



General Bid Bulletin No. 10
25 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. 10
Annex A

Item No.	Volume Section No. Page No. Clause No. / Title Reference Text	Clarification Request	Proposed Revised Text (if any)	Response
1.	Volume I of III, INVITATION FOR BIDS, IFB-2 7	<p>Bid must be delivered to the address above on or before 10:00 AM on 28 May 2021 and...</p> <p>Considering the complexity and difficulty of the requirements of the limited express trainsets in the Bidding Documents, the Bidder not only requires thorough review of the Bidding Documents, but also conducts series of meetings and discussions with its potential suppliers before submitting its proposal to DOTr.</p>	<p>Bid must be delivered to the address above on or before 10:00 AM on 28 May 15 September 2021 and...</p>	<p>Please refer to the General Bid Bulletin published at the websites as stipulated in BDS ITB 7.1.</p>
	SECTION II. BID DATA SHEET BDS-10 ITB 27.1	<p>The opening of the... Date: 28 May 2021 Time: 10:00 AM</p> <p>The due date of May 28, 2021 for both Technical and Price Proposals allows only three (3) months to put together this very important bid proposals, and jeopardizes our ability to obtain the detailed information</p>	<p>The opening of the... Date: 28 May 15 September 2021 Time: 10:00 AM</p>	

		<p>requested in this Bidding Documents from our potential suppliers.</p> <p>As such, to assure sufficient time for proposal preparation is available, we respectfully request an extension of three (3) months for submittal of the bid proposals.</p>		
2.	<p>Volume III of III SECTION VIII, Particular Conditions PC-8 Attachment 1, Summary of Key Dates</p>	<p>While KD 1 requires the Contractor to complete the Final Design Review in 18 months from commencement of this Contract, this Final Design Review covers not only submittal of design information, but also Employer’s review and approval of submitted design information, which is beyond the control of the Contractor.</p> <p>Additionally, it is understood that the Engineer’s Mock Up review will be conducted in Contractor’s design/manufacturing facility during the Design Review stages so that the Contractor can accommodate the Engineer’s comments, if any, and finalize its design for his/her final review and approval.</p> <p>Considering the required design activities including the Engineer’s design review/approval process and its Mock Up review process, we believe that it is not feasible to achieve KD 1 as currently-specified in Attachment 1 and therefore, the Bidder respectfully requests DOTr to delete the requirement of KD 1 from the Attachment</p>		<p>The bidder’s request is rejected. However, please refer to the Annex B for the amendment in Attachment 1 – Summary of Key Dates.</p>

		<p>1, or to reconsider revising the Achievement to “Submittal of documentation for the Final Design Review”.</p> <p>Unfortunately, however, if the above proposal is not acceptable to DOTr, please consider waving its right to assess delay damage for KD 1 in the event that (i) the Contractor fails to comply with KD 1, but (ii) the Contractor is able to comply with KD 6. In order for DOTr to start its revenue service as planned, delivery and completion of the testing of all trainsets in a timely manner is the mutual goal for both DOTr and the Contractor and so, we believe that it is most important for both of us to meet the schedule of KD 6. Please review our proposals above and consider accepting any of the above.</p>		
3.	<p>Volume III of III SECTION VIII, Particular Conditions PC-8 Attachment 1, Summary of Key Dates PC-11 Attachment 2, Time for Access to the Site</p>	<p>In order for the Contractor to meet the KD 1 of “Completing Final Design Review” by 18 months, any and all interface design information of the on-board Signaling System and other equipment to be mounted on the Rolling Stock supplied by CP NS-01 Contractor from E&M Systems and Track Works needs to be provided by the Employer during the Conceptual Design stage. Please include this Access Date in Attachment 2.</p>		<p>The bidder’s request is rejected. However, please refer to the Annex B for the amendment in Attachment 1 – Summary of Key Dates.</p>

4.	<p>Volume III of III SECTION VIII, Particular Conditions PC-8 Attachment 1, Summary of Key Dates</p> <p>Volume II of III SECTION VI, Employer's Requirements ERT-130 20.6.2</p>	<p>It is understood that the Contractor is required to support the Employer during the Trial Operation as specified in 20.6.2 of ERT, which means that the Employer is fully responsible to undertake the Trial Operations in cooperation with all related contractors. In this case, the Trial Operation is beyond the control of the Bidder and so, please eliminate KD 8 from the Attachment 1.</p>	<p>KD-8 Achievement: Completion of Trial Operation support and the whole of the Works. 53 months</p>	<p>The bidder's request is rejected. However, please refer to the Annex B for the amendment in Attachment 1 – Summary of Key Dates.</p>
5.	<p>Volume III of III SECTION VIII, Particular Conditions PC-8 Attachment 1, Summary of Key Dates PC-11 Attachment 2, Time for Access to the Site</p>	<p>While 20.6.8 of ERT specifies that all trains run the entire line during the Trial Operation, according to the Attachment 2 [Time for Access to the Site], the whole mainline from Calamba to CIA can be accessed in 77 months from the commencement of this Contract. When KD 6 is achieved, the mainline from CIA to Clark only is available and so, the Trial Operation will be conducted on the mainline from CIA to Clark. Please confirm this. In addition, please specify expected duration of the Trial Operation, where the Bidder is required to support the Employer's Trial Operation.</p>	<p>-NA-</p>	<p>Please refer to the Annex B for the amendment in Attachment 1 – Summary of Key Dates</p>

	<p>Volume II of III SECCION VI, Employer's Requirements ERT-131 20.6.8</p> <p>General Bid Bulletin No.4 Annex B PC-11 Attachment 2, Time for Access to the Site</p>			
6.	<p>Volume II Section VI ERT-2 1.2.3 ERT-34 2.8.1.8 ERT-35 Compatibility with MCRP, NSCR and NSRP-S</p>	<p>The Bidder is required to confirm that equipment arrangement of rolling stock in MCRP, NSCR and NSRP-S, and equipment arrangement of the Limited Express Trainsets shall be unified as possible in accordance with ERT 1.2.3. 2.8.1.8 and 2.8.1.9. Accordingly, the Bidder requests the Employer to provide the following essential information which is crucial in preparation of the bid proposal to comply the requirement.</p> <ol style="list-style-type: none"> 1. Equipment arrangement of the drivers cab, interior, roof, and underfloor with outline of each equipment including constraints such as cooling space, wire 	-NA-	<p>The requested information is not available to this time. This information shall be the Contractor obligation under the contract. Please refer to clause 1.3 – Scope of Work (Pg. SOW-1).</p>

		<p>separation, mounting direction etc.</p> <p>2. Air piping arrangement including test valves, valves and cocks</p>		
7.	<p>Volume II Section VI ERT-13 1.11.2.6 Brake reaction time</p>	<p>b) Emergency application: <u>1.2</u> seconds</p> <p>Since emergency brake will be applied on both of health train and failed train under the rescue operation, the Bidder considers that it is better to match the performance of emergency brake with NSCR, MCRP and NSRP-S project from compatibility perspective. Therefore, the Bidder requests the Employer to amend the response time of emergency application.</p>	<p>b) Emergency application: <u>1.5</u> seconds</p>	<p>Bidder request is noted.</p> <p>Please see Annex B.</p>
8.	<p>Volume II Section VI ERT-15 1.12.2.1 Vibration</p>	<p>This clause specifies the acceleration value of 0.315 m/sec², but it needs to define the frequency range for the vibration evaluation. Since the frequency range is not specified even in ISO 2631 or any equivalent international standards, the Bidder considers that the frequency range should be below 20 Hz in accordance with clause 1.12.2.3 2). Please confirm the foregoing understanding is correct.</p>	-NA-	<p>Vibration requirement has been updated.</p> <p>Please refer to Annex B.</p>
9.	<p>Volume II Section VI ERT-30 1.21.9 Automatic extended platform gap filler</p>	<p>The Contractor shall provide the automatic extended platform gap filler in the event of the platform gap between the carbody and the platform to address person with disability access and the risk of passenger trap in between the gap.</p>	<p>The Contractor shall provide the automatic extended platform gap filler in the event of the platform gap between the carbody and the</p>	<p>Bidder request is rejected.</p>

		In general, the automatic gap filler is equipped on the PSD or platform in order to accommodate with various gaps for each stopping position at each station. Accordingly, the Bidder requests the Employer to exclude this requirement from the scope of work of CP NS-03: Rolling Stock.	platform to address person with disability access and the risk of passenger trap in between the gap.	
10.	Volume II Section VI ERT-31 ERT 2.2.3 ERT 2.2.7 Carbody flatness	ERT 2.2.3: All body panels shall be free from wrinkles and other imperfections and shall be flat within <u>1 mm</u> in any 1 m span. ERT 2.2.7 The exterior of the carbody shall be polished finish <u>aluminum left un-painted.</u> The Bidder is of the opinion that applying putty, polishing the exterior of the carbody, and painting the surface is necessary to satisfy the requirement "flatness shall be within 1 mm in any 1 m span" stipulated in ERT 2.2.3. The Bidder requests the Employer to accept the foregoing proposal or amend the requirement of flatness of the carbody exterior as proposed revised text.	ERT 2.2.3 All body panels shall be free from wrinkles and other imperfections and shall be flat within <u>3 mm</u> in any 1 m span. or ERT 2.2.7 The exterior of the carbody shall be polished finish <u>stainless steel or aluminum with primer and accepted finishing paint.</u>	ERT 2.2.3 was updated. Please refer to GBB No. 7 dated 12 May 2021.
11.	Volume II Section VI ERT-33 2.4.3 Crash Worthiness	This clause allows the Contractor to propose an alternate crash worthiness in accordance with "Japanese Ministerial Ordinance, MLIT or EN 15227 C-111 or equivalent". Therefore the Bidder proposes to select Japanese Ministerial Ordinance (MLIT) of	-NA-	Bidder understanding is correct in the proposed selection of standard reference. However, the contractor shall ensure that factors to be considered shall

		crash worthiness, which defines the collision of train and truck at railroad crossings, among a several standards based on a huge amount of experiences of Japanese railways including express service trains. Please clarify our understanding is correct.		applicable to the intended operation of the Limited Express train not only limited to the collision of train and truck at railroad crossings.
12.	Volume II Section VI ERT-34 2.8.1.2 Wheel load	Note when fully assembles wheel load on a vehicle shall be less than +/-5% The Bidder will comply with the requirement of imbalance wheel load stipulated in ERT 2.8.1.1 which is same requirement in MLIT. However, the Bidder requests the Employer to clarify the meaning /definition of a requirement in this clause “when fully assembles wheel load on a vehicle shall be less than +/-5%” or remove this requirement.	-NA-	Bidder request is noted. Please see Annex B.
13.	Volume II Section VI ERT-34 2.8.1.6 ERT-134 21.2.9 Under-frame mounted equipment	The Bidder is of the opinion that applying the “Hard lock Nut”to mounting of the under-floor equipment which suspended directly from the underframe is sufficient for prevention of fastener loosening and to ensure that breakage or loss of the mounting will not occur. In addition, as far as the Bidder confirms the bidding documents for NSCR, MCRP and NSRP-S, the Bidder understands that the provision under clause 21.2.9 is not required. With the objective of the maintenance perspective, it is preferable that this requirement should be the same as the aforementioned projects. Therefore, the	21.2.9 For <u> </u> equipment suspended from the underframe, the load of the equipment on each bolt shall not the clamp load of the bolt. Set screws shall not be used. Where practical, load on the bolts shall be no greater that that exerted when the bolt is tightened to its	Bidder request is rejected. The requirement shall be demonstrated complied or unless otherwise, during the design stage and any further request for omission or relaxation shall be subjected to the review and given notice of no objection by the Engineer.

		Bidder humbly requests the Employer to delete the provision under clause 21.2.9.	recommended torque. When practical loads shall be on structural cross beams etc. Huck bolts can be used according to their strength specification.	
14.	Volume II Section VI ERT-37 3.1.15 c) Method of Evaluation, derailment coefficient	The bidder proposes to evaluate that ratio of the results to limited derailment coefficient, calculated by Nadal's formulation, are lower than predetermined values by applying carbody floor level measurement as Q/P measurement based on "INCREASING RUNNING SPEED ON CONVENTIONAL RAIL LINES Test Manual and Commentary" edited by Railway Technical Research Institute supervised by MLIT, which, we assume, complies with this requirement. The bidder considers that it is crucial to measure carbody floor level at specific running section which is typical track and most severe track for maximum car speed on straight track and curve track, and low speed on turnout. The Bidder requests the Employer to confirm the foregoing proposal for evaluation of the requirement complies with the requirement of clause 3.1.15 c).	-NA-	The Employer is unable to confirm with the bidder request. The requirement compliance demonstration shall be done during the project execution. Please see Annex B for the updated clause number for this requirement.
15.	Volume II Section VI ERT-41 3.10.1	Under all conditions of movement between the bogies and the carbody, including fully inflated and deflated air spring conditions, there shall basically exist a minimum	Clearance between the bogie-mounted and carbody-mounted equipment shall be	Bidder request is rejected.

	Minimum clearance between bogie-mounted and carbody-mounted equipment	<p>clearance of 50 mm between bogie-mounted and carbody-mounted equipment. This shall include any end of the vehicle having fully inflated air springs, with the opposite end having deflated air springs.</p> <p>The Bidder is of the opinion that the requirement "there shall basically exist a minimum clearance of 50 mm between bogie-mounted and carbody-mounted equipment under all conditions" is excessive for the reason provided below.</p> <p>Under the normal static condition, there will basically exist a minimum clearance of 50mm between the bogie and the carbody.</p> <p>However, it is not feasible to maintain a minimum clearance of 50mm even if the train faces air spring deflection and/or maximum rotational movement of bogie under the dynamic condition, etc. The bidder is of the opinion that it is important prevention of interference between bogie-mounted and carbody-mounted equipment under all conditions. Accordingly, the Bidder requests the Employer to amend the requirement as proposed revised text.</p>	designed to prevent any interference under worst case operating conditions including single failure condition.	
16.	Volume II Section VI ERT-42 3.11.4 fatigue test for bogie frame	For a new design bogie, fatigue testing is required. If the bogie is nominally identical to other products from the same supplier, the fatigue tests of the bogie shall be submitted to the Engineer for given the statement on No Objection.	For a new design bogie, fatigue testing <u>of the bogie frame</u> is required. If the bogie is nominally identical to other products from	Bidder request is noted. Please see Annex B.

