

Metro Manila Subway Project Phase 1 Package CP106: E&M Systems and Track Works																	
ITEM NO.	REFERENCE CLAUSE/SECTION	ADDENDUM No. 8															
<i>Volume II, Part 2 – Volume II, Part 2 – Employer’s Requirements (ER) c) Technical Requirements (ERT)</i>																	
1.	ERT, 2) SIGNALING SYSTEM, 2.1.1 General	<p>Revised 5th and 7th paragraphs with the following:</p> <p>5th paragraph, <i>“OCC <u>and</u> BOCC shall have five types of Operators namely,”</i></p> <p>7th paragraph, <i>“The contractor shall provide enough facilities within the OCC <u>and</u> BOCC for the operational staff to carry out their daily task without the need of leaving their desk or premises during their shifts.”</i></p>															
2.	ERT, 2) SIGNALING SYSTEM, 2.5.4.1 Signaling System	<p>Revised “Table 2.5.3” with the following requirements:</p> <p style="text-align: center;">Table 2.5.3 – Details of Signaling System</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th style="text-align: center;">No.</th> <th style="text-align: center;">Item</th> <th style="text-align: center;">Content</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">12.</td> <td>OCC (Operation Control Center) <u>& Administration Building</u></td> <td>Shall be installed in Depot area.</td> </tr> <tr> <td style="text-align: center;">13.</td> <td>OCC room</td> <td>Shall be installed in OCC <u>& Administration Building</u> and BOCC Building</td> </tr> <tr> <td style="text-align: center;">14.</td> <td>CER (Central Signal Equipment Room)</td> <td>Shall be installed in OCC <u>and Administration Building</u></td> </tr> <tr> <td style="text-align: center;">17.</td> <td><u>BOCC (Backup Operation Control Center)</u></td> <td><u>Shall be installed in North Avenue Station.</u></td> </tr> </tbody> </table>	No.	Item	Content	12.	OCC (Operation Control Center) <u>& Administration Building</u>	Shall be installed in Depot area.	13.	OCC room	Shall be installed in OCC <u>& Administration Building</u> and BOCC Building	14.	CER (Central Signal Equipment Room)	Shall be installed in OCC <u>and Administration Building</u>	17.	<u>BOCC (Backup Operation Control Center)</u>	<u>Shall be installed in North Avenue Station.</u>
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3.	ERT, 2) SIGNALING SYSTEM, 2.5.8 Automatic Traffic Supervision (ATS) System, 5) Large video display	Revised item 5) a) with the following requirements: The following information shall be displayed on a large video screen and the ATS Terminal in OCC <u>and</u> <u>BOCC</u> :
4.	ERT, 2) SIGNALING SYSTEM, 2.5.8 Automatic Traffic Supervision (ATS) System, 6) Train Diagram System	Revised item 6) with the following requirements: This shall be provided for diagram planning supporting staff in OCC <u>and</u> <u>BOCC</u> . The train diagram system shall use an ATS-DS in offline mode and have the following functions as a bare minimum:
5.	ERT, 2) SIGNALING SYSTEM, 2.5.10 Miscellaneous Signaling system, 13) TID (Train Information Display) Terminals/Server	Revised item 13) with the following requirements: b) Terminals shall be installed at Stations, Depot, OCC <u>and</u> <u>BOCC</u> etc. c) Number of terminals: 22-25 in total, Breakdown is as follows. OCCs & <u>BOCC</u> : 3 sets <u>each</u> , Stations: 16 sets, Depot: 3 sets, Total 22-25 sets. (Set referred to as one unit.) d) TID server gathers train traffic information and distributes it to the terminals. It shall be installed in the CER <u>for</u> <u>OCC</u> and in North Avenue Station <u>SER</u> <u>for</u> <u>BOCC</u> . <u>The number of terminals could vary based on the O&M requirement.</u>
6.	ERT, 2) SIGNALING SYSTEM, 2.5.11 OCC (Operation Control Center),	Revised item 1) with the following requirements: There shall be a central traffic monitoring large display and a terminal used for monitoring and control of train traffic of the entire line. <u>A replication of the OCC shall be installed in North Avenue Station which will act as a BOCC, in the event of total failure of OCC in the Depot.</u>

