General Bid Bulletin No. 6
05 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. 6
Annex A

Item No.	Volume Section No. Page No. Clause No. / Title Reference Text	Clarification Request	Proposed Revised Text (if any)	Response
1	Volume II of III Part 2 - Employer's Requirements ERT-1 1.1.4	The scope of this document is to assist in the procurement of new Rolling Stock fleet of seven (7) 8-car trainsets. The following shall, without limitation, be included in the Works: *The requirement indicates that the new Rolling Stock fleet shall be 8 car trainset. However, there are some sentences which are not clear if 8 car 7 trainsets configuration is a mandatory requirement or not. (Such as ERT 1.6.2.1)* 1.6.2.1 The following physical characteristics indicate fundamental vehicle dimensions that should be given careful attention. 1. Carbody Length (excluding coupler, overhang of leading car) 19,500 mm 2. Overall length (excluding overhang of leading car)? 20,000 mm 3. Train length (In case of 8 cars, excluding overhang of both leading cars) 160,000 mm	-NA-	Confirmed that 7 trainsets x 8 Cars is the requirement configuration. Please refer to Annex B on updated 1.6.2.1 (3).

		Therefore, please confirm that only 8 car x 7 trainsets configuration will be accepted and proposing other configuration will be considered as "NOT COMPLY".		
2	Volume II of III Part 2 - Employer's Requirements ERT-47 5.7.3	The seats shall be ergonomically designed and the materials to be used in the seat design shall be soft type with moquette, waterproof, fire and vandal resistant. Fire performance testing shall be undertaken by the Contractor with review by the Engineer. The seat design shall eliminate gaps that shall trap dirt or liquids and can be easily maintained. *Is it required armrests on the seats?* *Please confirm that the minimum interior free passage width is of 550mm as shown in Appendix B.*	-NA-	Please refer to clause 5.7 on Passenger seat requirements. Appendix B - Typical Limited Express Train Layout and B1- Door Position and Door Pitches are for the bidder reference and information only.

3	Volume II of III Part 2 - Employer's Requirements ERT-36 3.1.13	Slewing rings shall be provided with adequate number of standard grease fittings. If bolster-less connection is used, equipped with center pin and friction plates, the material and design of the friction plates shall not cause undue noise or any residual sound during start of traction and braking. The Contractor shall submit a detailed study of the friction plate properties and performance for review by the Engineer. *The Tenderer proposal is to use a bolster-less connection without any friction plates.* *Please, confirm that the proposed solution is acceptable and does not incur in any material deviation of the Technical Bid. Thank you.* *If the proposed solution is acceptable, please confirm that the submission of friction*	-NA-	Please refer to GBB No. 5 on updated clause 3.1.13. Bidder's proposed solution shall not only comply with clause 3.1.13 but the bidder's mentioned solution proposal shall comply with the entire performance requirements set forth in this tender. Submission of fiction plate properties and performance for bolster bogie shall be during project implementation only.

		plate properties and performances are not required.		
4	Volume II of III Part 2 - Employer's Requirements ERT-10 1.9 ERT-69 8.4.1.1	Ambient temperature: Min +15ºC – Max +45ºC The VAC system controls shall automatically maintain the interior temperature of the vehicle (including the Driver's Cab) at the setting temperature to the controller with any exterior ambient temperature ranging from 20°C to 40°C. If the exterior ambient temperature is above 40°C, the interior temperature shall be maintained at 15°C below the exterior ambient. Temperature overshoot from target temperature shall be limited to 1°C and hunting from target temperature shall not be happened, even in any ambient temperature, even with or without the heat loads from passengers, driver, motors, lights, etc., and solar gain.	The VAC system controls shall automatically maintain the interior temperature of the vehicle (including the Driver's Cab) at the setting temperature to the controller with any exterior ambient temperature ranging from 20°C to 40°C. If the exterior ambient temperature is **between ~~above~~** 40°C **and 45ºC,** the interior temperature shall be maintained at 15°C below the exterior ambient. Temperature overshoot from target temperature shall be limited to 1°C and hunting from target temperature shall not be happened, even in any ambient temperature, even with or without the heat	Bidder request is rejected. The Employer is unable to confirm the exterior temperature level. Nonetheless, the bidder can further refer to the Department of Science and Technology; Philippine Atmospheric, Geophysical and Astronomical Services Administration on Philippines ambient temperature data. Please refer to Annex B on the revised ambient temperature; Min +15ºC – Max +40ºC.

		The general 1.9 requirement states that the ambient temperature for which the train must be defined is in the range of +15ºC and +45ºC. *Requirement 8.4.1.1, it is stated "if the exterior ambient temperature is above 40ºC, the interior….".* *The Tenderer understands that as indicated in requirement 1.9, for the VAC dimensioning conditions, the maximum exterior temperature could raise to 45ºC.* *Please confirm that the exterior temperature will not be higher than 45ºC.*	loads from passengers, driver, motors, lights, etc., and solar gain.	
5	Volume II of III Part 2 - Employer's Requirements ~~157~~ ERT-12 1.11.2 ERT-87 12.1.6	Maximum Design Speed: 170 km/h or more The spring structure to suppress detachment shall be equipped to suppress	-NA-	The train performance maximum design speed is 170 km/h or higher. Please refer to Annex B for the updated requirement at clause 12.1.6.

		leaving overhead catenary at 180km/h, the design speed. *In requirement 1.11.2 it is stated that the maximum design Speed is 170 km/h or more. Whereas in 12.1.6 180km/h is defined as maximum design speed.* *According to Tenderer's experience, the maximum design speed is defined as the 10% above the maximum operational speed. Therefore, in this case, as maximum operational speed is 160km/h, 176km/h should be the maximum design speed.* *Please clarify which maximum speed should be considered.*		
6	Volume II of III Part 2 - Employer's Requirements ERT-43 4.1.4	The automatic coupler shall, in conjunction with the draft-gear automatically effect mechanical, electrical and pneumatic coupling. It shall also permit separation of units either manually from	-NA-	The operation of coupling and uncoupling, the design of mechanical coupling, pneumatic coupling, electrical coupling, electric plug for rescue, emergency connection cable etc. shall be identical with NSCR commuter (CP03 & CP NS-02) design, which shall

		the track side or remotely from the cab. *Tenderer would like to have information about the operation of coupling and uncoupling of the units.* *The mechanical coupling is completely automatic. The pneumatic and electrical coupling could be automatic or manual (by means of wiring installed manually from the track side)* *Please confirm that pneumatic coupling and uncoupling of units can be manually performed from the track side without remote separation from the cabin.* *Please confirm that electrical coupling and uncoupling of units can be manually performed from the track side without remote separation from the cabin.*		be the interfacing obligation of the Contractor during the project implementation. The confirmation shall be obtained from the interfacing requirements set forth in this tender. Please refer to Annex B for the updated requirement on clause 4 – Coupler and Draft Gear.

7	Volume II of III Part 2 - Employer's Requirements ERT-44 4.3.2 Volume II of III Part 2 - Employer's Requirements ERT-32 2.3.2.3	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 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… *To be in accordance with the resistance of the carbody as of Clause 2.3.2.3, similar tensile and compressive forces should be requested for the front coupler and semipermanent coupler.*	The coupler is designed to accommodate a 800kN ~~1500kN~~ compressive force and 600kN ~~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.	Bidder request is rejected. Please refer to Annex B for the updated draft gear requirements (4.3).

		Tenderer proposes to design both, carbody and couplers according to EN12663 category P III, which requires 600kN tensile force and 800kN compressive force. *Please confirm that Tenderer's proposal is acceptable without incurring into material deviation on the Technical Bid.*		
8	Volume II of III Part 2 - Employer's Requirements ERT-87 12.1.1	The 1500 VDC power shall be collected from the overhead line system using electrically operated pantographs. The pantograph assembly shall permit all necessary movement, taking into account the overhead line installation tolerances/clearances, vibration of rolling stock, deflation of suspension etc. and maintain the complete and effective collection of electrical power. Carbon or copper shall be used as the material of the contact strip.	The 1500 VDC power shall be collected from the overhead line system using ~~***electrically***~~ ***pneumatically*** operated pantographs. The pantograph assembly shall permit all necessary movement, taking into account the overhead line installation tolerances/clearances, vibration of rolling stock, deflation of suspension etc. and maintain the complete and effective	Bidder request is rejected. Any deviation to the employer requirement shall be stated as 'Partial Conformance' and required a specific details of explanation on the non-conformance and as well provided the reasons for such non-conformance and why the Employer should favorably consider accepting such non-conformance without the Employer determining that the Bidder's Technical Bid is not substantially responsive to the Employer's Requirements.

		According to the state of the art and after confirmation of the main market suppliers, it is not possible to have an electrically-operated pantograph in a 160km/h maximum speed service. Consequently, a pneumatically operated pantograph needs to be proposed. *Taking this into consideration, the Tenderer would like to confirm that pneumatically operated pantographs are acceptable without incurring into a material deviation on the Technical Bid.*	collection of electrical power. Carbon or copper shall be used as the material of the contact strip.	
9	Volume II of III Part 2 - Employer's Requirements ERT-93 14.7.9.3	The roll-out tray shall have resinous wheel so as to insulate the box and the carriage. *The requirement specifies resinous wheels for the battery box and its carriage. However, the Tenderer believes that metallic bearings are stiffer than resinous wheels.*	-NA-	The bidder request is rejected.

		In order to assure contact protection, the battery box and the carriage, could include grounding cable connection. *Can the Contractor confirm that metallic bearings and grounding cable connection can be used for the battery box and the carriage without incurring into a material deviation on the Technical Bid?*		
10	Volume II of III Part 2 - Employer's Requirements ERT 134 - 21.4.2.1 ERT 134 – 21.4.2.2	Cables shall conform to EN50264 or other equivalent standards. Unless otherwise specified, wire insulation shall be one of the following types, unless specifically reviewed and commented by the Engineer: a. Ethylene Tetrafluoroethylene (ETFE) fluoropolymer having a continuous temperature rating of 150 ^{0}C,	-NA-	Bidder understanding is correct that the EN50264 or other equivalent standards are acceptable.

		b. Abrasion resistant, filled Tetrafluoroethylene (TFE) with a temperature rating of 260 oC and meeting the requirements of MIL-W-22759/6, c. Cross-linked Polyolefin (XLPO), d. All wire insulation, except vehicle body wiring, shall be rated at 600 V minimum, unless otherwise specified or agreed to by the Engineer. Vehicle body wire insulation shall be rated at 2000 V minimum. e. Wires 6 mm2 and smaller shall have the appropriate insulation material as defined above. Wires larger than 6 mm2 shall be insulated only with Cross-linked Polyolefin (XLPO). *Clause 21.4.2.1 is requesting cables to conform EN50264 or other*		

		equivalent. And Clause 21.4.2.2 is requesting insulations that are not according to EN normatives. *The Tenderer understands that EN standards can be considered for the cables.* *Please confirm that the Tenderer's understanding is correct and therefore the insulation can be defined according to EN50264, EN50382 and EN50306 without incurring into a material deviation of the Technical Bid.*		
11	Volume II of III Part 2 - Employer's Requirements ERT-135 21.4.9	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	-NA-	Bidder understanding is correct. The separation of cables using any standard reference i.e. EN 50343 etc. shall addressed the bidder's compliance against section 21.4.9.

		5) Radio, Intercom, P/A wiring *Clause 21.4.2.1 is requesting cables to conform EN50264 or other equivalent.* *The Tenderer understands that as cables will be defined according to EN Standards, the wire segregations could be also defined according to EN Standards. EN 50343 would be the applicable standard for wire segregations.* *Please confirm that the Tenderer's understanding is correct*.		
12	Volume II Part 2 -Employer's Requirements Section V1. Technical Requirements ERT-43 4.1.14, 4.1.5 Coupler and Draft Gear	The coupler shall follow the coupler type for Commuter Trainset (CP NS-02) for interoperability capability. In both leading cars, an electrical connecting plug which is necessary for relief operation by connecting train-sets shall be equipped. Also, an emergency	The coupler shall follow the coupler type for Commuter Trainset (CP NS-02) for interoperability capability. ***The interoperability capability is requested only for rescue cases.***	Bidder request is rejected. No further changes will be made to clause 4.1.14. Please refer to Annex B for the updated requirement on clause 4 – Coupler and Draft Gear.

		connection cable that connects this electrical connection plug shall be equipped. By using this connecting cable, required functions such as brake command, broadcasting, buzzer etc. shall operate properly. Length and diagram of cable shall be also consistent with other commuter trains of NSCR, NSPR-South, MMSP. The position of this plug shall be consistent with other commuter trains of NSCR, NSRP-South, MMSP particularly length of cable shall be determined in consideration of the severest deviations during coupled with other train. Basically, utilization of adapter shall not be acceptable. *Regarding interoperability capability, the Tenderer kindly ask to confirm that the scope of this requirement is limited to rescue cases.*		

		According to the Tenderer's understanding, a rescue case would be defined as: *- Mechanical connection will be automatic.* *- Pneumatical connections: an emergency cable will be manually connected with the objective of realizing brake during hauling.* *- Electrical connections: an emergency cable will be manually connected for brake command, broadcasting and buzzer functions.* *The Tenderer's proposal is based on requirement 4.1.5 of Volume II of III (ERT43).* *Please confirm that the Tenderer's understanding is correct and interoperability is only requested for rescue cases.*		
13	Volume II Part 2 -Employer's Requirements Section V1. Technical Requirements	6.1.2: ...And the average illuminance shall be more than 300 lux over the saloon area on the height of 0.85 m	-NA-	6.3.4 has been deleted. Please refer to Annex B.

	ERT-57 6.1. General and 6.3. Passenger saloon area	above the floor level after delivery completed. 6.3.4: The lighting throughout the passenger saloon area shall be 300 Lux when measured at 1.2m above the floor. *The Tenderer would like to clarify the lighting levels in the saloon area. In both requirements (6.1.2. and 6.3.4) is stated > 300 lux. Nevertheless, the measuring point from the floor level are different (0,85m VS 1,2m).* *Therefore, for > 300 lux of lighting intensity, which would be the measuring point from the floor level to be considered?*		
14	Volume II of III Part 2 - Employer's Requirements ERT-112 17.17.1	ATO will be installed in the future. Therefore, the ETCS L2 and some concerned devices shall be interfaced keeping in view consideration for space, software, switch space, train lines, additional on-board antenna position, driver cab	-NA-	The design shall include the provision for ATO. Referring to Bidder's question on the ATO function implementation, the Employer shall reserve the right to instruct the Contractor to implement the ATO functions subject to the bounds of the contract.

		layout, speed sensor, CCTV and so on *Please, clarify when the ATO functionality will be ready for use. Will it be ready before NS-03 Contract trains start Service?* *Or once they are already in service?*		
15	GBB2 Pg. 25 Item 21	Bidder's understanding is correct. It shall state the compliance to the clauses in SOW, ERG and ERT. However, the Bidder shall comply with Appendix C: Rolling Stock Gauge and Construction Gauge shown in the ERT. *According to clarification N21 of GBB2, the Tenderer understands that Appendix F is for reference only and therefore the shown architecture is not mandatory.* *Please confirm that the Tenderer's* understanding is correct.	-NA-	Appendix F - Schematic diagram of model of control transmission System is for the bidder reference only. Bidder shall state the compliance on clause 15.3.18.