		<p>The Bidder is of the opinion that the fatigue test of bogie frame shall be conducted in accordance with JIS E 4207 with 2 million cycles for evaluation of 30 years life. Please confirm the foregoing understanding is correct and revise the requirement as proposed revised text accordingly.</p>	<p>the same supplier, the fatigue tests of the bogie shall be submitted to the Engineer for given the statement on No Objection.</p>	
17.	<p>Volume II Section VI ERT-50 5.12.7 Rain sensor/signal for control of propulsion and braking</p>	<p>If TMS uses rainy information from the rain sensor for control of propulsion and braking, there is possibility to cause performance reduction because the expected adhesion coefficient is related with not only precipitation of rain but also other factors such as oil, dust, temperature, etc between the wheel tread and the rail. In addition, propulsion/braking system have slip/slide control function to minimize the performance reduction when train slips or slides. Therefore, the bidder requests the Employer to exclude this requirement from the SOW of the rolling stock.</p>	<p>A rain sensor of proven quality shall be provided and integrated with the wiper unit for detection of rain. Signal from sensor should also be fed to TMS for control of propulsion and braking under wet conditions to avoid wheel slip.</p>	<p>Bidder request is accepted. Please refer to Annex B.</p>
18.	<p>Volume II Section VI ERT-53 5.18.1 Cab Air Conditioning System</p>	<p>Since an independent cab air conditioning system is not required, conditioned air from the passenger compartment is supplied with adjustable diffusers in the cab ceiling. Please confirm the foregoing understanding is correct and for avoidance of misunderstanding, please revise the requirement as proposed revised text.</p>	<p>Conditioned air system shall be ducted from the passenger compartment air supply, through adjustable diffusers in the cab ceiling, to maintain the specified vehicle interior</p>	<p>Bidder request is noted. Please refer to Annex B.</p>

			temperatures, or shall be installed air conditioning system for only cab. The driver shall be able to adjust conditions in his cab.	
19.	Volume II Section VI ERT-67 8.1.7 Diffuser arrangement	Diffuser shall be incorporated individually to window seats. While this clause specifies “Diffuser shall be incorporated individually to window seats”, the Bidder requests the Employer to amend the requirement as proposed revised text so that the Contractor can propose optimized interior design.	Diffuser shall be arranged consideration with window seat side distribution.	Bidder request is rejected.
20.	Volume II Section VI ERT-68 8.3.4 Drain pan of the VAC	The pan shall be made from stainless steel with suitable drain lines and shall be easily removable for cleaning. This clause states that a condensation pan (drain pan) of the VAC shall be easily removed for cleaning. However, condensation pans for VACs installed on most of trains in Japan are not removable, but easily accessible for cleaning without removing the condensation pan. Accordingly, the Bidder kindly requests Employer to allow such structure by revising the requirement as proposed revised text.	The pan shall be made from stainless steel with suitable drain lines and shall be easily removable realize easy for cleaning.	Bidder request is noted. Please see Annex B.

21.	Volume II Section VI ERT-75 9.6.2 Emergency brake application if brake shortage during braking by ATP	<p>The Bidders understanding of this clause is as follows:</p> <ul style="list-style-type: none"> - A brake shortage during braking is detected by the ATP - And then, the ATP outputs the emergency brake command - And then, emergency brake is applied (based on the emergency brake command by ATP) <p>Please confirm the foregoing understand is correct.</p>	-NA-	Correct.
22.	Volume II Section VI ERT-78 10.3.1 Pneumatic piping	<p>The Contractor shall submit details of stainless-steel pneumatic system for Engineer.</p> <p>The Bidder understands that "stainless-steel pneumatic system" as used in this clause means "Stainless steel piping for the pneumatic system". If the foregoing understanding is correct, the Bidder requests the Employer to make amendment to the first sentence in this clause as proposed revised text, so as to allow other materials such as copper, which is commonly used for similar mass transit projects, can also be used for the pneumatic system.</p>	The Contractor shall submit details of stainless-steel <u>piping or an equivalent service-proven material such as copper for the pneumatic system for review by</u> Engineer.	Bidder request is accepted. Please see Annex B.
23.	Volume II Section VI ERT-91 14.5.2 Circuit Breaker	Attention shall be paid that arrangement of the panels are coordinated in consideration with operations in MCRP, NSCR and NSRP-S.	-NA-	Bidder request is noted. Please see Annex B.

	Panels and Isolating Switches	The Bidder is required to confirm the arrangement of all circuit breakers and switches in the vehicle for rolling stock in MCRP, NSCR and NSRP-S to unify equipment arrangement as possible. Accordingly, the Bidder requests the Employer to provide the following essential information which is crucial in preparation of the bid proposal to comply the requirement. Arrangement of panels in the driver's cab, interior, and underfloor with outline of each panels and switches including the information of circuit breakers, relays, etc.		
24.	Volume II Section VI ERT-126 20.3.8 Parking brake test	Since the parking brake test on all consists is also stipulated in clause 20.4.3.1 as on-site commissioning, the Bidder is of the opinion that conducting the test at the timing of hand over as required in clause 20.3.8 is redundant. Accordingly, please amend the requirement as proposed revised text.	The test shall be undertaken at the time of handing over of Rolling Stock.	Bidder request is noted. Please see Annex B.
25.	Volume II Section VI ERT-133 21.2.5 Grade head mark indication of fasteners	All bolts and cap screws shall have the head marked to indicate grade. All nuts shall be marked to indicate grade. The Bidder requests the Employer to amend the requirement as proposed revised text, so as to allow the Bidder to use the most appropriate type of bolts, cap screws and nuts marked to indicate grade for the Project.	All <u>high-strength</u> bolts and cap screws shall have the head marked to indicate grade. All <u>high-strength</u> nuts shall be marked to indicate grade.	Bidder request is rejected.
26.	Volume II Section VI ERT-134	Cables shall conform to EN50264 or other equivalent standards.	Cables shall <u>comply with EN standards or Japanese</u>	Bidder request is rejected.

	21.4.2.1 Wire and cable	The Bidder assumes that the Japanese regulations/standards have been applied to the carbody and equipment wires and cables used in MCRP, NSCR and NSRP-S. Since EN50264 is the standard for specific wires and so, is not applicable to other types of wires such as shielded wires. Additionally, in consideration of compatibility with the equipment of MCRP, NSCR and NSRP-S, the Bidder assumes that the same Japanese regulations/standards should be accepted. Therefore, the Bidder requests the Employer to amend the requirement to allow Japanese regulations/standards.	regulations/standards conform to EN50264 or other equivalent standards.	
27.	Volume II Section VI ERT-6 1.5.1.3 1.5.1.4 Mockup General Bid Bulletin No.4 Annex B ERT-6	1.5.1.3 The Mockup shall be displayed to public at the location determined by the Employer. The Contractor shall bear all of the associated cost of the Mock-up from Manufacture's Factory to the location of display in Metro Manila, Philippines. 1.5.1.4 The Contractor shall prepare the provision of at least twelve (12) display sites which shall be determined by the Employer over a period of 18 months of mockup display. The Contractor shall bear all of the associated cost of the Mockup logistics and other i.e., security, authority approval etc. It is impossible for the Bidder to estimate the	1.5.1.3 The Mockup shall be displayed to public at the location determined by the Employer. The Contractor shall bear all of the associated cost of the Mock-up from Manufacture's Factory to <u>the first</u> location of display in Metro Manila, Philippines determined by the Employer. <u>Upon delivery of the Mockup to the first location, the</u>	The mockup site location shall be determined by the Employer during the project execution which shall be along the project alignment. All cost associated to Mock up shall be borne by the Contractor – Clause 1.5.1.4; including the handling of Mockup after the completion of display. Please see Annex B for updated clause 1.5.1.4. Please refer to Employer response item 70 in GBB 8

		<p>associated cost of the Mockup without detailed information for the display location determined by the Employer, the number of display sites and the duration of display for each site, etc. Further, any activities in connection with the Mockup display after the delivery of the Mockup to the first designated location are beyond the Contractor's control, any and all of the responsibilities and associated cost thereafter shall be bore by the Employer.</p> <p>Therefore, the Bidder humbly requests the Employer to reconsider limiting the Contractor's responsibility as appropriately so that the Bidder can offer the reasonable price.</p> <p>In addition, since the handling of Mockup after the completion of display is not specified in the bidding documents, the Bidder understands that the handling of Mockup after the completion of display is not the Contractor's responsibility. Please confirm it and add the following clause to clarify the responsibility.</p>	<p><u>title and risk of loss thereof shall be transferred to the Employer and the Employer shall be responsible for any of associated cost of the Mockup thereafter including, but not limited to, obtaining of permission of the display locations, unloading the Mock Up from the trailer for the display to public, security, logistics from the first location to the subsequent locations and handling of Mockup after completion of display.</u></p> <p>1.5.1.4 The Contractor shall prepare the provision of at least twelve (12) display sites which shall be determined by the Employer over a period of 18 months</p>	<p>dated 19 May 2021; item 24 in GBB 7 dated 12 May 2021; Item 5 (Annex B) GBB 4 dated 20 April 2021; item 41 and 43 GBB 2 dated 31 March 2021.</p>
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			of mockup display. The Contractor shall bear all of the associated cost of the Mockup logistics and other i.e., security, authority approval etc.	
28.	Volume I of III, SECTION II. BID DATA SHEET BDS-5 ITB 18.7	2. (ii) Import VAT and Import duties: Import VAT and Import duties will be assumed by the Employer, following the tax assumption scheme. The Bidder understands that the Employer will be the consignee of each shipment contractually specified and pay the Import VAT and Import duties directly to the Bureau of Internal Revenue. Please confirm if the Bidder's understanding is correct.	-NA-	The Employer shall be the consignee, referring to the ITB 18.7, import VAT and Import duties will be assumed by the Employer, following the tax assumption scheme.
29.	Volume III of III SECTION VIII, Particular Conditions PC-8 Attachment 1, Summary of Key Dates General Bid Bulletin No.4 Annex B PC-8	KD 2 Achievement: Deliver the Mock Up to the site 14 months In accordance with General Bid Bulletin No.4 dated 20 April 2021, KD 2 "Deliver the Mock Up to the site" has been changed from 31 months to 14 months. As stated in Item No. 2 above, the Bidder understands that the Engineer's Mock Up review will be conducted in Contractor's design/manufacturing facility during the	KD 2 Achievement: Deliver the Mock Up to the site 31 14 months	The bidder's request on the proposed amendment is rejected. However, please refer to the Annex B for the amendment in Attachment 1 – Summary of Key Dates.

		<p>Design Review stages so that the Contractor can accommodate the Engineer's comments, if any, and finalize its design for his/her final review and approval. Additionally, in the Bidder's experiences, the Contractor will be able to issue the drawings of the Mock Up after the Engineer's approval for the Preliminary Design so that the Mockup can be manufactured and reviewed by the Engineer to finalize the design.</p> <p>Considering the said circumstance, the Bidder assumes that it is not feasible to achieve the revised KD 2 (14 months) specified in General Bid Bulletin No.4. Thus, the Bidder sincerely requests the Employer to restore the KD 2 to the original schedule requirement of 31 months.</p>		
30.	<p>Volume III of III SECTION VIII, Particular Conditions PC-11 Attachment 2, Time for Access to the Site General Bid Bulletin No.4</p>	<p>AD 1 AD-1: for trainsets one to seven (1-7) supplied under this Contract 25 months</p> <p>In accordance with General Bid Bulletin No.4 dated 20 April 2021, AD-1 "for trainsets one to seven (1-7) supplied under this contract" has been changed from 37 months to 25 months.</p> <p>However, to complete production of the</p>	<p>AD 1 AD-1: for trainsets one to seven (1-7) supplied under this Contract 2125 months</p>	<p>The bidder's request on the proposed amendment is rejected. However, please refer to the Annex B for the amendment in Attachment 2 Time for Access to the site</p>

		trainsets and all required Design Qualification Testing, First Article Inspection and Factory Acceptance Test, and meet KD 3 and KD 6, the Bidder humbly requests the Employer to accelerate AD-1 further from 25 months to 21 months.		
31.	PART 1 – BIDDING PROCEDURES 4. Annexes for Technical Bid Forms Form MAN: Manufacturer's Authorization	<p>We hereby extend our full guarantee and warranty in accordance with Clause 11, Defect Liability, of the General Conditions of Contract, with respect to the goods offered by the above firm.</p> <p>Since the scope and responsibility of each manufacturer is limited and not the same as the Bidder's responsibility, most manufacturers do not agree with this paragraph referring to the General Conditions of Contract. This may limit substantially Bidder's options in finding competitive manufacturers.</p> <p>Therefore, although Bidder will try its best effort to complete Form MAN, we would like you to allow Form MAN to be signed by the Bidder or its subcontractor on behalf of the Manufacturer.</p> <p>This request is based on a similar experience in other similar contracts of procurement under Japanese ODA Loans.</p>	-NA-	<p>The bidder's request is rejected, reference to the evaluation and qualification criteria and, in the case of a Bidder who offers to supply and install major items of supply under the Contract that the Bidder did not manufacture or otherwise produce, the Bidder shall provide the manufacturer's authorization.</p> <p>The Form MAN is the standard bidding form, from the Standard Bidding Documents for the Procurement of Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by The Contractor (Trial Version) published by JICA in July 2015.</p>

32.	General Conditions. Section VII GC-73 18.1. b	b) copies of the policies for the insurances described in Sub-Clause 18.3 Copies of the policies for the insurances are requested. Please note that copies of the policies are not necessary to the extent that the certificates may contain the necessary information. Insurance companies tend to issue certificates in a more agile manner than policies.	b) copies certificates of the policies for the insurances described in Sub-Clause 18.3	The bidder's request is rejected.
33.	General Conditions. Section VII GC-74 18.1	When each premium is paid, the insuring Party shall submit evidence of payment to the other Party The certificates can include information about premium payments. Please confirm that if information about the payment is included in the certificate, there is no need to provide the evidence of payment.	-NA-	The bidder's request is rejected. The Contractor shall comply with the General Conditions.
34.	General Conditions. Section VII GC-74 18.1	If the insuring Party fails to provide satisfactory evidence and copies of policies	If the insuring Party fails to provide satisfactory evidence and copies certificates of policies	The bidder's request is rejected.
35..	General Conditions. Section VII GC-75 18.2	Unless otherwise stated in the Particular Conditions, Insurances under this Sub-Clause: b) shall cover all loss and damage from any cause not listed in sub. clause 17.	b) shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [Employer's Risks], as long as it is	The bidder's request is rejected.

			<i>insurable in the insurance market and is a good local standard condition.</i>	
36.	General Conditions. Section VII GC-75	Unless otherwise stated in the Particular Conditions, Insurances under this Sub-Clause: d) "Shall also cover, to the extent specifically required in the bidding documents of the Contract loss or damage to a part of the Works which is attributable to the use or occupation by the Employer of another part of the works, and loss or damage from the risks..." Please, clarify the purpose of this clause.	-NA-	Please refer to the Section VII General Conditions sub-items (c), (g), and (h) of Sub-Clause 17.3 Employer's Risk.
37.	Part 3 – Conditions of Contract and Contract Forms Section VIII – Particular Conditions PC-6 18.1	Periods for submission of 18.1 insurance. Conditions: (a) Evidence of payment (b) Relevant policies Data: (a) Fourteen (14) days from the Commencement Date. (b) Within twenty-eight (28) days from the Commencement Date. Conditions: Please note that copies of the policies are not necessary to the extent that the certificates may contain the necessary information. Data:	Conditions: (a) Evidence of payment (b) Relevant policies certificates (b) Within twenty-eight (28) sixty (60) days from the Commencement Date.	The bidder's request on the proposed amendment is rejected. The Contractor shall abide the conditions. Reference to the General Conditions clause 1.1.3.2: "'Commencement Date" means the date notified under Sub-Clause 8.1 [Commencement of Works]." The Contractor shall refer to the Section VII - General Conditions Article 18.2, 18.3 and 18.4 for the effect duration of different types of insurances.

