

**DESIGN, MANUFACTURE, SUPPLY, TESTING, COMMISSIONING AND
TRAINING OF 36 Nos. OF STANDARD GAUGE CARS FOR AIRPORT METRO EXPRESS
PROJECT
TENDER 'RS14'**

ADDENDUM NO. 5B

S.No	Part, Section, Description, Clause, Location etc	Amendments																											
1.	<ul style="list-style-type: none"> • Volume 3 • ERGS • Clause 10.2.1 • Page 6 of 84 	<p><u>REPLACE</u></p> <p>“The Contractor can be provided subject to availability approximately 400 sq m of total space at nominated depot for the setting up of contractor’s site offices and stores, and for working on the vehicles. These site offices shall be built commensurate with the architecture of the surrounding buildings and after obtaining the approval of Engineer for its broad design. The structure shall be handed over to Employer in good condition after the completion of the defect liability period.”</p> <p><u>WITH</u></p> <p>“The Contractor can be provided subject to availability approximately 150 sq m of built up space at nominated depot on pre defined rental charge of INR 650 per sq m area for setting up of contractor’s site offices and stores, and for working on the vehicles. Workshop floor area of 150 sq m can also be provided subject to availability at nominated depot on pre defined rental charge of INR 50 per sq m area.</p>																											
2.	<ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 1.3.1 • Table 1.2 • Page 6 of 84 	<p><u>REPLACE</u></p> <table border="1" data-bbox="581 1255 1421 1892"> <thead> <tr> <th data-bbox="581 1255 743 1325">Sl. No</th> <th data-bbox="743 1255 1154 1325">Equipment/Subsystem</th> <th data-bbox="1154 1255 1421 1325">Preferred Vendor</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="581 1325 1421 1394" style="text-align: center;">Roof and Propulsion Equipments</td> </tr> <tr> <td data-bbox="581 1394 743 1463">1</td> <td data-bbox="743 1394 1154 1463">Pantograph</td> <td data-bbox="1154 1394 1421 1463">Schunk</td> </tr> <tr> <td data-bbox="581 1463 743 1533">2</td> <td data-bbox="743 1463 1154 1533">Pantograph Isolation Switch</td> <td data-bbox="1154 1463 1421 1533">Secheron</td> </tr> <tr> <td data-bbox="581 1533 743 1602">2</td> <td data-bbox="743 1533 1154 1602">Surge Arrestor</td> <td data-bbox="1154 1533 1421 1602">Tyco/Melco</td> </tr> <tr> <td data-bbox="581 1602 743 1671">3</td> <td data-bbox="743 1602 1154 1671">Potential Transformer</td> <td data-bbox="1154 1602 1421 1671">Ritz/Melco</td> </tr> <tr> <td data-bbox="581 1671 743 1740">4</td> <td data-bbox="743 1671 1154 1740">VCB</td> <td data-bbox="1154 1671 1421 1740">Secheron</td> </tr> <tr> <td data-bbox="581 1740 743 1810">5</td> <td data-bbox="743 1740 1154 1810">EGS</td> <td data-bbox="1154 1740 1421 1810">Secheron</td> </tr> <tr> <td data-bbox="581 1810 743 1879">6</td> <td data-bbox="743 1810 1154 1879">Current Transformer</td> <td data-bbox="1154 1810 1421 1879">Melco</td> </tr> </tbody> </table>	Sl. No	Equipment/Subsystem	Preferred Vendor	Roof and Propulsion Equipments			1	Pantograph	Schunk	2	Pantograph Isolation Switch	Secheron	2	Surge Arrestor	Tyco/Melco	3	Potential Transformer	Ritz/Melco	4	VCB	Secheron	5	EGS	Secheron	6	Current Transformer	Melco
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		7	Transformer	Melco
		8	Converter Inverter (CI)	Melco
		9	Traction Motor	Melco
		10	Master Controller	Gessman
		TCMS		
		11	TCMS	CAF-COSMOS
		12	Event Recorder	Hasler
		Auxiliary Supply Equipment		
		13	Auxiliary Converter	MELCO
		14	Battery Set	Amco Saft
		Bogie		
		15	Bogie Frame	CAF
		16	Primary Suspension	CAF
		17	Secondary Suspension	Contitech
		18	Gear case unit	BMT
		19	Wheel Flange Lubricator	BIJUR DELIMON
		20	Primary Damper	Koni
		21	Secondary Damper	Koni
		22	Horizontal Damper	Koni
		23	Reaction Rod	Watteeuw
		Gangway		
		24	Gangway complete	Hubner
		Coupler		

		25	All Couplers	CAF
HVAC				
		26	Complete HVAC System	Klimat Fer
Brake & Pneumatics				
		27	Brake System equipment i.e. Brake Controller, Pneumatic valves, Pressure governors/switches etc.	Knorr Bremse
		28	Compressor	Knorr Bremse
		29	Air Dryer	Knorr Bremse
Door				
		30	Saloon Door	KBI/IFE
		31	Emergency Detrainment Door	Barat
<u>WITH</u>				
		Sl. No	Equipment/Subsystem	Preferred Vendor
Roof and Propulsion Equipments				
		1	Pantograph	Schunk
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		2a	Surge Arrestor	Tyco/Melco
		3	Potential Transformer	Ritz/Melco
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		9	Deleted	Deleted
		10	Master Controller	Gessman
		TCMS		
		11	Deleted	Deleted
		12	Deleted	Deleted
		Auxiliary Supply Equipment		
		13	Auxiliary Converter	MELCO
		14	Battery Set	Amco Soft
		Bogie		
		15	Complete Motor Bogie equipped with traction motor, wheel sets and brake units etc.	CAF
		16	All types of Complete Trailer bogie equipped with wheel sets and brake units etc.	CAF
		17	Deleted	Deleted
		18	Deleted	Deleted
		19	Deleted	Deleted
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3.	<ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 1.3.2 • Page 7 of 84 	<p><u>REPLACE</u> In case the contractor proposes to use a different make/type of equipment/subsystem from the above list, the contractor shall be required to additionally supply above UES spares in equivalent numbers needed for one complete 6 car trainset to DMRC and the cost for same shall be deemed to be included in the quoted tender price.</p> <p><u>WITH</u> In case the contractor proposes to use a different make/type of equipment/subsystem from the above list, the contractor shall be required to additionally supply each such UES spare (which are proposed to be different from items mentioned at Table 1.2) in equivalent numbers needed for one complete 6 car trainset to DMRC except for items at Sl.No. 7,8,15,16, 26 & 30 of Table 1.2 which shall be in equivalent numbers needed for one complete 3-car unit in case of different make/type and the cost for same shall be deemed to be included in the quoted tender price.</p>		
4.	<ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 2.5.8 • Page 12 of 84 	<p><u>REPLACE</u> The Contractor shall prepare a Fire Safety Design Report for review and acceptance by the Engineer. This shall be submitted within 2 months of Commencement Date and revised and updated for the completion of the preliminary, pre-final and final design stages. The design and materials used in the cars shall conform to fire safety requirements of NFPA130 and/or EN 45545 Part 1 to 7(Category 4-N, Hazard level HL3) latest editions as a minimum or the latest edition of other equivalent or better international standards applicable for similar Metro</p>		

