**General Bid Bulletin No. 26**
06 September 2021

**THE MALOLOS-CLARK RAILWAY PROJECT AND THE NORTH-SOUTH RAILWAY PROJECT SOUTH LINE COMMUTER PACKAGE CP NS-01: PROCUREMENT OF ELECTRICAL AND MECHANICAL SYSTEMS AND TRACK WORKS (IFB No: 21-040-3)**

**TO ALL PROSPECTIVE BIDDERS:**

This General Bid Bulletin is issued to amend/clarify certain provisions in the Bidding Documents for the above-mentioned Project. Please refer to the attached Annexes of this General Bid Bulletin for details:

1. **Annex "A"** — Clarification to the Bidding Documents
2. **Annex "B"** — Addendum to the Bidding Documents with "**Attachment 1**"
3. **Annex "C"** — Not Applicable

All other portions of the Bidding Documents not affected by these revisions, amendments and/or clarifications shall remain unchanged.

Revisions/amendments/clarifications made herein shall be conserved as an integral part of the Bidding Documents of this Project.

For your guidance and information.

For the Bids and Awards Committee

SIGNATURE REDACTED

**ENGR. JAIME M. NAVARRETE, JR**
Chairperson

# Annex A

# PACKAGE CP NS-01: E&M SYSTEMS AND TRACK WORKS
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# Annex A

<table>
<tr><th>Item No.</th><th>Volume Section No.<br>Page No.<br>Clause No. / Title<br>Reference Text</th><th>Clarification Request</th><th>Proposed Revised Text<br>(if any)</th><th>Response</th></tr>
<tr>
<td>1</td>
<td>Vol. 3, Part 2, Section VI, ERG-87, and<br>
Table 21.1: E&M systems and Track works RAM and Safety Targets
<table>
<tr><th colspan="2">RAM / Safety Targets</th></tr>
<tr><td>E&M systems and Track works Operational Availability to support Train service</td><td>99.95%</td></tr>
<tr><td>Passenger serious injuries</td><td><=2 per 20 Million passengers</td></tr>
<tr><td>Staff lost Time Injury</td><td><=2 per 200,000 Manhours worked.</td></tr>
</table>
ERG-90-91, 21.1.9, and<br><br>21.3.6, The Contractor shall follow System Assurance international standards primarily IEC 62278, IEC62279, and IEC 62425 or equivalent CENELEC standards, subject to review by the Engineer.<br><br>and<br><br>All RAM calculations shall use an annual operation of 19 hours a day, 7 days a week, with engineering downtime of 5 hours a day.</td>
<td>The Subsystems Availabilities (Table 21.2) and the System Operational Availability are linked by the following formula:<br><br>$$System\ Operational\ Availability = \prod_i Subsystems\ i\ Availability$$<br><br>Considering the result is not coherent with the value of 99.95%, the Contractor proposes to use in the calculation only the availability targets for the subsystems which have an impact on Operations (Track, Signalling, BTS, Power Supply & Distribution, OCS, GSM-R, Voice and Data system (mission-critical), PSD & IOCC).<br><br>Consequently, the System Operational Availability target to be considered/proposed by the Contractor is 99.785%. Please confirm your acceptance.</td>
<td></td>
<td>The Bidder’s understanding is correct on derivation of System Operational Service Availability target from Subsystem availability figures.<br><br>The Contractor shall consider the subsystems which have an impact to operations (revenue service delay greater than 5 minutes) into the calculation of overall E&M System Operational Service Availability.<br><br>The Contractor shall submit the System Assurance Management Plan with RAM calculation methodology as part of their Proposal to the Engineer and Employer for acceptance.</td>
</tr>
</table>

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<tr><th>Item No.</th><th>Volume Section No.<br>Page No.<br>Clause No. / Title<br>Reference Text</th><th>Clarification Request</th><th>Proposed Revised Text<br>(if any)</th><th>Response</th></tr>
<tr><td></td><td>For E&M Systems and Trackwork to achieve 99.95% or above, operational (timetable) service availability, the system shall be inherently fault-tolerant. Single point failures that are not safety-critical shall not cause a train service to be delayed or interrupted.<br><br>Table 21.2: E&M systems and Track works RAM Targets<br><table><tr><th rowspan="2">Item</th><th rowspan="2">System</th><th colspan="2">RAM Target</th></tr><tr><th>Availability (%)</th><th>MTTR</th></tr><tr><td>1</td><td>Track</td><td>99.96%</td><td>4 hours</td></tr><tr><td>2</td><td>Signalling</td><td>99.98%</td><td>0.5 hours</td></tr><tr><td>3</td><td>Backbone Transmission System (BTS)</td><td>99.99%</td><td>4 hours</td></tr><tr><td>4</td><td>Public Address System (PA)</td><td>99.95%</td><td>0.5 hours</td></tr><tr><td>5</td><td>Passenger Information System (PIS)</td><td>99.95%</td><td>0.5 hours</td></tr><tr><td>6</td><td>Power SCADA</td><td>99.99%</td><td>0.5 hours</td></tr><tr><td>7</td><td>CCTV</td><td>99.8%</td><td>0.5 hours</td></tr><tr><td>8</td><td>Power Supply</td><td>99.995%</td><td>0.5 hours</td></tr><tr><td>9</td><td>Power Distribution</td><td>99.995%</td><td>0.5 hours</td></tr><tr><td>10</td><td>Overhead Catenary System (OCS)</td><td>99.995%</td><td>0.5 hours</td></tr><tr><td>11</td><td>Automatic Fare Collection (AFC)</td><td>99.5%</td><td>0.5 hours</td></tr><tr><td>12</td><td>Depot Equipment</td><td>95%</td><td>4 hours</td></tr><tr><td>13</td><td>Radio System (GSM-R)</td><td>99.99%</td><td>4 hours</td></tr><tr><td>14</td><td>Voice and Data system (office telephone & data)</td><td>99.8%</td><td>0.5 hours</td></tr></table><br><table><tr><th rowspan="2">Item</th><th rowspan="2">System</th><th colspan="2">RAM Target</th></tr><tr><th>Availability (%)</th><th>MTTR</th></tr><tr><td>15</td><td>Voice and Data system (mission-critical telephones)</td><td>99.95%</td><td>0.5 hours</td></tr><tr><td>16</td><td>Master Clock and Time distribution</td><td>99.8%</td><td>0.5 hours</td></tr><tr><td>17</td><td>Platform Screen Doors (PSD)</td><td>99.98%</td><td>1 hour</td></tr><tr><td>18</td><td>Computerized Maintenance Management System (CMMS)</td><td>95%</td><td>4 hours</td></tr><tr><td>19</td><td>Integrated Operations Control Center (IOCC)</td><td>99.95%</td><td>1 hour</td></tr></table><br>*All the above values, may be subject to further review and revision.<br><br>Table 21.3: PSD Performance Requirements<br><table><tr><th>Sr. No.</th><th>Performance requirement – Platform Screen Doors (PSD)</th></tr><tr><td>1</td><td>PSD system shall have a failure rate of less than 1 in 1,000,000 operations cycle per door. (One operation cycle means one complete opening and closing cycle).</td></tr><tr><td>2</td><td>PSD system shall have MTTR as 60 minutes unless otherwise specified. (This time shall not include the time taken for the technician to arrive at the fault reported site).</td></tr></table></td><td></td><td></td><td></td></tr>
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| Item No. | Volume Section No.<br>Page No.<br>Clause No. / Title<br>Reference Text | Clarification Request | Proposed Revised Text<br>(if any) | Response |
|---|---|---|---|---|
| 2 | GBB6<br>Appendix 7 – Outline Interface Matrices<br>Annex 1 – Civil packages N-01 to N-05, ERG-137, A2.2. Station and depot, Item 11.<br>In the reference, cable recess, troughs, and pipes either across road or parallel to road, beneath road pavement concrete for all roadway is by CP NS-01. | We assume these road pavings will be completed before access is granted to the System Contractor CP NS-01.<br>Please confirm that the Item 11 of reference, the supply and fix/construction of cable recess, trough and pipes will be under Civil contractor's scope (CP N-05). | | The scope of cable recess, troughs, and pipes either across road or parallel to road, beneath road pavement concrete for all roadway is by CP NS-01. The contractor will be required to coordinate with the N-05 contractor regarding the time of these works. |
| 3 | BF – 48, Article 3<br>1.2.1, Price Schedule 1.8 covers the pricing of the Capital Spares which will not be carried forward to the Total Bid Amount. The rates or prices shall remain valid up to the issuance of the Taking Over certificate for the final section of the Works. The rates or prices of the Capital Spares shall be deemed to include all costs and expenses associated with the supply, manufacture and delivery by the Contractor, as the case may be | The validity of the prices for capital spares is not the same between the Article 3 in Bidding Forms and clause 1.2.1 in ERG. Please clarify.<br><br>Also please confirm if capital spares prices will be adjusted with the application of the CPA formula and conditions as stated in the main contract (General Conditions 13.8 and Table of Adjustment Data)<br>or<br>do we have to submit fixed and firm prices up to the end of validity period? | | The rates or prices shall remain valid up to the issuance of the Taking Over certificate for the final section of the Works. Please refer to the Annex B for the amendment in the definitions.<br><br>The capital spares price shall be fixed up to the end of validity period. |

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| | (including, without limitation, where appropriate, the cost of manufacture, packing, supply, storage and delivery to the Site, preliminaries and other general requirements, overheads and profit) and whether or not some or all of the items listed in Price Schedule 1.8 are ordered irrespective of the quantity of the items to be supplied. If the Employer chooses to place any order(s) for Capital Spares with the Contractor, any such order shall be instructed as a Variation under the Contract.<br><br>"Capital Spares" means those items which are expected to remain in operation and not require replacement until well beyond the end of the 2-year O&M period and which, because of the length of time it would take to get a replacement for such items, could cause a | | | |

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| Item No. | Volume Section No. Page No. Clause No. / Title Reference Text | Clarification Request | Proposed Revised Text (if any) | Response |
|---|---|---|---|---|
| | prolonged shutdown if they had to be replaced. The provision of these items is not included in the Accepted Contract Amount and, if required, shall be ordered by the Employer under separate purchase orders not forming part of the Contract. The applicable purchase rates shall nonetheless be those committed to by the Contractor under this Contract, which rates shall remain valid for a period of one year after the end of the Defects Notification Period | | | |
| 4 | Part 3 – Conditions of Contract and Contract Forms<br>Section VIII. Particular Conditions,<br>PC-12, PC-13,<br>KD 2-3, KD 2-6,<br>KD 2-3 \| Achievement: Substantial Completion of Power Supply to all stations to achieve "Power On" for all station. \| 30<br>KD 2-6 \| Achievement: Substantial Completion of Track Works and E&M Systems works to commence Integrated Testing and Commissioning and Test Running at Mainline using Rolling Stock procured under NSCR for full operation. \| 31 | The Contractor only has 1 month from Power On at all stations to complete the Integrated Testing and Commissioning.<br><br>We kindly request you to provide at least 3 months. | | The Engineer has proposed KD 2-2 Achievement: Substantial Completion of Power Supply and Distribution at Depot and all station to achieve "Power On" at Month 32. It is the discretion of the bidders to complete substations earlier if they so require.<br>KD 2-3 is now deleted.<br>KD 2-6 is at Month 33 |

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| | | | | (1) Achievement: Substantial Completion of Track Works and E&M Systems works to commence Integrated Testing and Commissioning and Test Running at Mainline using Rolling Stock procured under NSCR for full operation.<br>(2) Completion of Train operation simulators at the training center in the Depot<br>KD2-8 is at Month 36 : Achievement: Completion of first tranche of Training using Contractor supplied facilities and training aids, and delivery of contractual spare parts, consumables, tools and jigs, as-built documents, and operation and maintenance manuals. |