		<p>We understand that the Commencement Date is the same as Commencement of Work.</p> <p>Policies should start when the risk starts. Please confirm.</p> <p>Policies are issued by the Insurance Company. They have their own internal process and it can be longer than 28 days so kindly ask for an extension.</p>		The bidder's request on the proposed amendment is rejected. The Contractor shall abide the conditions.
38.	Part 3 – Conditions of Contract and Contract Forms Section VIII – Particular Conditions PC-6 18.(d)	<p>Deductible per occurrence shall not exceed Japanese Yen Ten Million (JPY10,000,000).</p> <p>Please note that deciding the franchise should be the responsibility of the Contractor. As this has a direct impact on the premium and to the extent that the Contractor has sufficient solvency to assume higher franchises, we kindly ask Employer to erase this clause.</p>	<p>Deductible per occurrence shall not exceed Japanese Yen Ten Million (JPY10,000,000).</p>	The bidder's request is rejected.
39.	Part 1 – Bidding Procedures Section IV – Bidding Forms BF-40 Milestone N. 301	<p>Manufacturing/fabrication of 1st trainset of 8 cars, completion of Factory Acceptance Tests, and shipping to Manila port on CIF basis (Incoterms) - (total of 1 trainset).</p> <p>According to "Section IV – Bidding Forms" of the Bidding documents, trainsets should be shipped to Manila port on CIF basis (Incoterms), that is to say, the Employer being the importer of records in the Philippines, clearing customs of the trainsets in its own name and behalf. Please, confirm</p>	-NA-	The Employer shall be the consignee, referring to the ITB 18.7, import VAT and Import duties will be assumed by the Employer, following the tax assumption scheme.

		<p>our understanding.</p> <p>Please, confirm that the Employer will also be the importer of records in the Philippines and will clear customs of all the rest off-shore scope (besides from the trainsets) of the project, like for example, the provision of spare parts and special tools for the Rolling Stock maintenance.</p>		
40.	<p>Volume II of III Part 2 Employer's Requirement ERT-27 27.1.1</p>	<p>Qty 1 set</p> <p>The quantities described in this table for the Equipment for Driving Simulator are defined as 1 set.</p> <p>Please confirm that 1 set means 1 complete unit of each related equipment and not 1 train set.</p>	-NA-	<p>Please refer to item 6 GBB 7 dated 12th May 2021.</p> <p>The list of equipment shall not be limited to the table in clause 27.1.1 and the it is the Contractor obligation to interface with CP NS-01 Contractor and adjust the amount based on Interface agreement.</p> <p>The unit 'set' denotes the required quantity for a driving simulator build requirement based on the bidder general and specific experience delivering a similar project with this tender.</p>

41.	Volume II of III Part 2 - Employer's Requirements ERT-47 5.4.11	<p>The entire floor construction shall be required to comply with the fire safety requirement as per clause 28.8 of this ERT.</p> <p>We understand that this is a typographical mistake and that the reference section is 21.8 rather than 28.8. Please confirm.</p>	<p>The entire floor construction shall be required to comply with the fire safety requirement as per clause 28.8 21.8 of this ERT.</p>	Please refer to Annex B.
42.	Volume II of III Part 2 - Employer's Requirements ERG-54 9.4.3	<p>The Contractor shall submit his designs for the works to the Engineer for review. The design shall be submitted in the following stages as stated in Sub-Clause 24.2 of the Technical Requirements:</p> <ol style="list-style-type: none"> 1) Conceptual design; 2) Preliminary design; and 3) Final design. <p>We understand that this is a typographical mistake. The content to be submitted in each Design Stage is indicated in Sub-Clause 22.2 instead of Sub-Clause 24.2. Please confirm.</p>	<p>The Contractor shall submit his designs for the works to the Engineer for review. The design shall be submitted in the following stages as stated in Sub-Clause 24.2 22.2 of the Technical Requirements:</p> <ol style="list-style-type: none"> 1) Conceptual design; 2) Preliminary design; and 3) Final design. 	Please refer to Annex B.
43.	Volume II of III Part 2 - Employer's Requirements ERT-6 1.6.1.3	<p>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.</p> <p>The requirement 1.6.1.3 states that Auxiliary Power System Equipment (APSE) cannot be mounted on the leading cars for avoiding EMI to the signalling equipment. Nevertheless, the</p>	-NA-	Please refer to Annex B.

		<p>industrial best practice allows the possibility to coexist both equipment in the same car. APSE system's IGBTs commutation is fixed (not variable as in the traction inverter) and the EMC compatibility analysis can be guaranteed. Additionally, design concepts are usually implemented for this (safety distance, ...) purpose and EMI compatibility can be ensured. Therefore, taking into account all these considerations, would it be acceptable for the Employer to mount the APS on the leading cars?</p>		
44.	<p>Volume I of III, INVITATION FOR BIDS, IFB-2 7</p> <p>SECTION II. BID DATA SHEET BDS-10 ITB24.1</p>	<p>Bid must be delivered to the address above on or before 10:00 AM on 28 May 2021 and...</p> <p>For Bid submission purpose only, and acting on behalf of the Employer, ...</p> <p>The deadline for Bid submission is: Date: 28 May 2021 Time: 10:00 AM</p> <p>We would like to request for extension of the bid submission deadline until 15 September, 2021 from the current due date. Because, we will be required to engage into various tasks, like investigation of relevant local regulations and rules, selection of local</p>	-NA-	<p>Please refer to the General Bid Bulletin published at the websites as stipulated in BDS ITB 7.1.</p>

		vendors, design development, price discovery, vendor correspondences, pre-bid negotiations, etc. under limitation due to current COVID-19 pandemic in order to prepare competitive bid given complexity of requirement in the bidding documents.		
45.	Part 3 – Conditions of Contract and Contract Forms Section VIII – Particular Conditions PC11 PC Attachment 2 Time for Access to the site	AD 3 Access to the mainline from CIA to Clark (as available) for Test running and Performance Proving 36 months AD 4 Access to the whole mainline from Calamba to CIA 77 months <i>Mainline CIA to Clark is only about 7.4 km long; And as per AD 4 access to the whole mainline is only possible after 77 months</i> <i>Bidder considers that not all the required tests e.g. as per ETR 20.4.3; ETR 20.5 and 20.6 can be achieved on the as per AD 3 accessible mainline section of approx. 7.4 km only.</i> <i>Especially the Trial Operation (ERG-73; ERG clause 12.2.4 5.) and ETR 20.6, specifically 20.6.8) to simulate revenue service and Fault</i>	-NA-	Bidder request Fault Free Running of 1500km on a test ring (e.g. in Europe) is rejected. Please refer to Annex B for the updated Attachment 2 Time for Access to the Site

		<p><i>Free Running of 1500km will not be possible to be adequately completed on this short section of accessible tracks.</i></p> <p><i>Bidder would request adequate access to the mainline to complete these tests. Alternatively, Employer should permit Bidder to complete all the reasonably possible tests including the Fault Free Running of 1500km on a test ring (e.g. in Europe). A limited Trial Operation for operator training etc. will be done on the line between CIA and Clark.</i></p> <p><i>After successful completion of these tests Employer shall issue the Taking over certificate.</i></p> <p><i>Issuance of Taking over Certificate shall not be withheld because of tests not being possible to be adequately completed, due to the limited access to the Mainline.</i></p>		
46.	<p>Part 3 – Conditions of Contract and Contract Forms</p> <p>Section VIII – Particular Conditions</p> <p>PC11</p> <p>PC Attachment 2</p> <p>Time for Access to the site</p>	<p>(General)</p> <p><i>Please indicate additional Access Date for the time when NS01 Contractor become ready to conduct Integrated Testing and Trial Operation.</i></p> <p><i>This is mandatory information for the Bidder to commit to the required KD.</i></p>	-NA-	<p>There is no additional access date.</p> <p>Please refer to Annex B for the updated Attachment 1 Summary of Key Dates and attachment 2 – Time for access to site.</p>

47.	GBB02 Page 28 Item No.26	<p>Achievement: Completing Final Design Review. 18 months</p> <p><i>As it is required approval (not only review), the Employer's clarification even makes requirement more strictly.</i></p> <p><i>The Bidder would like to ask the Employer's reconsideration to revise requirement to "Submission" as review or approval is out of the Contractor's Control.</i></p> <p><i>If it is not acceptable, the Bidder also ask the Employer to extend Key Date from 18 months to 24 months which is reasonable period not to make any delay on the production of EMU and to achieve following Key Dates.</i></p>	-NA-	Bidder request is rejected. However please refer to Annex B for updated Attachment 1 Summary of Key Dates.
48.	GBB02 Page 29 Item No.27	<p>Request the Employer to specify additional Time for Access for the event that the NS01 Contractor become available for interface coordination</p> <p><i>It is mandatory information when interface parties are available, otherwise the Bidder cannot ensure any schedule required interface coordination. The Bidder would like to request the Employer's reconsideration.</i></p>	-NA-	Please refer to the response provided on item 46.

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
Volume II Part 2 – Employer’s Requirements		
1	ERT-13 1.11.2.6	<p><u>Updated clause 1.11.2.6 (b):</u></p> <p>Emergency application : Max 1.5 seconds</p>
2	ERT-15 1.12.2	<p><u>Deleted clause 1.12.2.1:</u></p> <p><u>Clause 1.12.2.2 is now clause 1.12.2.1:</u></p> <p><u>Clause 1.12.2.3 is now clause 1.12.2.2:</u></p> <p><u>Added clause 1.12.2.3:</u></p> <p>The bidder is allowed to propose an equivalent standard for the vibration requirement as alternative to the above subject to review and given notice of no objection by the Engineer i.e. ISO 2631 etc.</p>
3	ERT-34 2.8.1	<p><u>Deleted clause 2.8.1.2:</u></p> <p><u>Clause 2.8.1.3 is now clause 2.8.1.2:</u></p> <p><u>Clause 2.8.1.4 is now clause 2.8.1.3:</u></p> <p><u>Clause 2.8.1.5 is now clause 2.8.1.4:</u></p>

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		<u>Clause 2.8.1.6 is now clause 2.8.1.5:</u> <u>Clause 2.8.1.7 is now clause 2.8.1.6:</u> <u>Clause 2.8.1.8 is now clause 2.8.1.7:</u> <u>Clause 2.8.1.9 is now clause 2.8.1.8:</u> <u>Clause 2.8.1.10 is now clause 2.8.1.9:</u>
4	ERT-37 3.1.15	<u>Clause 3.1.15 (c) is now 3.1.16:</u>
5	ERT-42 3.11.4	<u>Clause 3.11.4 was updated:</u> In addition, the Contractor shall provide Proof Load Case and Fatigue Load Case for all Bogie and Axle mounted equipment and parts. For a new design bogie, fatigue testing of the bogie frame is required according to JIS E 4207 or EN 13749 or equivalent standard. If the bogie is nominally identical to other products from the same supplier, the fatigue tests reports of the bogie shall be submitted to the Engineer for review and given the statement on No Objection.
6	ERT-50 5.12.7	<u>Clause 5.12.7 was updated:</u> Windshields shall be provided with external electric wiper/washer units and defogger unit. The driver shall be able to control the active Cab windshield wipers, washers and defogger via the active Driver's Desk. A fan defogger shall not be acceptable. This system shall have no adverse effect on the windshield including overheating in direct sunlight.

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
7	ERT-53 5.18.1	<p><u>Clause 5.18.1 was updated:</u></p> <p>Conditioned air system shall be ducted from the passenger compartment air supply, through adjustable diffusers in the cab ceiling, to maintain the specified vehicle interior temperatures and humidity.</p>
8	ERT-69 8.3.4	<p><u>Clause 8.3.4 was updated:</u></p> <p>Air flow over the evaporator coils shall be sufficiently low to prevent any moisture in the air from entering the main air supply duct, but in no case shall exceed 2.5 m/s. Evaporator coils shall preferably be manufactured from copper, and shall have copper fins, however, aluminum elements is also acceptable provided they are sufficiently protected from the elements. A condensate pan shall be provided beneath the evaporator coil. The pan shall be made from stainless steel with suitable drain lines and shall realize easy cleaning. The condensate drain lines shall be insulated to prevent condensation.</p>
9	ERT-78 10.3.1	<p><u>Clause 10.3.1 was updated:</u></p> <p>The Contractor shall submit details of stainless-steel pneumatic system piping or an equivalent service-proven material such as copper for the Engineer review. Joints shall be rail industry approved compression fittings. Joints shall not be made to connect straight runs of pipe work, unless reviewed and approved by the Engineer. Inaccessible runs of pipe work shall not utilize joints. All piping shall be installed to keep fittings to an absolute minimum.</p>

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
10	ERT-91 14.5.2	<p><u>Clause 14.5.2 was updated:</u></p> <p>All circuit breakers and switches necessary for vehicle revenue line fault intervention shall be located inside the drivers' cab. The final list of circuit breakers and switches shall be subject to review by the Engineer. All circuit breaker panels shall be reviewed and commented by the Engineer.</p>
11	ERT-126 20.3.8	<p><u>Clause 20.3.8 was updated:</u></p> <p>The parking brake shall be tested to demonstrate its ability to hold a consist on the specified gradient. The test shall record the actual force required to overcome the parking brake in a failure recovery situation on both level track and a 3.5% gradient. This shall be carried out with a number of parking brakes (20%) isolated.</p>
12	ERT-6 1.5.1.4	<p><u>Clause 1.5.1.4 was updated:</u></p> <p>The Contractor shall prepare the provision of at least twelve (12) display sites which shall be determined by the Employer over a period of 18 months of mockup display. The Contractor shall bear all of the associated cost of the Mockup logistics and others i.e., security, authority approval etc. including the demobilization of the mockup upon completion of the mockup display period.</p>

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13	ERT-47 5.4.11	<p><u>Clause 5.4.11 was updated:</u></p> <p>The entire floor construction shall be required to comply with the fire safety requirement as per clause 21.8 of this ERT.</p>
14	ERT-73 9.4.3	<p><u>Clause 9.4.3 was updated:</u></p> <p>The Contractor shall submit his designs for the works to the Engineer for review. The design shall be submitted in the following stages as stated in Sub-Clause 22.2 of the Technical Requirements:</p> <ol style="list-style-type: none"> 1) Conceptual design; 2) Preliminary design; and 3) Final design
15	ERT-6 1.6.1.3	<p><u>Clause 1.6.1.3 was changed to 1.6.1.4 (previous GBB):</u></p> <p><u>Clause 1.6.1.4 was updated:</u></p> <p>Auxiliary Power Equipment, Battery and Battery charger location shall be arranged to avoid the EMI to the signaling equipment unless otherwise specified.</p>
16	ERG 49-50 8.6.3	<p>Clause 8.6.3 was updated:</p> <p>The Rolling Stock Performance report shall be issued progressively on a monthly basis,</p>

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		<p>shall be finalized at the end of DNP, and shall provide:</p> <ol style="list-style-type: none"> 1) In-service FFR operational performance of individual trainsets as per clause 8.5; 2) In-service operational performance of the fleet (7 trainsets) MDBF as per clause 8.5; 3) The in-service OMTTR and CMTTR of all capital components as per clause 8.5, 4) Completion of Defect Remedial, 5) Completion of Open Item, 6) Completion of Modification, and 7) Completion of Spare Part, Special Tools and Test Equipment delivery, and 8) DRACAS report

