

ARE03 - Addendum (02)																																																																																																																																																																																																																																																																																																									
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1	Part-1, Section – IV, Bidding Forms	9		New Clause inserted : The bidder is permitted to submit the certificate within 30 days of Bid submission.																																																																																																																																																																																																																																																																																																					
2	Part 1, Section II - BDS (Bid Data Sheet)	ITB 44		New Clause inserted : Ministry of Finance, Department of Expenditure, Public Procurement Division, Government of India has issued an Order (Public Procurement No.1) on 23 July 2020 on Restrictions Under Rule 144(xi) of the General Financial Rules (GFRs), 2017. Based on which any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority. For details refer to Part 1, Section V-A, 'Requirements of a Bidder from a Country which Shares Land Border with India'																																																																																																																																																																																																																																																																																																					
3	Part 1, Section III - EQC	Section 2.5		New clause inserted : Sl. No. 9 High Voltage Equipments (Main Transformer & VCB) The proposed Main Transformer and VCB shall be in satisfactory revenue operation for at least Ten years, in a country other than the country of origin of manufacturer or in India at the time of bid submission. Form Sys-9																																																																																																																																																																																																																																																																																																					
4	Part 1, Section IV - Bidding Forms - Instructions for completing the pricing document (ICP)	Cl. 3.2.1 - Price variation / Price adjustment - 1st Para	Price adjustment is applicable on all the Price Centres excluding, Price Centre H (Training, operation and maintenance manuals) and Provisional Sum payable to the Contractor, in accordance with the Contract, during performance of the Contract to reflect changes in the cost of labour, copper, carbon steel, stainless steel/aluminium components and other inputs to the Works, in accordance with the following general formula specified;	Price adjustment is applicable on all the Price Centres payable to the contractor <u>excluding taxes & duties</u> , excluding Price Centre H (Training, operation and maintenance manuals), and excluding Provisional Sum, in accordance with the Contract, during performance of the Contract to reflect changes in the cost of labour, copper, carbon steel, stainless steel/aluminium components and other inputs to the Works, in accordance with the following general formula specified;																																																																																																																																																																																																																																																																																																					
5	Part 1, Section IV - Bidding Forms - Instructions for completing the pricing document (ICP)	Cl. 3.2.2 - Conditions applicable to price adjustment, S. No. (e)		New Clause inserted : The Contractor has to submit the Price adjustment bill preferably on every quarter (every three month interval) or upto maximum of Half yearly (Six months interval) basis without fail, in compliance with all the conditions stated above.																																																																																																																																																																																																																																																																																																					
6	Part 1, Section IV - Bidding Forms - Instructions for completing the pricing document (ICP)	Cl. 3.2.6 - Price variation during extended period of completion - 1st Para	The price adjustment as worked out above i.e. either increase or decrease will be applicable up to the stipulated Completion Date of the Works, including the extended period of completion where such extension has been granted under Sub-Clauses 8.4 of the Part 3 - General Conditions, and where such an extension has been granted, the price adjustment will be due as follows:	The price adjustment as worked out above i.e. either increase or decrease will be applicable up to the stipulated Completion Date (<u>applicable to all milestone dates</u>) of the Works , including the extended period of completion where such extension has been granted under Sub-Clauses 8.4 of the Part 3 - General Conditions, and where such an extension has <u>not</u> been granted, the price adjustment will be due as follows:																																																																																																																																																																																																																																																																																																					
7	Part 1, Section IV - Bidding Forms - Price Schedules	Cl. 4.3 - DETAILS OF TAXES / DUTIES / LEVIES ETC. INCLUDED IN THE LUMP SUM PRICE (PRICE CENTRE WISE) - TABLE 4.3.1	<table><tr><th colspan="6">Table 4.3.1: Taxes, Duties, Levies, etc.</th></tr><tr><th rowspan="3">Price Centre</th><th colspan="5">Taxes, Duties, Levies etc.⁽¹⁾</th></tr><tr><th colspan="2">Customs Duty</th><th colspan="2">Goods and Services Tax</th><th rowspan="2">Total amount of all taxes, duties, levies, cess etc.</th></tr><tr><th>Rate (%)</th><th>Amount</th><th>Rate (%)</th><th>Amount</th></tr><tr><td>A</td><td colspan="2" rowspan="4">NOT APPLICABLE</td><td></td><td></td><td></td></tr><tr><td>CST</td><td></td><td></td></tr><tr><td>FAI</td><td></td><td></td></tr><tr><td>CPT</td><td></td><td></td></tr><tr><td>B</td><td colspan="5">NOT USED</td></tr><tr><td>C</td><td colspan="2">NOT APPLICABLE</td><td></td><td></td><td></td></tr><tr><td>D</td><td colspan="5">NOT USED</td></tr><tr><td>E</td><td colspan="2" rowspan="2">NOT APPLICABLE</td><td></td><td></td><td></td></tr><tr><td>F</td><td></td><td></td></tr><tr><td>G</td><td></td><td></td><td></td><td></td></tr><tr><td>H</td><td colspan="2">NOT APPLICABLE</td><td></td><td></td><td></td></tr><tr><td>Total</td><td></td><td></td><td></td><td></td><td></td></tr></table>	Table 4.3.1: Taxes, Duties, Levies, etc.						Price Centre	Taxes, Duties, Levies etc. ⁽¹⁾					Customs Duty		Goods and Services Tax		Total amount of all taxes, duties, levies, cess etc.	Rate (%)	Amount	Rate (%)	Amount	A	NOT APPLICABLE					CST			FAI			CPT			B	NOT USED					C	NOT APPLICABLE					D	NOT USED					E	NOT APPLICABLE					F			G					H	NOT APPLICABLE					Total						<table><tr><th colspan="12">Table 4.3.1: Details of Taxes, Duties, Levies etc.,</th></tr><tr><th rowspan="5">Price Centre</th><th colspan="11">Taxes, Duties, Levies etc. (In INR)</th></tr><tr><th colspan="6">Customs Duty</th><th colspan="2">Goods and Services Tax</th><th colspan="2" rowspan="2">Any other taxes /duties / levies</th><th rowspan="2">Total amount of all taxes, duties, levies, cess etc.</th></tr><tr><th colspan="2">Basic Custom Duty</th><th colspan="2">IGST</th><th colspan="2">Social Welfare Surcharges</th><th colspan="2">CGST</th><th colspan="2">SGST</th></tr><tr><th>Rate (%)</th><th>Amount</th><th>Rate (%)</th><th>Amount</th><th>Rate (%)</th><th>Amount</th><th>Rate (%)</th><th>Amount</th><th>Rate (%)</th><th>Amount</th><th>Rate (%)</th><th>Amount</th></tr><tr><td>A</td><td colspan="6">NOT APPLICABLE</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CST</td><td colspan="6">NOT APPLICABLE</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>FAI</td><td colspan="6">NOT APPLICABLE</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CPT</td><td colspan="6">NOT APPLICABLE</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>B</td><td colspan="6">NOT USED</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>C</td><td colspan="6">NOT APPLICABLE</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>D</td><td colspan="6">NOT USED</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>E</td><td colspan="6">NOT APPLICABLE</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>F</td><td colspan="6">NOT APPLICABLE</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>G</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>H</td><td colspan="6">NOT APPLICABLE</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Total</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Table 4.3.1: Details of Taxes, Duties, Levies etc.,												Price Centre	Taxes, Duties, Levies etc. (In INR)											Customs Duty						Goods and Services Tax		Any other taxes /duties / levies		Total amount of all taxes, duties, levies, cess etc.	Basic Custom Duty		IGST		Social Welfare Surcharges		CGST		SGST		Rate (%)	Amount	Rate (%)	Amount	Rate (%)	Amount	Rate (%)	Amount	Rate (%)	Amount	Rate (%)	Amount	A	NOT APPLICABLE												CST	NOT APPLICABLE												FAI	NOT APPLICABLE												CPT	NOT APPLICABLE												B	NOT USED												C	NOT APPLICABLE												D	NOT USED												E	NOT APPLICABLE												F	NOT APPLICABLE												G													H	NOT APPLICABLE												Total												