# Annex B

# PACKAGE CP NS-01: E&M SYSTEMS AND TRACK WORKS
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# Annex B

| ITEM NO. | REFERENCE/CLAUSE/ SECTION | REVISIONS / AMENDMENTS |
|---|---|---|
| | | **Volume II Part 2 – Employer's Requirements** |
| 1 | Section IV - General Requirements<br>Page ERG-2 | Definition for "Capital Spares" was amended:<br>"Capital Spares" means those items which are expected to remain in operation and not require replacement until well beyond the end of the 2-year O&M period and which, because of the length of time it would take to get a replacement for such items, could cause a prolonged shutdown if they had to be replaced. The provision of these items is not included in the Accepted Contract Amount and, if required, shall be ordered by the Employer under separate purchase orders not forming part of the Contract. The applicable purchase rates shall nonetheless be those committed to by the Contractor under this Contract, which rates shall remain valid up to the issuance of the Taking Over certificate for the final section of the Works. |
| 2 | ERG 186, 187, APPENDIX 8- Outline Interface Demarcation with MMSP | Signaling row revised |
| 3 | ERT 165, 166, 167<br>Clause 2.26.10.2 | Clause revised and facilities added. |
| 4 | ERT 562 Clause 6.2.3( 5) | Additional interlocking added for Unscheduled Repair Shop's at both Mabalacat and Banlic depots, overhead travelling Crane (N02.01 and S02.01) and Wheel Reprofiling Shops (WRS at Mabalacat and Banlic Depot) |

| | | |
|---|---|---|
| 5 | Chapter 9, Part A of Appendix 8.1, N03.01 Underfloor Wheel Re-profiling Lathe, Page ERT-753 | Added section as below:<br><br>4.4 Suitable interlocking scheme between OCS, Jib Cranes and Shunting Locomotive while movement and operation with trainsets in WRS. |
| 6 | Chapter 9, Part A of Appendix 8.1, N03.02 Jib Crane, Page ERT-754 | Added section as below:<br><br>4.2 Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe and Shunting Locomotive for movement and operation with trainsets in WRS. |
| 7 | Chapter 9, Part A of Appendix 8.1, N41.01 Shunting Locomotive (Both Rail and Road Drive Type), Page ERT-940 | Added section as below:<br><br>4.2 Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe, Jib Cranes while movement and operation of trainsets in WRS. In addition, suitable interlocking also shall be done with OCS and Overhead Traveling Crane in URS. |
| 8 | Chapter 9, Part B of Appendix 8.1, S03.01 Underfloor Wheel Re-profiling Lathe, Page ERT-987 | Added section as below:<br><br>4.4 Suitable interlocking scheme between OCS, Jib Cranes and Shunting Locomotive while movement and operation with trainsets in WRS. |
| 9 | Chapter 9, Part B of Appendix 8.1, S03.02 Jib Crane, Page ERT-988 | Added section as below:<br><br>4.2 Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe and Shunting Locomotive for movement and operation with trainsets in WRS. |
| 10 | Chapter 9, Part B of Appendix 8.1, S41.01 Shunting Locomotive (Both Rail and Road Drive Type), Page ERT-995 | Added section as below:<br><br>4.2 Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe, Jib Cranes while movement and operation of trainsets in WRS. In addition, suitable interlocking also shall be done with OCS and Overhead Traveling Crane in URS. |

<table>
<tr>
<td>11</td>
<td>ERT-249:Table 3.11.4-NS-01 and MMSP Telecommunication Interface</td>
<td>
A. Updated item: GSM-R Infrastructure at MMSP Test and Transfer Track at Valenzuela Depot.
<table>
<tr>
<td>GSM-R Infrastructure at MMSP Test and Transfer Track at Valenzuela Depot</td>
<td>Shall design, install, test, and commission the GSM-R System/ Infrastructure at MMSP's Valenzuela Depot.<br><br>Shall identify and supply the testing and diagnostic equipment for the GSM-R Radio Systems</td>
<td>Valenzuela Depot</td>
<td>CP106</td>
<td>CP106: To provide Backbone Facilities for the GSM-R Infrastructure to be connected from Valenzuela Depot Test and Transfer Track to the Backbone Switch at Bicutan (MMSP's CER).</td>
</tr>
</table>
B. Added item - Driving Operation Simulator for Training.
<table>
<tr>
<td>Driving Operation Simulator for Training.</td>
<td>NS01 shall supply on board Telecom equipment for Driving Operation Simulator and interface with</td>
<td></td>
<td>CP107</td>
<td>CP107 and NS01 shall coordinate.</td>
</tr>
</table>
</td>
</tr>
</table>

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | CP107 as stipulated in the Signaling clause (below).<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) | | | (Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) | |
| 12 | ERG-188: MMSP Interface: Telecoms | Updated Clause on:<br>A) Test and Transfer Track.<br>B.) On board Telecom equipment for Driving Operation Simulator. | | | | | |
| 13 | Part 2 Section VI General Requirements ERG-7 | Added additional clause 3.6.2 (7) | | | | | |
| **Volume III Part 3 – Conditions of Contract and Contract Forms** | | | | | | | |
| 14 | Section VIII Particular Conditions<br>Part A - Contract Data<br>1.1.3.3 Time For Completion<br>Page PC-3 | Contract Data 1.1.3.3 was amended as shown in attachment 1 of this annex. | | | | | |
| 15 | Section VIII Particular Conditions<br>Part A - Contract Data<br>Table: Summary of Sections<br>Page PC-8 | Table: Summary of Sections was amended as shown in attachment 1 of this annex. | | | | | |
| 16 | Section VIII Particular Conditions<br>Part A - Contract Data<br>Attachment 1 | Key Dates table for Section 1 and 2 was amended as shown in attachment 1 of this annex. | | | | | |

| | | |
|---|---|---|
| | Summary Of Key Dates<br>Page PC-11, PC-12, PC-13 | |

# Annex B – Attachment 1

"Capital Spares" means those items which are expected to remain in operation and not require replacement until well beyond the end of the 2-year O&M period and which, because of the length of time it would take to get a replacement for such items, could cause a prolonged shutdown if they had to be replaced. The provision of these items is not included in the Accepted Contract Amount and, if required, shall be ordered by the Employer under separate purchase orders not forming part of the Contract. The applicable purchase rates shall nonetheless be those committed to by the Contractor under this Contract, which rates shall remain valid up to the issuance of the Taking Over certificate for the final section of the Works.

"Commissioning" means the process of setting to work the complete transportation system through a series of integrated tests that demonstrate the installation and performance in accordance with the specified criteria.

"Critical Path Method Network" means a networked project implementation program, usually depicted diagrammatically in bar chart form, that contains a logically connected sequence of interdependent activities each having no float, running from the planned start date through to the anticipated finish date, and which results in the longest overall duration for achieving completion of the project.

"Defect Notification Period" means the period during which the Contractor is responsible to remedy any defective work which becomes apparent during the Defect Notification Period (DNP).

"Designer" means who is responsible for the design of permanent works.

"Design Package" means the drawings, documents, structural analysis, simulation and calculation, test reports, etc. prepared by the Contractor.

"External Interfacing Parties" means those parties with whom it is the Contractor's responsibility to co-ordinate the design of the Contract Works with; and includes all relevant bodies and entities, in particular government authorities, departments and regulatory bodies utility companies, and the consultants, Project Management Units and contractors of adjacent Projects whether ongoing or planned. The Contractor shall identify such interfacing parties in his Interface Management Plan (IMP).

"Execution of the Works" means the manufacture, supply, transportation, delivery to Site, construction, erection, installation, testing, commissioning, performance testing, completion, and training in the use of the Works in accordance with the Contract; the preparation and/or delivery (as appropriate) of all information, drawings and manuals in respect of the Works required by the Contract, the provision of such spare parts, consumables, tools, and spare materials as are required by the Contract to be provided by the Contractor for the performance of its Defects Liability obligations, and the management of all such matters.

"Factory Acceptance Tests" means the tests to be performed at the Contractor's factories prior to delivery to the Site to verify compliance with the Technical Requirements and quality standards.

"Final Design" means the design developed to the stage where all manufacturing drawings are fully defined and specified.

"Installation Tests" means the tests to be performed to verify the conformity of completion of an installation/assembly to the design documents previously given a Notice of No Objection by the Engineer prior to the start of Commissioning. Installation Tests do not form part of the Tests on Completion to be performed by

"Capital Spares" means those items which are expected to remain in operation and not require replacement until well beyond the end of the 2-year O&M period and which, because of the length of time it would take to get a replacement for such items, could cause a prolonged shutdown if they had to be replaced. The provision of these items is not included in the Accepted Contract Amount and, if required, shall be ordered by the Employer under separate purchase orders not forming part of the Contract. The applicable purchase rates shall nonetheless be those committed to by the Contractor under this Contract, which rates shall remain valid up to the issuance of the Taking Over certificate for the final section of the Works.~~for a period of one year after the end of the Defects Notification Period~~

"Commissioning" means the process of setting to work the complete transportation system through a series of integrated tests that demonstrate the installation and performance in accordance with the specified criteria.

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"Final Design" means the design developed to the stage where all manufacturing drawings are fully defined and specified.

"Installation Tests" means the tests to be performed to verify the conformity of completion of an installation/assembly to the design documents previously given a Notice of No Objection by the Engineer prior to the start of Commissioning. Installation Tests do not form part of the Tests on Completion to be performed by

## APPENDIX 8- OUTLINE INTERFACE DEMARCATION WITH MMSP

| Discipline | MMSP INTERFACE | | | |
|---|---|---|---|---|
| | **NS-01** | **CP106** | **NS-01** | **CP107** |
| Trackwork | **Bicutan Station (Southside)**<br><br>The block joint in between the double-ended points of Northbound and Southbound lines with NSCR lines will act as a boundary limits for the respective projects.<br><br>NS-01 shall interface with CP106 for the chainages of the boundary limits at Southbound line and Northbound line<br><br>IRJ will be supplied by NS-01. | **Bicutan Station (Southside)**<br><br>The block joint in between the double-ended points of Northbound and Southbound lines with NSCR lines will act as a boundary limits for the respective projects.<br><br>NS-01 shall interface with CP106 for the chainages of the boundary limits at Southbound line and Northbound line | Rail-wheel interface study | Provision of wheel interface information to be used in rail-wheel interface study |
| Signaling | In addition to the track demarcation, NS-01 shall supply, install, test and commission signaling way side at MMSP line in coordination with CP106 for interoperability. | CP106 shall install way side equipment on MMSP track in coordination with NS-01 for normal train operation as well as for interoperability.<br>There shall be interface at CBI level for availability of route, | NS01 shall supply, test and commission the ETCS on-board equipment on MMSP trains.<br>NS01 and CP107 shall coordinate and agree on the size, space, location and installation plans. | CP107 shall install the on-board equipment.<br><br>CP107 and NS01 shall coordinate and agree on the size, space, location and installation plans. |

| Discipline | MMSP INTERFACE | | | |
|---|---|---|---|---|
| | NS-01 | CP106 | NS-01 | CP107 |
| | There shall be interface at CBI level for availability of route, exchange of slots and train approaching station<br>The interface shall cover operation of PSDs from the Signaling system in-charge at that time.<br><br>NS-01 shall interface with CP106 and CP107 for design, installation, testing and commission of on -board ETCS system interfaces with on-board CBTC system on CP107 Rolling stock,<br><br>NS-01 shall interface with CP106 for MMSP Depot test track and Transfer track to set up Train testing facility for ETCS<br><br>NS01 shall interface with CP106 for Banlic Depot CBTC test facility provided by CP106. | exchange of slots and train approaching station<br><br>The interface shall cover operation of PSDs from the Signaling system in-charge at that time.<br><br>CP106 shall interface with NS-01 for design, installation, testing and commission of on -board CBTC system interfaces with on-board ETCS system on CP107 Rolling stock,<br><br>CP106 shall interface for MMSP Depot test track and Transfer track for Train testing in ETCS mode by NS-01.<br><br>CP106 shall interface with NS01 for Banlic Depot CBTC test facility for Train testing in CBTC mode by CP106. | NS-01 shall supply ETCS on-board equipment and relevant information for Driving operation simulator to CP107. NS01 and CP107 shall coordinate. | CP107 shall develop the Simulator. CP107 and NS01 shall coordinate |
| Telecoms | NS-01 will follow the Telecoms Work Demarcation | CP106 will follow the Telecoms Work Demarcation | NS-01 shall supply, install (on the initial rolling stock only), test, and | CP107 shall interface for the development of an interface |