		<p>for underground operations with front evacuation, subject to the acceptance of the Engineer.</p> <p>The Contractor shall engage an internationally reputed agency for the audit and certification of their fire safety design report. The Contractor shall obtain Engineer's prior approval before selecting such agency. The audit report & certificate from this agency shall be submitted by the Contractor to the Engineer. If a fire safety certificate has already been obtained by contractor for the similar design cars supplied to DMRC then a fresh audit and certification of fire safety design report can be waived off at the discretion of the Engineer.</p> <p>N.B. Whichever Standard is selected for meeting the Fire Safety Criteria, then that standard shall be declared, and once accepted by the Engineer its requirements shall be met consistently throughout.</p> <p><u>WITH</u></p> <p>The Contractor shall prepare a Fire Safety Design Report for review and acceptance by the Engineer. This shall be submitted within 2 months of Commencement Date and revised and updated for the completion of the preliminary, pre-final and final design stages. The design and materials used in the cars shall conform to fire safety requirements of EN 45545 Part 1 to 7(Category 4-N, Hazard level HL3) latest editions as a minimum or the latest edition of other equivalent or better international standards applicable for similar Metro for underground operations with front evacuation, subject to the acceptance of the Engineer.</p> <p>The Contractor shall engage an internationally reputed agency for the audit and certification of their fire safety design report. The Contractor shall obtain Engineer's prior approval before selecting such agency. The audit report & certificate from this agency shall be submitted by the Contractor to the Engineer. If a fire safety certificate has already been obtained by contractor for the similar design cars supplied to DMRC then a fresh audit and certification of fire safety design report can be waived off at the discretion of the Engineer.</p> <p>N.B. Whichever Standard is selected for meeting the Fire Safety Criteria, then that standard shall be declared, and once accepted by the Engineer its requirements shall be met consistently throughout.</p>
5.	<ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 2.10.1(iii) • Page 25 of 84 	<p><u>REPLACE</u></p> <p>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. Flammable materials shall be well contained with IP 65 protection.</p> <p>The design and the materials used in the cars shall conform to fire safety requirements of NFPA130 and/or EN45545 Part 1 to 7 latest editions or the latest edition of other equivalent or better international standards for similar metro operations, subject to the acceptance of the Engineer.</p> <p><u>WITH</u></p> <p>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. Flammable materials shall be well contained with IP 65 protection.</p> <p>The design and the materials used in the cars shall conform to fire safety requirements of EN45545 Part 1 to 7 latest editions or the latest edition of other equivalent or better international standards for similar metro operations, subject to the acceptance of the Engineer.</p>

6.	<ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 4.3.13 • Page 46 of 84 	<p><u>REPLACE</u></p> <p>The car interior shall have very good resistance to fire and conform to NFPA-130 --'Standard For Fixed Guide way - Transit and Passenger Rail Systems' and/or EN-45545 Part 1 to 7 latest edition. Each car shall be provided with two dry powder type fire extinguishers located near the gangways. These shall be installed in a niche so that it will not cause injury to passengers.</p> <p><u>WITH</u></p> <p>The car interior shall have very good resistance to fire and conform to EN-45545 Part 1 to 7 latest edition. Each car shall be provided with two dry powder type fire extinguishers located near the gangways. These shall be installed in a niche so that it will not cause injury to passengers.</p>
7.	<ul style="list-style-type: none"> • Volume 3 • ERTS • Chapter 4 • Page 46 of 84 	<p>4.3.13 Seats</p> <ul style="list-style-type: none"> (i) The interior shall be arranged in three saloon areas, connected by two access vestibules. Comfortable transverse seating arrangement shall be provided in all cars except DMC1 car. (ii) In DMC1 car, the seating arrangement shall also be transverse except that the number of doors and their position shall be same as DMLC car of existing stock in line with ERTS Clause 1.2.3. (iii) The seats shall provide an adequate level of comfort, have a good appearance and vandal resistant and their mountings shall be capable of withstanding the loads arising in service conditions. (iv) Seat modules in similar situations in a vehicle shall be interchangeable. It is preferable that only one style of module be used throughout the train. <p>4.3.14 Flooring</p> <ul style="list-style-type: none"> (i) The floor panel shall be supported on the carbody underframe covered by rubber floor covering. (ii) The insulation shall be mounted between the carbody underframe structure and the floor panels. (iii) The floor covering shall be sealed along all edges and joints to prevent ingress of liquid and preserve a smooth finish. (iv) The total floor structure shall provide an effective fire barrier in accordance with NFPA 130 and/or EN45545 latest version. (v) The floor covering shall have a service life 15 years and colours shall not fade during the specified life. <p>4.3.15 Panelling</p> <ul style="list-style-type: none"> (i) Horizontal and vertical panels shall be located in the saloon area. Panels shall be modular and fully interchangeable. The panels shall cover all wiring, ducting, piping, structure and allow access for maintenance or repair to any components.