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9	Part 1, Section IV - Bidding Forms - Price Schedules	Cl. 4.3 - DETAILS OF TAXES / DUTIES / LEVIES ETC. INCLUDED IN THE LUMP SUM PRICE (PRICE CENTRE WISE) - FOOT NOTE - S. NO. 5	The bidders shall note that the customs duty, GST , leveis, etc. indicated in the above table are considered to be included in the lumpsum price (Price centre wise) i.e. Bid Total in INR currency and will be reimbursed by the Employer in INR, upon submission proof of discharge of contractor's liability subject to the ceiling of the amounts indicated in the above table. However if any rates of tax are increased or decreased, a new tax is introduced, an existing tax is abolisehed in the course of performance of contract, an equitable adjustment of the contract price shall be made to fully take into account any such change by addition to the contract price or deduction therefrom, as the case may be.	<p>The bidders shall note that the custom duty, GST, levies, etc. indicated in the above table are considered to be included in the lumpsum price (Price centre wise) i.e. Bid Total in INR currency and will be reimbursed by the Employer in INR only, upon submission proof of discharge of contractor's liability subject to the ceiling of the amounts indicated in the above table.</p> <p><u>Cost towards Currency fluctuations if any shall be deemed included in the Lumpsum Price and the Ceiling limit shall not be adjusted on this account.</u></p> <p><u>This ceiling limit shall proportionately be increased or decreased based on the work variation / Optional additional order (if any) as awarded by the Employer during the contract period.</u></p> <p><u>This ceiling limit shall also be increased or decreased based on the actual tax components incurred by the contractor towards Price variation payments during the contract period, as per approval of the Engineer / the Employer.</u></p> <p>However, if any rates of tax are increased or decreased, a new tax is introduced, an existing tax is abolished in the course of performance of contract, an equitable adjustment of the contract price shall be made to fully take into account any such change by addition to the contract price or deduction therefrom, as the case may be.</p>										
10	Part 1, Section IV - Bidding Forms - Price Schedules	Cl. 4.4.10 - Price Centre G - Column A & B	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. 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; 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.	<p>The bidder shall not fill the amounts here. The bidder shall quote their prices against individual items of Annexure GA1 to GA6 and the total cumulative sum derived from GA1 to GA6 shall be filled against 'Price Centre G' in Price bid form (Excel BOQ) only. Annexure GA1 to GA6 with the quoted prices against each items, shall be uploaded along with Letter of Price bid in Financial bid only. It shall not be uploaded anywhere in technical bid strictly.</p> <p>In case of dispute between amounts specified in Annexure GA1 to GA6 and Price quoted in Price Centre G in Price bid form (Excel BOQ), the price quoted in Price bid form (Excel BOQ) shall only prevail. In such case, the bidder needs to submit their revised price for Annexure GA1 to GA6 where applicable subject to the ceiling of the quoted amount against Price Centre G upon award of contract.</p> <p>Milestone Payment will be made to the contractor based on this Annexure GA1 to GA6 as per the stipulated conditions of contract.</p>										
11	Part 1, Section IV - Bidding Forms	Form No. 5.14	<p>5.14 Certificate confirming No deviation from tender conditions</p> <p>This is to certify that we, M/s. <i>[Insert name of the company (Single Entity / JV)]</i> have carefully examined all the contents of the bidding documents including all Addendums / Corrigendums.</p> <p>It is further certified that there are no additional comments, remarks, deviations, terms & conditions in our financial package. If any deviation found, it shall be treated as NULL and VOID and stands 'withdrawn from bid.'</p> <p>Signature of the Bidder</p>	<p>5.14 Certificate confirming No deviation from tender conditions</p> <p>This is to certify that we, M/s. <i>[Insert name of the company (Single Entity / JV)]</i> have carefully examined all the contents of the bidding documents including all Addendums / Corrigendums.</p> <p>We hereby confirm that our technical bid is fully and truly compliant with the tender conditions in totality (Part 1, Part 2 and Part 3) inclusive of all addendums / corrigendums.</p> <p>We hereby confirm that all implicit and explicit deviations, comments, remarks, mentioned elsewhere in our technical bid shall be treated as NULL and VOID and stand withdrawn.</p> <p>It is further certified that there are no additional comments, remarks, deviations, terms & conditions in our financial package. If any deviation found, it shall be treated as NULL and VOID and stands 'withdrawn from bid.'</p> <p>Signature of the Bidder</p>										
12	Part 1, Section IV - Bidding Forms	Form SOG: Schedule of Guarantee	<p>5.11 Form SOG: Schedule of Guarantee</p> <p><i>(This Module shall carry as the bid condition. The submission of such Performance/Schedule Guarantee required in Technical Requirements stated by the Employer.)</i></p> <table><tr><th>Required Performance/ Specific Guarantee</th><th>Value of Performance/Specific of Guarantee of the proposed price and implementation</th></tr><tr><td>1.</td><td></td></tr><tr><td>2.</td><td></td></tr><tr><td>3.</td><td></td></tr><tr><td></td><td></td></tr></table>	Required Performance/ Specific Guarantee	Value of Performance/Specific of Guarantee of the proposed price and implementation	1.		2.		3.				Not Applicable.
Required Performance/ Specific Guarantee	Value of Performance/Specific of Guarantee of the proposed price and implementation													
1.														
2.														
3.														
13	Part 1, Section IV - Bidding Forms	Form Sys-9		<p>New Form Inserted :</p> <p>Form Sys-9: Subcontractors/Manufacturers</p> <p>Whomsoever It may Concern</p> <p>We, M/s..... (Name of the Employer) have procured(mentioned the number of cars in both words and numbers) numbers of cars (Metro, LRT, Suburban EMUs, Train sets) from M/s.(Name of the manufacturer) during the period(start date of the contract) and(End date of last car delivery).</p> <p>The cars are fitted with Main Transformer designed and manufactured by(Main Transformer Design and manufacturer name) & Vacuum Circuit Breaker designed and manufactured by(Vacuum Circuit Breaker Design and manufacturer name). The cars(mentioned the number of cars in both words and numbers) with these Communication system are in service since(DD-MM-YYYY). The performance of these Main Transformer and Vacuum Circuit Breaker are found satisfactory.</p>										
14	Part 1, Section IV - Bidding Forms	Form Sys-9 (cont..)		<p>The Main Transformer is developed / manufactured at (Main Transformer manufacturer area and country) and delivered and used at(Customer area and country). The VCB is developed / manufactured at (VCB manufacturer area and country) and delivered and used at(Customer area and country)</p> <p>Signature of the Authorized Person</p> <p>Name of the customer Name of the Authorized person Designation of the Authorized person City State Country Phone number: E-mail id of Authorized person</p> <p>NOTE: CMRL will accept the Experience certificates in any other format too, provided that contains all the necessary informations sought in these bidding forms.</p>										

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S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
15	Part 1, Section IV - Bidding Forms	Form Sys 1 to Sys 9		New Note inserted : The sub-system proposed by the contractor shall be in line with requirements stipulated in Part 2 - ERTS. In case of an alternative variant proposed by the contractor, that sub-system must be of either equivalent or superior to the requirements stipulated in ERTS.
16	Part 1, Section V - Eligible Source Countries	Section V B, S. No. (vii) and (viii)		New Clause inserted : (vii) A bidder is permitted to procure raw material, components, sub-assemblies etc., from the vendors from countries which shares a land border with India. Such vendors will not be required to be registered with the Competent Authority, as it is not regarded as "Sub-contracting". (viii) However in case a bidder has proposed to supply finished goods procured directly/indirectly from the vendors from the countries sharing land border with India, such vendor will be required to be registered with the Competent Authority.
17	Part 3 - Section VIII - PCC - Part A: Contract Data	S. No. 16, CD 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.	10% of the Accepted Contract Amount (Excluding Provisional Sum), <u>excluding taxes & duties</u> , 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.
18	Part 3 - Section VIII - PCC - Part A: Contract Data	S. No. 19, CD 14.3 (c) - Limit of Retention money	5% of Accepted Contract Amount	5% of Accepted Contract Amount, <u>excluding taxes & duties</u> .
19	Part 3 - Section VIII - PCC - Part A: Contract Data	S. No. 28, CD 20.6 - Arbitration	Administrated by: Indian Arbitration Tribunal Conducted under: Arbitration and Conciliation Act, 1996 as amended from time to time.	Conducted under: Arbitration and Conciliation Act, 1996 as amended from time to time.