## APPENDIX 8- OUTLINE INTERFACE DEMARCATION WITH MMSP

| Discipline | MMSP INTERFACE | | | |
|---|---|---|---|---|
| | **NS-01** | **CP106** | **NS-01** | **CP107** |
| Trackwork | **Bicutan Station (Southside)**<br><br>The block joint in between the double-ended points of Northbound and Southbound lines with NSCR lines will act as a boundary limits for the respective projects.<br><br>NS-01 shall interface with CP106 for the chainages of the boundary limits at Southbound line and Northbound line<br><br>IRJ will be supplied by NS-01. | **Bicutan Station (Southside)**<br><br>The block joint in between the double-ended points of Northbound and Southbound lines with NSCR lines will act as a boundary limits for the respective projects.<br><br>NS-01 shall interface with CP106 for the chainages of the boundary limits at Southbound line and Northbound line | Rail-wheel interface study | Provision of wheel interface information to be used in rail-wheel interface study |
| Signaling | In addition to the track demarcation, NS-01 shall supply, install, test and commission signaling way side at MMSP line in coordination with CP106 for interoperability. | CP106 shall install way side equipment on MMSP track in coordination with NS-01 for normal train operation as well as for interoperability.<br>There shall be interface at CBI level for availability of route, | NS01 shall supply, test and commission the ETCS on-board equipment on MMSP trains.<br>NS01 and CP107 shall coordinate and agree on the size, space, location and installation plans. | CP107 shall install the on-board equipment.<br><br>CP107 and NS01 shall coordinate and agree on the size, space, location and installation plans. |

| Discipline | MMSP INTERFACE | | | |
|---|---|---|---|---|
| | NS-01 | CP106 | NS-01 | CP107 |
| | There shall be interface at CBI level for availability of route, exchange of slots and train approaching station<br>The interface shall cover operation of PSDs from the Signaling system in-charge at that time.<br><br>NS-01 shall interface with CP106 and CP107 for design, installation, testing and commission of on -board ETCS system interfaces with on-board CBTC system on CP107 Rolling stock,<br><br>NS-01 shall interface with CP106 for MMSP Depot test track and Transfer track to ~~for~~ set up Train testing facility for ETCS<br><br>NS01 shall interface with CP106 for Banlic Depot CBTC test facility provided by CP106. | exchange of slots and train approaching station<br><br>The interface shall cover operation of PSDs from the Signaling system in-charge at that time.<br><br>CP106 shall interface with NS-01 for design, installation, testing and commission of on -board CBTC system interfaces with on-board ETCS system on CP107 Rolling stock,<br><br>CP106 shall interface for MMSP Depot test track and Transfer track for Train testing in ETCS mode by NS-01.<br><br>CP106 shall interface with NS01 for Banlic Depot CBTC test facility for Train testing in CBTC mode by CP106. | NS-01 shall supply ETCS on-board equipment and relevant information for Driving operation simulator to CP107. NS01 and CP107 shall coordinate.~~NS-01 shall supply, install, test and commission GSM-R radio on CP107 Rolling stock and CP107 Simulator. For this purpose, NS-01 shall develop interface matrix for all related aspects with CP107 matrix and interface at all stages of the project with NS-01~~ | CP107 shall develop the Simulator. CP107 and NS01 shall coordinate~~CP107 shall interface for development of interface matrix and interface at all stages of the project with NS-01.~~ |
| Telecoms | NS-01 will follow the Telecoms Work Demarcation | CP106 will follow the Telecoms Work Demarcation | NS-01 shall supply, install (on the initial rolling stock only), test, and | CP107 shall interface for the development of an interface |

monitored by the central and local ATS equipment.

2.26.10 Interface between NSCR-EX and MMSP projects

2.26.10.1 An interface between the NSCR-EX line that will be signaled with ERTMS / ETCS Level 2 system and the MMSP line to be signaled with CBTC is required at Bicutan. The Contractor will need to clearly establish the signaling interface.

1. Trains moving from the MMSP line to the NSCR-EX line will need to register with the RBC, establish a radio connection and transition to ETCS Level 2. The trains shall be fitted with both ERTMS equipment and CBTC equipment.
2. Trains moving from the NSCR-EX line to the MMSP line will transition to CBTC after passing over the transition announcement balises and registering with a Zone Controller for the system. The trains shall be fitted with both ERTMS equipment and CBTC equipment.

   Bicutan Station will act as interchange for the two lines. Interface specification to detail interoperability and operational arrangement for changeover of systems shall be developed by the Contractor along with MMSP line contractors and submitted for the Engineer's review.

   No through-operation from MMSP to NSRP-South or from NSRP-South to MMSP. All train shall stop at Bicutan Station for turnback and for changeover to continue operation to NSRP-South and vice versa.
3. The Contractor is required to equip MMSP trains with ETCS Level 2 system. The contractor shall interface with MMSP Rolling Stock Contractor for design, supply, placement, fixing, installation, testing and commissioning ETCS Level 2 system for MMSP trains for bi-directional train movement for NSCR-EX line.
4. The contractor shall ensure that the MMSP train is protected by the trackside equipment at all times, including in the event of switchover failure from CBTC to ERTMS L2 or vice-versa.
5. In order to make inter-operability and interfacing effective between MMSP line and NSCR line, the contractor shall also be required to install, test and commission equipment on MMSP tracks/platforms at Bicutan.

2.26.10.2 Train Testing and Training Facilities

2.26.10.2.1 The ETCS Test Track at MMSP Depot:

1. The Contractor shall design, install, test, and commission the ETCS Test Track on the MMSP Depot (at Valenzuela). This ETCS Test Track is required and will be used by the MMSP operators to test the ETCS onboard equipment with MMSP rolling stock.
2. To achieve this requirement and its objective, the Contractor shall interface with the CP106 Contractor for the shared Test Track infrastructure. MMSP's test track will be equipped with a CBTC test setup by CP106 contractor as part of their Rolling Stock test for their Signaling system.
3. The requirements for the ETCS Test track are to set up to install, test, and commission the wayside equipment, and to arrange the switching over mode from CBTC to ETCS and vice-versa. The Contractor shall extend alarms and warnings to MMSP's OCC and DCC located in MMSP Depot. The Contractor may connect ETCS test track infrastructure to the central facilities for switching, certification, validation etc., available at OCC/IOCC at North Depot (at Clark) of NSCR line

via Optical Fiber back bone.

4. The Contractor shall also interface with MMSP contractor for the requirement of space and power for ETCS and GSM-R infrastructure.

5. The overall scheme shall be submitted to the Engineer for approval.

6. The Contractor shall identify and supply the testing and diagnostics equipment for the ETCS Test Track and NS01 On Board Signaling and Telecommunication equipment on MMSP trains needed by the MMSP operator for the downloading logs, diagnostics of equipment, testing of Signaling and Radio equipment, and propose these sets of equipment to the Engineer for approval.

2.26.10.2.2 ETCS test facility at Transfer track of Valenzuela Depot

In order to test ETCS onboard equipment while departing from Valenzuela depot, NS01 Contractor shall equip Transfer track at Valenzuela depot with ETCS Level 2 wayside equipment besides CBTC signaling wayside installed by CP106. The ETCS wayside Signaling system installed on the Transfer track in Valenzuela depot will communicate with NSCR-Ex OCC using backbone laid between Bicutan to Valenzuela Depot. CP106 contractor and NS01 contractors shall interface for provision of this test facility. The MMSP trains for revenue service shall be tested for ETCS operation prior to departure from Valenzuela Depot to avoid a non-communicating ETCS train to travel all the way to Bicutan.

2.26.10.2.3 CBTC test facility at Banlic Depot by MMSP E&M contractor

In order to ensure that the train departing from Banlic Depot towards East Valenzuela, is a CBTC communicating train, MMSP E&M contractor will equip some of the stabling lines (stabling lines to be decided in consultation with O&M operator) within Banlic Depot with CBTC wayside equipment for testing purpose, besides NS01 signaling wayside equipment. The CBTC Signaling system installed at Banlic depot will communicate with MMSP OCC using backbone laid between Bicutan to Banlic Depot. NS01 contractor and CP106 contractors shall interface for provision of this test facility. MMSP trains for revenue service shall be tested for CBTC operation prior to departure from Banlic Depot to avoid a non-communicating CBTC train to travel all the way to Bicutan.

2.26.10.2.4 CP107 Driving Operation Simulator for training

MMSP trains are planned to be interoperable with NSCR. For this reason, DOTr plans to reproduce the signals and wireless devices used in NSCR in the MMSP Driving Operation Simulator. NS01 shall provide Signaling and Telecom on board equipment with all accessories and cables in two sets to CP107 for the Training Simulator. The interfaces of this equipment with RS shall be same as defined in Interface documents. The contractor shall share information on physical parameters, electrical parameters and provide public document references (standards, Guidelines) for the systems.

The RS contractor CP107 shall develop Simulator using these parameters. The system made by CP107 contractor will generate the interface signals for controlling these devices and inputs them to the device provided by the NS01 contractor to build the simulator.

Incase NS01 has some information which is propriety in nature, the solution may be decided by the two contractors to develop a black-box or to simulate the equipment or some alternate means so that functionality of the Simulator is achieved.

NS01 contractor shall cooperate with CP107 contractor to coordinate the interface. NS01 contractor shall discuss with CP107 contractor if there are features that cannot be reproduced.

The NS01 contractor shall transport the equipment to the test facility in Yokohama Japan, where CP107 contractor is located, and CP107 contractor will transport from the test site of CP107 contractor to the final delivery location in Manila.

2.26.10.3 The Contractor shall also interface with the O&M Concessionaires for NSCR and MMSP Lines for effective interfacing with the MMSP project and propose solutions to the Engineer to obtain Notice of No Objection.

2.26.10.4 The Contractor will make all such arrangements within the contract price and no separate payment shall be made for the above-mentioned works; all associated costs shall be included in the CP NS 01 Contractor's bid.

## 2.27 Installation

2.27.1 Construction and Installation Plan

The Contractor shall submit a Construction and Installation Plan for the review of the Engineer. Activities shall be categorized as such that all works that are considered significant will require separate method statements outlining how the work will be carried out safely and risk assessments.

The Contractor shall provide their installation specifications, which shall ensure that installation work and quality conform to best-accepted railway Signaling practices. The installation specifications shall be submitted to the Engineer for their review.

Special attention shall also be paid to all equipment whose correct functioning is essential to the safe and efficient operation of the railway. In particular, the Contractor shall comply with the following requirements:

1) Tail cables running to the trackside equipment shall not be jointed;
2) All trackside equipment shall be installed sufficiently clear of the high voltage and heavy current equipment so that maintenance risk is reduced to a minimum;
3) All trackside equipment shall be installed clear of any stair or door access;
4) All trackside equipment shall be installed not to cause any infringement to the schedule of fixed and moving dimensions;
5) Trackside equipment such as disconnection boxes, etc. shall be installed at appropriate locations for ease of maintenance;
6) Appropriate fixed means of access shall be provided for easy and safe maintenance of Trackside equipment;
7) All train control Cables on the tracks shall cross the rails at right angles; and
8) Where train control cables are required to cross the power cable or traction return cable, this shall cross the power cables at right angles and where possible at a minimum separation of 600 mm.

The Contractor shall ensure that sufficient personnel are available in order to fulfill the overall program requirements.

2.27.2 Temporary Works

The design of the Temporary Works shall be submitted to the Engineer for review.

All Temporary Works shall be removed prior to Employer's taking over of the works or section, or as reviewed by the Engineer. All Temporary Works shall be clearly

monitored by the central and local ATS equipment.

2.26.10 Interface between NSCR-EX and MMSP projects

2.26.10.1 An interface between the NSCR-EX line that will be signaled with ERTMS / ETCS Level 2 system and the MMSP line to be signaled with CBTC is required at Bicutan. The Contractor will need to clearly establish the signaling interface.

1. Trains moving from the MMSP line to the NSCR-EX line will need to register with the RBC, establish a radio connection and transition to ETCS Level 2. The trains shall be fitted with both ERTMS equipment and CBTC equipment.
2. Trains moving from the NSCR-EX line to the MMSP line will transition to CBTC after passing over the transition announcement balises and registering with a Zone Controller for the system. The trains shall be fitted with both ERTMS equipment and CBTC equipment.

   Bicutan Station will act as interchange for the two lines. Interface specification to detail interoperability and operational arrangement for changeover of systems shall be developed by the Contractor along with MMSP line contractors and submitted for the Engineer's review.

   No through-operation from MMSP to NSRP-South or from NSRP-South to MMSP. All train shall stop at Bicutan Station for turnback and for changeover to continue operation to NSRP-South and vice versa.
3. The Contractor is required to equip MMSP trains with ETCS Level 2 system. The contractor shall interface with MMSP Rolling Stock Contractor for design, supply, placement, fixing, installation, testing and commissioning ETCS Level 2 system for MMSP trains for bi-directional train movement for NSCR-EX line.
4. The contractor shall ensure that the MMSP train is protected by the trackside equipment at all times, including in the event of switchover failure from CBTC to ERTMS L2 or vice-versa.
5. ~~5.~~ In order to make inter-operability and interfacing effective between MMSP line and NSCR line, the contractor shall also be required to install, test and commission equipment on MMSP tracks/platforms at Bicutan.

5.