16	Volume II of III Part 2 - Employer's Requirements ERT-99 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 *The Tenderer understands that the definition of "data services" would be data exchanged between the rolling stock and the wayside (operation control centre or servers).* *Therefore, the Tenderer would need more details about the technology on which it will be based (3G/4G, Wi-Fi...).* *Please, confirm that the Tenderer's understanding is correct and provide further detailed about the technology.*	-NA-	Bidder understanding is not correct. Data services is referring to ethernet based equipment to be equipped in the Rolling Stock. Please refer to clause 17.2.3.

17	Volume II of III Part 2 - Employer's Requirements ERT-103 16.9	The Train Radio System for the Rolling Stock shall be designed and supplied by the CP NS-01 Contractor for the CP NS-03 Contractor to install on the Rolling Stock. *In order to guarantee compatibility between the communication systems and the train radio, the Tenderer kindly requests details about the train radio system (drawings, electrical and mechanical interfaces, technology, …)* *Does the Employer intend to use a Train radio that has been used in previous projects/rolling stock that are currently in service? Please, confirm.*	-NA-	The Employer intend to use the train radio which shall be designed and supplied by the CP NS-01 Contractor.
18	Volume II of III Part 2 - Employer's Requirements ERT-94 15.1.9	The date of TMS shall be interfaced with communication system provided by CP NS-01. And the same images of TMS monitor in operator cab can be watched at OCC or	-NA-	Bidder understanding is correct. Please refer to clause 17.2.3.

	ERT-109 16.1.1	maintenance office PC monitor, etc. *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.* *The Tenderer understands that the images will be send using the train radio described in section 16 "Communications system", in particular using the data services described in 16.1.1* *Please, can you confirm that the Tenderer's understanding is correct?*		
19	Volume II of III Part 2 - Employer's Requirements ERT-103 16.7.6	3) The emergency voice recorder shall record the conversation for the duration of the call; and	-NA-	The location of emergency voice recorder location shall be designed by the Contractor with satisfaction of safety consideration of design (Clause 5 General Requirement) requirement

		With "Emergency Voice Recorder", does the customer intend to record the emergency call in the on-board Event recorder or in a separate device/location? *Please, the Tenderer kindly requests more details about this functionality.*		and interfaces requirement with CP NS-01 Contractor.
20	Volume II of III Part 2 - Employer's Requirements ERT 99 16.1.2 Table 16.1 SOW 3 16.9	Passenger emergency intercom to provide audio communication between carriages and the driver's cab to enable passengers to alert the driver should an emergency 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. *The Tenderer understands that the "onboard radio" described for this functionality is the same as*	-NA-	Please refer to clause 17.2.3. The amalgamation of train radio and intercom line shall be designed during project implementation.

		the "Train Radio" described in section 16.9. *This "Train Radio" will use the data services to send the audio from the rolling stock to the wayside and vice versa.* *Please, confirm that the Tenderer's understanding is correct.*		
21	Volume II of III Part 2 - Employer's Requirements ERT-99 16.2.1 ERT-103 16.7.6	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 shall be rationalized and kept to a minimum The driver shall be able to communicate via a separate dedicated handset for this purpose *Clause 16.2.1 indicates that the number of handsets shall*	-NA-	Please refer to clause 17.2.3. The amalgamation of train radio and intercom line shall be designed during project implementation.

		be rationalized and kept to a minimum. *Clause 16.7.6 indicates to use a separate handset for the CAB-PEI (emergency intercom) communication.* *In order to reduce the handsets to a minimum, we kindly ask the Employer to use the same handset for the following communications in the driver's cab:* • *CAB-CAB* • *CAB-PA* • *CAB-PEI (emergency intercom)* *Please confirm.*		
22	Volume II of III Part 2 - Employer's Requirements ERT-57 6.3.2	The Contractor shall provide LED lighting in the passenger area that is modern and aesthetically pleasing with a mass production of over 5 years' service proven. LED lighting shall be energy efficient and shall be designed to provide good quality lighting along	6.3.3 The minimum declared life shall be 50,000 hours. The lighting shall be powered by ~~220V AC~~ DC supply.	Bidder request is rejected. The electrical and power shall be designed during project implementation.

	ERT-58 6.3.3	with offering both variable and automatic illumination adjustment. The minimum declared life shall be 50,000 hours. The lighting shall be powered by 220V AC supply. *According to the state of the art in the railway market, LED technology is powered by DC. Therefore, can you please allow DC supply for the LED technology?*		
23	Volume II of III Part 2 - Employer's Requirements ERT-21 16.9.2	In addition to the communication devices mentioned above, at least the Train Operator Control Panel (TOCP) and the radio transceiver unit shall be included. *Tenderer would like to have confirmation that the TOCP and radio transceiver are part of the scope of supply of CP NS-01 Contractor.*	-NA-	TOCP and radio transceiver are part of the scope of supply of CP NS-01 Contractor.

24	Volume II of III Part 2 - Employer's Requirements ERT-101 16.3.2	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. *Considering that the worst-case conditions involve the train movement and the auxiliary equipment on, requirement of 0.6 is a extremly high value for such kind of conditions. According to IEC60268-16 standard, the typical application is not for a PA system in a rolling stock.* *Tenderer suggests decreasing the required value to 0.45 to be in accordance with other international standards such as the TSI.*	For speech intelligibility purposes, the design shall achieve an STI (Speech Transmission Index) in excess of ***0,45*** ~~***0.6***~~ under the worst-case ambient noise conditions.	Bidder request is rejected.
25	Volume II of III Part 2 - Employer's Requirements ERT-101	The message library shall be dimensioned with a minimum storage capacity of 1TByte.	The message library shall be dimensioned with a minimum storage capacity of ***8 GB*** ~~***1TByte***~~.	Bidder request is rejected.

		The Tenderer understands that the message library described in section 16.3 is composed only by audio and text messages and the requirement of 1 TB is oversized. *Tenderer suggest decreasing the required value for the storage capacity from 1 TB to 8 GB without incurring into a material deviation of the Technical Bid.*		
26	Volume II of III Part 2 - Employer's Requirements ERT-103 16.8	A full-duplex and highly reliable intercom facility shall be provided to enable personnel within the driver's cab at each end of the train to establish voice communications. *The Tenderer suggests using the same handset required in section 16.7 for the CAB-CAB communication instead of a specific intercom facility.* *Please confirm that the Tenderers' proposal is*	-NA-	Bidder proposal is rejected. Please refer to clause 17.2.3. The amalgamation of train radio and intercom line shall be design during project implementation.

		acceptable for the Employer and does not incur into a material deviation of the Technical Bid.		
27	Volume II of III Part 2 - Employer's Requirements ERT-104 16.9.4	2) Communication between the leading and trailing cabs via an intercom system; *The section 16.9.3 describes that the TOCP (Train Operator Control Panel) will include:* • *Loudspeaker* • *Volume control* • *Microphone gooseneck* • *PTT* • *System switch selector* *However, the section 16.9.4 describes an intercom for the communication between cabs, which is not described in the TOCP.* *For the CAB-CAB full duplex communication, in order to avoid possible feedback problems between the gooseneck microphone and*	-NA-	Bidder proposal is rejected. Any proposed solution shall demonstrate the compliance not limited with the technical requirement only, but shall include the interfacing requirement with CP NS-01 Contactor.

		the loudspeaker, the Tenderer suggests using the handset installed on the CAB. *Please confirm that this solution is acceptable for the Employer without incurring into a material deviation of the Technical Bid.*		
28	Volume II of III Part 2 - Employer's Requirements ERT-104 16.9.9	The train radio system shall be designed by the CP NS-01 Contractor to allow automatic switchover to the other radio unit on the train, in the case where there is failure of other radio lines *Tenderer would like to have confirmation regarding the exact meaning of the "other radio unit on the train".* *Does it mean:* *a) The radio located in the other cab?* *Or*	-NA-	Please refer to clause 17.2.3.

		b) The hand-held portable radio described in section 16.9.8? *Please clarify the meaning.*		
29	Volume II of III Part 2 - Employer's Requirements ERT-104 16.11	16.11.1 Preparation for Wi-Fi system shall be designed in consideration with follow but not limited to: 1) Space and position for installation 2) Materials of interior near the attachment 3) Capacity of powering 4) Preparation of circuit 5) Preparation of interface 16.11.2 Care shall be paid to assume that two individual systems of two companies are introduced. *Tenderer would like to receive more details about the future Wi-Fi system (drawings, electrical and mechanical interfaces, scope of supply, technology …).*	-NA-	The Contractor shall have to identify all interfaces requirement during project execution with reference to the Employer requirement set forth in this tender. Please refer to Annex B on updated 16.11.

30	Volume II of III Part 2 - Employer's Requirements ERT-54 5.19.1.4	17) Monitors for PSD operation *Tenderer would like to have confirmation that the Monitors for the PSD operation are part of the scope of supply of CP NS-01 Contractor.*	-NA-	Item 17 has been deleted. Please refer to Annex B.
31	Volume II of III Part 2 - Employer's Requirements ERT-105 17	*Tenderer would like to have more details about the train signalling system (drawings, electrical and mechanical interfaces, scope of supply, technology, safety requirements, and other interfaces with the rolling stock…)*	-NA-	The Contractor shall have to identify all interfaces requirement during project execution with reference to the Employer requirement set forth in this tender. The requested details are the Contractor's obligation to the Employer during project execution.
32	Volume II of III Part 2 - Employer's Requirements ERT-105 17.1.4	The CP NS-03 Contractor shall coordinate with the CP NS-01 Signaling Contractor for the design of all appurtenances. The CP NS-03 Contractor shall install all cabling free mating connectors, plug couplers and mounting fixtures for the signaling equipment on all the new trains according to the CP NS-01 Signaling Contractor's installation specifications	-NA-	The Contractor shall have to identify all interfaces requirement during project execution with reference to the Employer requirement set forth in this tender. The requested details are the Contractor's obligation to the Employer during project execution.

		Tenderer would like to receive additional details regarding the installation specification of the signalling system.		
33	Volume II of III Part 2 - Employer's Requirements ERT-113 18.1.1	Two type of image monitoring systems shall be equipped to one train. One is saloon monitoring system by CCTV system for security, the other is platform monitoring system for PSD operation through millimeter wave. *Tenderer would like to have confirmation that the equipment for the Image monitoring systems regarding the platform monitoring system for PSD operation described in section 18.1.1 will be supplied by CP NS-01 Contractor.* *Which would be the scope of supply of this image monitor system for the PSD?*	-NA-	Please refer to General Bid Bulletin No. 3 12 April 2021; Annex B Item 3.

34	Volume II of III Part 2 - Employer's Requirements ERT-90 14.2.4	The chassis of APSE shall be with the use of aluminum alloys. *The Tenderer kindly request to use alternative materials for the APSE chassis.* *Please confirm that this is acceptable for the Employer and it does not incur into a material deviation on the Technical Bid.*	The chassis of APSE shall be with the use of aluminum alloys ***or alternative material.***	Bidder suggestion is noted. Please refer to Annex B.
35	Volume II of III Part 2 - Employer's Requirements ERT-113 18.2.1.2	The following shall be addressed: 5) Employment-related implications for using in ward facing cameras that record the activities of operators and the current practices used by employers; *Requirement 18.2.1.2 addresses legal implications of Video Surveillance on Transit Systems. Among others, it includes an inward facing camera. However, there is no any other mention to this inward facing*	-NA-	Confirmed.

		camera in the Specification (Volume II of III). *The Tenderer would like to clarify if inward facing cameras need to be installed on Operators Cab. Please confirm.*		
36	Volume II of III Part 2 - Employer's Requirements ERT-151 24.8.1	Tight lock coupler and draft Gear *In section 24.8.1 "Main Special Tools and Diagnostic Test Equipment" a "tight lock" type couple is mentioned.* *The Tenderer would like to confirm if the front coupler installed on the existing Trains has a "tight lock" type head coupler. Please the Employer confirm it?* *The Tenderer kindly requests information about the tightlock head. Is it a standard tight lock head? Or is it a Taiwan tight lock head?*	-NA-	The Employer requirement for coupler is as per clause 4 of ERT. The "tight lock" has been deleted. Please refer to Annex B.

37	Volume II of III Part 2 - Employer's Requirements ERG-103 Appendix A: Definitions and Abbreviations ERT-10 1.10.1.2	W0 Vehicle Tare Weight W1 W0 + Seated Passenger W2 W1 + 4 passenger/meter standee W3 W1 + 7 passenger / meter standee W4 W3 + dynamic load and safety margin 1) W0 : Tare weight 2) W1 : W0 + Seated Passenger 3) W2 : W0 + Seated Passengers + Standing passengers 4) W3 : W2+ dynamic load and safety margin *There is an inconsistency for W3 and W4 weight definitions in the Specification.* *The Tenderer understands that W3 should be W1+ 7 pas/m2 and W4 W3 + dynamic load and safety margin.* *Can the Employer confirm that the Tenderer's understanding is correct?*	1.10.1.2 1) W0 : Tare weight 2) W1 : W0 + Seated Passenger 3) W2 : W0 + Seated Passengers + Standing passengers ***(4pas/m2)*** ***3) W3 : W0 + Seated Passengers + Standing passengers (7pas/m2)*** ***4) ~~W3~~ W4:*** W2+ dynamic load and safety margin	Bidder request is rejected. Please refer to Annex B for the updated definitions and abbreviation for added weight.

38	Volume II of III Part 2 - Employer's Requirements ERT-87 12.1.1	The 1500 VDC power shall be collected from the overhead line system using electrically operated pantographs. The pantograph assembly shall permit all necessary movement, taking into account the overhead line installation tolerances/clearances, vibration of rolling stock, deflation of suspension etc. and maintain the complete and effective collection of electrical power. Carbon or copper shall be used as the material of the contact strip. *The Tenderer understands that "electrically operated" is related with the way the raising and lowering of the pantograph is done. Therefore, the Tenderer believes that using air pressure under electrical command control for raising and lowering the pantograph complies with this requirement.*	-NA-	Bidder understanding is correct.

		Please confirm that the Tenderer's understanding is correct.		
39	GGB2 Annex A Clarification nº 77	Guaranty Period *In this clarification, the Employer indicates that the DNP and the Guaranty Period are not the same.* *Could the Employer explain which is the scope's difference for the DNP and the Guaranty Period? The clauses ERT 22.7.2 and 22.7.3.1, as they are written, requires the same scope for both concepts. This would involve, not just giving a design guaranty for the elements stated in ERT - 22.7.2, but also giving a full defect liability cover for the requested elements in the requested period.* *Therefore, we kindly as again the Employer to reconsider these clauses and proceed with one of the following options:*	Clause ERT - 22.7.2.1: 1) The vehicle body structure (including under frame and support brackets) and bogie frame shall be guaranteed for not less than ***10*** ~~***30***~~ years 2) The following equipment shall be guaranteed for an extended period of ***5*** ~~***20***~~ years: a) Major components of bogie system (bogie frame, axles, suspensions, Traction Motors, gearboxes, etc.), b) Painting: Corrosion Protection, and c) Glass. 3) The vehicle batteries shall be guaranteed for not less than three (***3*** ~~***5***~~) years.	Please refer to Annex B on the updated clause 22.7.2.1.