20	Part 3 - Section VIII - PCC - Part B: Specific Provisions	PCC Cl. 10 (SP 1.5) - 'Priority of documents'	<u>Replace Sub-Clause 1.5 with the following:</u> The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence: (a) the Contract Agreement, (b) the Letter of Acceptance (LoA), (c) Letter of Technical Bid and Letter of Price Bid (d) Addendum/Corrigendum to Tender (e) the Particular Conditions – Part A (Contract Data) (f) the Particular Conditions – Part B (Specific Provisions) (g) the General Conditions (h) Employer's Requirements – Technical Specifications (i) Pricing Document & Financial Bid (j) Schedules, any other documents forming part of the contract If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction	<u>Replace Sub-Clause 1.5 with the following:</u> The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence: (a) the Contract Agreement <u>along with schedules</u> , (b) the Letter of Acceptance (LoA), (c) Letter of Technical Bid and Letter of Price Bid (d) Addendum/Corrigendum to Tender (e) the Particular Conditions – Part A (Contract Data) (f) the Particular Conditions – Part B (Specific Provisions) (g) the General Conditions (h) Employer's Requirements – Technical Specifications (i) Pricing Document & Financial Bid (j),any other documents forming part of the contract If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction
21	Part 3 - Section VIII - PCC - Part B: Specific Provisions	PCC Cl. 18 (SP 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. 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. The security shall be returned to the Contractor immediately after its expiration.	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 <u>first 13 trains</u> are issued with the Taking-Over Certificate by the Employer. The security shall be returned to the Contractor immediately after its expiration.
22	Part 3 - Section VIII - PCC - Part B: Specific Provisions	PCC Cl. 19 (SP 4.2) - Performance Security	<u>Replace paragraph 2 of GCC Sub-Clause 4.2 with the following:</u> The Contractor shall deliver the Performance Security to the Employer within 28 days after receiving the Letter of Acceptance and shall send a copy to the Engineer. The Performance Security shall be issued by a Public sector bank (PSB) of India and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer, or in another form approved by the Employer.	<u>Replace paragraph 2 of GCC Sub-Clause 4.2 with the following:</u> The Contractor shall deliver the Performance Security to the Employer within 28 days after receiving the Letter of Acceptance and shall send a copy to the Engineer. The Performance Security shall be issued by a Public sector bank (PSB) of India <u>or Scheduled Commercial Banks in India or from a foreign bank having branch which has tie-up with PSU bank in India</u> and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer, or in another form approved by the Employer.
23	Part 3 - Section VIII - PCC - Part B: Specific Provisions	PCC Cl. 26 (SP 5.4) - Technical Standards and Regulations	<u>Add the following at the end of 1st paragraph:</u> "This shall also include metro safety certification and technical clearances, safety certification of Rolling stock for public carriage of passenger and all other rules, guidelines, Acts, as specified by the Government of India."	<u>Add the following at the end of 1st paragraph:</u> The Design and construction standards to be adopted by the contractor shall be in conformity with the Requirements of "Metro Railway Act for opening of Metro Railway for Public carriageway of Passengers, Rules" (along with amendments), "Metro Railway General rules, 2020" (along with amendments), "Rules for opening of a Railway or a section of a Railway for Public Carriage of Passengers" and "Rules for introduction of New type of Rolling stock" and to the satisfaction of the commissioner of Metro Railway Safety whose sanction is mandatory for commissioning of the system. Sanction of the Commissioner of Metro Railway Safety and other Statutory Authorities will be required for introduction of the systems. The contractor shall in this regard carry out all statutory tests and trials necessary for obtaining sanction of the Competent Authority for opening the system for public carriage of passengers and provide assistance and information as required by the appropriate statutory authorities in India. The contractor under the supervision of the Engineer shall also carry out all tests and trial runs and prepare reports and documents required for obtaining all approvals and sanctions of the Commissioner of Metro Railway Safety (CMRS) and any other statutory Authority.

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S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
24	Part 3 - Section VIII - PCC - Part B: Specific Provisions	PCC Cl. 41 (SP 13.8) - Adjustment for changes in cost	Price adjustment is applicable on all the Price Centres excluding Price Centre H (Training, operation and maintenance manuals) and Provisional Sum payable to the Contractor, in accordance with the Contract, during performance of the Contract to reflect changes in the cost of labour, copper, carbon steel, stainless steel/aluminium components and other inputs to the Works, as specified in Part 1 – Section IV – Bidding Forms – 'Instructions for Completing the Pricing document'.	Price adjustment is applicable on all the Price Centres payable to the contractor <u>excluding taxes & duties</u> , excluding Price Centre H (Training, operation and maintenance manuals), and excluding Provisional Sum, in accordance with the Contract, during performance of the Contract to reflect changes in the cost of labour, copper, carbon steel, stainless steel/aluminium components and other inputs to the Works. Reference shall be made to Cl. 3.2 of Part 1 - Section IV - Bidding Forms - 'Instructions for Completing the Pricing document'.
25	Part 3 - Section VIII - PCC - Part B: Specific Provisions	PCC Cl. 43 (SP 14.2) - 'Advance Payment' - 1st Para	The Employer shall make an interest free advance payment for mobilization when the Contractor submits a guarantee in accordance with this sub-clause. This guarantee shall be in the form of BG for an equivalent amount of the requested advance amount as per format given in the Annex to PCC from a Public sector bank (PSB) of India. The total advance payment and the applicable currencies and proportions, shall be as stated in Contract Data.	The Employer shall make an interest free advance payment for mobilization when the Contractor submits a guarantee in accordance with this sub-clause. This guarantee shall be in the form of BG for an equivalent amount of the requested advance amount as per format given in the Annex to PCC from a Public sector bank (PSB) of India <u>or Scheduled Commercial Banks in India or from a foreign bank having branch which has tie-up with PSU bank in India</u> . The total advance payment and the applicable currencies and proportions, shall be as stated in Contract Data.
26	Part 3 - Section VIII - PCC - Part B: Specific Provisions	PCC Cl. 45 (SP 14.9) - 'Payment of Retention money' - 1st & 2nd Para	Retention money shall be deducted at the rate of 5% on each Interim payment certificates (IPCs) in respective currencies and up to the cumulative value equal to 5% of the Contract Price. Upon the request of the Contractor, the Employer after issuance of Taking-Over certificate of each train may release 100% of the withheld retention money specific to that train, on submission of Bank Guarantee for an equivalent amount in respective currencies from a Public sector bank (PSB) of India, in the format annexed to the Particular Conditions.	Retention money shall be deducted at the rate of 5% on each Interim payment certificates (IPCs) <u>excluding taxes & duties</u> , in respective currencies and up to the cumulative value equal to <u>5% of the Accepted Contract Amount (Excluding Provisional Sum)</u> , <u>excluding taxes & duties</u> . Upon the request of the Contractor, the Employer after issuance of Taking-Over certificate of each train may release 100% of the withheld retention money specific to that train, on submission of Bank Guarantee for an equivalent amount in respective currencies from a Public sector bank (PSB) of India <u>or Scheduled Commercial Banks in India or from a foreign bank having branch which has tie-up with PSU bank in India</u> , in the format annexed to the Particular Conditions.
27	Part 3 - Section IX - Annex to PC - Contract Forms	Form 2 - Contract Agreement - S. No. 2	The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents. (a) the Letter of Acceptance (LoA), (b) Letter of Technical Bid and Letter of Price Bid (c) Addendum/Corrigendum to Tender (d) the Particular Conditions – Part A (Contract Data) (e) the Particular Conditions – Part B (Specific Provisions) (f) the General Conditions (g) Employer's Requirements – Technical Specifications (h) Pricing Document & Financial Bid (i) Schedules, any other documents forming part of the contract	The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement <u>along with schedules</u> shall prevail over all other Contract documents. (a) the Letter of Acceptance (LoA), (b) Letter of Technical Bid and Letter of Price Bid (c) Addendum/Corrigendum to Tender (d) the Particular Conditions – Part A (Contract Data) (e) the Particular Conditions – Part B (Specific Provisions) (f) the General Conditions (g) Employer's Requirements – Technical Specifications (h) Pricing Document & Financial Bid (i) any other documents forming part of the contract
28	Part 2 - ERTS	ERTS 2.7.4 Table 2-1	Length of cars over coupler Faces (max.) 22,600mm	Length of DMC / TC / MC over coupler faces 22,600mm
29	Part 2 - 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	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 65
30	Part 2 - ERTS	2.11.1		Additional content added: Note: The details mentioned above are tentative and it shall be RS contractor responsibility to confirm these values from relevant resources.