2.26.10.2 Train Testing and T~~t~~raining Facilities

~~2.26.10.2~~2.26.10.2.1 The ETCS Test Track at MMSP Depot:

1. The Contractor shall design, install, test, and commission the ETCS Test Track on the MMSP Depot (at Valenzuela). This ETCS Test Track is required and will be used by the MMSP operators to test the ETCS onboard equipment with MMSP rolling stock.
2. To achieve this requirement and its objective, the Contractor shall interface with the CP106 Contractor for the shared Test Track infrastructure. MMSP's test track will be equipped with a CBTC test setup by CP106 contractor as part of their Rolling Stock test for their Signaling system.
3. The requirements for the ETCS Test track are to set up to install, test, and commission the wayside equipment, and to arrange the switching over mode from CBTC to ETCS and vice-versa. The Contractor shall extend alarms and warnings to MMSP's OCC and DCC located in MMSP Depot. The Contractor may connect

ETCS test track infrastructure to the central facilities for switching, certification, validation etc., available at OCC/IOCC at North Depot (at Clark) of NSCR line via Optical Fiber back bone.

4. The Contractor shall also interface with MMSP ~~'s Civil Depot~~ contractor for the requirement of space and power for ETCS and GSM-R infrastructure.

5. The overall scheme shall be submitted to the Engineer for approval.

6. The Contractor shall identify and supply the testing and diagnostics equipment for the ETCS Test Track and NS01 On Board Signaling and Telecommunication equipment on MMSP trains needed by the MMSP operator for the downloading logs, diagnostics of equipment, testing of Signaling and Radio equipment, and propose these sets of equipment to the Engineer for approval.

2.26.10.2.2 ETCS test facility at Transfer track of Valenzuela Depot

In order to test ETCS onboard equipment while departing from Valenzuela depot, NS01 Contractor shall equip Transfer track at Valenzuela depot with ETCS Level 2 wayside equipment besides CBTC signaling wayside installed by CP106. The ETCS wayside Signaling system installed on the Transfer track in Valenzuela depot will communicate with NSCR-Ex OCC using backbone laid between Bicutan to Valenzuela Depot. CP106 contractor and NS01 contractors shall interface for provision of this test facility. The MMSP trains for revenue service shall be tested for ETCS operation prior to departure from Valenzuela Depot to avoid a non-communicating ETCS train to travel all the way to Bicutan.

2.26.10.2.3 CBTC test facility at Banlic Depot by MMSP E&M contractor

In order to ensure that the train departing from Banlic Depot towards East Valenzuela, is a CBTC communicating train, MMSP E&M contractor will equip some of the stabling lines (stabling lines to be decided in consultation with O&M operator) within Banlic Depot with CBTC wayside equipment for testing purpose, besides NS01 signaling wayside equipment. The CBTC Signaling system installed at Banlic depot will communicate with MMSP OCC using backbone laid between Bicutan to Banlic Depot. NS01 contractor and CP106 contractors shall interface for provision of this test facility. MMSP trains for revenue service shall be tested for CBTC operation prior to departure from Banlic Depot to avoid a non-communicating CBTC train to travel all the way to Bicutan.

2.26.10.2.4 CP107 Driving Operation Simulator for training

MMSP trains are planned to be interoperable with NSCR. For this reason, DOTr plans to reproduce the signals and wireless devices used in NSCR in the MMSP Driving Operation Simulator. NS01 shall provide Signaling and Telecom on board equipment with all accessories and cables in two sets to CP107 for the Training Simulator. The interfaces of this equipment with RS shall be same as defined in Interface documents. The contractor shall share information on physical parameters, electrical parameters and provide public document references (standards, Guidelines) for the systems.

The RS contractor CP107 shall develop Simulator using these parameters. The system made by CP107 contractor will generate the interface signals for controlling these devices and inputs them to the device provided by the NS01 contractor to build the simulator.

Incase NS01 has some information which is propriety in nature, the solution may be decided by the two contractors to develop a black-box or to simulate the equipment or some alternate means so that functionality of the Simulator is achieved.

NS01 contractor shall cooperate with CP107 contractor to coordinate the interface. NS01 contractor shall discuss with CP107 contractor if there are features that cannot be reproduced.

The NS01 contractor shall transport the equipment to the test facility in Yokohama Japan, where CP107 contractor is located, and CP107 contractor will transport from the test site of CP107 contractor to the final delivery location in Manila.

~~2.26.10.3~~ The Contractor shall also interface with the O&M Concessionaires for NSCR and MMSP Lines for effective interfacing with the MMSP project and propose solutions to the Engineer to obtain Notice of No Objection.

2.26.10.3

2.26.10.4 The Contractor will make all such arrangements within the contract price and no separate payment shall be made for the above-mentioned works; all associated costs shall be included in the CP NS 01 Contractor's bid.

## 2.27 Installation

2.27.1 Construction and Installation Plan

The Contractor shall submit a Construction and Installation Plan for the review of the Engineer. Activities shall be categorized as such that all works that are considered significant will require separate method statements outlining how the work will be carried out safely and risk assessments.

The Contractor shall provide their installation specifications, which shall ensure that installation work and quality conform to best-accepted railway Signaling practices. The installation specifications shall be submitted to the Engineer for their review.

Special attention shall also be paid to all equipment whose correct functioning is essential to the safe and efficient operation of the railway. In particular, the Contractor shall comply with the following requirements:

1) Tail cables running to the trackside equipment shall not be jointed;
2) All trackside equipment shall be installed sufficiently clear of the high voltage and heavy current equipment so that maintenance risk is reduced to a minimum;
3) All trackside equipment shall be installed clear of any stair or door access;
4) All trackside equipment shall be installed not to cause any infringement to the schedule of fixed and moving dimensions;
5) Trackside equipment such as disconnection boxes, etc. shall be installed at appropriate locations for ease of maintenance;
6) Appropriate fixed means of access shall be provided for easy and safe maintenance of Trackside equipment;
7) All train control Cables on the tracks shall cross the rails at right angles; and
8) Where train control cables are required to cross the power cable or traction return cable, this shall cross the power cables at right angles and where possible at a minimum separation of 600 mm.

The Contractor shall ensure that sufficient personnel are available in order to fulfill the overall program requirements.

2) Positive power feeder and negative return cable connections at traction substation.

3) Lightning/Surge Arrester, devices.

As certain works are closely related to civil, architecture, track works, signaling system, Communications System, power delivery system, traction substation, rolling stock, water drain system, water delivery system for firefighting, depot inspection, and operation system, the Contractor shall coordinate with interfacing Contractors for installation works including but not limited to:

a) Supporting structure for feeders and return cables in elevated, embankment section and depot;

b) Installation of return cables fixed with a high resistivity fire-proofed cleat.

c) Crossing conduit for return cables passed through under the plinth, or between plinth gaps or sleeper gaps;

d) Steel tubular pole foundation and guy anchor in elevated and embankment section;

e) Earthing connection between a pole earthing wire and earthing wire on elevated sand embankment sections. The Contractor shall install earthing electrode with resistance prescribed by the provisions and regulations;

f) Connection between lead wire from surge arrester and grounding wire inside PVC conduit embedded along every concrete pier, or at every other concrete pier (depends upon the design of the Contractor to be Approved by the Engineer);

g) Cable wiring for earthing devices of grounding wire and surge arrester for lightning;

h) Excavation, backfill, compacting, and finishes of trough, hand-holes, and pipe conduit for feeders, overhead return wire and return cable in depot; and

i) Furthermore, any matter not stipulated herein shall be determined through mutual consultation between the Engineer and Contractor, with the Engineer's consent ultimately.

4) Sectioning and feeding in the depots shall be designed to suit the various stages of construction and operation up to completion. The sectioning shall be designed to minimize disruption to operation during isolations for maintenance work.

5) For each of the 3 no. upper level maintenance decks in the Mabalacat Depot workshop, and in the Light Repair Shop's and Unscheduled Repair Shop's at both Mabalacat and Banlic depots interlocking shall be provided between the isolators and the doors giving access to the platforms. The scope of works includes doors, door locks, push bar for emergency escape and associated interlocking for isolators. The contractor shall coordinate with the civil contractor regarding the implementation of these systems.

In addition, Interlocking arrangements between overhead travelling Crane (N02.01 and S02.01) and retractable conductor rail shall be provided such that no crane operation shall be permitted until the conductor rail is fully retracted to safe position and grounded and no access to crane operator shall be permitted till OCS is retracted to its safe grounded position. Similarly in the Wheel Reprofiling Shops (WRS at Mabalacat and Banlic Depot) interlocking arrangement are required between WRS jib cranes (N03.02 and S03.02) with the OCS for safe operation.

2) Positive power feeder and negative return cable connections at traction substation.

3) Lightning/Surge Arrester, devices.

As certain works are closely related to civil, architecture, track works, signaling system, Communications System, power delivery system, traction substation, rolling stock, water drain system, water delivery system for firefighting, depot inspection, and operation system, the Contractor shall coordinate with interfacing Contractors for installation works including but not limited to:

a) Supporting structure for feeders and return cables in elevated, embankment section and depot;

b) Installation of return cables fixed with a high resistivity fire-proofed cleat.

c) Crossing conduit for return cables passed through under the plinth, or between plinth gaps or sleeper gaps;

d) Steel tubular pole foundation and guy anchor in elevated and embankment section;

e) Earthing connection between a pole earthing wire and earthing wire on elevated sand embankment sections. The Contractor shall install earthing electrode with resistance prescribed by the provisions and regulations;

f) Connection between lead wire from surge arrester and grounding wire inside PVC conduit embedded along every concrete pier, or at every other concrete pier (depends upon the design of the Contractor to be Approved by the Engineer);

g) Cable wiring for earthing devices of grounding wire and surge arrester for lightning;

h) Excavation, backfill, compacting, and finishes of trough, hand-holes, and pipe conduit for feeders, overhead return wire and return cable in depot; and

i) Furthermore, any matter not stipulated herein shall be determined through mutual consultation between the Engineer and Contractor, with the Engineer's consent ultimately.

4) Sectioning and feeding in the depots shall be designed to suit the various stages of construction and operation up to completion. The sectioning shall be designed to minimize disruption to operation during isolations for maintenance work.

5) For each of the 3 no. upper level maintenance decks in the Mabalacat Depot workshop, and in the Light Repair Shop's and Unscheduled Repair Shop's at both Mabalacat and Banlic depots interlocking shall be provided between the isolators and the doors giving access to the platforms. The scope of works includes doors, door locks, push bar for emergency escape and associated interlocking for isolators. The contractor shall coordinate with the civil contractor regarding the implementation of these systems.

In addition, Interlocking arrangements between overhead travelling Crane (N02.01 and S02.01) and retractable conductor rail shall be provided such that no crane operation shall be permitted until the conductor rail is fully retracted to safe position and grounded and no access to crane operator shall be permitted till OCS is retracted to its safe grounded position. Similarly in the Wheel Reprofiling Shops (WRS at Mabalacat and Banlic Depot) interlocking arrangement are required between WRS jib cranes (N03.02 and S03.02) with the OCS for safe operation.

iii. Equipment weight,

iv. Electric power supply, cable route, etc.,

v. Floor loading (t/m2) in floor contact areas.

4.2. The pit cover, floor grating or stairs to the pit, if required, shall be provided and installed with the machine.

4.3. Interface shall be taken with Rolling Stock Contractor at the appropriate timing.

4.4. Suitable interlocking scheme between OCS, Jib Cranes and Shunting Locomotive while movement and operation with trainsets in WRS.

5. Eligible Supplier

There is no preference.

iii. Equipment weight,

iv. Electric power supply, cable route, etc.,

v. Floor loading (t/m2) in floor contact areas.

4.2. The pit cover, floor grating or stairs to the pit, if required, shall be provided and installed with the machine.

4.3. Interface shall be taken with Rolling Stock Contractor at the appropriate timing.

4.4. Suitable interlocking scheme between OCS, Jib Cranes and Shunting Locomotive while movement and operation with trainsets in WRS.

5. Eligible Supplier

There is no preference.

**N03.02 Jib Crane 1t**

1. Quantity: Two (2) sets.

2. Functional Requirements

2.1. The jib cranes shall be provided for the N03 Wheel Re-profiling Shop.

2.2. Major performance shall be as follows:

i. Type: Cantilever-pillar, self standing type,

ii. Lifting capacity: 1 ton,

iii. Swing: 180deg. motorized,

iv. Reach: approx. 4 m,

v. Lifting height: approx. 4 m from the floor,

vi. Lifting speed: maker's standard (reference, 7 m/min.), with jogging,

vii. Hoist travel speed: maker's standard (reference, 20 m/min.),

viii. Swing speed: maker's standard.

3. Design

3.1. Operation and control on a pendant shall be applied, on which an emergency stop button shall be provided.

3.2. Safety devices shall be integrated for overload, highest/lowest limit switch, etc.

3.3. Arrangement of the equipment shall be referred to the drawing MCRP-DWG-DEP-DEF-0005, Wheel Re-profiling Shop Layout.

4. Interface Requirement

4.1. The Contractor shall provide and install the crane in the workshops, with appropriate interface coordination with the Building Contractor, regarding layout, anchor holes, anchor bolts, power supply, electric distribution box, installation work.

4.2. Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe and Shunting Locomotive for movement and operation with trainsets in WRS.

5. Eligible Supplier

There is no preference.

**N03.02 Jib Crane 1t**

1. Quantity: Two (2) sets.

2. Functional Requirements

2.1. The jib cranes shall be provided for the N03 Wheel Re-profiling Shop.

2.2. Major performance shall be as follows:

i. Type: Cantilever-pillar, self standing type,

ii. Lifting capacity: 1 ton,

iii. Swing: 180deg. motorized,

iv. Reach: approx. 4 m,

v. Lifting height: approx. 4 m from the floor,

vi. Lifting speed: maker's standard (reference, 7 m/min.), with jogging,

vii. Hoist travel speed: maker's standard (reference, 20 m/min.),

viii. Swing speed: maker's standard.

3. Design

3.1. Operation and control on a pendant shall be applied, on which an emergency stop button shall be provided.

3.2. Safety devices shall be integrated for overload, highest/lowest limit switch, etc.

3.3. Arrangement of the equipment shall be referred to the drawing MCRP-DWG-DEP-DEF-0005, Wheel Re-profiling Shop Layout.

4. Interface Requirement

4.1. The Contractor shall provide and install the crane in the workshops, with appropriate interface coordination with the Building Contractor, regarding layout, anchor holes, anchor bolts, power supply, electric distribution box, installation work.

4.2. Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe and Shunting Locomotive for movement and operation with trainsets in WRS.

5. Eligible Supplier

There is no preference.

## N41 SHUNTING CAR SHOP

### N41.01 Shunting Locomotive (Both Rail and Road Drive Type)

1. Quantity: One (1) set

2. Functional Requirements

2.1. The shunting locomotive (both rail and road drive type) shall be provided for the shunting of the car body in the Depot and Workshop.

2.2. The shunting locomotive (both rail and road drive type) shall be the structure which can be remotely operated and manned operation.

2.3. Major performance of the shunting locomotive shall be as follows; the Contractor shall confirm the type of coupler to the Rolling Stock Contractor:

i. Type: Battery locomotive, both rail and road drive,

ii. Track gauge: 1,435 mm,

iii. Coupler: the couplers of rolling stock,

iv. Driver cab: single cab for both direction operation, with the room light and the cooling fan,

v. Traction force: max. for rolling stock with Ten (10)-car set,

vi. Speed: max speed single car 5km/h (at horizontal level) with creep speed of 0.5 km/h on the rail operation.

vii. The speed on road operation shall be min 8 km/h.

3. Design

3.1. The shunting locomotive (both rail and road drive type) shall be able to operate by single driver or remote operation.

3.2. The shunting locomotive (both rail and road drive type) shall be equipped with the following features, but not limited to:

i. Windows shall be wide and clear view from the cab for safe operation,

ii. Visually checking of the coupling status in the cab,

iii. Remote releasing of coupling,

iv. Parking brake,

v. Melody horn and flashlight operated when in operation,

vi. Emergency stop buttons both on the vehicle and the remote control pendant.

3.3. The following accessories shall be included, but not limited to:

3.4. Standard accessories,

i. Maintenance tool kit.

4. Interface Requirement

4.1. Interface shall be taken with Rolling Stock Contractor at the appropriate timing.

4.2. Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe, Jib Cranes while movement and operation of trainsets in WRS. In addition, suitable interlocking also shall be done with OCS and Overhead Traveling Crane in URS.

5. Eligible Supplier

## N41 SHUNTING CAR SHOP

### N41.01 Shunting Locomotive (Both Rail and Road Drive Type)

1. Quantity: One (1) set

2. Functional Requirements

2.1. The shunting locomotive (both rail and road drive type) shall be provided for the shunting of the car body in the Depot and Workshop.

2.2. The shunting locomotive (both rail and road drive type) shall be the structure which can be remotely operated and manned operation.

2.3. Major performance of the shunting locomotive shall be as follows; the Contractor shall confirm the type of coupler to the Rolling Stock Contractor:

i. Type: Battery locomotive, both rail and road drive,

ii. Track gauge: 1,435 mm,

iii. Coupler: the couplers of rolling stock,

iv. Driver cab: single cab for both direction operation, with the room light and the cooling fan,

v. Traction force: max. for rolling stock with Ten (10)-car set,

vi. Speed: max speed single car 5km/h (at horizontal level) with creep speed of 0.5 km/h on the rail operation.

vii. The speed on road operation shall be min 8 km/h.

3. Design

3.1. The shunting locomotive (both rail and road drive type) shall be able to operate by single driver or remote operation.

3.2. The shunting locomotive (both rail and road drive type) shall be equipped with the following features, but not limited to:

i. Windows shall be wide and clear view from the cab for safe operation,

ii. Visually checking of the coupling status in the cab,

iii. Remote releasing of coupling,

iv. Parking brake,

v. Melody horn and flashlight operated when in operation,

vi. Emergency stop buttons both on the vehicle and the remote control pendant.

3.3. The following accessories shall be included, but not limited to:

3.4. Standard accessories,

i. Maintenance tool kit.

4. Interface Requirement

4.1. Interface shall be taken with Rolling Stock Contractor at the appropriate timing.

4.2. Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe, Jib Cranes while movement and operation of trainsets in WRS. In addition, suitable interlocking also shall be done with OCS and Overhead Traveling Crane in URS.

5. Eligible Supplier

4.2. The pit cover, floor grating or stairs to the pit, if required, shall be provided and installed with the machine.

4.3. Interface shall be taken with Rolling Stock Contractor at the appropriate timing.

4.4. Suitable interlocking scheme between OCS, Jib Cranes and Shunting Locomotive while movement and operation of the trainsets in WRS.

5. Eligible Supplier

There is no preference.

4.2. The pit cover, floor grating or stairs to the pit, if required, shall be provided and installed with the machine.

4.3. Interface shall be taken with Rolling Stock Contractor at the appropriate timing.

4.4. Suitable interlocking scheme between OCS, Jib Cranes and Shunting Locomotive while movement and operation of the trainsets in WRS.

5. Eligible Supplier

There is no preference.

**S03.02 Jib Crane 1t**

1. Quantity: Two (2) sets

2. Functional Requirements

2.1. The jib cranes shall be provided for the S03 Wheel Re-profiling Shop.

2.2. Major performance shall be as follows:

i. Type: Cantilever-pillar, self standing type,

ii. Lifting capacity: 1 ton,

iii. Swing: 180deg. motorized,

iv. Reach: approx. 4 m,

v. Lifting height: approx. 4 m from the floor,

vi. Lifting speed: maker's standard (reference, 7 m/min.), with jogging,

vii. Hoist travel speed: maker's standard (reference, 20 m/min.),

viii. Swing speed: maker's standard.

3. Design

3.1. Operation and control on a pendant shall be applied, on which an emergency stop button shall be provided.

3.2. Safety devices shall be integrated for overload, highest/lowest limit switch, etc.

3.3. Arrangement of the equipment shall be referred to the drawing NSRP-DWG-DEP-DEF-0005, Wheel Re-profiling Shop Layout.

4. Interface Requirement

4.1. The Contractor shall provide and install the crane in the workshops, with appropriate interface coordination with the Building Contractor, regarding layout, anchor holes, anchor bolts, power supply, electric distribution box, installation work.

4.2. Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe and Shunting Locomotive for movement and operation with trainsets in WRS.

5. Eligible Supplier

There is no preference.

**S03.02 Jib Crane 1t**

1. Quantity: Two (2) sets

2. Functional Requirements

2.1. The jib cranes shall be provided for the S03 Wheel Re-profiling Shop.

2.2. Major performance shall be as follows:

i. Type: Cantilever-pillar, self standing type,

ii. Lifting capacity: 1 ton,

iii. Swing: 180deg. motorized,

iv. Reach: approx. 4 m,

v. Lifting height: approx. 4 m from the floor,

vi. Lifting speed: maker's standard (reference, 7 m/min.), with jogging,

vii. Hoist travel speed: maker's standard (reference, 20 m/min.),

viii. Swing speed: maker's standard.

3. Design

3.1. Operation and control on a pendant shall be applied, on which an emergency stop button shall be provided.

3.2. Safety devices shall be integrated for overload, highest/lowest limit switch, etc.

3.3. Arrangement of the equipment shall be referred to the drawing NSRP-DWG-DEP-DEF-0005, Wheel Re-profiling Shop Layout.

4. Interface Requirement

4.1. The Contractor shall provide and install the crane in the workshops, with appropriate interface coordination with the Building Contractor, regarding layout, anchor holes, anchor bolts, power supply, electric distribution box, installation work.

4.2. Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe and Shunting Locomotive for movement and operation with trainsets in WRS.

5. Eligible Supplier

There is no preference.

## S41 SHUNTING CAR SHOP

### S41.01 Shunting Locomotive (Both Rail and Road Drive Type)

1. Quantity: One (1) set

2. Functional Requirements

2.1. The shunting locomotive (both rail and road drive type) shall be provided for the shunting of the car body in the S03 Wheel Re-Profiling Shop.

2.2. The shunting locomotive (both rail and road drive type) shall be the structure which can be remotely operated and manned operation.

2.3. Major performance of the shunting locomotive shall be as follows; the Contractor shall confirm the type of coupler to the Rolling Stock Contractor:

i. Type: Battery locomotive, both rail and road drive,

ii. Track gauge: 1,435 mm,

iii. Coupler: the couplers of rolling stock,

iv. Driver cab: single cab for both direction operation, with the room light and the cooling fan,

v. Traction force: max. for rolling stock with Ten (10)-car set,

vi. Speed: max speed single car 5km/h (at horizontal level).

3. Design

3.1. The shunting locomotive (both rail and road drive type) shall be able to operate by single driver or remote operation.

3.2. The shunting locomotive (both rail and road drive type) shall be equipped with the following features, but not limited to:

i. Windows shall be wide and clear view from the cab for safe operation,

ii. Visually checking of the coupling status in the cab,

iii. Remote releasing of coupling,

iv. Parking brake,

v. Melody horn and flashlight operated when in operation,

vi. Emergency stop buttons both on the vehicle and the remote control pendant.

3.3. The following accessories shall be included, but not limited to:

i. Standard accessories,

ii. Maintenance tool kit.

4. Interface Requirement

4.1. Interface shall be taken with Rolling Stock Contractor at the appropriate timing.

4.2. Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe, Jib Cranes while movement and operation of trainsets in WRS. In addition, suitable interlocking also shall be done with OCS and Overhead Traveling Crane in URS.

## S41 SHUNTING CAR SHOP

### S41.01 Shunting Locomotive (Both Rail and Road Drive Type)

1. Quantity: One (1) set

2. Functional Requirements

2.1. The shunting locomotive (both rail and road drive type) shall be provided for the shunting of the car body in the S03 Wheel Re-Profiling Shop.

2.2. The shunting locomotive (both rail and road drive type) shall be the structure which can be remotely operated and manned operation.

2.3. Major performance of the shunting locomotive shall be as follows; the Contractor shall confirm the type of coupler to the Rolling Stock Contractor:

i. Type: Battery locomotive, both rail and road drive,

ii. Track gauge: 1,435 mm,

iii. Coupler: the couplers of rolling stock,

iv. Driver cab: single cab for both direction operation, with the room light and the cooling fan,

v. Traction force: max. for rolling stock with Ten (10)-car set,

vi. Speed: max speed single car 5km/h (at horizontal level).

3. Design

3.1. The shunting locomotive (both rail and road drive type) shall be able to operate by single driver or remote operation.

3.2. The shunting locomotive (both rail and road drive type) shall be equipped with the following features, but not limited to:

i. Windows shall be wide and clear view from the cab for safe operation,

ii. Visually checking of the coupling status in the cab,

iii. Remote releasing of coupling,

iv. Parking brake,

v. Melody horn and flashlight operated when in operation,

vi. Emergency stop buttons both on the vehicle and the remote control pendant.

3.3. The following accessories shall be included, but not limited to:

i. Standard accessories,

ii. Maintenance tool kit.

4. Interface Requirement

4.1. Interface shall be taken with Rolling Stock Contractor at the appropriate timing.

4.2. Suitable interlocking scheme between OCS, Underfloor Wheel Re-profiling Lathe, Jib Cranes while movement and operation of trainsets in WRS. In addition, suitable interlocking also shall be done with OCS and Overhead Traveling Crane in URS.

| | | | | |
|---|---|---|---|---|
| | Line; GSM-R Radios will be provided to Bicutan Station Controller including portable Handheld Radio at Drivers lobby for Operations and Disaster Management | | | |
| Radio Systems: CBTC | Shall provide location and space for MMSP Broadband Radio Systems as per request. | Bicutan | CP106 | Shall supply and install, test, and commission all CBTC systems. |
| Voice and Data System | Shall provide the connectivity for all Voice and Data within the NSCR Line; the line to MMSP PABX System. | Bicutan | CP106 | Shall supply and install, test, and commission all MMSP PABX systems. |
| PIDS | Shall provide location and space required by MMSP for their PIDS on their Platform also space and location in the common areas between NSCR and MMSP | Bicutan | CP106 | Shall supply and install, test and commission all PIDS in their platforms and concourses. |
| Public Address (PA) System | Common PA System for FTI and Bicutan to avoid overlapping, MMSP PS System will be integrated with NSCR and will be managed by Station Operator for station announcements. The central announcements will be done by either MMSP OCC or NSCR OCC. | Bicutan and FTI | CP106 | |
| Time Server and Master Clock System | All clocks will be supplied, installed, test and commissioned by NS01, excluding the clocks that will be supplied by CP106 in FTI -MMSP Platform. | Bicutan and FTI | CP106 | To supply, install, test and commission all clocks in FTI's MMSP Platform.<br><br>MMSP's Master clock system to be installed at FTI & Bicutan stations for respective MMSP rail systems utilization. |
| GSM-R on-board equipment | NS-01 shall supply, test, and commission the onboard equipment on MMSP trains.<br><br>NS01 and CP107 shall coordinate and agree on the size, space, and location. | N/A | CP107 | CP107 shall install the on-board equipment.<br><br>CP107 and NS01 shall coordinate and agree on the size, space, and location. |
| GSM-R Infrastructure at MMSP Test and Transfer Track at Valenzuela Depot | Shall design, install, test, and commission the GSM-R System/ Infrastructure at MMSP's Valenzuela Depot.<br><br>Shall identify and supply the testing and diagnostic equipment for the GSM-R Radio Systems | Valenzuela Depot | CP106 | CP106: To provide Backbone Facilities for the GSM-R Infrastructure to be connected from Valenzuela Depot Test and Transfer Track to the Backbone Switch at Bicutan (MMSP's CER). |
| TETRA Infrastructure | NS-01- To provide Backbone Facilities for the TETRA Radio | Banlic Depot / | CP106 | Shall design, install, test, and commission the TETRA |

| | | | | |
|---|---|---|---|---|
| for Testing at Banlic Depot. | Infrastructure to be connected from Banlic Depot to the Backbone Switch at Bicutan (NS-01's CER).<br><br>CIVIL (S-07)- To provide space and power for the TETRA Infrastructure at Banlic Depot. | Bicutan Station | | Infrastructure at NSCR's Banlic Depot.<br><br>Shall identify and supply the testing and diagnostic equipment for the TETRA Systems |
| Driving Operation Simulator for Training. | NS01 shall supply on board Telecom equipment for Driving Operation Simulator and interface with CP107 as stipulated in the Signaling clause (below).<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) | | CP107 | CP107 and NS01 shall coordinate.<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) |

| | | | | |
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| | | | | MMSP rail systems utilization. |
| GSM-R on-board equipment | NS-01 shall supply, test, and commission the onboard equipment on MMSP trains.<br><br>NS01 and CP107 shall coordinate and agree on the size, space, and location. | N/A | CP107 | CP107 shall install the on-board equipment.<br><br>CP107 and NS01 shall coordinate and agree on the size, space, and location. |
| GSM-R Infrastructure at MMSP Test and Transfer Track at Valenzuela Depot | Shall design, install, test, and commission the GSM-R System/ Infrastructure at MMSP's Valenzuela Depot.<br><br>Shall identify and supply the testing and diagnostic equipment for the GSM-R Radio Systems | Valenzuela Depot | CP106 ~~– CIVIL~~ | CP106: To provide Backbone Facilities for the GSM-R Infrastructure ~~(Base Station)~~ to be connected from Valenzuela Depot Test and Transfer Track to the Backbone Switch ~~and OCC/IOCC~~ at Bicutan (MMSP's CER).<br><br>~~CIVIL: To provide space and power for the GSM-R Infrastructure.~~ |
| TETRA Infrastructure for Testing at Banlic Depot. | NS-01- To provide Backbone Facilities for the TETRA Radio Infrastructure to be connected from Banlic Depot to the Backbone Switch at Bicutan (NS-01's CER).<br><br>CIVIL (S-07)- To provide space and power for the TETRA Infrastructure at Banlic Depot. | Banlic Depot / Bicutan Station | CP106 | Shall design, install, test, and commission the TETRA Infrastructure at NSCR's Banlic Depot.<br><br>Shall identify and supply the testing and diagnostic equipment for the TETRA Systems |
| Driving Operation Simulator for Training. | NS01 shall supply on board Telecom equipment for Driving Operation Simulator and interface with CP107 as stipulated in the Signaling clause (below).<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) | | CP107 | CP107 and NS01 shall coordinate.<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) |

| | | | | |
|---|---|---|---|---|
| | | | | MMSP rail systems utilization. |
| GSM-R on-board equipment | NS-01 shall supply,, test, and commission the onboard equipment on MMSP trains.<br><br>NS01 and CP107 shall coordinate and agree on the size, space, and location. | N/A | CP107 | CP107 shall install the on-board equipment.<br><br>CP107 and NS01 shall coordinate and agree on the size, space, and location. |
| GSM-R Infrastructure at MMSP Test and Transfer Track at Valenzuela Depot | Shall design, install, test, and commission the GSM-R System/ Infrastructure at MMSP's Valenzuela Depot.<br><br>Shall identify and supply the testing and diagnostic equipment for the GSM-R Radio Systems | Valenzuela Depot | CP106 | CP106: To provide Backbone Facilities for the GSM-R Infrastructure to be connected from Valenzuela Depot Test and Transfer Track to the Backbone Switch at Bicutan (MMSP's CER). |
| TETRA Infrastructure for Testing at Banlic Depot. | NS-01- To provide Backbone Facilities for the TETRA Radio Infrastructure to be connected from Banlic Depot to the Backbone Switch at Bicutan (NS-01's CER).<br><br>CIVIL (S-07)- To provide space and power for the TETRA Infrastructure at Banlic Depot. | Banlic Depot / Bicutan Station | CP106 | Shall design, install, test, and commission the TETRA Infrastructure at NSCR's Banlic Depot.<br><br>Shall identify and supply the testing and diagnostic equipment for the TETRA Systems |
| Driving Operation Simulator for Training. | NS01 shall supply on board Telecom equipment for Driving Operation Simulator and interface with CP107 as stipulated in the Signaling clause (below).<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) | | CP107 | CP107 and NS01 shall coordinate.<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) |

| Discipline | MMSP INTERFACE | | | |
|---|---|---|---|---|
| | **NS-01** | **CP106** | **NS-01** | **CP107** |
| | with CP106 for all Telecom Systems works. NS-01 will facilitate and provide all Telecom Systems work terminations for CP106 either or both at FTI and Bicutan Stations.<br><br>NS-01 will provide connectivity for the Backbone, Radio Systems (GSM-R), PABX, PA System.<br><br>NS-01 will supply, install, test, and commission the clocks for FTI and Bicutan stations. Excluding the clocks on FTI's MMSP Platform.<br><br>NS-01 shall interface with CP106 for their Banlic Depot TETRA infrastructure requirements.<br><br>NS-01 shall provide Backbone Facilities for the TETRA Radio Infrastructure to be connected from Banlic Depot to the Backbone Switch at Bicutan. | with NS-01 for all Telecom Systems works. CP106 will terminate all Telecom Systems work termination to NS-01 either or both at FTI and Bicutan Stations.<br><br>CP106 will supply all equipment to connect to the NSCR backbone system.<br><br>CP106 will supply, install, test, and commission the equipment for Millimeter-wave, Backbone Radio System (CBTC), PABX, PIDS.<br><br>CP106 shall interface with NS-01 for their Valenzuela Depot Test and Transfer Track for GSMR infrastructure requirements.<br><br>CP106 shall provide Backbone Facilities for the GSM-R Infrastructure to be connected from the Valenzuela Depot Test Track to the Backbone Switch at Bicutan. | commission GSM-R radio on CP107 Rolling stock. For this purpose, NS-01 shall develop an interface matrix for all related aspects with CP107 matrix and interface at all stages of the project with NS-01<br><br>NS01 shall supply on board Telecom equipment for Driving Operation Simulator and interface with CP107 as stipulated in the Signaling clause (below).<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) | matrix and interface at all stages of the project with NS-01.<br><br>CP107 will install the GSM-R onboard equipment succeeding trains following the installation on the initial rolling stock.<br><br>CP107 and NS01 shall coordinate on the on board Telecom equipment for the Driving Operation Simulator.<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) |

| Discipline | MMSP INTERFACE | | | |
|---|---|---|---|---|
| | NS-01 | CP106 | NS-01 | CP107 |
| | with CP106 for all Telecom Systems works. NS-01 will facilitate and provide all Telecom Systems work terminations for CP106 either or both at FTI and Bicutan Stations.<br><br>NS-01 will provide connectivity for the Backbone, Radio Systems (GSM-R), PABX, PA System.<br><br>NS-01 will supply, install, test, and commission the clocks for FTI and Bicutan stations. Excluding the clocks on FTI's MMSP Platform.<br><br>NS-01 shall interface with CP106 for their Banlic Depot TETRA infrastructure requirements.<br><br>NS-01 shall provide Backbone Facilities for the TETRA Radio Infrastructure to be connected from Banlic Depot to the Backbone Switch at Bicutan. | with NS-01 for all Telecom Systems works. CP106 will terminate all Telecom Systems work termination to NS-01 either or both at FTI and Bicutan Stations.<br><br>CP106 will supply all equipment to connect to the NSCR backbone system.<br><br>CP106 will supply, install, test, and commission the equipment for Millimeter-wave, Backbone Radio System (CBTC), PABX, PIDS.<br><br>CP106 shall interface with NS-01 for their Valenzuela Depot Test and Transfer Track for GSMR infrastructure requirements.<br><br>CP106 shall provide Backbone Facilities for the GSM-R Infrastructure to be connected from the Valenzuela Depot Test Track to the Backbone Switch at Bicutan. | commission GSM-R radio on CP107 Rolling stock. For this purpose, NS-01 shall develop an interface matrix for all related aspects with CP107 matrix and interface at all stages of the project with NS-01<br><br>NS01 shall supply on board Telecom equipment for Driving Operation Simulator and interface with CP107 as stipulated in the Signaling clause (below).<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) | matrix and interface at all stages of the project with NS-01.<br><br>CP107 will install the GSM-R onboard equipment succeeding trains following the installation on the initial rolling stock.<br><br>CP107 and NS01 shall coordinate on the on board Telecom equipment for the Driving Operation Simulator.<br><br>(Please refer to Clause 2.26.10.2.4 in the Signalling Bidding Documents.) |

The Contractor shall provide, erect, construct and equip all offices, workshops, stores, sheds, loading and unloading facilities and the like required by him, complete with all machines and equipment and all services, access roads, rail tracks and the like, required by him for the site depot, in consultation with the Engineer.

## 3.5. Vehicles

The Contractor shall provide all necessary road vehicles for material transportation at the site depots like trucks (with cranes), trailers, and cars. Vehicles shall also be provided by the Contractor for site transportation of labor where necessary.

Furthermore, the Contractor may also provide road-rail vehicles such as track-type (with cranes), etc. where required for cable laying, material transportation at the sites, etc.

Competent licensed drivers shall be appointed for all the vehicles and the vehicles shall be well maintained throughout the Contract including during the Defect Notification Period.

## 3.6. Utilities for Temporary Facilities

3.6.1. Water

All water required for and in connection with the equipment and plants, devices, dust control, for settling of backfill material, or for any other use as may be required for proper completion of the Works, shall be provided by and at the expense of the Contractor. No separate payment for water used.

3.6.2. Temporary Power and Lighting

(1) Temporary power shall consist of temporary power for construction operations and temporary lighting.

(2) The Contractor shall provide all power for operation of his plant and equipment, or any other use, including cooling and lighting of buildings for use by the Engineer.

