

**ADDENDUM NO. 1: DESIGN VERIFICATION, DETAILED ENGINEERING, MANUFACTURE, SUPPLY, DELIVERY AND STORAGE AT SITE, LAYING, INSTALLATION, TESTING AND COMMISSIONING (INCLUDING INTEGRATED TESTING & COMMISSIONING), TRAINING OF PERSONNEL, DEMONSTRATION OF PERFORMANCE OF SYSTEM / EQUIPMENT & ANNUAL MAINTENANCE CONTRACT OF ENVIRONMENT CONTROL SYSTEM (ECS) & INTEGRATED STATION MAINTENANCE SYSTEM (ISMS) OF KOLKATA METRO EAST-WEST LINE PROJECT- PHASE I**

Date: 14<sup>th</sup> July, 2017

SI No.	Points for Consideration	Original Clause	Addendum Clause
1.	Vol 1, Instruction to Tenderers and Annexures, Forming FORM OF TENDER – APPENDIX 6, Page ITT Annexure 2 / 8	9. Design Parameters and Data  Tenderer is required to confirm the proposed ECS and ISMS Design will comply with specific design parameters of the KMRCL Metro System and also submit specific design data that is in absolute compliance with this Technical Specification.	9. Design Parameters and Data  Tenderer is required to confirm the proposed ECS and ISMS will comply with Technical Specification.
2.	Vol 3 (Part 1), Technical, MCC 33.2, Construction, page 258	All panels shall be constructed of galvanized sheet steel of not less than 1.6 mm thick, built up on substantial framing with all necessary stiffeners, supports and return edges. Removable lifting lugs shall be provided on top of the cubicles.	All panels shall be constructed of nominal 2 mm thick CRCA steel sheet built up on substantial framing with all necessary stiffeners, supports and return edges. Removable lifting lugs shall be provided on top of the cubicles.
3.	Vol 3 (Part 1), Technical, MCC 33.2, 3. Painting, page 259	a) All paint finishes shall be of high quality baked melamine alkyd resin. A primer, undercoat and two layers of top coating shall be applied, each built-up and baked separately.	a) All sheet steel work undergo a process of degreasing, pickling in acid, cold rinsing, phosphating, passivating (seven tank processing) and then painted with electrostatic paint (Powder coating). The shade of colour of panel inside/outside shall be as indicated in Specification & approved by Engineer.
4.	Vol 3 (Part 1), Technical, MCC 7. Moulded Case Circuit Breakers, page 263 & 264	(g) Utilization category: B  (n) MCCBs shall have over-current tripping mechanism of the thermal magnetic, temperature compensated type for ambient temperature of 25°C to 50°C and calibrated at 45°C to give time delay overload circuit protection and instantaneous short-circuit interruption. The operating characteristic shall be such that the time delay on overload tripping is inversely proportional to the overcurrent up to a threshold value of approximately seven times the rated current at 45°C and the tripping setting shall be adjustable.	(g) Utilization category: A  (n) MCCBs of rating of 160A and below shall have over-current tripping mechanism of the thermal magnetic (without Communication Facility, notwithstanding description in BOQ), temperature compensated type for ambient temperature of 25°C to 50°C and calibrated at 40°C to give time delay overload circuit protection and instantaneous short-circuit interruption. The operating characteristic shall be such that the time delay on overload tripping is inversely proportional to the overcurrent up to a threshold value of approximately seven times the rated current at 40°C and the tripping setting shall be adjustable. <b>Protection for MCCBs of rating above 160A shall be Microprocessor based with communication capability.</b>
5.	Vol 1, Instruction to Tenderers and Annexures, A 1.6	The Contractor shall be responsible for carrying out developing key design information keeping in view the projected traffic volume (for East-West Corridor). The Contractor shall also carry out Integrated Testing and Commissioning of Environment Control System and Integrated Station Management System in co-ordination with Designated Contractors, under the supervision of the Engineer. He shall also carry out all statutory tests and trials necessary for obtaining sanction of the Competent Authority for opening the Environment Control System for public carriage of passengers and provide assistance and information as required by the appropriate statutory authorities in India.	The Contractor shall also carry out Integrated Testing and Commissioning of Environment Control System and Integrated Station Management System in co-ordination with Designated Contractors, under the supervision of the Engineer. He shall also carry out all statutory tests and trials necessary for obtaining sanction of the Competent Authority for opening the Environment Control System for public carriage of passengers and provide assistance and information as required by the appropriate statutory authorities in India.