		Whether delete clauses 22.7.2 and 22.7.3.3, or alternatively, amend the 22.7.2 clause to the following periods (based on CP Commuter NS-02): *1) The vehicle body structure (including under frame and support brackets) and bogie frame shall be guaranteed for not less than 10 years* *2) The following equipment shall be guaranteed for an extended period of 5 years:* *a) Major components of bogie system (bogie frame, axles, suspensions, Traction Motors, gearboxes, etc.),* *b) Painting: Corrosion Protection, and* *c) Glass.* *3) The vehicle batteries shall be guaranteed for not less than three (3) years.* *4) All other vehicle components and system shall be guaranteed for a period of five (2) years* *Besides this, we would like to point out that if clauses are*	4) All other vehicle components and system shall be guaranteed for a period of ***two ~~five~~*** (***2 ~~5~~***) years	

		not amended, the Guaranty Period would exceed the General Overhaul period for some elements (for example gearboxes), which wouldn't make any sense. *Finally, we would like to highlight again that there is a contradiction between clause 1.6 of the ERG, where the DNP is 2 years, and clause 22.7.2.1 point 4 of the ERT, where the Guaranty Period is 5 years. Therefore, the amendment of the clause is mandatory for clarification.*		
40	Volume II of III Part 2 - Employer's Requirements ERG-8 8.5.3	OMTTR – Operation Mean Time to Restore *1) In this section, an OMTTR of 15 minutes is required. According to the Rolling Stock State of the Art and Contractor's experience as a Maintainer, this requirement is not realistic or achievable. Therefore, we kindly request to the Employer to amend*	-NA-	Bidder request is rejected. No further changes to clause 8.1.8.

		the requirement to at least 90 min. *2) Besides this, please confirm that the logistic times are excluded from this time.*		
41	Volume II of III Part 2 - Employer's Requirements ERT- 14 1.14.1, Table 1	Basic Rolling Stock Maintenance Categories *Based on the maintenance intervals requested in this Table, please confirm:* *1) That the requested Maintenance Intervals are minimum requirements, and that the Contractor can offer higher maintenance intervals.* *2) When a temporary and Km based interval is defined for an interval, for example, Semi Overhaul Within 4 years or Within 600,000 km, and Overhaul Within 8 years or Within 1,200,000 km, the interval would proceed whichever comes first (time or km), as the times defined here do not match with the annual*	ERT 1.14.1, Table 1, Heavy Maintenance: Semi Overhaul: Within 4 years or Within 600,000 km***, whichever comes first.*** Overhaul: Within 8 years or Within 1,200,000 km***, whichever comes first.***	Please be advised that clause 1.14.2 has explicitly stated that table 1 to be considered as a guide. Bidder proposal is accepted. Please refer to Annex B.

		mileage stablished in ERT 1.14.7 (280.000Km/year) *3) Please confirm that these intervals are just indicative and not binding, and that the Contractor will define the Final Maintenance Plan at the Project Stage.*		
42	Volume II of III Part 2 - Employer's Requirements ERG-80 16. Publicity and Public Relation	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 responsibilities of the Contractor shall, without limitation, include: 1) Coordinate public relations matters and exercises with the Engineer and keep the Engineer informed at all times of relevant issues; 2) Engage and liaise with relevant local government departments, other	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 responsibilities of the Contractor shall, without limitation, include: 1) Coordinate public relations matters and	The Contractor shall develop the PR plan as part of the Proposed Project Management Plan. The key responsibilities and activities will be described in the plan document to suit the project structure i.e. EPCM, D&B etc. with reference to Clause 16. Bidder request for deletion of item 5, 16.1.1 is rejected. Bidder request for deletion on *"outside working hours"* is noted. Please refer to Annex B. Bidder request on item 11, 16.1.1is rejected. The insertion of commercial requirement is inappropriate. Bidder request on item 12, 16.1.1 is rejected. Working hours shall be

		authorities and key stakeholders to develop and coordinate public relations exercises; 3) Establish a sense of partnership among the government and stakeholder groups in the implementation of the Project; 4) Promote the Project to the public and the parties concerned with a positive message and explain the benefits which shall be realized by the development of the Project; 5) Gain support and minimize objections from the community and concerned parties; 6) Ensure adequate transparency of the Project to the public and key stakeholders; 7) Implement a robust process for receiving, addressing and tracking comments, criticism and complaints from all parties during the Contract;	exercises with the Engineer and keep the Engineer informed at all times of relevant issues; 2) Engage and liaise with relevant local government departments, other authorities and key stakeholders to develop and coordinate public relations exercises; 3) Establish a sense of partnership among the government and stakeholder groups in the implementation of the Project; 4) Promote the Project to the public and the parties concerned with a positive message and explain the benefits which shall be realized by the	defined in the Proposed Project Management Plan. Bidder request on 16.1.2 is rejected. The nomination of PR Manager i.e. either PM or others, shall be defined in the Proposed Project Management Plan. Bidder request to delete 16.3 is rejected. This section shall be defined in the Contactor's proposed project management plan documents. Bidder request to delete 16.4 is rejected. This section shall be defined in the Contactor's proposed project management plan documents. Clause 16.4.5 was deleted. Please refer to Annex B.

		8) Resolve public relations issues arising during the course of construction and elevate major issues to the Employer via the Engineer, as required; 9) Prevent and/or mitigate any nuisance or disturbance to the public due to the construction activities at the earliest possible time; 10) Attend and answer queries for the purpose of public consultation including but not limited to LGUs, MMDA, PNR, Emergency Services, Stakeholders, the Employer, related competent agencies, Non-Governmental Organizations (NGOs) or individual members of the public, local authorities and people in the affected areas, during and outside normal office hours; 11) Prepare and supply all necessary drawings, photomontages, documents, consultation papers, presentations, display	development of the Project; ~~***5) Gain support and minimize objections from the community and concerned parties;***~~ 6) Ensure adequate transparency of the Project to the public and key stakeholders; 7) Implement a robust process for receiving, addressing and tracking comments, criticism and complaints from all parties during the Contract; 8) Resolve public relations issues arising during the course of construction and elevate major issues to the Employer via the Engineer, as required;	

		materials, etc. for public consultations; and 12) Provide assistance and information to facilitate all Public Relations (PR) activities as per the PR Plan and as instructed by the Employer and the Engineer. 16.1.2 The Contractor shall nominate a qualified and experienced Public Relations Manager to manage and coordinate the required public relations responsibilities. 16.2 Public Relations Plan 16.2.1 The PR Plan shall include the methodology, specific ways and actions to be carried out for informing and consulting the public and promotion of the Project. The PR Plan shall also include the methodology specific ways and actions to handle reactions from the public, in particular issues relating to congestion, pollution, vibration, ground movement,	9) Prevent and/or mitigate any nuisance or disturbance to the public due to the construction activities at the earliest possible time; 10) Attend and answer queries for the purpose of public consultation including but not limited to LGUs, MMDA, PNR, Emergency Services, Stakeholders, the Employer, related competent agencies, Non-Governmental Organizations (NGOs) or individual members of the public, local authorities and people in the affected areas, during ~~***and outside***~~ normal office hours; 11) Prepare and supply all necessary drawings, photomontages,	

		noise, nuisance, compensation, etc. 16.2.2 The PR Plan shall give proposals and details on effective liaising, consulting, informing, meeting, contacting, clarifying with the public and gaining their support and understanding on the importance and benefits of MCRP/NSRP-S projects and the mitigation measures to reduce the impacts which may generate during execution of the Works. 16.2.3 The Contractor shall update quarterly and submit the PR Plan including a summary of PR events conducted and complaints, queries handled in the past quarter and PR events to be conducted and complaints and queries envisaged in the future, throughout the Contract period. 16.3 Public Consultation 16.3.1 The Contractor shall undertake public consultation works with the	documents, consultation papers, presentations, display materials, etc. for public consultations. ***All these activities and materials will be limited to 50.000 €/year with a maximum of 3 years from NTP***; and 12) Provide assistance and information to facilitate all Public Relations (PR) activities as per the PR Plan and as instructed by the Employer and the Engineer. ***This assistance and information will be done during normal office hours by the Project Manager.*** 16.1.2 The Contractor ***through the Project Manager will ~~shall~~***	

		guidance of the Engineer, including but not limited to, the following: 1) Inform and consult the relevant Government departments and authorities concerning the Project, local residents, property developments, shops, schools and sensitive receivers at least two months prior to the commencement of construction works; 2) Attend and participate in all public consultations and PR exercises; 3) Gain support, ease concerns and minimize objections from the public affected by the construction works through public consultation; 4) Address public concerns and feedback as far as possible to minimize disturbance to the public during construction, at the Contractor's own expenses; and 5) Report and give presentations to the	~~***nominate a qualified and experienced Public Relations Manager to***~~ manage and coordinate the required public relations responsibilities. 16.2 Public Relations Plan 16.2.1 The PR Plan shall include the methodology, specific ways and actions to be carried out for informing and consulting the public and promotion of the Project. The PR Plan shall also include the methodology specific ways and actions to handle reactions from the public, in particular issues relating to congestion, pollution, vibration, ground	

		Engineer, Employer, stakeholder agencies, NGOs and local authorities of the affected areas, about the progress of the construction works and other information as requested. 16.3.2 The Contractor shall ensure proper communications with the public by establishing an effective communication channel. The communications shall be open and transparent in the form of an interactive two-way system. Stakeholders and parties concerned shall be updated regularly on the progress of the Works and implementation of the Project through an easily accessible system, in particular on matters relating to local traffic control arrangements, expected delays, etc. Queries, feedback and comments from the stakeholders and parties concerned shall be considered and handled	movement, noise, nuisance, compensation, etc. 16.2.2 The PR Plan shall give proposals and details on effective liaising, consulting, informing, meeting, contacting, clarifying with the public and gaining their support and understanding on the importance and benefits of MCRP/NSRP-S projects and the mitigation measures to reduce the impacts which may generate during execution of the Works. 16.2.3 The Contractor shall update quarterly and submit the PR Plan including a summary of PR events conducted and complaints, queries	

		properly in an effective manner. An effective communication system of on-site notices, website and phone hotlines shall be established by the Contractor. 16.4 Public Relations Tools 16.4.1 The Contractor shall provide and make use of, but not be limited to, the following Public Relations tools in carrying out its PR duties. 16.4.2 Newsletter 16.4.2.1 The Contractor shall design and produce newsletters with the guidance of the Engineer at three-monthly intervals throughout the construction period and distribute to concerned Government departments, the Employer, stakeholders, related competent agencies, NGOs or individual members of the public, local authorities and people in the affected areas, etc. The newsletters shall be published in both English and Filipino Language	handled in the past quarter and PR events to be conducted and complaints and queries envisaged in the future, throughout the Contract period. ~~***16.3 Public Consultation***~~ ~~***16.3.1 The Contractor shall undertake public consultation works with the guidance of the Engineer, including but not limited to, the following:***~~ ~~***1) Inform and consult the relevant Government departments and authorities concerning the Project, local residents, property developments,***~~	

		providing in depth descriptions of MCRP/NSRP-S projects Project and the latest development and construction progress of the Works. It shall highlight the benefits of the Project, Schedule of Prices events of the construction activities and mitigation measures taken to minimize the impact to the public. Ways of communication channels shall also be published in the newsletters such as the website, and phone numbers of the enquiry hotline. 16.4.3 On-Site Notice 16.4.3.1 The Contractor shall post on-site notices with the guidance of the Engineer with a clear description of the Works and indication of anticipated completion dates together with the enquiry hotline and internet website information. Advance notices shall be given in carrying out the	~~***shops, schools and sensitive receivers at least two months prior to the commencement of construction works;***~~ ~~***2) Attend and participate in all public consultations and PR exercises;***~~ ~~***3) Gain support, ease concerns and minimize objections from the public affected by the construction works through public consultation;***~~ ~~***4) Address public concerns and feedback as far as possible to minimize disturbance to the public during construction, at the Contractor's own expenses; and***~~	

		Works which maximize the impact on local residents. 16.4.4 Hotline 16.4.4.1 The Contractor shall set up a twenty-four (24) hour hotline with the guidance of the Engineer to provide enquiry services to the public and the Contractor shall ensure queries and enquiries regarding the Works are taken seriously and dealt with swiftly. 16.4.4.2 Whenever a complaint is received, response shall be made within seven (7) calendar days. If a longer processing time is needed, an interim reply shall be served to the complainant within seven (7) calendar days. 16.4.5 Construction Site Tour 16.4.5.1 The Contractor shall cooperate with and provide periodic tours of the Works to the public and stakeholders during the construction period. The	~~*5) Report and give presentations to the Engineer, Employer, stakeholder agencies, NGOs and local authorities of the affected areas, about the progress of the construction works and other information as requested.*~~ ~~*16.3.2 The Contractor shall ensure proper communications with the public by establishing an effective communication channel. The communications shall be open and transparent in the form of an interactive two-way system. Stakeholders and parties concerned shall be updated*~~	

		main target audiences are stakeholders, ordinary families and students. Site visitors can become a means for advertising and promoting the benefit of MCRP/NSRP-S projects. Tours shall be planned at least once in every three months, subject to the Engineer's review. 16.4.6 Coordination with Other Contractors 16.4.6.1 The Contractor shall coordinate with external interfacing parties and interface contractors in the implementation of public relations activities. 16.4.7 Measurement and Payment 16.4.7.1 No separate payment shall be paid for preparing and submitting the public relations plan, public consultation, and public relation tools all associated costs shall be deemed to be included in the other BOQ items describe above.	~~***regularly on the progress of the Works and implementation of the Project through an easily accessible system, in particular on matters relating to local traffic control arrangements, expected delays, etc. Queries, feedback and comments from the stakeholders and parties concerned shall be considered and handled properly in an effective manner. An effective communication system of on-site notices, website and phone hotlines shall be established by the Contractor.***~~ ~~***16.4 Public Relations Tools***~~	

		After analysing carefully referred clause, we realised that the scope of requested activities seems to be more related to an Infrastructure Contract than to a R&S procurement contract. Considering that the production of trains will be done outside the Philippines and our previous experience in other similar contracts, we kindly ask to delete this clause or at least consider the enclosed reviewed text which will avoid important extra costs.	~~***16.4.1 The Contractor shall provide and make use of, but not be limited to, the following Public Relations tools in carrying out its PR duties.***~~ ~~***16.4.2 Newsletter***~~ ~~***16.4.2.1 The Contractor shall design and produce newsletters with the guidance of the Engineer at three-monthly intervals throughout the construction period and distribute to concerned Government departments, the Employer, stakeholders, related competent agencies, NGOs or individual members of the public, local***~~	

			~~authorities and people in the affected areas, etc. The newsletters shall be published in both English and Filipino Language providing in depth descriptions of MCRP/NSRP-S projects Project and the latest development and construction progress of the Works. It shall highlight the benefits of the Project, Schedule of Prices events of the construction activities and mitigation measures taken to minimize the impact to the public. Ways of communication channels shall also be published in the newsletters such as the website, and~~	

			~~*phone numbers of the enquiry*~~ ~~*hotline.*~~ ~~*16.4.3 On-Site Notice*~~ ~~*16.4.3.1 The Contractor shall post on-site notices with the guidance of the Engineer with a clear description of the Works and indication of anticipated completion dates together with the enquiry hotline and internet website information. Advance notices shall be given in carrying out the Works which maximize the impact on local residents.*~~ ~~*16.4.4 Hotline*~~ ~~*16.4.4.1 The Contractor shall set up a twenty-four (24)*~~	

			~~hour hotline with the guidance of the Engineer to provide enquiry services to the public and the Contractor shall ensure queries and enquiries regarding the Works are taken seriously and dealt with swiftly.~~ ~~16.4.4.2 Whenever a complaint is received, response shall be made within seven (7) calendar days.~~ ~~If a longer processing time is needed, an interim reply shall be served to the complainant within seven (7) calendar days.~~ ~~16.4.5 Construction Site Tour~~ ~~16.4.5.1 The Contractor shall~~	

			~~cooperate with and provide periodic tours of the Works to the public and stakeholders during the construction period. The main target audiences are stakeholders, ordinary families and students. Site visitors can become a means for advertising and promoting the benefit of MCRP/NSRP-S projects. Tours shall be planned at least once in every three months, subject to the Engineer's review.~~ ~~16.4.6 Coordination with Other Contractors~~ ~~16.4.6.1 The Contractor shall coordinate with~~	

			~~external interfacing parties and interface contractors in the implementation of public relations activities.~~ ~~16.4.7 Measurement and Payment~~ ~~16.4.7.1 No separate payment shall be paid for preparing and submitting the public relations plan, public consultation, and public relation tools all associated costs shall be deemed to be included in the other BOQ items describe above.~~	

Annex B

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
Volume II Part 2 – Employer's Requirements		
1	ERT-8 1.6.2.3.(3)	Updated 1.6.2.1: 1. Carbody Length (excluding coupler, overhang of leading car) — 19,500 mm 2. Overall length (excluding overhang of leading car)? — 20,000 mm 3. Train length (8 cars consist, excluding overhang of both leading cars) — 160,000 mm 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

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		13. Passenger Doors — Bi-parting 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
2	ERT-10 1.9.1 (1)	<u>Updated 1.9.1 (1):</u> 1) Ambient temperature : Min. + 15°C - Max. +40 °C
3	ERT-88 12.1.6	<u>Updated clause 12.1.6:</u> The spring structure to suppress detachment shall be equipped to suppress leaving overhead catenary at the required train performance maximum design speed, as per clause 1.11.2.1 (Item2).