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ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS																								
Volume III Part 3 – Conditions of Contract and Contract Forms																										
17	Section VIII Particular Conditions Attachment 1 Summary of Key Dates	<p>The table in the Summary of Key Dates is updated:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3" style="text-align: center;">TABLE 1 – KEY DATES</th> </tr> <tr> <th style="text-align: center;">Key Date</th> <th style="text-align: center;">Element of Work</th> <th style="text-align: center;">No. of Months</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">KD 1</td> <td>Achievement: Completing Final Design Review.</td> <td style="text-align: center;">30 months</td> </tr> <tr> <td style="text-align: center;">KD 2</td> <td>Achievement: Deliver the Mock Up to the site</td> <td style="text-align: center;">23 months</td> </tr> <tr> <td style="text-align: center;">KD 3</td> <td>Achievement: Completing FAI and FAT.</td> <td style="text-align: center;">36 months</td> </tr> <tr> <td style="text-align: center;">KD 4</td> <td> Achievement: Supply and delivery of the following Rolling Stock equipment for training purposes to the CP NS-01 Contractor at the North Depot (for Training Center Facility): <ul style="list-style-type: none"> - Equipment for driving simulator, - Pantograph, and - Bogie assembly for motor car including traction motor, gearbox and coupling. </td> <td style="text-align: center;">36 months</td> </tr> <tr> <td style="text-align: center;">KD 5</td> <td>Achievement: Completion of training and delivery of Operation and Maintenance Manual.</td> <td style="text-align: center;">70 months</td> </tr> <tr> <td style="text-align: center;">KD 6</td> <td>Achievement: Delivery of 7 trainsets (1-7) and completion of testing and commissioning thereof plus handing over.</td> <td style="text-align: center;">72 months</td> </tr> </tbody> </table>	TABLE 1 – KEY DATES			Key Date	Element of Work	No. of Months	KD 1	Achievement: Completing Final Design Review.	30 months	KD 2	Achievement: Deliver the Mock Up to the site	23 months	KD 3	Achievement: Completing FAI and FAT.	36 months	KD 4	Achievement: Supply and delivery of the following Rolling Stock equipment for training purposes to the CP NS-01 Contractor at the North Depot (for Training Center Facility): <ul style="list-style-type: none"> - Equipment for driving simulator, - Pantograph, and - Bogie assembly for motor car including traction motor, gearbox and coupling. 	36 months	KD 5	Achievement: Completion of training and delivery of Operation and Maintenance Manual.	70 months	KD 6	Achievement: Delivery of 7 trainsets (1-7) and completion of testing and commissioning thereof plus handing over.	72 months
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		KD 7	Achievement: Delivery of all spare parts, consumables, special tools and jigs, plus as-built drawings.	72 months															
		KD 8	Achievement: Completion of Trial Operation support and the whole of the Works.	75 months															
18	Section VIII Particular Conditions Attachment 2 Time for Access to the Site	<p><u>The table in the Time for Access to the Site is updated:</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Access Date</th> <th style="text-align: center;">Site (Works Area)</th> <th style="text-align: center;">Month no.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">AD 1</td> <td> On-board Signalling System and other equipment to be mounted on the Rolling Stock supplied by CP NS-01 Contractor from E&M Systems and Track Works. The E&M System and Track Works Contractor will supply this equipment in Japan at the Rolling Stock Contractor's premises or at alternative agreed location(s) </td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">AD-1: for trainsets one to seven (1-7) supplied under this contract</td> <td style="text-align: center;">37 months</td> </tr> <tr> <td style="text-align: center;">AD 2</td> <td>Access to allocated areas within the North Depot for receiving trainsets, assembling, testing, commissioning and test running within the depot.</td> <td style="text-align: center;">29 months</td> </tr> <tr> <td style="text-align: center;">AD 3</td> <td>Access to the mainline from CIA to Solis for On-Site Testing and Commissioning</td> <td style="text-align: center;">34 months</td> </tr> </tbody> </table>			Access Date	Site (Works Area)	Month no.	AD 1	On-board Signalling System and other equipment to be mounted on the Rolling Stock supplied by CP NS-01 Contractor from E&M Systems and Track Works. The E&M System and Track Works Contractor will supply this equipment in Japan at the Rolling Stock Contractor's premises or at alternative agreed location(s)			AD-1: for trainsets one to seven (1-7) supplied under this contract	37 months	AD 2	Access to allocated areas within the North Depot for receiving trainsets, assembling, testing, commissioning and test running within the depot.	29 months	AD 3	Access to the mainline from CIA to Solis for On-Site Testing and Commissioning	34 months
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			AD 4	Access to the whole mainline from Calamba to CIA	70 months	
			NB	<ol style="list-style-type: none"> 1. <i>Access will be given progressively to the whole of the North South Commuter Railway for the use of this Rolling Stock.</i> 2. <i>Obtaining permission from the Railway Safety Inspector to use the Rolling Stock for commercial operations will be the responsibility of the Employer with the support of the Rolling Stock manufacturer.</i> 		

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between the calculated speed and the actual speed, and overshoot.) This design speed applies to all railway systems

3.	Acceleration (at W2 loading)	: Minimum 0.83 m/s ² (0-40 kmph, thereafter, the Bidder shall make their own calculation of traction force in order to comply with the basic requirements)
4.	Starting Tractive effort	:400 kN or higher
5.	Maximum Power output at wheel	:5200 kW
6.	Jerk limit under all acceleration and service braking conditions (Max.)	: 1.1 m/s ³
7.	Service deceleration	: 4.2km/h/s
8.	Wheel diameter	: 860mm (New) / : 820mm (Half worn) : 780mm (Fully worn) : (792 minimum reprofiling diameter)
9.	Emergency deceleration	: 4.7km/h/s
10.	Axial Thrust	:1500kN
11.	Severity of Service	: Shall meet conditions of continuous 1 round trip of peak operation at loads of 7t/car or higher without adverse effect to any system (7t/car is passenger load but see comments about EN 15663 clause 6 Table 3)

1.11.2.2 Acceleration and deceleration values shall be maintained under all loading conditions. All braking requirements shall be maintained under all loading conditions.

1.11.2.3 Coefficients of adhesion for the train speed between 120km/h and 160km/h should be lower ~~than the~~ than the train speed under 120km/h. During the design stage, adhesion should be considered during deceleration of speed over 120km/h is lower compare to the speed under 120km/h, and for the average deceleration the adhesion must satisfied the demanded braking effort for emergency braking.

1.11.2.4 Jerk during acceleration and deceleration shall not be more than 1.1 m/s³ (except under emergency braking condition) and in any direction. Failure of jerk limiting system shall not limit braking effort.

1.11.2.5 Indicated speed shall be within ±2km/h of actual speed at any speed.

1.11.2.6 In addition, the pneumatic system shall meet the following brake reaction time or to follow EN 13452:

- a) Full service application : 1.5 seconds
- b) Emergency application : Max 1.5 seconds~~1.2 seconds~~
- c) Full service release : 2.0 seconds
- d) Emergency release : 3.0 seconds

1.11.2.7 The brake reaction times of a and b are defined from the order of braking to 90% of BC pressure, and these of c and d are defined from full pressure to 10% of BC pressure.

1.11.2.8 Brake slip/slide protection shall apply to all braking modes.

1.11.3 Performance Characteristics

1.11.3.1 Performance curves for traction and braking shall be established based on kN / metric ton versus speed for the W2 loading condition.

6.	Jerk limit under all acceleration and service braking conditions (Max.)	: 1.1 m/s ³
7.	Service deceleration	: 4.2km/h/s
8.	Wheel diameter	: 860mm (New) / : 820mm (Half worn) : 780mm (Fully worn) : (792 minimum reprofiling diameter)
9.	Emergency deceleration	: 4.7km/h/s
10.	Axial Thrust	:1500kN
11.	Severity of Service	: Shall meet conditions of continuous 1 round trip of peak operation at loads of 7t/car or higher without adverse effect to any system (7t/car is passenger load but see comments about EN 15663 clause 6 Table 3)

1.11.2.2 Acceleration and deceleration values shall be maintained under all loading conditions. All braking requirements shall be maintained under all loading conditions.

1.11.2.3 Coefficients of adhesion for the train speed between 120km/h and 160km/h should be lower than the train speed under 120km/h. During the design stage, adhesion should be considered during deceleration of speed over 120km/h is lower compare to the speed under 120km/h, and for the average deceleration the adhesion must satisfied the demanded braking effort for emergency braking.

1.11.2.4 Jerk during acceleration and deceleration shall not be more than 1.1 m/s³ (except under emergency braking condition) and in any direction. Failure of jerk limiting system shall not limit braking effort.

1.11.2.5 Indicated speed shall be within ±2km/h of actual speed at any speed.

1.11.2.6 In addition, the pneumatic system shall meet the following brake reaction time or to follow EN 13452:

- a) Full service application : 1.5 seconds
- b) Emergency application : Max 1.5 seconds
- c) Full service release : 2.0 seconds
- d) Emergency release : 3.0 seconds

1.11.2.7 The brake reaction times of a and b are defined from the order of braking to 90% of BC pressure, and these of c and d are defined from full pressure to 10% of BC pressure.

1.11.2.8 Brake slip/slide protection shall apply to all braking modes.

1.11.3 Performance Characteristics

1.11.3.1 Performance curves for traction and braking shall be established based on kN / metric ton versus speed for the W2 loading condition.

1.11.3.2 The corresponding traction motor characteristics, and the train mass, shall be considered in the Design Performance Curve as defined in JIS E 6102 or equivalent standard.

1.11.4 Degraded/Emergency Performance

1.11.4.1 The Contractor shall confirm by calculation and test that 8 cars trainset at the 7t/car loading condition, with the isolation of 25% motorised bogies the limited express train is capable of completing continuous trip within the stipulated running time.

1.11.4.2 The Contractor shall confirm by calculation and test that 8 cars trainset at 7t/car loading

1.11.6 Performance Calculation

1.11.6.1 The Contractor shall calculate train performance by simulation. Running curve with speed versus distance for both directions in powering and braking modes at W0 and W2 loading shall be provided as a simulation result.

1.11.6.2 Rotating mass shall be calculated by the shape of the wheel, brake disc, rotor of motor etc. for the performance calculation.

1.11.7 Energy Consumption

1.11.7.1 The Contractor shall design the train to minimize the energy consumption.

1.11.7.2 The Contractor shall calculate the energy consumption of train at the unit of kWh/ton/km in case of running on entire revenue line for both directions at loading condition of W0, and W2.

1.11.7.3 The motor efficiency shall not be less than 94%.

1.12 Noise, Vibration and Aerodynamics

1.12.1 Noise Requirements

1.12.1.1 The trains shall be designed and tested to meet the following noise levels:

1.12.1.2 The interior noise level at any point in any vehicle (including the Driver’s Cab), 1.6m above floor level, while stationary on an open section of track, but with all auxiliary systems running, shall not exceed 63 dBA.

1.12.1.3 The exterior noise level of any vehicle, measured 7.5m from the center and 1.5m above rail level, while stationary on an open section of track with all auxiliary systems running, shall not exceed 75 dBA.

1.12.1.4 The interior noise level at any point in any vehicle (including the Driver’s Cab) 1.6m above floor level, with the train running at 90 km/h in the tunnel section of track, with all auxiliary systems running, shall not exceed 88 dBA.

1.12.1.5 Test to be conducted at the Contractors’ proposed facility.

1.12.1.6 The exterior noise level of any vehicle, measured 7.5m from the center and 1.5m above rail level, with the train running at 90km/h on an open section of track with all auxiliary systems running, shall not exceed 88 dBA. Test to be conducted at the Contractors’ proposed facility.

1.12.1.7 The tests shall be conducted according to JIS E4021 or other equivalent standards for the internal noise except for provisions specified above.

1.12.1.8 The tests shall be conducted according to JIS E4025 or other equivalent standards for the external noise except for provisions specified above.

1.12.1.9 Measurement of running train noise, both for the interior and the exterior noise, shall be conducted on NSCR, MCRP and NSRP-S mainline track or at the Contractor’s proposed facility where rail roughness is compliant with JIS E4021/4025 or other equivalent standards.

1.12.1.10 Noise requirements and test plan shall be submitted by the Contractor and reviewed by the Engineer.

1.12.2 Vibration Requirements

~~1.12.2.1 The measured vibration on any portion of the car floor, walls, ceiling panels, stanchions, handholds or seat frames shall not exceed the values specified in ISO 2631-1 for 24 hours~~

~~exposure time and not higher than 0.315m/sec² as specified in ISO 2631 or equivalent international standard.~~

~~1.12.2.2~~ 1.12.2.1 All equipment, sub-assemblies and components shall be capable of withstanding shock and vibrations of the Rolling Stock satisfactorily such that they do not fail prematurely on this account earlier to the designed life. To establish this requirement, all of equipment, sub-assemblies and components shall be subjected to shock and vibration test to JIS E 4031 or other relevant standard. Various equipment on the vehicles complies with JIS E 4031 standard, which can withstand the vibration level with frequency 1 - 500Hz in longitudinal, lateral and vertical directions. If the trains run in full speed, each piece of equipment and the carbody of the vehicle does not resonate.

~~1.12.2.3~~ 1.12.2.2 With the train at stationary and with all auxiliary equipment operating at rated capacity, no portion of the interior of the vehicles shall exceed the following levels of vibration:

- 1) 2.5 mm peak-to-peak amplitude for frequencies less than 1.4 Hz,
- 2) 0.01 g peak acceleration for the frequency range 1.4 Hz to 20 Hz, and
- 3) 0.75 mm/second peak velocity for the frequency range above 20 Hz.

~~1.12.2.3~~ The bidder is allowed to propose an equivalent standard for the vibration requirement as alternative to the above subject to review and given notice of no objection by the Engineer i.e. ISO 2631 etc.

1.12.3 Noise and Vibration Control

1.12.3.1 Rotating or reciprocating equipment and inductive electrical equipment (such as transformers, inductors, etc.) mounted to the rail carbody, which may become a source of vibration, and any equipment (bogie or carbody mounted) which may become a source of noise shall be adequately provided with resilient suspension and acoustically attenuated respectively.

1.12.3.2 The resonant frequency of the resilient suspension system shall be designed to avoid coupling with that of the vehicle structure. All suspensions are to be designed to provide maximum isolation for all modes of vibration. Also, resilient mounts must be arranged in a manner such that the equipment will be retained safely on the vehicle, and may continue operation, under all operating conditions stated in this ERT and any other applicable specification, in the event of a complete failure of the elastomeric material.

1.12.3.3 It shall be the responsibility of the Contractor to take all necessary precautions to minimize noise radiation and transmission by using up-to-date design techniques and proper acoustic attenuation materials, where required. The Contractor shall provide for review all pertinent details of the acoustic attenuation and any special noise reduction techniques used.