31	Part 2 - ERTS	2.13.2.1	Following ISO 2631-1/2 standards, vibration frequencies shall be outside of the maximal sensibility range.	Following ISO 2631-4 standards, vibration frequencies shall be outside of the maximal sensibility range.
32	Part 2 - ERTS	2.15.3.3	Each motor design shall utilize standard sealed roller bearings for railway applications.	Each motor design shall utilize standard sealed roller bearings for railway applications.
33	Part 2 - ERTS	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.	The traction motors shall be designed for a life of thirty-five years with no need for major overhaul before 1.2 Million Kms.
34	Part 2 - 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	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 TEN (10) seconds. Alternatively, the contractor must demonstrate fail safe proven design to CMRL
35	Part 2 - 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.	Clause Deleted.
36	Part 2 - ERTS	2.17.3.3	The noise limits in Table 2-6 shall not be exceeded when testing according to ISO 3381	The noise limits in Table 2-9 shall not be exceeded when testing according to ISO 3381
37	Part 2 - ERTS	2.17.3.4 (a)	During Stationary condition the specified limits shall be met with all auxiliary equipment operating simultaneously at maximum capacity.	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.
38	Part 2 - ERTS	2.17.3.9	Door Operation Noise produced by simultaneous operation of all saloon doors on one side of the car shall not exceed 75dBA during the sliding operation and 78 dBA for the locking/unlocking, measured on the fast meter scale. This should be measured at all points in the car 300mm from the doors and 1000mm above the floor.	Door Operation Noise produced by simultaneous operation of all saloon doors on one side of the car shall not exceed 72dBA during the sliding operation and 75 dBA for the locking/unlocking, measured on the fast meter scale. This should be measured at all points in the car 300mm from the doors and 1000mm above the floor during train stationary condition.

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S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition																								
39	Part 2 - ERTS	ERTS 2.17.4.2 Table 2-11	<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 kmh, 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 kmh , maximum acceleration or maximum full service brake with all auxiliaries operating under normal conditions.	82 dBA at 15 m	<p>Microphones shall be placed 1.2 m above top of rail.</p> <table><tr><th colspan="2">Table 2-11: Maximum Wayside Noise Levels</th></tr><tr><th>Condition</th><th>Maximum Level of Exterior Noise in dBA @ 7.5 m from center of track on either sides</th></tr><tr><td>All systems operating simultaneously, including air conditioning and propulsion cooling system, rake stationary</td><td>67 dBA at 7.5 m</td></tr><tr><td>Each auxiliary system operating alone, car stationary.</td><td>65 dBA at 7.5 m</td></tr><tr><td>Rake at any speed from 0 Km/h to 75 km/h, including maximum acceleration, maximum deceleration, maximum full service brake with all auxiliaries operating under normal conditions.</td><td>82 dBA at 7.5 m</td></tr><tr><td>Rake between 30 km/h and 80 kmh, 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	Maximum Level of Exterior Noise in dBA @ 7.5 m from center of track on either sides	All systems operating simultaneously, including air conditioning and propulsion cooling system, rake stationary	67 dBA at 7.5 m	Each auxiliary system operating alone, car stationary.	65 dBA at 7.5 m	Rake at any speed from 0 Km/h to 75 km/h, including maximum acceleration, maximum deceleration , maximum full service brake with all auxiliaries operating under normal conditions.	82 dBA at 7.5 m	Rake between 30 km/h and 80 kmh, maximum acceleration or maximum full service brake with all auxiliaries operating under normal conditions.	82 dBA at 15 m
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40	Part 2 - ERTS	Clause 2.26.1	(iv) Flammable materials shall be well contained with IP 65 protection.	(iv)The train shall be designed to prevent fire propagation through the use of fire barriers in the floor, and in walls at the sides and ends and fire-resistant equipment housings. The flammable materials will be tested according to EN45545-2 requirements. The vehicle floor shall provide a fire barrier of 30 minutes duration tested in accordance with EN45545 Part 1 to 7 (Category 4-A, Hazard level HL3) latest editions or better equivalent standard.																								
41	Part 2 - ERTS	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. Metallic conduit, tubing, piping, and fittings shall not require replacement for the design life of the car. Additionally, the car body shall be designed with safety margins commonly used in the railroad industry or as detailed in this Specification.	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 ERTS clause 17.6.13. Metallic conduit, tubing, piping, and fittings shall not require replacement for the design life of the car. Additionally, the car body shall be designed with safety margins commonly used in the railroad industry or as detailed in this Specification.																								
42	Part 2 - ERTS	3.4.1.4.7		All equipment boxes and covers shall be made of stainless steel or Aluminum such that the boxes, covers and anti-corrosive coating above them shall last for the life of the Car body, i.e. for 35 years. RS contractor shall also provide a declaration for the same during the design stage.																								
43	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.	For a welded construction, the camber on coach body under fully loaded condition (AW4) shall be such that the structure shall not sag below the horizontal plane throughout the vehicle's 35 years life. Alternatively, the 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 (AW4) shall not sag below the horizontal plane throughout the vehicle's 35 years life to ensure proper operation of doors under all loading conditions. Detailed calculations shall be submitted by the Contractor for the expected deflection 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. Vertical deflection of the car body structure, up to the fully laden condition, shall not hinder the normal operation of the passenger doors. The car body, and any equipment mounted on / beneath or within it shall be designed to withstand the fatigue loads that the car body structure will encounter over a period of 35 years in service, in accordance with the criteria described herein. The fatigue life assessment of body structure shall be carried out using recognized techniques and shall be submitted by the Contractor for review and approval by CMRL.																								
44	Part 2 - ERTS	4.6.1.7	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	Connector, Closing mechanism of Electrical Head of the Rake's Front and rear end Coupler shall be rated for at-least IP 55 in accordance with EN 60529																								
45	Part 2 - ERTS	5.5.7	FORWARD – CUT-OUT MODES: Two type of cut-out mode operation shall be provided in case of failure of train side signalling system, low speed cut-out mode (25 kmph) shall be provided for Depot operations and High speed cut-out mode (40 kmph) shall be provided for Mainline operations. These speed limits in mainline and in depot operations shall be governed by Rolling stock system independently.	FORWARD – CUT-OUT MODES: Two type of cut-out mode operation shall be provided in case of failure of train side signalling system, low speed cut-out mode (25 kmph) shall be provided for Depot operations and High speed cut-out mode (40 kmph) shall be provided for Mainline operations. Also, it shall be possible to select either Low speed or High speed cut out from Rolling stock during operation in Main line. These speed limits in mainline and in depot operations shall be governed by Rolling stock system independently.																								
46	Part 2 - ERTS	5.5.7		Additional clause: Note: Modes mentioned here are indicative. RS contractor shall interface with STC contractor as per Appendix C requirements and shall adopt required number of modes in train considering all modes of operation.																								
47	Part 2 - ERTS	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.	The two door panels at each passenger doorway shall be synchronously controlled with Anti-drag Feature 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.																								
48	Part 2 - ERTS	6.2.3	The passenger door pitch shall be approximately equally spaced over the length of rake. The Contractor shall submit the door layout design for approval. (CDRL 6-1)	The passenger doors shall be equally spaced over the complete length of the rake from Front-end Coupler head to rear end Coupler head of train. The Door pitch shall have equal segments from end coupler head of DMC 1 coach to end Coupler head of DMC 2 coach such that train doors of three types of Rolling stock in CMRL Phase 2 shall match with the station PSD's door pitch. Car length requirements of ERTS 2.7.4 Table 2-1 shall be followed. The Contractor shall submit the door layout design for approval of CMRL. (CDRL 6-1).																								

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S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
49	Part 2 - ERTS	6.9.12	Mechanism of Detrainment door shall have below four functions: a)Door Un-locking – It shall be possible to unlock the detrainment door either in stationary or dynamic condition of train. The unlocking of detrainment door shall apply irrevocable Emergency brakes in the train. However, the door shall not be able to be opened in this condition. b)Door Opening – It shall be possible to open the detrainment door only after the acknowledgement of OCC/BCC/DCC and when the train is in stationary condition and after door is un-locked. c)Door closing – It shall be possible to close the detrainment door from inside the train. d)Door Locking – It shall be possible to lock the detrainment door from inside the train with proper communication to TCMS, RSC consoles of OCC, BCC & DCCs.	Mechanism of Detrainment door shall have below four functions: a)Door Un-locking – It shall be possible to manually unlock the detrainment door either in stationary or dynamic condition of train. The unlocking of detrainment door shall apply irrevocable Emergency brakes in the train. However, the door shall not be able to be opened in this condition. b)Door Opening – It shall be possible to open the detrainment door only after the acknowledgement of OCC/BCC/DCC and when the train is in stationary condition and after door is manually un-locked. c)Door closing – It shall be possible to manually close the detrainment door from inside the train. d) Door Locking – It shall be possible to manually lock the detrainment door from inside the train. Once the door is locked, relevant communication shall be sent to TCMS, RSC consoles of OCC, BCC & DCCs.