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
4	ERT-44 Clause 4	<u>Updated clause 4.1.1:</u> The end cars in each train shall be fitted with an automatic coupler. The coupler shall be placed in a readily accessible position under and from either side of the end vehicle. The position (right side or left side) of parts operated shall be consistent for all end vehicle. It shall be possible to connect with other commuter train of North-South Commuter Railway (NSCR), North-South Railway Project-South, MMSP Line (NSRP-South) without any adapter during train rescue or hauling. <u>Updated clause 4.1.2:</u> The automatic coupler shall be able to couple with other types of rail vehicle with, if necessary, an adaptor. The adaptor, if required, shall be provided by the rolling stock supply Contractor. <u>Updated clause 4.13:</u> The automatic coupler shall be able to connect a unit with the coupler of another unit on all curves in the depots and main line. The coupler height, measured from the center of the coupler to the top of rail, shall be within 880 mm +10/-15 mm. <u>Updated clause 4.14:</u>

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		The automatic coupler shall, in conjunction with the draft-gear automatically effect mechanical, electrical and pneumatic coupling. It shall also permit separation of units either by manually from the track side and/or remotely from the cab.
5	ERT-45 Clause 4.3	Updated clause 4.3.2 was deleted:
6	ERT-59 Clause 6.3	Deleted clause 6.3.4: Clause 6.3.5 changed to 6.3.4: Clause 6.3.6 changed to 6.3.5: Clause 6.3.7 changed to 6.3.6: Clause 6.3.8 changed to 6.3.7:
7	ERT-105 Clause 16.11	Updated clause 16.11: 16.11 Provision for Wi-Fi system 16.11.1 Provision for Wi-Fi system shall be designed in consideration with the following, but not limited to: 1) Space and position for installation 2) Materials of interior near the attachment 3) Capacity of powering

<table>
<tr><th>ITEM NO.</th><th>REFERENCE/CLAUSE/ SECTION</th><th>REVISIONS / AMENDMENTS</th></tr>
<tr><td></td><td></td><td>4) Provision of circuit
5) Provision of interface
16.11.2 Care shall be paid to assume that two individual systems of two companies are introduced.</td></tr>
<tr><td>8</td><td>ERT-56
5.19.1.4</td><td><u>Item 5.19.1.4(17) was deleted</u></td></tr>
<tr><td>9</td><td>ERT-91
14.2.4</td><td><u>Updated Clause 14.2.4:</u>

The chassis of APSE shall be with the use of aluminum alloys or other suitable materials which suitable for use on railways vehicles which are subsequently subjected to vibration and shock owing to the nature of railway operating environment.</td></tr>
<tr><td>10</td><td>ERT-85
11.2.7</td><td><u>Updated Clause 11.2.7:</u>

The material of chassis of PCE shall be with the use of aluminum alloys or other suitable materials which suitable for use on railways vehicles which are subsequently subjected to vibration and shock owing to the nature of railway operating environment.</td></tr>
<tr><td>11</td><td>ERT-152
24.8.1</td><td><u>Updated 24.8.1:</u>

24.8.1 The main Special Tools and Diagnostic Test Equipment are as follows, but not limited to them.

<table><tr><th>ID</th><th>Name</th></tr><tr><td></td><td>Safety device tester</td></tr></table></td></tr>
</table>

			Light repair（2 depots）	Event recorder reader
				VVVF log reader
				Brake control unit log reader
				Rewriting device for internal display system
				Rewriting device for external display system
				Rewriting device for public address system
				Brake-pad replacement tool
			PTU	VVVF
				BCU
				ACU
				Doors
				TMS
				APSE
			Bogie removal	Radius arm gauge
			Traction Motor	Motor disassembling/reassembling tools
				WM coupling extractor
				Non-disassembling bearing exchange special tool
			Bogie	Bogie disassembling/reassembling special tools
				Lock bolt for axle spring
			Coupler and draft gear	Special tool for draft gear
			Air Conditioner	Special tool for air conditioner overhaul
				Refrigerant extractor
				Refrigerant filler
				Gas leak tester
				Cleaner for special parts
			Electric Shop	HB tester
				High voltage device tester
				Contactor tester
				Solenoid valve tester
				Electronic relay tester
				Door operating device tester

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

<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></td><td>Safety device tester</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Event recorder reader and analyzer</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Failure data reading device</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Train radio tester</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Speed sensor tester</td></tr>
<tr><td></td><td></td><td></td><td></td><td>VVVF inverter tester</td></tr>
<tr><td></td><td></td><td></td><td></td><td>VVVF log reader</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Cleaner for special parts</td></tr>
<tr><td></td><td></td><td></td><td>Bearings</td><td>Special tool for bearing overhaul</td></tr>
<tr><td></td><td></td><td></td><td>Spring, Air Spring & Iron work</td><td>Special tool for air-spring overhaul</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Special tool for damper overhaul</td></tr>
<tr><td></td><td></td><td></td><td>Air Brake valve</td><td>Brake test equipment</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Brake control unit log reader</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Special tool for air valve overhaul</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Special tool for compressor overhaul</td></tr>
<tr><td></td><td></td><td></td><td>Final adjustment</td><td>Safety device tester</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Event recorder reader</td></tr>
<tr><td>12</td><td>ERG-103
Abbreviation</td><td colspan="3"><u>Updated Abbreviation table on page ERG-103:</u>

<table>
<tr><td>VVVF</td><td>Variable Voltage Variable Frequency</td></tr>
<tr><td>V-LAN</td><td>Virtual LAN</td></tr>
<tr><td></td><td></td></tr>
<tr><td>W0</td><td>Vehicle Tare Weight</td></tr>
<tr><td>W1</td><td>W0 + Seated Passenger</td></tr>
</table></td></tr>
</table>

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

<table>
<tr><th>ITEM NO.</th><th>REFERENCE/CLAUSE/ SECTION</th><th>REVISIONS / AMENDMENTS</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>W2</td><td>W0 + Seated Passengers + Standing passengers</td></tr>
<tr><td>W3</td><td>W2+ dynamic load and safety margin</td></tr>
<tr><td></td><td></td></tr>
<tr><td>WBS</td><td>Work Breakdown Structure</td></tr>
<tr><td></td><td></td></tr>
<tr><td>XLPO</td><td>Cross-linked polyolefin</td></tr>
</table>
</td></tr>
<tr><td>13</td><td>ERT-144
22.7.2.1</td><td><u>Updated 22.7.2.1:</u>

22.7.2.1 Unless otherwise specified, the guaranty period for the following components shall commence from the date of issue of Taking over Certificate, which shall be done after all action items has been closed out on the vehicle on which they are installed.
1) The vehicle body structure (including under frame and support brackets) and bogie frame shall be guaranteed for not less than 10 years
2) The following equipment shall be guaranteed for an extended period of 5 years:
a) Major components of bogie system (bogie frame, axles, suspensions, Traction Motors, gearboxes, etc.),
b) Painting: Corrosion Protection, and
c) Glass.</td></tr>
</table>

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

<table>
<tr><th>ITEM NO.</th><th>REFERENCE/CLAUSE/ SECTION</th><th>REVISIONS / AMENDMENTS</th></tr>
<tr><td></td><td></td><td>3) The vehicle batteries shall be guaranteed for not less than three (3) years.
4) All other vehicle components and system shall be guaranteed for a period of two (2)) years.</td></tr>
<tr><td>14</td><td>ERT- 17
1.14.1, Table 1</td><td>Updated Table 1: Basic Rolling Stock Maintenance Categories
<table>
<tr><th colspan="2">Category</th><th>Period</th><th>Maintenance Content</th></tr>
<tr><td colspan="2">Departure Inspection</td><td>Before departure</td><td>Check in-service monitoring, visual check of major parts of cars.

Driver check on visual from ground level, internal for passenger comfort, functional a/s. doors etc.</td></tr>
<tr><td>Light Maintenance</td><td>Weekly Inspection</td><td>Within 6 days mileage preferred, supplier to state</td><td>Check status of bogies, wheels, pantograph, doors and other items while cars are connected.
Replace consumables for brakes, pantographs and other items.</td></tr>
</table></td></tr>
</table>

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS			
			Monthly Inspection	Within 3 months (90 days) mileage preferred, over a pit including roof access	Confirm the status of cars and their functions while cars are connected. Replace consumables, measure voltage of auxiliary circuits, control circuit and other circuits, inspect functioning of main circuit, etc.
		Heavy Maintenance	Semi overhaul	Within 4 years or Within 600,000 km whichever comes first.	Remove bogies, wheels, wheel axles, brakes, main motors and other major parts, perform detailed inspection and replace parts
			Overhaul	Within 8 years or Within 1,200,000 km whichever comes first.	Disassemble almost all parts, perform detailed inspection of devices. Paint carbody.
			General overhaul (Renewal)	Every 12 to 15 years	General overhaul shall carry out replacement of the major electronic parts with new one. If it is necessary, the interior is renewed.
		Other Maintenance	Unscheduled Repair	Whenever necessary	Replace broken-down parts. (bogies, pantograph, air conditioner, etc.).
			Wheel re-profiling	150,000km (after starting service revenue operation)	Use wheel profiler to correct wheel shape and maintain ride comfort level.
			Axle NDT/UAT	based on design, likely 150,000km	

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 4
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
15	ERG-80 16.1.1	Updated Item 16.1.1 (10): Attend and answer queries for the purpose of public consultation including but not limited to LGUs, MMDA, PNR, Emergency Services, Stakeholders, the Employer, related competent agencies, Non-Governmental Organizations (NGOs) or individual members of the public, local authorities and people in the affected areas, during normal office hours;
16	ERG-82 16.4.5	Clause 16.4.5 was deleted: Clause 16.4.6 is now 16.4.5: Clause 16.4.7 is now 16.4.6

Annex B – Attachment 1

shall meet the system requirements in this tender not limited to weights limits, train performance, noise and vibration etc. The proposed train formation and equipment architecture data/documents shall be provided in the bid submission.

1.6.1.3 The limited express train formation and equipment arrangement architecture shall be finalised during design stage. Any time and cost implication to the changes of train formation and equipment arrangement architecture from the bid submission to the given notice of no objection at final design, shall be borne by the Contractor and no contract variation shall be provided by the Employer.

~~1.6.1.3~~1.6.1.4 Auxiliary Power System Equipment (APSE) shall not be mounted on both leading cars for avoiding EMI to the signaling equipment, but Battery and Battery charger may be mounted on both leading cars.

~~1.6.1.4~~1.6.1.5 The mass (tare weight) of the 8-cars trainset shall be 315 tons or less.

~~1.6.1.5~~1.6.1.6 Weight balance, lower center of gravity, etc., shall be taken into consideration. The weight distribution shall be as defined in IEC 61133 or any equivalent standard approved the Engineer.

~~1.6.1.6~~1.6.1.7 Total gross axle load of leading car and middle car shall not exceed 16 Tonnes for loads as in section 8.5 of IEC61133

~~1.6.1.7~~1.6.1.8 Provision for 10 car trainsets shall be provided for future upgrade. The evidence of data/document shall be provided in the bid submission.

~~1.6.1.8~~1.6.1.9 Typical Power and Auxiliary Electric System Configuration is as follow:

1) Six (6) power conversion systems which can drive four (4) AC motors shall be equipped in suitable three (3) intermediate cars of trainsets. Two (2) auxiliary power supply systems with a primary inverter to serve the auxiliary loads shall be equipped in the proper place of trainsets. The simplified block diagram for reference is shown in Appendix A

~~6)~~1.6.1.10 The bidder shall propose the power and auxiliary electric system configuration and this proposal shall be submitted in the bid submission. The positions where these ~~devices shall~~devices shall be reviewed by the Engineers. Both leading cars shall be trailer car (not motor mounted) considering EMC and the mounted space for on-board ETCS, Running and Stopping Assistant system and PSD controller.

~~7) The Contractor shall able to propose the alternative to the Power and Auxiliary Electric System Configuration for the Engineer review.~~

~~The simplified block diagram for reference is shown in Appendix A.~~

1.6.1.11 Under emergency conditions, one train in W2 (Clause 1.1) loading must be capable of operating with another train in W2 loading coupled to it for hauling or pushing.

~~1.6.1.9~~1.6.1.12 The major electrical equipment table shall be provided by bidder in the bid submission. The major electrical equipment table shall be finalized during design stage.

1.6.2 Vehicle Physical Characteristics

1.6.2.1 The following physical characteristics indicate fundamental vehicle dimensions that should be given careful attention.

1.	Carbody Length (excluding coupler, overhang of leading car)	19,500 mm
2.	Overall length (excluding overhang of leading car)?	20,000 mm
3.	Train length	160,000 mm

	(~~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 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

architecture data/documents shall be provided in the bid submission.

1.6.1.3 The limited express train formation and equipment arrangement architecture shall be finalised during design stage. Any time and cost implication to the changes of train formation and equipment arrangement architecture from the bid submission to the given notice of no objection at final design, shall be borne by the Contractor and no contract variation shall be provided by the Employer.

1.6.1.4 Auxiliary Power System Equipment (APSE) shall not be mounted on both leading cars for avoiding EMI to the signaling equipment, but Battery and Battery charger may be mounted on both leading cars.

1.6.1.5 The mass (tare weight) of the 8-cars trainset shall be 315 tons or less.

1.6.1.6 Weight balance, lower center of gravity, etc., shall be taken into consideration. The weight distribution shall be as defined in IEC 61133 or any equivalent standard approved the Engineer.

1.6.1.7 Total gross axle load of leading car and middle car shall not exceed 16 Tonnes for loads as in section 8.5 of IEC61133

1.6.1.8 Provision for 10 car trainsets shall be provided for future upgrade. The evidence of data/document shall be provided in the bid submission.