		<p>(ii) Panels shall have effective sealing against dirt and foreign bodies between all adjacent elements of the interior trim. Panels shall be manufactured with polyester resin reinforced with fibreglass (GRP). Composite panels shall comply with the Fire Performance Requirements of NFPA 130 and/or EN 45545 latest version.</p> <p>WITH</p> <p>4.3.15 Seats</p> <p>(i) The interior shall be arranged in three saloon areas, connected by two access vestibules. Comfortable transverse seating arrangement shall be provided in all cars except DMC1 car.</p> <p>(ii) In DMC1 car, the seating arrangement shall also be transverse except that the number of doors and their position shall be same as DMLC car of existing stock in line with ERTS Clause 1.2.3.</p> <p>(iii) The seats shall provide an adequate level of comfort, have a good appearance and vandal resistant and their mountings shall be capable of withstanding the loads arising in service conditions.</p> <p>(iv) Seat modules in similar situations in a vehicle shall be interchangeable. It is preferable that only one style of module be used throughout the train.</p> <p>4.3.16 Flooring</p> <p>(i) The floor panel shall be supported on the carbody underframe covered by rubber floor covering.</p> <p>(ii) The insulation shall be mounted between the carbody underframe structure and the floor panels.</p> <p>(iii) The floor covering shall be sealed along all edges and joints to prevent ingress of liquid and preserve a smooth finish.</p> <p>(iv) The total floor structure shall provide an effective fire barrier in accordance with EN45545 latest version.</p> <p>(v) The floor covering shall have a service life 15 years and colours shall not fade during the specified life.</p> <p>4.3.17 Panelling</p> <p>(i) Horizontal and vertical panels shall be located in the saloon area. Panels shall be modular and fully interchangeable. The panels shall cover all wiring, ducting, piping, structure and allow access for maintenance or repair to any components.</p> <p>(ii) Panels shall have effective sealing against dirt and foreign bodies between all adjacent elements of the interior trim. Panels shall be manufactured with polyester resin reinforced with fibreglass (GRP). Composite panels shall comply with the Fire Performance Requirements of EN 45545 latest version.</p>
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<p>8.</p>	<ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 9.10.2 • Page 68 of 84 	<p>REPLACE Standby batteries shall be adequate capacity to power all emergency equipment and services as specified in NFPA 130 Standard and/or EN 45545 latest edition for Fixed Guide way Transit Systems.</p> <p>WITH Standby batteries shall be adequate capacity to power all emergency equipment and services as specified in EN 45545 latest edition for Fixed Guide way Transit Systems.</p>																													
<p>9.</p>	<ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 2.9.3 • Table 2.6 • Page 23 of 84 	<p>REPLACE</p> <p style="text-align: center;">Table 2.6 : Interior Noise Levels (L_{pAeq})</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="background-color: #d9ead3;">Location (Section)</th> <th colspan="2" style="background-color: #d9ead3;">Interior Noise Measurements in dBA</th> </tr> <tr> <th style="background-color: #d9ead3;">Stationary</th> <th style="background-color: #d9ead3;">Running (at 80 kmph)</th> </tr> </thead> <tbody> <tr> <td>All cars except in driving console</td> <td style="text-align: center;">60</td> <td style="text-align: center;">68</td> </tr> <tr> <td>Driving cab</td> <td style="text-align: center;">60</td> <td style="text-align: center;">68</td> </tr> </tbody> </table> <p>WITH</p> <p style="text-align: center;">Table 2.6 : Interior Noise Levels ($L_{pAeq20sec}$)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="3" style="background-color: #d9ead3;">Location (Section)</th> <th colspan="3" style="background-color: #d9ead3;">Interior Noise Measurements in dBA</th> </tr> <tr> <th colspan="2" style="background-color: #d9ead3;">Stationary</th> <th style="background-color: #d9ead3;">Running (Elevated and At Grade)</th> </tr> <tr> <th style="background-color: #d9ead3;">Elevated</th> <th style="background-color: #d9ead3;">Underground</th> <th style="background-color: #d9ead3;">75 kmph)</th> </tr> </thead> <tbody> <tr> <td>All cars except in driving cab (Elevated and at grade)</td> <td style="text-align: center;">68</td> <td style="text-align: center;">75</td> <td style="text-align: center;">75</td> </tr> <tr> <td>Driving Cab (Elevated and at grade)</td> <td style="text-align: center;">68</td> <td style="text-align: center;">72</td> <td style="text-align: center;">70</td> </tr> </tbody> </table>	Location (Section)	Interior Noise Measurements in dBA		Stationary	Running (at 80 kmph)	All cars except in driving console	60	68	Driving cab	60	68	Location (Section)	Interior Noise Measurements in dBA			Stationary		Running (Elevated and At Grade)	Elevated	Underground	75 kmph)	All cars except in driving cab (Elevated and at grade)	68	75	75	Driving Cab (Elevated and at grade)	68	72	70
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<p>10.</p> <ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 2.9.4 • Table 2.6 • Page 24 of 84 		<p><u>REPLACE</u></p> <p style="text-align: center;">Exterior Noise Levels(L_{pAeq})</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d4edda;"> <th colspan="2" style="text-align: center;">Maximum Level of Exterior Noise in dBA</th> </tr> <tr style="background-color: #d4edda;"> <th style="width: 50%;">Stationary</th> <th style="width: 50%;">Running at 80Kmph</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">72</td> <td style="text-align: center;">88</td> </tr> </tbody> </table> <p><u>WITH</u></p> <p style="text-align: center;">Exterior Noise Levels($L_{pAeq20sec}$)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d4edda;"> <th colspan="2" style="text-align: center;">Maximum Level of Exterior Noise in dBA @ 7.5m from centre of track on either sides</th> </tr> <tr style="background-color: #d4edda;"> <th style="width: 50%;">Stationary</th> <th style="width: 50%;">Running at 75 Kmph</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">67</td> <td style="text-align: center;">82</td> </tr> </tbody> </table>	Maximum Level of Exterior Noise in dBA		Stationary	Running at 80Kmph	72	88	Maximum Level of Exterior Noise in dBA @ 7.5m from centre of track on either sides		Stationary	Running at 75 Kmph	67	82		
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<p>11.</p> <ul style="list-style-type: none"> • Volume 3 • ERTS • Clause 3.9.1 • Table 3.7 • Page 32 of 84 		<p><u>REPLACE</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d4edda;"> <th style="width: 60%;">Description</th> <th style="width: 40%;">Limiting Values</th> </tr> </thead> <tbody> <tr> <td>Maximum ambient temperature (See note 1 below)</td> <td>47°C</td> </tr> <tr> <td>Minimum temperature</td> <td>3°C</td> </tr> <tr> <td>Humidity (See note 2 below)</td> <td>100% saturation during rainy season</td> </tr> <tr> <td>Rainfall</td> <td>Rain occurs generally from June to September. Average annual rainfall is approximately 850 mm. Maximum rainfall in any 24h period can be upto 250mm.</td> </tr> <tr> <td>Atmosphere during hot season</td> <td>Extremely dusty including bird feathers</td> </tr> <tr> <td>Maximum wind Speed</td> <td>100 km/hr</td> </tr> </tbody> </table>	Description	Limiting Values	Maximum ambient temperature (See note 1 below)	47°C	Minimum temperature	3°C	Humidity (See note 2 below)	100% saturation during rainy season	Rainfall	Rain occurs generally from June to September. Average annual rainfall is approximately 850 mm. Maximum rainfall in any 24h period can be upto 250mm.	Atmosphere during hot season	Extremely dusty including bird feathers	Maximum wind Speed	100 km/hr
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		Vibration & Shocks	The sub-systems & their mounting arrangements shall be designed to withstand satisfactorily the vibration and shocks encountered in service as specified in IEC 61373 and IEC 60571.
		SO ₂ level in atmosphere	80 – 120 mg/m ³
		Suspended particulate matter in atmosphere	360 – 540 mg/m ³
		WITH	
		Description	Limiting Values
		Maximum ambient temperature (See note 1 below)	47°C
		Minimum temperature	3°C
		Humidity (See note 2 below)	95% saturation during rainy season
		Rainfall	Rain occurs generally from June to September. Average annual rainfall is approximately 850 mm. Maximum rainfall in any 24h period can be upto 250mm.
		Atmosphere during hot season	Extremely dusty including bird feathers
		Maximum wind Speed	100 km/hr
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12.	<ul style="list-style-type: none"> Volume 3 ERTS Clause 3.22.1 Table 3.7 Page 39 of 84 	<p><u>REPLACE</u></p> <p>Table 3.7 Performance Requirements</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Design/Safe speed</td> <td>135 kmph</td> </tr> <tr> <td>Maximum operational speed</td> <td>120 kmph</td> </tr> <tr> <td>Acceleration</td> <td>1 m/s²</td> </tr> <tr> <td>Deceleration</td> <td>1 m/s²</td> </tr> <tr> <td>Emergency Breaking</td> <td>1.35 m/s²</td> </tr> <tr> <td>Jerk rate</td> <td>0.8 m/s³</td> </tr> </tbody> </table> <p><u>WITH</u></p> <p>Table 3.7 Performance Requirements</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Design/Safe speed</td> <td>135 kmph</td> </tr> <tr> <td>Maximum operational speed</td> <td>120 kmph</td> </tr> <tr> <td>Acceleration (For AW3 load condition on level tangent track with speed 0-45 Kmph)</td> <td>1 m/s²</td> </tr> <tr> <td>Deceleration</td> <td>1 m/s²</td> </tr> <tr> <td>Emergency Breaking</td> <td>1.35 m/s²</td> </tr> <tr> <td>Jerk rate</td> <td>0.8 m/s³</td> </tr> </tbody> </table>	Item	Value	Design/Safe speed	135 kmph	Maximum operational speed	120 kmph	Acceleration	1 m/s ²	Deceleration	1 m/s ²	Emergency Breaking	1.35 m/s ²	Jerk rate	0.8 m/s ³	Item	Value	Design/Safe speed	135 kmph	Maximum operational speed	120 kmph	Acceleration (For AW3 load condition on level tangent track with speed 0-45 Kmph)	1 m/s ²	Deceleration	1 m/s ²	Emergency Breaking	1.35 m/s ²	Jerk rate	0.8 m/s ³	
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13.	<ul style="list-style-type: none"> VOLUME 3 ERTS Clause 4.1.1 (i) Page 42 of 84 	<p><u>REPLACE</u></p> <p>"The carbody, as the shell of the vehicle, shall be created to respond to the technical, aesthetic and operation requirements. The car body should be lightweight, conforming to EN 12663:2000 category P-II – railway application – 'Structural Requirements of Railway Vehicle Bodies'. The car strength shall comply with UIC 566 --'Loading of car bodies and their components'. However, compressive load shall be 12000 kilo Newton."</p> <p><u>WITH</u></p> <p>"The carbody, as the shell of the vehicle, shall be created to respond to the technical, aesthetic and operation requirements. The car body should be lightweight, conforming to EN 12663:2000 category P-II –</p>																													