(3) The Contractor shall arrange with the utility company to provide and pay for the service required for power and lighting.

(4) The Contractor shall provide temporary lighting for all work areas and buildings, to protect the Works and maintain suitable working conditions. Temporary lighting shall be maintained in all areas under the control of the Contractor.

(5) The Contractor shall provide and install circuit and branch wiring, with area distribution boxes located so that power and lighting are available throughout the construction site.

(6) Standby Generators with a suitable capacity shall be furnished by the Contractor to cope with the cases of power supply cut-off.

(7) The Contractor shall provide all temporary power for any works necessary prior to the date of commissioning of the permanent power supply system for the applicable location.

3.6.3. Air Conditioning

The temporary facilities shall be equipped with air conditioning units to provide climate

The Contractor shall provide, erect, construct and equip all offices, workshops, stores, sheds, loading and unloading facilities and the like required by him, complete with all machines and equipment and all services, access roads, rail tracks and the like, required by him for the site depot, in consultation with the Engineer.

## 3.5. Vehicles

The Contractor shall provide all necessary road vehicles for material transportation at the site depots like trucks (with cranes), trailers, and cars. Vehicles shall also be provided by the Contractor for site transportation of labor where necessary.

Furthermore, the Contractor may also provide road-rail vehicles such as track-type (with cranes), etc. where required for cable laying, material transportation at the sites, etc.

Competent licensed drivers shall be appointed for all the vehicles and the vehicles shall be well maintained throughout the Contract including during the Defect Notification Period.

## 3.6. Utilities for Temporary Facilities

3.6.1. Water

All water required for and in connection with the equipment and plants, devices, dust control, for settling of backfill material, or for any other use as may be required for proper completion of the Works, shall be provided by and at the expense of the Contractor. No separate payment for water used.

3.6.2. Temporary Power and Lighting

(1) Temporary power shall consist of temporary power for construction operations and temporary lighting.

(2) The Contractor shall provide all power for operation of his plant and equipment, or any other use, including cooling and lighting of buildings for use by the Engineer.

(3) The Contractor shall arrange with the utility company to provide and pay for the service required for power and lighting.

(4) The Contractor shall provide temporary lighting for all work areas and buildings, to protect the Works and maintain suitable working conditions. Temporary lighting shall be maintained in all areas under the control of the Contractor.

(5) The Contractor shall provide and install circuit and branch wiring, with area distribution boxes located so that power and lighting are available throughout the construction site.

(6) Standby Generators with a suitable capacity shall be furnished by the Contractor to cope with the cases of power supply cut-off.

~~(6)~~(7) The Contractor shall provide all temporary power for any works necessary prior to the date of commissioning of the permanent power supply system for the applicable location.

3.6.3. Air Conditioning

The temporary facilities shall be equipped with air conditioning units to provide climate

# Particular Conditions (PC)

## Part A - Contract Data

| Conditions | Sub-Clause | Data |
|---|---|---|
| **Employer's name and address** | 1.1.2.2 & 1.3 | Department of Transportation (DOTr).<br>Pinatubo Street,<br>corner Sergio Osmeña Sr. Street,<br>Clark Freeport Zone,<br>Angeles City, Pampanga,<br>2009 Philippines |
| **Engineer's name and address** | 1.1.2.4 & 1.3 | GCR Consortium,<br>20th and 21st Floor, Greenfield Tower, Mayflower Street, Greenfield District, 1500 Mandaluyong City, Metro Manila, Philippines |
| **Bank's name** | 1.1.2.11 | Japan International Cooperation Agency (JICA) |
| **Borrower's name** | 1.1.2.12 | The Government of the Republic of the Philippines |
| **Time for Completion** | 1.1.3.3 | Time for Completion (including Integrated System Testing, attendance on Performance Testing and Test Run by Rolling Stock Contractors, and assistance on Trial Operation by Operator):<br><br>**Section 1**: 39 months: Acceptance of the Platform Screen Door system for Section 1 certified as Substantially Complete,<br><br>**Section 2**: 59 months: Completion of the whole of works for Section 2,<br><br>**Section 3**: 48 months: Completion of the whole of works for Section 3,<br><br>**Section 4**: 76 months: Completion of the whole of works for Section 4 including attendance on Rolling Stock for performance proving.<br><br>The Contractor shall provide attendance on NS-02 and NS-03 Rolling Stock |

# Particular Conditions (PC)

## Part A - Contract Data

| Conditions | Sub-Clause | Data |
|---|---|---|
| **Employer's name and address** | 1.1.2.2 & 1.3 | Department of Transportation (DOTr).<br>Pinatubo Street,<br>corner Sergio Osmeña Sr. Street,<br>Clark Freeport Zone,<br>Angeles City, Pampanga,<br>2009 Philippines |
| **Engineer's name and address** | 1.1.2.4 & 1.3 | GCR Consortium,<br>20th and 21st Floor, Greenfield Tower, Mayflower Street, Greenfield District, 1500 Mandaluyong City, Metro Manila, Philippines |
| **Bank's name** | 1.1.2.11 | Japan International Cooperation Agency (JICA) |
| **Borrower's name** | 1.1.2.12 | The Government of the Republic of the Philippines |
| **Time for Completion** | 1.1.3.3 | Time for Completion (including Integrated System Testing, attendance on Performance Testing and Test Run by Rolling Stock Contractors, and assistance on Trial Operation by Operator):<br><br>**Section 1**: ~~37~~ 39 months: Acceptance of the Platform Screen Door system for Section 1 certified as Substantially Complete,<br><br>**Section 2**: ~~40~~ 59 months: Completion of the whole of works for Section 2,<br><br>**Section 3**: 48 months: Completion of the whole of works for Section 3,<br><br>**Section 4**: 76 months: Completion of the whole of works for Section 4 including attendance on Rolling Stock for performance proving.<br><br>The Contractor shall provide attendance on NS-02 and NS-03 Rolling Stock |

**Table: Summary of Sections**

| Section Name/Description (Sub-Clause 1.1.5.6) | Time for Completion (Sub-Clause 1.1.3.3) | Damages for Delay (Sub-Clause 8.7) |
|---|---|---|
| **Section 1**: Platform Screen Door (PSD) and related works at the stations of the North- South Commuter Railway Project (Malolos-Tutuban) (NSCR). Approximately length of NSCR, 37.6km and 9 stations. | Thirty-Nine (39) months for the whole of the works for Section 1 certified as Substantially Complete. *[To be finalized referring to the NSCR' schedule]* | Five hundredths of a percent (0.05%) of the corresponding Amount of Section 1* per day for delay in the completion of the whole of works for Section 1 and for delay in achieving each Key Date for the respective elements of the Works. |
| **Section 2**: the Malolos Clark Railway Project (MCRP). Approximately length of MCRP, 50.5 km and 6 stations including the north depot. | Fifty-Nine (59) months for the whole of the works for Section 2 excluding attendance on NS-02 and NS-03 contractors for performance testing of on-board equipment | Five hundredths of a percent (0.05%) of the corresponding Amount of Section 2* per day for delay in the completion of the whole of works for Section 2 and for delay in achieving each Key Date for the respective elements of the Works. |
| **Section 3**: Section between NSCR stations (Solis exclusive) and Blumentritt and Tutuban stations (inclusive) of the Malolos Clark Railway Project- (Blumentritt Extension) (MCRP-Ext.). Approximate length of 6.479 km and 2 stations. | Forty-Eight (48) months) for the whole of the works for Section 3. | Five hundredths of a percent (0.05%) of the corresponding Amount for Section 3* per day for delay in the completion of the whole of works for Section 3 and for delay in achieving each Key Date for the respective elements of the Works. |
| **Section 4**:Section between Blumentritt station (exclusive) and Calamba station (inclusive) of the North South Railway Project-South Line (Commuter) (NSRP-South). Approximately length of 54.6 km and 18 stations including the south depot. | Seventy-Six (76) months for the whole of the works for Section 4 and the whole of the Works excluding attendance on NS-02 and NS-03 Contractors for performance testing of on-board equipment | Five hundredths of a percent (0.05%) of the corresponding Amount for Section 4* per day for delay in the completion of the whole of works for Section 4 and for the completion of the whole of the Works, and for delay in achieving each Key Date for the respective elements of the Works. |
| Attendance on the Rolling Stock Contractors NS-02 and NS-03 will be required between months 37 to 76. Provided that there are no delays attributable to the NS-01 Contractor from the respective contract programs for Integrated Testing and Commissioning, Trial Operation and performance testing, no damages will be payable by the NS-01 Contractor. If the NS-01 Contractor is culpable, then damages as given above will be payable for each day of delay. | | |

Note: * The Amount for each Section will be the Accepted Contract Amount multiplied by the

**Table: Summary of Sections**

| Section Name/Description (Sub-Clause 1.1.5.6) | Time for Completion (Sub-Clause 1.1.3.3) | Damages for Delay (Sub-Clause 8.7) |
|---|---|---|
| **Section 1**: Platform Screen Door (PSD) and related works at the stations of the North- South Commuter Railway Project (Malolos-Tutuban) (NSCR). Approximately length of NSCR, 37.6km and 9 stations. | Thirty-~~Seven~~ Nine (~~37~~39) months for the whole of the works for Section 1 certified as Substantially Complete. *[To be finalized referring to the NSCR' schedule]* | Five hundredths of a percent (0.05%) of the corresponding Amount of Section 1* per day for delay in the completion of the whole of works for Section 1 and for delay in achieving each Key Date for the respective elements of the Works. |
| **Section 2**: the Malolos Clark Railway Project (MCRP). Approximately length of MCRP, 50.5 km and 6 stations including the north depot. | ~~Forty~~ Fifty-Nine (~~40~~59) months for the whole of the works for Section 2 excluding attendance on NS-02 and NS-03 contractors for performance testing of on-board equipment | Five hundredths of a percent (0.05%) of the corresponding Amount of Section 2* per day for delay in the completion of the whole of works for Section 2 and for delay in achieving each Key Date for the respective elements of the Works. |
| **Section 3**: Section between NSCR stations (Solis exclusive) and Blumentritt and Tutuban stations (inclusive) of the Malolos Clark Railway Project- (Blumentritt Extension) (MCRP-Ext.). Approximate length of 6.479 km and 2 stations. | Forty-Eight (48) months) for the whole of the works for Section 3. | Five hundredths of a percent (0.05%) of the corresponding Amount for Section 3* per day for delay in the completion of the whole of works for Section 3 and for delay in achieving each Key Date for the respective elements of the Works. |
| **Section 4**:Section between Blumentritt station (exclusive) and Calamba station (inclusive) of the North South Railway Project-South Line (Commuter) (NSRP-South). Approximately length of 54.6 km and 18 stations including the south depot. | Seventy-Six (76) months for the whole of the works for Section 4 and the whole of the Works excluding attendance on NS-02 and NS-03 Contractors for performance testing of on-board equipment | Five hundredths of a percent (0.05%) of the corresponding Amount for Section 4* per day for delay in the completion of the whole of works for Section 4 and for the completion of the whole of the Works, and for delay in achieving each Key Date for the respective elements of the Works. |
| Attendance on the Rolling Stock Contractors NS-02 and NS-03 will be required between months 37 to 76. Provided that there are no delays attributable to the NS-01 Contractor from the respective contract programs for Integrated Testing and Commissioning, Trial Operation and performance testing, no damages will be payable by the NS-01 Contractor. If the NS-01 Contractor is culpable, then damages as given above will be payable for each day of delay. | | |

Note: * The Amount for each Section will be the Accepted Contract Amount multiplied by the

- Package CP S-03a Building and Engineering Works for approximately 7.9 km of at Grade and Viaduct Railway Track Structure including Elevated Station at Buendia, and at grade stations at EDSA and Senate
- Package CP S-03b Civil Engineering, Tunnel and Building Works for approximately 6.1 km of Railway with 4.7km of Underground Railway and 1.4km of at-Grade Railway, including FTI Station and Tunnelling Works to connect to MMSP Senate station
- Package CP S-03c Building and Engineering Works for Approximately 5.8 kms of Railway Viaduct Structure including Elevated Stations at Bicutan and Sucat
- Package CP S-04 Building and Civil Engineering Works for approximately 8.5 Kms of Viaduct Structure including 2 Station Buildings at Alabang and Muntinlupa
- Package CP S-05 Building and Civil Engineering Works for approximately 12.8 km of Viaduct Structure including 4 Station Buildings at San Pedro, Pacita, Binan and Santa Rosa
- Package CP S-06 Building and Civil Engineering Works for approximately 10.3 kms of Viaduct Structure and Approximately 1.4 Kms of Depot Access Line including 3 Station Buildings at Cabuyao, Banlic and Calamba
- Package CP S-07 Building and Civil Engineering Works for South Depot Buildings including related infrastructure and Trackwork Sub-Ballast.