6.	Vol 1, PREPARATION OF TENDERS, C 18.1	The Tenderer shall submit with his Tender a Tender Security for the sum mentioned in Appendix 1 to the Form of Tender in the form of an irrevocable bank guarantee issued by a Scheduled Commercial Bank in India or from a Scheduled Foreign Bank as defined in Section 2(e) of RBI Act 1934 read with 2 <sup>nd</sup> Schedule in the form given in Annexure 3 to the Instruction to Tenderers. In the case where the Tenderer is a JV or consortium, the Bank Guarantee for Tender	The Tenderer shall submit with his Tender a Tender Security for the sum mentioned in Appendix 1 to the Form of Tender in the form of an irrevocable bank guarantee issued by a Scheduled Commercial Bank in India or from a Scheduled Foreign Bank as defined in Section 2(e) of RBI Act 1934 read with 2 <sup>nd</sup> Schedule in the form given in Annexure 3 to the Instruction to Tenderers. Any

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		Security shall be from JV or Consortium and not from individual members except that a local member of the JV or Consortium is permitted to furnish the tender Security with an assurance from the other JV or Consortium members to back such a Security. The Tender Security shall be submitted in a sealed envelope clearly marked on top "Tender Security for Contract –UG-ECS." The Tender Security shall remain valid for a period of 28 days beyond the validity period for the Tender and including extension periods.	member of the JV or Consortium is permitted to furnish the tender Security with an assurance from the other JV or Consortium members to back such a Security. The Tender Security shall be submitted in a sealed envelope clearly marked on top "Tender Security for Contract –UG/ECS." The Tender Security shall remain valid for a period of 28 days beyond the validity period for the Tender and including extension periods.																																																																													
7.	Vol 2, SCC 57. Additional Clause: BOCW (Building and Other Construction Works)		Bidders need to judge the applicability of BOCW for the work. Any liabilities on account of BOCW at any stage shall be on part of bidder and the quoted price shall be inclusive of BOCW charges. If same is not applicable, the bidder needs to submit required undertaking/certificates. The Employer shall make the deduction accordingly and deposit the amount to the concerned authorities.																																																																													
8.	Vol 1, Appendix 1A, Page FOT Appendix 1A/1	<p style="text-align: center;"><b>CONTRACT UG-ECS FORM OF TENDER APPENDIX 1A CONTRACT KEY DATES AND ACCESS DATES Section 1 - Key Dates</b></p> <table border="1"> <thead> <tr> <th>Key Date</th> <th>Description</th> <th>Phase</th> <th>Date</th> <th>No. of Weeks from LOA</th> </tr> </thead> <tbody> <tr> <td>KD1</td> <td>Provide ECS/ISMS Input to Interface Contractors</td> <td>1</td> <td>-</td> <td>04</td> </tr> <tr> <td>KD2A</td> <td>ECS General Requirements and Preliminary Design</td> <td>1</td> <td>-</td> <td>08</td> </tr> <tr> <td>KD2B</td> <td>ISMS General Requirements and Preliminary Design</td> <td>1</td> <td>-</td> <td>08</td> </tr> <tr> <td>KD3A</td> <td>ECS Final Design</td> <td rowspan="2">1</td> <td>-</td> <td>14</td> </tr> <tr> <td>KD3B</td> <td>ISMS Final Design</td> <td>14</td> </tr> <tr> <td>KD4A</td> <td>Complete Delivery of all ECS/ISMS Equipment (except Sealdah Station)</td> <td rowspan="2">1</td> <td>-</td> <td>34</td> </tr> <tr> <td>KD4B</td> <td>Complete Delivery of all ECS/ISMS Equipment of Sealdah Station</td> <td>50</td> </tr> <tr> <td>KD5A</td> <td>Complete ECS/ISMS Installation, Testing &amp; Commissioning (except Sealdah Station)</td> <td rowspan="2">1</td> <td>-</td> <td>62</td> </tr> <tr> <td>KD5B</td> <td>Complete ECS/ISMS Installation, Testing &amp;</td> <td>105</td> </tr> </tbody> </table>	Key Date	Description	Phase	Date	No. of Weeks from LOA	KD1	Provide ECS/ISMS Input to Interface Contractors	1	-	04	KD2A	ECS General Requirements and Preliminary Design	1	-	08	KD2B	ISMS General Requirements and Preliminary Design	1	-	08	KD3A	ECS Final Design	1	-	14	KD3B	ISMS Final Design	14	KD4A	Complete Delivery of all ECS/ISMS Equipment (except Sealdah Station)	1	-	34	KD4B	Complete Delivery of all ECS/ISMS Equipment of Sealdah Station	50	KD5A	Complete ECS/ISMS Installation, Testing & Commissioning (except Sealdah Station)	1	-	62	KD5B	Complete ECS/ISMS Installation, Testing &	105	<p style="text-align: center;"><b>CONTRACT UG-ECS FORM OF TENDER APPENDIX 1A CONTRACT KEY DATES AND ACCESS DATES Section 1 - Key Dates</b></p> <table border="1"> <thead> <tr> <th>Key Date</th> <th>Description</th> <th>Phase</th> <th>Date</th> <th>No. of Weeks from LOA</th> </tr> </thead> <tbody> <tr> <td>KD1</td> <td>Provide ECS/ISMS Input to Interface Contractors</td> <td>1</td> <td>-</td> <td>04</td> </tr> <tr> <td>KD2A</td> <td>ECS General Requirements and Preliminary Design Verification</td> <td>1</td> <td>-</td> <td>08</td> </tr> <tr> <td>KD2B</td> <td>ISMS General Requirements and Preliminary Design</td> <td>1</td> <td>-</td> <td>08</td> </tr> <tr> <td>KD3A</td> <td>ECS Final Design Verification, Detail Engineering, Submission of Technical proposals for major equipment, submission of drawings etc.</td> <td rowspan="2">1</td> <td>-</td> <td>14</td> </tr> <tr> <td>KD3B</td> <td>ISMS Final Design, Detail Engineering, Submission of Technical proposals for major equipment, submission of drawings etc.</td> <td>14</td> </tr> <tr> <td>KD4A</td> <td>Complete Delivery of all ECS/ISMS Equipment (except Sealdah Station)</td> <td>1</td> <td>-</td> <td>30</td> </tr> </tbody> </table>	Key Date	Description	Phase	Date	No. of Weeks from LOA	KD1	Provide ECS/ISMS Input to Interface Contractors	1	-	04	KD2A	ECS General Requirements and Preliminary Design Verification	1	-	08	KD2B	ISMS General Requirements and Preliminary Design	1	-	08	KD3A	ECS Final Design Verification, Detail Engineering, Submission of Technical proposals for major equipment, submission of drawings etc.	1	-	14	KD3B	ISMS Final Design, Detail Engineering, Submission of Technical proposals for major equipment, submission of drawings etc.	14	KD4A	Complete Delivery of all ECS/ISMS Equipment (except Sealdah Station)	1	-	30
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SI No.	Points for Consideration	Original Clause					Addendum Clause							
			Commissioning of Sealdah Station											
		KD5C	Complete Elevated Stations ISMS Installation, Testing & Commissioning			-								50
		KD6A	ECS Integrated System Testing, Service Trial and Handover (except Sealdah Station)	1		-								50
		KD6B	ECS Integrated System Testing, Service Trial and Handover of Sealdah Station	1		-								105
		KD7A	ISMS Integrated System Testing, Service Trial and Handover (except Sealdah Station)	1		-								32
		KD7B	ISMS Integrated System Testing, Service Trial and Handover of Sealdah Station	1		-								57
														125
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														36
9.	Vol 6, Appendix A, A3.1-19.1 & Vol 6, Appendix B, B3.1-19.1	a.	25 mm thick fiber glass /Rock wool as per data sheet		400 Sq.mm.					a.	25 mm thick fiber glass /Rock wool as per data sheet		4000 Sq.mm.	