		railway application – 'Structural Requirements of Railway Vehicle Bodies'. The car strength shall comply with UIC 566 --'Loading of car bodies and their components'. However, compressive load shall be 1200 kilo Newton
14.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 4.1.1 (iv) • Page 42 of 84 	<p><u>REPLACE</u></p> <p>Anti-climbing devices shall be provided on headstock of all vehicles and shall remain fully engaged and operational under the action of vertical shear loads (upwards or downwards) equal to half the AW4 vehicle weight. During an engagement of anti-climbing devices, the resultant damages shall be restricted to couplers and anti-climbing devices.</p> <p><u>WITH</u></p> <p>Anti-climbing devices shall be provided on headstock of all vehicles and its design shall ensure that:</p> <ul style="list-style-type: none"> • Impacts up to 10 km/h must be absorbed by recoverable devices mounted in coupler shank. No damage in any element of the vehicle should occur. • Impacts up to 20 km/h must be absorbed by elastic deformation in coupler devices, and plastic deformation of anticlimber boxes. No damage in body shell should occur, unless the controlled failure of the shear off device that release the coupler once
15.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 4.2 (vi) • Page 45 of 84 	<p><u>REPLACE</u></p> <p>The Contractor shall prepare and handover to the Engineer, one true model of stainless steel (nonworking) of a 6 car train DMC1-TC-MC-MC-TC-DMC2, approximately 1:20 size, duly equipped with representative track, OCS, interior-exterior furnishings, internal illumination, headlight, marker light and flasher light, display boards, pedestal and casings. All lights in the model shall be functional. Suitable stand (duly approved by the Engineer) shall be provided with the model. The same shall be delivered along with the delivery of the prototype train. Sample of the model shall be got approved from the Engineer."</p> <p><u>WITH</u></p> <p><u>Deleted.</u></p>
16.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 4.3.13 • Page 46 of 84 	<p><u>REPLACE</u></p> <p>The car interior shall have very good resistance to fire and conform to NFPA-130 -'Standard For Fixed Guide way - Transit and Passenger Rail Systems' and/or EN-45545 Part 1 to 7 latest edition. Each car shall be provided with two dry powder type fire extinguishers located near the gangways. These shall be installed in a niche so that it will not cause injury to passengers."</p> <p><u>WITH</u></p> <p>The car interior shall have very good resistance to fire and conform to EN-45545 Part 1 to 7 latest edition. Each car shall be provided with two dry powder type fire extinguishers located near the gangways. These shall be installed in a niche so that it will not cause injury to passengers."</p>

<p>17.</p>	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 5.1.6 • Page 48 of 84 	<p><u>REPLACE</u></p> <p>The bogie design shall ensures that as many components as possible are identical and fully interchangeable between motor and trailer bogies. Following this common- design concept as far as practicable, motor and trailer bogies shall use common components as listed below:"</p> <ul style="list-style-type: none"> (i) Disc braked wheels (ii) Axle boxes and bearings (iii) Dampers (iv) Bogie frame (v) Brake cylinders and callipers (vi) Primary suspension (vii) Secondary suspension (viii) Air springs (ix) Traction links and centre pivot (x) Axle shaft <p>Only the following item can differ:</p> <ul style="list-style-type: none"> (i) Propulsion equipment <p><u>WITH</u></p> <p>The bogie design shall ensure that as many components as possible are identical and fully interchangeable between motor and trailer bogies.</p>
<p>18.</p>	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 5.2.1 • Page 49 of 84 	<p><u>REPLACE</u></p> <p>The main characteristics of the bogies shall be as follows:</p> <p>Wheel diameter (new/worn)860/780mm</p> <p>Radial tyre wear40mm</p> <p>Wheel base2,500mm</p> <p>Distance between pneumatic air bags2,080mm</p> <p>Axle journal diameter.....130mm</p> <p>Assembly of brake discs..... wheel mounted</p> <p>Number of discs per bogie4</p>

		<p>Brake disc external diameter.....680mm</p> <p>Height of top of air bag ARL (inflated)865mm</p> <p>Number of motors per motor bogie2</p> <p>Motor installation frame hung</p> <p>Maximum design speed..... 135km/h</p> <p>Maximum service speed..... 120km/h</p> <p>Axle bearings life rating3 million km</p> <p><u>WITH</u></p> <p>Deleted.</p>																								
<p>19.</p>	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Page 47 of 84 	<p>Append the following in chapter-4 of ERTS after Clause 4.4</p> <p>4.5 Principal Notional Vehicle dimensions shall be as follows:</p> <table border="1" data-bbox="581 835 1334 1881"> <thead> <tr> <th colspan="2">Description</th> <th>Dimension</th> </tr> </thead> <tbody> <tr> <td colspan="2">Gauge</td> <td>1,435 mm</td> </tr> <tr> <td rowspan="2">Maximum length over buffers/couplers</td> <td>DMC1/ DMC2 between automatic and intermediate couplers</td> <td>24,626 mm</td> </tr> <tr> <td>TC/MC between intermediate couplers</td> <td>22,500 mm</td> </tr> <tr> <td colspan="2">Maximum width over body</td> <td>3000 mm</td> </tr> <tr> <td rowspan="2">Height of floor from rail level</td> <td>Maximum</td> <td>1,130 mm</td> </tr> <tr> <td>Minimum</td> <td>1,100 mm</td> </tr> <tr> <td rowspan="2">Wheel diameter</td> <td>New</td> <td>860 mm</td> </tr> <tr> <td>Fully worn</td> <td>780 mm</td> </tr> </tbody> </table>	Description		Dimension	Gauge		1,435 mm	Maximum length over buffers/couplers	DMC1/ DMC2 between automatic and intermediate couplers	24,626 mm	TC/MC between intermediate couplers	22,500 mm	Maximum width over body		3000 mm	Height of floor from rail level	Maximum	1,130 mm	Minimum	1,100 mm	Wheel diameter	New	860 mm	Fully worn	780 mm
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		Wheel base	2500 mm
		Axle bearing life rating	3 million km
		Maximum axle load	16 Tonne
20.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 5.2.2 (iii) • Page 49 of 84 	<p><u>REPLACE</u> Fully suspended traction motor and gear unit</p> <p><u>WITH</u> The traction motor shall be bogie frame mounted, complete with suitable drive and suspension. Mounting arrangement shall ensure that under no circumstances traction motor would fall on line during operation.</p>	
21.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 6.5.2 • Page 55 of 84 	<p><u>REPLACE</u> The piping shall be of stainless steel conforming to the requirements of JISG3459. The pipe fittings will conform to the requirements of DIN 2353.</p> <p><u>WITH</u> The piping shall be of stainless steel SUS316L. The pipe fittings will conform to the requirements of DIN 2353.</p>	
22.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 6.6.2 • Page 56 of 84 	<p><u>REPLACE</u> The compressor shall be an oil free piston unit fitted with an after cooler, a check valve and a safety valve.</p> <p><u>WITH</u> Deleted.</p>	
23.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 6.8.5 (iii) • Page 57 of 84 	<p><u>REPLACE</u> All pressure gauges shall be glazed and sealed to IP 54 as defined in IEC 519.</p> <p><u>WITH</u> All pressure gauges shall be glazed and sealed to IP 43 as defined in IEC 519.</p>	
24.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 7.1.3 (b) • Page 59 of 84 	<p><u>REPLACE</u> Internal and external release;</p> <p><u>WITH</u> Internal release in all doors and external release in two doors (one each side) in T car.</p>	