50	Part 2 - 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.	The air conditioning units shall be sized to cater for fully laden load of AW3 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.
51	Part 2 - 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 TCMS. These details shall also be displayed in RSC consoles of OCC, BCC & DCCs.	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 10 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.
52	Part 2 - ERTS	7.6.2	(d) AW4 passenger loading in all cars.	(d) AW3 passenger loading in all cars.
53	Part 2 - ERTS	7.6.3	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.	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.
54	Part 2 - ERTS	7.6.11	The fresh air intake shall be taken as minimum 2.5 litre/sec per passenger for AW4 condition in cooling mode.	The fresh air intake shall be taken as minimum 2.5 litre/sec per passenger for AW3 condition in cooling mode.
55	Part 2 - ERTS	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.	The saloon interior lighting intensity shall be uniformly distributed and level of illumination shall be atleast 200 lux at the floor level of the Coach and not less than 300 lux at seating positions. Lighting intensity requirements inside coaches shall also comply with EN13272.
56	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.	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) .
57	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)	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)
58	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 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 auxiliary converter shall be housed in a container, which is mounted under floor, The material of the container shall be made of stainless steel or Aluminum such that the boxes, covers and anti-corrosive coating above them shall last for 35 years. RS contractor shall also provide a declaration for the same during the design stage. 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
59	Part 2 - ERTS	9.10.3	During rescue operation, the sick train electrical controls and power supply shall be provided by healthy train. The controls shall consist at-least the below mentioned operations. a)Application & release of all kinds of brake functions in sick train b)Communication between two trains' (Healthy and Sick) operators 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	During rescue operation, the sick train electrical controls and power supply shall be provided by healthy train. The controls shall consist at-least the below mentioned operations. a)Application & release of all kinds of brake functions in sick train b)Communication between two trains' (Healthy and Sick) operators 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 <u>All networks and TCMS which are required to acheive this above functions shall be available during rescue mode operation between two trains.</u>

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S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
60	Part 2 - 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.	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 such that there is no duplication of High Voltage equipment for two pantographs.
61	Part 2 - ERTS	10.3.4	A pantograph auto-drop function which shall drop the pantograph automatically when excessive height is detected shall be provided. An indication shall be provided to the train operator when this function has been operated.	A pantograph auto-drop function which shall drop the pantograph automatically when excessive height is detected shall be provided. An indication shall be provided to the train operator <u>and RSC consoles of OCC, BCC & DCC when this function has been operated.</u> <u>During pantograph entanglement with OHE catenary, there shall be an indication to the train operator and RSC consoles of OCC, BCC & DCC.</u>
62	Part 2 - ERTS	10.4.1	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.	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 <u>and additionally</u> type tested with 300,000 operations & with IEC 60077.
63	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 material of the container shall be in accordance to the Carbody material. 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.	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 made of stainless steel or Aluminum such that the boxes, covers and anti-corrosive coating above them shall last for the life of the Car body, i.e. 35 years. RS contractor shall also provide a declaration for the same during the design stage." 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.
64	Part 2 - ERTS	10.13.18	Traction motor rotor design shall be of copper material.	Traction motor rotor shall be Copper or Aluminium material.
65	Part 2 - ERTS	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 car wear on the system as defined in ERTS Section 2.	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 <u>Wheel</u> wear on the system as defined in ERTS Section 2.
66	Part 2 - ERTS	11.5.1.1	"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. Provision shall be made for de-bogieing in areas of limited headroom, such as under bridges."	"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. Provision shall be made for de-bogieing in areas of limited headroom, such as under bridges."
67	Part 2 - 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 3.5.8 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.	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 <u>clause 3.14.9</u> 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.
68	Part 2 - ERTS	11.9.23.1	""The measured load per axle shall not exceed the above mentioned figure by more than 2% according to IEC 61133 . Under AW0 load condition of car, weight shall comply to IEC 61133 standard. The following requirements of IEC 61133 Clause 5.3.6 are acceptable for the vehicle: a) Measured load on the line of wheels on one side does not differ by more than +/- 4% 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 +/- 4% from the average load per wheel on this axle."	The car axle (including AW0 unbalanced weight) shall be not more than 16T. The measured load per axle shall not exceed the above mentioned figure by more than 2% according to IEC 61133:1992 . Under AW0 load condition of car, weight shall comply to IEC 61133 standard. The following requirements of IEC 61133:1992 Clause 5.3.6 are acceptable for the vehicle: a) Measured load on the line of wheels on one side does not differ by more than +/- 4% 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 +/- 4% from the average load per wheel on this axle."
69	Part 2 - 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.	In the event of a failure of the dynamic brake, the friction brake shall be capable of carrying out TWO 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.
70	Part 2 - 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, 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.
71	Part 2 - 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.	The associated EP brake unit shall be of the energize-to-release type during <u>Emergency Brake and energize-to-apply for other friction brakes</u> and shall contain all the pneumatic items necessary to control all applications and release of the friction service brakes and emergency brakes on that car.
72	Part 2 - ERTS	12.12.3	In the event of wheel slip/slide, the traction equipment shall manage the strategy to adopt, in implementing either the electric braking or the pneumatic braking reaction, without having the blending in opposition.	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

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S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
73	Part 2 - ERTS	13.13.5	In addition to the cameras provided inside the saloon, contractor shall install cameras outside the saloon to monitor the track, OHE, pantograph and platforms of each station. Outside cameras shall be weatherproof and operate in all conditions of passenger service and in commissioning. The recordings from these cameras must be clear in dark, daytime, night-time and in all hours of operation even in case of non-availability of any exterior lighting. All the train cameras shall be Infra-red type or latest better type. Contractor shall submit CCTV camera locations for both inside and outside the coach for CMRL approval (CDRL 13-10).	In addition to the cameras provided inside the saloon, contractor shall install cameras outside the saloon to monitor the track, OHE, pantograph and platforms of each station. External mounted cameras of each coach shall clearly cover platform to coach passenger ingress-egress for all the doors of coach. These cameras shall be specific to each coach side. Passenger obstacle detection at any door of train shall be clearly identifiable through these external mounted CCTV camera footages. All external mounted cameras shall have Ingress Protection with IP 65 rating. All interior and exterior cameras of train shall be vandal resistance with IK 10 rating and shall operate in all exterior temperature and humidity conditions of Chennai mentioned in ERTS Table 7-1 and Table 2-6. They shall operate during all passenger service modes including commissioning. All cameras of train shall be compatible with EN 50155. The recordings from these cameras must be clear in dark, daytime, night-time and in all hours of operation even in case of non-availability of any exterior lighting. All the train cameras shall be Infra-red type or latest better type. Contractor shall submit CCTV camera locations for both inside and outside the coach for CMRL approval (CDRL 13-10).
74	Part 2 - ERTS	14.1.10	Conceptual Approval Only Design approval of proposed TCMS shall imply only conceptual approval. Further changes as required by CMRL based on operational, maintenance and functionality considerations shall be discussed during the contract execution stage and solution shall be implemented by the contractor to the satisfaction of CMRL without any additional cost. This will include finalization of event list, fault priorities, diagnostics, RTR-DMS data transfer, details to be transmitted to OCC central server for operational and fault diagnosis requirements as defined under this ERTS section 14.	Design approval of proposed TCMS shall imply only conceptual approval. Further changes as required by Other Designated contractors and Rolling Stock Sub-systems during DLP, shall be discussed during the contract execution stage and solution shall be implemented by the contractor to the satisfaction of CMRL without any additional cost. This will include finalization of event list, fault priorities, diagnostics, RTR-DMS data transfer, details to be transmitted to OCC central server for operational, fault diagnosis requirements and other requirements defined under the ERTS clauses related to TCMS functionalities. If in case the requirements not stipulated in ERTS, variation can be raised by the Contractor, subject to approval by CMRL.
75	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.	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.
76	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. 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.	Clause Deleted.