1.12.4 Aerodynamics and Pressure Effects

1.12.4.1 The Modular design and construction shall ensure that passengers and/or staff do not experience significant discomfort due to internal pressure changes when operating over the designated route induced by infrastructure and passing trains and effects on passengers on platforms and on trackside workers.

1.12.4.2 In the future, the new line between Clark station and New Clark City station will be open.

1.12.4.3 The new line plan has some tunnel and maximum operation speed is 160km/h. Airtight structure is required for rolling stock body.

1.11.7.2 The Contractor shall calculate the energy consumption of train at the unit of kWh/ton/km in case of running on entire revenue line for both directions at loading condition of W0, and W2.

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1.12.1.9 Measurement of running train noise, both for the interior and the exterior noise, shall be conducted on NSCR, MCRP and NSRP-S mainline track or at the Contractor’s proposed facility where rail roughness is compliant with JIS E4021/4025 or other equivalent standards.

1.12.1.10 Noise requirements and test plan shall be submitted by the Contractor and reviewed by the Engineer.

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1.12.2.1 All equipment, sub-assemblies and components shall be capable of withstanding shock and vibrations of the Rolling Stock satisfactorily such that they do not fail prematurely on this account earlier to the designed life. To establish this requirement, all of equipment, sub-assemblies and components shall be subjected to shock and vibration test to JIS E 4031 or other relevant standard. Various equipment on the vehicles complies with JIS E 4031 standard, which can withstand the vibration level with frequency 1 - 500Hz in longitudinal, lateral and vertical directions. If the trains run in full speed, each piece of equipment and the carbody of the vehicle does not resonate.

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- 1) 2.5 mm peak-to-peak amplitude for frequencies less than 1.4 Hz,

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1.12.3.2 The resonant frequency of the resilient suspension system shall be designed to avoid coupling with that of the vehicle structure. All suspensions are to be designed to provide maximum isolation for all modes of vibration. Also, resilient mounts must be arranged in a manner such that the equipment will be retained safely on the vehicle, and may continue operation, under all operating conditions stated in this ERT and any other applicable specification, in the event of a complete failure of the elastomeric material.

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1.13 Ride Quality

1.13.1 The vehicle shall be designed to be free from undue vibration and shock. All mounted equipment shall be free from resonance to avoid undue audible and visual distraction.

1.13.2 The ride quality shall be evaluated according to JIS E 4023 or other international standards. The Contractor shall provide a vibration analysis for the Engineer’s review and acceptance, which shall demonstrate compliance to these ride quality requirements.

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

sub-structure.

- 2.7.5 Floor covering panels shall be insulated from the metallic structure by elastomeric tape or equivalent. At all door openings, the floor shall have a weather tight connection with the threshold plates. Floor covering materials and installation shall be in accordance to the provision of Sub-Clause 5.4 of this ERT and shall be compliant to the Fire Safety requirements specified in Sub-Clause 21.8.

2.8 Equipment Mounting

2.8.1 General

- 2.8.1.1 Equipment arrangement, weight distribution purposes, on all vehicles shall be as even as possible under W0 loading conditions. Loading difference of axles when measured on weighbridge shall not be more than 1000kg from the average of 4 axles and loading between wheels in an axle shall be less than 10%.

~~2.8.1.2 Note when fully assembled wheel load on a vehicle shall be less than +/- 5%~~

~~2.8.1.3~~ 2.8.1.2 All equipment mounts shall meet the requirements of Sub-Clauses 1.12 Noise Vibration and Aerodynamics and 1.14 Maintainability Requirements of this ERT and shall have a fatigue life of not less than 30 years.

~~2.8.1.4~~ 2.8.1.3 Equipment shall be logically grouped into enclosures, which shall meet the requirements of Clause 23 of this ERT. Care shall be taken to ensure that the equipment within the enclosures is readily maintainable, taking into consideration the required maintenance interval. Mounting of equipment enclosures/boxes shall be made to allow easy access and opening given the constraints of the maintenance pit/facility.

~~2.8.1.5~~ 2.8.1.4 All equipment and corresponding cases shall be mounted such that removal and replacement of each is possible without requiring the removal of other major equipment or cases. Similar but non-interchangeable parts shall have different mounting arrangements, to ensure against mistakes in fitting.

~~2.8.1.6~~ 2.8.1.5 The Contractor shall ensure that safety mounts are provided for all under-frame mounted equipment to prevent derailment risk in the event of main mounts failure in service. Similarly, equipment’s enclosures shall have the doors securely attached to prevent falling off and cause derailment or other damage.

~~2.8.1.7~~ 2.8.1.6 The Contractor shall ensure that all fasteners are of the same material when attaching components to the carbody and be of the same grade appropriate to the load and position.

~~2.8.1.8~~ 2.8.1.7 The Contractor shall design equipment arrangement in consideration with signaling system and radio system adopted or planned to adopt in MCRP, NSCR and NSRP-S. Basically, space of under floor in leading cars shall be secured for signaling equipment, radio equipment, in addition, equipment desirable to be mounted to leading cars such as door controller and so on.

~~2.8.1.9~~ 2.8.1.8 The Contractor shall confirm equipment arrangement of rolling stock in MCRP, NSCR and NSRP-S, and equipment arrangement shall be unified as possible, paying attention to mounted side, mounted positions (especially test valves, valves and cocks used in emergency), and so on. Equipment arrangement shall be designed not to affect maintainability and emergency operation even if special operations are adopted. Example, equipment arrangement shall be designed in consideration with symmetry, when reversed train formation operation will be adopted.

~~2.8.1.10~~ 2.8.1.9 Equipment arrangement shall be reviewed by the Engineer.

the carbody.

- 2.5.3 The carbody shell shall be designed and tested to allow an empty vehicle, with bogies attached, to be lifted at the extreme ends at the bolster jacking pads, or any combination thereof (particularly during re-railing operations), without exceeding the yield strength of any portion of the carbody.

2.6 Car Roof

- 2.6.1 Roof construction shall be sufficiently robust as to allow several maintenance personnel to walk over the roof at one time, without causing undue deflection or permanent deformation. Rain gutters shall run for the full length of the vehicles to prevent the spillage of rainwater over passengers when the train is entering or leaving stations. Both ends of the vehicle shall have gutters with adequate water drainpipe that runs to the lowest possible point under the vehicle.

- 2.6.2 A roof mat under and around the pantograph area shall be installed for electrical insulation and anti-slip protection. In addition, anti-slip surface shall also be provided along the side of the roof covering the whole length of the vehicle.

2.7 Floor

- 2.7.1 The floor and its mounting structure shall be designed to withstand any loading condition specified herein, for over 30 years in normal operation of the train.

- 2.7.2 Transverse joints shall be located over carbody structural members and away from doorways.

- 2.7.3 All exposed edges of the panels, including openings for ducts and conduits, and joints between panels shall be waterproofed and adequately sealed.

- 2.7.4 The floor design shall allow the floor covering to be removed without damage to the floor sub-structure.

- 2.7.5 Floor covering panels shall be insulated from the metallic structure by elastomeric tape or equivalent. At all door openings, the floor shall have a weather tight connection with the threshold plates. Floor covering materials and installation shall be in accordance to the provision of Sub-Clause 5.4 of this ERT and shall be compliant to the Fire Safety requirements specified in Sub-Clause 21.8.

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- 2.8.1.1 Equipment arrangement, weight distribution purposes, on all vehicles shall be as even as possible under W0 loading conditions. Loading difference of axles when measured on weighbridge shall not be more than 1000kg from the average of 4 axles and loading between wheels in an axle shall be less than 10%.

- 2.8.1.2 All equipment mounts shall meet the requirements of Sub-Clauses 1.12 Noise Vibration and Aerodynamics and 1.14 Maintainability Requirements of this ERT and shall have a fatigue life of not less than 30 years.

- 2.8.1.3 Equipment shall be logically grouped into enclosures, which shall meet the requirements of Clause 23 of this ERT. Care shall be taken to ensure that the equipment within the enclosures is readily maintainable, taking into consideration the required maintenance interval. Mounting of equipment enclosures/boxes shall be made to allow easy access and opening given the constraints of the maintenance pit/facility.

- 2.8.1.4 All equipment and corresponding cases shall be mounted such that removal and replacement of each is possible without requiring the removal of other major equipment or cases. Similar but non-interchangeable parts shall have different mounting arrangements, to ensure against mistakes in fitting.
- 2.8.1.5 The Contractor shall ensure that safety mounts are provided for all under-frame mounted equipment to prevent derailment risk in the event of main mounts failure in service. Similarly, equipment’s enclosures shall have the doors securely attached to prevent falling off and cause derailment or other damage.
- 2.8.1.6 The Contractor shall ensure that all fasteners are of the same material when attaching components to the carbody and be of the same grade appropriate to the load and position.
- 2.8.1.7 The Contractor shall design equipment arrangement in consideration with signaling system and radio system adopted or planned to adopt in MCRP, NSCR and NSRP-S. Basically, space of under floor in leading cars shall be secured for signaling equipment, radio equipment, in addition, equipment desirable to be mounted to leading cars such as door controller and so on.
- 2.8.1.8 The Contractor shall confirm equipment arrangement of rolling stock in MCRP, NSCR and NSRP-S, and equipment arrangement shall be unified as possible, paying attention to mounted side, mounted positions (especially test valves, valves and cocks used in emergency), and so on. Equipment arrangement shall be designed not to affect maintainability and emergency operation even if special operations are adopted. Example, equipment arrangement shall be designed in consideration with symmetry, when reversed train formation operation will be adopted.
- 2.8.1.9 Equipment arrangement shall be reviewed by the Engineer.
- 2.8.2 Cabin and Saloon Access Handrails and Steps
 - 2.8.2.1 The Contractor shall ensure that a set of steps with non-slip treads is provided under each driver’s door; to warrant the Driver’s safety when boarding and exiting the vehicle when not at platform level.
 - 2.8.2.2 The Contractor shall ensure that easy access steps with non-slip treads and handrails fit for purpose will be provided at each passenger side entrance door on both sides, this will allow passengers to easily and safety exit the cars during evacuation circumstances when the car is not at platform level. Signage and instructions on how to alight from the train safely shall be provided for each passenger door.
 - 2.8.2.3 The stiffness and strength of the handrails and their connections shall be designed and tested to ensure that they will withstand the rigors of use and the environment. They shall be designed and tested to withstand, without permanent deformation, a load of 1.3 kN applied at the midpoint of the span.
 - 2.8.2.4 The stiffness and strength of the steps and their connections shall be designed and tested to allow use by a person exerting a force of 1.3 kN (load applied at angle of 45 degrees), without permanent deformation, and with the maximum deflection limited to 1 mm.
- 2.9 **Stanchions, Handrails, Grab Handles, Door Screen**
 - 2.9.1 General
 - 2.9.1.1 The interior will be equipped with sufficient stanchions and handrails to accommodate the safety of standee passengers. When normally loaded to W2 and onwards, capacity there shall be sufficient handholds for all passengers.
 - 2.9.1.2 Stanchions and handrails shall be securely held at each end in fittings. Fittings shall be

- a) The location and mounting of velocity sensors (considering signalling system and ATO)
 - b) Mounting arrangements and termination of the associated cabling.
- 3.1.16 The major component of bogie such as wheel profile and so on, Contractor shall propose ~~the~~ the most suitable specifications based on calculated results such as the estimated derailment coefficient ratio described in Technical Regulatory Standard on Japanese Railway issued by MLIT including public notice and Approved Model Specification, limited speed for shunting and shall be given Statement of No Objection by engineer. Moreover, before start of business, Contractor shall measure Q/P for all running section, which include reverse running operation or single line parallel operation during emergency situation, by running actually at normal speed and low speed (necessary section) and shall confirm that ratio of the results to limited derailment coefficient, calculated by Nadal’s formulation, are lower than predetermined values. If there are sections that the values are higher than predetermined values, the Contractor shall do as much as the Contractor can and report it the Engineer.

3.2 Suspension System

3.2.1 General

- 3.2.1.1 The suspension system shall be comprised of a primary and secondary suspension systems, the characteristics of which shall provide good riding comfort, low transmissibility of vibration to the carbody and minimize impact and vibration noise. The primary suspension shall be equipped with service proven Coil/Hydro springs, or equivalent, and that air springs be used for the secondary suspension. The material used in the suspension shall be ozone protected. The bogie design shall provide good curving performance to minimize wheel noise and wheel/rail wear and unnecessary wheel unloading.
- 3.2.1.2 The suspension system shall be such as to ensure that the vehicle remains within the Rolling Stock Gauge under all conditions of passenger loading at static condition and maintain sufficient clearance between structure gauge under all combinations of passenger loading, vehicle speed consistent with the system’s track curvature / speed restrictions and track curvature including super elevation. The vehicles must remain clearance under the conditions of deflated air springs, over-inflated air springs, broken primary springs, etc.
- 3.2.1.3 The rotational resistance of the bogie/carbody interface and the bogie suspension elements shall be such as to minimize excessive wheel flange contact and, hence, minimize wheel squeal and wheel/rail head wear, while preventing yaw instability (hunting) throughout the vehicle’s speed range. If necessary, yaw damper and vertical damper in parallel with primary or secondary suspension may be acceptable for preventing instability when running. The bogies shall be designed to allow the complete vehicles to meet the ride quality requirements of Sub-Clause 1.13 of this ERT. The Contractor may adapt active/semi-active suspension system, after permission of engineer.

3.2.2 Primary Suspension

- 3.2.2.1 The primary suspension shall be designed to provide the required degree of wheel set guidance and to minimize wheel flange wear. However, wheel set yaw stiffness and damping shall not be such as to allow a yaw instability condition throughout any portion of the vehicle speed range.
- 3.2.2.2 Primary suspension vertical stiffness shall not be so great as to impart undue forces on the rail under dynamic conditions and shall be sufficiently flexible to prevent the degree

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~~conditions, ...etc.-its), -type and number of elements,~~ and the criteria used for the acceptability of stress levels, other provisions shall be subjected to the Engineer for review and comments.

- 3.11.4 In addition, the Contractor shall provide Proof Load Case and Fatigue Load Case for all Bogie and Axle mounted equipment and parts. For a new design bogie, fatigue testing of the bogie frame is required according to JIS E 4207 or EN 13749 or equivalent standard. If the bogie is nominally identical to other products from the same supplier, the fatigue tests reports of the bogie shall be submitted to the Engineer for review and given the statement on No Objection.
- 3.11.5 The natural frequencies of the bogie, including any suspension, shall be sufficiently separated from any other natural frequencies of either the carbody or any equipment mounted thereto, such that resonance, noise and excessive vibration are avoided with the bogie in any operating condition, and with any acceptable level of wear of bogie components.
- 3.12 Bogie Maintainability**
- 3.12.1 The bogie frame shall be fitted with suitable locations for lifting off the wheels and axles, for lifting the complete bogie frame during maintenance in the workshop and for re-railing a car or bogie. Jacking pad location shall be provided to match the shop equipment during the design stage.
- 3.12.2 In addition, the design of the bogie frame shall incorporate horizontal and vertical pads at diagonal positions for re-railing operations following derailments.
- 3.12.3 The bogies shall be capable of being cleaned using high-pressure hot water or steam jet cleaning equipment, with or without detergents. All closed sections and pockets shall be self-draining or sealed against water ingress. All bearings except traction motor and gear box shall be adequately sealed to ensure that water and cleaning fluids do not enter during the cleaning process.
- 3.12.4 Bogies shall be capable of being disconnected and reconnected easily and with a minimum of operations by personnel working in pits or alongside the bogies. It shall be possible to easily inspect for correct reconnection. In case special tools or instruments are required for this work, the Contractor shall provide these tools.
- 3.12.5 It shall be possible for personnel working in pits or alongside the bogie to visually inspect the condition of bogie components, such as brakes and wheel profiles and condition easily and without the use of special tools.
- 3.12.6 The bogie shall provide easy and safe access for all maintenance, including access for the train operator, driver or technician to operate the isolating cocks for bogie-mounted equipment and parking brake manual releases.
- 3.12.7 Lubricated bearings shall be adequately sealed to ensure that water and cleaning fluids shall not enter during the cleaning process.
- 3.12.8 The attachments between the body and the bogie shall be such that if the car is lifted without disconnecting the bogies, the bogies, traction drives, and wheel sets shall be retained captive to the car without the need for additional restraints at the time of lifting. No damage shall result to any of the connections as a result of this action.
- 3.12.9 Wheels, axles, bearings, gearboxes and motor assemblies shall be interchangeable between ends of the bogie and between bogies.