1.6.1.9 Typical Power and Auxiliary Electric System Configuration is as follow:

1) Six (6) power conversion systems which can drive four (4) AC motors shall be equipped in suitable three (3) intermediate cars of trainsets. Two (2) auxiliary power supply systems with a primary inverter to serve the auxiliary loads shall be equipped in the proper place of trainsets. The simplified block diagram for reference is shown in Appendix A

1.6.1.10 The bidder shall propose the power and auxiliary electric system configuration and this proposal shall be submitted in the bid submission. The positions where these devices shall be reviewed by the Engineers. Both leading cars shall be trailer car (not motor mounted) considering EMC and the mounted space for on-board ETCS, Running and Stopping Assistant system and PSD controller.

1.6.1.11 Under emergency conditions, one train in W2 (Clause 1.1) loading must be capable of operating with another train in W2 loading coupled to it for hauling or pushing.

1.6.1.12 The major electrical equipment table shall be provided by bidder in the bid submission. The major electrical equipment table shall be finalized during design stage.

1.6.2 Vehicle Physical Characteristics

1.6.2.1 The following physical characteristics indicate fundamental vehicle dimensions that should be given careful attention.

1.	Carbody Length (excluding coupler, overhang of leading car)	19,500 mm
2.	Overall length (excluding overhang of leading car)?	20,000 mm
3.	Train length (8 cars consist, excluding overhang of both leading cars)	160,000 mm
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 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

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

2) 3,000 m (Section with the operation speed of under 120km/h,

3) 4,000m apply to the radius of less than 800m)

4) Vertical curve is required for more than 10/1,000 of gradient change

1.8.4.3 For NSCR-SC:

1) 3,000m (4,000m where curve radius is less than 600m)

2) 2,000m (6,000m where curve radius is less than 600m) (absolute maximum)

3) Vertical curve is required for more than 10/1,000 of gradient change

1.8.5 Distance between track Centers

1.8.5.1 4.0 m (Main line), more than 4.0 m (Station), 4.0 m (Stabling track) (for NSCR-N1, NSCR-N2 and NSCR-SC)

1.8.6 Width of Structure Gauge

1.8.6.1 Width of Structure Gauge: 3.8m

1.8.7 Station Platform

1) Length : 180m (8-car)

2) Width : 8m (Standard)

3) Platform height must be lower than train floor at W2 on all including curved platform

4) UK standard GIRT7020 clause 2.3.1

1.8.7.1 The usable width of a new single face platform, and alterations (as defined) to existing single face platforms, shall not be less than:

1) 3000 mm where the permissible or enhanced permissible speed on the line adjacent to the platform exceeds 100 mph (160 km/h).

2) 2500 mm at other platforms.

1.8.8 Signaling System

1.8.8.1 European Train Control System (ETCS)-Level 2 signaling system shall be adopted for the MCRP, NSCR and NSRP-S Project (Clark – Calamba). Provision for ATO over ETCS shall be included.

1.9 Environmental Conditions

1.9.1 The general environmental conditions in the Manila area are as follows:

1) Ambient temperature : Min. + 15°C - Max. +40~~5~~ °C

2) Relative humidity : Min. 60% - Max. 100%

3) Maximum rainfall : 60 min. rating 120 mm/h

4) 30 min. rating : 180 mm/h

5) 10 min. rating : 270 mm/h

6) Maximum wind velocity : Approx. 70m/sec (based on DPWH standard) 252km/h.

7) Maximum wind velocity at which train operations will be stopped: 25 m/sec 90km/h

1.9.2 The Contractor is reminded that the alignment is near to sea coast line and runs through relatively polluted air environment which may present mildly corrosive atmosphere.

1) 3,000m (4,000m where curve radius is less than 600m)
2) 2,000m (6,000m where curve radius is less than 600m) (absolute maximum)
3) Vertical curve is required for more than 10/1,000 of gradient change

1.8.5 Distance between track Centers

1.8.5.1 4.0 m (Main line), more than 4.0 m (Station), 4.0 m (Stabling track) (for NSCR-N1, NSCR-N2 and NSCR-SC)

1.8.6 Width of Structure Gauge

1.8.6.1 Width of Structure Gauge: 3.8m

1.8.7 Station Platform

1) Length : 180m (8-car)
2) Width : 8m (Standard)
3) Platform height must be lower than train floor at W2 on all including curved platform
4) UK standard GIRT7020 clause 2.3.1

1.8.7.1 The usable width of a new single face platform, and alterations (as defined) to existing single face platforms, shall not be less than:

1) 3000 mm where the permissible or enhanced permissible speed on the line adjacent to the platform exceeds 100 mph (160 km/h).
2) 2500 mm at other platforms.

1.8.8 Signaling System

1.8.8.1 European Train Control System (ETCS)-Level 2 signaling system shall be adopted for the MCRP, NSCR and NSRP-S Project (Clark – Calamba). Provision for ATO over ETCS shall be included.

1.9 Environmental Conditions

1.9.1 The general environmental conditions in the Manila area are as follows:

1) Ambient temperature : Min. + 15°C - Max. +40 °C
2) Relative humidity : Min. 60% - Max. 100%
3) Maximum rainfall : 60 min. rating 120 mm/h
4) 30 min. rating : 180 mm/h
5) 10 min. rating : 270 mm/h
6) Maximum wind velocity : Approx. 70m/sec (based on DPWH standard) 252km/h.
7) Maximum wind velocity at which train operations will be stopped: 25 m/sec 90km/h

1.9.2 The Contractor is reminded that the alignment is near to sea coast line and runs through relatively polluted air environment which may present mildly corrosive atmosphere. Also, because of the generally long dry season, the air has high dust content.

1.9.3 The Contractor shall ensure that all equipment will operate satisfactorily under the above conditions and in a high level of air pollution and dusty conditions.

1.10 Weight limits

logged fault related to the switching of element and behavior of instantaneous current and voltage, etc. shall be required to be available for fault diagnostic analysis.

11.4.3.3 Attention shall be provided to automatically discharge capacitors which the voltage might present a hazard to the maintenance personnel opening any enclosure. Discharge time shall not be more than 5 minutes.

12 Primary Power System

12.1 Current Collection

12.1.1 The 1500 VDC power shall be collected from the overhead line system using electrically operated pantographs. The pantograph assembly shall permit all necessary movement, taking into account the overhead line installation tolerances/clearances, vibration of rolling stock, deflation of suspension etc. and maintain the complete and effective collection of electrical power. Carbon or copper shall be used as the material of the contact strip.

12.1.2 The pantograph within the train-sets shall equip both the function to raise and lower at all pantographs on the train the same time and the function to raise or lower individually, and each pantograph shall be able to be raised by releasing the lock manually.

12.1.3 Each guide pipe for the two parts of the current collector shall be equipped with respectively in order to have higher guidance function for the shaking of the catenary than the single guide pipe between the two parts of the current collector.

12.1.4 A lightning arrester shall be installed on the appropriate position adjacent to the pantograph(s).

12.1.5 Pantograph shall be mounted on the roof with double insulation.

12.1.6 The spring structure to suppress detachment shall be equipped to suppress leaving overhead catenary at ~~180km/h,~~ the required train performance maximum design speed, as per clause 1.11.2.1 (Item2).~~.~~

12.1.7 A function shall be provided to judge whether the pantograph is rising or descending and shall be displayed in the TMS.

12.1.8 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.

12.1.9 Pantograph cover shall be equipped for suppression of aerial noise, in consideration of body oscillations.

12.1.10 Wires of high voltage from pantographs shall be shielded adequately to suppress EMI and to weaken magnetic flux in the car.

12.2 Input Protection (HSCB)

12.2.1 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

present a hazard to the maintenance personnel opening any enclosure. Discharge time shall not be more than 5 minutes.

12 Primary Power System

12.1 Current Collection

12.1.1 The 1500 VDC power shall be collected from the overhead line system using electrically operated pantographs. The pantograph assembly shall permit all necessary movement, taking into account the overhead line installation tolerances/clearances, vibration of rolling stock, deflation of suspension etc. and maintain the complete and effective collection of electrical power. Carbon or copper shall be used as the material of the contact strip.

12.1.2 The pantograph within the train-sets shall equip both the function to raise and lower at all pantographs on the train the same time and the function to raise or lower individually, and each pantograph shall be able to be raised by releasing the lock manually.

12.1.3 Each guide pipe for the two parts of the current collector shall be equipped with respectively in order to have higher guidance function for the shaking of the catenary than the single guide pipe between the two parts of the current collector.

12.1.4 A lightning arrester shall be installed on the appropriate position adjacent to the pantograph(s).

12.1.5 Pantograph shall be mounted on the roof with double insulation.

12.1.6 The spring structure to suppress detachment shall be equipped to suppress leaving overhead catenary at the required train performance maximum design speed, as per clause 1.11.2.1 (Item2).

12.1.7 A function shall be provided to judge whether the pantograph is rising or descending and shall be displayed in the TMS.

12.1.8 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.

12.1.9 Pantograph cover shall be equipped for suppression of aerial noise, in consideration of body oscillations.

12.1.10 Wires of high voltage from pantographs shall be shielded adequately to suppress EMI and to weaken magnetic flux in the car.

12.2 Input Protection (HSCB)

12.2.1 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.

12.2.2 Tripping of the HSCB shall be enunciated in the Driver's Cab and shall be registered in the Fault Indication System of the TMS and PECE. The HSCB shall capable to be reset

4 Coupler and Draft Gear

4.1 General

4.1.1 The end cars in each train shall be fitted with an automatic coupler. The coupler shall be placed in a readily accessible position under and from either side of the end vehicle. The position (right side or left side) of parts operated shall be consistent for all end vehicle. It shall be possible to connect with other commuter train of North-South Commuter Railway (NSCR), North-South Railway Project-South, MMSP Line (NSRP-South) without any adapter during train rescue or hauling.

4.1.2 The automatic coupler shall be able to couple with other types of rail vehicle with, if necessary, an adaptor. The adaptor, if required, shall be provided by the rolling stock supply Contractor.

4.1.3 The automatic coupler shall be able to connect a unit with the coupler of another unit on all curves in the depots and main line. The coupler height, measured from the center of the coupler to the top of rail, shall be within 880 mm +10/-15 mm.

4.1.4 The automatic coupler shall, in conjunction with the draft-gear automatically effect mechanical, electrical and pneumatic coupling. It shall also permit separation of units either by manually from the track side and/or remotely from the cab.

4.1.5 In both leading cars, an electrical connecting plug which is necessary for relief operation by connecting train-sets shall be equipped. Also, an emergency connection cable that connects this electrical connection plug shall be equipped. By using this connecting cable, required functions such as brake command, broadcasting, buzzer etc. shall operate properly. Length and diagram of cable shall be also consistent with other commuter trains of NSCR, NSPR-South, MMSP. The position of this plug shall be consistent with other commuter trains of NSCR, NSRP-South, MMSP particularly length of cable shall be determined in consideration of the severest deviations during coupled with other train. Basically, utilization of adapter shall not be acceptable.

4.1.6 The Contractor shall provide the required cabinet for housing the emergency connection cable on the train. Alternatively, the Contractor shall provide proper mechanism for retaining the emergency connection cable when it is not in used.

4.1.7 All electrical connections shall be made to terminal blocks in junction boxes compliant with IP 65, via jumper cables, using quick connect/disconnect couplings securely locked with wire.

4.1.8 Cable hoses shall be made out of high quality, weather and abrasion resistant insulated rubber.

4.1.9 The connectors for each cable, if of the same size, shall be keyed differently to prevent misconnection, and shall be color coded to enable connectors to be easily distinguished.

4.1.10 In all cases, care shall be taken to ensure that strain relief is provided for all cables leaving the junction boxes, and that all cables are properly supported in suitable cleats, and that no chafing of the cabling takes place under all possible movements of the coupler.

4.1.11 The arrangement shall prevent damage from coupling with misaligned couplers, and shall minimize damage to the carbody wiring, should excessive tension be applied to the cables in the event of an accident.

4.1.12 The couplers shall be designed to prevent the coupler swinging transversely when it is not coupled.

4.1.13 Couplers and draft gear shall be capable of withstanding all coupling, buffing and draft

4 Coupler and Draft Gear

4.1 General

4.1.1 The end cars in each train shall be fitted with an automatic coupler. The coupler shall be placed in a readily accessible position under and from either side of the end vehicle. The position (right side or left side) of parts operated shall be consistent for all end vehicle. It shall be possible to connect with other commuter train of North-South Commuter Railway (NSCR), North-South Railway Project-South, MMSP Line (NSRP-South) without any adapter during train rescue or hauling.

4.1.2 The automatic coupler shall be able to couple with other types of rail vehicle with, if necessary, an adaptor. The adaptor, if required, shall be provided by the rolling stock supply Contractor.

4.1.3 The automatic coupler shall be able to connect a unit with the coupler of another unit on all curves in the depots and main line. The coupler height, measured from the center of the coupler to the top of rail, shall be within 880 mm +10/-15 mm.

4.1.4 The automatic coupler shall, in conjunction with the draft-gear automatically effect mechanical, electrical and pneumatic coupling. It shall also permit separation of units either by manually from the track side and/or remotely from the cab.

4.1.5 In both leading cars, an electrical connecting plug which is necessary for relief operation by connecting train-sets shall be equipped. Also, an emergency connection cable that connects this electrical connection plug shall be equipped. By using this connecting cable, required functions such as brake command, broadcasting, buzzer etc. shall operate properly. Length and diagram of cable shall be also consistent with other commuter trains of NSCR, NSPR-South, MMSP. The position of this plug shall be consistent with other commuter trains of NSCR, NSRP-South, MMSP particularly length of cable shall be determined in consideration of the severest deviations during coupled with other train. Basically, utilization of adapter shall not be acceptable.

4.1.6 The Contractor shall provide the required cabinet for housing the emergency connection cable on the train. Alternatively, the Contractor shall provide proper mechanism for retaining the emergency connection cable when it is not in used.

4.1.7 All electrical connections shall be made to terminal blocks in junction boxes compliant with IP 65, via jumper cables, using quick connect/disconnect couplings securely locked with wire.

4.1.8 Cable hoses shall be made out of high quality, weather and abrasion resistant insulated rubber.

4.1.9 The connectors for each cable, if of the same size, shall be keyed differently to prevent misconnection, and shall be color coded to enable connectors to be easily distinguished.

4.1.10 In all cases, care shall be taken to ensure that strain relief is provided for all cables leaving the junction boxes, and that all cables are properly supported in suitable cleats, and that no chafing of the cabling takes place under all possible movements of the coupler.

4.1.11 The arrangement shall prevent damage from coupling with misaligned couplers, and shall minimize damage to the carbody wiring, should excessive tension be applied to the cables in the event of an accident.

4.1.12 The couplers shall be designed to prevent the coupler swinging transversely when it is not coupled.

4.1.13 Couplers and draft gear shall be capable of withstanding all coupling, buffing and draft

loads to be expected in normal and emergency conditions. The draft gear shall be suitably damped and be designed to prevent the occurrence of unduly large dynamic deflection and associated forces under the above condition. The coupler and underframe shall comply with Railway applications - Structural requirements of railway vehicle bodies - EN12663-1 section 6.

4.1.14 The coupler shall follow the coupler type for Commuter Trainset (CP NS-02) for interoperability capability.

4.2 Semi-Permanent Couplers

4.2.1 The semi-permanent couplers will only be coupled or uncoupled in depot. (Pneumatic connections shall be made when coupling the semi-permanent couplers).

4.3 Draft gear

4.3.1 Each coupler type shall utilize rubber, double acting draft gear capable of withstanding all the loads described in this ERT, and which will not transmit undue vibrations into the carbody.

~~4.3.2 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.~~

loads to be expected in normal and emergency conditions. The draft gear shall be suitably damped and be designed to prevent the occurrence of unduly large dynamic deflection and associated forces under the above condition. The coupler and underframe shall comply with Railway applications - Structural requirements of railway vehicle bodies - EN12663-1 section 6.

4.1.14 The coupler shall follow the coupler type for Commuter Trainset (CP NS-02) for interoperability capability.

4.2 Semi-Permanent Couplers

4.2.1 The semi-permanent couplers will only be coupled or uncoupled in depot. (Pneumatic connections shall be made when coupling the semi-permanent couplers).

4.3 Draft gear

4.3.1 Each coupler type shall utilize rubber, double acting draft gear capable of withstanding all the loads described in this ERT, and which will not transmit undue vibrations into the carbody.

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.

~~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.

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.

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.

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

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 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.

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

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.

6.3.7 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.

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.

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.

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

5) System selector switch.

16.9.4 The TOCP shall, as a minimum, enable the following functions to be performed:

1) Communication between the cab driver and the OCC via the train radio system;
2) Communication between the leading and trailing cabs via an intercom system;
3) Driver announcements from the cab to passengers within the train via the train PA system; and
4) Display of major telecoms system alarms.

16.9.5 The design shall enable the OCC to communicate with train passengers via the train radio system by broadcasting audio announcements within carriages via the train PA system.

16.9.6 The CP NS-01 Contractor shall be responsible for the configuration, set-up and optimization adjustment of the on-board train radio equipment to ensure full inter-operation with the line side train radio network and facilities within the OCC.

16.9.7 The CP NS-01 Contractor shall determine, in conjunction with the radio equipment manufacturer, all of the necessary interfacing requirements to the various sub-systems.

16.9.8 Within each train cab an integrated hand-held portable radio battery charger with integral cradle shall be provided by CP NS-01 and to be installed by CP NS-03.

16.9.9 The train radio system shall be designed by the CP NS-01 Contractor to allow automatic switchover to the other radio unit on the train, in the case where there is failure of other radio lines.

16.10 Operation of the Mobile Communications Devices

16.10.1 The train structure shall be designed so as not to impede the operation of mobile phones and other similar radio communications devices within the train carriages whilst accessing public operated mobile communications networks such as GSM (2G), UMPS (3G), LTE (4G) or other more advanced network.

16.10.2 In particular, for such signals the attenuation (penetration loss) of the side windows shall not exceed 3dB when the train is on straight track with the side windows perpendicular to the rail.

16.11 ~~Preparation~~ Provision for Wi-Fi system

16.11.1 ~~Preparation~~ Provision for Wi-Fi system shall be designed in consideration with the following, but not limited to:

1) Space and position for installation
2) Materials of interior near the attachment
3) Capacity of powering
4) ~~Preparation~~ Provision of circuit
5) ~~Preparation~~ Provision of interface

16.11.2 Care shall be paid to assume that two individual systems of two companies are introduced.

5) System selector switch.

16.9.4 The TOCP shall, as a minimum, enable the following functions to be performed:

1) Communication between the cab driver and the OCC via the train radio system;
2) Communication between the leading and trailing cabs via an intercom system;
3) Driver announcements from the cab to passengers within the train via the train PA system; and
4) Display of major telecoms system alarms.

16.9.5 The design shall enable the OCC to communicate with train passengers via the train radio system by broadcasting audio announcements within carriages via the train PA system.

16.9.6 The CP NS-01 Contractor shall be responsible for the configuration, set-up and optimization adjustment of the on-board train radio equipment to ensure full inter-operation with the line side train radio network and facilities within the OCC.

16.9.7 The CP NS-01 Contractor shall determine, in conjunction with the radio equipment manufacturer, all of the necessary interfacing requirements to the various sub-systems.

16.9.8 Within each train cab an integrated hand-held portable radio battery charger with integral cradle shall be provided by CP NS-01 and to be installed by CP NS-03.

16.9.9 The train radio system shall be designed by the CP NS-01 Contractor to allow automatic switchover to the other radio unit on the train, in the case where there is failure of other radio lines.

16.10 Operation of the Mobile Communications Devices

16.10.1 The train structure shall be designed so as not to impede the operation of mobile phones and other similar radio communications devices within the train carriages whilst accessing public operated mobile communications networks such as GSM (2G), UMPS (3G), LTE (4G) or other more advanced network.

16.10.2 In particular, for such signals the attenuation (penetration loss) of the side windows shall not exceed 3dB when the train is on straight track with the side windows perpendicular to the rail.

16.11 Provision for Wi-Fi system

16.11.1 Provision for Wi-Fi system shall be designed in consideration with the following, but not limited to:

1) Space and position for installation
2) Materials of interior near the attachment
3) Capacity of powering
4) Provision of circuit
5) Provision of interface

16.11.2 Care shall be paid to assume that two individual systems of two companies are introduced.

~~17) Monitors for PSD operation~~

~~18)~~17) Speedometer

5.19.2 Master Controller

5.19.2.1 The master controller shall control accelerating and braking in several steps adjustable, linear manner, as follows:

	Handle Position	Function
1.	Vertically upright	OFF position
2.	Forward from the vertical position until the handle reaches its end position with a spring return device.	Propulsion, with acceleration increasing acoording 4 steps with handle movement.
3.	Backwards from the vertical position until the handle engages a a spring loaded detent.	Normal Braking, with the effort increasing acoording to 7 steps with handle movement.
4.	Backwards from the spring loaded detent in 3, until the handle reaches its end position.	Emergency braking.

5.19.2.2 The Master Controller shall be ergonomically designed to minimize unnecessary physical strain and fatigue to the driver.

5.19.2.3 The Master Controller shall have a control system for keeping the constant speed in case of powering.

5.19.2.4 The Master Controller shall be locked/unlocked by the Driver's key and Reversing Switch.

5.19.2.5 When the driver's key is in the ON position and Reversing Switch is in the forward or reverse position, the Master Controller shall be unlocked.

5.19.2.6 The driver's key shall itself be captive when The Master Controller is not in the predetermined Emergency position.

5.19.2.7 The driver's key shall itself be captive when The Reversing Switch is not in the predetermined OFF(Neutral) position.

5.19.2.8 Only one cab of 2 cabs on a trainset shall be able to be activated at any time.

5.19.3 Reversing Switch

5.19.3.1 The Reversing Switch has three (3) positions, as follows.

	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

increased solar load through the cab's windshield and the heat load produced by the equipment inside the Driver's cab.

5.19 Cab Controls of Driver's Cab

5.19.1 General

5.19.1.1 The driver's controls shall be incorporated into a modern, ergonomic console design located at the cab front end structure. All controls, instruments, displays and gauges shall comply with the requirements of ISO 9355 - ergonomic requirements or equivalent for the design of displays and control actuators.

5.19.1.2 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.

5.19.1.3 The Contractor shall demonstrate by using cab mock-up that the display panel and lamps are located where sunlight will not affect the display.

5.19.1.4 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)
5) Driver's Controls Cluster, consisting of the Master Controller, Driving Mode switch, Reverse Lock switch, Master Key switch, etc.
6) On board Signaling cluster.
7) ATP Cut out Switch
8) Emergency (Security) Brake Push Button, for the application of emergency brake, automatic lowering of pantograph and opening of line circuit breakers,
9) P.A. Cluster, consisting of Passenger Alarm lighted push button, microphone,
10) Windshield Washer/Wiper Cluster, with wiper speed control (High Speed, Low Speed, Intermittent-infinitely variable),
11) Vigilance Alarm Buzzer,
12) Loud Speakers,
13) On board ATP Buzzer,
14) Fault Buzzers,
15) Miscellaneous Switches. (Horn, headlight (high/low beam), and
16) Gauges/voltmeter - such as speedometer, line voltage, Brake Cylinder pressure, main reservoir pressure, etc.
17) Speedometer

output load.

~~14.1.4~~14.1.6 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.

~~14.1.5~~14.1.7 Sufficient capacitor shall be equipped when the pantograph leaves from overhead catenary instantaneously, the power supply of APSE shall not stop. This guarantee time shall be reviewed by the Engineer.

~~14.1.6~~14.1.8 The Contractor shall submit the required capacity calculation considering 10 cars train-sets in the future extension and reviewed by the Engineer.

~~14.1.7~~14.1.9 The design of the auxiliary electrical system shall have sufficient capacity to provide backup power for normal operation of the emergency loads even in the event of lost overhead power. The design of the auxiliary electrical system and its capacity, including the backup power, shall be reviewed by the Engineer.

~~14.1.8~~14.1.10 This system shall have fuse and HSCB.

14.2 Auxiliary Power Supply Equipment

14.2.1 ~~Two (2) cars in the 8-cars train-set shall be equipped with~~The Auxiliary Power Supply Equipment (APSE) shall 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.

14.2.2 The APSE shall consist of but not limited to ~~an~~ auxiliary power inverter (Si-IGBT or Hybrid-SiC Technology, force ventilated), to supply all AC power, and a Low Voltage Power Supply (LVPS) to provide low voltage DC power.~~.~~ ~~And APS shall have~~ HSCB and Fuse to protect from over current.

14.2.3 When designing the auxiliary power inverter, particular care shall be taken to account for the simultaneous starting of large auxiliary loads, such that rapid cycling is avoided (particularly the VAC compressor). The inverter shall use a control scheme that contains extensive self-diagnostic logic, and receptacles shall be placed in the vehicle interior and exterior to allow the connections to any necessary test equipment.

14.2.4 The chassis of APSE shall be with the use of aluminum alloys or other suitable materials which suitable for use on railways vehicles which are subsequently subjected to vibration and shock owing to the nature of railway operating environment.~~.~~

14.2.5 The auxiliary power inverter output transformer shall be galvanically isolated, and the secondary windings shall incorporate a ground fault protection system. Upon detection of a ground fault, a fault message shall be transmitted to the TMS.

14.2.6 The LVPS shall provide the power to all system controls, including the Power Conversion Equipment, friction brakes (computer, brake control units, dump valves, etc.), VAC equipment, lighting, communication equipment, doors, radio, ATP, etc. The LVPS shall be solid-state and shall contain appropriate transient suppression and protective circuitry. The LVPS shall also incorporate appropriate fault and operation indicating lights and test switches. 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 behavior of instantaneous current and voltage etc. shall be required to be available for fault diagnostic analysis.

14.2.7 The output of the LVPS shall be routed to the low voltage distribution panel/cabinet

shall be reviewed by the Engineer.

14.1.8 The Contractor shall submit the required capacity calculation considering 10 cars train-sets in the future extension and reviewed by the Engineer.

14.1.9 The design of the auxiliary electrical system shall have sufficient capacity to provide backup power for normal operation of the emergency loads even in the event of lost overhead power. The design of the auxiliary electrical system and its capacity, including the backup power, shall be reviewed by the Engineer.

14.1.10 This system shall have fuse and HSCB.

14.2 **Auxiliary Power Supply Equipment**

14.2.1 The Auxiliary Power Supply Equipment (APSE) shall 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.

14.2.2 The APSE shall consist of but not limited to auxiliary power inverter (Si-IGBT or Hybrid-SiC Technology, force ventilated), to supply all AC power, and a Low Voltage Power Supply (LVPS) to provide low voltage DC power, HSCB and Fuse to protect from over current.

14.2.3 When designing the auxiliary power inverter, particular care shall be taken to account for the simultaneous starting of large auxiliary loads, such that rapid cycling is avoided (particularly the VAC compressor). The inverter shall use a control scheme that contains extensive self-diagnostic logic, and receptacles shall be placed in the vehicle interior and exterior to allow the connections to any necessary test equipment.

14.2.4 The chassis of APSE shall be with the use of aluminum alloys or other suitable materials which suitable for use on railways vehicles which are subsequently subjected to vibration and shock owing to the nature of railway operating environment.

14.2.5 The auxiliary power inverter output transformer shall be galvanically isolated, and the secondary windings shall incorporate a ground fault protection system. Upon detection of a ground fault, a fault message shall be transmitted to the TMS.

14.2.6 The LVPS shall provide the power to all system controls, including the Power Conversion Equipment, friction brakes (computer, brake control units, dump valves, etc.), VAC equipment, lighting, communication equipment, doors, radio, ATP, etc. The LVPS shall be solid-state and shall contain appropriate transient suppression and protective circuitry. The LVPS shall also incorporate appropriate fault and operation indicating lights and test switches. 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 behavior of instantaneous current and voltage etc. shall be required to be available for fault diagnostic analysis.

14.2.7 The output of the LVPS shall be routed to the low voltage distribution panel/cabinet inside the car. The negative return current from each subsystem shall run individually to the Engineer's reviewed insulated common point located in an enclosure under the car.

14.2.8 The entire Auxiliary Power Supply Equipment and controls shall be reviewed and commented by the Engineer.

14.2.9 If APS stops to operate by a serious failure, switch which can reset from the driver cab shall be installed.

within certain time and discharging time shall be subject to Engineer's review.

11.2 **Power Conversion Equipment**

11.2.1 The Power Conversion Equipment (PCE), and the Power Electronics Control Equipment (PECE) shall consist of all necessary equipment to condition the power supply system into a fully useable power supply to drive the traction motors under fully controlled conditions, meeting the requirements with respect to speed, acceleration, torque, and regenerative braking. Such equipment shall include, but not necessarily be limited to:

1) Inverter equipment,
2) Inverter controls,
3) Inverter protection equipment, except the main circuit breaker,
4) Propulsion system interface with the door control, the ATP systems, Running and stopping assistant system, emergency brake circuit, and TMS.
5) Propulsion system control interface with TMS

11.2.2 PECE shall be equipped to detect the onset of wheel slip and slide, and shall regulate the PCE to control the event. The PECE shall provide the regenerative brake feedback signal to the TMS to ensure smooth brake blending.

11.2.3 The PCE equipment shall be sufficiently convection cooled. The PCE enclosure shall be integrated with the vehicle design to ensure that the motion of the vehicle produces sufficient air flow across the cooling fins to produce the required heat transfer. The Contractor shall be required to demonstrate by calculation and by test that the maximum thermal stress upon the equipment will not result or contribute to reduction of PCE service life, under expected service conditions.

11.2.4 The inverter power semiconductors shall be housed in watertight, dust proof enclosures meeting IP55 requirements and shall be convection cooled. The devices shall not be protected by fuses.

11.2.5 The output of the propulsion inverters shall incorporate ground fault protection. Upon detection of a ground fault, the affected inverter shall be shut down. Three (3) successful detection of ground fault within a predetermined time shall cause the locking out of the inverter system and would only be reactivated by authorized personnel. A ground fault shall be enunciated in the Driver's Cab and shall be registered in the TMS.

11.2.6 The Power Conversion Equipment shall be provided with over-temperature protection, which shall initiate a reduced level of performance from the affected unit. Upon temperatures returning to normal, the PCE shall automatically be reset. PCE over-temperature shall be enunciated in the Driver's Cab and shall be registered in the TMS.

11.2.7 The material of chassis of PCE shall be with the use of aluminum alloys or other suitable materials which suitable for use on railways vehicles which are subsequently subjected to vibration and shock owing to the nature of railway operating environment. -

11.2.8 The propulsion equipment shall be of very high reliability, low maintenance and fit for purpose in a harsh operating environment to that in Manila.