10.	Vol 6, Appendix A, A1.1-2.1.1 & Vol 6, Appendix B,	Primary Horizontal split case centrifugal pump set with bronze impeller, TEFC IP-55 motor (IE2) with class 'F' insulation and EN-8 shaft complete with base plate, inertia base foundation and all necessary civil works, complete as per specification and data sheet as per the site requirement. The system shall be complete in all respects and					Primary Horizontal split case centrifugal pump set with bronze impeller, TEFC IP-55 motor (IE2) with class 'F' insulation and EN-8 shaft complete with base plate, inertia base foundation and all necessary civil works, complete as per specification and data sheet as per the site requirement. The system shall be complete in all respects and							

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SI No.	Points for Consideration	Original Clause	Addendum Clause
	B1.1-2.1.1	suitable for following ratings. a) Capacity : 23.71 LPS, Operating Head 120 Kpa	suitable for following ratings. Capacity : 23.71 LPS, Operating Head 90 Kpa
11.	Vol 6, Appendix A, A1.1-2.2 & Vol 6, Appendix B, B1.1-2.2	Condenser Water Pumps Horizontal split casing condenser water circulating centrifugal pump sets with bronze impeller, for condenser water recirculation complete with TEFC IP-55 motor (IE2) with class 'F' insulation and EN-8 shaft (suitable for 415 V + 10%, 50Hz + 3% 3 phase AC) with base plate, inertia base foundation etc. including foundation and all necessary civil work confirming to technical specification and as per following parameters, complete with motor, base plate etc. as per specifications and data sheet. a) Capacity : 32.89 LPS , Operating Head 170 Kpa	Condenser Water Pumps Horizontal split casing condenser water circulating centrifugal pump sets with bronze impeller, for condenser water recirculation complete with TEFC IP-55 motor (IE2) with class 'F' insulation and EN-8 shaft (suitable for 415 V + 10%, 50Hz + 3% 3 phase AC) with base plate, inertia base foundation etc. including foundation and all necessary civil work confirming to technical specification and as per following parameters, complete with motor, base plate etc. as per specifications and data sheet. Capacity : 32.89 LPS , Operating Head 180 Kpa
12.	Vol 6, Appendix A, A1.1-6.1 & Vol 6, Appendix B, B1.1-6.1	Over Ground Piping Insulation Thickness (mm) RM d) 125MM 50 20	Over Ground Piping Insulation Thickness (mm) RM d) 125mm 50 40
13.	Vol 6, Appendix A, A1.1-7.1 & Vol 6, Appendix B, B1.1-7.1	Butterfly valves Insulation Thickness (mm) Nos. b) 100MM 50 6 c) 80MM 50 2	Butterfly valves Insulation Thickness (mm) Nos. b) 125MM 50 2 c) 100MM 50 6
14.	Vol 6, Appendix A, A1.1-7.4 & Vol 6, Appendix B, B1.1-7.4	Y-Strainer Insulation Thickness (mm) Nos. b) 100MM 50 3 c) 80MM 50 1	Y-Strainer Insulation Thickness (mm) Nos. b) 125MM 50 1 c) 100MM 50 3
15.	Vol 6, Appendix A, A1.1-7.7.1 & Vol 6, Appendix B, B1.1-7.7.1	AHU Control Valves Insulation Thickness (mm) Nos. a) 80MM 50 1 b) 100MM 50 3	AHU Control Valves Insulation Thickness (mm) Nos. a) 100MM 50 2 b) 125MM 50 2
16.	Vol 6, Appendix A, A1.1-17.1 & Vol 6, Appendix B, B1.1-17.1	Water Treatment system consisting of dosing tank pumps, chemical formulation to (a) keep water circulating system clean and free from corrosion and b) to control organic and algae growth in the circulating water (board spectrum biocide), piping from dosing pumps to return header, necessary valves and accessories, pump mounting arrangement on tanks, tank covers, and piping insulation wherever necessary. the system shall consist of, but not limited to, the following:-  Dosing tank of 100 liters capacity, Electronic Positive Displacement Dosing pump made from polypropylene capable of withstanding a back-pressure of 3.5 Kg/Sq.cm complete with 1 phase motor, low-level switch and anti-syphon valve assembly, UPVC piping from dosing pumps to header, Valve and accessories as per specification. - Lot 1	Water Treatment system consisting of dosing tank pumps, chemical formulation to (a) keep water circulating system clean and free from corrosion and b) to control organic and algae growth in the circulating water (board spectrum biocide), piping from dosing pumps to condenser water return header, necessary valves and accessories, pump mounting arrangement on tanks, tank covers, and piping insulation wherever necessary. the system shall consist of, but not limited to, the following:-  Dosing tank of 100 liters capacity – 4 Nos.  Electronic Positive Displacement Dosing pump made from polypropylene capable of withstanding a back-pressure of 3.5 Kg/Sq.cm complete with 1 phase motor, low-level switch and anti-syphon valve assembly, - 4 Nos.  UPVC piping from dosing pumps to header – Lot 1 Valve and accessories as per specification. – Lot 1
17.	Vol 6, Appendix A, A1.1-17.3 & Vol 6, Appendix B, B1.1-17.3	Non-chemical water treatment system for Condenser water system as per the specification. – Lot 1	Deleted

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SI No.	Points for Consideration	Original Clause	Addendum Clause