77	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.	Ethernet Consist Network with dual-homing ladder-type topology or Ring Network type or latest better technology (compliant with IEC 61375-3-4) shall be adopted. The ECN shall maintain redundant communication links to the ETB.
78	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.	Inserted additional clause: 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.
79	Part 2 - ERTS	14.5.4	Editing DDU Screens The format/no./ contents of DDU screens shall be proposed by the Contractor during design and may have to be changed during the contract based on operational/ maintenance requirements. The Contractor shall make such changes as and when required by CMRL during the contract and shall also train CMRL engineers to design, review and execute the changes in DDU screens in post contract period. Necessary software tools shall be provided for each Depot.	Editing DDU Screens The format/no./ contents of DDU screens shall be proposed by the Contractor during design and may have to be changed during the contract execution stage based on Other Designated contractors and Rolling Stock Sub-systems during DLP, operational / maintenance / functional requirements shall be discussed during the contract execution stage and solution shall be implemented by the contractor to the satisfaction of CMRL without any additional cost. If in case the requirements not stipulated in ERTS, variation can be raised by the Contractor, subject to approval by CMRL. The Contractor shall make such changes as and when required by CMRL during the contract and shall also train CMRL engineers to design, review and execute the changes in DDU screens in post contract period. Necessary software tools & Manulas shall be provided for each Depot.
80	Part 2 - ERTS	14.5.6	Test Mode Extension of DDU : 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.	Clause Deleted.
81	Part 2 - ERTS	14.10.6.2 (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	Clause Deleted.
82	Part 2 - ERTS	17.5.3.1 (o)	Fresh Air Quantity Measurements	Fresh Air Quantity Measurements: This shall be done with Air capturing hood with pressure balance air flow measurement. The airflow shall be automatic measurement suitable for air flow measurements in turbulent air flow streams and providing airflow volume directly.

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S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
83	Part 2 - 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.	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. <u>If brake components other than the tread brake block and/or disk brake components are used, such components shall be subject to equivalent thermal capacity testing.</u>
84	Part 2 - ERTS	17.6.13	<p>Car body Water-tightness Acceptance Testing</p> <p>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:</p> <p>a. Prior to the car body water test, the door shall be adjusted and tested to verify that they meet the requirements of ERTS section 6.</p> <p>b. All spray applications shall run for ten minutes before the inspection for leaks begins and shall run continuously during the inspection.</p> <p>c. The flow of the water during the test shall be not less than 2.46 liters per minute delivered to each 3.05 x 3.05 m of surface being tested, and the nozzle velocity of the water shall not be less than 45.72 m per second.</p> <p>d. Underfloor boxes, which are required to be watertight, shall receive a pressure water test similar to the watertightness test for the carbody.</p>	<p>Car body Water-tightness Acceptance Testing</p> <p>The Contractor shall subject each car to a complete test for water tightness. Water tightness shall be conducted on Car Body including 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. Water droplets shall not enter into the coach during conduction of test as per the following specifications:</p> <p>a. Prior to the car body water test, the door shall be adjusted and tested to verify that they meet the requirements of ERTS section 6.</p> <p>b. All spray applications shall run for ten minutes before the inspection for leaks begins and shall run continuously during the inspection.</p> <p>c. The flow of the water during the test shall be not less than 2.46 liters per minute delivered to each 3.05 x 3.05 m of surface being tested, and the nozzle velocity of the water shall not be less than 45.72 m per second.</p> <p>d. Underfloor boxes, which are required to be watertight, shall receive a pressure water test similar to the watertightness test for the carbody.</p>
85	Part 2 - ERTS	Appendix C 2.3.11 (c)		<p>New Clause inserted :</p> <p>XXIII) Corridor 3 - Corridor 5 put together can work as a circular loop. Circular operation is envisaged in this loop along with other linear operations. The On-board Papis system and the interface provided by the signalling system shall be designed to cater for the circular operation of trains. The strategy for displaying unambiguous information for the train borne passengers shall be proposed jointly by the contractors to CMRL for NoNO. The strategy for linear operation (with destination concept) and the strategy for circular operation shall be distinct and shall meet the passenger requirement of comprehensive, real time and unambiguous information</p>
86	Part 2 - ERTS	Appendix C 2.3.11 (c)		<p>New Clause inserted :</p> <p>XXIV) Service loop is provided between C5 and C4 near Karambakkam station and Valasaravakkam Station (Refer the track alignment). This service loop will be used for the movement of Rakes as well as for the movement of passenger trains. The On-board Papis system and the Interface provided by signalling system shall be designed to cater for this inter-corridor operation of trains. The strategy for displaying unambiguous information for the train borne passengers shall be proposed jointly by the contractors to CMRL for NoNO</p>
87	Part 2 - ERTS	Appendix C 2.4.7	There shall be 4 separate radio systems for communication between Train and wayside. The system will broadly cater to Train Radio (TETRA), CBTC Radio, CCTV Radio and passenger Wi-Fi radio. The radio system (TETRA) for Train Radio traffic shall be provided by the Telecommunication Contractor primarily for voice communication and for limited system alarms and controls. CBTC radio is for train control functionalities as well as for certain remote-control facilities of the train with ATS. CCTV traffic is for video streams, alarms and status to ATS as well as for RTR-DMS. Passenger Wi-Fi radio is for providing Wi-Fi internet for passengers onboard. The design of the respective wireless networks, its antennas, its relative positions, other wireless network parameters etc shall take the influence of other radios into consideration.	<p>There shall be 3 separate radio systems for communication between Train and wayside. The system will broadly cater to Train Radio (TETRA), CBTC Radio and CCTV Radio. The radio system (TETRA) for Train Radio traffic shall be provided by the TETRA Contractor primarily for voice communication and for limited system alarms and controls. CBTC radio is for train control functionalities as well as for certain remote-control facilities of the train with ATS <u>which shall be provided by STC contractor.</u> CCTV traffic is for video streams, alarms and status to ATS as well as for RTR-DMS. <u>CCTV radio shall be provided by STC contractor.</u> The design of the respective wireless networks, its antennas, its relative positions, other wireless network parameters etc shall take the influence of other radios into consideration.</p>
88	Part 2 - ERTS	Appendix C - 2.4.46	The Levels and protocols for this interface shall be proposed by the STC contractor and agreed by the RS contractor in compliance with open interoperability standards in CCTV industry (e.g.: ONVIF). The onboard and wayside equipment of this interface (Cameras, NVR, video management softwares etc) shall implement modern codecs (e.g. H.264 or higher) for the efficient and reliable use of wireless network bandwidth available.	The Levels and protocols for this interface shall be proposed by the STC contractor and agreed by the RS contractor in compliance with open interoperability standards in CCTV industry (e.g.: ONVIF). The onboard and wayside equipment of this interface (Cameras, NVR, video management softwares etc) shall implement band width optimisation techniques like multicast transmission, modern codecs (e.g. H.264 or higher) for the efficient and reliable use of wireless network bandwidth available.