11.2.9 The design of the entire propulsion system shall be submitted for review and comments by the Engineer.

11.2.10 If the load to regenerative power is insufficient, PECE shall limit the regenerative braking

11.2 Power Conversion Equipment

11.2.1 The Power Conversion Equipment (PCE), and the Power Electronics Control Equipment (PECE) shall consist of all necessary equipment to condition the power supply system into a fully useable power supply to drive the traction motors under fully controlled conditions, meeting the requirements with respect to speed, acceleration, torque, and regenerative braking. Such equipment shall include, but not necessarily be limited to:

1) Inverter equipment,
2) Inverter controls,
3) Inverter protection equipment, except the main circuit breaker,
4) Propulsion system interface with the door control, the ATP systems, Running and stopping assistant system, emergency brake circuit, and TMS.
5) Propulsion system control interface with TMS

11.2.2 PECE shall be equipped to detect the onset of wheel slip and slide, and shall regulate the PCE to control the event. The PECE shall provide the regenerative brake feedback signal to the TMS to ensure smooth brake blending.

11.2.3 The PCE equipment shall be sufficiently convection cooled. The PCE enclosure shall be integrated with the vehicle design to ensure that the motion of the vehicle produces sufficient air flow across the cooling fins to produce the required heat transfer. The Contractor shall be required to demonstrate by calculation and by test that the maximum thermal stress upon the equipment will not result or contribute to reduction of PCE service life, under expected service conditions.

11.2.4 The inverter power semiconductors shall be housed in watertight, dust proof enclosures meeting IP55 requirements and shall be convection cooled. The devices shall not be protected by fuses.

11.2.5 The output of the propulsion inverters shall incorporate ground fault protection. Upon detection of a ground fault, the affected inverter shall be shut down. Three (3) successful detection of ground fault within a predetermined time shall cause the locking out of the inverter system and would only be reactivated by authorized personnel. A ground fault shall be enunciated in the Driver's Cab and shall be registered in the TMS.

11.2.6 The Power Conversion Equipment shall be provided with over-temperature protection, which shall initiate a reduced level of performance from the affected unit. Upon temperatures returning to normal, the PCE shall automatically be reset. PCE over-temperature shall be enunciated in the Driver's Cab and shall be registered in the TMS.

11.2.7 The material of chassis of PCE shall be with the use of aluminum alloys or other suitable materials which suitable for use on railways vehicles which are subsequently subjected to vibration and shock owing to the nature of railway operating environment.

11.2.8 The propulsion equipment shall be of very high reliability, low maintenance and fit for purpose in a harsh operating environment to that in Manila.

11.2.9 The design of the entire propulsion system shall be submitted for review and comments by the Engineer.

11.2.10 If the load to regenerative power is insufficient, PECE shall limit the regenerative braking torque to proper regenerative braking torque while making maximum use of the regenerative braking torque considering not only catenary voltage but also the electric

3) Spare parts and consumables;

4) Five (5) sets of replacement cable and connector assemblies and a suitable amount of interface hardware for each piece of test equipment;

5) Any other parts/item necessary or required to complete the diagnostic tests; and

6) An external re-loadable software (in CD or USB) as back-up installer shall be made available in case the PTU/laptop software for diagnostics become corrupted.

24.7.6 There shall be no restriction (license) in the usage of the re-loadable software.

24.8 Main Special Tools and Diagnostic Test Equipment

24.8.1 The main Special Tools and Diagnostic Test Equipment are as follows, but not limited to them.

ID	Name
Light repair（2 depots）	Safety device tester
	Event recorder reader
	VVVF log reader
	Brake control unit log reader
	Rewriting device for internal display system
	Rewriting device for external display system
	Rewriting device for public address system
	Brake-pad replacement tool
PTU	VVVF
	BCU
	ACU
	Doors
	TMS
	APSE
Bogie removal	Radius arm gauge
Traction Motor	Motor disassembling/reassembling tools
	WM coupling extractor
	Non-disassembling bearing exchange special tool
Bogie	Bogie disassembling/reassembling special tools
	Lock bolt for axle spring
~~Tight lock c~~Coupler and draft gear	Special tool for draft gear
Air Conditioner	Special tool for air conditioner overhaul
	Refrigerant extractor
	Refrigerant filler
	Gas leak tester
	Cleaner for special parts
Electric Shop	HB tester
	High voltage device tester
	Contactor tester
	Solenoid valve tester
	Electronic relay tester
	Door operating device tester

ID	Name
	Safety device tester
	Event recorder reader and analyzer
	Failure data reading device
	Train radio tester
	Speed sensor tester
	VVVF inverter tester
	VVVF log reader
	Cleaner for special parts
Bearings	Special tool for bearing overhaul
Spring, Air Spring & Iron work	Special tool for air-spring overhaul
	Special tool for damper overhaul
Air Brake valve	Brake test equipment
	Brake control unit log reader
	Special tool for air valve overhaul
	Special tool for compressor overhaul
Final adjustment	Safety device tester
	Event recorder reader

24.8.2 The final special tools and diagnostic test equipment list shall be determined after the Operation and Maintenance (O&M) Manuals have been concluded.

24.8.3 If any additional special tools and diagnostic test equipment are identified during the development of the (O&M) Manuals, those items shall be added to the list proposed during the Bid and shall be provided by the Contractor. The cost for the additional special tools and diagnostic test equipment shall be deemed to have been included in the Price Schedules.

3) Spare parts and consumables;

4) Five (5) sets of replacement cable and connector assemblies and a suitable amount of interface hardware for each piece of test equipment;

5) Any other parts/item necessary or required to complete the diagnostic tests; and

6) An external re-loadable software (in CD or USB) as back-up installer shall be made available in case the PTU/laptop software for diagnostics become corrupted.

24.7.6 There shall be no restriction (license) in the usage of the re-loadable software.

24.8 Main Special Tools and Diagnostic Test Equipment

24.8.1 The main Special Tools and Diagnostic Test Equipment are as follows, but not limited to them.

ID	Name
Light repair（2 depots）	Safety device tester
	Event recorder reader
	VVVF log reader
	Brake control unit log reader
	Rewriting device for internal display system
	Rewriting device for external display system
	Rewriting device for public address system
	Brake-pad replacement tool
PTU	VVVF
	BCU
	ACU
	Doors
	TMS
	APSE
Bogie removal	Radius arm gauge
Traction Motor	Motor disassembling/reassembling tools
	WM coupling extractor
	Non-disassembling bearing exchange special tool
Bogie	Bogie disassembling/reassembling special tools
	Lock bolt for axle spring
Coupler and draft gear	Special tool for draft gear
Air Conditioner	Special tool for air conditioner overhaul
	Refrigerant extractor
	Refrigerant filler
	Gas leak tester
	Cleaner for special parts
Electric Shop	HB tester
	High voltage device tester
	Contactor tester
	Solenoid valve tester
	Electronic relay tester
	Door operating device tester
	Safety device tester

ID	Name
	Event recorder reader and analyzer
	Failure data reading device
	Train radio tester
	Speed sensor tester
	VVVF inverter tester
	VVVF log reader
	Cleaner for special parts
Bearings	Special tool for bearing overhaul
Spring, Air Spring & Iron work	Special tool for air-spring overhaul
	Special tool for damper overhaul
Air Brake valve	Brake test equipment
	Brake control unit log reader
	Special tool for air valve overhaul
	Special tool for compressor overhaul
Final adjustment	Safety device tester
	Event recorder reader

24.8.2 The final special tools and diagnostic test equipment list shall be determined after the Operation and Maintenance (O&M) Manuals have been concluded.

24.8.3 If any additional special tools and diagnostic test equipment are identified during the development of the (O&M) Manuals, those items shall be added to the list proposed during the Bid and shall be provided by the Contractor. The cost for the additional special tools and diagnostic test equipment shall be deemed to have been included in the Price Schedules.

Abbreviation	Original terms
VVVF	Variable Voltage Variable Frequency
V-LAN	Virtual LAN
W0	Vehicle Tare Weight
W1	W0 + Seated Passenger
W2	~~W1 + 4 passenger/meter standee~~ W0 + Seated Passengers + Standing passengers
W3	~~W1 + 7 passenger / meter standee~~ W2+ dynamic load and safety margin
~~**W4**~~	~~W3 + dynamic load and safety margin~~
WBS	Work Breakdown Structure
XLPO	Cross-linked polyolefin

Abbreviation	Original terms
VVVF	Variable Voltage Variable Frequency
V-LAN	Virtual LAN
W0	Vehicle Tare Weight
W1	W0 + Seated Passenger
W2	W0 + Seated Passengers + Standing passengers
W3	W2+ dynamic load and safety margin
WBS	Work Breakdown Structure
XLPO	Cross-linked polyolefin

commencement until completion of the Works.~~up to the point of issue of the TOC~~.

22.6.8.2 These cars may be purchased in accordance with existing laws, rules and regulations, or leased by the Contractor, or a combination of both arrangements, whichever is best suited for the particular situation subject to the Engineer's review.

22.6.8.3 Leased cars will go off-hire but any purchased cars shall be transferred to the Employer at this time.

22.6.8.4 For the Employer; 5 units – MPV or SUV, Diesel, automatic transmission.

22.6.8.5 Authorized drivers only shall be allowed to use the cars, which shall be well maintained to the appropriate standard.

22.7 Warranty/Guaranties

22.7.1 The Contractor shall warrant that the design, materials and workmanship incorporated and used in the production of each system and vehicle shall be free from defects and that system and its related components and apparatus comply with their corresponding specification and/or relevant data and drawings with consent of Engineer.

22.7.2 Guaranty Period

22.7.2.1 Unless otherwise specified, the guaranty period for the following components shall commence from the date of issue of Taking over Certificate, which shall be done after all action items has been closed out on the vehicle on which they are installed.

1) The vehicle body structure (including under frame and support brackets) and bogie frame shall be guaranteed for not less than 10~~30~~ years
2) The following equipment shall be guaranteed for an extended period of 5~~20~~ years:
    a) Major components of bogie system (bogie frame, axles, suspensions, Traction Motors, gearboxes, etc.),
    b) Painting: Corrosion Protection, and
    c) Glass.
3) The vehicle batteries shall be guaranteed for not less than three (3~~5~~) years.
4) All other vehicle components and system shall be guaranteed for a period of two~~five~~ (2~~5~~)) years.

22.7.3 Responsibility of the Contractor

22.7.3.1 Under this warranty/guaranty, the Contractor shall be responsible, at his own cost and expense (including cost of removal and installation), for the repair and/or replacement of each component or apparatus which, under normal use and maintenance becomes defective or inadequate in the performance of its function during the guaranty period, or during such period fails to comply with the ERT.

22.7.3.2 Should the removal or replacement of a failed component or apparatus cause removal or replacement of any other equipment or parts, such work and related cost shall be borne by the Contractor.

22.7.3.3 The warranty/guaranty covering any component or apparatus repaired or replaced by the Contractor shall be renewed for a period equal to the period of the original

commencement until completion of the Works..

22.6.8.2 These cars may be purchased in accordance with existing laws, rules and regulations, or leased by the Contractor, or a combination of both arrangements, whichever is best suited for the particular situation subject to the Engineer's review.

22.6.8.3 Leased cars will go off-hire but any purchased cars shall be transferred to the Employer at this time.

22.6.8.4 For the Employer; 5 units – MPV or SUV, Diesel, automatic transmission.

22.6.8.5 Authorized drivers only shall be allowed to use the cars, which shall be well maintained to the appropriate standard.

22.7 **Warranty/Guaranties**

22.7.1 The Contractor shall warrant that the design, materials and workmanship incorporated and used in the production of each system and vehicle shall be free from defects and that system and its related components and apparatus comply with their corresponding specification and/or relevant data and drawings with consent of Engineer.

22.7.2 Guaranty Period

22.7.2.1 Unless otherwise specified, the guaranty period for the following components shall commence from the date of issue of Taking over Certificate, which shall be done after all action items has been closed out on the vehicle on which they are installed.

1) The vehicle body structure (including under frame and support brackets) and bogie frame shall be guaranteed for not less than 10 years
2) The following equipment shall be guaranteed for an extended period of 5 years:
    a) Major components of bogie system (bogie frame, axles, suspensions, Traction Motors, gearboxes, etc.),
    b) Painting: Corrosion Protection, and
    c) Glass.
3) The vehicle batteries shall be guaranteed for not less than three (3) years.
4) All other vehicle components and system shall be guaranteed for a period of two (2)) years.

22.7.3 Responsibility of the Contractor

22.7.3.1 Under this warranty/guaranty, the Contractor shall be responsible, at his own cost and expense (including cost of removal and installation), for the repair and/or replacement of each component or apparatus which, under normal use and maintenance becomes defective or inadequate in the performance of its function during the guaranty period, or during such period fails to comply with the ERT.

22.7.3.2 Should the removal or replacement of a failed component or apparatus cause removal or replacement of any other equipment or parts, such work and related cost shall be borne by the Contractor.

22.7.3.3 The warranty/guaranty covering any component or apparatus repaired or replaced by the Contractor shall be renewed for a period equal to the period of the original

1.13.3 The Contractor shall implement test runs to measure the ride quality level and the ride quality coefficient. The maximum ride index shall be calculated in new and worn wheel profile condition, both in the vertical and lateral planes, under tare and fully loaded conditions up to 160 km/h, for all different types of vehicle of a trainset. The tests will be performed using the standard new profile, and the fully worn profile. The ride quality level and the ride quality coefficient shall be calculated by Japanese manner or other applicable or equivalent international methods/standards/qualities. The results and the process of calculation shall be submitted for review by the Engineer. If the results would be worse than the calculated value, the Contractor shall investigate the cause and shall propose the corrective step to be taken for improvement.

1.14 Maintainability Requirements

1.14.1 In addition to the requirements specified elsewhere herein, the vehicles shall be designed to meet the following criteria: The detailed schedule and intervals are required to be submitted at design stage.

1) On the premise that various maintenance shown in the following is to be carried out, other special maintenance work should not be required.

2) The Contractor shall ensure all sub assembly and on-board systems inspection intervals shall harmonize.

Table 1: Basic Rolling Stock Maintenance Categories

Category		Period	Maintenance Content
Departure Inspection		Before departure	Check in-service monitoring, visual check of major parts of cars. Driver check on visual from ground level, internal for passenger comfort, functional a/s. doors etc.
Light Maintenance	Weekly Inspection	Within 6 days mileage preferred, supplier to state	Check status of bogies, wheels, pantograph, doors and other items while cars are connected. Replace consumables for brakes, pantographs and other items.
	Monthly Inspection	Within 3 months (90 days) mileage preferred, over a pit including roof access	Confirm the status of cars and their functions while cars are connected. Replace consumables, measure voltage of auxiliary circuits, control circuit and other circuits, inspect functioning of main circuit, etc.
Heavy Maintenance	Semi overhaul	Within 4 years or Within 600,000 km whichever comes first.	Remove bogies, wheels, wheel axles, brakes, main motors and other major parts, perform detailed inspection and replace parts
	Overhaul	Within 8 years or Within 1,200,000 km whichever comes first.	Disassemble almost all parts, perform detailed inspection of devices. Paint carbody.

Category		Period	Maintenance Content
	General overhaul (Renewal)	Every 12 to 15 years	General overhaul shall carry out replacement of the major electronic parts with new one. If it is necessary, the interior is renewed.
Other Maintenance	Unscheduled Repair	Whenever necessary	Replace broken-down parts. (bogies, pantograph, air conditioner, etc.).
	Wheel re-profiling	150,000km (after starting service revenue operation)	Use wheel profiler to correct wheel shape and maintain ride comfort level.
	Axle NDT/UAT	based on design, likely 150,000km	

1.14.2 This table 1 above to be considered as a guide. Contractor to specify and provide "star chart" containing intervals, inspection level and component. Full details to appear with spares required, tools etc. and safety instructions in the maintenance manual and procedures.