18.	Vol 6, Appendix A, A1.1-18.2.1 & Vol 6, Appendix B, B1.1-18.2.1	Sheet Metal Duct painted with fire-resistant paint and 100 mm thick, 120 kg density Rock wool insulation (Price shall include cost of paint and Rock wool insulation) a) 1.20 mm thick (18 Gauge) - 3600 Sqm.	Sheet Metal Duct painted with fire-resistant paint and 100 mm thick, 120 kg density Rock wool insulation (Price shall include cost of paint and Rock wool insulation) a) 0.83 mm thick (22 Gauge) - 200 Sqm. b) 1.00 mm thick (20 Gauge) - 200 Sqm c) 1.20 mm thick (18 Gauge) - 3600 Sqm
19.	Vol 6, Appendix A, A1.1-41 & Vol 6, Appendix B, B1.1-41	PANEL INTERNAL CO <sub>2</sub> FLOODING SYSTEM All the items not specifically mentioned here but necessary to make the system complete and suitable for desired application as per M & W Specifications and Drawings will be deemed to be included in the quoted prices. Providing, Installation, Testing and Commissioning of internal CO <sub>2</sub> / clean agent Panel Flooding System complete in following Panels. a) MCC-PBG-01 b) MCC-PBG-02 c) MCC-PBG-05 d) MCC-PBG-06 - 1 Lot	PANEL INTERNAL CO <sub>2</sub> FLOODING SYSTEM All the items not specifically mentioned here but necessary to make the system complete and suitable for desired application as per M & W Specifications and Drawings will be deemed to be included in the quoted prices. Providing, Installation, Testing and Commissioning of internal CO <sub>2</sub> / clean agent Panel Flooding System complete in following Panels. a) MCC-PBG-01 b) MCC-PBG-01A c) MCC-PBG-02 d) MCC-PBG-05 e) MCC-PBG-06 - 1 Lot
20.	Vol 6, Appendix A, A1.1-31 & Vol 6, Appendix B, B1.1-31	AHU control panel Cubicle type, dead front, sheet steel, wall mounted control panels with microprocessor based Soft Starter complete with below details including anchoring into the wall with changeover panel. All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through ISMS. All starters shall be provided with potential free Contact for Connections to Integrated Station Management System. All internal wiring and copper earthing of air handling unit motors from the panel shall be included. The panel shall include the following components and accessories. The panel shall include the following components and accessories. 1) MCCB as per the ratings given below suitable for motor duty 2) Terminal block for power distribution. 3) Phase indicating lights and indicating light for ON status. 4) Digital voltmeter and digital ammeter with selector switches. 5) Wiring for microswitch for stopping the fan when fire damper closes. 6) For on/off/remote and local operation, 3 pole single throw switch shall be provided in each AHU panel to facilitate override of the automatic operation. 7) All starters shall be provided with suitable potential free contract for connections to the Integrated Station Management System. 8) 3 Nos of Single Pole MCB's Shall be provided at the incoming section of the starter panel for PLC Panel, fire damper actuator & as a spare. 9) 220 / 24 V Transformer	AHU control panel Cubicle type, dead front, sheet steel, wall mounted control panels with microprocessor based Soft Starter complete with below details including anchoring into the wall with changeover panel. All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through ISMS. All starters shall be provided with potential free Contact for Connections to Integrated Station Management System. All internal wiring and copper earthing of air handling unit motors from the panel shall be included. The panel shall include the following components and accessories. The panel shall include the following components and accessories. 1) MCCB as per the ratings given below suitable for motor duty 2) Terminal block for power distribution. 3) Phase indicating lights and indicating light for ON status. 4) Digital voltmeter and digital ammeter with selector switches. 5) Wiring for microswitch for stopping the fan when fire damper closes. 6) For on/off/remote and local operation, 3 pole single throw switch shall be provided in each AHU panel to facilitate override of the automatic operation. 7) All starters shall be provided with suitable potential free contract for connections to the Integrated Station Management System. 8) 3 Nos of Single Pole MCB's Shall be provided at the incoming section of the starter panel for PLC Panel, fire damper actuator & as a spare. 9) 220 / 24 V Transformer 10) One Manual Changeover device for duty and standby motor as per their rating
21.	Vol 6, Appendix A, A2.1-1.2.1 & Vol 6, Appendix B, B2.1-1.2.1	Sheet Metal Duct painted with fire-resistant paint and 100 mm thick, 120 kg density Rock wool insulation (Price shall include cost of paint and Rock wool insulation) a) 1.20 mm thick (18 Gauge) - 500 Sqm.	Sheet Metal Duct painted with fire-resistant paint and 100 mm thick, 120 kg density Rock wool insulation (Price shall include cost of paint and Rock wool insulation) a) 0.83 mm thick (22 Gauge) - 50 Sqm. b) 1.00 mm thick (20 Gauge) - 50 Sqm c) 1.20 mm thick (18 Gauge) - 500 Sqm
22.	Vol 6, Appendix A, A3.1-6.1	Over Ground Piping d) 100MM Insulation Thickness (mm) 50 RM 40	Over Ground Piping d) 125MM Insulation Thickness (mm) 50 RM 40



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SI No.	Points for Consideration	Original Clause	Addendum Clause