25.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 7.1.3 (f) • Page 59 of 84 	<p><u>REPLACE</u> Door sensing facilities shall detect an obstruction and inhibit train movement.</p> <p><u>WITH</u> Obstacle detection as per EN 14752 (2005)</p>
26.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 12.5 • Page 72 of 84 	<p><u>REPLACE</u> An Auxiliary communications panel, controlling functions related to public address and cab-to-cab communications shall be provided on the non-driving side (Auxiliary Desk) of the cab.</p> <p><u>WITH</u> Deleted.</p>
27.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 4.3.6 • Page 46 of 84 	<p><u>REPLACE</u> Modern System map showing the AMEL system.</p> <p><u>WITH</u> Modern System map showing the Airport Metro Express Line (AMEL) system including proposed extension as per ERTS 1.1.2.</p>
28.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 4.3.10 • Page 46 of 84 	<p><u>REPLACE</u> The interior lighting of the car shall provide an average illumination at 1000mm above the floor of the car of at least 200 lux.</p> <p><u>WITH</u> The interior lighting of the car shall be energy efficient, power LED based lights and shall provide an average illumination at 1000mm above the floor of the car of at least 200 lux.</p>
29.	<ul style="list-style-type: none"> • VOLUME 3 • ERGS • Clause 9.4.1 (ii) • Page 46 of 60 	<p><u>REPLACE</u> Stage one shall consist of training in the basic concepts and principles. These shall include system configuration and specification, operation and control of all equipments installed in the cars, preventive maintenance procedures, overhaul and repair concepts, fault diagnostic and trouble shooting and emergency procedures. The training shall consist of class room (theory) training; computer based inter-active training and mock-up training.</p> <p><u>WITH</u> Stage one shall consist of training in the basic concepts and principles. These shall include system configuration and specification, operation and control of all equipments installed in the cars, preventive</p>

		<p>maintenance procedures, overhaul and repair concepts, fault diagnostic and trouble shooting and emergency procedures. The training shall consist of class room (theory) training; and mock-up training.</p>
30.	<ul style="list-style-type: none"> • VOLUME 3 • ERGS • Clause 1.8.3 • Page 8 of 60 	<p><u>REPLACE</u></p> <p>The warranty period of unit exchange, mandatory and overhauling spares, special tools, testing and diagnostic equipment, special jigs, fixtures and gauges, simulator or any other item / equipment delivered shall be:</p> <p>(i) either 24 months from the date of acceptance or (ii) upto expiry of the defect liability period of trains (clause 1.8.1), whichever is later.</p> <p><u>WITH</u></p> <p>The warranty period of unit exchange, mandatory and overhauling spares, special tools, testing and diagnostic equipment, special jigs, fixtures and gauges, or any other item / equipment delivered shall be:</p> <p>(i) either 24 months from the date of acceptance or (ii) upto expiry of the defect liability period of trains (clause 1.8.1), whichever is later.</p>
31.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 5.3.4 • Page 50 of 84 	<p><u>REPLACE</u></p> <p>The material chosen for the construction of the bogie frame structure shall be rolled steel plate, according to EN 10113, having the following mechanical characteristics.</p> <p><u>WITH</u></p> <p>The material chosen for the construction of the bogie frame structure shall be rolled steel plate, according to EN 10113 and/or EN 10025/JIS G3114 or any other relevant international standard.</p>
32.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 5.8.3 • Page 51 of 84 	<p><u>REPLACE</u></p> <p>The levelling system for the secondary suspension for each car shall consist of three valves. Two valves shall be located in one bogie (one for each airspring) and one in the other bogie.</p> <p><u>WITH</u></p> <p>The levelling system for the secondary suspension for each car shall consist of three or more valves. Minimum two valves shall be located in one bogie (one for each airspring).</p>
33.	<ul style="list-style-type: none"> • VOLUME 3 • ERTS • Clause 2.10.2 • Page 26 of 84 	<p><u>REPLACE</u></p> <p>Material Properties</p> <p>Materials used in the cars shall meet the Flammability, Smoke Emission and Toxicity requirements of the chosen Specification. (See 2.5.8)</p> <p>Fire load of the individual coach shall not exceed the following:</p> <ul style="list-style-type: none"> • DMC Car: 610 MJ/m²

		<ul style="list-style-type: none"> • TC/MC Car: 640 MJ/m² • Total Unit (6 car train) : 3780 MJ/m² <p>Contractor shall furnish the relevant data, fire load calculations, certifications etc. of the items considered in fire load calculations. The calculations and validation shall conform to the standard adopted by the contractor for fire strategy.</p> <p><u>WITH</u></p> <p>Material Properties</p> <p>Materials used in the cars shall meet the Flammability, Smoke Emission and Toxicity requirements of the chosen Specification. (See 2.5.8)</p> <p>Fire load of the individual coach shall not exceed the following:</p> <ul style="list-style-type: none"> • DMC Car: 670 MJ/m² • TC/MC Car: 690 MJ/m² • Total Unit (6 car train) : 4100 MJ/m² <p>Contractor shall furnish the relevant data, fire load calculations, certifications etc. of the items considered in fire load calculations. The calculations and validation shall conform to the standard adopted by the contractor for fire strategy.</p>
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Clarification of Tender 'RS14' Documents : DMRC Comments on Tenderer's Queries

DMRC Internal Query No.	Volume No.	Clause No.	Clause Description	Tenderer's Query/Comment						
1	Volume 3 ERGS	10.2.1	The Contractor can be provided subject to availability approximately 400 sq m of total space at nominated depot for the setting up of contractor's site offices and stores, and for working on the vehicles. These site offices shall be built commensurate with the architecture of the surrounding buildings and after obtaining the approval of Engineer for its broad design. The structure shall be handed over to Employer in good condition after the completion of the defect	As Depot is already constructed for this project, we understand Contractor has no need construct contractor's site office. Hence, this clause is not applicable. Please confirm. Also do confirm if same shall be available to contractor free of charge.						
DMRC Comments: Please Refer Addendum-5B										
2	Volume 3 ERTS	10.2.1	1.3 Broad Requirements 1.3.1 At present, DMRC has 8 trains supplied by CAF for the existing Airport Express line. In order to have uniformity of spares/equipment and minimization of inventory, ease in training, maintenance and operation with respect to the existing Rolling Stock for the section, the contractor shall preferably supply the following items similar to the existing stock of the line from suppliers/OEMs mentioned below: <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3">Auxiliary Supply Equipment</th> </tr> </thead> <tbody> <tr> <td>13</td> <td>Auxiliary Converter</td> <td>MELCO</td> </tr> </tbody> </table>	Auxiliary Supply Equipment			13	Auxiliary Converter	MELCO	As per our understanding in the existing train the supplier for Auxiliary Converter was Sepsa. We do request you to add Sepsa in the list of preferred vendor for Auxiliary Converter in order for us to consider either MELCO/Sepa for best technical & commercial offer.
Auxiliary Supply Equipment										
13	Auxiliary Converter	MELCO								
DMRC Comments: Please Refer Addendum-5B										
3	Volume 3 ERTS	3.3	Propulsion System (Traction motor, Converter-Inverter and Auxiliary Converter-Inverter)	We do request Auxiliary Converter can be sourced from different eligible sub-contractor & should not be a part of Traction Package from single sub-contractor.						
DMRC Comments: Please Refer Addendum-5B										
4	Volume 3 ERTS	2.9.1	(iii) Ride quality vibration measurements shall be carried out in accordance with ISO 2631-1 (1997) and ISO 2631-4(2001).	In order to have uniformity in the design with respect to the existing Rolling Stock, please kindly confirm that EN12299 (1999) Nmv<=2,5 standard can be used instead of the ISO 2631-1?						
DMRC Comments: Please Follow Tender Condition										
5	Volume 3 ERTS	2.10.2	Fire load of the individual coach shall not exceed the following: • DMC Car: 610 MJ/m ² • TC/MC Car: 640 MJ/m ²	Please confirm that the following values could be acceptable. • DMC Car: 670 MJ/m ² • TC/MC Car: 690 MJ/m ²						
DMRC Comments: Please Refer Addendum-5B										
6	Volume 3 ERTS	3.6.7	All the regulations as per "The persons with disabilities [equal opportunities, protection of rights and full participation] Act; 1995" shall be followed for the Rolling stock design, manufacture & features.	Please confirm whether will be acceptable the same solution to allow access to disability persons as the one implemented in the existing rolling stock.						
DMRC Comments: Please Follow Tender Condition										
7	Volume 3 ERTS	3.14.1	Distance between Door Threshold plate and Platform coping: 60mm/-	Our understanding is that the specified gap of 60mm/- is applicable for straight stations. Please kindly define the gap to be fulfilled for stations in curve, if any.						
DMRC Comments: Please Follow Tender Condition										
8	Volume 3 ERTS	3.18.2	"The minimum number of passengers required to be carried in a 6-car train is 1399 (including 352 of whom shall be seated). The number of passengers is estimated on the basis of standees at the rate of 6 persons per square meter. The weight of each passenger may be taken as 65 kg. The approximate per car passenger capacity shall be as under: Driving Motor Car (DMC1 and DMC2): 284 and 223 Trailer Car: 223 Motor Car: 223	Please confirm confirm whether different car passenger distributions will be acceptable as long as the minimum number of passengers of 1,399 is achieved, considering at least 352 seated.						
DMRC Comments: Please Follow Tender Condition										
9	Volume 3 ERTS	3.22.1	The performance requirements are given in Table 3.7 are with fully loaded train(AW3) and tangent track	Our understanding is that the acceleration rate of 1.0 m/s ² applies only to initial speeds (from 0 to 45 km/h), and from tare to AW3 load, on level tangent track with 820mm wheel diameter. Please kindly confirm.						
DMRC Comments: Please Refer Addendum-5B										
10	Volume 3 ERTS	3.23.1	"(i) One serviceable fully loaded 6-Car train (AW3 condition) shall be capable of pushing a fully loaded defective 6-Car train without parking brakes applied, on mainline including a section of 3.74% gradient up to the next station. Thereafter, the healthy train shall, after all the passengers have detrained at the station, continue to push the defective train up to the terminal station. There shall be no equipment damage or degradation, while maintaining safe operation."	In order to have uniformity in the design with respect to the existing rolling stock and considering that the maximum gradient of the existing section is 3.0%, please confirm that the maximum gradient to be considered for rescue calculation is 3.0%.						
DMRC Comments: Please Follow Tender Condition										
11	Volume 3 ERTS	4.1.1	"(i) The carbody, as the shell of the vehicle, shall be created to respond to the technical, aesthetic and operation requirements. The car body should be lightweight, conforming to EN 12663:2000 category P-II – railway application – 'Structural Requirements of Railway Vehicle Bodies'. The car strength shall comply with UIC 566 --'Loading of car bodies and their components'. However,	We kindly ask to review the required compressive load as it seems to be a typo mistake. Our understanding is that it should be 1,200 kN instead of 12,000 kN.						
DMRC Comments: Please Refer Addendum 5B										

