAEAMS-G-25667 SAE J673	Request CMRL to delete these standards and specify only the International standards list at Appendix B			As mentioend in ERTS 1.2.3 & 1.2.4, other standards are also acceptable, subject to approval by CMRL. Tender condition prevails.	N
35	Part-2, Section - VI - (ERTS)	19.61	Flammability and smoke emission	This clause is contradicting with clause 2.26.			It is understood that the bidder is having query on the Standards mentioned in the ERTS clause 2.26. The bidder is free to follow as per ERTS Clause 1.2.3.	N