General Bid Bulletin No. 8
19 May 2021

IFB No. 21-031-4

THE MALOLOS-CLARK RAILWAY PROJECT AND THE NORTH SOUTH RAILWAY PROJECT-SOUTH LINE (COMMUTER) PACKAGE CP NS-03: ROLLING STOCK-LIMITED EXPRESS TRAINSETS

This General Bid Bulletin is issued to amend/clarify certain provisions in the Bidding Documents for the abovementioned project. Please refer to the attached Annexes of this General Bid Bulletin duly approved by the end-user and co-implementer for details:

1. **Annex "A"** –Answers to Queries from Prospective Bidders including clarifications to the Bidding Documents;

2. **Annex "B"**– Revisions to the Bidding Documents; and

3. **Annex "B – 1"** – Revised pages/amendments and final form as revised/amended.

All other portions of the Bidding Documents affected by these revisions, amendments and/or clarifications shall be made to conform to the same.

Revisions/amendments/clarifications made herein shall be considered an integral part of the Bidding Documents for this project.

For your information and guidance.

For the Bids and Awards Committee IV:

SIGNATURE REDACTED

JOSEPH CONRAD D. DUEÑAS
Chairperson

Annex A

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 8
Annex A

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The Bidder understands;
1) “Experience in Similar Works” intends any works relates to railway business field.
2) “Experience as Manager” intends any type of manager (not exactly same as each required manager position)

Please confirm if the Bidder’s understanding is correct.
</td>
<td>-NA-</td>
<td>1) The bidder’s understanding is not correct. The similar works in this context is referring to the Rolling Stock.

2) The bidder’s understanding is not correct.
The “Experience as Manager” here is referring to the experience same as each respective</td>
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				required position shown in the 1st column of the table 2.2 “Position”.
2.	Part 1 – Bidding Procedures Section III. Evaluation and Qualification Criteria EQC12 3.2	With the exception of the Project Manager, the above personnel may be from Specialist Subcontractors. *The Bidder understand the Employer does not allow the Bidder to nominate Project Manager from the Specialist Subcontractor (EMU manufacturer in this case).* *The Bidder, Japanese trading firm plans to assign its representative (i.e. the Contractor’s Representative) based the Site (Philippines) during contract implementation, however since Project Manager is required to manage not only design negotiation with the Employer and commissioning at the Site, but also production of EMU at the manufacturing site, the Bidder understands it is most beneficial that the Project Manager to be assigned from EMU manufacturer.* *With this, the Bidder would request the Employer to accept to nominate Project manager from Specialist Subcontractor (EMU manufacturer) as long as the Bidder nominate its representative separately.*	~~With the exception of the Project Manager, the above personnel may be from Specialist Subcontractors.~~	The bidder’s request is rejected. It is allowed if the Specialist Subcontractor is the JV partner of the bidder. The bidders may propose other non-key personnel in their proposed Project Management Plan.
3.	Section VIII. General Conditions GC-78	The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer’s Equipment and Free-	Please add Particular Conditions (PC), Part A Contract Data 17.6	The bidder’s request is rejected.

	GC 17.6 Limitation of Liability	Issue Material], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in the Contract Data, or (if such multiplier or other sum is not so stated), the Accepted Contract Amount. *The limitation of liability at 100% of Contract price is too high; widely established rolling stock industry standard is a limit of 20%.*	Limitation of Liability: 20% of the Contract Amount.	
4.	Section VIII. General Conditions GC-78 GCC 19.6 Optional Termination, Payment and Release	If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment]. *The time given for Termination in case of Force Majeure is too short and Bidder suggest to extend it. Further the right for optional termination should only be given to the Party which is not affected by Force Majeure*	If the execution of substantially all the Works in progress is prevented for a continuous period of ~~84~~ 180 days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], or for multiple periods which total more than ~~140~~ 360 days due to the same notified Force Majeure If the execution of substantially all the Works in progress is prevented for a continuous period of ~~84~~ 180 days by reason of	The bidder's request is rejected.

		This modification is fair and would be to the benefit of both parties.	Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], or for multiple periods which total more than ~~140~~ *360* days due to the same notified Force Majeure, then ~~either~~ the Party not affected by Force Majeure may give to the affected Party a notice of termination of the Contract	
5.	Part 3 – Conditions of Contract and Contract Forms Section IX – Contract Forms CF1 SECTION IX: ANNEXES and CONTRACT FORMS Annexes - Table of Securities	A. Parent Company Guarantee: see Form of Contract Annex A B. Tender Security: see Form of Contract Annex B *The Bidder understands;* - *A. Parent Company Guarantee is not applicable for this tender* - *B. Tender Security shall refer Form of Bid Security in Section IV – Bidding Forms* *Please confirm if the Bidder's understanding is correct.*	-NA-	The bidder's understanding is correct. Refer to the Annex B for the amendment.
6.	Part 2 – Employer's Requirements	24.2.5 The spare part supplied during DNP shall include at least the below list of spare parts as minimum. The quantity shall be based on one (1)	24.2.5 The spare part supplied during DNP shall include at least the below	1) The bidder's understanding is correct.

	Section V1. Employer's Requirements Technical Requirements ERT147 24.2 Spare Parts	trainset basis. Final list shall be confirmed during design stage. 1: Wheel and Axle Assembly for Motor; 2: Wheel and Axle Assembly for Trailer Bogie; 3: Wheel Assembly; ……. 59: 2 Spare Trailer Bogies Complete 60: 2 Spare Motor Bogies Complete 61: Spare trailer bogie wheels – 1 trainset 62: Spare motor bogie wheels – 1 trainset *1) The Bidder understand, 59: 2 Trailer Bogies Complete & 60: Motor Bogies Complete are not required to supply for one trainset basis but 2 units each only, please confirm (the Bidder wants to clarify the requirement as stipulated in the next column).* *There are many items referring wheel, please reconfirm, required minimum quantities of item 1, 2, 3, 61 and 62.*	list of spare parts as minimum. Unless otherwise stated, the quantity shall be based on one (1) trainset basis. Final list shall be confirmed during design stage.	Refer to the Annex B for the amendment. The Contractor shall submit the final list of capital spare during the design stage The bidder shall refer to the quantity stated as a minimum, however, please note that the list is not exhausted, the Contractor shall provide a list for material and spares use for 2 years based on the anticipated train mileage and previous contracts experience.
7.	GBB03 1 Annex B	ERG-107 Table B.2 Deleted Table B.2: Split Responsibility in Special Tools for Rolling Stock and Depot Equipment *The Bidder does not understand purpose of this deletion. Information under Table B.2: Split Responsibility in Special Tools for Rolling Stock and*	-NA-	The Bidder shall adhere to the instruction given in Part 1 – Bidding Procedures Section IV – Bidding Forms – Appendix 6.8. Bidder - Bidder shall provide the preliminary list of special tools and

		Depot Equipment is mandatory information for the Bidder's pricing.		shall be finalised during design phase. The deleted Table B.2 did not represent a mandatory requirement. There is no split responsibility on special tools for rolling stocks with the depot equipment. This is due to that the special purpose of the tools are for the rolling stock operation and maintenance and it's an engineered tool that a manufacturer may provide to a transit operator or an entity to service a transit vehicle after delivery. Deletion is to avoid bidder confusion and ensuring that the bidder will develop the preliminary list of special tools based on the bidder general and specific experience

				delivering a rolling stock manufacturing and supply projects.
8.	Volume II/III - Part 2 Section VI SOW Chapter 1.4 12/355 (SOW-2) Procurement of Materials, Components and Sub-Systems	The Contractor shall procure materials, components and sub-systems which are required for the Rolling Stock manufacturing. The materials to be used in the manufacturing shall be of high quality and comply with relevant international standards acceptable to the Employer/Engineer. All materials, components and sub-systems shall be procured from reputable suppliers which are ISO 9001 certified or working toward this certification. *Many sub-suppliers of the Bidder are not ISO 9001 certified, but have different measures in effect to guarantee the quality of the components.* *Therefore, please accept equivalent quality management processes, in case such component manufacturer does not obtain ISO 9001.*	The Contractor shall procure materials, components and sub-systems which are required for the Rolling Stock manufacturing. The materials to be used in the manufacturing shall be of high quality and comply with relevant international standards acceptable to the Employer/Engineer. All materials, components and sub-systems shall be procured from reputable suppliers which are ISO 9001 certified or ~~working toward this certification.~~ have equivalent quality management processes in effect.	Bidder request is rejected.
9.	Volume II/III - Part 2 Section VI ERG Chapter 7.8 Clause 7.8.1 59/355	The Contractor shall use an Electronic Document Management System (EDMS), which is compatible with the Employer's EDMS, to coordinate and control the document flow (creation, processing, storage, retrieval and distribution) of electronic and paper documents in a secure and efficient manner.	-NA-	Bidder request is rejected. The Employer believe that the bidder is capable to source or estimate the cost on

	(ERG-42) Electronic Document Management System (EDMS)			establishment of ACONEX based on bidder general and specific experience in rolling stock manufacturing and supply project. The Employer will not provide any amount in this response to clarification. The provisional sum shall not be utilised for ACONEX.
	GBB03 28/61 Item 25	ACONEX was used as the EDMS for the NSCR-EX project wide, thus Bidder's proposal shall include the same EDMS to ensure the compatibility. Clause ERG 7.8.1 was amended. *The Bidder proposes to use CATALOGcreator alternatively.* *CATALOGcreator is integrated into the Bidders engineering infrastructure and has a customer front end for the Employer, which allows the Employer to access the latest versions of technical information like drawings, spare part information, links to the maintenance documentation etc.* *If it is not accepted;* *The Bidder understands the Employer intends to use ACCONEX for all integrated document management of NSCR-EX project wide (not only this NS03 package), and thus the Employer (or the Engineer) already has procured/implemented it, and NS03 Contractor will shoulder appropriate cost for NS03. If the Bidder's understanding is correct, please provide the amount the NS03 Contractor will shoulder. Otherwise (or if such cost is not clear at this moment), please allocate applicable amount for*		

		Provisional Sum, as it is not practical for the Bidder to estimate precise cost at the time of bidding.		
10.	Volume II/III - Part 2 Section VI ERG Chapter 11.9 Clause 11.9.1 88/355 (ERG-71) Train Operation Simulator Parts	The Contractor shall transport, set up and adjust the train operation simulator by the designated date. *According to chapter 27.1 of ERT the contractor is supposed to prepare and supply equipment to the Driving Simulator Contractor (CP NS-01). The Driving Simulator Contractor is thus responsible for design and manufacture of the simulator.* *The Bidder would therefore kindly request to add the transport, set up and adjustment of the train operation simulator to the responsibilities of the Driving Simulator Contractor.*	The Contractor shall prepare the equipment for driving simulator, as specified in ERT 27.1, and supply it to the Driving Simulator Contractor (CP NS-01).	Bidder request is rejected. Please refer to Annex B for the updated clause 11.9.1.
11.	Volume II/III - Part 2 Section VI ERG Appendix B 120/355 (ERG-104) Split Responsibility on Rolling Stock and Other Works Interface Responsibility Matrix	*Different components which have to be mounted on the vehicles are supplied by the CP NS-01 contractor. As far as the Bidder understands, the contractor and therefore the components are not yet determined. This leads to a certain lack of information regarding the interface with these systems.* *Could you please supply any additional information you have regarding these components, especially for the ETCS train control system, the communication system and the PSD controller?* *Furthermore the Bidder do not fully understand the system boundary for the communication system. Are*	-NA-	The information on ETCS train control system, the communication system and the PSD controller shall be obtained during project implementation through interfacing with CP NS 01 Contactor. Please refer to Table 16.1 of ERT on communication system requirements.

		there any components on the vehicles which are supplied by the CP NS-01 contractor?		
12.	Volume II/III - Part 2 Section VI ERT Chapter 1.3 Clause 1.3.2.5 150/355 (ERT-5) System Requirements - Configuration Control	Each name plate shall contain the following information: 1) Manufacturer's name; 2) Component description; 3) Manufacturer's Part number; 4) Serial number; and 5) Modification 'strike box' with a minimum of 10 positions. *The Bidder would like to ask if the modification "strike box" must be implemented in each component or if the Bidder can focus it on the main components only.*	-NA-	Please refer to clause 1.3.2.2 and 1.3.2.4. The Contractor shall identify the components to be installed with nameplate.
13.	Volume II/III - Part 2 Section VI ERT Chapter 1.9 Clause 1.9.1 155/355 (ERT-10) Environmental Conditions	2) Maximum rainfall : 60 min. rating 120 mm/h *The Bidder assume that the trains will be stopped if the tracks are flooded. Please confirm.*	-NA-	Confirmed.
14.	Volume II/III - Part 2 Section VI ERT Chapter 2.3 Clause 2.3.2.3 Chapter 4.3 Clause 4.3.2 177/355	The carbody shell shall be designed to withstand a minimum compressive load of 490kN and tensile end load of 350 kN applied through the draft gear attachment points, in combination with the most adverse vertical loading associated with the W2 loading conditions. ... The previous requirement is in conflict with:	The carbody shell shall be designed to withstand a minimum compressive load of 490kN and tensile end load of 350 kN applied through the draft gear attachment points, in combination with the	Please refer to GBB No. 6 dated 5 May 2021. Noted on the obstacle deflector. The Contractor shall identify all associated design requirements i.e.

	(ERT-32) and 189/355 (ERT-44) Carbody Structural requirements Coupler and draft gear Draft gear	The coupler is designed to accommodate a 1500kN compressive force and 1000kN tensile force. In the event of the compressive force being exceeded, there requires to be a mechanical indication of overload, such as deformation cylinder or excessive movement indicator when the compression exceeds that which would be experience by the rated compressive force. *The load requirements are compatible with the safety standards for structural requirements according to EN 12663-1 (category P-III) and EN 15227. Category P-III defines a longitudinal design compressive force at buffers and/or coupler attachment of 800 kN. As required, the crash energy management is designed according to EN 15227, category C-II.* *The specific coupler design requirement (with 1500 kN compressive and 1000 kN tensile force) is in conflict with the carbody strength. Compared with the carbody, the coupler loads are much higher: this will result in significant damage or even unfavourable collapse of the car bodies prior to a controlled energy absorption of the coupler. Therefore, the Bidder strongly request to adapt the coupler loads.* *Furthermore, the Bidder has recognised the absence of a requirement regarding obstacle deflector. The obstacle deflector clear the rails and protect the equipment mounted in the underfloor of the trainset.*	most adverse vertical loading associated with the W2 loading conditions. ... The coupler is designed to accommodate a ~~1500kN~~ 800 kN compressive force and ~~1000kN~~ 600 kN tensile force. In the event of the compressive force being exceeded, there requires to be a mechanical indication of overload, such as deformation cylinder or excessive movement indicator when the compression exceeds that which would be experience by the rated compressive force.	hazard log during the project implementation.

		The Bidder suggest the use of an obstacle deflector for an operational speed of 160 km/h and dimensioned according to EN 15227.		
15.	Volume II/III - Part 2 Section VI ERT Chapter 3.1 Clause 3.1.14 181/355 (ERT-36) Bogie - General	The bogies shall be capable of being disconnected and reconnected to carbody with minimal operation requirements. The maximum time to remove and replace a bogie with an exchange bogie shall be less than two (2) hours. As per the Bidder's experience, the Bidder understands the 2 hours for the entire operation (disconnection and connection of the bogie) This is extremely challenging and highly depends on the maintenance shop arrangement.	The bogies shall be capable of being disconnected and reconnected to carbody with minimal operation requirements. The maximum time to remove and replace a bogie with an exchange bogie shall be less than five (5) hours subject to the maintenance shop facility arrangement.	Bidder request is rejected.
16.	Volume II/III - Part 2 Section VI ERT Chapter 5.4 Clause 5.4.10 191/355 (ERT-46) Car Interior - Flooring	The floor covering material shall meet the following performance requirements or shall be the enough service-proven: 1) Slip resistance of 0.75 dry and 0.62 wet in accordance with JRIS J0745 or other equivalent standards, 2) Hardness of Shore A Hardness 85-90, 3) Resistance to chemicals in accordance with JIS A 1454 (or other equivalent standards) with noticeable variation, and 4) Tensile strength in accordance with JIS K6251 (or other equivalent standards) - 7.3MPa; ...	-NA-	Clause 5.4.10 (10) already mentioned that the employer will consider equivalent standard than JRIS J0745. Therefore, the bidder request is noted. Further evaluation shall be provided during project implementation subject to the issuance of notice of no objection from the Engineer.

		The Bidder would like to have the Employer's consideration to accept the coefficient of slip resistance according to the DIN 51130 (R9) requirements as well. *This would be in line with the state of the art used in Europe.*		
17.	Volume II/III - Part 2 Section VI ERT Chapter 5.7 Clause 5.7.2 192/355 (ERT-47) Passenger seats - Rotating function	All seats with limited reclining function shall be automatically/manually changeable the direction with locking system and installed to the floor by one stand to facilitate cleaning. *The Bidder assumes that the change of the seating direction is "automatically **or** manually"?* *Bidder would offer a manual solution.* *Kindly confirm Bidder assumption is correct.*	-NA-	Bidder assumption is correct. The method of changing the direction of the seats (automatic or manual) is subject to the Engineer's approval during the project implementation.
18.	Volume II/III - Part 2 Section VI ERT Chapter 5.7 Clause 5.7.5 193/355 (ERT-48) Passenger seats - USB port	The electrical sockets (220V 60Hz) / USB ports shall be provided adequate position on the seats one socket per person. The sockets shall be protected by a low amp breaker. As there are three (3) designs of socket sed in the Philippines, types A, B and C the most popular type shall be provided. *One electrical socket is defined per seating place.* *The Bidder assumes, that one USB port per seating place is necessary. Please confirm.* *The type of USB port is not defined. Is the Bidder*	-NA-	The USB port shall be one socket per seated passenger. Please refer GBB No. 2 dated 31 Mar 2021 – Employer response to type of USB port.

		authorised to offer a combined solution with one USB-port Type C (3A) and one USB-port A (2A) for a double seat? Please confirm.		
19.	Volume II/III - Part 2 Section VI ERT Chapter 5.14 Clause 5.14.1 196/355 (ERT-51) Vehicle Exterior	3) Aerodynamically efficient and futuristic including a streamlined designed nose cover for the front couplings *The trainsets are not foreseen for a multiple unit operation (with exception for towing situations). Therefore, the Bidder proposes to use a manual nose cover.*	Aerodynamically efficient and futuristic including a streamlined designed nose cover for the front couplings. The nose cover can be opened manually, by sliding, flipping or removing the cover.	Bidder request is rejected. Details on the coupler cover shall be proposed during design stage.
20.	Volume II/III - Part 2 Section VI ERT Chapter 5.16 Clause 5.16.1 197/355 (ERT-52) Driver's cab	….. An emergency break glass handle shall be on the passenger compartment door into the cab. …. *The Bidder propose to use a panic handle bar instead of an emergency break glass handle. In case of an emergency escape, the cab door can be opened from the driver's cab by pressing the panic handle bar avoiding so the use of tools or keys.* *Furthermore, for safety reasons the Bidder strongly recommend to not have an emergency brake handle in the passenger compartment. Unauthorized access to the cab will be so completely avoided.*	A Driver's cab shall be provided at each end of a train. The driver's cab shall be provided with an interior door that can be locked/unlocked inside by a handle locked/unlocked from the passenger compartment. and the same arrangement will be for both sides cab doors. An emergency ~~break glass handle~~ panic handle bar shall be located ~~shall on the passenger compartment door~~ into the cab. The doors shall be manufactured as	Bidder proposal is noted. Please refer to Annex B.

			provided for in Sub-Clause 7.2 of this ERT.	
21.	Volume II/III - Part 2 Section VI ERT Chapter 5.19 Clause 5.19.1.4 199/355 (ERT-54) Cab Controls of Driver's Cab - General	The following Driver's controls shall be provided on the console as a minimum: 1) Bypass switches shall be a sealed type, 2) Communications Cluster, consisting of a telephone handset, voice synthesizer, etc., 3) Door Controls Cluster (including Door open/close), 4) Human Machine Interface (HMI) for Train Management System, (TMS monitor that can be operated by touch) … *For a more tidy drivers desk with displays flexibility the brake cylinder pressure, the main reservoir pressure with gauges as well as other indications are showed on different displays (ATP or operation display). Speed indication might be shown on the ETCS display.* *Is the Bidder solution accepted?*	-NA-	Noted on the bidder proposed solution. The driver cab layout shall be designed and presented during project implementation.
22.	Volume II/III - Part 2 Section VI ERT Chapter 5.19 Clause 5.19.2.1 200/355 (ERT-55) Cab Controls of Driver's Cab -	The master controller shall control accelerating and braking in several steps adjustable, linear manner, as follows: Table 5.19.2.1 *The master controller controls acceleration and braking in stepless adjustable, linear manner. The Bidder understands it is commonly adopted all over the world and provides easier control. Therefore, the Bidder propose to modify the requirement.*	Please modify the entire table as following: ~~The master controller shall control accelerating and braking in several steps adjustable, linear manner, as follows:~~ The master controller shall control accelerating and braking in stepless	Bidder request is rejected.

	Master Controller		adjustable, linear manner, as follows: 1. Coasting / neutral position: The centre position is notched. Traction is not applied. 2.Traction: Pull lever forwards 0..100% of the path proportionally sets desired tractive effort. 3. Braking: Push lever backward, 0..100% of the path proportionally sets the braking effort. 4. Emergency brake: Notched to prevent accidental triggering by the driver.	
23.	Volume II/III - Part 2 Section VI ERT Chapter 5.19 Clause 5.19.6.1 201/355 (ERT-56) Miscellaneous Cab Equipment	The Cab shall incorporate a locker for storing the Driver's personal belongings (baggage, etc.) and another one for storing emergency equipment (first aid kit, flashlight, emergency connection cable, wheel chocks, etc.). All emergency equipment shall be indelibly marked with the name and logo. The Contractor shall coordinate with the O&M team and Engineer for the naming convention and labelling. These shall be submitted to Engineer for review and given statement of No Objection. *The Bidder would like to know the volume and quantity of the needed emergency equipment in order*	-NA-	The volume and quantity of needed emergency equipment shall be determined during design stage after considering safety requirement from hazard log and vehicle system safety analysis.

		to define the necessary space. Please send us this information.		
24.	Volume II/III - Part 2 Section VI ERT Chapter 5.19 Clause 5.19.6.4 201/355 (ERT-56) Miscellaneous Cab Equipment	A switch disconnecting stick shall be equipped in each cab. *The Bidder do not understand the meaning of switch disconnecting stick. Please clarify.*	-NA-	5.19.6.4 has been deleted. Please refer to Annex B.
25.	Volume II/III - Part 2 Section VI ERT Chapter 6.3 Clause 6.3.3 203/355 (ERT-58) Passenger Saloon Lights	The minimum declared life shall be 50,000 hours. The lighting shall be powered by 220V AC supply. *All passenger saloon lights are powered by the 110V DC Battery system. The Bidder ask to allow this solution.*	The minimum declared life shall be 50,000 hours. The lighting shall be powered by 110V DC or 220V AC supply.	Bidder request is rejected. The battery shall power the emergency lighting only.
26.	Volume II/III - Part 2 Section VI ERT Chapter 6.3 Clauses 6.3.4 and 6-3-5 Chapter 6.4 Clause 6.4.3 203/355 (ERT-58)	The lighting throughout the passenger saloon area shall be 300 Lux when measured at 1.2m above the floor. The lighting intensity at passenger sitting reading level (500mm above seat level) shall be no less than 400 lux and at 850 mm above floor level no less than 200 lux. Passenger saloon lighting will have no significant dark areas behind the diffusers.	~~The lighting throughout the passenger saloon area shall be 300 Lux when measured at 1.2m above the floor.~~ ~~The lighting intensity at passenger sitting reading level (500mm above seat level) shall be no less~~	6.3.4 was deleted. Please refer to GBB 6 dated 5th May 2021. Bidder request is noted. Please refer to Annex B.