The Malolos-Clark Railway Project (MCRP) and the North South Railway Project – South Line (Commuter) (NSRP-South):
- Package CP NS-02 Rolling Stock – Commuter Trainsets
- Package CP NS-03 Rolling Stock – Limited Express Trainsets

The Metro Manila Subway Project (MMSP):
- Package CP 101– Three Underground Stations, Tunnels and Depot
- Package CP 106 – Electromechanical Systems and Track Works
- Package CP 107 – Rolling Stock

**Section 1**: Platform Screen Door (PSD) and related works at the stations of the North- South Commuter Railway Project (Malolos-Tutuban) (NSCR).
*(To be coordinated with GC of NSCR, NS Tren)*

| Key Date | Description | Month No. |
|---|---|---|
| KD 1-1 | Achievement: Substantial Completion of installation of Platform Screen Doors and related works to commence Integrated Testing and Commissioning and Test Running using rolling stock in cooperation and coordination with NSCR N1 project CP 01, CP 02, CP 03 and CP 04 Contractors. | 33 |
| KD 1-2 | Achievement: Attendance by NS-01 Contractor on the NSCR N1 project contractors to enable the NSCR N1 Contractors to hold the Integrated Testing and Commissioning and Test | 36 |

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|---|---|---|
| | Running using CP 03 Rolling Stock prior to commencement of Trial Running and Performance Testing. | |
| KD 1-3 | Achievement: Completion of Training and delivery of contractual spare parts, consumables, tools and jigs, as-built documents, and operation and maintenance manuals for the Platform Screen Doors | 39 |
| Completion of Section 1 | Achievement: Acceptance of the Platform Screen Door system for Section 1 certified as Substantially Complete. | 39 |

**Section 2**: the Malolos-Clark Railway Project (MCRP). Approximate length of 50.5 km and 6 stations)

| Key Date | Description | Month No. |
|---|---|---|
| KD 2-1 | Design collaboration with N1 CP 03 Contractor of North-South Commuter Railway Project (Malolos-Tutuban) (NSCR), for Signaling, Telecommunications and other on-board systems equipment. | 12 |
| KD 2-2 | Achievement: Substantial Completion of Power Supply and Distribution at Depot and all stations to achieve "Power On" | 32 |
| KD 2-3 | Achievement: Supply of On-board Equipment including all accessories and fittings at the premises of the Rolling Stock Contractors in Japan/or elsewhere as advised.<br><br>Key Dates KD 2-3 is sub-divided as shown below; | |
| | KD 2-3.1: Supply to CP NS-02 Contractor for 1st trainset | 27 |
| | KD 2-3.2: Supply to CP NS-02 Contractor for trainsets 2 to 5 | 27 |
| | KD 2-3.3: Supply to CP NS-02 Contractor for trainsets 6 to 10 | 31 |
| | KD 2-3.4: Supply to CP NS-02 Contractor for trainsets 11 to 15 | 36 |
| | KD 2-3.5: Supply to CP NS-02 Contractor for trainsets 16 to 19 | 40 |
| | KD 2-3.6: Supply to CP NS-03 Contractor for trainsets 1st trainset | 34 |
| | KD 2-3.7: Supply to CP NS-03 Contractor for trainsets 2 to 7 | 40 |
| KD 2-4 | Achievement: Substantial Completion of rolling stock equipment, rescue equipment etc. required for to commencing Integrated Testing and Commissioning using rolling stock and Test Running at Mainline for full operation. | 33 |
| KD 2-5 | Achievement: Substantial Completion of Track Works and E&M Systems works to commence Integrated Testing and Commissioning and Test Running at Mainline using Rolling | 33 |

| | | |
|---|---|---|
| | Stock procured under NSCR for full operation.<br><br>Achievement: Completion of Train operation simulators at the training center in the Depot. | |
| KD 2-6 | Achievement: Substantial completion of E&M Systems and Track Works (including rail grinding) and all connections between MCRP and NSCR projects, including the Integrated Testing and Commissioning of MCRP and between MCRP and NSCR using rolling stock on the Mainline, at Stations and in the North Depot to allow the Employer with Contractors support to commence Trial Running. | 39 |
| KD 2-7 | Achievement: Completion of first tranche of Training using Contractor supplied facilities and training aids, and delivery of contractual spare parts, consumables, tools and jigs, as-built documents, and operation and maintenance manuals. | 36 |
| KD 2-8 | Attendance on Rolling Stock Contractors NS-02 and NS-03 for performance proving of Rolling Stock and associated E&M systems for Taking Over by the Employer.<br><br>a) NS-02 trainsets (trainsets 1 to 19)<br><br>b) NS-03 trainsets (trainsets 1 to 7) | <br><br>59<br><br>58 |
| KD 2-9 | Assist the Employer to obtain the certification (permission) from the regulatory authority to commence the commercial operations for the railway.<br><br>a) Between Malolos and CIA Stations<br><br>b) Between Solis and CIA Stations | <br><br>39<br><br>39 |
| KD 2-10 | Achievement: Substantial Completion of installation and testing of workshop equipment and other apparatus in the North Depot. | 39 |
| Completion | Achievement: Completion of the whole of works for Section 2. | 59 |

- Package CP S-03a Building and Engineering Works for approximately 7.9 km of at Grade and Viaduct Railway Track Structure including Elevated Station at Buendia, and at grade stations at EDSA and Senate
- Package CP S-03b Civil Engineering, Tunnel and Building Works for approximately 6.1 km of Railway with 4.7km of Underground Railway and 1.4km of at-Grade Railway, including FTI Station and Tunnelling Works to connect to MMSP Senate station
- Package CP S-03c Building and Engineering Works for Approximately 5.8 kms of Railway Viaduct Structure including Elevated Stations at Bicutan and Sucat
- Package CP S-04 Building and Civil Engineering Works for approximately 8.5 Kms of Viaduct Structure including 2 Station Buildings at Alabang and Muntinlupa
- Package CP S-05 Building and Civil Engineering Works for approximately 12.8 km of Viaduct Structure including 4 Station Buildings at San Pedro, Pacita, Binan and Santa Rosa
- Package CP S-06 Building and Civil Engineering Works for approximately 10.3 kms of Viaduct Structure and Approximately 1.4 Kms of Depot Access Line including 3 Station Buildings at Cabuyao, Banlic and Calamba
- Package CP S-07 Building and Civil Engineering Works for South Depot Buildings including related infrastructure and Trackwork Sub-Ballast.

The Malolos-Clark Railway Project (MCRP) and the North South Railway Project – South Line (Commuter) (NSRP-South):

- Package CP NS-02 Rolling Stock – Commuter Trainsets
- Package CP NS-03 Rolling Stock – Limited Express Trainsets

The Metro Manila Subway Project (MMSP):

- Package CP 101– Three Underground Stations, Tunnels and Depot
- Package CP 106 – Electromechanical Systems and Track Works
- Package CP 107 – Rolling Stock

**Section 1**: Platform Screen Door (PSD) and related works at the stations of the North- South Commuter Railway Project (Malolos-Tutuban) (NSCR).
*(To be coordinated with GC of NSCR, NS Tren)*

| Key Date | Description | Month No. |
|---|---|---|
| KD 1-1 | Achievement: Substantial Completion of installation of Platform Screen Doors and related works to commence Integrated Testing and Commissioning and Test Running using rolling stock in cooperation and coordination with NSCR N-1 project CP 01, CP 02, CP 03 and CP 04 Contractors. | ~~31~~33 |
| KD 1-2 | Achievement: Attendance by NS-01 Contractor on the NSCR N-1 project contractors to enable the NSCR N-1 Contractors to hold the Integrated Testing and Commissioning and Test | ~~34~~36 |

| | | |
|---|---|---|
| | Running using CP 03 Rolling Stock prior to commencement of Trial Running and Performance Testing. | |
| KD 1-3 | Achievement: Completion of Training and delivery of contractual spare parts, consumables, tools and jigs, as-built documents, and operation and maintenance manuals for the Platform Screen Doors | ~~37~~39 |
| Completion of Section 1 | Achievement: Acceptance of the Platform Screen Door system for Section 1 certified as Substantially Complete. | ~~37~~39 |

**Section 2**: the Malolos-Clark Railway Project (MCRP). Approximate length of 50.5 km and 6 stations)

| Key Date | Description | Month No. |
|---|---|---|
| KD 2-1 | Design collaboration with N-1 CP 03 Contractor of North-South Commuter Railway Project (Malolos-Tutuban) (NSCR), for Signaling, Telecommunications and other on-board systems equipment. | 12 |
| KD 2-2 | Achievement: Substantial Completion of Power Supply and Distribution at Depot and all stations to achieve "Power On" ~~for full operation~~ | ~~30~~32 |
| ~~KD 2-3~~ | ~~Achievement: Substantial Completion of Power Supply to all stations to achieve "Power On" for all station.~~ | ~~30~~ |
| KD 2-~~4~~3 | Achievement: Supply of On-board Equipment including all accessories and fittings at the premises of the Rolling Stock Contractors in Japan/or elsewhere as advised.<br><br>Key Dates KD 2-~~4~~3 is sub-divided as shown below; | |
| | KD 2-~~4~~3.1: Supply to CP NS-02 Contractor for 1st trainset ~~& CP NS-03 Contractor for trainsets 1-7.~~ | 27 |
| | KD 2-~~4~~3.2: Supply to CP NS-02 Contractor for trainsets 2 to 5 | 27 |
| | KD 2-~~4~~3.3: Supply to CP NS-02 Contractor for trainsets 6 to 10 | 31 |
| | KD 2-~~4~~3.4: Supply to CP NS-02 Contractor for trainsets 11 to 15 | 36 |
| | KD 2-~~4~~3.5: Supply to CP NS-02 Contractor for trainsets 16 to 19 | 40 |
| | KD 2-3.6: Supply to CP NS-03 Contractor for trainsets 1st trainset | 34 |
| | KD 2-3.7: Supply to CP NS-03 Contractor for trainsets 2 to 7 | 40 |

| | | |
|---|---|---|
| KD 2-~~5~~4 | Achievement: Substantial Completion of ~~all essential workshop equipment,~~ rolling stock equipment, rescue equipment ~~and other equipment, apparatus,~~ etc. required for to commencing Integrated Testing and Commissioning using rolling stock and Test Running at Mainline ~~and Depot~~ for full operation. | ~~31~~33 |
| KD 2-~~6~~5 | Achievement: Substantial Completion of Track Works and E&M Systems works to commence Integrated Testing and Commissioning and Test Running at Mainline using Rolling Stock procured under NSCR for full operation.<br><br>Achievement: Completion of Train operation simulators at the training center in the Depot. | ~~31~~33 |
| KD 2-~~7~~6 | Achievement: Substantial completion of E&M Systems and Track Works (including rail grinding) and all connections between MCRP and NSCR projects, including the Integrated Testing and Commissioning of MCRP and between MCRP and NSCR using rolling stock on the Mainline, at Stations and in the North Depot to allow the Employer with Contractors support to commence Trial Running.<br><br>~~Between Solis and CIA stations using rolling stock supplied by NSCR N-1 project~~<br><br>~~Between Solis and CIA stations using rolling stock supplied by NS-02 contractor.~~ | ~~34~~39<br><br>~~34~~ |
| KD 2-~~8~~7 | Achievement: Completion of first tranche of Training using Contractor supplied facilities and training aids, and delivery of contractual spare parts, consumables, tools and jigs, as-built documents, and operation and maintenance manuals. | ~~31~~36 |
| KD 2-~~9~~8 | Attendance on Rolling Stock Contractors NS-02 and NS-03 for performance proving of Rolling Stock and associated E&M systems for Taking Over by the Employer.<br><br>a) NS-02 trainsets (trainsets 1 to 19)<br><br>b) NS-03 trainsets (trainsets 1 to 7) | ~~In accordance with the agreed schedules~~59<br><br>58 |
| KD 2-~~10~~9 | Assist the Employer to obtain the certification (permission) from the regulatory authority to commence the commercial operations for the railway.<br><br>a) Between Malolos and CIA Stations<br><br>b) Between Solis and CIA Stations | ~~37~~39<br><br>~~37~~39 |
| KD 2-~~11~~10 | Achievement: Substantial Completion of installation and testing of workshop equipment and other apparatus in the North Depot. | ~~37~~39 |

| | | |
|---|---|---|
| Completion | Achievement: Completion of the whole of works for Section 2. | ~~40~~59 |