ARE03 - Addendum (02)				
S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
89	Part 2 - ERTS	Appendix C 2.4.47	Interface plan to address the procedures to be adopted for rescuing the immobile train on line by un manned & un attended coupling of the failure train with healthy train and clearing the line in Pull/Push mode with healthy train. These procedures shall be proposed for UTO and Non-UTO modes of operations.	<p>The operation of the mechanical coupling in the front and rear end automatic couplers of the rake shall be completely automatic when coupling and un-coupling between rakes.</p> <p>With one uncoupling command from TCMS & RSC console of OCC / BCC / DCC, it shall enable sequential dis-engagement of electrical head, pneumatic head and mechanical head uncoupling within each front end coupler of train. Uncoupling shall be possible only when the rake is stationary.</p> <p>In front-end automatic coupling operation,RS Contractor shall ensure that the operation of the electrical head coupling occurs only after effective and successful engagement of both mechanical and pneumatic coupling between rakes. There shall always be a manual command provision from TCMS and RSC console of OCC/BCC/DCC to allow/not-allow the engagement of electrical heads between rakes after effective and successful mechanical & pneumatic coupling.</p> <p>As trains shall operate in UTO mode (with GoA 4), automatic couplers shall be used in such a way that in all degraded operation modes, in general operational modes and in emergency cases, no manual intervention at coupler is required to couple/uncouple the defective train with healthy train (and vice-versa) in the complete alignment of CMRL Phase 2.</p> <p>Interface plan to address the procedures to be adopted for rescuing the immobile train on line by un manned & un attended coupling of the failure train with healthy train and clearing the line in Pull/Push mode with healthy train. These procedures shall be proposed for UTO and Non-UTO modes of operations.</p>
90	Part 2 - ERTS	Appendix C 2.4.61		<p>New clause inserted :</p> <p>The car wise passenger load of the train shall be continuously communicated to the signalling system by the rolling stock system, in a continuous manner with a defined level of accuracy (less than 3% deviation). The signalling system shall use this data along with train number and location details for various data analysis and information displays.</p>
91	Part 2 - ERTS	Appendix C 2.4.62		<p>New clause inserted :</p> <p>The external ambient air temperature of the train shall be continuously communicated to the signalling system by the rolling stock system. The signalling system shall use this data along with the location details for various data analysis and information displays.</p>
92	Part 2 - ERTS	Appendix C 2.4.63		<p>New clause inserted :</p> <p>Rolling stock contractor shall interface with STC contractor for Operation of Train's VCB's in Neutral section by using commands from on-board ATP as primary method. This function shall be a vital output from on-board ATP. However, RS contractor shall provide a back-up software logic in train for operation of VCBs during all modes of train operation while passing in Neutral section region.</p> <p>The VCB operation facility by signalling shall work in UTO,DTO, ATO,ATP mode of operation irrespective of the classification of train in ATS (time tabled, non-time tabled, with/without train ID, passenger-non-passenger etc)</p>
93	Part 2 - ERTS	Appendix C 2.4.64		<p>Door Loop Monitoring;</p> <p>If any door or emergency exit door on a Train is detected to be unlocked while the Train is in UTO/ATO/ATP/Signaling RM mode in motion, on-board signalling system shall apply emergency brake to stop the train</p>
94	Part 2 - ERTS	Appendix C 2.9.3		<p>New clause inserted :</p> <p>Signalling contractor and RS Contractor shall interface to make the functionality available to execute certain critical remote commands from OCC (ATS system) to TCMS through TETRA radio system, in addition to the functionality through CBTC Wi-Fi radio. This facility will be utilised by the ATS when the signalling Wi-Fi radio transmission network is not available because of any reason for a particular train. Adequate reliability and availability shall be built into this functionality by suitable measures (e.g.: message duplicated telegrams, acknowledgements, message counters, time stamps etc). Emergency door release is one such remote command under this interface. The detail list of critical remote commands from ATS to Rolling stock through TETRA shall be finalised by RS, Signalling and TETRA contractors in the detail interface design phase in consultation with CMRL.</p>
95	Part 2 - ERTS	Appendix C 3.5.30		<p>New Clause inserted :</p> <p>TETRA contractor shall furnish RS Contractor with the interface required between the TETRA radio system and the Rolling stock system/ TCMS to execute certain critical remote commands to train from OCC (ATS system). This facility will be utilised by the ATS when the signalling radio transmission network is not available because of any reason for a particular train. Adequate reliability and availability shall be build into this functionality by suitable measures (e.g.: message duplicated telegrams, acknowledgements, message counters, time stamps etc). Emergency door release is one such remote command under this interface. The detail list of critical remote commands from ATS to Rolling stock through TETRA shall be finalised by RS, Signalling and TETRA contractors in the detail interface design phase in consultation with CMRL.</p>
96	Part 2 - ERTS	Appendix C 5.4.3 (Table)		<p>New clause inserted :</p> <p>23. Gradient of OHE: RS Contractor RS contractor requires details of gradient of OHE to obtain smooth current collection OCS Contractor OCS Contractor shall agree to give the details of gradient of OHE</p>

ARE03 - Addendum (02)				
S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
97	Part 2 - ERTS	Appendix C 6.2.6	TRW Contractor shall provide necessary support to resolve all pending or new interface related issues arising during the operation of the trains till completion of RS Contractor defect liability period. RS Contractor shall provide necessary support to resolve all pending or new interface related issues arising during the operation of trains till completion of TRW Contractor defect liability period.	TRW Contractor shall provide necessary support to resolve all pending or new interface related issues arising during the operation of the trains till completion of TRW Contractor defect liability period. RS Contractor shall provide necessary support to resolve all pending or new interface related issues arising during the operation of trains till completion of RS Contractor defect liability period.
98	Part 2 - ERTS	Appendix C 6.4.2	Interface between Rolling stock and Tracks contractors shall be for all the three corridors of CMRL Phase 2 i.e., Corridor 3, Corridor 4, Corridor 5, their future extensions and for their inter-corridor operations.	Interface between Rolling stock and Tracks contractors shall be for all the three corridors of CMRL Phase 2 i.e., Corridor 3, Corridor 4, Corridor 5, their future extensions and for their inter-corridor operations. The TRW Contractor shall interface for the Corridor which come under his contractual jurisdiction.
99	Part 2 - ERTS	Appendix C 6.4.3 (Table)	3. Rail wheel interaction RS Contractor The wheel profile and Wheel back-to back spacing shall be compatible with the rail profiles and track gauge. TRW Contractor TWR shall provide the details of gauge, rail profile to RS Track gauge is 1435mm and rail profile is UIC 60, E1 profile,	3. Rail wheel interaction RS Contractor The wheel profile and Wheel back-to back spacing shall be compatible with the rail profiles and track gauge. TRW Contractor TWR shall provide the details of gauge, rail profile to RS. Track gauge is 1435mm and rail profile is UIC 60, E1 profile, Rail Section on main line is 60 E1 1080 Grade HH Rail on main line. Main Line – Ballast less track. Rail Section on Depot is 60 E1 Grade 880 Rail. Depot – Ballasted & Ballast less track.
100	Part 2 - ERTS	Appendix C 6.4.3 (Table)	6. Materials: Wheel and rail materials shall be optimised to give the minimum whole-life cost. RS Contractor RS shall give details of wheel hardness and take into consideration of rail hardness provided by TWR inorder to ensure rail wheel compatibility and to provide optimum service life. TRW Contractor TWR shall provide the details of rail hardness and rail characteristics to RS contractor Steel hardness for mainline is 340-390BHN for 1080 rails	6. Materials: Wheel and rail materials shall be optimised to give the minimum whole-life cost. RS Contractor RS shall give details of wheel hardness and take into consideration of rail hardness provided by TWR inorder to ensure rail wheel compatibility and to provide optimum service life. TRW Contractor TWR shall provide the details of rail hardness and rail characteristics to RS contractor Steel hardness for mainline is 340-390BHN for 1080 rails Rail Section on main line is 60 E1 1080 Grade HH Rail on main line. Main Line – Ballast less track. Rail Section on Depot is 60 E1 Grade 880 Rail. Depot – Ballasted & Ballast less track.
101	Part 2 - ERTS	Appendix C 6.4.3 (Table)	7. The Buffer stops used in all the depots of the CMRL phase 2 project shall be compatible with the train's front & rear end automatic couplers & anti climbers. RS Contractor RS contractor shall share the details of couplers including anti-climbers as required by TRW contractor. TRW Contractor TRW Contractor shall design Buffer stop & other related equipment according to the details of Rolling stock.	7. The Buffer stops used in all the depots of the CMRL phase 2 project shall be compatible with the train's front & rear end automatic couplers & anti climbers. RS Contractor RS contractor shall share the details of couplers including anti-climbers as required by TRW contractor. TRW Contractor TRW Contractor shall interface with RS for design of Buffer stop & Wheel stoppers
102	Part 2 - ERTS	Appendix C 6.4.3 (Table)		New Clause inserted : 17. Structure Gauge test: (RS Contractor) RS Contractor will participate the Structure gauge test for complete network (TRW Contractor) Structure Gauge will be prepared by TRW contractor and run throughout the section on completion of track works for complete network.
103	Part 2 - ERTS	Appendix C 6.4.3 (Table)		New Clause inserted : 18. Attainable Speed: (RS Contractor) Based on track geometry details provided by TRW Contractor, RS Contractor shall carry out simulation studies both normal stopping at station and station skip and provide results with respect to attainable speed along the alignment. (TRW Contractor) TRW Contractor based on attainable speed as per simulation study shall modify the value of actual cant and provide the same during construction stage. Value of maximum speed on curves according to revised actual cant also to be revised.