Clarification of Tender 'RS14' Documents : DMRC Comments on Tenderer's Queries

DMRC Internal Query No.	Volume No.	Clause No.	Clause Description	Tenderer's Query/Comment
12	Volume 3 ERTS	4.1.1	(iii) The structure of all the cars of the consist shall be self-supporting and common for all. The structure of the end cars shall only differ from that of the intermediate cars it contains, at the uncoupled end of the driver cab.	Our understanding is that all the cars will have similar constructive solutions and profiles and also some subassemblies will be shared for all the cars. Please kindly confirm whether our understanding is correct.
DMRC Comments: Please Follow Tender Condition				
13	Volume 3 ERTS	4.1.1	(iv) Anti-climbing devices shall be provided on headstock of all vehicles and shall remain fully engaged and operational under the action of vertical shear loads (upwards or downwards) equal to half the AW4 vehicle weight. During an engagement of anti-climbing devices, the resultant damages shall be restricted to couplers and anti-climbing devices.	Please confirm that following crash considerations will be acceptable: Crash between two identical trains in tare conditions and brakes released: 1- Impact at 10km/h No damage, the shock is absorbed by the coupler 2- Impact at 20km/h. Damages limited to mounting screws of the coupler, Anticlimbers and GRP parts of the cabin end.
DMRC Comments: Please Refer Addendum 5B				
14	Volume 3 ERTS	4.1.1	(vii) Floor level of the car shall be as the same level as the platform.	In order to have uniformity in the design with respect to the existing rolling stock, please confirm that the rolling stock floor level height of 1,130 mm is acceptable.
DMRC Comments: Please Follow Tender Condition				
15	Volume 3 ERTS	4.2	(i) The Contractor shall make available for review at specified locations, the digital mock-ups to be specified by the Engineer during design stage. The Contractor may combine various aspects into one or several mock-ups, so long as a clear demonstration is possible of each of the aspects or functions. Complete car body as mock-up will be preferred."	Our understanding is that the digital mock-ups refers to 3D Catia models. Please confirm.
DMRC Comments: Please Follow Tender Condition				
16	Volume 3 ERTS	4.2	(vi) The Contractor shall prepare and handover to the Engineer, one true model of stainless steel (nonworking) of a 6 car train DMC1-TC-MC-MC-TC-DMC2, approximately 1:20 size, duly equipped with representative track, OCS, interior-exterior furnishings, internal illumination, headlight, marker light and flasher light, display boards, pedestal and casings. All lights in the model shall be functional. Suitable stand (duly approved by the Engineer) shall be provided with the model. The same shall be delivered along with the delivery of the prototype train. Sample of the model shall be got approved from the Engineer."	Our understanding is that alternative materials could be considered for the 1/20 mock-up. Please confirm.
DMRC Comments: Please Refer Addendum-5B				
17	Volume 3 ERTS	4.3.13	"The car interior shall have very good resistance to fire and conform to NFPA-130 -- 'Standard For Fixed Guide way - Transit and Passenger Rail Systems' and/or EN-45545 Part 1 to 7 latest edition. Each car shall be provided with two dry powder type fire extinguishers located near the gangways. These shall be installed in a niche so that it will not cause injury to passengers."	Our understanding is that NFPA 130 should be fulfilled for the fire control measurements and the NFF16101 for materials reaction to fire. Please kindly confirm whether our understanding is correct.
DMRC Comments: Please Refer Addendum-5B				
18	Volume 3 ERTS	5.1.6	"The bogie design shall ensure that as many components as possible are identical and fully interchangeable between motor and trailer bogies. Following this common- design concept as far as practicable, motor and trailer bogies shall use common components as listed below:" (ii) Axle boxes and bearings (v) Brake cylinders and callipers (x) Axle shaft	Our understanding is that by technical reasons there will be different axle boxes (prepared or odometer, or return current devices) as well as different brake cylinder (with spring for parking or not) and axle safes (prepared to receive the garbox in the motor bogies or without this preparation in trailer axles). Please kindly confirm whether our understanding is correct.
DMRC Comments: Please Refer Addendum 5B				
19	Volume 3 ERTS	5.2.1	Distance between pneumatic air bags2,080mm	Please confirm whether a distance between pneumatic air bags of 2,000mm could be acceptable.
DMRC Comments: Please Refer Addendum-5B				
20	Volume 3 ERTS	5.2.1	Height of top of air bag ARL (inflated)865mm	Please confirm whether a height of top of air bag ARL of 895mm could be acceptable.
DMRC Comments: Please Refer Addendum 5B				
21	Volume 3 ERTS	5.2.2	(iii) Fully suspended traction motor and gear unit	In order to have uniformity in the design with respect to the existing rolling stock, please confirm that a Traction motor with motor hung will be acceptable as well as an axle mounted gearbox.
DMRC Comments: Please Refer Addendum 5B				
22	Volume 3 ERTS	6.5.2	The piping shall be of stainless steel conforming to the requirements of JISG3459. The pipe fittings will conform to the requirements of DIN 2353.	In order to have uniformity in the design with respect to the existing rolling stock, please confirm that pipes in stainless steel AISI 304L and compliant with EN10216-5 could be acceptable.
DMRC Comments: Please Refer Addendum 5B				
23	Volume 3 ERTS	6.6.2	The compressor shall be an oil free piston unit fitted with an after cooler, a check valve and a safety valve.	In order to have uniformity in the design with respect to the existing rolling stock, please confirm that same compressor as the one used in previous series could be acceptable.
DMRC Comments: Please Refer Addendum 5B				
24	Volume 3 ERTS	6.5.3	Air brake hoses shall be manufactured, tested and inspected in accordance with the requirements of BS 3682 or equivalent. Flexible elastomer hoses shall be used only for drophoses and intercar connections.	In order to have uniformity in the design with respect to the existing rolling stock, please confirm whether a synthetic rubber hoses with one compact braided layer of steel wire could be acceptable.
DMRC Comments: Please Follow Tender Condition				
25	Volume 3 ERTS	6.8.5	(iii) All pressure gauges shall be glazed and sealed to IP 54 as defined in IEC 519.	Considering that this device is to be installed inside the cabin, please kindly confirm whether IP43 could be acceptable.
DMRC Comments: Please Refer Addendum 5B				
26	Volume 3 ERTS	7.1.1.1	The two doors (corresponding to the luggage doors of DMLC of existing trains) of DMC1 shall only be opened manually by maintenance staff.	Our understanding is that in line with the existing rolling stock, all the doors are to be fitted with an emergency egress device that allows manual opening by passengers and/or staff of the doors in emergency case. Please kindly confirm whether our understanding is correct.
DMRC Comments: Please Follow Tender Condition				
27	Volume 3 ERTS	7.1.3	"The door mechanism shall have safety provision that the train cannot start unless all doors have been closed and electrically locked. The doors shall have following additional safety features:" b) Internal and external release;	In order to have uniformity in the design with respect to the existing rolling stock, please confirm whether could be acceptable that doors are to be fitted with interior manual release (egress device for use in case the electrical operation will not work) and external device will be only in two doors (one each side) of the T cars.
DMRC Comments: Please Refer Addendum 5B				

Clarification of Tender 'RS14' Documents : DMRC Comments on Tenderer's Queries

DMRC Internal Query No.	Volume No.	Clause No.	Clause Description	Tenderer's Query/Comment											
28	Volume 3 ERTS	7.1.3	"The door mechanism shall have safety provision that the train cannot start unless all doors have been closed and electrically locked. The doors shall have following additional safety features:" f) Door sensing facilities shall detect an obstruction and inhibit train movement.	In order to have uniformity in the design with respect to the existing rolling stock, please confirm whether solutions based on obstacle detection as per EN 14752 (2005) could be acceptable.											
DMRC Comments: Please Refer Addendum 5B															
29	Volume 3 ERTS	7.4.2	For opening the door from the passenger saloon to the Train Operator cab, a special key shall be provided; the key shall be accessed by a break-glass cover fixed to the door. During an evacuation scenario, passengers may access the Train Operator cab to exit via the bridge doorway, via the normally locked doors.	In order to have uniformity in the design with respect to the existing rolling stock, please confirm whether could be acceptable a solution considering the cabin door lock to be provided with a double handle, standard on the driver's side and protected by a breakable glass on the passenger's side.											
DMRC Comments: Please Follow Tender Condition															
30	Volume 3 ERTS	9.9.5	The casing and the parts for mounting shall be manufactured in aluminium.	Please kindly confirm whether paint steel could be acceptable.											
DMRC Comments: Please Follow Tender Condition															
31	Volume 3 ERTS	12.5	An Auxiliary communications panel, controlling functions related to public address and cab-to-cab communications shall be provided on the non-driving side(Auxiliary Desk) of the cab.	In order to have uniformity in the design with respect to the existing rolling stock, only one control panel for the PIS system is to be placed in the driver's desk. Please kindly confirm whether our understanding is correct.											
DMRC Comments: Please Refer Addendum 5B															
32	Volume 3 ERTS	13.6.1	(v) 6 car train (with 1MC isolation) pushing 6 car train on 4% gradient shall also be included as one of the investigative case.	In order to have uniformity in the design with respect to the existing rolling stock and considering that the maximum gradient of the existing section is 3.0%, please confirm that the maximum gradient to be considered for rescue calculation is 3.0%.											
DMRC Comments: Please Follow Tender Condition															
33	Volume 3 ERTS	2.9.3	<p>Table 2.6 : Interior Noise Levels (L_{PN})</p> <table border="1"> <thead> <tr> <th rowspan="2">Location (Section)</th> <th colspan="2">Interior Noise Measurements in dBA</th> </tr> <tr> <th>Stationary</th> <th>Running (at 80 kmph)</th> </tr> </thead> <tbody> <tr> <td>All cars except in driving console</td> <td>60</td> <td>68</td> </tr> <tr> <td>Driving cab</td> <td>60</td> <td>68</td> </tr> </tbody> </table>	Location (Section)	Interior Noise Measurements in dBA		Stationary	Running (at 80 kmph)	All cars except in driving console	60	68	Driving cab	60	68	<p>In order to have uniformity in the design with respect to the existing rolling stock, please confirm whether the following values could be acceptable.</p> <ul style="list-style-type: none"> - Standstill: * Cab: 62dBA // All cars except in driving console: 60dBA - Running (at 80 kmph): * Cab: 70dBA // All cars except in driving console: 70dBA
Location (Section)	Interior Noise Measurements in dBA														
	Stationary	Running (at 80 kmph)													
All cars except in driving console	60	68													
Driving cab	60	68													
DMRC Comments: Please refer Addendum-5B															
34	Volume 3 ERTS	2.9.4	(i) Exterior Noise level measurement to be done at a location 7.5 m horizontally from the track centreline on a horizontal plane passing through the axle centreline at any point along the length of the vehicle on either side.	Our understanding is that Exterior noise measurements are to be made in accordance with ISO 3095 at card body level (platform level). Please confirm whether our understanding is correct.											
DMRC Comments: Please Follow Tender Condition															
35	Volume 3 ERTS	3.9.1	(Table 3.1) Humidity : 100% saturation during rainy season	In order to have uniformity in the design with respect to the existing rolling stock, please confirm whether a humidity of 95% saturation during rainy season could be acceptable.											
DMRC Comments: Please Follow Tender Condition															
36	Volume 3/ERTS Appendix TD. Interfaces Between Rolling Stock, Signalling, and Telecommunications Contractors			<p>In order to have uniformity of spares/equipment with respect to the existing Rolling Stock as well as to make a right assessment of the integration costs, please kindly confirm the following</p> <ol style="list-style-type: none"> 1) Signalling System Contractor will provide the same equipment (Siemens LZB 700 M ATP/ATO) as the one installed in the trains currently in revenue service in the existing section. 2) Telecommunication Contractor will provide the same mobile radio equipment (Alcatel Lucent TRC (MTM800)) as the one installed in the trains currently in revenue service in the existing section. 											
DMRC Comments: Please Follow Tender Condition															
37	Volume 3	ERTS 1.2.3	In view of above, the DMC1 car shall be provided with the same number of saloon doors (i.e. 4 nos.on each side) and out of these, only 2 doors (towards the gangway end of DMC1 cars) shall be available to passengers for boarding/alighting as in DMLC in existing stock to match the existing PSDs. There shall be no luggage compartment in DMC1 car and passenger seats shall be provided in that area also.	It is mentioned in the clause that there shall be no luggage compartment in DMC1 car and passenger seats to be provided in that area. Kindly confirm that luggage compartment is not required in the complete train.											
DMRC Comments: Please Follow Tender Condition															
38	Volume 3	ERTS 1.3.1	At present, DMRC has 8 trains supplied by CAF for the existing Airport Express line. In order to have uniformity of spares/equipment and minimization of inventory, ease in training, maintenance and operation with respect.....	In table no 1.2 preferred vendor list has been provided indicating the make of the existing aggregates. Technical specification details of the aggregates may please be provided to enable us to make a competitive offer. Also, if the same make is used, type test waiver may please be provided.											
DMRC Comments: Please Follow Tender Condition															
39	Volume 3	ERTS 1.3.2	In case the contractor proposes to use a different make/type of equipment/subsystem from the above list, the contractor shall be required to additionally supply above UES spares in equivalent numbers needed for one complete 6 car trainset to DMRC and the cost for same shall be deemed to be included in the quoted tender price.	The clause mentions that in case different makes are used, one train-set UES to be included in the offer. In such a case the Contractor will not be commercially competitive. As such it is requested that the UES cost be kept separate.											
DMRC Comments: Please Follow Tender Condition															
40	Volume 3	ERTS 2.2	Interface Activities	The existing interface documents may please be shared during design stage. Kindly confirm the same.											
DMRC Comments: Please Follow Tender Condition															