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	1) Overview	
7.	ERT, 2) SIGNALING SYSTEM, 2.5.11 OCC (Operation Control Center)	Revised item 2) with the following requirements: 2) OCC <u>and BOCC</u> functions and structure
8.	ERT, 2) SIGNALING SYSTEM, 2.5.11 OCC (Operation Control Center)	Revised table title with the following: Table 2.5.5 - OCC <u>and BOCC</u> Operator classification and terminals
9.	ERT, 2) SIGNALING SYSTEM, 2.5.11 OCC (Operation Control Center)	Revised item 4) with the following requirements: 4) <u>OCC and BOCC</u> Equipment layout a) OCC <u>and BOCC</u> Equipment layout is shown in Figure 2.5.3 below. b) Furniture procurement; The following furniture shall be procured by <u>the Contractor as a minimum</u> . <ul style="list-style-type: none"> • Operator desk with 18 chairs; • 1 Meeting table with 8 chairs; and • 7 Book shelves • <u>The Contractor shall carry out Ergonomic, OH&S and Psychological study for the equipment selection which shall be assessed by the Engineer and approved by the Employer.</u>

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10.	ERT, 2) SIGNALLING SYSTEM, 2.5.11 OCC (Operation Control Center)	Revised item 5) and Fig 2.5.3 titles with the following: 5) OCC <u>and BOCC</u> construction classification Figure Error! No text of specified style in document..1 <u>Typical OCC and BOCC Equipment Layout</u>
11.	ERT, 2) SIGNALING SYSTEM, 2.6 PERFORMANCE REQUIREMENTS	Revised Table 2.6.2, item 5.5 with the following: 5-5 Power Supply system for OCC, <u>BOCC</u> and Depot
12.	ERT, 2) SIGNALING SYSTEM, 2.7.3 Ergonomic Technology (specifically for OCC <u>and BOCC</u> systems)	Revised section 2.7.3 with the following requirements: 2.7.3 <u>Ergonomic Technology (specifically for OCC and BOCC systems)</u> Systems with human-machine interface such as console and mimic panel for ATS system shall be designed considering average human height and conditions. Especially the color for indication, switches and buttons layout for operation shall be designed with ergonomic technology. <u>Contractor should consider lighting and sound proofing factors in the OCC & BOCC room as part of the Ergonomic design.</u>

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13.	ERT, 2) SIGNALING SYSTEM, 2.8 INTERFACE REQUIREMENTS	<p>Revised item 3) with the following requirements:</p> <p>3) The optical fiber cables between the Signaling Equipment Room at each station, Depot Signaling Equipment Room, and OCC <u>and</u> BOCC shall be supplied by the Communication system. All signaling cables shall be supplied by the CONTRACTOR.</p>									
14.	ERT, 2) SIGNALING SYSTEM, 2.8 INTERFACE REQUIREMENTS	<p>Revised Table 2.8.1 & Table 2.8.2 with the following requirements:</p> <p style="text-align: center;">Table Error! No text of specified style in document..1 Interface Requirement Specification. (CP101 to CP105, CP108 & CP109)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Requirement section</th> <th style="text-align: center;">Requirement Item</th> <th style="text-align: center;">Document or Drawing</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: middle;">Architecture (Elevated section and Depot)</td> <td>Space, Specification and cable route of CER & CUR in Depot, OCC <u>and</u> BOCC.</td> <td>Floor space of CER, CUR; cable trays, cable entry/exit points in OCC and cable ducts within the depot area.</td> </tr> <tr> <td></td> <td>Space and Specification of Control Room in OCC <u>and</u> BOCC, and cable route</td> <td>Layout of OCC <u>and</u> BOCC control room, cable trays and cable ducts</td> </tr> </tbody> </table>	Requirement section	Requirement Item	Document or Drawing	Architecture (Elevated section and Depot)	Space, Specification and cable route of CER & CUR in Depot, OCC <u>and</u> BOCC.	Floor space of CER, CUR; cable trays, cable entry/exit points in OCC and cable ducts within the depot area.		Space and Specification of Control Room in OCC <u>and</u> BOCC, and cable route	Layout of OCC <u>and</u> BOCC control room, cable trays and cable ducts
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15.	ERT, 2) SIGNALING SYSTEM, APPENDIX A – LIST OF INTERFACE SHEETS	<p>Revised Appendix A listing with the following:</p> <p>Interface Control Sheet (No.5) - Space and Specification of OCC <u>and BOCC</u>.</p>								
16.	ERT, 2) SIGNALING SYSTEM, Appendix A.5 – Space and Specification of OCC <u>& BOCC</u>	<p>Revised Appendix A.5 with the following:</p> <p>Appendix A. 1 - Space and Specification of OCC <u>& BOCC</u></p> <table border="1"> <thead> <tr> <th>Interface Title</th> <th colspan="2">Space and Specification of OCC <u>& BOCC</u></th> </tr> </thead> <tbody> <tr> <td rowspan="2">Interface Between</td> <td>System/Area 1</td> <td>Signaling System</td> </tr> <tr> <td>System/Area 2</td> <td> <ul style="list-style-type: none"> OCC <u>and BOCC</u> Architectural Power Supply system </td> </tr> </tbody> </table>	Interface Title	Space and Specification of OCC <u>& BOCC</u>		Interface Between	System/Area 1	Signaling System	System/Area 2	<ul style="list-style-type: none"> OCC <u>and BOCC</u> Architectural Power Supply system
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			<ul style="list-style-type: none"> • Communication system
	Interface Detail Description	1) Confirm the space and specification of OCC (Operation Control Centre) <u>and BOCC</u> Specification of OCC and <u>BOCC</u> shall be as follows. <ul style="list-style-type: none"> • Environment Air conditioning • Brightness 1500 lux at floor • Floor Free access floor • Weight of floor 500 Kg/m² • Cable connection Under the free access false flooring • Material handing Lift and handcart 2) Space requirement and specification of Power system operator, Communication system operator <ul style="list-style-type: none"> • P-SCADA - Power supply system • CCTV, Communication monitoring - Communication system 3) Signaling system shall convey the amount of heat dissipated by the signaling equipment installed in OCC <u>and BOCC</u> .	
	Action/Data required	<ul style="list-style-type: none"> • OCC <u>and BOCC</u> space, Structure diagram and cross-sectional view of OCC <u>and BOCC</u>. • P-SCADA specification • CCTV and communication monitoring specification. 	