1.14.3 The period of wheel re-profiling should be finally revised based on the condition of wheel profile after commercial use.

1.14.4 All units or sub-assemblies requiring replacement or off-train adjustment shall be arranged for easy unit exchange.

1.14.5 Equipment and systems shall be accessible for inspection, maintenance and repair with minimum strain to people involved. The Contractor shall ensure that all maintenance considerations are duly incorporated into the design of the train including health and safety of maintenance personnel, human factors, accessibility for maintenance, interface with depot maintenance facilities and optimize the use of line replaceable units/workshop replaceable units.

1.14.6 The Contractor shall submit a detailed work process chart illustrating how the medium and major maintenance requirement shall be achieved. The work process shall indicate work tasks, labor, tools, and material/component requirements, supplemented by workload in terms of manhours, a critical path analysis. The complete work process shall be subjected to a maintenance demonstration to confirm the validity of the work process model.

1.14.7 For purposes of defining the maintenance requirement of each consist, the yearly-accumulated kilometer run shall be about 280,000 km.

1.14.8 The Contractor shall schedule the maintenance work meeting for maintainability requirements in consideration of the component design life.

1.15 General Electrical Requirements

1.15.1 Electric-Magnetic Compatibility (EMC)

1.15.1.1 Conducted and radiated Electro-Magnetic Interference/Radio Frequency Interference (EMI/RFI) shall be held to a minimum commensurate with good design practices, and in no case shall signal levels be permitted which interfere with, or compromise, the operation of on-board signal equipment, on-board intercom equipment or Ultra High Frequency (UHF) radio equipment. EMI/RFI or any other form of interference shall not affect the proper and safe operation of through service in MCRP, NSCR and NSRP-S

be worse than the calculated value, the Contractor shall investigate the cause and shall propose the corrective step to be taken for improvement.

1.14 Maintainability Requirements

1.14.1 In addition to the requirements specified elsewhere herein, the vehicles shall be designed to meet the following criteria: The detailed schedule and intervals are required to be submitted at design stage.

1) On the premise that various maintenance shown in the following is to be carried out, other special maintenance work should not be required.

2) The Contractor shall ensure all sub assembly and on-board systems inspection intervals shall harmonize.

Table 1: Basic Rolling Stock Maintenance Categories

Category		Period	Maintenance Content
Departure Inspection		Before departure	Check in-service monitoring, visual check of major parts of cars. Driver check on visual from ground level, internal for passenger comfort, functional a/s. doors etc.
Light Maintenance	Weekly Inspection	Within 6 days mileage preferred, supplier to state	Check status of bogies, wheels, pantograph, doors and other items while cars are connected. Replace consumables for brakes, pantographs and other items.
	Monthly Inspection	Within 3 months (90 days) mileage preferred, over a pit including roof access	Confirm the status of cars and their functions while cars are connected. Replace consumables, measure voltage of auxiliary circuits, control circuit and other circuits, inspect functioning of main circuit, etc.
Heavy Maintenance	Semi overhaul	Within 4 years or Within 600,000 km whichever comes first.	Remove bogies, wheels, wheel axles, brakes, main motors and other major parts, perform detailed inspection and replace parts
	Overhaul	Within 8 years or Within 1,200,000 km whichever comes first.	Disassemble almost all parts, perform detailed inspection of devices. Paint carbody.
	General overhaul (Renewal)	Every 12 to 15 years	General overhaul shall carry out replacement of the major electronic parts with new one. If it is necessary, the interior is renewed.
Other Main tenan	Unscheduled Repair	Whenever necessary	Replace broken-down parts. (bogies, pantograph, air conditioner, etc.).

Category		Period	Maintenance Content
	Wheel re-profiling	150,000km (after starting service revenue operation)	Use wheel profiler to correct wheel shape and maintain ride comfort level.
	Axle NDT/UAT	based on design, likely 150,000km	

1.14.2 This table 1 above to be considered as a guide. Contractor to specify and provide "star chart" containing intervals, inspection level and component. Full details to appear with spares required, tools etc. and safety instructions in the maintenance manual and procedures.

1.14.3 The period of wheel re-profiling should be finally revised based on the condition of wheel profile after commercial use.

1.14.4 All units or sub-assemblies requiring replacement or off-train adjustment shall be arranged for easy unit exchange.

1.14.5 Equipment and systems shall be accessible for inspection, maintenance and repair with minimum strain to people involved. The Contractor shall ensure that all maintenance considerations are duly incorporated into the design of the train including health and safety of maintenance personnel, human factors, accessibility for maintenance, interface with depot maintenance facilities and optimize the use of line replaceable units/workshop replaceable units.

1.14.6 The Contractor shall submit a detailed work process chart illustrating how the medium and major maintenance requirement shall be achieved. The work process shall indicate work tasks, labor, tools, and material/component requirements, supplemented by workload in terms of manhours, a critical path analysis. The complete work process shall be subjected to a maintenance demonstration to confirm the validity of the work process model.

1.14.7 For purposes of defining the maintenance requirement of each consist, the yearly-accumulated kilometer run shall be about 280,000 km.

1.14.8 The Contractor shall schedule the maintenance work meeting for maintainability requirements in consideration of the component design life.

1.15 General Electrical Requirements

1.15.1 Electric-Magnetic Compatibility (EMC)

1.15.1.1 Conducted and radiated Electro-Magnetic Interference/Radio Frequency Interference (EMI/RFI) shall be held to a minimum commensurate with good design practices, and in no case shall signal levels be permitted which interfere with, or compromise, the operation of on-board signal equipment, on-board intercom equipment or Ultra High Frequency (UHF) radio equipment. EMI/RFI or any other form of interference shall not affect the proper and safe operation of through service in MCRP, NSCR and NSRP-S section and any other local facilities.

1.15.1.2 Electrostatic and magnetic electrical shielding methods shall be employed to minimize the effect of stray signals and transient voltage on low level interconnecting cables.

1.15.1.3 Components and functional circuits shall be grouped according to their similar sensitivities to electrical interference and power supply needs and grouped to reduce the effects of voltage drops in the ground circuits, power and return leads, and shall be

15.1.4 All wires shall be labelled at connection of terminal or connectors with identifying numbers indicated in wiring diagrams and terminal numbers or pin numbers of connectors.

15.1.5 All labels used shall be highly durable, scratch and chemical resistant and have high UV resistance.

16 PUBLICITY AND PUBLIC RELATIONS

16.1 General

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 responsibilities of the Contractor shall, without limitation, include:

1) Coordinate public relations matters and exercises with the Engineer and keep the Engineer informed at all times of relevant issues;

2) Engage and liaise with relevant local government departments, other authorities and key stakeholders to develop and coordinate public relations exercises;

3) Establish a sense of partnership among the government and stakeholder groups in the implementation of the Project;

4) Promote the Project to the public and the parties concerned with a positive message and explain the benefits which shall be realized by the development of the Project;

5) Gain support and minimize objections from the community and concerned parties;

6) Ensure adequate transparency of the Project to the public and key stakeholders;

7) Implement a robust process for receiving, addressing and tracking comments, criticism and complaints from all parties during the Contract;

8) Resolve public relations issues arising during the course of construction and elevate major issues to the Employer via the Engineer, as required;

9) Prevent and/or mitigate any nuisance or disturbance to the public due to the construction activities at the earliest possible time;

10) -Attend and answer queries for the purpose of public consultation including but not limited to LGUs, MMDA, PNR, Emergency Services, Stakeholders, the Employer, related competent agencies, Non-Governmental Organizations (NGOs) or individual members of the public, local authorities and people in the affected areas, during ~~and outside~~ normal office hours;

11) Prepare and supply all necessary drawings, photomontages, documents, consultation papers, presentations, display materials, etc. for public consultations; and

12) Provide assistance and information to facilitate all Public Relations (PR) activities as per the PR Plan and as instructed by the Employer and the Engineer.

16.1.2 The Contractor shall nominate a qualified and experienced Public Relations Manager to manage and coordinate the required public relations responsibilities.

16.2 Public Relations Plan

16.2.1 The PR Plan shall include the methodology, specific ways and actions to be carried out for informing and consulting the public and promotion of the Project. The PR Plan shall also include the methodology specific ways and actions to handle reactions from the

15.1.4 All wires shall be labelled at connection of terminal or connectors with identifying numbers indicated in wiring diagrams and terminal numbers or pin numbers of connectors.

15.1.5 All labels used shall be highly durable, scratch and chemical resistant and have high UV resistance.

16 PUBLICITY AND PUBLIC RELATIONS

16.1 General

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 responsibilities of the Contractor shall, without limitation, include:

1) Coordinate public relations matters and exercises with the Engineer and keep the Engineer informed at all times of relevant issues;
2) Engage and liaise with relevant local government departments, other authorities and key stakeholders to develop and coordinate public relations exercises;
3) Establish a sense of partnership among the government and stakeholder groups in the implementation of the Project;
4) Promote the Project to the public and the parties concerned with a positive message and explain the benefits which shall be realized by the development of the Project;
5) Gain support and minimize objections from the community and concerned parties;
6) Ensure adequate transparency of the Project to the public and key stakeholders;
7) Implement a robust process for receiving, addressing and tracking comments, criticism and complaints from all parties during the Contract;
8) Resolve public relations issues arising during the course of construction and elevate major issues to the Employer via the Engineer, as required;
9) Prevent and/or mitigate any nuisance or disturbance to the public due to the construction activities at the earliest possible time;
10) Attend and answer queries for the purpose of public consultation including but not limited to LGUs, MMDA, PNR, Emergency Services, Stakeholders, the Employer, related competent agencies, Non-Governmental Organizations (NGOs) or individual members of the public, local authorities and people in the affected areas, during normal office hours;
11) Prepare and supply all necessary drawings, photomontages, documents, consultation papers, presentations, display materials, etc. for public consultations; and
12) Provide assistance and information to facilitate all Public Relations (PR) activities as per the PR Plan and as instructed by the Employer and the Engineer.

16.1.2 The Contractor shall nominate a qualified and experienced Public Relations Manager to manage and coordinate the required public relations responsibilities.

16.2 Public Relations Plan

16.2.1 The PR Plan shall include the methodology, specific ways and actions to be carried out for informing and consulting the public and promotion of the Project. The PR Plan shall also include the methodology specific ways and actions to handle reactions from the

Project, Schedule of Prices events of the construction activities and mitigation measures taken to minimize the impact to the public. Ways of communication channels shall also be published in the newsletters such as the website, and phone numbers of the enquiry hotline.

16.4.3 On-Site Notice

16.4.3.1 The Contractor shall post on-site notices with the guidance of the Engineer with a clear description of the Works and indication of anticipated completion dates together with the enquiry hotline and internet website information. Advance notices shall be given in carrying out the Works which maximize the impact on local residents.

16.4.4 Hotline

16.4.4.1 The Contractor shall set up a twenty-four (24) hour hotline with the guidance of the Engineer to provide enquiry services to the public and the Contractor shall ensure queries and enquiries regarding the Works are taken seriously and dealt with swiftly.

16.4.4.2 Whenever a complaint is received, response shall be made within seven (7) calendar days. If a longer processing time is needed, an interim reply shall be served to the complainant within seven (7) calendar days.

~~16.4.5 Construction Site Tour~~

~~16.4.5.1 The Contractor shall cooperate with and provide periodic tours of the Works to the public and stakeholders during the construction period. The main target audiences are stakeholders, ordinary families and students. Site visitors can become a means for advertising and promoting the benefit of MCRP/NSRP-S projects. Tours shall be planned at least once in every three months, subject to the Engineer's review.~~

~~16.4.6~~16.4.5 Coordination with Other Contractors

~~16.4.6.1~~16.4.5.1 The Contractor shall coordinate with external interfacing parties and interface contractors in the implementation of public relations activities.

~~16.4.7~~16.4.6 Measurement and Payment

~~16.4.7.1~~16.4.6.1 No separate payment shall be paid for preparing and submitting the public relations plan, public consultation, and public relation tools all associated costs shall be deemed to be included in the other BOQ items describe above.

17 (NOT USED)

18 REQUIREMENTS MANAGEMENT

18.1 General

18.1.1 The Contractor shall use ComplyPro software to manage the requirements and supply a total of three (3) licenses for the Engineer and Employer. All the cost associated to the software usage and maintenance (including the licenses supplied to the Engineer and Employer) shall be under Contractor own cost. The licenses shall be maintained until the issuance of the Performance Certificate for the final trainset. The Contractor shall appoint a suitably qualified and competent persons to carry out requirements management.

18.1.2 The Contractor shall prepare and submit to the Engineer a Requirement Management Plan within thirty (30) days of the date of the commence date. The Requirement Management Plan shall define the processes employed by the Contractor to ensure that all appropriate requirements are managed to ensure the proposed design solution meets the design requirements and demonstrated through verification and validation evidence. The Requirement traceability database will be managed through the rational database;

Project, Schedule of Prices events of the construction activities and mitigation measures taken to minimize the impact to the public. Ways of communication channels shall also be published in the newsletters such as the website, and phone numbers of the enquiry hotline.

16.4.3 On-Site Notice

16.4.3.1 The Contractor shall post on-site notices with the guidance of the Engineer with a clear description of the Works and indication of anticipated completion dates together with the enquiry hotline and internet website information. Advance notices shall be given in carrying out the Works which maximize the impact on local residents.

16.4.4 Hotline

16.4.4.1 The Contractor shall set up a twenty-four (24) hour hotline with the guidance of the Engineer to provide enquiry services to the public and the Contractor shall ensure queries and enquiries regarding the Works are taken seriously and dealt with swiftly.

16.4.4.2 Whenever a complaint is received, response shall be made within seven (7) calendar days. If a longer processing time is needed, an interim reply shall be served to the complainant within seven (7) calendar days.

16.4.5 Coordination with Other Contractors

16.4.5.1 The Contractor shall coordinate with external interfacing parties and interface contractors in the implementation of public relations activities.

16.4.6 Measurement and Payment

16.4.6.1 No separate payment shall be paid for preparing and submitting the public relations plan, public consultation, and public relation tools all associated costs shall be deemed to be included in the other BOQ items describe above.

17 (NOT USED)

18 REQUIREMENTS MANAGEMENT

18.1 General

18.1.1 The Contractor shall use ComplyPro software to manage the requirements and supply a total of three (3) licenses for the Engineer and Employer. All the cost associated to the software usage and maintenance (including the licenses supplied to the Engineer and Employer) shall be under Contractor own cost. The licenses shall be maintained until the issuance of the Performance Certificate for the final trainset. The Contractor shall appoint a suitably qualified and competent persons to carry out requirements management.

18.1.2 The Contractor shall prepare and submit to the Engineer a Requirement Management Plan within thirty (30) days of the date of the commence date. The Requirement Management Plan shall define the processes employed by the Contractor to ensure that all appropriate requirements are managed to ensure the proposed design solution meets the design requirements and demonstrated through verification and validation evidence. The Requirement traceability database will be managed through the rational database; "ComplyPro".

18.1.3 The Contractor shall develop a database of all requirements associated with a number of definition documents defined such as but not limited to, the ERG and ERT. The Contractor will then provide evidence that the identified requirements have been managed appropriately. The database shall:

l) Ensure that the criteria for the purpose of verification and validation of the