Clarification of Tender 'RS14' Documents : DMRC Comments on Tenderer's Queries

DMRC Internal Query No.	Volume No.	Clause No.	Clause Description	Tenderer's Query/Comment
41	Volume 3	ERTS 3.22.1	The Rolling stock shall be designed for safe speed of 135Kmph and operational speed of and120kmph respectively. In the interface with signaling contractor, the safe operational speed shall beconsidered as 135kmph, so that the maximum Target speed under ATP/ATO shall be 120kmph.Safe speed shall be considered as Rolling Stock design speed	Note of table 3.7 states that the present maximum operating speed is 80 kmph& the new rolling stock may not be tested for 135 kmph. In such a case the option of new train having maximum operating speed of 80 kmph& design speed of 90 kmph may be considered. Kindly confirm.
DMRC Comments: Please Follow Tender Condition				
42	Volume 3	ERTS 4.3.6	Modern System map showing the AMEL system.	The clause states that Modern System map showing the AMEL system to be provided. The full form / meaning of AMEL may please be clarified.
DMRC Comments: Please Refer Addendum 5B				
43	Volume 3	ERTS 4.3.10	The interior lighting of the car shall provide an average illumination at 1000mm above the floor of the car of at least 200 lux.	Kindly confirm whether saloon lighting system should be of LED type.
DMRC Comments: Please Refer Addendum 5B				
44	Volume 3	ERTS 4.3.13	The car interior shall have very good resistance to fire and conform to NFPA-130 -- 'Standard For Fixed Guide way - Transit and Passenger Rail Systems' and/or EN-45545 Part 1 to 7 latest edition. Each car shall be provided with two dry powder type fire extinguishers located near the gangways. These shall be installed in a niche so that it will not cause injury to passengers.	Seat technical details of cushioning, upholstery, etc. may be provided.
DMRC Comments: Please Follow Tender Condition				
45	Volume 3	ERTS 4.3.15(ii)	Panelling	The clause states that polyester resin FRP panels to be used. Kindly confirm whether phenolic resin is acceptable. Also, whether aluminium honeycomb panels can be used for ceiling.
DMRC Comments: Please Follow Tender Condition				
46	Volume 3	ERTS 5.2	BOGIE CHARACTERISTICS	Kindly confirm whether bogie characteristics needs to be exactly same as mentioned in this clause. Can the wheel base & distance between pneumatic air bags be different.
DMRC Comments: Please Refer Addendum 5B				
47	Volume 3	ERTS 5.7	PRIMARY SUSPENSION	Kindly confirm whether conical metal-rubber bonded springs be used in primary suspension in place of helical coil spring.
DMRC Comments: Please Follow Tender Condition				
48	Volume 3	ERTS 5.3.4	The material chosen for the construction of the bogie frame structure shall be rolled steel plate, according to EN 10113.	In the clause the material mechanical characteristics may please be specified.
DMRC Comments: Please Refer Addendum 5B				
49	Volume 3	ERTS 5.4.1	The wheel shall be an R7 quality monoblock, non-alloyed steel wheel, in accordance with specification UIC 812-3.	Whether R8 wheels can be used in place of R7. Kindly confirm.
DMRC Comments: Please Follow Tender Condition				
50	General	-	Car details like width, length, coupler height, etc may please be provided.	
DMRC Comments: Please Refer Addendum 5B				
51	General	-		We understand that the new trains may not be tested for 135 kmph speed as the present maximum operating speed is 80 kmph. In such a case,we request you to kindly clarify the reason for the want of trains with higher speed capability. Please clarify.
DMRC Comments: Please Follow Tender Condition				
52	Volume 3	ERGS 10.2.1	The Contractor can be provided subject to availability approximately 400 sq m of total space at nominated depot for the setting up of contractor's site offices and stores, and for working on the vehicles. These site offices shall be built commensurate with the architecture of the surrounding buildings and after obtaining the approval of Engineer for its broad design.	Do DMRC provide the rolling stock contractor with the constructed / built up office space at Dwarka depot? Kindly clarify. If yes to the above point, kindly confirm if DMRC shall provide the facility free of cost without any rent to the contractor?
DMRC Comments: Please Refer Addendum 5B				
53	Volume 3	ERGS 9.4.1 (ii)	Stage one shall consist of training in the basic concepts and principles. These shall include system configuration and specification, operation and control of all equipments installed in the cars, preventive maintenance procedures, overhaul and repair concepts, fault diagnostic and trouble shooting and emergency procedures. The training shall consist of class room (theory) training; computer based inter-active training and mock-up training.	As per our understanding, that Computer based training is not required for the project. Accordingly kindly modify.
DMRC Comments: Please Refer Addendum 5B				
54	Volume 3	ERGS 1.8.3	The warranty period of unit exchange, mandatory and overhauling spares, special tools, testing and diagnostic equipment, special jigs, fixtures and gauges, simulator or any other item / equipment delivered shall be	We understand that the requirement of simulator does not exist for the project. Kindly confirm.
DMRC Comments: Please Refer Addendum 5B				
55	3	2.9.3	Interior Noise Level shall not be more than those specified in table 2.6.	DMRC request for 60dBA for stationary and 68dBA for running at speed of 80kmph. As it is suggested to modify to 68dBA for stationary and 75dBA for running at speed of 75 kmph. Tenderer's Comment: 1. For the exiting Airport Line the noise value have not met the requirement. 2. Normally the value shall consider similar to Noida Project.
DMRC Comments: Please follow Tender Condition.				
56	3	4.3.13	The car interior shall have very good resistance to fire and conform to NFPA-130 -- 'Standard For Fixed Guide way - Transit and Passenger Rail Systems' and/or EN-45545 Part 1 to 7 latest edition. Each car shall be provided with two dry powder type fire extinguishers located near the gangways. These shall be installed in a niche so that it will not cause injury to passengers.	1. Here mentioned two standards, as we understood, the bidder shall comply with one of them for the performance. Kindly confirm. 2. If we choose EN-45545 standard, but some components may be very difficult to comply with EN 45545, could you please clarify if we can comply with BS 6853 or DIN 5510 for these components? Tenderer's Comment:
DMRC Comments: Please follow Tender Condition.				
57	3	5.4.1 and 5.4.7	5.4.1 The wheel shall be an R7 quality monoblock, non-alloyed steel wheel, in accordance with specification UIC 812-3;	UIC 812-3 mentioned in Clause 5.4.1 have been abolished, EN 13262 is mentioned in Clause 5.4.2, it is a bit confused which standard shall be conformed to. It is suggested to delete UIC 812-3 and conform to EN 13262 directly. Tenderer's Comment:
DMRC Comments: Please Follow Tender Condition.				
58	3	5.8.3	5.8.3 The levelling system for the secondary suspension for each car shall consist of three valves. Two valves shall be located in one bogie (one for each airspring) and one in the other bogie.	It will be more comfortable for the passengers if use four valves to control the airspring. It is suggest to modify to: The levelling system for the secondary suspension for each car shall consist of three or more valves. Two or more valves shall be located in one bogie (one for each airspring). Tenderer's Comment:
DMRC Comments: Please Refer Addendum 5B				