		<p>included. The panel shall include the following components and accessories. The panel shall include the following components and accessories.</p> <ol style="list-style-type: none"> <li>1) MCCB as per the ratings given below suitable for motor duty</li> <li>2) Terminal block for power distribution.</li> <li>3) Phase indicating lights and indicating light for ON status.</li> <li>4) Digital voltmeter and digital ammeter with selector switches.</li> <li>5) Wiring for microswitch for stopping the fan when fire damper closes.</li> <li>6) For on/off/remote and local operation, 3 pole single throw switch shall be provided in each AHU panel to facilitate override of the automatic operation.</li> <li>7) All starters shall be provided with suitable potential free contact for connections to the Integrated Station Management System.</li> <li>8) 3 Nos of Single Pole MCB's Shall be provided at the incoming section of the starter panel for PLC Panel, fire damper actuator &amp; as a spare.</li> <li>9) 220 / 24 V Transformer</li> </ol>	<p>included. The panel shall include the following components and accessories. The panel shall include the following components and accessories.</p> <ol style="list-style-type: none"> <li>1) MCCB as per the ratings given below suitable for motor duty</li> <li>2) Terminal block for power distribution.</li> <li>3) Phase indicating lights and indicating light for ON status.</li> <li>4) Digital voltmeter and digital ammeter with selector switches.</li> <li>5) Wiring for microswitch for stopping the fan when fire damper closes.</li> <li>6) For on/off/remote and local operation, 3 pole single throw switch shall be provided in each AHU panel to facilitate override of the automatic operation.</li> <li>7) All starters shall be provided with suitable potential free contact for connections to the Integrated Station Management System.</li> <li>8) 3 Nos of Single Pole MCB's Shall be provided at the incoming section of the starter panel for PLC Panel, fire damper actuator &amp; as a spare.</li> <li>9) 220 / 24 V Transformer</li> <li>10) One Manual Changeover device for duty and standby motor as per their rating</li> </ol>
30.	Vol 6, Appendix A, A1.2-8.1, & Vol 6, Appendix B, B1.2-8.1,	<p>The redundant PLC features shall be, modular complete with Power supply, base plate incorporating terminals for field wiring and shall include: An industrial computer that has been hardened to operate in the harsh environment; Familiar relay ladder diagram programming; I/O control through user logic programming' Instruction set designed specifically for the ISMS industrial control and process control environment; Previously used on Metro Projects; Communications with cell controllers, operator interface terminals, dumb terminals, personal computers, and similar devices. The contractor shall cross reference the PLC Panel Ref No. to Housing Type as above. A by-pass switch/s shall be provided to completely by-pass the PLC in the event of a total failure of the PLC and associates equipment to enable the normal operation of the equipment controlled by the PLC. Panels shall be fitted with a suitable pocket to contain circuit diagrams and other relevant Definitive Design Drawings. An "as installed" set shall be having.</p> <p>Redundant CPU Module with on board Ethernet RS 485 port, Integrated Remote I/O Bus Manager, 96 word Base memory, 12,000 I/O capacity, 64 process channels :6 Sets</p> <p>CPU Module with Remote I/O Bus manager</p> <p>256 KB memory Extension Capsule</p> <p>AI Module</p> <p>DI Module</p> <p>DO Module</p> <p>AO Module</p> <p>IO Rack Power Supply Module , 230 V , 50 W</p> <p>6 slot CPU rack</p> <p>Redundancy Module</p> <p>Back Plane Rack for PC modules &amp; IO</p> <p>Expansion Rack for remote IO modules</p> <p>FIPIO trunk cable</p> <p>Ethernet Module TCP/IP 10/100 MBPS CP 343-1</p> <p>FIPWAY adopter for remote IO rack</p> <p>Remote FIPWAY Agent Module</p> <p>Tap for each Node on the remote IO module</p> <p>- 1 Lot</p>	<p>The redundant PLC including interface plc panel features shall be, modular complete with Power supply, base plate incorporating terminals for field wiring and shall include: An industrial computer that has been hardened to operate in the harsh environment; Familiar relay ladder diagram programming; I/O control through user logic programming' Instruction set designed specifically for the ISMS industrial control and process control environment; Previously used on Metro Projects; Communications with cell controllers, operator interface terminals, dumb terminals, personal computers, and similar devices. The contractor shall cross reference the PLC Panel Ref No. to Housing Type as above. A by-pass switch/s shall be provided to completely by-pass the PLC in the event of a total failure of the PLC and associates equipment to enable the normal operation of the equipment controlled by the PLC. Panels shall be fitted with a suitable pocket to contain circuit diagrams and other relevant Definitive Design Drawings. An "as installed" set shall be having.</p> <p>Redundant CPU Module with on board Ethernet RS 485 port, Integrated Remote I/O Bus Manager, 96 word Base memory, 12,000 I/O capacity, 64 process channels :6 Sets</p> <p>CPU Module with Remote I/O Bus manager</p> <p>256 KB memory Extension Capsule</p> <p>AI Module</p> <p>DI Module</p> <p>DO Module</p> <p>AO Module</p> <p>IO Rack Power Supply Module , 230 V , 50 W</p> <p>6 slot CPU rack</p> <p>Redundancy Module</p> <p>Back Plane Rack for PC modules &amp; IO</p> <p>Expansion Rack for remote IO modules</p> <p>FIPIO trunk cable</p> <p>Ethernet Module TCP/IP 10/100 MBPS CP 343-1</p> <p>FIPWAY adopter for remote IO rack</p> <p>Remote FIPWAY Agent Module</p> <p>Tap for each Node on the remote IO module</p> <p>- 1 Lot</p>

**ADDENDUM NO. 1: DESIGN VERIFICATION, DETAILED ENGINEERING, MANUFACTURE, SUPPLY, DELIVERY AND STORAGE AT SITE, LAYING, INSTALLATION, TESTING AND COMMISSIONING (INCLUDING INTEGRATED TESTING & COMMISSIONING), TRAINING OF PERSONNEL, DEMONSTRATION OF PERFORMANCE OF SYSTEM / EQUIPMENT & ANNUAL MAINTENANCE CONTRACT OF ENVIRONMENT CONTROL SYSTEM (ECS) & INTEGRATED STATION MAINTENANCE SYSTEM (ISMS) OF KOLKATA METRO EAST-WEST LINE PROJECT- PHASE I**

SI No.	Points for Consideration	Original Clause	Addendum Clause
31.	Vol 6, Appendix A, A1.2-11 & Vol 6, Appendix B, B1.2-11	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot
32.	Vol 6, Appendix A, A2.2-8.1, & Vol 6, Appendix B, B2.2-8.1,	<p>The redundant PLC features shall be, modular complete with Power supply, base plate incorporating terminals for field wiring and shall include: An industrial computer that has been hardened to operate in the harsh environment; Familiar relay ladder diagram programming; I/O control through user logic programming' Instruction set designed specifically for the ISMS industrial control and process control environment; Previously used on Metro Projects; Communications with cell controllers, operator interface terminals, dumb terminals, personal computers, and similar devices. The contractor shall cross reference the PLC Panel Ref No. to Housing Type as above. A by-pass switch/s shall be provided to completely by-pass the PLC in the event of a total failure of the PLC and associates equipment to enable the normal operation of the equipment controlled by the PLC. Panels shall be fitted with a suitable pocket to contain circuit diagrams and other relevant Definitive Design Drawings. An "as installed" set shall be having.</p> <p>Redundant CPU Module with on board Ethernet RS 485 port, Integrated Remote I/O Bus Manager, 96 word Base memory, 12,000 I/O capacity, 64 process channels :6 Sets</p> <p>CPU Module with Remote I/O Bus manager</p> <p>256 KB memory Extension Capsule</p> <p>AI Module</p> <p>DI Module</p> <p>DO Module</p> <p>AO Module</p> <p>IO Rack Power Supply Module , 230 V , 50 W</p> <p>6 slot CPU rack</p> <p>Redundancy Module</p> <p>Back Plane Rack for PC modules &amp; IO</p> <p>Expansion Rack for remote IO modules</p> <p>FIPIO trunk cable</p> <p>Ethernet Module TCP/IP 10/100 MBPS CP 343-1</p> <p>FIPWAY adopter for remote IO rack</p> <p>Remote FIPWAY Agent Module</p> <p>Tap for each Node on the remote IO module</p> <p>- 1 Lot</p>	<p>The redundant PLC including interface plc panel features shall be, modular complete with Power supply, base plate incorporating terminals for field wiring and shall include: An industrial computer that has been hardened to operate in the harsh environment; Familiar relay ladder diagram programming; I/O control through user logic programming' Instruction set designed specifically for the ISMS industrial control and process control environment; Previously used on Metro Projects; Communications with cell controllers, operator interface terminals, dumb terminals, personal computers, and similar devices. The contractor shall cross reference the PLC Panel Ref No. to Housing Type as above. A by-pass switch/s shall be provided to completely by-pass the PLC in the event of a total failure of the PLC and associates equipment to enable the normal operation of the equipment controlled by the PLC. Panels shall be fitted with a suitable pocket to contain circuit diagrams and other relevant Definitive Design Drawings. An "as installed" set shall be having.</p> <p>Redundant CPU Module with on board Ethernet RS 485 port, Integrated Remote I/O Bus Manager, 96 word Base memory, 12,000 I/O capacity, 64 process channels :6 Sets</p> <p>CPU Module with Remote I/O Bus manager</p> <p>256 KB memory Extension Capsule</p> <p>AI Module</p> <p>DI Module</p> <p>DO Module</p> <p>AO Module</p> <p>IO Rack Power Supply Module , 230 V , 50 W</p> <p>6 slot CPU rack</p> <p>Redundancy Module</p> <p>Back Plane Rack for PC modules &amp; IO</p> <p>Expansion Rack for remote IO modules</p> <p>FIPIO trunk cable</p> <p>Ethernet Module TCP/IP 10/100 MBPS CP 343-1</p> <p>FIPWAY adopter for remote IO rack</p> <p>Remote FIPWAY Agent Module</p> <p>Tap for each Node on the remote IO module</p> <p>- 1 Lot</p>
33.	Vol 6, Appendix A, A2.2-11 & Vol 6, Appendix B, B2.2-11	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot
34.	Vol 6, Appendix A, A3.2-8.1, & Vol 6, Appendix B,	<p>The redundant PLC features shall be, modular complete with Power supply, base plate incorporating terminals for field wiring and shall include: An industrial computer that has been hardened to operate in the harsh environment; Familiar relay ladder diagram programming; I/O control through user logic programming' Instruction set designed specifically for the ISMS industrial control and process control environment; Previously</p>	<p>The redundant PLC including interface plc panel features shall be, modular complete with Power supply, base plate incorporating terminals for field wiring and shall include: An industrial computer that has been hardened to operate in the harsh environment; Familiar relay ladder diagram programming; I/O control through user logic programming' Instruction set designed specifically for the ISMS industrial control and</p>

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SI No.	Points for Consideration	Original Clause	Addendum Clause
	B3.2-8.1,	<p>used on Metro Projects; Communications with cell controllers, operator interface terminals, dumb terminals, personal computers, and similar devices. The contractor shall cross reference the PLC Panel Ref No. to Housing Type as above. A by-pass switch/s shall be provided to completely by-pass the PLC in the event of a total failure of the PLC and associates equipment to enable the normal operation of the equipment controlled by the PLC. Panels shall be fitted with a suitable pocket to contain circuit diagrams and other relevant Definitive Design Drawings. An "as installed" set shall be having.</p> <p>Redundant CPU Module with on board Ethernet RS 485 port, Integrated Remote I/O Bus Manager, 96 word Base memory, 12,000 I/O capacity, 64 process channels :6 Sets</p> <p>CPU Module with Remote I/O Bus manager</p> <p>256 KB memory Extension Capsule</p> <p>AI Module</p> <p>DI Module</p> <p>DO Module</p> <p>AO Module</p> <p>IO Rack Power Supply Module , 230 V , 50 W</p> <p>6 slot CPU rack</p> <p>Redundancy Module</p> <p>Back Plane Rack for PC modules &amp; IO</p> <p>Expansion Rack for remote IO modules</p> <p>FIPIO trunk cable</p> <p>Ethernet Module TCP/IP 10/100 MBPS CP 343-1</p> <p>FIPWAY adopter for remote IO rack</p> <p>Remote FIPWAY Agent Module</p> <p>Tap for each Node on the remote IO module</p> <p>- 1 Lot</p>	<p>process control environment; Previously used on Metro Projects; Communications with cell controllers, operator interface terminals, dumb terminals, personal computers, and similar devices. The contractor shall cross reference the PLC Panel Ref No. to Housing Type as above. A by-pass switch/s shall be provided to completely by-pass the PLC in the event of a total failure of the PLC and associates equipment to enable the normal operation of the equipment controlled by the PLC. Panels shall be fitted with a suitable pocket to contain circuit diagrams and other relevant Definitive Design Drawings. An "as installed" set shall be having.</p> <p>Redundant CPU Module with on board Ethernet RS 485 port, Integrated Remote I/O Bus Manager, 96 word Base memory, 12,000 I/O capacity, 64 process channels :6 Sets</p> <p>CPU Module with Remote I/O Bus manager</p> <p>256 KB memory Extension Capsule</p> <p>AI Module</p> <p>DI Module</p> <p>DO Module</p> <p>AO Module</p> <p>IO Rack Power Supply Module , 230 V , 50 W</p> <p>6 slot CPU rack</p> <p>Redundancy Module</p> <p>Back Plane Rack for PC modules &amp; IO</p> <p>Expansion Rack for remote IO modules</p> <p>FIPIO trunk cable</p> <p>Ethernet Module TCP/IP 10/100 MBPS CP 343-1 T</p> <p>FIPWAY adopter for remote IO rack</p> <p>Remote FIPWAY Agent Module</p> <p>Tap for each Node on the remote IO module</p> <p>- 1 Lot</p>
35.	Vol 6, Appendix A, A3.2-11 & Vol 6, Appendix B, B3.2-11	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot
36.	Vol 6, Appendix A, A10.2-11 & Vol 6, Appendix B, B10.2-11	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot
37.	Vol 6, Appendix A, A11.2-11 & Vol 6, Appendix B, B11.2-11	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot
38.	Vol 6, Appendix A, A12.2-11 & Vol 6, Appendix B,	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot

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SI No.	Points for Consideration	Original Clause	Addendum Clause
	B12.2-11		
39.	Vol 6, Appendix A, A13.2-11 & Vol 6, Appendix B, B13.2-11	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot
40.	Vol 6, Appendix A, A14.2-11 & Vol 6, Appendix B, B14.2-11	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot
41.	Vol 6, Appendix A, A15.2-11 & Vol 6, Appendix B, B15.2-11	Integrated Backup Panel (IBP) with all accessories - 1 Lot	Integrated Backup Panel (IBP) including PLC as required with all accessories - 1 Lot
42.	Vol 3 (Part 1), Technical Specification, Insulation, 35.3.8.1	Insulated pipes shall be provided with high-density rock-wool insulation of minimum 160kg/m3 density.	Insulated pipes shall be provided with high-density rock-wool insulation of minimum 160kg/m3 density with two layer of aluminium foil, reinforced kraft paper, fire resistant adhesive and reinforced with fibre glass yarn with vapour barrier on one side.
43.	Vol 3 (Part 1), Technical Specification, Insulation, 35.3.2	Semi-rigid fibreglass / wool or rockwool duct wrapped with a factory applied vapour barrier jacketing secured in position with adhesive and fixing pin/retaining washers. Vapour barrier shall be double sided Aluminum foil kraft paper, fire resistant adhesive and reinforced with fibre glass yarn. The kraft paper shall be permanently treated to assure permanent fire and smoke safety, and to prevent corrosion of the foil.	Semi-rigid fibre glasswool or rockwool duct wrapped with a factory applied vapour barrier jacketing secured in position with adhesive and fixing pin/retaining washers. Vapour barrier shall be on one side with Aluminum foil kraft paper, fire resistant adhesive and reinforced with fibre glass yarn. The kraft paper shall be permanently treated to assure permanent fire and smoke safety, and to prevent corrosion of the foil.
44.	Vol 6, Schedule X,	<p style="text-align: center;"><b><u>SCHEDULE-X</u></b></p> <p style="text-align: center;"><b>APPENDIX A1.1 to A3.1, A1.2 to A3.2 &amp; A10.2 to A15.2 AND APPENDIX G</b></p> <p>Cost for various Items of Works in Appendixes under Schedule-X comprise all those obligations and ongoing activities throughout the Contract not associated directly with any other Schedule and Appendix. To be entitled for payment, the contractor is required to <b>obtain the "Notice of No Objection" or "Notice of No Objection subject to_____” from the Engineer for:</b></p> <p><u>The ECS and ISMS equipment and materials including all accessories</u></p> <ul style="list-style-type: none"> <li>• Design verification of the complete Environmental Control System and design of Integrated Station Management System with a reference to the tender drawings and items of works and their quantities included in the Bills of Quantities,</li> <li>• Detailed Engineering,</li> </ul>	<p style="text-align: center;"><b><u>SCHEDULE-X</u></b></p> <p style="text-align: center;"><b>APPENDIX A1.1 to A3.1, A1.2 to A3.2 &amp; A10.2 to A15.2 AND APPENDIX G</b></p> <p>Cost for various Items of Works in Appendixes under Schedule-X comprise all those obligations and ongoing activities throughout the Contract not associated directly with any other Schedule and Appendix. To be entitled for payment, the contractor is required to <b>obtain the "Notice of No Objection" or "Notice of No Objection subject to_____” from the Engineer for:</b></p> <p><u>The ECS and ISMS equipment and materials including all accessories</u></p> <ul style="list-style-type: none"> <li>• Design verification of the complete Environmental Control System and design of Integrated Station Management System with a reference to the tender drawings and items of works and their quantities included in the Bills of Quantities,</li> <li>• Detailed Engineering,</li> </ul>

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SI No.	Points for Consideration	Original Clause	Addendum Clause
		<ul style="list-style-type: none"> <li>• Selection of suppliers for major system and sub-systems,</li> <li>• Manufacture,</li> <li>• Completion of all routine and type testing of equipment and accessories at works,</li> <li>• Completion of all Factory Acceptance Tests, Endurance Test on Proto type and Issue of Inspection Certificate on satisfactory completion of all Factory Tests/running,</li>   <li>• Completion of test running in factory,</li> <li>• Completion of manufacture, testing, running, etc. and inspection/clearance of ECS (including ISMS) Equipment by the Engineer;</li> <li>• Completion of the shipment to port in India (if required)</li> <li>• Supply, Delivery to site</li> <li>• Provision of Marine Insurance (if required) from off-shore Factory to Port in India</li> <li>• Provision of Transit Insurance from Port in India to site</li> <li>• Inland transportation/delivery of manufactured items within India including handling charges at port of India and/or at Site, and all other incidental costs, receipt of equipment at Site, storage &amp; handling at site</li> <li>• Any additional modifications as determined during the testing of the ECS (including ISMS) Equipment.</li> <li>• Training of Employer's Personnel,</li> <li>• Preparation and Submission of Operation &amp; Maintenance Manuals,</li> <li>• Any other item(s) considered necessary to comply with Scope of Work.</li> </ul>	<ul style="list-style-type: none"> <li>• Selection of suppliers for major system and sub-systems,</li> <li>• Manufacture,</li> <li>• Completion of all routine and type testing of equipment and accessories at works,</li> <li>• Completion of all Factory Acceptance Tests, Endurance Test on Proto type and Issue of Inspection Certificate on satisfactory completion of all Factory Tests/running,</li>   <li>• Completion of test running in factory,</li> <li>• Completion of manufacture, testing, running, etc. and inspection/clearance of ECS (including ISMS) Equipment by the Engineer;</li> <li>• Dispatch of the shipment to port in India (if required)</li> <li>• Provision of Marine Insurance (if required) from off-shore Factory to Port in India &amp; transit insurance from port in India to site ( as applicable).</li> <li>• Any additional modifications as determined during the testing of the ECS (including ISMS) Equipment.</li> <li>• Training of Employer's Personnel,</li> <li>• Preparation and Submission of Operation &amp; Maintenance Manuals,</li> <li>• Any other item(s) considered necessary to comply with Scope of Work.</li> </ul>
45.	Vol 6, Schedule Y,	<p style="text-align: center;"><b><u>SCHEDULE-Y</u></b></p> <p style="text-align: center;"><b>APPENDIX B1.1 to B3.1, B1.2 to B3.2 &amp; B10.2 to B15.2 AND D1</b></p> <p>Cost for various Items of Works in Appendixes under Schedule-Y comprise all those obligations and ongoing activities throughout the Contract not associated directly with any other Schedule and Appendix. To be entitled for payment, the contractor is required to <b>Obtain the "Notice of No Objection" or "Notice of No Objection subject to _____" from the Engineer for</b></p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> <li>• Delivery/transportation to installation Site from store including handling,</li> <li>• Submission of Construction Plan, installation drawings, circuit diagrams for construction,</li> </ul>	<p style="text-align: center;"><b><u>SCHEDULE-Y</u></b></p> <p style="text-align: center;"><b>APPENDIX B1.1 to B3.1, B1.2 to B3.2 &amp; B10.2 to B15.2 AND D1</b></p> <p>Cost for various Items of Works in Appendixes under Schedule-Y comprise all those obligations and ongoing activities throughout the Contract not associated directly with any other Schedule and Appendix. To be entitled for payment, the contractor is required to <b>Obtain the "Notice of No Objection" or "Notice of No Objection subject to _____" from the Engineer for</b></p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> <li>• Inland transportation/delivery of manufactured items within India including handling charges at port of India and/or at Site, and all other incidental costs, receipt of equipment at Site, storage &amp; handling at site</li> </ul>

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SI No.	Points for Consideration	Original Clause	Addendum Clause
		<ul style="list-style-type: none"> <li>• Submission of Validation test plan,</li> <li>• Pre-installation tests, inspection of equipment and Site preparations,</li> <li>• Complete fixing of piping/ducting etc, cabling and wiring of all ECS and ISMS Equipment and accessories for Underground Stations and associated tunnels in accordance with circuit and installation diagrams,</li> <li>• Installation of all ECS and ISMS Equipment and accessories for Underground Stations and associated tunnels including testing and commissioning,</li> <li>• DLP Requirement (Specified in detail elsewhere)</li> </ul> <p>Post installation tests at Employer's site including:</p> <ol style="list-style-type: none"> <li>1. Pre-power up checking, power up, customisation and configuration of equipment.</li> <li>2. Local functional test for all local Environment Control System (ECS) Equipment and Integrated Station Management System (ISMS) Equipment scenarios including degraded modes.</li> <li>3. Functional test.</li> <li>4. