

**Metro Manila Subway Project Phase 1
Package CP106: E&M Systems and Track Works**

ITEM NO.	REFERENCE CLAUSE/SECTION	ADDENDUM No. 18																																
<i>Volume I, Part 1 – Bidding Procedures</i>																																		
1.	SECTION V, COST CENTRE A, SCHEDULE A1 - PRELIMINARIES AND GENERAL REQUIREMENTS Sheet 1 of 2	<p>Revise this schedule by add with the following new item (f):</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; text-align: center;">ITEM</th> <th style="width: 60%; text-align: center;">DESCRIPTION</th> <th colspan="2" style="width: 30%; text-align: center;">AMOUNT</th> </tr> </thead> <tbody> <tr> <td>A1.6</td> <td>Obtain Notice of No Objection or Notice of No Objection With Comment(s) from the Engineer for the following:</td> <td></td> <td></td> </tr> <tr> <td>(a)</td> <td>Works Programme</td> <td></td> <td></td> </tr> <tr> <td>(b)</td> <td>Site Quality Management Plan</td> <td></td> <td></td> </tr> <tr> <td>(c)</td> <td>Site Safety Plan</td> <td></td> <td></td> </tr> <tr> <td>(d)</td> <td>Site Environmental Plan</td> <td></td> <td></td> </tr> <tr> <td>(e)</td> <td>Site Environmental Monitoring Plan</td> <td></td> <td></td> </tr> <tr> <td>(f)</td> <td><u>Design for Depot Yard and Depot Street Lighting (Preliminary, Pre-Final, Final Design and As-Built Document)</u></td> <td></td> <td></td> </tr> </tbody> </table>	ITEM	DESCRIPTION	AMOUNT		A1.6	Obtain Notice of No Objection or Notice of No Objection With Comment(s) from the Engineer for the following:			(a)	Works Programme			(b)	Site Quality Management Plan			(c)	Site Safety Plan			(d)	Site Environmental Plan			(e)	Site Environmental Monitoring Plan			(f)	<u>Design for Depot Yard and Depot Street Lighting (Preliminary, Pre-Final, Final Design and As-Built Document)</u>		
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2.	SECTION V, COST CENTRE D, SCHEDULE D3 – MANUFACTURE & DELIVERY	<p>Revise this schedule with the following:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; text-align: center;">ITEM</th> <th style="width: 60%;"></th> <th colspan="2" style="width: 30%; text-align: center;">AMOUNT</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	ITEM		AMOUNT																													
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	OF DEPOT EQUIPMENT		DESCRIPTION	FOREIGN CURRENCY	PHP	
		D3.1	Obtain Notice of No Objection or Notice of No Objection With Comment(s) from the Engineer for Factory Acceptance Tests for Depot Equipment as stipulated under Volume II, Part 2, Section VI, c) Employer Requirement Technical (ERT), item 8. Contractor shall list down all items listed above and provide unit price to each equipment.			
		D3.2	Delivery <u>and Installation</u> of the Depot Equipment to the Site:			
		D3.3	<u>Delivery and Installation of Depot Yard and Depot Road's street Lighting</u>			
		D3.3 D3.4	Completion of the remaining works.			
		D3.4 D3.5	Contractor's other cost:- Contractor shall list down separately any other specific items of work obligations or services which have not been included in other documents or drawings. _____			
		Total of Schedule D3 carried forward to Summary of Cost Centre D:				

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3.	SECTION V, COST CENTRE D, SCHEDULE D4 – TESTING OF DEPOT EQUIPMENT	<p>Revise this schedule with the following:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 10%; text-align: center;">ITEM</th> <th rowspan="2" style="width: 50%; text-align: center;">DESCRIPTION</th> <th colspan="2" style="text-align: center;">AMOUNT</th> </tr> <tr> <th style="width: 20%; text-align: center;">FOREIGN CURRENCY</th> <th style="width: 20%; text-align: center;">PHP</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">D4.1</td> <td>Completion of testing of Depot Equipment as stipulated under Volume II, Part 2, Section VI, c) Employer Requirement Technical (ERT), item 8. Contractor shall list down all items listed above and provide unit price to each equipment.</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">D4.2</td> <td style="color: red;"><u>Testing of Depot Yard and Depot Road's street Lighting</u></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">D4.2 D4.3</td> <td>Completion of the remaining works.</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">D4.3 D4.4</td> <td>Contractor's other cost :- Contractor shall list down separately any other specific items of work obligations or services which have not been included in other documents or drawings.</td> <td></td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;">Total of Schedule D4 carried forward to Summary of Cost Centre D:</td> <td></td> <td></td> </tr> </tbody> </table>			ITEM	DESCRIPTION	AMOUNT		FOREIGN CURRENCY	PHP	D4.1	Completion of testing of Depot Equipment as stipulated under Volume II, Part 2, Section VI, c) Employer Requirement Technical (ERT), item 8. Contractor shall list down all items listed above and provide unit price to each equipment.			D4.2	<u>Testing of Depot Yard and Depot Road's street Lighting</u>			D4.2 D4.3	Completion of the remaining works.			D4.3 D4.4	Contractor's other cost :- Contractor shall list down separately any other specific items of work obligations or services which have not been included in other documents or drawings.			Total of Schedule D4 carried forward to Summary of Cost Centre D:			
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<i>Volume II, Part 2 – Employer’s Requirements (ER)</i>		
<i>b) General Requirements (ERG)</i>		
4.	5.23 YARD & ROAD LIGHTING IN DEPOT	<p>Add new section with the following:</p> <p><u>5.23 DEPOT YARD AND DEPOT ROAD LIGHTING</u></p> <p><u>5.23.1 Scope</u></p> <p><u>The Contractor shall design, supply, install, test and commissioning the Depot yard and Depot road lighting at the East Valenzuela Depot. It shall include street light pole, Yard lighting Poles, wiring, luminaire and all other accessories. The Dept lighting shall be provided throughout the Depot and along the Depot road for operation and maintenance staff activities, Depot road lights circulating vehicles and pedestrian walkway. Where street lighting is not possible, the area covering lighting shall be provided instead.</u></p> <p><u>The foundation for the lighting poles and underground cable ducts is designed and constructed by the Civil Contractor. The CP 106 Contractor shall coordinate with the Civil Contractor for all interfaces. Depot Yard lighting coverage analysis to be conducted by CP 106 to ensure adequate lighting to cover the entire Depot area provided.</u></p> <p><u>Please refer Volume III, Part 2 – Employer’s Requirements (ER), d), Drawing No. DP-C-E-1961 to DP-C-E-1971</u></p>

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		<p><u>concept drawing indicating Pole, Foundation & Underground Cable Ducts of the Road Lighting in Depot as a reference.</u></p> <p><u>5.23.2 Applicable Standards</u></p> <p><u>The Depot yard and road lighting with all other components shall be in accordance with the applicable specifications as follows:</u></p> <ul style="list-style-type: none"> a) <u>ASTMA123: Specification for Black and Hot- Dipped Zinc Coated (galvanized) Longitudinally Welded Steel Pipes</u> b) <u>IEC EN 60598-1: Luminaires - General requirements and tests</u> c) <u>IEC EN 60598-2-3: Particular requirements - Luminaires for Road & Street Lighting</u> d) <u>IEC EN 62031: LED modules for general lighting – Safety specifications</u> e) <u>EN 55015: Limits & methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment</u> f) <u>EN 61547: Equipment for general lighting purposes – EMC immunity requirements</u> g) <u>EN 61000-3-2: Limits for Harmonic emissions (<16A per phase)</u> h) <u>EN 61000-3-3: Limitation of voltage fluctuation and flicker in Low-voltage supply systems for</u>

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		<p><u>equipment with rated current 16A</u></p> <p>i) <u>EN 61347-1: General and Safety requirements for the driver</u></p> <p>j) <u>EN 61347-2-13: Particular requirements for DC or AC supplied electronic driver for LED modules</u></p> <p>k) <u>EN 62471: Photo biological safety of Lamps and lamp systems</u></p> <p>l) <u>LM-79-08: Approved Method: Electrical and Photometric Testing of Solid-State Lighting Devices Describes the procedures for performing standardized measurements of the power, light output, and color characteristics of SSL products.</u></p> <p>m) <u>EN 13032 – 1/2/4 - Light and lighting - Measurement and presentation of photometric data of lamps and luminaires</u></p> <p>a) <u>LM-80-08: Approved Method: Measuring Lumen Depreciation of LED Light Sources Specifies conditions for long-term testing of LED packages, arrays, and modules</u></p> <p>b) <u>IEC 62384: DC or AC supplied electronic control gear for LED modules</u></p> <p>c) <u>BS5489-1:2013: Code of practice for the design of road lighting</u></p> <p>d) <u>PNS 26:1992: Specification for Steel - Black and hot-dipped zinc coated (galvanized) longitudinally welded steel pipes</u></p> <p>e) <u>EN 12464-2:2014, Lighting Design Criteria</u></p> <p><u>5.23.3 Lighting Levels</u></p> <p><u>Lighting illuminance level for safety and comfort for staff shall be provided for uniform patterns of lighting in Depot</u></p>

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		<p><u>area. Consideration shall be given to adequate and evenly distributed lighting with trains in the area of depot. The Contractor shall propose and define lighting level of road lighting in accordance with international standard practice used in Philippines.</u></p> <p><u>Use of high efficacy light sources and of high efficiency luminaires with suitable luminous intensity distributions installed in appropriate positions to provide adequate Depot Yard utilances/utilisation factors (not too much light onto the tracks). The disability glare experienced by a train driver when approaching an open or covered station shall be evaluated.</u></p> <p><u>5.23.4 Roadway Lighting</u></p> <p><u>The Contractor shall provide installation of light luminaires, cable runs and control panels. Parameters for Depot road lighting shall include the following.</u></p> <ul style="list-style-type: none"> a) <u>Energy efficiency. The efficiency of the complete lighting installation shall be taken into account, including the effectiveness of the light source, control gear and luminaire optic combination in providing the lighting on the road, with the desired degree of colour rendering.</u> b) <u>Colour rendering. The colour rendering attributes of the light source shall be appropriate to the task particularly where there is a high level of pedestrian activity as well as the where the appearance of areas that is particularly significant.</u> c) <u>Colour appearance. Light sources shall be warm or intermediate colour appearance.</u> <p><u>5.23.5 Luminaire Requirements</u></p> <p><u>Luminaires shall be defined as a complete lighting apparatus consisting of the housing and all integral parts</u></p>

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		<p><u>necessary for its mounting, optical assembly, control gears and wiring assembly.</u></p> <p><u>All luminaires shall meet applicable design and testing requirements of the latest edition of the applicable standards. If other equivalent internationally accepted standards are used, these standards and other supplementary standards, if applicable, shall be explicitly stated in the design proposal.</u></p> <p><u>The luminaires shall be designed to operate at+/- 230 Volts AC 60 hertz, single-phase.</u></p> <p><u>5.23.6 Design and Construction Features</u></p> <p>The housing of the luminaire shall be made of heat-treated, high pressure die-cast aluminum or aluminum alloy with <1% copper content and shall be painted with an electro-coated gray paint finish.</p> <p>Hardware such as hinges, latches, springs, nuts, screws, washers, pins, etc. shall be made of materials compatible to the housing material and shall be inherently corrosion proof or have been protected by finishes approved for corrosion-resistance. However, those exposed to the elements shall be made of high-grade stainless steel (SUS304 or better).</p> <p>The luminaire shall be used for horizontal mounting on a mast arm. The mounting shall be designed using a clamping plate.</p> <p>The luminaire housing shall bear a nameplate or other type of indelible marking that shall identify it as to type, rating, manufacturer, date manufactured, catalog number, etc. The marking shall comply with the requirements of IEC 60598-2-3.</p> <p>A wattage marking in accordance with the latest edition of the PNS shall be provided on the underside of the housing</p>

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		<p>using black-colored numerals 50.8 mm minimum height with yellow gold-colored square background 76.2 mm minimum dimension on the side. The marking shall be visible from an observer on the ground and shall be designed to endure the life of the luminaire.</p> <p>The luminaire housing shall have an option to provide for a receptacle for a three-prong, twist-lock type photoelectric control (NEMA Type) or if not available, a separate box with the receptacle outside the luminaire is to be provided.</p> <p>The luminaire surfaces, joints, and rim shall be smooth and free of burrs and sharp edges that could cause injury to the workman.</p> <p><u>5.23.7 Optical Assembly for LED Roadway Luminaire</u></p> <p><u>The refractor shall be prismatic or clear type made from heat-tempered glass. It shall be held in place in such a manner as to allow for its expansion and contraction.</u></p> <p><u>The refractor-housing and socket-reflector junctions or optical chamber shall be adequately sealed against entry of moisture, rainwater, dust or insects, with provisions for thermal breathing and air filtering. It shall be rated for IP 66 or better. No special tools shall be required for the insertion and withdrawal of the lamp and control gear. A lamp fully inserted shall be rigidly held with its axis substantially coincident with that of the pole under normal conditions of wind, vibration and mechanical shock.</u></p> <p><u>The lighting design and calculation method shall be in accordance with the following documents:</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>Item</u></th> <th style="text-align: center;"><u>Description</u></th> <th style="text-align: center;"><u>Reference document</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td><u>Lighting Design</u></td> <td><u>CIE 115: 2010 2nd Edition</u></td> </tr> </tbody> </table>	<u>Item</u>	<u>Description</u>	<u>Reference document</u>	1	<u>Lighting Design</u>	<u>CIE 115: 2010 2nd Edition</u>
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		<p><u>All materials (equipment and devices) to be installed by the contractor shall be new and shall bear the Certification Mark (Philippine Standard Quality Mark or Import Commodity Clearance) issued by the Department of Trade and Industry-Bureau of Product Standards (DTI-BPS) for specific purposes.</u></p> <p><u>5.23.11 Pole Material and Finish</u></p> <p>a) <u>All lighting poles, made of steel, shall be hot-dip galvanized based on ASTM A 123/A 123M Standard Specification for Zinc (hot-dip galvanized) Coating on Iron and Steel Products.</u></p> <p>b) <u>The zinc coating shall be relatively smooth and reasonably uniform in thickness. The parts shall be free from uncoated areas, blisters, flux deposits, block spots, dross inclusions, and other defects not consistent with good galvanizing practice.</u></p> <p>c) <u>Pole surface shall be matte or dull finished to prevent glare.</u></p> <p><u>5.23.12 Foundations of Pole</u></p> <p>The foundations of pole shall be designed in accordance with National Structural Code of the Philippines (NSCP) to adequately support the luminaire and pole structure as well as resist wind blows and vibrations inherent in the area where the poles are to be located. The foundation shall be provided by the Civil Contractor.</p>
<p><i>Volume III, Part 2 – Employer’s Requirements (ER)</i></p> <p><i>d) Drawings</i></p>		
5.	Depot Yard & Road Lighting	New drawing added with following:

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ITEM NO.	REFERENCE CLAUSE/SECTION	ADDENDUM No. 18
	Layout (NEW DRAWING)	<ul style="list-style-type: none"> • <u>FOUNDATION & UNDERGROUND CABLE DUCTS FOR ROAD LIGHTING KEY PLAN, DWG NO. DP-C-E-1961 to DP-C-E-1967;</u> • <u>SITE ROAD LIGHTING FOUNDATION COORDINATES & DETAILS, DWG NO. DP-C-E-1968;</u> • <u>SITE ROAD LIGHTING MANHOLE TYPE, DWG NO. DP-C-E-1969;</u> • <u>SITE ROAD LIGHTING MANHOLE DETAILS, DWG NO. DP-C-E-1970 to DP-C-E-1971.</u>