	Lighting - Passenger Saloon Lights Passenger Emergency Lighting	The minimum emergency lighting levels for the period of 60 minutes after APSE failure shall be a minimum of 30 lux at all exit thresholds, a minimum of 30 lux at floor level along all walkways, a minimum of 20 lux 750mm above floor level in vestibules and gangways and a minimum of 20 lux for all emergency equipment cubicles. *The required light intensity is in contrast with the EN requirements. The Bidder propose to replace the three paragraphs with a reference to the EN standard.*	~~than 400 lux and at 850 mm above floor level no less than 200 lux. Passenger saloon lighting will have no significant dark areas behind the diffusers.~~ ~~The minimum emergency lighting levels for the period of 60 minutes after APSE failure shall be a minimum of 30 lux at all exit thresholds, a minimum of 30 lux at floor level along all walkways, a minimum of 20 lux 750mm above floor level in vestibules and gangways and a minimum of 20 lux for all emergency equipment cubicles.~~ The Contractor shall ensure that all lighting fulfils the minimum mandatory requirements of the EN 13272 Railway applications - Electrical lighting for rolling stock in public transport systems.	

27.	Volume II/III - Part 2 Section VI ERT Chapter 6.5 Clause 6.5.9 204/355 (ERT-59) Exterior Lights	The Contractor shall ensure that inspection lights are provided in the vicinity of the underframe mounted equipment. The inspection lights shall be push-button activated from the cab and underframe and shall incorporate design features to ensure that the lights are not inadvertently left on when the train is in operation. *Please remove this requirement. Normal inspection will be done on a well lit location. Additionally, underfloor lights are vulnerable to flying objects and will surely increase maintenance and repair cost.* *An alternative solution would be the use of flashlights.*	~~The Contractor shall ensure that inspection lights are provided in the vicinity of the underframe mounted equipment. The inspection lights shall be push-button activated from the cab and underframe and shall incorporate design features to ensure that the lights are not inadvertently left on when the train is in operation.~~	Bidder request is approved. Please refer to Annex B.
28.	Volume II/III - Part 2 Section VI ERT Chapter 8 Clause 8.1.7 212/355 (ERT-67) Ventilation and Air-Conditioning General	Diffuser shall be incorporated individually to window seats. *The Bidder interpret, that individually adjusted diffuser are not required. Please confirm.* *The Bidder propose a comfort level in the passenger compartment according to EN14750-1 class A. This is a state-of-the-art European solution and used therefore also in the south located countries: passengers seating on the window side will still feel comfortable.*	-NA-	Bidder interpretation is not correct. The comfort level shall consider the weather and environment of Philippines. This shall be designed and presented during design phase.
29.	Volume II/III - Part 2	Openings shall be closed automatically when running through tunnel to prevent pressure variation,	-NA-	Please refer to clause 8.2.4 on air composition

	Section VI ERT Chapter 8.2 Clause 8.2.8 213/355 (ERT-68) Ventilation and Air-Conditioning Ventilation system	and open automatically after running through tunnel. For above, information of position from TMS shall be used. *The Bidder recommends to not install a pressure protection system.* *The maximal CO2 level inside the car is defined by specific standards. Therefore, the dampers must be open after some minutes. Further information concerning the service operation in the tunnel are necessary in order to be able to calculate the CO2 level inside the car. Please confirm, that the CO2 level inside the car is a higher priority.*		requirement in the passenger compartment. Further design solution shall be presented during project implementation. Clause 8.2.8 was deleted. Please refer to Annex B.
30.	Volume II/III - Part 2 Section VI ERT Chapter 10.2 Clause 10.2.5 222/355 (ERT-77) Air Compressor Assembly	Each compressor assembly shall be capable of supplying all of the air requirements for an 8-cars train-set in the event of failure of one compressor unit. *The Bidder propose to optimize the capacity of the compressors and to not define the quantity in a trainset.*	The ~~Each~~ compressor ~~assembly~~ assemblies shall be capable of supplying all of the air requirements for an 8-cars train-set in the event of failure of one compressor unit. For example: if three compressors are installed in case of failure of one compressor the other two must be able of supplying all the air requirement of the trainset.	Bidder request is noted. Please refer to Annex B.

31.	Volume II/III - Part 2 Section VI ERT Chapter 14.1 Clause 14.1.1 234/355 (ERT-89) Auxiliary Electrical Systems - General	The limited express train shall be provided with auxiliary power supply equipment (APSE). The AC output of the APSE shall be sinusoidal under all conditions of load. The types of loads connected to the auxiliary electrical system shall include, not but limited to: 1)Emergency Lighting; 2) All Exterior Lights; 3) Communication Systems, AP system and CCTV system; 4) Propulsion, TMS, Brake Controls, and Air Compressor system; 5) Door Controls; 6) On Board Signalling equipment; 7) Cab console indicators; 8) Horn; 9) Wiper control/system; 10) Active Ventilation System of VAC. *The listed components (except air condition compressor and horn) are connected to the LVPS (low voltage power supply = battery).* *The battery capacity of the railway-units is limited. Therefore, an emergency-regime is necessary to power the most important systems for as long as possible.* *The Bidder proposes to remove the air compressor system from the list. The units are equipped with sufficient air tanks to provide pressurized air in an emergency situation. Furthermore, the horn should*	The limited express train shall be provided with auxiliary power supply equipment (APSE). The AC output of the APSE shall be sinusoidal under all conditions of load. The types of <u>emergency</u> loads connected to the <u>battery loads</u> ~~auxiliary electrical system~~ shall include, not but limited to: 1) Emergency Lighting; 2) All Exterior Lights; 3) Communication Systems, AP system and CCTV system; 4) <u>Controls of</u> Propulsion, TMS and Brake ~~Controls, and Air Compressor system~~; 5) Door Controls; 6) On Board Signalling equipment; 7) Cab console indicators; 8) Horn <u>(only when powered electrically)</u>; 9) Wiper control/system; 10) Active Ventilation System of VAC.	Bidder request is rejected. 14.1.1 is not only limited to emergency load connected to LVPS/battery. Bidder assumption is not correct. Possibly, the HV box fan blower would be powered by APSE.

		only be on the list when powered electrically. *The Bidder supposes, that the propulsion system itself does not have to work, only the controls of the propulsion system. Is the Bidder assumption correct?*		
32.	Volume II/III - Part 2 Section VI ERT Chapter 14.1 Clauses 14.1.2-14.1.8 234/355 (ERT-89) Auxiliary Electrical systems - General	All electrical equipment on the trains, other than the Power Conversion Equipment and the supply to the Auxiliary Power Supply Equipment (APSE), shall operate using the following nominal voltages, respectively: 1) 440 VAC, 3-phase, 60 Hz, 2) 220 VAC, 1-phase, 60 Hz, 3) 100 VDC 4) 12/24V DC The AC output shall be regulated within ±3% for all variations in input voltage and output load. The DC output shall be regulated within ±1% for all variations in input voltage and controlled not to damage the battery that has been floating charge. *The Bidder would like to clarify the voltage levees as well as tolerances for a proper selection of the electrical equipment. The EN50533 and IEC 60571 shall be followed.*	All electrical equipment on the trains, other than the Power Conversion Equipment and the supply to the Auxiliary Power Supply Equipment (APSE), shall operate using the following nominal voltages in respect of the EN50533 and IEC 60751 requirements, respectively: 1) 440 VAC, 3-phase, 60 Hz, 2) 220 VAC, 1-phase, 60 Hz, 3) ~~100~~ 110 VDC 4) 12/24V DC The DC output shall be regulated according to IEC regulations ~~within ±1%~~ for all variations in input voltage and controlled not to damage	Bidder request is rejected. The bidder may suggest any reference standard for APSE voltages during the design phase.

			the battery that has been floating charge	
33.	Volume II/III - Part 2 Section VI ERT Chapter 14.2 Clause 14.2.1 234/355 (ERT-89) Auxiliary Electrical Systems - Auxiliary Power Supply Equipment	Two (2) cars in the 8-cars train-set shall be equipped with Auxiliary Power Supply Equipment (APSE) capable of supplying all loads continuously. The failure of an APSE shall be enunciated in the Driver's cab and shall be recorded in the TMS and APSE. At least one dead battery start device shall be incorporate in one train-set, which shall be located in the Driver's cab. *Please explain the function and operation of the "dead battery start device".*	-NA-	It's the device for raising the pantograph in case of loss of train batteries.
34.	Volume II/III - Part 2 Section VI ERT Chapter 14.2 Clause 14.2.6 Chapter 14.4 Clause 14.4.2 235/355 (ERT-90) Auxiliary Electrical Systems - Auxiliary Power Supply Equipment	.. The failure of an LVPS shall be recorded in the TMS and APSE. Logged fault into the TMS and APSE shall be stored and remain until certain number of faults. APSE shall have ordinary-speed and high-speed trace function. In high-speed trace function, logged fault related to the switching of element and behaviour of instantaneous current and voltage etc. shall be required to be available for fault diagnostic analysis. Any fault in the APSE or the ACU shall be logged and into the Fault Indication System of the TMS and ACU. What is needed of any fault shall be enunciated in the Driver's Cab. Logged fault into the TMS and ACU shall be stored and remain until certain number of faults. ACU shall have ordinary-speed and high-speed trace function. In high-speed	-NA-	The APSE and the ACU operating software shall have the trace functions as mentioned in this requirement.

		trace function, logged fault related to the switching of element and behavior of instantaneous current and voltage etc.... *Please clarify the following sentences "APSE (Auxiliary Power Supply Equipment) shall have ordinary-speed and high-speed trace function" and " ACU (Air-Conditioning Unit) shall have ordinary-speed and high-speed trace function".*		
35.	Volume II/III - Part 2 Section VI ERT Chapter 14.5 Clauses 14.5.1-14.5.2 236/355 (ERT-91) Auxiliary Electrical systems - Circuit Breaker Panels and Isolating Switches	All isolating switches and Circuit breakers necessary for vehicle intervention shall be placed inside the driver's cab for easy access and intervention. *Some switches and circuit breakers may be distributed outside the driver's cab. Therefore, the Bidder propose to modify the requirement.*	All isolating switches and Circuit breakers necessary for vehicle intervention shall be placed inside the driver's cab, as far as feasible, for easy access and intervention.	Bidder request is rejected. Clause 14.5.2 stated that circuit breakers and switches necessary for vehicle revenue line fault intervention shall be located inside the drivers' cab.
36.	Volume II/III - Part 2 Section VI ERT Chapter 16.3 Clause 16.3.2 246/355	For speech intelligibility purposes, the design shall achieve an STI (Speech Transmission Index) in excess of 0.6 under the worst-case ambient noise conditions.	For speech intelligibility purposes, the design shall achieve an ~~STI~~ STIPA (Speech Transmission Index for Public Address system) in	Bidder request is rejected. Please refer to GBB 6 dated 5th May 2021.

	(ERT-101) Public Address (PA) System	*According Bidder's experience, a STI of 0.6 at maximum speed is feasible whereas a STI of 0.6 in a tunnel at maximum speed with a group of students performing loud conversation is not possible. The Bidder proposes to consider the open track scenario and to change from STI to STIPA.*	excess of 0.6 ~~under the worst-case~~ at standstill and with exterior (no tunnel and running HVAC) ambient noise conditions.	
37.	Volume II/III - Part 2 Section VI ERT Chapter 16.3 Clause 16.3.10 246/355 (ERT-101) Public Address (PA) System	The message library shall be dimensioned with a minimum storage capacity of 1TByte. *The Bidder strongly do not recommend the use of 1 Tbyte for libraries: 1 Tbyte shockproof SSDs are quite expensive and have a reduced lifespan compared to smaller models. Therefore, the Bidder propose the use of 128 - 256 GB models: for the foreseen application this solution is more reliable and , state of the art.*	The message library shall be dimensioned with a minimum storage capacity of at least 128 Gbyte ~~1TByte~~.	Bidder request is rejected. Please refer to GBB 6 dated 5th May 2021.
38.	Volume II/III - Part 2 Section VI ERT Chapter 19 Clause 19.1.4 260/355 (ERT-115) General Documentation Requirements	All drawings shall conform to current industry standards for microfilm reproduction. All drawings shall be supplied in electronic format, the specific format to be reviewed by the Engineer, and with the required number of prints. *Is microfilm still relevant? The Bidder proposes to focus on electronic format instead.*	~~All drawings shall conform to current industry standards for microfilm reproduction.~~ All drawings shall be supplied in electronic format, the specific format to be reviewed by the Engineer, and with the required number of prints.	Bidder request is noted. Please refer to Annex B for the updated clause 19.
39.	Volume II/III - Part 2 Section VI ERT	Drawing language shall be English with Filipino translation (or vice versa).	Drawing language shall be English ~~with Filipino translation (or vice versa)~~.	Bidder request is noted.

	Chapter 19.1 Clause 19.1.5 260/355 (ERT-115) General Documentation Requirements - General	*The Bidder ask to limit to one official drawing language.*		Please refer to Annex B for the updated clause 19.
40.	Volume II/III - Part 2 Section VI ERT Chapter 21.4 Clause 21.4.2.2 279/355 (ERT-134) Electrical components - Wire Insulation	Unless otherwise specified, wire insulation shall be one of the following types, unless specifically reviewed and commented by the Engineer: ... 4) All wire insulation, except carbody wiring, shall be rated at 600 V minimum; unless otherwise specified or agreed to by the Engineer. ... *Bus and coax cable Voltage category 300/300V is commonly used in other countries. Therefore, please accept the Bidder to propose bus and coax cable Voltage category 300/300V subject to design review during implementation.*	-NA-	Please comply with the clause 21.4.2.2. Any deviation shall subject to the given notice of no objection by the Engineer during the project implementation.
41.	Volume II/III - Part 2 Section VI ERT Chapter 21.4 Clause 21.4.9 280/355 (ERT-135) Electrical Components -	Wires shall be segregated into separate bundles/harnesses and connectors according to the voltage ratings in the following classes: 1) Line voltage DC wiring, 2) Low voltage AC wiring (Under 600V), 3) Battery voltage wiring (Under 125V), 4) ETCS wiring, and 5) Radio, Intercom, P/A wiring.	-NA-	The separation of cables using standard reference i.e. IEC 62995:2018 Railway applications - Rolling stock - Rules for installation of cabling is applicable or etc.,

	Voltage Segregation	*The Bidder will propose an EN / IEC compliant trainset. To avoid conflicts with the IEC, the Bidder asks the Employer's confirmation that the requirements of the IEC 62995:2018 Railway applications - Rolling stock - Rules for installation of cabling is applicable alternatively.*		shall address the bidder's compliance against section 21.4.9.
42.	Volume II/III - Part 2 Section VI ERT Chapter 21.5 Clause 21.5.1 281/355 (ERT-136) Electronic Equipment	As a minimum, all electronic equipment shall comply with JIS E 5006: Electronic Equipment used on Rail Vehicles (or other equivalent standards), for design, manufacture and testing and shall use components purchased against an internationally recognized quality. *The Bidder would like to ask the Employer's confirmation, if IEC 60571:2012 Railway applications - Electronic equipment used on rolling stock can be equivalent standard of required JIS E 5006.*	-NA-	JIS E 5006:2017 is cross referenced with IEC 60571 (2012-09), MOD. Bidder shall propose the equivalent standard for all electronic equipment and shall subject to the approval of the engineer during the design stage.
43.	Volume II/III - Part 2 Section VI ERT Chapter 3.11 Clause 3.11.3 187/355 (ERT-42) Bogie - Structural Requirements	The model, its type and number of elements, and the criteria used for the acceptability of stress levels, other provisions shall be subjected to the Engineer for review and comments. *Due to conflicts with the Bidder intellectual properties the entire bogie model will not be delivered. The Bidder will provide a detailed and comprehensive report of the calculations.*	Detailed ~~The~~ model information~~, its type and~~ (number as well as type of elements, boundary conditions, …), and the criteria used for the acceptability of stress levels, other provisions shall be subjected to the Engineer for review and comments.	Bidder proposal is accepted. Please refer to Annex B.

44.	Volume II/III - Part 2 Section VI ERT Chapter 5.3 Clause 5.3.4 191/355 (ERT-46) Interior Finish	The interior close-off panels on the side of the car shall be designed to accept information/advertisement cards. *The Bidder ask to change the requirement as proposed in the revised text.*	The interior ~~close-off~~ panels ~~on the side~~ of the car shall be designed to accept information/advertisement cards.	Bidder proposal is accepted. Please refer to Annex B.
45.	Volume II/III - Part 2 Section VI ERT Chapter 16 Clause 16.1.2 244/355 (ERT-99) Communication System - General	Guidance display for the customer shall be placed above the door in the CP NS-03 passenger coaches (or saloons). Guidance display shall be digital signage to present on dedicated TV-style color monitors using 17-inch LCD displays, and it shall be possible to display the destination, the next station, the side of opening door, transit information, line map, time to arrive at each station, the guidance of the next station and attention, etc. One monitor shall be installed on one door. Securing space and supplying the wiring shall be prepared so that another screen can be added for advertisement. Advertisement display for the customer shall be placed above the window between doors in the passenger coaches (or saloons). Advertisement display shall be digital signage to present on dedicated TV-style color monitors using 21.5-inch or more LCD displays. (BG This may interfere with luggage racks).	Guidance display for the customer shall be placed under the ceiling ~~above the door~~ in the CP NS-03 passenger coaches (or saloons). Guidance display shall be digital signage to present on dedicated TV-style color monitors using 17~~-inch~~ LCD displays which is 17-inch or bigger size. Advertisement display for the customer shall be placed ~~above the window between doors~~ in the passenger coaches (or saloons). Advertisement display shall be digital signage to present on dedicated TV-style color monitors using 21.5-inch or more LCD displays.	Bidder proposal is accepted. Please refer to Annex B.

		The Bidder suggest not to limit size of display but allows the Contractor to propose most feasible size of displays in accordance with actual design of train. *Please change the position of the guidance display from above the door to under the ceiling to allow a flexible and optimized display disposition.* *Please clarify the meaning of the sentence "One monitor shall be installed on one door". From the Bidder point of view, the integration of a monitor in an interior sliding door is not practicable.* *Please remove the required position of the advertisement display.*	(BG This may interfere with luggage racks).	
46.	Volume II/III - Part 2 Section VI ERT Chapter 1.11 Clause 1.11.1.2 Chapter 17.9 Clause 17.9.3 157/355 (ERT-12) and 255/355 (ERT-110) Train Performance - General	The Contractor shall manufacture and supply one complete eight (8)-car train and 'T+M' unit duly equipped with test and measuring equipment and sensors for carrying out the following tests, in addition to those specified in IEC 61133 or an accepted International Standard, on respective lines. 4) Tests to determine the levels of interference with traction power supply and signal and telecommunication train control equipment and facilities, to prove that these are within acceptable limits. The CP NS-03 Contractor shall ensure that the return current in the track at the specified frequencies, if any, does not exceed the values specified by the CP NS-01 Contractor.	-NA-	Confirmed.

	Electro-Magnetic Compatibility (EMC) / Electro-Magnetic Interference (EMI) Interface	*Please confirm that the test shall be done according to IEC 61133, the interference current levels according to TSI CCS (due to the ETCS Level 2) and the vehicle impedance according to EN 50388 (>0.3 Ohm @50Hz).*		
47.	Volume II/III - Part 2 Section VI ERT Chapter 11.1 Clause 11.1.5 225/355 (ERT-80) Propulsion system - General	An additional simulation is required for which the Contractor shall use an "Constant speed" operation for simulation purposes. *The Bidder do not understand the meaning of "Constant speed". Please explain.*	-NA-	Constant speed is the single speed value (cruise speed) in the additional simulation.
48.	Volume II/III - Part 2 Section VI ERT Chapter 11.1 Clause 11.1.23 228/355 (ERT-83) Propulsion system - General	Load weighing shall be provided for all vehicle weights up to W2. The tractive and regenerative performance of propulsion system at the higher condition than W2 shall be designed as high as possible and reviewed by the Engineer. The failure of electric braking to provide the requested rate shall initiate supplemental friction braking. *As written in clause 1.10.1.3, the W2 load is defined as the limit of static weight for the Rolling Stock structure before the introduction of dynamic effects and safety margin.*	-NA-	Confirmed.

		Therefore, the Bidder interpret that this load scenario is to be considered as the highest load for the vehicle performance. Please confirm.		
49.	Volume II/III - Part 2 Section VI ERT Chapter 11.1 Clause 11.1.29 228/355 (ERT-83) Propulsion system - General	The propulsion equipment shall be incorporated the Grand Switch, Core of main circuit and Connectors for High voltage pressure test. *The Bidder do not understand the meaning of the requirement. Please explain.*	-NA-	The Grand Switch is the requirement of a breaker i.e. Line breaker unit or MCCB etc. Please see the updated clause in Annex B.
50.	Volume II/III - Part 2 Section VI ERT Chapter 11.4 Clause 11.1.4.3.2 231/355 (ERT-86) Propulsion system - Maintenance requirements	Any fault in the PCE or the PECE shall be logged and into the Fault Indication System of the TMS and PECE. All fault shall be enunciated in the Driver's Cab. Logged fault into the TMS and PECE shall be stored and remain until certain number of faults. PECE shall have ordinary-speed and high-speed fault log trace function. In high-speed trace function, logged fault related to the switching of element and behaviour of instantaneous current and voltage, etc. shall be required to be available for fault diagnostic analysis. *The Bidder interpret that the log trace function is done through a service computer Please confirm.*	-NA-	Bidder interpretation is not correct. The fault log trace function shall be equipped with the PECE. The PECE shall house the electronic control unit that capable to log fault event of the PCE and PECE operation.