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17.	<p>ERT, 7) PSD SYSTEM,</p> <p>7.3. DESIGN REQUIREMENTS,</p> <p>7.3.1 GENERAL REQUIREMENTS</p>	<p>Add new item (16) with the following requirements:</p> <p>(16) <u>The Electrical Insulation Membrane shall be of high resistivity having minimum thickness of 2.5mm to 3mm and shall have Volume Resistivity Test to exceed 5 x 10¹⁴ ohm-cm electrical resistivity as per ASTM D257:2007 Standard. Testing of the Membrane shall be carried out with Digital Insulation Tester with a testing voltage of 250/500V DC and the passing criteria shall be as follows:</u></p> <p style="margin-left: 40px;">a) <u>On membrane surface – 500,000 ohms in dry/damp condition and</u></p> <p style="margin-left: 40px;">b) <u>On Platform Surface:</u></p> <ul style="list-style-type: none"> • <u>35,000 ohms in dry condition and;</u> • <u>10,000 ohms in a damp condition.</u> <p><u>The Insulation Membrane shall have the properties compliant with the flowing Internal Standards:</u></p> <ol style="list-style-type: none"> 1. <u>DIN VDE 0115 Railway applications – General construction and safety requirements and</u> 2. <u>EN 50122-1 Railway application – Fixed installations – Electrical safety, earthing and return circuit – Part 1: Protective provisions against electric shock.</u> <p><u>The PSD Contractor or his nominated Sub-Contractor shall design and detail an effective platform insulation system for the protection zone to prevent passengers on the platform from possible electric shocks caused by touch voltage when boarding/alighting or touching the train or when touching the Platform Screen Doors (PSDs).</u></p>

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		<p><u>The Contractor shall design and supply the insulation membrane and liaise with Civils' Contractor to develop the installation strategy. Installation will be carried out by Civils' Contractor under the supervision of CP106 Contractor.</u></p>
18.	<p>ERT, 7) PSD SYSTEM,</p> <p>7.3. DESIGN REQUIREMENTS,</p> <p>7.3.2. SAFETY REQUIREMENTS</p>	<p>Add new item (12) with the following requirements:</p> <p><u>(12) The Platform Screen Doors and the adjacent Platform Edge Screen (PES) posts shall be electrically isolated from the remainder of the PES frame above, and the the platform edge rebar. This is to safeguard the passengers on the platform from possible electrical shocks caused by touch and step voltages which can occur during:</u></p> <ul style="list-style-type: none"> • <u>Boarding / Alighting;</u> • <u>Physical contact with the train and;</u> • <u>Physical contact with Platform Screen Doors.</u> <p><u>PSD Contractor shall take into consideration the following factors for their design and build to mitigate electrical shocks namely,</u></p> <ul style="list-style-type: none"> • <u>Platform Touch Voltage Protection using Insulation Membrane and;</u> • <u>Platform Screen Doors Structure Earthing and Bonding Strategy.</u>
19.	<p>ERT, 7) PSD SYSTEM,</p> <p>7.4. CONTROL & MONITORING,</p>	<p>Revise item no. (5) with the following requirements:</p> <p>(5) PSD status monitoring and alarms in station office, OCC <u>and BOCC</u></p> <p>a) The Contractor shall provide a means of monitoring PSD status in the station office at</p>

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	7.4.2. DOOR MONITORING	each station and in the OCC and BOCC. It shall include an audible alarm to draw the attention of the operator when an unexpected event occurs. It shall also have a simple means of alarm acknowledgement to silence an incoming alarm.