...etc.), and the criteria used for the acceptability of stress levels, other provisions shall be subjected to the Engineer for review and comments.

- 3.11.4 In addition, the Contractor shall provide Proof Load Case and Fatigue Load Case for all Bogie and Axle mounted equipment and parts. For a new design bogie, fatigue testing of the bogie frame is required according to JIS E 4207 or EN 13749 or equivalent standard. If the bogie is nominally identical to other products from the same supplier, the fatigue tests reports of the bogie shall be submitted to the Engineer for review and given the statement on No Objection.
- 3.11.5 The natural frequencies of the bogie, including any suspension, shall be sufficiently separated from any other natural frequencies of either the carbody or any equipment mounted thereto, such that resonance, noise and excessive vibration are avoided with the bogie in any operating condition, and with any acceptable level of wear of bogie components.
- 3.12 **Bogie Maintainability**
- 3.12.1 The bogie frame shall be fitted with suitable locations for lifting off the wheels and axles, for lifting the complete bogie frame during maintenance in the workshop and for re-railing a car or bogie. Jacking pad location shall be provided to match the shop equipment during the design stage.
- 3.12.2 In addition, the design of the bogie frame shall incorporate horizontal and vertical pads at diagonal positions for re-railing operations following derailments.
- 3.12.3 The bogies shall be capable of being cleaned using high-pressure hot water or steam jet cleaning equipment, with or without detergents. All closed sections and pockets shall be self-draining or sealed against water ingress. All bearings except traction motor and gear box shall be adequately sealed to ensure that water and cleaning fluids do not enter during the cleaning process.
- 3.12.4 Bogies shall be capable of being disconnected and reconnected easily and with a minimum of operations by personnel working in pits or alongside the bogies. It shall be possible to easily inspect for correct reconnection. In case special tools or instruments are required for this work, the Contractor shall provide these tools.
- 3.12.5 It shall be possible for personnel working in pits or alongside the bogie to visually inspect the condition of bogie components, such as brakes and wheel profiles and condition easily and without the use of special tools.
- 3.12.6 The bogie shall provide easy and safe access for all maintenance, including access for the train operator, driver or technician to operate the isolating cocks for bogie-mounted equipment and parking brake manual releases.
- 3.12.7 Lubricated bearings shall be adequately sealed to ensure that water and cleaning fluids shall not enter during the cleaning process.
- 3.12.8 The attachments between the body and the bogie shall be such that if the car is lifted without disconnecting the bogies, the bogies, traction drives, and wheel sets shall be retained captive to the car without the need for additional restraints at the time of lifting. No damage shall result to any of the connections as a result of this action.
- 3.12.9 Wheels, axles, bearings, gearboxes and motor assemblies shall be interchangeable between ends of the bogie and between bogies.

level of thermal insulation consistent with the requirements of the air conditioning system.

- 5.11.8 Glazing shall be readily removed and replaced without remove the interior linings.
- 5.11.9 Contractor shall provide related repair procedure.
- 5.11.10 Each window, including glazing shall have sufficient strength when tested in accordance with JIS R 3213 or other equivalent standards.
- 5.11.11 All side windows shall transmit less than 7% of the incident ultraviolet radiation. Body side and door glazing shall be capable of rejecting 50% to 80% solar energy with visible light transmission of 40% to 55%.
- 5.11.12 Glazing of windows, on body-side and doors, shall resist to an act of vandalism. The windows shall be high enough to prevent accidental breakage.
- 5.11.13 Window seals shall be designed to prevent ingress of water to the inside of walls. The sealing material shall be so selected that it lasts at least the mid-life interval overhauls of carbody.
- 5.11.14 Door windows shall have a window similar to the windows provided in the carbody as far as possible in respect of solar gain, thermal insulation, replacement criteria, strength, resistance to pressure, and the transmission of light, and solar heat gain.
- 5.11.15 Door windows single glazed with toughened/tempered glass shall be replaceable without removal of the door leaf.
- 5.11.16 Curtains or blinds preventing sunshine shall be equipped for all windows.

5.12 Drivers Cab Windshield

- 5.12.1 The Cab front windshield shall be of tempered safety glass meeting the requirements of JIS R 3213 or other equivalent standards.
- 5.12.2 Windscreens shall have sufficient strength to resist penetration as per the requirements of UIC 651 or equivalent standard.
- 5.12.3 The Cab windshield shall be bonded directly to the Carbody window frame. The design shall ensure that, in the event of breakage, sufficient visibility is maintained to operate the train safely for the remainder service.
- 5.12.4 Windshield shall be replaceable within a four (4)-hour period. Glue and sealant will be of a type to cure to a level sufficient for the unit to re-enter Revenue Service 8 hours after the completion of the installation of the windshield.
- 5.12.5 A sun visor shall be installed to provide protection from direct and reflected sunlight over as large an area as possible.
- 5.12.6 The windshield design shall minimize glare and reflections, including any internal reflection from the TMS screen, gauges and controls.
- 5.12.7 Windshields shall be provided with external electric wiper/washer units and defogger unit. The driver shall be able to control the active Cab windshield wipers, washers and defogger via the active Driver’s Desk. A fan defogger shall not be acceptable. This system shall have no adverse effect on the windshield including overheating in direct sunlight. ~~A rain sensor of proven quality shall be provided and integrated with the wiper unit for detection of rain. Signal from sensor should also be fed to TMS for control of propulsion and braking under wet conditions to avoid wheel slip.~~

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- 5.12.7 Windshields shall be provided with external electric wiper/washer units and defogger unit. The driver shall be able to control the active Cab windshield wipers, washers and defogger via the active Driver’s Desk. A fan defogger shall not be acceptable. This system shall have no adverse effect on the windshield including overheating in direct sunlight.
- 5.12.8 The windshield wipers, washers and defogger equipment shall not impair the Driver’s line of sight. The windshield wipers shall include adjustable speeds of operation with intermittent function and “park” position. At least 80% of the width and 60% of the height of the windshield shall be swept over a complete cycle. Design of the windshield wipers

statement of No Objection.

5.18 Cab Air Conditioning System

- 5.18.1 Conditioned air system shall be ducted from the passenger compartment air supply, through adjustable diffusers in the cab ceiling, to maintain the specified vehicle interior temperatures ~~and humidity, or shall be installed air conditioning system for only cab. The driver shall be able to adjust conditions in his cab.~~
- 5.18.2 The Driver’s cab air supply design, arrangement and calculations shall include the 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-ininitely variable),

(VDTs) or equivalent; and

- 3) JIS Z 8502 Ergonomic principles related to mental workload or other equivalent standards.

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

For example:

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

5.17 **Driver's Seat**

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

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

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

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

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

5.18 **Cab Air Conditioning System**

5.18.1 Conditioned air system shall be ducted from the passenger compartment air supply, through adjustable diffusers in the cab ceiling, to maintain the specified vehicle interior temperatures and humidity.

5.18.2 The Driver’s cab air supply design, arrangement and calculations shall include the increased solar load through the cab's windshield and the heat load produced by the equipment inside the Driver’s cab.

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

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

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

~~8.2.98.2.8~~ Active-ventilation system actuated by the battery supply shall be necessary, according to the requirements of the Japanese Ministerial Ordinance, MLIT Chapter 8, Section 4, Article 73 (Structure of Saloon) or other equivalent standards. Active ventilation system shall be operated at least one (1) hour by the battery supply.

~~8.2.108.2.9~~ The entire ventilation system shall be submitted to the Engineer for review and comments.

8.3 Cooling System

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

8.3.2 The calculated capacity shall be reviewed by the Engineer.

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

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

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

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

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

8.3.8 Blowers shall be direct driven by the motor, which shall be powered by the 440 Vac

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

operation ratio. For this control, train line or transmission of TMS may be utilized.

10.3 Pneumatic System

- 10.3.1 The Contractor shall submit details of stainless-steel pneumatic system piping or an equivalent service-proven material such as copper for ~~for Engineer~~ the Engineer review. Joints shall be rail industry approved compression fittings. Joints shall not be made to connect straight runs of pipe work, unless reviewed and approved by the Engineer. Inaccessible runs of pipe work shall not utilize joints. All piping shall be installed to keep fittings to an absolute minimum.
- 10.3.2 Cut-out valve handles shall be installed so that in the open position they are parallel to the flow of air, and in the closed position they are perpendicular to the flow of air. Cut-out cock handles shall be readily accessible for use in an emergency. All cut-out cocks shall be of the vented type, unless the function prohibits their use. The function of all cut-out cocks shall be clearly identified by means of engraved stainless-steel plates riveted to structure adjacent to the valve, the lettering on which shall be filled with black epoxy paint and suitable color coded.
- 10.3.3 All pneumatic tanks or reservoirs shall have drain valve to remove condensates.
- 10.3.4 All pneumatic tanks shall be in accordance with EN286-C or EN286-4 or other equivalent standard.
- 10.3.5 A cut-off valve shall be provided at a place required for maintenance or abnormality.
- 10.3.6 Separate systems within the pneumatic system shall be supplied via a vented cut-out valve and a strainer, and shall be provided with separate air reservoirs, supplied through a check valve to protect against sudden loss of air pressure. The air brake reservoir shall be sized to provide at least three emergency brake operations under W2 loading conditions. Reservoirs shall be set to assist moisture collection and shall include automatic/manual drain valves.
- 10.3.7 The main air reservoir shall have sufficient capacity for the simultaneous operation of all pneumatic devices. Calculations for the capacity of all reservoirs shall be submitted to the Engineer for review.
- 10.3.8 All air reservoir structure shall comply with EN286-C or EN286-4. or other equivalent standards.
- 10.3.9 All flexible hoses shall be date stamped, and its full life indicated. All flexible hose connections on removable assemblies shall be of railway service proven, quick connect coupling.
- 10.3.10 The device and air pipe from the last tank as the source of the braking force to brake cylinder used to service brake and emergency brake shall be placed within the width of bogie.
- 10.3.11 The device and air pipe from the last tank as the source of the braking force to brake cylinder used to security brake shall be placed within the width of bogie frame.
- 10.3.12 Pneumatic air supply distribution system shall be designed in such a way that any single point failure can be readily isolated to ensure that the affected train can be continued in service in a safe manner.

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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.

14.3 Redundant system

14.3.1 ~~Two (2)~~ APSEs mounted on ~~train-set~~limited express train shall ~~perform~~have a parallel synchronous operation. If one of two performing parallel synchronous stops by trouble, the other APSE shall perform normally. Then, the signal of VAC degraded mode of operation shall be transmitted to VAC of the affected area through TMS.

14.4 Maintenance Requirements

14.4.1 No component in the APSE and the ACU except for cover packing, power supply unit (AVR), gate IF, contacts of LB shall require removal or replacement for at least 12 years.

14.4.2 Any fault in the APSE or the ACU shall be logged and into the Fault Indication System of the TMS and ACU. What is needed of any fault shall be enunciated in the Driver’s Cab. Logged fault into the TMS and ACU shall be stored and remain until certain number of faults. ACU shall have ordinary-speed and high-speed trace function. In high-speed 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.

14.4.3 Means shall be provided to automatically discharge capacitors whose voltage might present a hazard to a maintenance worker opening any enclosure. Discharge time shall not be more than 5 minutes.

14.5 Circuit Breaker Panels and Isolating Switches

14.5.1 The following distribution panels shall be provided:

- 1) Low (100 Vdc) Voltage Circuit Breaker Panel;
- 2) 220/440 V_{AC} Circuit Breaker Panel;
- 3) All 220/440 V_{AC} circuit breakers shall be located in a separate enclosure, and shall individually protect the circuits;
- 4) Panel for Auxiliary Power Supply Equipment;
- 5) Spare Circuit Breakers for all panels and
- 6) All isolating switches and Circuit breakers necessary for vehicle intervention shall be placed inside the driver’s cab for easy access and intervention.

14.5.2 All circuit breakers and switches necessary for vehicle revenue line fault intervention shall be located inside the drivers’ cab. The final list of circuit breakers and switches shall be subject to review by the Engineer. All circuit breaker panels shall be reviewed and commented by the Engineer. ~~Attention shall be paid that arrangement of the panels are coordinated in consideration with operations in MCRP, NSCR and NSRP S.~~

14.6 Emergency Power Supply

14.6.1 When battery capacity decreases, pantographs cannot be raised and APSE cannot operate

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14.6 Emergency Power Supply

14.6.1 When battery capacity decreases, pantographs cannot be raised and APSE cannot operate because of lack of DC100V as control power voltage. Therefore, the Emergency Power Supply function, shown below, shall be equipped.

14.6.2 After pantograph raised by releasing the lock manually, it shall be able to take DC1500V power from overhead catenary and the power shall be converted to DC100V by Emergency Power Supply function. This is done at transformer level.

14.6.3 In this case, insufficient voltage supply to device which need DC100V shall not be permissible for appropriate initialize of device. Cutting off the DC100V circuit from battery may be acceptable, if necessary.

for review a Commissioning Plan Compendium, recording all testing carried out, functions and performance demonstrated, reports produced and reviewed by the Engineer. This shall include the Trial Operation as mentioned in ERG clause 12.2.4.

20.2.3 Testing Details

- 20.2.3.1 For any tests where the Engineer has indicated that they wish to witness, no testing shall be carried out against a test specification prior to its review by the Engineer.
- 20.2.3.2 The test specification shall include sample test certificates and the design values and also the tolerances shall be shown.
- 20.2.3.3 All materials and/or details represented by samples, which are found to be non-compliant, will be rejected.
- 20.2.3.4 The Contractor shall replace any material or detail destroyed in the process of testing.