51.	Volume II/III - Part 2 Section VI ERT Chapter 12.1 Clause 12.1.8 232/355 (ERT-87) Primary Power System - Current Collection	Number of pantographs shall be determined in consideration not over each acceptable value even when train current is maximum, the capacity calculation shall be reviewed by the Engineer. Also, consistency with multi-pantograph system, such as distance between pantographs, shall be taken into consideration. *The Bidder would like to receive more information about:* *1) the required minimal and maximal distance between two pantographs.* *2) the number of pantographs that can be raised at the same time.* *3) the minimal and maximal contact pressure as well as current that can be applied by the pantograph on the overhead line (in standstill and in service).*	-NA-	The requested information is the Contractor obligation during the design and the project implementation.
52.	Volume II/III - Part 2 Section VI ERT Chapter 12.2 Clause 12.2.1 232/355 (ERT-87) Primary Power System - Input Protection (HSCB)	The power supply shall be protected by a heavy duty, transit proven, ultra-high-speed circuit breaker, which shall be capable of handling the short circuit capacity of the Power Conversion Equipment. The High-Speed Circuit Breaker (HSCB) shall be installed in a dedicated explosion-proof enclosure. The Contractor shall select the HSCB so as to have sufficient capacity to break the short-circuit current. The set value to trip shall be appropriate so as not to trip unnecessarily when the catenary voltage changes rapidly in actual operation.	-NA-	The requested information is the Contractor obligation during the design and the project implementation.

		The Bidder require more information from the infrastructure side (short circuit currents, trip level from the line power supply,).		
53.	Volume II/III - Part 2 Section VI ERG Chapter 1.7 1.7.4.1 Chapter 4.4 Clause 4.4 22/355 (ERG-5) 31/355 (ERG-14) Site Safety Management Plan (SSMP)	The Contractor shall submit within forty-two (42) days from the Commencement Date of the Works, a comprehensive Site Safety Management Plan (SSMP) as per the requirements of Sub-Clause 4.4 of this document for the Engineer's review. This shall include, but not limited to, to a site plan which contains details of the office, workplace and facilities on Site, a hazard analysis plan, fire control program, evacuation procedure, details of PPE, chain of reporting and all pertinent details to ensure hazards are rapidly identified and actions are taken to minimize risks to personnel, equipment & materials, together with detailing Methods of reporting and continuous improvement. The SSMP shall be in compliance with the Philippines' Department of Labor and Employment (DOLE) Occupational Health and Safety (OH&S) standards and any other applicable local and international statutory regulations and requirements. And others. *The Bidder has no major installations on the actual construction site and operates there only with a limited personnel number. Most of the work is done at different Bidder manufacturing sites.*	-NA-	Bidder understanding is not correct. The Contractor obligation under the contract shall comprehensively throughout the project lifecycle including the testing and commissioning at project site and not limited to the Contractor manufacturing site only. Therefore, a comprehensive Site Safety Management Plan shall be developed and any identified constraint shall be stated in the plan.

		Which of these sites shall the Site Safety Management Plan describe? The manufacturing site abroad or the site in the Philippines where just commissioning and testing is happening? *If latter, should not the main contractor of this site be the main responsible for safety and therefore the author of the SSMP? The Bidder would of course supply and comply with the regulations stated by the SSMP.* *Please advise what is expected from the Bidder (rolling stock supplier) in this regard.*		
54.	Volume II/III - Part 2 Section VI ERG Chapter 3.3 3.3.2 Chapter 4.5 Clause 4.5.5.5 28/355 (ERG-11) 31/355 (ERG-14) Environmental Management Plan (EMP)	The Environmental Management Plan by the Contractor shall reflect the NSCR Environmental Impact Assessment (EIA) prepared by the Employer and agreed with the Department of Environment and Natural Resource (DENR) and the Environmental Management Board. 1) The Contractor shall impose controls and conduct any assessments as required regarding statutory noise regulations and Project Environmental Impact Statement (EIS) report. Copies of noise assessments shall be made available for inspection by the Employer and the Engineer. Further requirements with respect to disturbance from noise are set out in Sub-Clause 9.8.	-NA-	The EIA and EIS is available in the following link: https://dotr.gov.ph component/k2/item/988-north-south-commuter-railway-extension-project.html

		Are the EIA and the EIS already available or will these documents be issued in a later phase? *if it is available already, please advise where can these documents be obtained?*		
55.	Volume II/III - Part 2 Section VI ERG Chapter 4.5 Clause 4.5.4 37/355 (ERG-20) Control Against Insects and Rodents	2) Whenever, the presence of insects or rodents is observed, the Contractor shall carry out disinfection/rodent eradication according to the Engineer's review. *The Bidder assumes, that this requirement in this procurement package is only valid for the site assigned to the contractor. Please confirm this assumption.*	-NA-	The Bidder assumption is correct.
56.	Volume II/III - Part 2 Section VI ERG Chapter 7.10 Clause 7.10.6.1 61/355 (ERG-44) Availability of Application Software and Development Tools	With the exception of Commercial off-the-shelf (COTS) software, the Engineer shall be provided with access to the software documentation including source code listings and development tool details; unless it is tagged as an intellectual property. This would help the Employer for the application and maintenance of that COTS software and can make minor changes when the railway configuration changes. The documentation of software may be supplied after the expiry of the warranty period, under the terms and conditions to be mutually agreed during the Contract negotiations. Balance source code with all relevant documentation shall be kept by the Contractor in an Escrow	-NA-	Minor changes mean the changes that would not affect or compromise with the build configuration, safety and integrity of the rolling stock. i.e. replacement/ improve features (e.g. cctv, dynamic display etc.) which to be integrated with the TMS etc.

		account. The initial three years lease of Escrow account shall be paid by the Contractor. *The access to software documentation, including development tools and source code for the Engineer will be limited. The relevant documentation will be kept in an Escrow account.* *Since the Bidder needs to guarantee for the performance and safety of the vehicles, including the software, even minor changes by the employer will not be possible. However, many parameters of the Vehicle Control Software can be adapted without changing the software itself, e.g. temperature settings for the HVAC or information displayed by the communication system.* *If the Employer insists on changing the software itself the Bidder will be no longer in a position to guarantee for the performance and safety of the vehicles.* *Could you please clarify what kind of changes are meant with "minor changes" in this requirement?*		
57.	Volume II/III - Part 2 Section VI ERG Chapter 7.10 Clause 7.10.6.1	All test software, with the exclusion of built-in test software, shall be produced in accordance with a quality system controlled under the requirements of accepted international standards. Test software shall be developed and documented using structured techniques and shall be designed to be maintainable throughout the	-NA-	Test software is on clause 7.10.8. Bidder request is noted.

	62/355 (ERG-45) Test software	duration of the Contract. All test software shall be documented to be supportive of maintenance. Any test software, which is to be delivered to the Employer/Engineer (for long term testing use), shall be fully documented including source code listings to allow the Employer/Engineer to maintain the software for the life of the supported system. *Source codes of software cannot be published due to intellectual property rights.* *Can you please add the possibility to store the source codes of the test software in an Escrow account?*		Please see Annex B for the updated clause 7.10.8.1
58.	Volume II/III - Part 2 Section VI ERT Chapter 7.3 Clause 7.3.20 209/355 (ERT-64) Passenger Door, Operators and Controls	The driver must reset the device before the train can proceed. The device shall be recessed and suitably sealed to prevent accidental actuation. *Please clarify which device must be reset and for which purpose. As per clause 7.3.19 defective door will be isolated and locked.*	-NA-	This is based on Japanese train solution approach. Whereby, the reset of a device (i.e. seal/covered push button etc.) in the driver cab that authorised a train movement with isolated/locked door. Please refer to annex B.
59.	Volume II/III - Part 2 Section VI ERT	If air-conditioning stops to operate by any serious failure, switch shall be installed to allow the driver to be able to reset from the driver's cab.	-NA-	Bidder understanding is noted.

	Chapter 8.1 Clause 8.1.4 212/355 (ERT-67) Ventilation and Air-Conditioning	*Please clarify about 'serious failure'.* *The Bidder understanding of a 'serious failure' requires service and/or maintenance. A reset might help on a minor fault via TCMS.*		Please refer to Annex B.
60.	Volume II/III - Part 2 Section VI ERT Chapter 1.21 Clause 1.21.2 74/355 (ERT-29) System Requirements - Rolling Stock Gauge	The rolling stock gauge defined in the Appendix C shall be referred as the Kinematic Envelope of the train. *The Bidder has analysed the technical requirements and has remarked that the rolling stock gauge represented on the left side of the technical drawing (Appendix C / ERT-170) is in conflict with the different requirements present in the Volume II (clause 1.6.2.1 / ERT-7 for example). Therefore, based on the analysis the Bidder must assume that the represented rolling stock gauge is the Static envelope of the train and not the Kinematic envelope.*	The rolling stock gauge defined in the Appendix C shall be referred as the ~~Kinematic~~ Static Envelope of the train.	Bidder understanding is not correct. Bidder request is rejected. The Appendix C shall be referred as the Kinematic Envelope of the train.
61.	Volume II/III - Part 2 Section VI ERT Chapter 1.21 Clause 1.21.3 Clause 1.21.4 74/355 (ERT-29) System	The design of the train and its suspension shall ensure that the specified Kinematic Envelope will not be exceeded. The Kinematic Envelope is the maximum envelope for any part of the train not to exceed during normal and abnormal operations, taking into account all possible displacement due to dynamic movements of the train in relation to the track center line resulting	-NA-	Please refer to clause 1.21.8. The Contractor shall submit the proposed static gauge of the train for Engineer review during project implementation.

	Requirements - Rolling Stock Gauge	from the operation, train and track maintenance tolerances, and failure conditions including a deflated air bag. Any Kinematic Envelope exceedances under any operating condition shall be submitted to the Engineer for review. *The Bidder require to receive the kinematic envelope for the rolling stock. Otherwise, please confirm that the Contractor needs to submit a Kinematic Envelope during contract for the necessary adjustment of the infrastructure.*		
62.	Volume II/III - Part 2 Section VI ERT Chapter 2.9 Clause 2.9.3.1 180/355 (ERT-35) Stanchions, Handrails, Grab Handles, Door Screen - Grab Handles	Grab handles shall be provided for standee passenger. The grab handles shall be robust and use concealed fasteners. Colors and finishes shall match the stanchions and the passenger seat frame. The Bidder ask to remove this requirement. Grap handles (which we understand to be installed above the standing passenger) are normally used for trainsets operating as metro and having a longitudinal seat disposition (and not rotating seats). Airport express trainsets (e.g. the Tokyo Skyliner) are not equipped with grab handles. The passenger seats will be equipped with side handles for standing passenger to grab.	~~Grab handles shall be provided for standee passenger. The grab handles shall be robust and use concealed fasteners. Colors and finishes shall match the stanchions and the passenger seat frame.~~	Requirement 2.9.3.1 is the grab handles attached to the passenger seat frame.
63.	Volume II/III - Part 2 Section VI ERT Chapter 2.9	Glass screens (windscreens or draught screens) shall be provided. Each screen shall incorporate a vertical curved stanchion and a clear laminated	~~Glass screens (windscreens or draught screens) shall be provided. Each screen~~	Bidder request is rejected. The glass screen shall be incorporated with the

	Clause 2.9.4.1 180/355 (ERT-35) Stanchions, Handrails, Grab Handles, Door Screen - Glass screens	safety glass panel at least 6mm thick with polished edges. The Bidder ask to remove this requirement. Glass screens are necessary for trainsets having passenger seats near to an entrance area (vestibule) without any separation. The clause 5.6.1 require: ... Between saloon and vestibule the partition with door shall be provided. interior door... Therefore, a physical separation is already present. The use of additional glass screens will not be useful and lead only to additional maintenance as well as costs.	~~shall incorporate a vertical curved stanchion and a clear laminated safety glass panel at least 6mm thick with polished edges.~~	stanchion to accommodate standee passengers. If the Contractor approved interior design did not promote a glass screen, the Contractor can request for an omission subject to the given notice of no objection by the Engineer.
64.	Volume II/III - Part 2 Section VI ERT Chapter 11.1 Clause 11.1.12 226/355 (ERT-81) Propulsion System - General	The speed sensor-less control system shall be supplied. During initiation of acceleration or deceleration (regenerative braking), speed estimation shall be completed successfully within 200ms after motor current begins to flow. In particular, even in the case of the low-speed range and the recession started, speed estimation shall be completed successfully, to avoid unnecessary vibration, worsening of ride and protection operation for example, overcurrent of motor, frailer of speed estimation or detection of recession shall not be happened. Speed sensor for backup shall be incorporated in the train line, which may be used. During vehicle is traveling in the opposite direction to the command direction in the	~~The speed sensor-less control system shall be supplied. During initiation of acceleration or deceleration (regenerative braking), speed estimation shall be completed successfully within 200ms after motor current begins to flow. In particular, even in the case of the low-speed range and the recession started, speed estimation shall be completed~~	Bidder request is rejected.

		range of 0 to 5 km / h, the train shall be able to start normally without vibration and protection operation etc. The Bidder cannot provide a sensor-less system as specified for grouped drive topologies. Nevertheless, no additional speed sensor are used for the traction control. The speed signal for the traction control is acquired by an existing channel of the sensor provided for the pneumatic wheel slide control unit. This lead to a maximum adhesion utilisation as well as enables the detection of torsional oscillation of the axle. For that reason the Bidder ask to remove the requirement and accept the Bidder's intended method above as alternative.	~~successfully, to avoid unnecessary vibration, worsening of ride and protection operation for example, overcurrent of motor, frailer of speed estimation or detection of recession shall not be happened. Speed sensor for backup shall be incorporated in the train line,~~ ~~which may be used. During vehicle is traveling in the opposite direction to the command direction in the range of 0 to 5 km / h, the train shall be able to start normally without vibration and protection operation etc.~~	
65.	Volume II/III - Part 2 Section VI ERT Chapter 5.2 Clause 5.2.1.1 190/355 (ERT-45) Insulation - Thermal Insulation	The carbody side walls and roof shall be insulated with a suitable grade of fiberglass insulation, which shall have been treated to resist fungus and mildew. The fiberglass insulation shall be installed so as to prevent shakedown in service and where accessible shall be suitably protected/covered. All insulation shall be fire resistant. Samples shall be tested as per DIN 5510-2.	The carbody side walls and roof shall be insulated with a suitable grade of fiberglass insulation, which shall have been treated to resist fungus and mildew. The <u>hydrophobic</u> ~~fiberglass~~ insulation shall be installed so as to prevent shakedown in	Bidder request is noted. Please refer to Annex B.

		The Bidder ask the Employer to accept EN standard alternatively and to accept hydrophobic insulation (instead of fiberglass).	service and where accessible shall be suitably protected/covered. All insulation shall be fire resistant. Samples shall be tested as per DIN 5510-2 or EN45545.	
66.	Volume II/III - Part 2 Section VI ERT Chapter 5.2 Clause 5.2.2.2 190/355 (ERT-45) Insulation - Acoustic Insulation	All insulation shall be fire resistant. Samples shall be tested as per DIN 5510-2. *The Bidder ask the Employer to accept EN standard alternatively.*	All insulation shall be fire resistant. Samples shall be tested as per DIN 5510-2 or EN45545.	Bidder request is noted. Please refer to Annex B.
67.	Volume II/III - Part 2 Section VI ERT Chapter 20.1 Clause 20.1.1.9 268/355 (ERT-123) Inspection, Testing, and Commissioning - General	Temporary certificate shall be published after completion of speed limit 120km/h; then final certificate shall be published after completion of speed limit160km/h. So, the Contractor shall test the performance twice. *The Bidder would like to known which tests are necessary once that the temporary certificate for the speed limit 120 km/h has been published. Shall the Bidder really plan with all test twice or are some test of the 120 km/h speed limit also valid for the 160 km/h speed limit?*	-NA-	Clause 20.1.1.9 has been deleted. Please refer to Annex B.

68.	Volume II/III - Part 2 Section VI ERT Chapter 24.8 Clause 24.8.1 296/355 (ERT-151) Main Special Tools and Diagnostic Test Equipment	The main Special Tools and Diagnostic Test Equipment are as follows, but not limited to them. *The Bidder understands required minimum quantity of each listed tools and test equipment are one (1) unit. Please confirm the Bidder's understanding is correct, otherwise please provide minimum quantity requirement.*	-NA-	The bidder understanding is not correct. Please refer to clause 24.6.1. The Contractor shall provide a sufficient number of special tools required, to enable the Employer to properly maintain the trains.
69.	GBB05 3/18 Item 3	The Employer requirement is to have Bi-parting plug-in sliding doors. Please confirm that a single leaf plug-in door is acceptable with compliance to the requirements 1.6.2.1 and 7.1.4 (Doorway typology) as well as 7.1.14 and 7.3.17 (Opening/closing times) as long as long as interface with PSD is well managed during implementation stage. The advantages of a single leaf door are a better airtightness and the possibility to integrate an adequate size of side window, as required in 7.1.17.	The Employer requirement is to have Bi-parting or single leaf plug-in sliding doors.	Bidder request is noted. Please refer to Annex B.
70.	Volume II of III Part 2 - Employer's Requirements ERT-6 1.5.1.4	The Contractor shall prepare the provision of at least twelve (12) display sites which shall be determined by the Employer over a period of 18 months of mockup display. The Contractor shall bear all of the associated cost of the Mockup logistics and others i.e., security, authority approval etc...	-NA-	The 12 display sites shall be along the project alignment.

		In order to quote and define at tender stage all related Mock-up costs, please confirm or define the following information: *- As any display site has a related logistic cost Tenderer understands that the 12 display sites will be located in Manila metropolitan area. Please confirm.* *- Please confirm that any display site proposed by the Buyer will have the appropriate dimensions for installing the mock-up and that it will not have any technical issue that can complicate/difficult the mounting/ dismounting or the transportation activities creating extra costs.*		Bidder understanding is correct on the display site condition.
71.	Volume II of III Part 2 - Employer's Requirements ERT- 97 15.4.1 ERT-54 5.19.1.2	The event recorder shall either incorporate its function into TMS or be as a separate device and shall comply with IEC 62625-1 or other equivalent standard. The TMS shall also be capable of recording, with sufficient memory capacity to store more than 30 days operation. Any control operation and train condition shall be recorded in the Event Recording device of TMS in both leading cars. These memories shall be physically located in a position on the train such that it will be extremely unlikely to receive damage during a train collision. In the memories of both leading cars, the same contents shall be recorded. The Contractor shall ensure the security of the data. Data stored in this memory shall be readily available to support any accident investigation.	-NA-	Bidder understanding is correct.

		Section 15.4.1 states that the event recorder system can be integrated or not in the TMS if IEC62625-1 is fulfilled. *While section 5.19.1.2 states that the Event recording device shall be installed in both leading cars. That is to say, two devices per train unit.* *As consequence of this, in case a separate device for the event recorder is proposed, which is not integrated in the TMS, two event recording devices shall be installed per train (both in leading cars).* *Please confirm that the Tenderer's understanding is correct.*		
72.	GBB5 Item No.3	The Employer requirement is to have Bi-parting plug-in sliding doors. Please refer to Annex B for the updated employer requirement on clause 7.1.4. *In order to confirm compatibility between the Rolling stock and Infrastructure, please confirm the horizontal distance to the station platform (track axis to station platform edge). In response to GBB5 Item No.3, the Employer confirmed that sliding-plug doors are required. Due to the kinematic movements of this type of doors and their envelope in open position (station), the required information is necessary to confirm compatibility. In order to confirm compatibility with*	-NA-	The confirmation required by the bidder is the Contractor obligation in the project delivery. Please refer to clause 1.21.8. Please refer response. item #70

		PSD, their position in stations in respect to the track axis is also required.		
73.	Volume II of III Part 2 Employer's Requirement ERT-142 22.6.1	The Contractor shall make available experienced Maintenance Engineers & maintenance staff to provide assistance throughout all Defects Notification Periods. All works carried by the Contractor during the Defects Notification Period shall be carried out within the operating schedule maintenance periods. During the Defects Notification Periods, it is preferable that engineers & maintenance staffs should stay near the depot or place to work. *The Employer defines the construction of 2 Depots under CP N-05 and CP S-07 Contract Packages.* *In order to provide the most competitive offer to the Employer and taking into account the reduced size of the fleet for the CP NS-03 Rolling Stock – Limited Express Trainsets Project (7 units), the Tenderer requests the possibility to consider one unique depot (North Depot, for example) for warranty activities during the Defect Notification Period.* *Please confirm if the proposal is accepted.*	-NA-	Please refer to GBB N0. 3 dated 12 April 2021. The primary delivery location for the Limited Express Trainsets is the Mabalacat Depot. However, the Employer shall reserve the right to change the delivery location during the project implementation.
74.	Volume II of III Part 2 - Employer's Requirements ERG-80 16. Publicity and Public	16.1.1 The Contractor shall prepare and submit a Public Relations (PR) plan as part of the Project Management Plan to the Engineer. The Contractor shall also carry out PR activities and public consultation works with the instruction and guidance of the Engineer. The	-NA-	Bidder request is rejected.