104	Part 2 - ERTS	Appendix C 6.4.3 (Table)		New Clause inserted : 19. Oscillation Trial: (RS Contractor) RS contractor shall share the report / results of oscillation trial to TRW Contractor. (TRW Contractor) TRW contractor shall associate during integrated testing and commissioning and carry out necessary rectification of track if any based on oscillation trial report.
105	Part 2 - ERTS	Appendix C Section 7	Viaduct Contractor	Detailed Design Consultants - Viaduct
106	Part 2 - ERTS	Appendix C Section 8	Tunnel Contractor	Detailed Design Consultants - Tunnel
107	Part 2 - ERTS	Appendix C Section 9	Underground Station Contractor	Detailed Design Consultants - Underground Station
108	Part 2 - ERTS	Appendix C Section 10	Depot Design & Construction Contractor	Detailed Design Consultants - Depot

ARE03 - Addendum (02)				
S. No.	Part/Section	Clause No.	Original Bid Condition	Revised Bid Condition
109	Part 2 - ERTS	Appendix C 10.2.1	RS Contractor shall be the Lead Contractor. The Lead Contractor will be responsible to initiate, plan, coordinate and produce jointly with the Participating Contractors all the required interfaces and interface design documents and interface progress reports for submission to CMRL for acceptance. The Lead Contractor will also prepare and issue all interface meeting minutes after incorporating RS Contractors comments within 3 days of the meeting and provide bi weekly interface progress reports to all the participating contractors for information. Later, forwarding of issued minutes of meeting and bi weekly interface progress reports to respective Engineers shall be responsibility of concerned Contractors.	Detailed Design Consultants - Depot shall be the Lead Contractor. The Lead Contractor will be responsible to initiate, plan, coordinate and produce jointly with the Participating Contractors all the required interfaces and interface design documents and interface progress reports for submission to CMRL for acceptance. The Lead Contractor will also prepare and issue all interface meeting minutes after incorporating RS Contractors comments within 3 days of the meeting and provide bi weekly interface progress reports to all the participating contractors for information. Later, forwarding of issued minutes of meeting and bi weekly interface progress reports to respective Engineers shall be responsibility of concerned Contractors.
110	Part 2 - ERTS	Appendix C 12.4 (Table)	1. Train Configuration (RS Contractor) RS shall provide the details of train configuration, and technical specification for Subway Environmental Simulation / IDA Tunnel to design Tunnel ventilation and Track way exhaust system. (TVS Contractor) TVS Contractor shall get the details of train configuration and technical specification for Subway Environmental Simulation / IDA Tunnel to design Tunnel ventilation and Track way exhaust system.	1. Train Configuration (RS Contractor) RS Contractor shall provide the details of: -train configuration, -kinematic envelope, -structural gauge -average empty car weight, -train rolling resistance coefficient -skin friction coefficient -drag coefficient of the rolling stock, and any other data required by the TVS Contractor to verify the necessary Subway Environmental Simulation / IDA Tunnel and 3-dimensional CFD analyses. (TVS Contractor) TVS Contractor shall obtain the necessary inputs for Train Physical Data to verify and validate the Subway Environmental Simulation / IDA Tunnel and 3-dimensional CFD analyses.
111	Part 2 - ERTS	Appendix C 12.4 (Table)	2. Fire Load (RS Contractor) RS Contractor shall provide the details of train fire load to design Tunnel ventilation and Track way exhaust system. (TVS Contractor) TVS Contractor shall get the details of train fire load to design Tunnel ventilation and Track way exhaust system.	2. Fire Load (RS Contractor) RS Contractor shall provide the details of: -train design heat release rate -fire growth rate and curve -heat of combustion -soot yield -CO yield material composition for the train walls, train floor and the seats. (TVS Contractor)TVS Contractor shall obtain the necessary inputs for the Fire Load parameters to verify and validate the Tunnel Ventilation System design and TVF/OTE fan capacities.
112	Part 2 - ERTS	Appendix C 12.4 (Table)	3. Heat Release (RS Contractor) RS Contractor shall provide the heat release rate from train such as air conditioning unit, braking/ traction equipment and other auxiliary equipment to design track way exhaust system. (TVS Contractor) TVS Contractor shall get the heat release rate from train such as air conditioning unit, braking/ traction equipment and other auxiliary equipment to design track way exhaust system.	3. Auxiliaries Heat Release (RS Contractor) RS Contractor shall provide: -the location and details of braking / traction equipment -sensible and latent heat rejection from auxiliaries -power consumption of auxiliaries -regeneration braking effectiveness -regeneration braking efficiency and any other data required by the TVS Contractor to verify and validate the required fan flow capacities during normal and congested operations. (TVS Contractor) TVS Contractor shall obtain the necessary inputs for the Auxiliaries Heat Release parameters to verify and validate the required fan flow capacities during normal and congested operations.
113	Part 2 - ERTS	Appendix C 12.4 (Table)	4. VAC Unit (RS Contractor) RS Contractor shall provide the location details of train air conditioning unit, braking/ traction equipment and other auxiliary equipment to provide openings in the over track way exhaust duct. (TVS Contractor) TVS Contractor shall get the location details of train air conditioning unit, braking/traction equipment and other auxiliary equipment to provide openings in the over track way exhaust duct	4. VAC Unit (RS Contractor) RS Contractor shall provide: -the location and details of train air conditioning unit -Condenser fan flowrate -fan diameter -nominal and crush-loaded passenger loading capacities -AC unit COP -AC unit off-loading / cut-off temperature and any other data required by the TVS Contractor to verify and validate the required fan flow capacities during normal and congested operations. (TVS Contractor) TVS Contractor shall obtain the necessary inputs for the Train VAC Unit parameters to verify and validate the required tunnel ventilation fan flow capacities during normal and congested operations.
114	Part 2 - ERTS	Appendix C 12.4 (Table)	5. Rolling Stock Parameters (RS Contractor) RS Contractor shall provide the details of train speed, acceleration, deceleration, dwell time and operating headways in each underground stations and tunnels to design Tunnel ventilation and Track way exhaust system. (TVS Contractor) TVS Contractor shall get the details of train speed, acceleration, deceleration, dwell time and operating headways in each underground stations and tunnels to design Tunnel ventilation and Track way exhaust system.	Clause Deleted.
115	Part 2 - ERTS	Appendix C 12.4 (Table)	6. Train Data (RS Contractor) RS Contractor shall share the details regarding Train Data (TVS Contractor) TVS Contractor shall get the details regarding Train Data.	6. Train Performance Data (RS Contractor) RS Contractor shall provide: -the train speed and respective tractive effort at those speeds, -acceleration rate -deceleration rate -max operating speed -design operating speed in tunnels and any other data required by the TVS Contractor to verify the necessary Subway Environmental Simulation / IDA Tunnel analyses. (TVS Contractor) TVS Contractor shall obtain the necessary inputs for Train Performance Data to verify and validate the Subway Environmental Simulation / IDA Tunnel analyses.
116	Part 2 - ERTS	Appendix C 12.4 (Table)	Detailed Interface document (DID): RS contractor shall provide the necessary information as requested by RS contractor. TVS contractor shall prepare DID and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance, etc.,	Detailed Interface document (DID): RS contractor shall provide the necessary information as requested by TVS contractor. TVS contractor shall prepare DID and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance, etc.,

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S. No.	Part/Section	Clause No.	Original Bid Condition				Revised Bid Condition													
117	Part 2 - ERTS	Appendix C – Clause 5.4.3 S.No 13																		
			<table><tr><td>S. No.</td><td>Item</td><td>RS contractor</td><td>OCS contractor</td></tr><tr><td>13</td><td>Neutral Section</td><td>Shall check and Confirm suitability</td><td>Shall provide information about location, arrangement, etc., to RS Contractor</td></tr></table>	S. No.	Item	RS contractor	OCS contractor	13	Neutral Section	Shall check and Confirm suitability	Shall provide information about location, arrangement, etc., to RS Contractor	<table><tr><td>S. No.</td><td>Item</td><td>RS contractor</td><td>OCS contractor</td></tr><tr><td>13</td><td>Neutral Section</td><td>Rolling stock contractor shall interface with STC contractor for Operation of Train's VCB's in Neutral section by using commands from on-board ATP as primary method. This function shall be a vital output from on-board ATP. However, RS contractor shall provide a back-up software logic in train for operation of VCBs during all modes of train operation while passing in Neutral section region.</td><td>Shall provide information about location, arrangement, etc., to RS Contractor</td></tr></table>				S. No.	Item	RS contractor	OCS contractor	13
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