20.3 Design Qualification Testing

- 20.3.1 As part of the design verification process, type tests shall be carried out to demonstrate that the design of the train consist, and its systems are in full compliance with the requirements specified in this ERT. The tests shall be completed at the Contractor’s manufacturing facility unless otherwise specified or reviewed by the Engineer.
- 20.3.2 The Contractor shall perform an endurance test in accordance to the requirements of Sub-Clause 7.1 of this ERT on the proposed door design to demonstrate that the requirements specified therein are met.
- 20.3.3 The door system shall be endurance tested on a rig in suitable climatic conditions to demonstrate that the door system will allow the train consist to meet the requirements of this ERT. The rig shall test opening and closing of the door, obstruction detection and re-open of the door in a combination to simulate likely service operation and shall be submitted for review by the Engineer.
- 20.3.4 Design Qualification testing shall be performed of the complete propulsion, braking and Train Management System (TMS) systems configuration, using simulated loads on the traction motors. Combined propulsion system testing shall be in accordance with JIS E 5008 and JIS E 5011 or other equivalent standards like IEC 61287-1 and IEC 61377.
- 20.3.5 Design Qualification testing shall be performed on the complete auxiliary power system configuration, using simulated loads. Combined auxiliary power system testing shall be in accordance with JIS E 5008 or other equivalent standards like IEC 61287-1.
- 20.3.6 Design Qualification testing shall be performed for the TMS system to verify designed capacity of the systems, functional requirement and correct interfacing. The real interface hardware and software should be used where possible.
- 20.3.7 The braking system shall be tested to demonstrate its ability to satisfactorily interface with the Train Control and Signaling systems and provide performance as specified herein.
- 20.3.8 The parking brake shall be tested to demonstrate its ability to hold a consist on the specified gradient. The test shall record the actual force required to overcome the parking brake in a failure recovery situation on both level track and a 3.5% gradient. ~~The test shall be undertaken at the time of handing over of Rolling Stock.~~ This shall be carried out with a number of parking brakes (20%) isolated.

20.2.3 Testing Details

- 20.2.3.1 For any tests where the Engineer has indicated that they wish to witness, no testing shall be carried out against a test specification prior to its review by the Engineer.
- 20.2.3.2 The test specification shall include sample test certificates and the design values and also the tolerances shall be shown.
- 20.2.3.3 All materials and/or details represented by samples, which are found to be non-compliant, will be rejected.
- 20.2.3.4 The Contractor shall replace any material or detail destroyed in the process of testing.

20.3 Design Qualification Testing

- 20.3.1 As part of the design verification process, type tests shall be carried out to demonstrate that the design of the train consist, and its systems are in full compliance with the requirements specified in this ERT. The tests shall be completed at the Contractor’s manufacturing facility unless otherwise specified or reviewed by the Engineer.
- 20.3.2 The Contractor shall perform an endurance test in accordance to the requirements of Sub-Clause 7.1 of this ERT on the proposed door design to demonstrate that the requirements specified therein are met.
- 20.3.3 The door system shall be endurance tested on a rig in suitable climatic conditions to demonstrate that the door system will allow the train consist to meet the requirements of this ERT. The rig shall test opening and closing of the door, obstruction detection and re-open of the door in a combination to simulate likely service operation and shall be submitted for review by the Engineer.
- 20.3.4 Design Qualification testing shall be performed of the complete propulsion, braking and Train Management System (TMS) systems configuration, using simulated loads on the traction motors. Combined propulsion system testing shall be in accordance with JIS E 5008 and JIS E 5011 or other equivalent standards like IEC 61287-1 and IEC 61377.
- 20.3.5 Design Qualification testing shall be performed on the complete auxiliary power system configuration, using simulated loads. Combined auxiliary power system testing shall be in accordance with JIS E 5008 or other equivalent standards like IEC 61287-1.
- 20.3.6 Design Qualification testing shall be performed for the TMS system to verify designed capacity of the systems, functional requirement and correct interfacing. The real interface hardware and software should be used where possible.
- 20.3.7 The braking system shall be tested to demonstrate its ability to satisfactorily interface with the Train Control and Signaling systems and provide performance as specified herein.
- 20.3.8 The parking brake shall be tested to demonstrate its ability to hold a consist on the specified gradient. The test shall record the actual force required to overcome the parking brake in a failure recovery situation on both level track and a 3.5% gradient. This shall be carried out with a number of parking brakes (20%) isolated.
- 20.3.9 Before transporting the Rolling Stock to Manila, the Contractor shall perform a test to demonstrate that the Emergency Braking and service requirements have been met each design deceleration.

5) Modification 'strike box' with a minimum of 10 positions.

1.3.3 Software Configuration

1.3.3.1 Configuration of software shall comply with the requirements of EN 50128 or any equivalent standard approved by the Engineer.

1.4 Special Responsibility of the Contractor

1.4.1.1 No examination, review and given statement of No Objection by the Engineer of the design, drawings, and documents submitted by the Contractor, with or without amendment, or any given statement of No Objection or consent given by the Engineer for any equipment or part of the Works, shall absolve the Contractor from any of his obligations under the contract or any liability arising out of the designs, drawings and documents or equipment or part of Works.

1.5 Mockup

1.5.1.1 In order to evaluate the effectiveness of the vehicle interior and its layout, the Contractor shall develop the interior design using a full-scale half- vehicle (with driver’s cab) mockup. The drivers cab mockup shall be fully equipped to show completely built condition. The entire design of the vehicle interior including the drivers cab shall be reviewed by the Engineer/Employer.

1.5.1.2 The exterior of the mockup shall accurately represent that of the vehicle, and shall be painted to simulate actual materials or equivalent used. The mock-up shall be strong enough to accommodate persons inside without the damage or deformation. It shall be constructed on a substantial platform, to facilitate transportation and to prevent damage (cracking) and distortion of the hardware.

1.5.1.3 The Mockup shall be displayed to public at the location determined by the Employer. The Contractor shall bear all of the associated cost of the mock-up from Manufacturer’s Factory to the location of display in Metro Manila, Philippines.

1.5.1.4 The Contractor shall prepare the provision of at least twelve (12) display sites which shall be determined by the Employer over a period of 18 months of mockup display. The Contractor shall bear all of the associated cost of the Mockup logistics and others i.e., security, authority approval etc. including the demobilization of the mockup upon completion of the mockup display period.

1.6 Basic Train Formation

1.6.1 General Vehicle Configuration

1.6.1.1 ~~The limited express train is consisting of 6 motor mounted cars and 2 trailer (not motor mounted) cars with operator cab. However, the Contractor can propose alternative to the motor configuration during the design stage. The limited express train formation shall consist of eight (8) car sets comprises of motor mounted cars and trailer cars (not motor mounted) with operator cab. The design flexibility shall be provided for the limited express train formation of 10 car sets per consist for future expansion.~~

1.6.1.2 Typical vehicle configuration consisting of 6 motor mounted cars and 2 trailer (not motor mounted) cars with operator cab is shown in Appendix AB. The bidder shall propose the limited express eight (8) cars train formation comprises of motor mounted cars, trailer

5) Modification 'strike box' with a minimum of 10 positions.

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1.3.3.1 Configuration of software shall comply with the requirements of EN 50128 or any equivalent standard approved by the Engineer.

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1.4.1.1 No examination, review and given statement of No Objection by the Engineer of the design, drawings, and documents submitted by the Contractor, with or without amendment, or any given statement of No Objection or consent given by the Engineer for any equipment or part of the Works, shall absolve the Contractor from any of his obligations under the contract or any liability arising out of the designs, drawings and documents or equipment or part of Works.

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1.6 **Basic Train Formation**

1.6.1 General Vehicle Configuration

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1.6.1.2 Typical vehicle configuration consisting of 6 motor mounted cars and 2 trailer (not motor mounted) cars with operator cab is shown in Appendix A. The bidder shall propose the limited express eight (8) cars train formation comprises of motor mounted cars, trailer cars and cars with operator cab. The proposed formation and the equipment architecture shall meet the system requirements in this tender not limited to weights limits, train

be the enough service-proven:

- 1) Slip resistance of 0.75 dry and 0.62 wet in accordance with JRIS J0745 or other equivalent standards,
- 2) Hardness of Shore A Hardness 85-90,
- 3) Resistance to chemicals in accordance with JIS A 1454 (or other equivalent standards) with noticeable variation, and
- 4) Tensile strength in accordance with JIS K6251 (or other equivalent standards) - 7.3MPa;

The Contractor can propose alternative to the above requirement value for the Engineer review.

- 5.4.11 The entire floor construction shall be required to comply with the fire safety requirement as per clause 21.8 of this ERT.
- 5.4.12 All floor penetrations (for piping, conduit, etc.) shall be suitably sealed against the elements, and be required to comply with the fire safety requirement as per clause 21.8 of this ERT.

5.5 Ceiling

- 5.5.1 The vehicle ceiling shall present an aesthetically pleasing smooth service, and shall incorporate lighting fixtures, conditioned air outlet grilles, public address speakers, etc. The ceiling panels and fixtures shall not vibrate, rattle or squeak during normal service conditions. Panels shall comply with fire regulations DIN 5510-2.

5.6 Entrance Room

- 5.6.1 At the end of passenger saloon, a vestibule shall be provided for the purpose of separating the door area from the passenger accommodation and keeping cooled air in the saloon. Between saloon and vestibule the partition with door shall be provided. That door shall be automatically opened and closed by floor based or button or sensor. Passenger get on and get off the train through vestibule.
- 5.6.2 Alternate arrangement can be suggested by the Contractor looking into optimum space utilization and carrying capacity in rush hours and will be subject to review and comments by the Engineer.

5.7 Passenger Seats

- 5.7.1 The Contractor shall propose a cross seating arrangement. Same needs to be submitted for Engineer’s review and comments.
- 5.7.2 All seats with limited reclining function shall be automatically/manually changeable the direction with locking system and installed to the floor by one stand to facilitate cleaning of floors and storage of Passengers’ belongings underneath.
- 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

be the enough service-proven:

- 1) Slip resistance of 0.75 dry and 0.62 wet in accordance with JRIS J0745 or other equivalent standards,
- 2) Hardness of Shore A Hardness 85-90,
- 3) Resistance to chemicals in accordance with JIS A 1454 (or other equivalent standards) with noticeable variation, and
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correspondence, documents, drawings and information and ensure efficient information management on the Project including the tracking of Progress with user friendly Monitoring, Tracker Modules, Dash boards, Triggers and reminders throughout the project life from Design stage to Testing & Commissioning and trial run.

9.4 Submission of Information – General

- 9.4.1 The Contractor shall submit to the Employer/Engineer, designs, general arrangement and detail drawings, specifications, reports and other technical literature, method statements, calculations, schedules, programs, samples, patterns and models for review in accordance with the requirements of the Contractor's final time schedule.
- 9.4.2 The Contractor shall be responsible for the completeness of all information submitted.
- 9.4.3 The Contractor shall submit his designs for the works to the Engineer for review. The design shall be submitted in the following stages as stated in Sub-Clause 224.2 of the Technical Requirements:
- 1) Conceptual design;
 - 2) Preliminary design; and
 - 3) Final design.

9.5 Submission of Information for Review

- 9.5.1 Drawings, diagrams, specifications, calculations, technical details, reports, method statements, technical literature, schedules and all other documents submitted by the Contractor for review shall comply with the following:
- 1) The drawings, diagrams, specifications, calculations, schedules and all other documents shall be complete, duly signed and of good legible quality;
 - 2) Drawings and diagrams shall be submitted on "A" series sheets. Drawings shall be titled, numbered and dated;
 - 3) All specifications, calculations, schedules and documents shall have a front cover sheet stating the title, date and document reference number;
 - 4) When schematics or diagrams are submitted, they shall be accompanied by all of the necessary supplementary information to describe the function and operation of the equipment;
 - 5) When drawings, diagrams, specifications, calculations, schedules and other documents are revised and/or resubmitted for review, all the revisions shall be clearly defined and located on all copies, and the document reference number shall contain a revision letter or number. The letter accompanying the drawings shall list the following information in tabular form:
 - b) The drawing number, including the current revision letter or number;
 - c) The drawing title;
 - d) A brief description of the latest revision; and
 - e) The reference number of the Engineer’s letter, to which the revisions correspond.
 - 6) The Contractor shall issue to the Employer/Engineer six (6) prints of each drawing and a copy of the electronic files. The electronic format shall be as given Notice of No Objection by the Engineer, but must allow the Employer/Engineer to clearly document future changes;

management on the Project including the tracking of Progress with user friendly Monitoring, Tracker Modules, Dash boards, Triggers and reminders throughout the project life from Design stage to Testing & Commissioning and trial run.

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- 9.4.2 The Contractor shall be responsible for the completeness of all information submitted.
- 9.4.3 The Contractor shall submit his designs for the works to the Engineer for review. The design shall be submitted in the following stages as stated in Sub-Clause 22.2 of the Technical Requirements:
- 1) Conceptual design;
 - 2) Preliminary design; and
 - 3) Final design.

9.5 Submission of Information for Review

- 9.5.1 Drawings, diagrams, specifications, calculations, technical details, reports, method statements, technical literature, schedules and all other documents submitted by the Contractor for review shall comply with the following:
- 1) The drawings, diagrams, specifications, calculations, schedules and all other documents shall be complete, duly signed and of good legible quality;
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 - 7) The Contractor shall provide to the Employer/Engineer six (6) prints of all networks

cars and cars with operator cab. The proposed formation and the equipment architecture 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. Auxiliary Power Equipment, Battery and Battery charger location shall be arranged to avoid the EMI to the signaling equipment unless otherwise specified.

~~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 | 19,500 mm |
|-------------------|-----------|

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.
- 1.6.1.4 Auxiliary Power Equipment, Battery and Battery charger location shall be arranged to avoid the EMI to the signaling equipment unless otherwise specified.
- 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:
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- 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	

- 2) **In-service Operations** - 10,000 km or two (2) months of continuous in-service operational FFR.

8.5.3 The train fleet (7 trainsets) as a whole shall achieve:

- 1) **MDBF** – In service operational faults, MDBF no less than 50,000 km causing a delay greater than 5 minutes.
- 2) **OMTTR** – Operational Mean Time To Restore (OMTTR) capital components; the trainsets shall be restored to operational order in an OMTTR of 15 minutes.
- 3) **CMTTR** – Corrective Mean Time To Repair (CMTTR) capital components shall not be greater than 4 hours.

8.5.4 Where appropriate, the Contractor shall also specify RAM (Reliability, Availability and Maintainability) requirements for the design, operation and maintenance of subsystems where the failure mode, effects and criticality analysis (FMECA) identify failure modes that have a maintenance, operations or safety impact, using the risk assessment methodology.

8.5.5 The Contractor shall commence the use of the Data reporting analysis and corrective action system (DRACAS) prior to any factory or site acceptance tests and report to the Employer/Engineer on a regular basis.

8.5.6 (Not Used)

8.6 Performance Reports

8.6.1 The Contractor shall provide Performance Reports to support the applications for Rolling Stock TOC for each trainset and the Performance Certificate for the fleet (7 trainsets).

8.6.2 The Rolling Stock TOC Performance report shall be issued for each trainset prior to operational acceptance and shall provide:

- 1) Technical design justification of performance;
- 2) Cross reference to Rolling Stock performance in a similar application;
- 3) The design prediction at LRU (Line replaceable unit) level (MDBF, OMTTR and CMTTR) of all capital components;
- 4) Failure mode, effect, & criticality analysis (FMECA) and Fault Tree Analysis (FTA)
- 5) Reliability Critical item list which might impact the operations of the train or train service,
- 6) Manufacturing Completion Certificate for each train,
- 7) Design Qualification Testing Completion Certificate,
- 8) Factory Acceptance Tests Completion Certificate,
- 9) Train Delivery to site completion Certificate,
- 10) As-built Drawing,
- 11) Completion of Training program,
- 12) On-site Testing and Commissioning Completion Certificate for each train, and
- 13) Train Operation Completion Certificate for each train 1500 km (FFR)

8.6.3 The Rolling Stock Performance report shall be issued progressively on a monthly basis, shall be finalized at the end of DNP, and shall provide:

- 1) In-service FFR operational performance of individual trainsets as per clause 8.53-3;

- 2) In-service operational performance of the fleet (7 trainsets) MDBF as per clause 8.53-3;
- 3) The in-service OMTTR and CMTTR of all capital components as per clause 8.53-3,
- 4) Completion of Defect Remedial,
- 5) Completion of Open Item,
- 6) Completion of Modification, and
- 7) Completion of Spare Part, Special Tools and Test Equipment delivery, and
- 8) DRACAS report

8.7 Performance Certificate

- 8.7.1 During the in-service Defects Notification Period (DNP), the fleet (all 7 trainsets) in total shall demonstrate successful achievement of the Performance Acceptance Criteria (PAC) which will be a prerequisite of the application for a Performance Certificate to be issued by the Engineer.
- 8.7.2 Failure to meet the PAC within the DNP shall mean that the DNP shall be extended until such time as the PAC of the total fleet has been met. All cost associated with the extension of the DNP shall be borne by the Contractor.
- 8.7.3 The DNP shall be up to a limit of 4 years from the date of commencement of the first train in-service operation.

8.8 Safety Assurance

8.8.1 Safety

8.8.1.1 Safety is defined as freedom from those conditions that can cause death, injury, occupational illness, or damage to or loss of equipment or property. All circumstances susceptible to cause injuries or fatalities of passengers, operation staff, and maintenance staff are considered as risks, and by extension, includes all events leading to a partial or total destruction of costly equipment. The objective of safety is expressed by the capability of the Rolling Stock to keep the physical integrity of the asset and to preserve the safety during railway operations and maintenance for passengers, staff and persons in general. The safety assurance program aims to reduce to a tolerable level the probability of occurrence of catastrophic or critical events causing damage to assets or harm to any person. The Contractor shall follow appropriate risk reduction principle such as ALARP (As Low as Reasonably Possible) to demonstrate the risk acceptance to the Employer.

8.8.1.2 The Contractor shall bear the duty of safety in design for the assurance of safety for the life cycle of operations for MCRP and NSRP-S. The Rolling Stock shall fulfil the safety requirements of all General Requirements and Technical Requirements and shall demonstrate that the train is fit for purpose to be operated and maintained in a safe manner for these projects.

8.8.2 Safety Assurance Plan (SAP)

8.8.2.1 Within the SAMP, the Contractor shall provide a Safety Assurance Plan (SAP) for review by the Engineer. The SAP shall cover the design, manufacture, testing, commissioning and integrated testing phases, and safety management for in-service passenger operations. The Plan shall further identify how the magnitude and seriousness of events or malfunctions which could result in harm to passengers or staff and damage to equipment or property will be minimized.

- 2) **In-service Operations** - 10,000 km or two (2) months of continuous in-service operational FFR.

8.5.3 The train fleet (7 trainsets) as a whole shall achieve:

- 1) **MDBF** – In service operational faults, MDBF no less than 50,000 km causing a delay greater than 5 minutes.
- 2) **OMTTR** – Operational Mean Time To Restore (OMTTR) capital components; the trainsets shall be restored to operational order in an OMTTR of 15 minutes.
- 3) **CMTTR** – Corrective Mean Time To Repair (CMTTR) capital components shall not be greater than 4 hours.

8.5.4 Where appropriate, the Contractor shall also specify RAM (Reliability, Availability and Maintainability) requirements for the design, operation and maintenance of subsystems where the failure mode, effects and criticality analysis (FMECA) identify failure modes that have a maintenance, operations or safety impact, using the risk assessment methodology.

8.5.5 The Contractor shall commence the use of the Data reporting analysis and corrective action system (DRACAS) prior to any factory or site acceptance tests and report to the Employer/Engineer on a regular basis.

8.5.6 (Not Used)

8.6 Performance Reports

8.6.1 The Contractor shall provide Performance Reports to support the applications for Rolling Stock TOC for each trainset and the Performance Certificate for the fleet (7 trainsets).

8.6.2 The Rolling Stock TOC Performance report shall be issued for each trainset prior to operational acceptance and shall provide:

- 1) Technical design justification of performance;
- 2) Cross reference to Rolling Stock performance in a similar application;
- 3) The design prediction at LRU (Line replaceable unit) level (MDBF, OMTTR and CMTTR) of all capital components;
- 4) Failure mode, effect, & criticality analysis (FMECA) and Fault Tree Analysis (FTA)
- 5) Reliability Critical item list which might impact the operations of the train or train service,
- 6) Manufacturing Completion Certificate for each train,
- 7) Design Qualification Testing Completion Certificate,
- 8) Factory Acceptance Tests Completion Certificate,
- 9) Train Delivery to site completion Certificate,
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- 11) Completion of Training program,
- 12) On-site Testing and Commissioning Completion Certificate for each train, and
- 13) Train Operation Completion Certificate for each train 1500 km (FFR)

8.6.3 The Rolling Stock Performance report shall be issued progressively on a monthly basis, shall be finalized at the end of DNP, and shall provide:

- 1) In-service FFR operational performance of individual trainsets as per clause 8.5;

- 2) In-service operational performance of the fleet (7 trainsets) MDBF as per clause 8.5;
- 3) The in-service OMTR and CMTTR of all capital components as per clause 8.5,
- 4) Completion of Defect Remedial,
- 5) Completion of Open Item,
- 6) Completion of Modification, and
- 7) Completion of Spare Part, Special Tools and Test Equipment delivery, and
- 8) DRACAS report

8.7 Performance Certificate

- 8.7.1 During the in-service Defects Notification Period (DNP), the fleet (all 7 trainsets) in total shall demonstrate successful achievement of the Performance Acceptance Criteria (PAC) which will be a prerequisite of the application for a Performance Certificate to be issued by the Engineer.
- 8.7.2 Failure to meet the PAC within the DNP shall mean that the DNP shall be extended until such time as the PAC of the total fleet has been met. All cost associated with the extension of the DNP shall be borne by the Contractor.
- 8.7.3 The DNP shall be up to a limit of 4 years from the date of commencement of the first train in-service operation.

8.8 Safety Assurance

8.8.1 Safety

8.8.1.1 Safety is defined as freedom from those conditions that can cause death, injury, occupational illness, or damage to or loss of equipment or property. All circumstances susceptible to cause injuries or fatalities of passengers, operation staff, and maintenance staff are considered as risks, and by extension, includes all events leading to a partial or total destruction of costly equipment. The objective of safety is expressed by the capability of the Rolling Stock to keep the physical integrity of the asset and to preserve the safety during railway operations and maintenance for passengers, staff and persons in general. The safety assurance program aims to reduce to a tolerable level the probability of occurrence of catastrophic or critical events causing damage to assets or harm to any person. The Contractor shall follow appropriate risk reduction principle such as ALARP (As Low as Reasonably Possible) to demonstrate the risk acceptance to the Employer.

8.8.1.2 The Contractor shall bear the duty of safety in design for the assurance of safety for the life cycle of operations for MCRP and NSRP-S. The Rolling Stock shall fulfil the safety requirements of all General Requirements and Technical Requirements and shall demonstrate that the train is fit for purpose to be operated and maintained in a safe manner for these projects.

8.8.2 Safety Assurance Plan (SAP)

8.8.2.1 Within the SAMP, the Contractor shall provide a Safety Assurance Plan (SAP) for review by the Engineer. The SAP shall cover the design, manufacture, testing, commissioning and integrated testing phases, and safety management for in-service passenger operations. The Plan shall further identify how the magnitude and seriousness of events or malfunctions which could result in harm to passengers or staff and damage to equipment or property will be minimized.

8.8.2.2 System Safety Assurance Management Plan shall detail, but not limited to, the following:

ATTACHMENT 1

SUMMARY OF KEY DATES

- (1) The Employer requires the Contractor to complete certain elements of work by specific Key Dates (KD). Delay in achieving those Key Dates shall render the Contractor liable to pay Delay Damages (as set out in Part A, Contract Data, of the Particular Conditions).
- (2) Achieving a Key Date for an element of work means that, before the expiry of the number of months relevant to the element in question (as specified in “Table 1 – Key Dates” below), all works related to that element have been completed to the satisfaction of the Engineer. The number of months shown in Table 1 against a Key Date and its specific element of work signifies the maximum duration in months from the Commencement Date within which the identified element must be completed. The number of months shown in Table 1 will be converted into actual calendar dates after receipt by the Contractor of the Engineer’s notification of the Commencement Date for the Project.

TABLE 1 – KEY DATES		
Key Date	Element of Work	No. of Months
KD 1	Achievement: Completing Final Design Review.	18 ³⁰ 19 months
KD 2	Achievement: Deliver the Mock Up to the site	31 ²³ 14 months
KD 3	Achievement: Completing FAI and FAT.	36 ³⁶ 43 months
KD 4	Achievement: Supply and delivery of the following Rolling Stock equipment for training purposes to the CP NS-01 Contractor at the North Depot (for Training Center Facility): <ul style="list-style-type: none"> - Equipment for driving simulator, - Pantograph, and - Bogie assembly for motor car including traction motor, gearbox and coupling. 	40 ³⁶ 48 months
KD 5	Achievement: Completion of training and delivery of Operation and Maintenance Manual.	48 ⁷⁰ 49 months
KD 6	Achievement: Delivery of 7 trainsets (1-7) and completion of testing and commissioning thereof plus handing over.	72 ⁴⁶ months
KD 7	Achievement: Delivery of all spare parts, consumables, special tools and jigs, plus as-built drawings.	72 ⁴⁹ months
KD 8	Achievement: Completion of Trial Operation support and the whole of the Works.	75 ⁵³ months

ATTACHMENT 1

SUMMARY OF KEY DATES

- (1) The Employer requires the Contractor to complete certain elements of work by specific Key Dates (KD). Delay in achieving those Key Dates shall render the Contractor liable to pay Delay Damages (as set out in Part A, Contract Data, of the Particular Conditions).
- (2) Achieving a Key Date for an element of work means that, before the expiry of the number of months relevant to the element in question (as specified in “Table 1 – Key Dates” below), all works related to that element have been completed to the satisfaction of the Engineer. The number of months shown in Table 1 against a Key Date and its specific element of work signifies the maximum duration in months from the Commencement Date within which the identified element must be completed. The number of months shown in Table 1 will be converted into actual calendar dates after receipt by the Contractor of the Engineer’s notification of the Commencement Date for the Project.

TABLE 1 – KEY DATES		
Key Date	Element of Work	No. of Months
KD 1	Achievement: Completing Final Design Review.	30 months
KD 2	Achievement: Deliver the Mock Up to the site	23 months
KD 3	Achievement: Completing FAI and FAT.	36 months
KD 4	Achievement: Supply and delivery of the following Rolling Stock equipment for training purposes to the CP NS-01 Contractor at the North Depot (for Training Center Facility): <ul style="list-style-type: none"> - Equipment for driving simulator, - Pantograph, and - Bogie assembly for motor car including traction motor, gearbox and coupling. 	36 months
KD 5	Achievement: Completion of training and delivery of Operation and Maintenance Manual.	70 months
KD 6	Achievement: Delivery of 7 trainsets (1-7) and completion of testing and commissioning thereof plus handing over.	72 months
KD 7	Achievement: Delivery of all spare parts, consumables, special tools and jigs, plus as-built drawings.	72 months
KD 8	Achievement: Completion of Trial Operation support and the whole of the Works.	75 months

- (3) The Contract Packages with which the Works will be required to interface are as shown below.
- The North South Commuter Railway Project (Malolos-Tutuban) (NSCR):

ATTACHMENT 2

TIME FOR ACCESS TO THE SITE

- (1) The date on which the right to access to a part of the Site as the works area available to the Contractor are defined below and the extents of such areas are specified in the Employer’s Requirements.
- (2) Month numbers shown in the schedule signify the elapsed time in months from the Commencement Date. The month numbers shall be converted into actual calendar dates after receipt by the Contractor of the Engineer’s notification of the Commencement Date. Access Date means the first day of the month specified below

Access Date	Site (Works Area)	Month no.
AD 1	On-board Signalling System and other equipment to be mounted on the Rolling Stock supplied by CP NS-01 Contractor from E&M Systems and Track Works. The E&M System and Track Works Contractor will supply this equipment in Japan at the Rolling Stock Contractor’s premises or at alternative agreed location(s)	
	AD-1: for trainsets one to seven (1-7) supplied under this contract	37-3725 months
AD 2	Access to allocated areas within the North Depot for receiving trainsets, assembling, testing, commissioning and test running within the depot.	35-298 months
AD 3	Access to the mainline from CIA to Clark (as available) Solis for Test running and Performance Proving <u>On-Site Testing and Commissioning</u>	36-3428 months
AD 4	Access to the whole mainline from Calamba to CIA	68-7078 months
NB	<ol style="list-style-type: none"> 1. <i>Access will be given progressively to the whole of the North South Commuter Railway for the use of this Rolling Stock.</i> 2. <i>Obtaining permission from the Railway Safety Inspector to use the Rolling Stock for commercial operations will be the responsibility of the Employer with the support of the Rolling Stock manufacturer.</i> 	

ATTACHMENT 2

TIME FOR ACCESS TO THE SITE

- (1) The date on which the right to access to a part of the Site as the works area available to the Contractor are defined below and the extents of such areas are specified in the Employer’s Requirements.
- (2) Month numbers shown in the schedule signify the elapsed time in months from the Commencement Date. The month numbers shall be converted into actual calendar dates after receipt by the Contractor of the Engineer’s notification of the Commencement Date. Access Date means the first day of the month specified below

Access Date	Site (Works Area)	Month no.
AD 1	On-board Signalling System and other equipment to be mounted on the Rolling Stock supplied by CP NS-01 Contractor from E&M Systems and Track Works. The E&M System and Track Works Contractor will supply this equipment in Japan at the Rolling Stock Contractor’s premises or at alternative agreed location(s)	
	AD-1: for trainsets one to seven (1-7) supplied under this contract	37 months
AD 2	Access to allocated areas within the North Depot for receiving trainsets, assembling, testing, commissioning and test running within the depot.	29 months
AD 3	Access to the mainline from CIA to Solis for On-Site Testing and Commissioning	34 months
AD 4	Access to the whole mainline from Calamba to CIA	70 months
NB	<ol style="list-style-type: none"> 1. <i>Access will be given progressively to the whole of the North South Commuter Railway for the use of this Rolling Stock.</i> 2. <i>Obtaining permission from the Railway Safety Inspector to use the Rolling Stock for commercial operations will be the responsibility of the Employer with the support of the Rolling Stock manufacturer.</i> 	