	Relation	responsibilities of the Contractor shall, without limitation, include: … *The definition of the requirement is vague and unclear, therefore the offered price by each Tenderer would not be comparable on apple to apple basis because assumption of each Tenderer would be different.* *The cost is not capped and remains into Employer's final decision, therefore Tenderers would face a risk which is difficult to assess.* *In addition, Publicity and Public Relation was considered and included in the Provisional Sums in similar projects executed by DOTr.* *Therefore, we would like to kindly ask you to include this requirement in the Provisional Sums same as other projects.* *Otherwise, please limit and specify the scope clearly in order for the Employer to be able to compare all the bids at the same level of assumption by each Tenderer.*		

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Volume II Part 2 – Employer's Requirements
1	ERT-147 24.2.5	Updated Clause 24.2.5: The spare part supplied during DNP shall include at least the below list of spare parts as minimum. Unless otherwise stated, the quantity shall be based on one (1) trainset basis. Final list shall be confirmed during design stage.
2	ERG-71 11.9.1	Updated Clause 11.9.1: The Contractor shall procure and transport to the Driving Simulator Contractor (under CP NS-01: E&M System and Track Works) the equipment for the Driving Simulator to be installed in the Training Center by the designated date.
3	ERT-52 5.16	Updated Clause 5.16.1: A Driver's cab shall be provided at each end of a train. The driver's cab shall be equipped with an interior door and two side doors. Each door can be locked inside and outside by a key. The doors shall be manufactured as provided for in Sub-Clause 7.2 of this ERT. The driver's cab accessibility, security and evacuation shall be designed during the project implementation. Clause 5.16.3 was deleted:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Clause 5.16.4 is now 5.16.3: Clause 5.16.5 is now 5.16.4: Clause 5.16.6 is now 5.16.5: Clause 5.16.7 is now 5.16.6:
4	ERT-56 5.19.6.4	Clause 5.19.6.4 was deleted:
5	ERT-58 6.3.4	Updated Clause 6.3.4: The lighting intensity at passenger sitting reading level (500mm above seat level) shall be no less than 400 lux and at 850 mm above floor level no less than 200 lux. Passenger saloon lighting will have no significant dark areas behind the diffusers. Alternatively, the lighting intensity shall be designed in accordance with EN13272 or any equivalent standard and which shall meet the safety requirement, provide a comfortable and pleasing visual environment.
6	ERT-59 6.5.9	Clause 6.5.9 was deleted: Clause 6.5.10 is now 6.5.9: Clause 6.5.9 was updated:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		The Contractor shall ensure that all exterior lights are powered from the low voltage DC power supply system. The low batteries DC load analysis shall be presented during the design phase to simulate event of APSE failure Clause 6.5.11 is now 6.5.10: Clause 6.5.12 is now 6.5.11:
7	ERT-64 8.2.8	Clause 8.2.8 was deleted: Clause 8.2.9 is now 8.2.8: Clause 8.2.10 is now 8.2.9:
8	ERT-77 10.2.5	Updated clause 10.2.5: The design of the pneumatic system shall be capable of supplying all of the air requirements for a train consist in the event of failure of one compressor unit.
9	ERT-115 19	Clause 19.1.4 is now 19.2: Clause 19.1.4.1 is now 19.2.1: Clause 19.2.1:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		All drawings shall conform to current industry standards. All drawings shall be supplied in electronic format, the specific format to be reviewed by the Engineer, and with the required number of prints; Clause 19.1.4.2 is now 19.2.2: Clause 19.1.4.3 is now 19.2.3: Clause 19.1.4.4 is now 19.2.4: Clause 19.1.4.5 is now 19.2.5: Clause 19.2.5: Drawing language shall be English. Clause 19.1.4.6 is now 19.3: Clause 19.1.6.1 is now 19.3.1: Clause 19.1.6.2 is now 19.3.2:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Clause 19.1.6.3 is now 19.3.3: Clause 19.1.6.4 is now 19.3.4: Clause 19.1.6.5 is now 19.3.5: Clause 19.1.6.6 is now 19.3.6: Clause 19.1.6.7 is now 19.3.7: Clause 19.1.6.8 is now 19.3.8: Clause 19.1.7 is now 19.3.9: Clause 19.2 is now 19.4: Clause 19.2.1 is now 19.4.1: Clause 19.2.2 is now 19.4.2: Clause 19.2.3 is now 19.4.3: Clause 19.2.4 is now 19.4.4: Clause 19.2.5 is now 19.4.5:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Clause 19.2.6 is now 19.4.6: Clause 19.2.7 is now 19.4.7: Clause 19.2.8 is now 19.4.8: Clause 19.2.9 is now 19.4.9: Clause 19.3 is now 19.5: Clause 19.3.1 is now 19.5.1: Clause 19.3.2 is now 19.5.2: Clause 19.3.3 is now 19.5.3: Clause 19.3.4 is now 19.5.4: Clause 19.3.5 is now 19.5.5: Clause 19.3.6 is now 19.5.6: Clause 19.3.6.1 is now 19.5.6.1:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Clause 19.3.6.2 is now 19.5.6.2: Clause 19.4 is now 19.6: Clause 19.4 is now 19.6: Clause 19.4.1 is now 19.6.1: Clause 19.5 is now 19.7: Clause 19.5.1 is now 19.7.1: Clause 19.5.2 is now 19.7.2: Clause 19.6 is now 19.8: Clause 19.6.1 is now 19.8.1: Clause 19.7 is now 19.9: Clause 19.7.1 is now 19.9.1: Clause 19.7.1.1 is now 19.9.1.1: Clause 19.7.1.2 is now 19.9.1.2:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Clause 19.7.1.3 is now 19.9.1.3: Clause 19.7.1.4 is now 19.9.1.4: Clause 19.7.1.5 is now 19.9.1.5: Clause 19.7.1.6 is now 19.9.1.6: Clause 19.7.1.7 is now 19.9.1.7: Clause 19.7.2 is now 19.9.2: Clause 19.7.2.1 is now 19.9.2.1: Clause 19.7.3 is now 19.9.3: Clause 19.7.3.1 is now 19.9.3.1: Clause 19.7.4 is now 19.9.4: Clause 19.7.4.1 is now 19.9.4.1: Clause 19.7.4.2 is now 19.9.4.2: Clause 19.7.4.3 is now 19.9.4.3:

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ITEM NO.	**REFERENCE/CLAUSE/ SECTION**	**REVISIONS / AMENDMENTS**
		Clause 19.8 is now 19.10: Clause 19.8.1 is now 19.10.1: Clause 19.8.2 is now 19.10.2: Clause 19.8.3 is now 19.10.3: Clause 19.8.4 is now 19.10.4: Clause 19.8.5 is now 19.10.5: Clause 19.8.6 is now 19.10.6: Clause 19.9 is now 19.11: Clause 19.9.1 is now 19.11.1: Clause 19.9.2 is now 19.11.2: Clause 19.9.3 is now 19.11.3: Clause 19.9.4 is now 19.11.4: Clause 19.10 is now 19.12:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Clause 19.10.1 is now 19.12.1: Clause 19.10.2 is now 19.12.2: Clause 19.10.3 is now 19.12.3: Clause 19.10.4 is now 19.12.4: Clause 19.11 is now 19.13: Clause 19.11.1 is now 19.13.1: Clause 19.11.2 is now 19.13.2: Clause 19.11.3 is now 19.13.3: Clause 19.12 is now 19.14: Clause 19.12.1 is now 19.14.1: Clause 19.12.2 is now 19.14.2: Clause 19.12.3 is now 19.14.3:

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<table>
<tr><th>ITEM NO.</th><th>REFERENCE/CLAUSE/ SECTION</th><th>REVISIONS / AMENDMENTS</th></tr>
<tr><td>10</td><td>ERT-42
3.11.3</td><td><u>Updated clause 3.11.3:</u>

Detailed model information, (number as well as type of elements, boundary conditions, …etc.), and the criteria used for the acceptability of stress levels, other provisions shall be subjected to the Engineer for review and comments.</td></tr>
<tr><td>11</td><td>ERT-46
5.3.4</td><td><u>Updated clause 5.3.4:</u>

The interior panels of the car shall be designed to accept information/advertisement cards.</td></tr>
<tr><td>12</td><td>ERT-99

Table 16.1</td><td>Updated table 16.1 Responsibility Matrix:

<table>
<tr><th>SOW</th><th>Item Description</th><th>By Contractor</th></tr>
<tr><td>1</td><td>Public Address (PA) System to broadcast speech messages to train passengers from the driver’s cab.
Facility to broadcast over the train PA System from the Operations Control Center (OCC) with the associated message content relayed to the train via the Train Radio System.</td><td>CP NS-03

CP NS-01</td></tr>
<tr><td>2</td><td>Guidance display for the customer shall be placed under the ceiling in the passenger coaches (or saloons). Guidance display shall be digital signage to present on dedicated TV-style color monitors using LCD displays which is 17-inch or bigger size, and it shall be possible to display the destination, the next station, the side of opening door, transit information, line map, time to arrive at each station, the guidance of the</td><td>CP NS-03</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>ITEM NO.</th><th>REFERENCE/CLAUSE/ SECTION</th><th colspan="3">REVISIONS / AMENDMENTS</th></tr>
<tr><td></td><td></td><td></td><td>next station and attention, etc. One monitor shall be installed on one door. Securing space and supplying the wiring shall be prepared so that another screen can be added for advertisement.

Advertisement display for the customer shall be placed in the passenger coaches (or saloons). Advertisement display shall be digital signage to present on dedicated TV-style color monitors using 21.5-inch or more LCD displays. (BG This may interfere with luggage racks)</td><td></td></tr>
<tr><td></td><td></td><td>3</td><td>Passenger emergency intercom to provide audio communication between carriages and the driver’s cab to enable passengers to alert the driver should an emergency situation occur within the train carriage.

In case the driver does not pick up the passenger emergency intercom within a predefined time, it automatically connects to the OCC, using the onboard radio.</td><td>CP NS-03

CP NS-01</td></tr>
<tr><td></td><td></td><td>4</td><td>Driver’s intercom system to allow full-duplex audio communication between driver’s cabs.</td><td>CP NS-03</td></tr>
<tr><td></td><td></td><td>5</td><td>Train radio system to allow full-duplex audio communication between the driver and the OCC. Additional interfaces shall be provided within the OCC to relay to the trains PA audio messages.
Train Protection Radio</td><td>CP NS-01</td></tr>
<tr><td></td><td></td><td>6</td><td>Outdoor display (mounting on the train) consisting of a full color LED to display destination stations for the passengers on the platform.</td><td>CP NS-03</td></tr>
<tr><td>13</td><td>ERT-83
11.1.29</td><td colspan="3"><u>Updated clause 11.1.29:</u></td></tr>
</table>

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		The propulsion equipment shall be incorporated with the Main Switch, as the Core of main circuit and the connectors for High voltage pressure test.
14	ERG-45 7.10.8.1	Updated clause 7.10.8.1: All test software, with the exclusion of built-in test software, shall be produced in accordance with a quality system controlled under the requirements of accepted international standards. Test software shall be developed and documented using structured techniques and shall be designed to be maintainable throughout the duration of the Contract. All test software shall be documented to be supportive of maintenance. Any test software, which is to be delivered to the Employer/Engineer (for long term testing use), shall be fully documented including source code listings to allow the Employer/Engineer to maintain the software for the life of the supported system. Balance source code with all relevant documentation shall be kept by the Contractor in an Escrow account. The initial three years lease of Escrow account shall be paid by the Contractor.
15	ERT-64 7.3.20	Updated clause 7.3.20: The driver must reset the device before the train can proceed or without a reset device depending on the system safety design of the rolling stock. The device shall be recessed and suitably sealed to prevent accidental actuation.
16	ERT-67 8.1.4	Updated clause 8.1.4:

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		If air-conditioning stops to operate by any minor failure i.e. Communication or link error etc., switch shall be installed to allow the driver to be able to reset from the driver's cab.
17	ERT-45 5.2.1.1	Updated clause 5.2.1.1: The carbody side walls and roof shall be insulated with a suitable grade of fiberglass insulation or suitable material, which shall have been treated to resist fungus and mildew. The insulation materials shall be installed so as to prevent shakedown in service and where accessible shall be suitably protected/covered. All insulation shall be fire resistant. Samples shall be tested as per DIN 5510-2 or any equivalent standard which shall be reviewed and given notice of no objection by the Engineer.
18	ERT-45 5.2.2.2	Updated clause 5.2.2.2: All insulation shall be fire resistant. Samples shall be tested as per DIN 5510-2 or any equivalent standard which shall be reviewed and given notice of no objection by the Engineer.
19	ERT-31 2.2.7, 2.2.8	Updated clause 2.2.7: The exterior of the carbody shall be polished finish stainless steel or aluminum. The doors shall also to be made with stainless steel skin or aluminum having the same finish as the carbody. Proven quality Signages and Graphic films can be provided on the exterior of the Car bodies to enhance the aesthetics of the Train subject to review by the Engineer. The Contractor shall submit external signages, graphics scheme and specifications for the

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Engineer's review and given Statement of No Objection. In case where the cab exterior is other than stainless steel, then painting shall be required. The Contractor shall submit the painting specifications for the Engineer to review. <u>Updated clause 2.2.8:</u> The underframe members shall be made of stainless steel or aluminum alloy. They shall provide durability and good resistance to abrasion, moisture, oils, and track work environment, to corrosion of coated metalwork and to car cleaning. Any component parts of the underframe that are made of high tensile steel or aluminum shall be painted with a half gloss black paint system, which has been proven in metro rail transit and/or similar applications. It shall provide durability and good resistance to abrasion, moisture, oils, and the track work environment, to corrosion of coated metalwork and to car cleaning. The Contractor shall submit the painting scheme and specifications for review by the Engineer.
20	ERT-123 20.1.1.9	<u>Clause 20.1.1.9 was deleted:</u>
21	ERT-7 1.6.2.1 (13)	<u>Updated clause 1.6.2.1 (13):</u> 13. Passenger Doors — Bi-parting of single leaf plug-in sliding Doors

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
22	ERT-60 7.1.4	<u>Updated clause 7.1.4:</u> Side door number is two for each side, and position of the door must adjust to PSD door position. When express train stop at station, train door shall be inside the width of the PSD door, considering the accuracy of stopping ±350mm by ATO (Automatic Train Operation). The Contractor shall Interface with the PSD NS-01 Contractor on the requirement of door positioning between the Rolling Stock and PSD in accordance with section 7.8 of the ERT. The doors shall be bi-parting or single leaf plug-in sliding doors, constructed to prevent hands/finger pinning at the pocket section during operation. An airtight structure is preferred. If airtight structure is adopted, the mechanical door system must be fit to this system. The proposed door type shall be a proven solution to the constructability with the platform door under CP NS01 contract, the maintainability, the safety and the performance of the rolling stock.
Volume III Part 3 – Conditions of Contract and Contract Forms		
23	Section IX: Annexes and Contract Forms Annexes - Table of Securities	<u>Annexes - Table of Securities (Standard Form of Contract Annex References) and the Note was amended with the following, refer to the Annex B – Attachment 1 for the amended page:</u> **<u>Annexes - Table of Securities</u>** (Standard Form of Contract Annex References) A. *Not used* B. Bid Security: *see Part 1 Section IV – Bidding Forms* C. Performance Security - *see Contract Forms CF5*

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Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Demand Guarantee: *D. Not used* E. Advance Payment Security: *see Contract Forms CF6 see Contract* F. Retention Money Guarantee: *Forms CF7* *G. Not used* …… **Notes:** 1. Forms attached to these Particular Conditions may be modified as considered necessary, and shall be completed at the time of finalizing the Contract. 2. Annexes B shall be submitted with the Bid – see Instructions for Bidders 3. Annexes C, E and F may be completed in conjunction with the Award of Contract

Annex B – Attachment 1

24 Spare Parts and Special Tools

24.1 General

24.1.1 The Contractor shall provide spare parts, special tools as specified in both the General Requirements as well as this clause.

24.1.2 As part of the performance acceptance criteria, the Contractor shall deliver the spares and consumables, special tools and diagnose test equipment to the Site.

24.2 Spare Parts

24.2.1 The Contractor shall provide a list of capital spares and consumables (spares and consumables) and supply for the Defects Notification Period (DNP).

24.2.2 The Employer may order additional spares required for the following 15 years from the recommended spare parts and consumables list as provided by the Contractor.

24.2.3 The Contractor shall provide a complete listing of spares and consumables to be supplied, including the following information:

a. Contractor part number;
b. Original equipment manufacturer part number; and
c. Part description.
d. Price
e. Primary Vendor name/contact/address
f. Secondary Vendor name/ contact/ address

24.2.4 The Contractor shall submit the final list of capital spare during the design stage.

24.2.5 The spare part supplied during DNP shall include at least the below list of spare parts as minimum. Unless otherwise stated, t~~T~~he quantity shall be based on one (1) trainset basis. Final list shall be confirmed during design stage.

No	Description
1	Wheel and Axle Assembly for Motor;
2	Wheel and Axle Assembly for Trailer Bogie;
3	Wheel Assembly;
4	Primary Suspension;
5	Secondary Suspension;
6	Tread Brake Assembles;
7	Gearbox Assembly;
8	Flexible Coupling Assembly (link for Gear box and Traction Motor);
9	Traction Motor Assembly;
10	Current Return Assembly;
11	Air Compressor Assembly;
12	Air Drier for Compressed Air;
13	Pantograph Assembly;
14	Arrestor Assembly
15	Air Conditioning Unit Assembly;
16	ACU Compressor Assembly;
17	Unit Brake Assemblies;
18	Evaporator Blower Assembly;

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7	Gearbox Assembly;
8	Flexible Coupling Assembly (link for Gear box and Traction Motor);
9	Traction Motor Assembly;
10	Current Return Assembly;
11	Air Compressor Assembly;
12	Air Drier for Compressed Air;
13	Pantograph Assembly;
14	Arrestor Assembly
15	Air Conditioning Unit Assembly;
16	ACU Compressor Assembly;
17	Unit Brake Assemblies;
18	Evaporator Blower Assembly;

11.2 Spare Parts Manufacture and Delivery

11.2.1 Spares parts shall be manufactured, tested and delivered to the Employer by the Contractor, as part of the Performance Acceptance Criteria (PAC) stated at Clause 8.5. The spare parts shall suitably packed and identified for prolonged storage.

11.3 Special Tools and Test Equipment

11.3.1 Special tools, test equipment, jigs, fixtures and gauges required to carry out all functions described in the maintenance instructions or as required by the Particular Technical Requirements shall be delivered as part of the Performance Acceptance Criteria (PAC) stated at Clause 8.5, according to the approved lists by the Employer/Engineer.

11.3.2 The Contractor may add any additional equipment required, but, at no extra cost to the Employer. The extent of supply shall include protective or carrying cases, as may be appropriate for the storage and use of each item.

11.3.3 In the event the Employer/Engineer encountered an inconsistency of the approved list and the maintenance manual or other means, at no adjustment to the Contract sum, the Contractor shall with immediate effect shall update the lists and delivered the additional special tools and test equipment as per clause 11.1.5 and as part of the PAC stated at Clause 8.3.

11.4 Capital Spares

11.4.1 The Contractor is to provide recommended list of Capital Spares for the limited express train.

11.4.2 The proposed capital spares by the Contractor shall be able to support the unit exchange program and to achieve the efficient CMTTR as per clause 8.5.3.

11.5 Consumable Spares

11.5.1 The Contractor shall provide all spare parts for all of its supplied equipment necessary during the Defects Notification Period, the price of which shall have been included in the Schedule of Prices.

11.5.2 The spare parts shall be listed in a practical format.

11.5.3 The stock of all consumable spare parts shall be replenished at the end of the Defects Notification Period to match as a minimum the list of consumables of the bid and be handed over to the Employer.

11.6 Start-Up Material

11.6.1 The Contractor shall provide all material for testing and commissioning and sufficient material to start the service.

11.7 Spare Parts Installation Support

11.7.1 The Contractor shall provide sufficient maintenance support staff to ensure that the all spares can be efficiently installed during the Defects Notification Period.

11.8 (Not Used)

11.9 Train Operation Simulator Parts

11.9.1 ~~The Contractor shall transport, set up and adjust the train operation simulator by the designated date.~~The Contractor shall procure and transport to the Driving Simulator Contractor (under CP NS-01: E&M System and Track Works) the equipment for the

Driving Simulator to be installed in the Training Center by the designated date.

12 INSPECTION, TESTING AND COMMISSIONING

12.1 General

12.1.1 The Contractor shall perform all necessary testing and commissioning activities in order to ensure satisfactory operation of the Rolling Stock completed system plus compliance with the requirements of the Technical Requirements. The Engineer shall witness the tests as set out in the test plan.

12.1.2 The test of the signaling Equipment provided by the CP NS-01 and CP04 Contractors shall be part of the test plan and the technical responsibility for integrated performance sets with the CP NS-01 and CP04 Contractors.

12.1.3 All inspections, testing and commissioning shall be clearly identified in the Quality Management Plan identifying the witness, inspection and hold points as required by the Contractor, the Engineer or both. The quality management plan shall be submitted by the Contractor to the Engineer for review in accordance with the Quality Management Plan (refer Sub-Clause 7.1).

12.1.4 All tests shall be carried out by the Contractor in the presence of the Employer and the Engineer in accordance with the agreed Quality Management Plan.

12.1.5 The Contractor shall provide testing procedures that shall be in accordance with the Technical Requirements and the International and Philippine Standards (as specified in the Technical Requirements Sub-Clause 1.2.2**,** Codes, Standards and Requirements).

12.1.6 The Contractor shall appoint a dedicated test and commissioning manager, to coordinate all activities of the commissioning schedule.

12.1.7 All costs associated with testing shall be borne by the Contractor, including any expenses incurred due to re-testing caused by defects or failure of equipment to meet the requirements of the Contract in the first instance.

12.1.8 The cost of permanent power which is consumed in testing and commissioning by the Contractor as part of the Works shall not be the responsibility of the Contractor.

12.1.9 The cost to provide water and other services including train operation personnel (train operators and rolling stock personnel) required for inspection, testing and commissioning including integrated testing and commissioning and trial run shall be borne by the Contractor. Train operator and associated rolling stock personnel required for all Interfacing Contractors will be provided by the CP NS-03 Contractor as required for the completion of testing & commissioning.

12.2 Inspection, Testing and Commissioning Plan

12.2.1 According to Sub-Clause 22.2.2 of the ERT the Contractor shall submit to the Engineer for review an inspection, testing and commissioning plan giving full details of all tests to be carried out under the Contract with an explanation of the planned achievements.

12.2.2 The plan shall demonstrate that the Rolling Stock conforms to specifications, standards and other normative documents.

12.2.3 Testing and commissioning shall be in accordance with the Railway Application Standard JIS E4041 or other equivalent standards for testing of Rolling Stock or on completion of construction and before entry into service and according to Clause 22 of the ERT.

12.2.4 The inspection, testing and commissioning plan shall include as a minimum the following tests:

11.2 Spare Parts Manufacture and Delivery

11.2.1 Spares parts shall be manufactured, tested and delivered to the Employer by the Contractor, as part of the Performance Acceptance Criteria (PAC) stated at Clause 8.5. The spare parts shall suitably packed and identified for prolonged storage.

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11.3.1 Special tools, test equipment, jigs, fixtures and gauges required to carry out all functions described in the maintenance instructions or as required by the Particular Technical Requirements shall be delivered as part of the Performance Acceptance Criteria (PAC) stated at Clause 8.5, according to the approved lists by the Employer/Engineer.

11.3.2 The Contractor may add any additional equipment required, but, at no extra cost to the Employer. The extent of supply shall include protective or carrying cases, as may be appropriate for the storage and use of each item.

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11.5.2 The spare parts shall be listed in a practical format.

11.5.3 The stock of all consumable spare parts shall be replenished at the end of the Defects Notification Period to match as a minimum the list of consumables of the bid and be handed over to the Employer.

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11.6.1 The Contractor shall provide all material for testing and commissioning and sufficient material to start the service.

11.7 Spare Parts Installation Support

11.7.1 The Contractor shall provide sufficient maintenance support staff to ensure that the all spares can be efficiently installed during the Defects Notification Period.

11.8 (Not Used)

11.9 Train Operation Simulator Parts

11.9.1 The Contractor shall procure and transport to the Driving Simulator Contractor (under CP NS-01: E&M System and Track Works) the equipment for the Driving Simulator to be installed in the Training Center by the designated date.

2) Aerodynamically efficient and futuristic including a streamlined designed nose cover for the front couplings;

3) Easily cleaned and maintained.

4) In view of the fact that most surface contamination on the train bodyside is from corrosion deposit from rails, this should be considered in the design, color scheme and maintainability of the surface.

5.14.2 The Contractor shall submit three (3) full color, high quality options for the rendering of the train in the corporate livery of the operator to be nominated by the client. The renderings shall show the colors, locations and sizes of all logos and livery applied. The final livery renderings as chosen shall be demonstrated on the mock up car.

5.14.3 Decals for, but not limited to the following shall be installed on the vehicle exterior.

1) The Service livery,

2) Vehicle number,

3) NSCR Logo,

4) Identification of lifting and jacking points,

5) Identification of maintenance requirements,

6) Door Gap and height reminders, and

7) Safety Reminders.

5.15 Miscellaneous Equipment

5.15.1 Fire extinguishers of the 6.5kg chemical water type, or equivalent, shall be provided. One shall be fitted in each Driver's Cab and two shall be fitted in each passenger saloon. Those in the passenger saloon shall be recessed in a break glass cabinet but shall be readily accessible. The housing of the fire extinguishers shall be incorporated to the interior.

5.16 Driver's Cab

5.16.1 A Driver's cab shall be provided at each end of a train. ~~The driver's cab shall be provided with an interior door that can be locked/unlocked inside by a handle locked/unlocked from the passenger compartment. and the same arrangement will be for both sides cab doors. An emergency break glass handle shall be on the passenger compartment door into the cab.~~ The driver's cab shall be equipped with an interior door and two side doors. Each door can be locked inside and outside by a key. The doors shall be manufactured as provided for in Sub-Clause 7.2 of this ERT. The driver's cab accessibility, security and evacuation shall be designed during the project implementation.

5.16.2 As part of the design process the Contractor shall manufacture a full size, fully equipped Cab Mock-Up for the purpose of evaluating design.

~~5.16.3 The Driver's Cab layout shall be agreed between the Contractor and the Engineer. Cab layout shall be nearly the same as MCRP and NSRP-S New Commuter train (CP NS-02) cab layout.~~

~~5.16.4~~5.16.3 The Contractor shall finish the Driver's Cab in neutral tones to create a pleasant environment without visual distractions and shall be designed to reduce glare and the

effects of sunlight at low angles on screens. Low gloss levels shall be provided in the design of the Driver's Cab console.

~~5.16.5~~5.16.4 Driver's cabs shall incorporate necessary switches such as the switch turning on/off propulsion equipment.

~~5.16.6~~5.16.5 The layout shall comply with the requirements shown below, including but not limited to:

1) MLIT Article 72 Ergonomic principles in the design of work systems or other equivalent standards;
2) ISO 9241Ergonomic requirements for office work with visual display terminals (VDTs) or equivalent; and
3) JIS Z 8502 Ergonomic principles related to mental workload or other equivalent standards.

~~5.16.7~~5.16.6 Driver cab shall be designed taking into consideration that some equipment is necessary for each line individually. The Contractor shall design the arrangement in the cab to cater for this need.;

For example:

1) Signaling systems
2) Radio systems
3) Train protection radios

5.17 Driver's Seat

5.17.1 The Contractor shall place the Driver's seat to ensure that the Driver's sighting requirements are achieved. The cab size and crew seat locations shall ensure un-restricted movements to and from the cab access doors.

5.17.2 Each driver's position shall be fitted with a fully adjustable, ergonomically designed, railway service proven gas cylinder suspension equipped crew seat.

1) The seat shall fit 95 percentiles of males in Philippines
2) The seat shall have as a minimum the following adjustments:
3) Vertical seat height,
4) Horizontal distance from console (forward/backward),
5) Backrest angle,
6) Lumbar support,
7) Head rest, and
8) Revolving movement with locking system.

5.17.3 An additional folding seat shall be provided inside the drivers' cab for the use of other Service staff.

5.17.4 The Contractor shall propose and submit three (3) different driver's seat design concepts and color scheme for Engineer's review. Computer generated graphics for each proposed design shall be provided. The design proposals including material sample board to indicate all design materials and finishes shall be submitted for review and given

3) Easily cleaned and maintained.

4) In view of the fact that most surface contamination on the train bodyside is from corrosion deposit from rails, this should be considered in the design, color scheme and maintainability of the surface.

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5.16.3 The Contractor shall finish the Driver's Cab in neutral tones to create a pleasant environment without visual distractions and shall be designed to reduce glare and the effects of sunlight at low angles on screens. Low gloss levels shall be provided in the design of the Driver's Cab console.

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5.18 Cab Air Conditioning System

5.18.1 Conditioned air system shall be ducted from the passenger compartment air supply, through adjustable diffusers in the cab ceiling, to maintain the specified vehicle interior temperatures, or shall be installed air conditioning system for only cab. The driver shall be able to adjust conditions in his cab.

5.18.2 The Driver's cab air supply design, arrangement and calculations shall include the

	Reversing Switch Position	Direction of the train
1.	Vertically upright	OFF position
2.	Forward from the vertical position	Forward
3.	Backwards from the vertical position	Reverse

5.19.3.2 When the Driver's key is in the ON position and The Master Controller is in the predetermined Emergency position, the Reversing Switch shall be unlocked.

5.19.3.3 The Driver`s key can be removed when Master Controller is in Emergency position and the Reversing Switch is in OFF(Neutral) position.

5.19.4 Driver's Vigilance System

5.19.4.1 The Master Controller handle or its vicinity shall incorporate a button which shall be pressed and released on a regular, predetermined basis, to prevent the application of emergency braking.

5.19.4.2 The feature shall be coordinated such that either action prevents brake application.

1) If within a certain period of time there is no master controller operation by the driver, the alarm sounds.

2) Within 5 seconds after the alarm sounds, if there is no operation of the confirmation button, or no master controller operation, emergency brake is operated.

5.19.4.3 The idling time limit for alarm shall be able to be adjusted by the maintainer. (=/- 50% only)

5.19.5 ATP Mode

5.19.5.1 The ATP mode shall be locked by the Driver's key and a sealed switch for ATP cut-out shall be provided.

5.19.5.2 The train shall be designed to make provision for an additional on-board signaling system.

5.19.5.3 Details of the signaling system will be provided by the CP NS-01 Contractor during the interface meeting as described in ERT Clause 17.

5.19.6 Miscellaneous Cab Equipment

5.19.6.1 The Cab shall incorporate a locker for storing the Driver's personal belongings (baggage, etc.) and another one for storing emergency equipment (first aid kit, flashlight, emergency connection cable, wheel chocks, etc.). All emergency equipment shall be indelibly marked with the name and logo. The Contractor shall coordinate with the O&M team and Engineer for the naming convention and labelling. These shall be submitted to Engineer for review and given statement of No Objection.

5.19.6.2 Lockers containing emergency equipment shall be clearly marked and visible from all cab locations. These locations shall not be lockable but shall have a seal which can easily be broken by opening the locker. Where possible the cover shall be transparent so that contents can be checked by driver on entering the cab.

5.19.6.3 Crew keys and equipment box keys shall be identical and preferably exchangeable.

~~5.19.6.4 A switch disconnecting stick shall be equipped in each cab.~~

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5.19.6.3 Crew keys and equipment box keys shall be identical and preferably exchangeable.

5.20 Vehicle Fire Safety and Protection

5.20.1 All materials to be used for vehicle construction and equipment shall provide fire propagation resistance and safety complying with clause 21.8 of this ERT and EN 45545 or equivalent standard

along with offering both variable and automatic illumination adjustment.

6.3.3 The minimum declared life shall be 50,000 hours. The lighting shall be powered by 220V AC supply.

~~6.3.4 The lighting throughout the passenger saloon area shall be 300 Lux when measured at 1.2m above the floor.~~

~~6.3.5~~6.3.4 The lighting intensity at passenger sitting reading level (500mm above seat level) shall be no less than 400 lux and at 850 mm above floor level no less than 200 lux. Passenger saloon lighting will have no significant dark areas behind the diffusers. Alternatively, the lighting intensity shall be designed in accordance with EN13272 or any equivalent standard and which shall meet the safety requirement, provide a comfortable and pleasing visual environment.

~~6.3.6~~6.3.5 The main passenger lights circuit will be protected from abnormal currents via a separate circuit breaker.

~~6.3.7~~6.3.6 No single point failure shall cause the loss of more than 50% of interior lighting. The remaining illumination shall be distributed along the entire car length.

~~6.3.8~~6.3.7 Unit type LED shall be aesthetically pleasing. The cover of LED lighting shall be required to comply with the fire safety requirements given in the clause 21.8 of this ERT.

6.4 Passenger Emergency Lighting

6.4.1 The emergency lighting shall be configured at 30% or more from the total number of main lighting. The emergency lighting shall operate when there no present of overhead power and the failure of Auxiliary Power Supply Equipment (APSE).

6.4.2 Emergency lighting shall be provided by LED lighting with the capacity to allow lighting to be provided within all Passenger saloons, at all inter-car locations and in the both saloon and entrance room, which shall be powered by the battery.

6.4.3 The minimum emergency lighting levels for the period of 60 minutes after APSE failure shall be a minimum of 30 lux at all exit thresholds, a minimum of 30 lux at floor level along all walkways, a minimum of 20 lux 750mm above floor level in vestibules and gangways and a minimum of 20 lux for all emergency equipment cubicles. Alternatively, the emergency lighting levels shall be designed in accordance with EN13272 or any equivalent standard and which shall meet the safety requirement, provide a comfortable and pleasing visual environment.

6.4.4 The emergency passenger lights circuit shall be protected from abnormal currents via a separate miniature circuit breaker.

6.4.5 In the event of loss of the overhead supply, the battery shall be able to support all essential services, such as lighting, ventilation, etc. for 60 minutes.

6.5 Exterior Lights

6.5.1 The Contractor shall provide LED type headlights.

6.5.2 Headlight shall have two functions. One is down lighting mode. Another is high-beam mode. The Contractor shall ensure that the state of the headlight is available in the TMS monitor.

along with offering both variable and automatic illumination adjustment.

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6.5.3 The Contractor shall ensure that a headlight fault detection system is provided for each train cab, providing Fault indication and status information to the driver by TMS monitor.

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6.5.4 The light intensity of headlights shall comply with Table.7 in item 5.2.1 of JRIS R 1645 or any equivalent standard.

6.5.5 Headlight (LED) shall be able to be accessed either from outside and inside of the driver cab. The optical axis of head lamps shall capable of being easily adjusted.

6.5.6 The Contractor shall ensure that the red tail-lights or white marker lights are automatically activated based upon the Cab activation status as follows:

1) Red taillights displayed - associated Cab is not activated, or non-activated Cab is at rear of the Train, or when both cabs in the train are inactive.

2) White marker light displayed - associated Cab has been activated, indicating this will be the front of the train. The white marker lights shall be lit when vehicles are driven in reverse direction.

6.5.7 LED type marker lights shall be provided, and combination red/white units may be proposed.

6.5.8 The Contractor shall ensure that two indicating lights are installed above each door, one inside and one outside. The lights shall be illuminated when the doors open while not lit up when the doors are closed. The lights shall be blinking during opening and closing cycle of the door. The light shall be illuminated together with an indication on the driver's panel or TMS monitor when the door is faulty and/or isolated.

~~6.5.9 The Contractor shall ensure that inspection lights are provided in the vicinity of the underframe mounted equipment. The inspection lights shall be push-button activated from the cab and underframe and shall incorporate design features to ensure that the lights are not inadvertently left on when the train is in operation.~~

~~6.5.10~~6.5.9 The Contractor shall ensure that all exterior lights are powered from the low voltage DC power supply system. ~~All lights shall be powered by the batteries in the event of APSE failure.~~ The low batteries DC load analysis shall be presented during the design phase to simulate event of APSE failure

~~6.5.11~~6.5.10 The Contractor shall ensure that indicating lights are installed in both side of car. The light on the side where all the doors are not closed illuminates.

~~6.5.12~~6.5.11 The Contractor shall ensure that indicating lights are installed in both side of car. The lights shall be illuminated when emergency call is activated in the car.

6.5.4 The light intensity of headlights shall comply with Table.7 in item 5.2.1 of JRIS R 1645 or any equivalent standard.

6.5.5 Headlight (LED) shall be able to be accessed either from outside and inside of the driver cab. The optical axis of head lamps shall capable of being easily adjusted.

6.5.6 The Contractor shall ensure that the red tail-lights or white marker lights are automatically activated based upon the Cab activation status as follows:

1) Red taillights displayed - associated Cab is not activated, or non-activated Cab is at rear of the Train, or when both cabs in the train are inactive.

2) White marker light displayed - associated Cab has been activated, indicating this will be the front of the train. The white marker lights shall be lit when vehicles are driven in reverse direction.

6.5.7 LED type marker lights shall be provided, and combination red/white units may be proposed.

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from dislodging them shall the filters become saturated. They shall seal well at all edges. The filters shall be easily replaced but shall be sized not to require replacement at intervals less than 3500 hours of operation.

8.2.7 In order to reduce the frequency of replacement of the filter, the roll filter shall be used. The roll filter is that the furnace material is wound around the core, and when the set time has elapsed, a new furnace material portion is automatically set. Setting time of the winding is able to be changed arbitrarily by maintenance people. The length of the roll filter shall be determined with the reviewed of the Engineer.

~~8.2.8 Openings shall be closed automatically when running through tunnel to prevent pressure variation, and open automatically after running through tunnel. For above, information of position from TMS shall be used.~~

~~8.2.9~~8.2.8 Active-ventilation system actuated by the battery supply shall be necessary, according to the requirements of the Japanese Ministerial Ordinance, MLIT Chapter 8, Section 4, Article 73 (Structure of Saloon) or other equivalent standards. Active ventilation system shall be operated at least one (1) hour by the battery supply.

~~8.2.10~~8.2.9 The entire ventilation system shall be submitted to the Engineer for review and comments.

8.3 Cooling System

8.3.1 The air conditioning system shall be thermostatically controlled and shall be service-proven and shall automatically maintain the specified interior temperature conditions. Relative humidity in the vehicle shall not exceed 60% under stabilized conditions. The capacity of air conditioning system shall be calculated considering the maximum number of passengers compared the demand forecast and W2 load condition.

8.3.2 The calculated capacity shall be reviewed by the Engineer.

8.3.3 In order to lower the center of gravity, the weight of one outside unit should be as light as possible. And the Contractor should carry out the lighter weight as much as possible, for example using aluminum and selecting most adequate compressor, etc.

8.3.4 Air flow over the evaporator coils shall be sufficiently low to prevent any moisture in the air from entering the main air supply duct, but in no case shall exceed 2.5 m/s. Evaporator coils shall preferably be manufactured from copper, and shall have copper fins, however, aluminum elements is also acceptable provided they are sufficiently protected from the elements. A condensate pan shall be provided beneath the evaporator coil. The pan shall be made from stainless steel with suitable drain lines and shall be easily removable for cleaning. The condensate drain lines shall be insulated to prevent condensation.

8.3.5 The refrigerant used shall be environmentally friendly such as R407C or equivalent the use of refrigerant containing fluorocarbons is not allowed.

8.3.6 Because of preventing trouble of moisture and water, connectors in outside units shall be waterproof type.

8.3.7 The evaporator unit shall include all required components, such as the liquid line solenoid valve, modulating solenoid valve, thermal expansion valves, liquid line strainer, liquid line sight glass/moisture indicator, etc. Appropriate gauge ports for troubleshooting shall be provided.

8.3.8 Blowers shall be direct driven by the motor, which shall be powered by the 440 Vac auxiliary power supply system.

The filters shall be easily replaced but shall be sized not to require replacement at intervals less than 3500 hours of operation.

8.2.7 In order to reduce the frequency of replacement of the filter, the roll filter shall be used. The roll filter is that the furnace material is wound around the core, and when the set time has elapsed, a new furnace material portion is automatically set. Setting time of the winding is able to be changed arbitrarily by maintenance people. The length of the roll filter shall be determined with the reviewed of the Engineer.

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8.3.4 Air flow over the evaporator coils shall be sufficiently low to prevent any moisture in the air from entering the main air supply duct, but in no case shall exceed 2.5 m/s. Evaporator coils shall preferably be manufactured from copper, and shall have copper fins, however, aluminum elements is also acceptable provided they are sufficiently protected from the elements. A condensate pan shall be provided beneath the evaporator coil. The pan shall be made from stainless steel with suitable drain lines and shall be easily removable for cleaning. The condensate drain lines shall be insulated to prevent condensation.

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8.3.8 Blowers shall be direct driven by the motor, which shall be powered by the 440 Vac auxiliary power supply system.

8.3.9 The compressor-condenser unit shall be heavy duty transportation grade, service-proven combined hermetic compressor/condensing unit. The compressor motor shall be powered by the 440 VAC auxiliary power supply system. Cylinder unloaders shall be easily adjusted and shall provide at least two stages of unloading for a total of not less than two-

10 Pneumatic Equipment

10.1 General

10.1.1 The trains shall be supplied with the equipment and functions specified herein, such that a complete, fully integrated and fully functioning friction brake and pneumatic system is provided.

10.1.2 The number and capacity of complete pneumatic system, which shall consist of an air compressor assembly and all associated piping, reservoirs, fittings, etc., to provide a fully functional system capable of supplying all air requirements for the friction braking system, air suspension system,), horns, etc., shall be provided.

10.1.3 Compressed air shall be produced by the air compressor assembly described in Sub-Clause 10.2 of this ERT. Compressed air shall be sufficiently filtered and dried prior to entering the pneumatic lines. All feeds from the main supply line shall be protected by check valves, to prevent the rapid loss of air shall a rupture of leakage in the line occur. Flexible connections from the air compressor to the main supply line shall be likewise protected by check valves.

10.1.4 The pneumatic equipment, including the compressor shall have a maximum operating pressure of 1MPa (10bars). The compressor shall be adequately protected, including from over pressure.

10.1.5 The Contractor shall submit the air system design document including the number and capacity of air compressor unit and air tank capacity and function, etc., It shall be reviewed by the Engineer.. In the event of one compressor unit failure, the adjacent compressor shall be able to support the pressure level without degradation of the train operation performance.

10.2 Air Compressor Assembly

10.2.1 The train shall be equipped with require number of transit service-proven air compressor assembly, which shall consist of an air compressor unit directly driven by an electric motor, air filtration, air drier equipment, inter cooler, safety valves, etc.

10.2.2 The assembly shall be installed under the vehicle via resilient mounts, and care shall be taken to minimize the amount of noise and vibration transmitted into the carbody structure and to the wayside.

10.2.3 The air compressor shall be scroll type or better reliable than; and the maximum discharge pressure of air compressor shall be more than 1MPa ~~The air compressor shall be scroll type, and the maximum discharge pressure of air compressor shall be more than 1MPa.~~

10.2.4 The air compressor motor shall be powered from the 440 VAC, 60 Hz auxiliary power supply system.

10.2.5 ~~Each compressor assembly shall be capable of supplying all of the air requirements for an 8-cars train-set in the event of failure of one compressor unit.~~The design of the pneumatic system shall be capable of supplying all of the air requirements for a train consist in the event of failure of one compressor unit.

10.2.6 The capacity of air compressor shall have sufficient for the simultaneous operation of all pneumatic devices. Calculations for the capacity of air compressor shall be submitted for review by the Engineer.

10.2.7 All air compressors shall be started/stopped synchronously to average each compressor's

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10.1.3 Compressed air shall be produced by the air compressor assembly described in Sub-Clause 10.2 of this ERT. Compressed air shall be sufficiently filtered and dried prior to entering the pneumatic lines. All feeds from the main supply line shall be protected by check valves, to prevent the rapid loss of air shall a rupture of leakage in the line occur. Flexible connections from the air compressor to the main supply line shall be likewise protected by check valves.

10.1.4 The pneumatic equipment, including the compressor shall have a maximum operating pressure of 1MPa (10bars). The compressor shall be adequately protected, including from over pressure.

10.1.5 The Contractor shall submit the air system design document including the number and capacity of air compressor unit and air tank capacity and function, etc., It shall be reviewed by the Engineer. In the event of one compressor unit failure, the adjacent compressor shall be able to support the pressure level without degradation of the train operation performance.

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10.2.2 The assembly shall be installed under the vehicle via resilient mounts, and care shall be taken to minimize the amount of noise and vibration transmitted into the carbody structure and to the wayside.

10.2.3 The air compressor shall be scroll type or better reliable than; and the maximum discharge pressure of air compressor shall be more than 1MPa

10.2.4 The air compressor motor shall be powered from the 440 VAC, 60 Hz auxiliary power supply system.

10.2.5 The design of the pneumatic system shall be capable of supplying all of the air requirements for a train consist in the event of failure of one compressor unit.

10.2.6 The capacity of air compressor shall have sufficient for the simultaneous operation of all pneumatic devices. Calculations for the capacity of air compressor shall be submitted for review by the Engineer.

10.2.7 All air compressors shall be started/stopped synchronously to average each compressor's operation ratio. For this control, train line or transmission of TMS may be utilized.

19 General Documentation Requirements

19.1 General

19.1.1 All documents shall be written in the English language and all drawing drawn to SI/metric units. Documents shall be made in well-structured manner relevant to the vehicle system.

19.1.2 All documents and drawings shall be supplied in Electronic Format, and in the required number of prints. Where special software is required in the use/access of the supplied documents/drawings, the corresponding software, all interface programs and hardware shall also be provided. All software/programs that were custom designed for this project shall have no licensing restrictions.

19.1.3 All drawings furnished by the Contractor shall be in accordance with the guidelines to be provided by the Engineer, including but not limited to the following:

~~19.1.4~~19.2 **Drawing Submittals**

~~19.1.4.1~~19.2.1 ~~All drawings shall conform to current industry standards for microfilm reproduction. All drawings shall be supplied in electronic format, the specific format to be reviewed by the Engineer, and with the required number of prints.~~All drawings shall conform to current industry standards. All drawings shall be supplied in electronic format, the specific format to be reviewed by the Engineer, and with the required number of prints;

~~19.1.4.2~~19.2.2 The drawings submitted shall be of a quality capable of being reproduced clearly.

~~19.1.4.3~~19.2.3 The drawing number and its revision level shall be clearly marked on the drawing.

~~19.1.4.4~~19.2.4 When revisions are made to drawings resulting in re-submittal, such drawings shall be accompanied by a covering letter detailing the changes made.

~~19.1.5~~19.2.5 Drawing language shall be English ~~with Filipino translation (or vice versa).~~

~~19.1.6~~19.3 **Drawings to be submitted for given statement of No Objection**

~~19.1.6.1~~19.3.1 All top-level assembly drawings of items installed on the vehicle (These drawings shall be production drawings). Dimensioned outline drawings may be considered acceptable upon review by the Engineer. All dimensions shall be metric.

~~19.1.6.2~~19.3.2 Wiring and interconnecting diagrams or tables for equipment, panels, assemblies and components, etc. requiring connection on the car,

~~19.1.6.3~~19.3.3 Complete schematic diagrams for equipment and systems (electric, air, hydraulic, etc.),

~~19.1.6.4~~19.3.4 Interface drawings (unless all interface information is contained on other drawings),

~~19.1.6.5~~19.3.5 Assembly or outline drawings which show the details of mechanical attachment and electrical connection interfaces,

~~19.1.6.6~~19.3.6 Switch logic diagrams (where appropriate),

~~19.1.6.7~~19.3.7 Performance curves (traction, braking) and/or tabulations of equipment, systems, components, etc., and

~~19.1.6.8~~19.3.8 Drawing Tree, delineating all major drawings entering into the construction of the vehicles, and indicating construction and system logic.

~~19.1.7~~19.3.9 The Employer through the Engineer reserves the right to approve any or all

drawings used in the design and manufacture of these vehicles.

~~19.2~~19.4 General Format

~~19.2.1~~19.4.1 A full directory of all issued documents, drawings, procedures, reports etc. shall be maintained and provided to the Engineer. Update of the directory will be supplied on all submissions to the Engineer. The soft copy of the directory shall be searchable

~~19.2.2~~19.4.2 The documentation management system shall be submitted to the Engineer for given statement of No Objection and maintained by the Contractor on each new or amended submission.

~~19.2.3~~19.4.3 All drawings shall be produced on standard sheet sizes and format as required in the General Specifications or as approved by the Engineer.

~~19.2.4~~19.4.4 All drawings shall contain a title block containing the following minimum information:

1) Supplier Company names,
2) Drawing title (which should not be ambiguous),
3) Revision level of drawing, and date of revision (which must be updated for change and then be resubmitted for the Engineer's acceptance),
4) Scale, where appropriate,
5) Number of sheets as "x" of "y", and
6) Date of released of Drawing.

~~19.2.5~~19.4.5 A table of revisions shall be provided for each drawing, which shall show each revision level, the date and the revision made.

~~19.2.6~~19.4.6 A list of parts and required quantities shall be provided on each drawing, or as a separate bill of material.

~~19.2.7~~19.4.7 A table of reference shall be provided for product acceptance criteria.

~~19.2.8~~19.4.8 The drawing shall comply with accepted drawing standards. The Contractor shall state in their proposal and quotation which standard is used.

~~19.2.9~~19.4.9 Two clear areas shall be made available in the title block of the drawing for the Employer's use.

~~19.3~~19.5 Drawing Requirements

~~19.3.1~~19.5.1 Drawings submitted shall conform to the following minimum requirements in relation to scope, content and format.

~~19.3.2~~19.5.2 These requirements are not intended to restrict the presentation of information and should be applied as appropriate to the equipment concerned.

~~19.3.3~~19.5.3 Top Level Assembly/Outline Drawing:

1) Scope - to show equipment, as supplied, in sufficient detail to determine basic specification compliance.
2) Content Information

~~19.3.4~~19.5.4 As a minimum, the content information shall consist of:

1) Important dimensions,
2) Mounting arrangements and their tolerances,
3) Panel, enclosure, frame, etc. construction, material, and finish,
4) Direction of rotation (where applicable), speed or frequency, and amount of unbalance,
5) Location of center of gravity, mass (in full working order), and mass carried at each mounting point,
6) Location and size of grounding straps or grounding facility,
7) Location of servicing features and clearance requirements for removal of all normal service items,
8) Labeling and location of notices and decals,
9) Special mounting instructions,
10) Equipment arrangement, including fastening hardware, and
11) List of parts, which must include the type, part number and number of devices as documented by the original manufacturer. Original Equipment Manufacturer (OEM) name and contact details shall be listed together with OEM part number. Weight and dimensions and other relative factors such, electrical, International Protection Rating (IP) quality, of all parts shall be provided. All suppliers shall be registered international standards such as Quality Management -ISO9000, Environment - ISO14000 and etc.

~~19.3.5~~19.5.5 Electrical Information Requirements

1) Operating voltage, power consumption, power factor, and tolerances thereon;
2) Type of windings (for transformers and machines) and type of insulation;
3) Resistance and tolerances;
4) Contact ratings;
5) Operating parameters relevant to type of device, Type and size of cables and wires used;
6) Wire codes, and marking methods of wires and devices; and
7) Indication of color-coding of wire insulation (if used). All suppliers shall comply with the same color code- IEC 60446
8) Electrical symbols of all suppliers and sub suppliers shall be to IEC 60617.

~~19.3.6~~19.5.6 Schematic Diagram

~~19.3.6.1~~19.5.6.1 As a minimum, the schematic diagram shall consist of:

1) Scope - to show in diagrammatic form how the subsystem equipment, Printed Circuit Boards, etc. functions, without regard to the physical location of the equipment or cable routing.
2) Content Information

a) All circuits contained within the equipment concerned,

b) Wire identification code numbers,

c) Vehicle builder/Supplier interface terminal code numbers and connector pin numbers,

d) Trip/rupture current values of all protective devices,

e) Settings of all pressure, temperature, vacuum float, limit switches, time delay relays, etc., with tolerances,

f) Values and tolerance of passive components,

g) Load power consumption,

h) Circuit voltages (nominal),

i) Terminal code numbers on polarity sensitive components and subsystems for which a separate schematic is provided, and

j) Control logic charts and sequence diagrams,

k) Software Logic diagram and truth table for major fault events showing associated hardware and signals along relevant parametric values.

l) Requirements for wire and transmission lines, if any (twisted, separated from AC line, etc.).

~~19.3.6.2~~19.5.6.2 Electrical symbols on schematics and wiring diagrams shall comply with accepted standards. (IEC 60617) If the Contractor wishes to use an alternative; he shall propose the alternative to the Engineer. Whichever standard is authorized by the Engineer, this standard shall be used by all suppliers and sub suppliers to the RST Contractor.

~~19.4~~19.6 Drawings and Design Data Changes

~~19.4.1~~19.6.1 Prior to the qualification tests, the Contractor must notify the Employer of any design change. After the First Article Configuration Inspection (FACI) is approved, any change to any part must be submitted to the Employer for review, together with an assessment of its impact on performance, reliability and interchangeability. All design changed shall require to be approved before implementation.

~~19.5~~19.7 Engineering Documentation

~~19.5.1~~19.7.1 The Contractor shall furnish three copies in electronic format and all required prints of the latest revision of all necessary contract drawings and documents. Thereafter, the Contractor shall update all subsequent revisions to these documents and shall submit three (3) copies in electronic format and all required prints of all revisions of these controlled documents to the Engineer for review.

~~19.5.2~~19.7.2 The Contractor shall provide six copies in electronic format and six (sets) copies of prints of the as-built drawings.

~~19.6~~19.8 As-Built Vehicle Specification

~~19.6.1~~19.8.1 The Contractor shall be required to provide an electronic copy and six (6) hard

copies of this ERT, updated and modified to reflect the as-built specification of the train.

~~19.7~~19.9 Maintenance Manuals

~~19.7.1~~19.9.1 General

~~19.7.1.1~~19.9.1.1 A fully integrated maintenance manual shall be provided, which provide step-by-step instructions on how to maintain, repair and replace all components on the vehicles, down to the Lowest Level Replaceable Unit (LLRU) and working time required (man hours) for all maintenance and repair activities.

~~19.7.1.2~~19.9.1.2 The work instructions shall be provided for every maintenance and repair task shall include safety instructions, tools required, spares and consumables required. Torque settings for fixings and test/inspection requirements for the repaired/maintained/modified item.

~~19.7.1.3~~19.9.1.3 The style of the documents may assume that the technicians performing this work have familiarity with rail vehicles, but not a detailed working knowledge. The LLRU shall be defined as any component within an assembly that is identified in the Original Equipment Manufacturers (OEM) illustrated parts catalog and/or is offered for sale by the original equipment manufacturer.

~~19.7.1.4~~19.9.1.4 The maintenance manual shall provide all necessary detail to perform the work required, and shall include the judicious use of diagrams, drawings, photographs, illustrations, etc., as appropriate for the task at hand, including necessary safety precautions. Detailed maintenance and troubleshooting procedures and test and repair procedures and work instructions shall be provided for all electronic assemblies and circuit boards. Manuals shall identify all tools (special and standard) needed to perform the work. This listing of tools shall be provided in the section describing the discrete task being performed.

~~19.7.1.5~~19.9.1.5 The Contractor shall provide an appropriate number of all special tools for the Employer's use. Special tools are loosely described as anything that the local hardware shop does not stock. Special tools shall include but not limited to diagnostic test equipment for all electronic assemblies and circuit boards, test stands and simulators as may apply, interface hardware & software, hook-up lines/cables and to test all train lined systems.

~~19.7.1.6~~19.9.1.6 All manuals shall be provided in electronic format, and six (6) prints of properly bound oil and dirt resistant hard copies. The material for the hard copies shall be reviewed and commented by the Engineer.

~~19.7.1.7~~19.9.1.7 The maintenance manuals shall be divided into three parts:

1) Running Maintenance Manual,
2) Scheduled Maintenance Manual, and
3) Overhaul Manual.

~~19.7.2~~19.9.2 Running Maintenance Manual

~~19.7.2.1~~19.9.2.1 The Running Maintenance Manual shall describe all work and inspections to be performed on the trains on a routine basis, including servicing, lubrication, adjustments, problem diagnosis, etc. Recommended cleaning procedures shall be provided, including necessary cleaning solutions, together with any safety data sheets. A substantial

troubleshooting and repair guide shall be included to streamline the process of finding the root cause of problems and providing resolution.

~~19.7.3~~19.9.3 Scheduled Maintenance Manual

~~19.7.3.1~~19.9.3.1 The scheduled maintenance manual shall describe all work and inspections to be performed on the trains according to pre-set time periods or accumulated km-run and per sub-system structure (i.e., body, bogie, propulsion, auxiliary, ACU, pneumatics, braking, etc.). An appropriate troubleshooting guide and/or parts repair /replacement shall be provided.

~~19.7.4~~19.9.4 Overhaul Manual

~~19.7.4.1~~19.9.4.1 The Overhaul Manual shall describe all work and inspections to be performed on the trains at designated overhaul periods (or after accumulating certain number of km run).

~~19.7.4.2~~19.9.4.2 The Overhaul procedures shall be for the life of the train.

~~19.7.4.3~~19.9.4.3 An appropriate troubleshooting guide and/or parts repair/replacement shall be provided.

~~19.8~~19.10 Illustrated Parts Catalogs

~~19.8.1~~19.10.1 The Illustrated Parts Catalogs (IPC) shall enumerate and describe all assemblies and constituent components down to the LRU.

~~19.8.2~~19.10.2 The IPCs shall be ordered in a logical fashion, by system, and shall identify the Contractor's part number and the OEM parts number. Additionally, the Contractor shall provide the pertinent information on at least two different alternative suppliers for all non-proprietary components.

~~19.8.3~~19.10.3 Parts common to different assemblies shall bear the same Contractor number. The next level assembly of all parts shall be clearly identified.

~~19.8.4~~19.10.4 The judicious use of cutaway isometric and exploded drawings, photographs, illustrations, etc., shall be used to clearly identify all components down to the LRU.

~~19.8.5~~19.10.5 Six (6) copies of the IPCs shall be provided in electronic and interactive format, along with six (6) properly bound oil and dirt resistant hard copies.

~~19.8.6~~19.10.6 The Illustrated Parts Catalogs shall be reviewed and commented by the Engineer.

~~19.9~~19.11 Operator's (Drivers') Manuals

~~19.9.1~~19.11.1 The Contractor shall provide six (6) sets of properly bound, oil and dirt resistant hard copies of Operator's Manuals, which shall contain all information required for the proper operation of the vehicles. This shall include general vehicle familiarization material and the location, function and operation of all controls, switches, indicators, gauges, etc.

~~19.9.2~~19.11.2 Fault finding shall be included.

~~19.9.3~~19.11.3 The Operator's Manuals shall also be provided in electronic format (6 copies).

~~19.9.4~~19.11.4 The Operator's Manuals shall be reviewed and commented by the Engineer.

~~19.10~~19.12 Training Material

~~19.10.1~~19.12.1 The Contractor shall provide six (6) sets of all material used to train the Employer's personnel to operate and maintain the vehicles.

~~19.10.2~~19.12.2 For maintenance staff this shall include every work instruction provided, the length of time for each training course shall be proposed by the Contractor and be based on the content contained therein. Training shall be carried out in English or Filipino as required by the client. Training material shall be carried out in English or Filipino as required by the client.

~~19.10.3~~19.12.3 The training material and the entire training program shall be reviewed and commented by the Engineer.

~~19.10.4~~19.12.4 The training materials shall also be provided in electronic format (6 sets).

~~19.11~~19.13 Vehicle History Books

~~19.11.1~~19.13.1 The Contractor shall provide a Vehicle History Book for each vehicle at the time of delivery and acceptance. Each Vehicle History Book shall contain but not limited to the following car-specific information:

1) Certified weight (vehicle and axle loads), including scale tickets;
2) Results summary of all tests performed on the complete vehicle and its systems, subsystems and components, including certification performed where required;
3) A set of test results for each component or system where these are required;
4) A description of each configuration changes from the base line in sufficient detail for the Engineer's understanding;
5) Configuration record of each assembly, sub-assemblies and major component, including revision number and dates;
6) List of defects noted, status and disposition;
7) List, description, weight and serial number and location of serial-numbered equipment;
8) List of "as built" drawings with revision status;
9) Axle assembly (wheels, bearings, gears) mounting records, including pressing charts and NDT records;
10) Provision for the Service to record inspection, servicing, overhaul and repair activities; and
11) Shipping documents.

~~19.11.2~~19.13.2 The Contractor shall supply an electronic format, and six (6) hard copies of properly bound oil and dirt resistant hard copies for each car of the full history and configuration records, arranged by component type, assembly, sub-assembly, major component and other serially numbered components, including spares, test equipment and special tools.

~~19.11.3~~19.13.3 The Vehicle History Book format shall be reviewed and commented by the Engineer.

~~19.12~~19.14 **Intervention/Modifications History Record (During Warranty Period)**

~~19.12.1~~19.14.1 The Contractor shall provide a supplemental History record for each vehicle at the time of final acceptance/after the warranty period. Each supplemental History record shall contain the following car-specific information:

1) Intervention and repairs during warranty period,
2) All modifications/revisions done during the warranty period,
3) All tests/validation tests reports and records, and
4) Component exchange, component change reports and new component/serial numbers
5) Signed documentation to show the Employer and/or the Engineer had approved all intervention, modification/ component change and testing.

~~19.12.2~~19.14.2 The Intervention/Modification History Record shall be provided in electronic format, and six (6) copies of properly bound oil and dirt resistant hard copies.

~~19.12.3~~19.14.3 The Intervention/Modification History Record format shall be reviewed and commented by the Engineer.

19 General Documentation Requirements

19.1 General

19.1.1 All documents shall be written in the English language and all drawing drawn to SI/metric units. Documents shall be made in well-structured manner relevant to the vehicle system.

19.1.2 All documents and drawings shall be supplied in Electronic Format, and in the required number of prints. Where special software is required in the use/access of the supplied documents/drawings, the corresponding software, all interface programs and hardware shall also be provided. All software/programs that were custom designed for this project shall have no licensing restrictions.

19.1.3 All drawings furnished by the Contractor shall be in accordance with the guidelines to be provided by the Engineer, including but not limited to the following:

19.2 Drawing Submittals

19.2.1 All drawings shall conform to current industry standards. All drawings shall be supplied in electronic format, the specific format to be reviewed by the Engineer, and with the required number of prints;

19.2.2 The drawings submitted shall be of a quality capable of being reproduced clearly.

19.2.3 The drawing number and its revision level shall be clearly marked on the drawing.

19.2.4 When revisions are made to drawings resulting in re-submittal, such drawings shall be accompanied by a covering letter detailing the changes made.

19.2.5 Drawing language shall be English.

19.3 Drawings to be submitted for given statement of No Objection

19.3.1 All top-level assembly drawings of items installed on the vehicle (These drawings shall be production drawings). Dimensioned outline drawings may be considered acceptable upon review by the Engineer. All dimensions shall be metric.

19.3.2 Wiring and interconnecting diagrams or tables for equipment, panels, assemblies and components, etc. requiring connection on the car,

19.3.3 Complete schematic diagrams for equipment and systems (electric, air, hydraulic, etc.),

19.3.4 Interface drawings (unless all interface information is contained on other drawings),

19.3.5 Assembly or outline drawings which show the details of mechanical attachment and electrical connection interfaces,

19.3.6 Switch logic diagrams (where appropriate),

19.3.7 Performance curves (traction, braking) and/or tabulations of equipment, systems, components, etc., and

19.3.8 Drawing Tree, delineating all major drawings entering into the construction of the vehicles, and indicating construction and system logic.

19.3.9 The Employer through the Engineer reserves the right to approve any or all drawings used in the design and manufacture of these vehicles.

19.4 General Format

19.4.1 A full directory of all issued documents, drawings, procedures, reports etc. shall be maintained and provided to the Engineer. Update of the directory will be supplied on all submissions to the Engineer. The soft copy of the directory shall be searchable

19.4.2 The documentation management system shall be submitted to the Engineer for given statement of No Objection and maintained by the Contractor on each new or amended submission.

19.4.3 All drawings shall be produced on standard sheet sizes and format as required in the General Specifications or as approved by the Engineer.

19.4.4 All drawings shall contain a title block containing the following minimum information:

1) Supplier Company names,
2) Drawing title (which should not be ambiguous),
3) Revision level of drawing, and date of revision (which must be updated for change and then be resubmitted for the Engineer's acceptance),
4) Scale, where appropriate,
5) Number of sheets as "x" of "y", and
6) Date of released of Drawing.

19.4.5 A table of revisions shall be provided for each drawing, which shall show each revision level, the date and the revision made.

19.4.6 A list of parts and required quantities shall be provided on each drawing, or as a separate bill of material.

19.4.7 A table of reference shall be provided for product acceptance criteria.

19.4.8 The drawing shall comply with accepted drawing standards. The Contractor shall state in their proposal and quotation which standard is used.

19.4.9 Two clear areas shall be made available in the title block of the drawing for the Employer's use.

19.5 Drawing Requirements

19.5.1 Drawings submitted shall conform to the following minimum requirements in relation to scope, content and format.

19.5.2 These requirements are not intended to restrict the presentation of information and should be applied as appropriate to the equipment concerned.

19.5.3 Top Level Assembly/Outline Drawing:

1) Scope - to show equipment, as supplied, in sufficient detail to determine basic specification compliance.
2) Content Information

19.5.4 As a minimum, the content information shall consist of:

1) Important dimensions,
2) Mounting arrangements and their tolerances,
3) Panel, enclosure, frame, etc. construction, material, and finish,

4) Direction of rotation (where applicable), speed or frequency, and amount of unbalance,
5) Location of center of gravity, mass (in full working order), and mass carried at each mounting point,
6) Location and size of grounding straps or grounding facility,
7) Location of servicing features and clearance requirements for removal of all normal service items,
8) Labeling and location of notices and decals,
9) Special mounting instructions,
10) Equipment arrangement, including fastening hardware, and
11) List of parts, which must include the type, part number and number of devices as documented by the original manufacturer. Original Equipment Manufacturer (OEM) name and contact details shall be listed together with OEM part number. Weight and dimensions and other relative factors such, electrical, International Protection Rating (IP) quality, of all parts shall be provided. All suppliers shall be registered international standards such as Quality Management -ISO9000, Environment - ISO14000 and etc.

19.5.5 Electrical Information Requirements

1) Operating voltage, power consumption, power factor, and tolerances thereon;
2) Type of windings (for transformers and machines) and type of insulation;
3) Resistance and tolerances;
4) Contact ratings;
5) Operating parameters relevant to type of device, Type and size of cables and wires used;
6) Wire codes, and marking methods of wires and devices; and
7) Indication of color-coding of wire insulation (if used). All suppliers shall comply with the same color code- IEC 60446
8) Electrical symbols of all suppliers and sub suppliers shall be to IEC 60617.

19.5.6 Schematic Diagram

19.5.6.1 As a minimum, the schematic diagram shall consist of:

1) Scope - to show in diagrammatic form how the subsystem equipment, Printed Circuit Boards, etc. functions, without regard to the physical location of the equipment or cable routing.
2) Content Information
    a) All circuits contained within the equipment concerned,
    b) Wire identification code numbers,
    c) Vehicle builder/Supplier interface terminal code numbers and connector pin numbers,

d) Trip/rupture current values of all protective devices,

e) Settings of all pressure, temperature, vacuum float, limit switches, time delay relays, etc., with tolerances,

f) Values and tolerance of passive components,

g) Load power consumption,

h) Circuit voltages (nominal),

i) Terminal code numbers on polarity sensitive components and subsystems for which a separate schematic is provided, and

j) Control logic charts and sequence diagrams,

k) Software Logic diagram and truth table for major fault events showing associated hardware and signals along relevant parametric values.

l) Requirements for wire and transmission lines, if any (twisted, separated from AC line, etc.).

19.5.6.2 Electrical symbols on schematics and wiring diagrams shall comply with accepted standards. (IEC 60617) If the Contractor wishes to use an alternative; he shall propose the alternative to the Engineer. Whichever standard is authorized by the Engineer, this standard shall be used by all suppliers and sub suppliers to the RST Contractor.

19.6 Drawings and Design Data Changes

19.6.1 Prior to the qualification tests, the Contractor must notify the Employer of any design change. After the First Article Configuration Inspection (FACI) is approved, any change to any part must be submitted to the Employer for review, together with an assessment of its impact on performance, reliability and interchangeability. All design changed shall require to be approved before implementation.

19.7 Engineering Documentation

19.7.1 The Contractor shall furnish three copies in electronic format and all required prints of the latest revision of all necessary contract drawings and documents. Thereafter, the Contractor shall update all subsequent revisions to these documents and shall submit three (3) copies in electronic format and all required prints of all revisions of these controlled documents to the Engineer for review.

19.7.2 The Contractor shall provide six copies in electronic format and six (sets) copies of prints of the as-built drawings.

19.8 As-Built Vehicle Specification

19.8.1 The Contractor shall be required to provide an electronic copy and six (6) hard copies of this ERT, updated and modified to reflect the as-built specification of the train.

19.9 Maintenance Manuals

19.9.1 General

19.9.1.1 A fully integrated maintenance manual shall be provided, which provide step-by-step instructions on how to maintain, repair and replace all components on the vehicles, down to the Lowest Level Replaceable Unit (LLRU) and working time required (man hours) for all maintenance and repair activities.

19.9.1.2 The work instructions shall be provided for every maintenance and repair task shall include safety instructions, tools required, spares and consumables required. Torque settings for fixings and test/inspection requirements for the repaired/maintained/modified item.

19.9.1.3 The style of the documents may assume that the technicians performing this work have familiarity with rail vehicles, but not a detailed working knowledge. The LLRU shall be defined as any component within an assembly that is identified in the Original Equipment Manufacturers (OEM) illustrated parts catalog and/or is offered for sale by the original equipment manufacturer.

19.9.1.4 The maintenance manual shall provide all necessary detail to perform the work required, and shall include the judicious use of diagrams, drawings, photographs, illustrations, etc., as appropriate for the task at hand, including necessary safety precautions. Detailed maintenance and troubleshooting procedures and test and repair procedures and work instructions shall be provided for all electronic assemblies and circuit boards. Manuals shall identify all tools (special and standard) needed to perform the work. This listing of tools shall be provided in the section describing the discrete task being performed.

19.9.1.5 The Contractor shall provide an appropriate number of all special tools for the Employer's use. Special tools are loosely described as anything that the local hardware shop does not stock. Special tools shall include but not limited to diagnostic test equipment for all electronic assemblies and circuit boards, test stands and simulators as may apply, interface hardware & software, hook-up lines/cables and to test all train lined systems.

19.9.1.6 All manuals shall be provided in electronic format, and six (6) prints of properly bound oil and dirt resistant hard copies. The material for the hard copies shall be reviewed and commented by the Engineer.

19.9.1.7 The maintenance manuals shall be divided into three parts:

1) Running Maintenance Manual,
2) Scheduled Maintenance Manual, and
3) Overhaul Manual.

19.9.2 Running Maintenance Manual

19.9.2.1 The Running Maintenance Manual shall describe all work and inspections to be performed on the trains on a routine basis, including servicing, lubrication, adjustments, problem diagnosis, etc. Recommended cleaning procedures shall be provided, including necessary cleaning solutions, together with any safety data sheets. A substantial troubleshooting and repair guide shall be included to streamline the process of finding the root cause of problems and providing resolution.

19.9.3 Scheduled Maintenance Manual

19.9.3.1 The scheduled maintenance manual shall describe all work and inspections to be performed on the trains according to pre-set time periods or accumulated km-run and per sub-system structure (i.e., body, bogie, propulsion, auxiliary, ACU, pneumatics, braking,

etc.). An appropriate troubleshooting guide and/or parts repair /replacement shall be provided.

19.9.4 Overhaul Manual

19.9.4.1 The Overhaul Manual shall describe all work and inspections to be performed on the trains at designated overhaul periods (or after accumulating certain number of km run).

19.9.4.2 The Overhaul procedures shall be for the life of the train.

19.9.4.3 An appropriate troubleshooting guide and/or parts repair/replacement shall be provided.

19.10 Illustrated Parts Catalogs

19.10.1 The Illustrated Parts Catalogs (IPC) shall enumerate and describe all assemblies and constituent components down to the LRU.

19.10.2 The IPCs shall be ordered in a logical fashion, by system, and shall identify the Contractor's part number and the OEM parts number. Additionally, the Contractor shall provide the pertinent information on at least two different alternative suppliers for all non-proprietary components.

19.10.3 Parts common to different assemblies shall bear the same Contractor number. The next level assembly of all parts shall be clearly identified.

19.10.4 The judicious use of cutaway isometric and exploded drawings, photographs, illustrations, etc., shall be used to clearly identify all components down to the LRU.

19.10.5 Six (6) copies of the IPCs shall be provided in electronic and interactive format, along with six (6) properly bound oil and dirt resistant hard copies.

19.10.6 The Illustrated Parts Catalogs shall be reviewed and commented by the Engineer.

19.11 Operator's (Drivers') Manuals

19.11.1 The Contractor shall provide six (6) sets of properly bound, oil and dirt resistant hard copies of Operator's Manuals, which shall contain all information required for the proper operation of the vehicles. This shall include general vehicle familiarization material and the location, function and operation of all controls, switches, indicators, gauges, etc.

19.11.2 Fault finding shall be included.

19.11.3 The Operator's Manuals shall also be provided in electronic format (6 copies).

19.11.4 The Operator's Manuals shall be reviewed and commented by the Engineer.

19.12 Training Material

19.12.1 The Contractor shall provide six (6) sets of all material used to train the Employer's personnel to operate and maintain the vehicles.

19.12.2 For maintenance staff this shall include every work instruction provided, the length of time for each training course shall be proposed by the Contractor and be based on the content contained therein. Training shall be carried out in English or Filipino as required by the client. Training material shall be carried out in English or Filipino as required by the client.

19.12.3 The training material and the entire training program shall be reviewed and commented by the Engineer.

19.12.4 The training materials shall also be provided in electronic format (6 sets).

19.13 Vehicle History Books

19.13.1 The Contractor shall provide a Vehicle History Book for each vehicle at the time of delivery and acceptance. Each Vehicle History Book shall contain but not limited to the following car-specific information:

1) Certified weight (vehicle and axle loads), including scale tickets;
2) Results summary of all tests performed on the complete vehicle and its systems, subsystems and components, including certification performed where required;
3) A set of test results for each component or system where these are required;
4) A description of each configuration changes from the base line in sufficient detail for the Engineer's understanding;
5) Configuration record of each assembly, sub-assemblies and major component, including revision number and dates;
6) List of defects noted, status and disposition;
7) List, description, weight and serial number and location of serial-numbered equipment;
8) List of "as built" drawings with revision status;
9) Axle assembly (wheels, bearings, gears) mounting records, including pressing charts and NDT records;
10) Provision for the Service to record inspection, servicing, overhaul and repair activities; and
11) Shipping documents.

19.13.2 The Contractor shall supply an electronic format, and six (6) hard copies of properly bound oil and dirt resistant hard copies for each car of the full history and configuration records, arranged by component type, assembly, sub-assembly, major component and other serially numbered components, including spares, test equipment and special tools.

19.13.3 The Vehicle History Book format shall be reviewed and commented by the Engineer.

19.14 Intervention/Modifications History Record (During Warranty Period)

19.14.1 The Contractor shall provide a supplemental History record for each vehicle at the time of final acceptance/after the warranty period. Each supplemental History record shall contain the following car-specific information:

1) Intervention and repairs during warranty period,
2) All modifications/revisions done during the warranty period,
3) All tests/validation tests reports and records, and
4) Component exchange, component change reports and new component/serial numbers

5) Signed documentation to show the Employer and/or the Engineer had approved all intervention, modification/ component change and testing.

19.14.2 The Intervention/Modification History Record shall be provided in electronic format, and six (6) copies of properly bound oil and dirt resistant hard copies.

19.14.3 The Intervention/Modification History Record format shall be reviewed and commented by the Engineer.

3.11.3 Detailed ~~The~~ model information, (number as well as type of elements, boundary conditions, …etc. ~~its), type and number of elements,~~ and the criteria used for the acceptability of stress levels, other provisions shall be subjected to the Engineer for review and comments.

3.11.4 In addition, the Contractor shall provide Proof Load Case and Fatigue Load Case for all Bogie and Axle mounted equipment and parts. For a new design bogie, fatigue testing is required. If the bogie is nominally identical to other products from the same supplier, the fatigue tests of the bogie shall be submitted to the Engineer for given the statement on No Objection.

3.11.5 The natural frequencies of the bogie, including any suspension, shall be sufficiently separated from any other natural frequencies of either the carbody or any equipment mounted thereto, such that resonance, noise and excessive vibration are avoided with the bogie in any operating condition, and with any acceptable level of wear of bogie components.

3.12 Bogie Maintainability

3.12.1 The bogie frame shall be fitted with suitable locations for lifting off the wheels and axles, for lifting the complete bogie frame during maintenance in the workshop and for re-railing a car or bogie. Jacking pad location shall be provided to match the shop equipment during the design stage.

3.12.2 In addition, the design of the bogie frame shall incorporate horizontal and vertical pads at diagonal positions for re-railing operations following derailments.

3.12.3 The bogies shall be capable of being cleaned using high-pressure hot water or steam jet cleaning equipment, with or without detergents. All closed sections and pockets shall be self-draining or sealed against water ingress. All bearings except traction motor and gear box shall be adequately sealed to ensure that water and cleaning fluids do not enter during the cleaning process.

3.12.4 Bogies shall be capable of being disconnected and reconnected easily and with a minimum of operations by personnel working in pits or alongside the bogies. It shall be possible to easily inspect for correct reconnection. In case special tools or instruments are required for this work, the Contractor shall provide these tools.

3.12.5 It shall be possible for personnel working in pits or alongside the bogie to visually inspect the condition of bogie components, such as brakes and wheel profiles and condition easily and without the use of special tools.

3.12.6 The bogie shall provide easy and safe access for all maintenance, including access for the train operator, driver or technician to operate the isolating cocks for bogie-mounted equipment and parking brake manual releases.

3.12.7 Lubricated bearings shall be adequately sealed to ensure that water and cleaning fluids shall not enter during the cleaning process.

3.12.8 The attachments between the body and the bogie shall be such that if the car is lifted without disconnecting the bogies, the bogies, traction drives, and wheel sets shall be retained captive to the car without the need for additional restraints at the time of lifting. No damage shall result to any of the connections as a result of this action.

3.12.9 Wheels, axles, bearings, gearboxes and motor assemblies shall be interchangeable between ends of the bogie and between bogies.

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3.12.9 Wheels, axles, bearings, gearboxes and motor assemblies shall be interchangeable between ends of the bogie and between bogies.

5.3 Interior Finish

5.3.1 The Contractor shall propose and submit three (3) different saloon interior design concepts and three (3) different color schemes for the Employer and Engineer's review and acceptance. Computer generated graphics for each proposed interior design and color scheme shall be provided. The design proposals including material sample board to indicate all design materials and finishes shall be submitted for review and given statement of No Objection.

5.3.2 Interior finish panels shall be lightweight, of balanced construction to minimize warping under differing temperature conditions, shall be vandal resistant (impact, graffiti, etc.), and shall have a proven record in rail transit service. The panels shall not fade nor discolor over time.

5.3.3 The edges of interior finish panels shall be rounded to the extent possible to preclude passenger injury and to facilitate cleaning. The surfaces of interior finish panels shall be smooth, and no edges shall be created which will cause dust traps.

5.3.4 The interior ~~close-off~~ panels ~~on the side~~ of the car shall be designed to accept information/advertisement cards.

5.3.5 Stainless Steel kick plates of 150 mm depth with radius coving are required on all exposed vertical surfaces above floor level.

5.4 Flooring

5.4.1 The interior flooring shall be supported by the carbody under frame structure, which shall be constructed to minimize floor deflection under full passenger loading W2.

5.4.2 All floors including floor coverings shall be complied with JRIS J0745 or equivalent standard.

5.4.3 All floors including floor coverings shall withstand a force of 1000 N applied over an area of 25 mm^2 without suffering any deformation or marking. The interior flooring shall cover the entire passenger saloon area with transit grade floor covering.

5.4.4 To prevent noise due to vehicle deflections, the flooring composition shall be insulated from the metallic structure by a suitable nonflammable material.

5.4.5 The floor design and bonding process shall allow the floor covering to be removed and replaced without damage to the floor sub structure.

5.4.6 All saloon floor to wall interfaces shall have a radius to allow easy cleaning and avoid dirt traps.

5.4.7 The floor covering shall be required to continue up the side walls by service-proven measures, to provide a sanitary cove.

5.4.8 It is preferred that floor covering are seamless. Where seams do exist, they shall be fully sealed and shall not create a tripping hazard.

5.4.9 The Contractor shall offer a contrasting floor covering for vestibule areas compared with Passenger saloon area.

5.4.10 The floor covering material shall meet the following performance requirements or shall

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5.4.9 The Contractor shall offer a contrasting floor covering for vestibule areas compared with Passenger saloon area.

5.4.10 The floor covering material shall meet the following performance requirements or shall be the enough service-proven:

16 Communication System

16.1 General

16.1.1 The Rolling Stock shall be equipped with communications equipment to provide voice, video and data services. This Clause describes the requirements for the CP NS-01 (Communication System) Contractor, and the CP NS-03 (Rolling Stock) Contractor.

16.1.2 Both Contractors shall ensure that all requirements of the specification pertaining to interfaces are comprehensively fulfilled. Below is a brief outline of responsibilities between the CP NS-03 and CP NS-01 Contractors. Further details are specified in following Sub-Clauses:

Table 16.1 Responsibility Matrix

SOW	Item Description	By Contractor
1	Public Address (PA) System to broadcast speech messages to train passengers from the driver's cab. Facility to broadcast over the train PA System from the Operations Control Center (OCC) with the associated message content relayed to the train via the Train Radio System.	CP NS-03 CP NS-01
2	Guidance display for the customer shall be placed ~~above the door~~ under the ceiling in the passenger coaches (or saloons). Guidance display shall be digital signage to present on dedicated TV-style color monitors using ~~17-inch LCD~~ LCD displays which is 17-inch or bigger size~~displays~~, and it shall be possible to display the destination, the next station, the side of opening door, transit information, line map, time to arrive at each station, the guidance of the next station and attention, etc. One monitor shall be installed on one door. Securing space and supplying the wiring shall be prepared so that another screen can be added for advertisement. Advertisement display for the customer shall be placed ~~above the window between doors~~ in the passenger coaches (or saloons). Advertisement display shall be digital signage to present on dedicated TV-style color monitors using 21.5-inch or more LCD displays. (BG This may interfere with luggage racks)	CP NS-03
3	Passenger emergency intercom to provide audio communication between carriages and the driver's cab to enable passengers to alert the driver should an emergency situation occur within the train carriage. In case the driver does not pick up the passenger emergency intercom within a predefined time, it automatically connects to the OCC, using the onboard radio.	CP NS-03 CP NS-01
4	Driver's intercom system to allow full-duplex audio communication between driver's cabs.	CP NS-03
5	Train radio system to allow full-duplex audio communication between the driver and the OCC. Additional interfaces shall be provided within the OCC to relay to the trains PA audio messages. Train Protection Radio	CP NS-01
6	Outdoor display (mounting on the train) consisting of a full color LED to display destination stations for the passengers on the platform.	CP NS-03

16.2 General Requirements

16.2.1 The CP NS-03 Contractor shall equip each driver's cab with the necessary Human Machine Interface (HMI) facilities for the operation, control and monitoring by the driver of the on-board communications systems. The number of handsets required for driver use

16 Communication System

16.1 General

16.1.1 The Rolling Stock shall be equipped with communications equipment to provide voice, video and data services. This Clause describes the requirements for the CP NS-01 (Communication System) Contractor, and the CP NS-03 (Rolling Stock) Contractor.

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Table 16.1 Responsibility Matrix

SOW	Item Description	By Contractor
1	Public Address (PA) System to broadcast speech messages to train passengers from the driver's cab. Facility to broadcast over the train PA System from the Operations Control Center (OCC) with the associated message content relayed to the train via the Train Radio System.	CP NS-03 CP NS-01
2	Guidance display for the customer shall be placed under the ceiling in the passenger coaches (or saloons). Guidance display shall be digital signage to present on dedicated TV-style color monitors using LCD displays which is 17-inch or bigger size, and it shall be possible to display the destination, the next station, the side of opening door, transit information, line map, time to arrive at each station, the guidance of the next station and attention, etc. One monitor shall be installed on one door. Securing space and supplying the wiring shall be prepared so that another screen can be added for advertisement. Advertisement display for the customer shall be placed in the passenger coaches (or saloons). Advertisement display shall be digital signage to present on dedicated TV-style color monitors using 21.5-inch or more LCD displays. (BG This may interfere with luggage racks)	CP NS-03
3	Passenger emergency intercom to provide audio communication between carriages and the driver's cab to enable passengers to alert the driver should an emergency situation occur within the train carriage. In case the driver does not pick up the passenger emergency intercom within a predefined time, it automatically connects to the OCC, using the onboard radio.	CP NS-03 CP NS-01
4	Driver's intercom system to allow full-duplex audio communication between driver's cabs.	CP NS-03
5	Train radio system to allow full-duplex audio communication between the driver and the OCC. Additional interfaces shall be provided within the OCC to relay to the trains PA audio messages. Train Protection Radio	CP NS-01
6	Outdoor display (mounting on the train) consisting of a full color LED to display destination stations for the passengers on the platform.	CP NS-03

16.2 General Requirements

16.2.1 The CP NS-03 Contractor shall equip each driver's cab with the necessary Human Machine Interface (HMI) facilities for the operation, control and monitoring by the driver of the on-board communications systems. The number of handsets required for driver use

	As close to the speed limit as possible. (Basically, -2km/h to speed limit is the target speed.)	
NSCR	Constant speed As close to the speed limit as possible. (Basically, -2km/h to speed limit is the target speed.)	Appendix D
NSRP-South	Constant speed As close to the speed limit as possible. (Basically, -2km/h to speed limit is the target speed.)	Appendix D

11.1.22 Based on the above, the characteristics of the Propulsion system shall be superior to the following characteristics shown in Appendix D.

11.1.23 Load weighing shall be provided for all vehicle weights up to W2. The tractive and regenerative performance of propulsion system at the higher condition than W2 shall be designed as high as possible and reviewed by the Engineer. The failure of electric braking to provide the requested rate shall initiate supplemental friction braking.

11.1.24 Traction power circuit shall be cut out if pressure of main reservoir is below the minimum required working pressure. In this case, the emergency brake shall be operated at the same time, and line breaker (LB) shall be open when emergency brake (including security brake) is operated.

11.1.25 The design for propulsion system shall be considered compensating for wheel diameter variations of no less than 6mm among axles on the same vehicle automatically. The Contractor shall consider the influence to propulsion system such as the temperature rise, the wheel slip-slide control and so on by the wheel diameter variations. The Contractor shall incorporate the function that each vehicle wheel diameter is input from TMS. If this function is not used or used incorrectly, the propulsion system shall operate recognized wheel diameter as 820mm.

11.1.26 The Contractor will be required to perform a Combined Propulsion System test in accordance with a procedure reviewed. This test will consist of installing the entire propulsion system, including the Power Conversion Equipment (PCE), traction motors and associated cabling. The temperature of critical components, among other parameters, shall be monitored to gauge suitability for the intended service.

11.1.27 The equipment to be supplied shall require minimal maintenance, and any items requiring periodic attention shall not require such at intervals less than the interval of monthly inspection.

11.1.28 The capacity of propulsion system shall be determined at 7t/car load condition. The Contractor shall calculate capacity based on data shown in Appendix H expressing data of through-operation from MCRP to NSRP-South. Provisions of calculation shall be determined based on discussion between the Engineer and the Contractor.

11.1.29 The propulsion equipment shall be incorporated with the ~~Grand~~ Main Switch, as the Core of main circuit and the ~~C~~connectors for High voltage pressure test.

11.1.30 In case Main Switch is opened, charge (energy) of filter capacitor shall be discharged

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11.1.29 The propulsion equipment shall be incorporated with the Main Switch, as the Core of main circuit and the connectors for High voltage pressure test.

11.1.30 In case Main Switch is opened, charge (energy) of filter capacitor shall be discharged within certain time and discharging time shall be subject to Engineer's review.

7.10.8 Test Software

7.10.8.1 All test software, with the exclusion of built-in test software, shall be produced in accordance with a quality system controlled under the requirements of accepted international standards. Test software shall be developed and documented using structured techniques and shall be designed to be maintainable throughout the duration of the Contract. All test software shall be documented to be supportive of maintenance. Any test software, which is to be delivered to the Employer/Engineer (for long term testing use), shall be fully documented including source code listings to allow the Employer/Engineer to maintain the software for the life of the supported system. Balance source code with all relevant documentation shall be kept by the Contractor in an Escrow account. The initial three years lease of Escrow account shall be paid by the Contractor.

7.10.8.2 Software Rights

7.10.8.3 The Contractor shall ensure that the Employer/the Engineer or its licensee is granted all necessary rights to use software embodied in the equipment and there are no restrictions attached to the use of any information supplied by the Contractor which might later prevent or hinder the Employer/the Engineer or its licensee from modifying or adopting or extending the system. The Contractor shall indemnify the Employer/the Engineer, its heir or licensees against the claim of any party, subcontractor for the unauthorized possession or use of the software supplied.

7.10.9 Security

7.10.9.1 The Contractor shall define the procedures to maintain the security of the software. Aspects to be considered include:

1) Sabotage

   a) The Contractor shall describe what measures are to be taken to protect the software against sabotage during the development phase. This description shall define the physical restrictions as well as procedural measures and specific tests to be carried out on the software.

2) Unauthorized Access

   a) The Contractor shall describe what measures are to be taken to protect the software against unauthorized access and subsequent modification. The description shall define both physical and procedural methods.

3) Virus

   a) The Contractor shall ensure software, which is susceptible to viruses, is developed in environment certified free from computer viruses. To achieve this, the Contractor shall use propriety virus detection software and suppression tools.

4) All software delivered to site shall be accompanied by evidence that demonstrates the media is free of viruses.

7.10.10 Security Obligations

7.10.10.1 Within 14 days of the installation of any safety critical software or software which may impact the train operation, into the Works, the Contractor shall deposit the software in the escrow account, which shall include, without limitation:

1) All design documentation relating to the software; and

2) Any specified development tools required for maintenance of the software, including, but not limited to, editors, compilers and linkers.

7.10.10.2 The access to the above-mentioned escrow account shall be given to the Employer for

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7.3.14 Time delay of door motion shall be adjustable from 0 second to 3 second.

7.3.15 Door warning shall be clearly audible to both internally and externally to the cars at all door passenger portals.

7.3.16 The volume of door warning tones shall be adjustable by Maintenance Staff only.

7.3.17 The opening and closing of doors shall only be possible from the operative cab, and it shall not be possible to energize the door open circuits if train speed is greater than 3 km/h. Door closing or opening time shall be adjustable between two and five seconds. The doors shall be able to be opened only when a certain amount of braking force is operating.

7.3.18 Propulsion power shall be inhibited until all doors have closed and are locked; the Contractor shall provide the function that does not enable brake release and train start if all doors are not closed and locked.

7.3.19 It shall be possible to isolate and mechanically lock a defective door on any car from the door open command, at which time the yellow fault lights on that side of the exterior of the car shall illuminate. The isolated door(s) of a car(s) shall be identified in the TMS and marked "X" to denote it has been isolated.

7.3.20 The driver must reset the device before the train can proceed or without a reset device depending on the system safety design of the rolling stock. The device shall be recessed and suitably sealed to prevent accidental actuation.

7.3.21 Emergency Egress Device

7.3.21.1 Adjacent to each doorway in the passenger compartment shall be installed an emergency door opening handle, (Emergency Egress Device) which may be used by passengers to open the one door in the event of an emergency. There shall also be one (1) handle inside the car that can open all of the four doors in the car. The emergency door opening device which can open the several doors shall be included. The position and function, numbers of emergency door opening device shall be reviewed by the Engineer.

7.3.21.2 The device shall adjacent to the door and be recessed and suitably sealed to prevent accidental actuation and at a height compatible with passenger height.

7.3.21.3 The manual emergency release shall however be shielded from unintentional use by passengers, whilst still being available in an emergency. Seal or lift transparent flap to be fitted. Once the handle is operated, the driver loses power and the door can be manually opened if train speed drops sufficiently., it shall be indicated to the train operator as an open door. The driver will have an override button which will keep power for a short time so that the driver can move to a safer location to attend to the emergency. Only when the train comes to nominal zero speed, can the passenger open the door fully manually.

7.3.21.4 If these devices are operated, crews shall be alarmed by indicating through TMS monitor and sounds.

7.3.21.5 This Egress device, once activated, requires the driver to reset with a key.

7.3.22 Normal Door Opening

7.3.22.1 Normal door opening shall be possible to open passenger doors only when Door authorization/command is available from On Board Signaling System. This requires zero speed signal and driver button operation.

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8 Ventilation and Air-Conditioning

8.1 General

8.1.1 Each vehicle shall be provided with Ventilation and Air-Conditioning (VAC) system complete with relative humidity control. All system components shall be service-proven, and shall be tested to demonstrate compliance with the requirements of this ERT. Testing shall also be performed to determine the carbody heat transfer coefficient.

8.1.2 The Contractor shall submit a complete design of the air handling and diffusing system along with air flow and velocity calculation. Qualified testing of VAC system's air balancing shall be required to verify values. Upon installation on the vehicle, the complete air supply/diffusing system shall be measured and balanced and the air flow and velocity confirmed.

8.1.3 The Contractor shall provide test and service equipment necessary for the maintenance and repair of the Ventilation and Air-Conditioning units. This shall include but not limited to off-board test bench, refrigerant recovery/recycling equipment and portable vacuum pump.

8.1.4 If air-conditioning stops to operate by any ~~serious~~minor failure i.e. Communication or link error etc., switch shall be installed to allow the driver to be able to reset from the driver's cab.

8.1.5 One outside unit of air conditioning system shall be mounted on the roof of carbody. The unit weight shall be below 800kg.

8.1.6 In case the compressors don't operate normally by serious failure, the operation of the other compressors shall not be affected by the failed compressor.

8.1.7 Diffuser shall be incorporated individually to window seats.

8.2 Ventilation System

8.2.1 Blower fans supplied as part of the overhead evaporator units shall be capable to provide vehicle ventilation. Fresh air shall enter the vehicle through screened openings in the roof on each side, pass-through stainless-steel ducts (sloped downwards to drain), and pass through a filter into a plenum chamber adjacent to each overhead evaporator unit. The design shall prevent blown rain from entering the plenum and leaking into the vehicle interior.

8.2.2 It shall be possible to change by TMS monitor whether function of entering ambience air is valid. Validity shall be changed as to section (tunnel/outside) as a minimum.

8.2.3 Re-circulated air shall be drawn through grilles in the ceiling and mix with the fresh air. This air mixture shall then pass through another filter into the evaporator unit, from where the blower shall force the air through the evaporator coils into the main air ducts.

8.2.4 Means shall be provided to adjust the volumes of fresh and re-circulated air. Approx. 1100 m3/h of fresh air per vehicle shall be provided when VAC system is operated.

8.2.5 The main air distribution duct shall be manufactured from anodized aluminum or the material that is enough service-proven and shall be constructed to ensure that the exiting air velocity is constant along its length. Ceiling panels may act as the lower side of the duct, provided adequately sealed.

8.2.6 Air filters shall be washable/re-useable and shall be well supported to prevent passing air

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5 Car Interior

5.1 General

5.1.1 The interior of the cars shall be aesthetically pleasing and the arrangement and materials used shall reflect the current best industry practice and standards. All materials used must meet the fire safety requirements of Clause 21.8 of this ERT. The interior arrangement shall allow for easy maintenance, and all edges shall be rounded to the extent possible to preclude passengers, train crew and maintenance personnel injury and to facilitate cleaning.

5.1.2 The Contractor shall provide a selection of colored artist's renderings for review and comments by the Engineer. Using these as a foundation, the Contractor will work with the Engineer to supply a final set, which will be used as the basis for the color and configuration of the interior arrangements and external view of each type of vehicle.

5.1.3 Visible fasteners in the passenger saloon and the Driver's cabs shall be avoided. Fasteners must be of the tamper-resistant type, manufactured from stainless steel.

5.1.4 The Contractor shall propose three (3) interior saloons along with external car design for review by the engineer. Computer generated 3-D design graphics for each proposed interior and external design shall be provided. The design proposals including material sample board to indicate all design materials and finishes shall be submitted to the engineer for given statement of No Objection.

5.1.5 The Contractor shall also provide design drawings for passenger seating and flow analysis of a floor plan for review by the Engineer.

5.1.6 The vehicle including its covers and panels shall be designed to ensure it can be easily maintained with all critical element of the train, including cables and piping, being easily accessible for maintenance activities.

5.1.7 The train shall be designed to safely transport all population, including, children, passengers with luggage, senior citizens, disabled people, blind or deaf people, handicapped persons, including non-ambulatory persons in wheelchairs.

5.2 Insulation

5.2.1 Thermal Insulation

5.2.1.1 The carbody side walls and roof shall be insulated with a suitable grade of fiberglass insulation or suitable material, which shall have been treated to resist fungus and mildew. The ~~fiberglass~~ insulation materials shall be installed so as to prevent shakedown in service and where accessible shall be suitably protected/covered. All insulation shall be fire resistant. Samples shall be tested as per DIN 5510-2 or any equivalent standard which shall be reviewed and given notice of no objection by the Engineer.~~.~~

5.2.2 Acoustic Insulation

5.2.2.1 Where found necessary by the Contractor's noise analysis, viscoelastic sound damping material shall be installed in the vehicle to damp noise-generated vibrations.

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comment. This section shall be read in conjunction with Clause 20 – Inspection, Testing and Commissioning in this ERT.

2.2.7 The exterior of the carbody shall be polished finish stainless steel or aluminum ~~left un-painted~~. The doors shall also to be made with stainless steel skin or aluminum having the same finish as the carbody. Proven quality Signages and Graphic films can be provided on the exterior of the Car bodies to enhance the aesthetics of the Train subject to review by the Engineer. The Contractor shall submit external signages, graphics scheme and specifications for the Engineer's review and given Statement of No Objection. In case where the cab exterior is other than stainless steel, then painting shall be required. The Contractor shall submit the painting specifications for the Engineer to review.

2.2.8 The underframe members shall be made of stainless steel or aluminum alloy. They shall provide durability and good resistance to abrasion, moisture, oils, and track work environment, to corrosion of coated metalwork and to car cleaning. Any component parts of the underframe that are made of high tensile steel or aluminum shall be painted with a half gloss black paint system, which has been proven in metro rail transit and/or similar applications. It shall provide durability and good resistance to abrasion, moisture, oils, and the track work environment, to corrosion of coated metalwork and to car cleaning. The Contractor shall submit the painting scheme and specifications for review by the Engineer.

2.2.9 The paint system shall comply with DIN5510-2 or equivalent standard and include the Contractor's value of the paint materials such as smoke generated in the event of fire. Surface preparation requirements, number of coats and thickness with application instructions shall be provided for the Engineer's review.

2.2.10 The fittings and materials shall be easily cleanable (paint, graffiti, glue, etc.). They shall therefore withstand frequent use of various cleaning products (alkaline or acid detergents, petroleum solvents, mechanical action of brushes) without losing their color or a noticeable deterioration of their surface aspect.

2.3 Structural Requirements

2.3.1 General

2.3.1.1 The carbody shells shall be of integral construction as well as designed and tested to withstand the loading conditions described herein. The Contractor shall submit a stress analysis for the review and acceptance. The stress analysis shall include the use of a suitable Finite Element Model (FEM), supported by classical hand analysis for detailed components.

2.3.1.2 The Contractor shall ensure the entire carbody structure, bogies, bogie attachments, equipment supports, doors, seats, and interior appointments, are designed in accordance with this ERT and in compliance to JIS E 7106 (2018) or other equivalent standards.

2.3.1.3 The Contractor shall ensure the carbody, bogie and axle mounted components have a minimum design fatigue life of at least five (5) years in excess of the declared service design life. The Contractor is required to submit supporting calculations to demonstrate compliance, with the calculations taking into consideration the operating environment in MCRP, NSCR and NSRP-S. An item that failed within the Contractor's declared life shall be repaired at the Contractor's expense. The Contractor shall provide proposals for this in the bidding.

2.3.2 End Loading and Deflection Requirements

2.3.2.1 The Contractor shall carry out stress analysis of the carbody (including torsion mode)

etc. shall be submitted to Engineer for review.

2.1.7 The Contractor shall provide suitable repair procedures for carbody damage.

2.2 Materials and Construction

2.2.1 The Carbody including but not limited to the roof, carbody shell, flooring support sheet, etc. shall be manufactured from aluminum alloy and stainless steel, which shall provide excellent performance in relation to:

1) Corrosion resistance;
2) Resistance to chemical attack;
3) Long term structural performance;
4) Aesthetic qualities;
5) Low maintenance requirements; and
6) Less tare weight and low specific energy consumption.

2.2.2 The Contractor shall ensure that no materials are to be installed or used on the Train which could be damaging to the short or long-term health of passengers, Train Crew, cleaning, environment and maintenance/repair staff.

2.2.3 All body panels shall be free from wrinkles and other imperfections and shall be flat within 3 mm in any 1 m span or better. Materials shall be suitable for current repair operations (cutting, welding, etc.). Materials shall be in accordance with the relevant standard, appropriate for the application. Particular attention should be paid to fatigue limit, corrosion and material degradation with element and time.

2.2.4 The use of the following materials in the construction of the Train shall be restricted and only subject to prior agreement with the Engineer:

1) Ceramic fiber;
2) Rockwool;
3) Urea formaldehyde;
4) Polyethylene foam;
5) Polyurethane foam;
6) Polyurethane rigid moldings; and
7) Encapsulated lead.

2.2.5 Other materials such as steel, carbon steel etc. that comply with the requirements specified herein, will be accepted subject to the Engineer's review.

2.2.6 The Contractor shall submit details, including Safety Data Sheets (SDS), for all proposed materials to be used in the construction of the Train to the Engineer for review and comment. This section shall be read in conjunction with Clause 20 – Inspection, Testing and Commissioning in this ERT.

2.2.7 The exterior of the carbody shall be polished finish stainless steel or aluminum. The doors shall also to be made with stainless steel skin or aluminum having the same finish as the carbody. Proven quality Signages and Graphic films can be provided on the exterior of the Car bodies to enhance the aesthetics of the Train subject to review by the Engineer. The Contractor shall submit external signages, graphics scheme and specifications for the Engineer's review and given Statement of No Objection. In case where the cab exterior

is other than stainless steel, then painting shall be required. The Contractor shall submit the painting specifications for the Engineer to review.

2.2.8 The underframe members shall be made of stainless steel or aluminum alloy. They shall provide durability and good resistance to abrasion, moisture, oils, and track work environment, to corrosion of coated metalwork and to car cleaning. Any component parts of the underframe that are made of high tensile steel or aluminum shall be painted with a half gloss black paint system, which has been proven in metro rail transit and/or similar applications. It shall provide durability and good resistance to abrasion, moisture, oils, and the track work environment, to corrosion of coated metalwork and to car cleaning. The Contractor shall submit the painting scheme and specifications for review by the Engineer.

2.2.9 The paint system shall comply with DIN5510-2 or equivalent standard and include the Contractor's value of the paint materials such as smoke generated in the event of fire. Surface preparation requirements, number of coats and thickness with application instructions shall be provided for the Engineer's review.

2.2.10 The fittings and materials shall be easily cleanable (paint, graffiti, glue, etc.). They shall therefore withstand frequent use of various cleaning products (alkaline or acid detergents, petroleum solvents, mechanical action of brushes) without losing their color or a noticeable deterioration of their surface aspect.

2.3 Structural Requirements

2.3.1 General

2.3.1.1 The carbody shells shall be of integral construction as well as designed and tested to withstand the loading conditions described herein. The Contractor shall submit a stress analysis for the review and acceptance. The stress analysis shall include the use of a suitable Finite Element Model (FEM), supported by classical hand analysis for detailed components.

2.3.1.2 The Contractor shall ensure the entire carbody structure, bogies, bogie attachments, equipment supports, doors, seats, and interior appointments, are designed in accordance with this ERT and in compliance to JIS E 7106 (2018) or other equivalent standards.

2.3.1.3 The Contractor shall ensure the carbody, bogie and axle mounted components have a minimum design fatigue life of at least five (5) years in excess of the declared service design life. The Contractor is required to submit supporting calculations to demonstrate compliance, with the calculations taking into consideration the operating environment in MCRP, NSCR and NSRP-S. An item that failed within the Contractor's declared life shall be repaired at the Contractor's expense. The Contractor shall provide proposals for this in the bidding.

2.3.2 End Loading and Deflection Requirements

2.3.2.1 The Contractor shall carry out stress analysis of the carbody (including torsion mode) using Finite Element Analysis. The analysis shall demonstrate that the 30 years life requirement and all static and fatigue strength requirement of the carbody and equipment mountings are satisfied.

2.3.2.2 The mechanical strength of the carbody structure shall comply with the requirements of UIC 566 or equivalent standard except for the compressive load, which is applied at the end of the carbody at the centerline of the coupler and shall be compatible in respect of crashworthiness. The tensile force shall be reduced in the same ratio as the compressive force in UIC 566 or equivalent standard.

20 Inspection, Testing, and Commissioning

20.1 Inspection

20.1.1 General

20.1.1.1 The Engineer shall have free access to the Contractor's premises throughout the contract, for the purpose of reviewing and inspecting the design and manufacture processes.

20.1.1.2 The Contractor shall extend to the Engineer or their nominee full cooperation and provide facilities at its premises and final assembly site to enable convenient inspection of materials, work and equipment.

20.1.1.3 To initiate this process the Contractor shall arrange for some orientation meetings, whereby the Engineer and Employer shall attend their premises for discussions leading to greater mutual understanding of the Contract.

20.1.1.4 The Contractor shall bear the cost of attendance in line with that stated in Sub-Clause 22.1.2 item d.

20.1.1.5 It is anticipated, that the level of support will in accordance with that shown in Table 22.1, below.

Table 22.1 Orientation Trips

No.	Attendance	Quantity	Remarks
1	Employer	2 roundtrips*7 days*2 persons	Orientation
2	Engineer	2 roundtrips*7 days*5 persons	

20.1.1.6 Copies of all Design Data shall be provided. Design data shall be sufficient to enable the Engineer to review design, construction, assembly, installation, workmanship, clearance, tolerances, and functioning of consists. The Engineer shall have unrestricted rights of inspection of all documents, tools, and test equipment to be delivered to the Engineer as part of the works.

20.1.1.7 The Engineer shall be at liberty to inspect the manufacturing process at any stage. Without prejudice to any other provision of the Contract, the Engineer reserves the right to reject all materials and workmanship, which do not fully conform to this ERT. Repetitious rejections at either a Subcontractors' or the Contractors' facilities shall be cause for the Engineer to suspend inspection. In such case, the work in question shall also be suspended until satisfactory corrective action is taken by the Contractor.

20.1.1.8 The Engineer shall have unrestricted rights of inspection of all documents, tools and test equipment.

~~20.1.1.9 Temporary certificate shall be published after completion of speed limit 120km/h; then final certificate shall be published after completion of speed limit160km/h. So, the Contractor shall test the performance twice.~~

20.1.2 Inspection Hold Points

20.1.2.1 The Contractor shall propose a structured set of inspection hold points. The hold points shall be structured so that a formal hold point is allowed for each significant element of the car's manufacturing process. At each hold point the Engineer shall hold a formal inspection, or advice that the inspection have been waived.

20.1.2.2 The construction of each vehicle shall not proceed until the inspection by the Engineer has been completed or waived.

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20.1.2.2 The construction of each vehicle shall not proceed until the inspection by the Engineer has been completed or waived.

20.1.2.3 The Contractor shall propose the inspection hold points within 180 days of the Date for Commencement of the Works. The inspection hold points shall be submitted for review by the Engineer.

	(~~In case of~~ 8 cars consist, excluding overhang of both leading cars)	
4.	Overall Width (excluding light on both sides of the vehicle)	2,950 mm
5.	Overall height from top of rail to roof (excluding air conditioning system on the roof)	3,655 mm
6.	Door arrangement shall comply with Sub-Clause 8.1 of this ERT	
7.	Floor height	1,130～1,150 mm
8.	Pantograph lock down height	Max. 4,150 mm
9.	Pantograph height working range	4,400 – 5,415 mm
10.	Wheel Diameter	780～860 mm
11.	Wheelbase	2,100 - 2700 mm
12.	Distance between Bogie center	13,800 mm
13.	Passenger Doors	Bi-parting of single leaf plug-in sliding Doors
14.	Doorway entrance width	more than 900 mm (This is narrow, 1300 is usual which allows 2 streams of passengers to enter/exit)
15.	Gangway door width	more than 800 mm
16.	Doorway height	1,850 mm
17.	Windows	Double glazed, tempered safety glass suggests shown as laminated glass
18.	Maximum axle load under W2 condition	16,000 kg
19.	Wheel back-to-back	1359 – 1362 mm

1.7 Track Standards

Main Line	: EN 60 E1	Standard Length 25m
Depot	: JIS 50N	Standard Length 25m

1.8 Route Data

1.8.1 Horizontal Curve Radius

1) For main line: More than 260 m for NSCR-N1, NSCR-N2 and NSCR-SC
2) For side track: More than 100m
3) For stations: More than 400 m
4) For turnouts: More than 160 m (Main Line) for NSCR-N1;
   More than 165m (Main Line) for NSCR-N2 and NSCR-SC
5) For depot: More than 100 m for NSCR-N1, NSCR-N2 and NSCR-SC

1.8.2 Transition Curve Length:

1.8.2.1 For NSCR-N1:

1) Maximum out of L1, L2, and L3
2) Where L1=800 C, L2=7.5 CV, L3=6.75 CdV
3) Length between transition curves: more than 20 m

	this ERT	
7.	Floor height	1,130～1,150 mm
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4) For turnouts: More than 160 m (Main Line) for NSCR-N1;
   More than 165m (Main Line) for NSCR-N2 and NSCR-SC
5) For depot: More than 100 m for NSCR-N1, NSCR-N2 and NSCR-SC

1.8.2 Transition Curve Length:

1.8.2.1 For NSCR-N1:

1) Maximum out of L1, L2, and L3
2) Where L1=800 C, L2=7.5 CV, L3=6.75 CdV
3) Length between transition curves: more than 20 m

1.8.2.2 For NSCR-N2 and NSCR-SC:

1) Maximum out of L1, L2 and L3
2) L1=1000 Ca (over 120 km/h section),
3) L2= 7.5 CaV, L3=6.7 CdV

7 Doors and Door Control

7.1 Passenger Side Entrance Doors, Gangway Doors and Saloon Separation Doors

7.1.1 The side entrance door operator design and functionality shall be based on a "fail-safe" principle and high standards of safety and security for passengers. Design, safety and testing of the passenger doors shall be compliant with MLIT Article 74 or other equivalent standards.

7.1.2 Two (2) electrically operated doors shall be provided on each side of every car. All doorways shall have a clear opening of 900 mm, as minimum, (1300mm is preferred as this allows 2 streams of passengers to alight/board simultaneously see TCRP report 13) and a clear height of 1850 mm.

7.1.3 The number of the doors and their dimensions shall allow the complete evacuation within three minutes by passengers in emergency. An emergency exit shall be able to be opened by a passenger from inside the train. All external passenger doors shall be equipped with emergency opening devices allowing them to be used as emergency exits

7.1.4 Side door number is two for each side, and position of the door must adjust to PSD door position. When express train stop at station, train door shall be inside the width of the PSD door, considering the accuracy of stopping ±350mm by ATO (Automatic Train Operation). The Contractor shall Interface with the PSD NS-01 Contractor on the requirement of door positioning between the Rolling Stock and PSD in accordance with section 7.8 of the ERT. The doors shall be ~~the sliding pocket~~ bi-parting or single leaf plug-in sliding doors, constructed to prevent hands/finger pinning at the pocket section during operation. An airtight structure is preferred. If airtight structure is adopted, the mechanical door system must be fit to this system. The proposed door type shall be a proven solution to the constructability with the platform door under CP NS-01 contract, the maintainability, the safety and the performance of the rolling stock.

7.1.5 The Rolling Stock shall be a high-floor design, with level boarding from platforms. Wheelchair and mobility-impaired boarding shall not require the use of bridging or lifting devices. The horizontal distance of the passenger door thresholds shall be 1,475 +/- 25 mm from the track center.

7.1.6 Doors shall be vibration free and sufficiently insulated against heat and sound transmission. Exterior and Interior surfaces of the door leaves shall be finished to match the adjacent surfaces of the car. The doors shall be free from dimples, warping, spot welding depression and any other blemish.

7.1.7 The closed door leaves shall be capable of withstanding loads imposed by passengers leaning on them under crush loading conditions. The doors shall be designed and tested such that the door leaves sustain such pressure with no permanent deformation. The Contractor shall submit test procedure and results based on best international practices.

7.1.8 It shall be extremely improbable for a door to detached from the car under any operating conditions, including heavy side load from standing passengers or sudden pressure transients.

7.1.9 No single defect or failure of any part of any door system shall produce a situation capable of causing injury to the passenger and the employer personnel etc.

7.1.10 Door guides and supports shall be mounted within the section of doorway protected by the door seals and shall not allow ingress of dirt, debris, or any other foreign matter likely to result in excessive wear or incorrect operation of the door equipment.

7.1.11 The Contractor shall indicate the amount of time required to replace a door leaf in-situ

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SECTION IX: ANNEXES and CONTRACT FORMS

Annexes - Table of Securities

(Standard Form of Contract Annex References)

A. *Not used*~~Parent Company Guarantee: see Form of Contract Annex A~~

B. ~~Tender~~ Bid Security: see ~~*Form of Contract Annex B*~~*Part 1 Section IV – Bidding Forms*

C. Performance Security – Demand Guarantee: *see Contract Forms CF5*

D. Not used

E. Advance Payment Security: *see Contract Forms CF6*

F. Retention Money Guarantee: *see Contract Forms CF7*

G. Not used

Contract Forms

CF1. Letter of Acceptance

CF2. Contract Agreement

CF3. Schedules

CF4. Contractor's Proposal

CF5. Performance Securities

CF6. Advance Payment Securities

CF7. Retention Money Security

CF8. Dispute Board Agreement (for each member of a three-person DB)

Notes:

1. Forms attached to these Particular Conditions may be modified as considered necessary, and shall be completed at the time of finalizing the Contract.
2. Annexes ~~A and~~ B shall be submitted with the ~~Tender~~ Bid – see Instructions for Bidders
3. Annexes C, E and F may be completed in conjunction with the Award of Contract

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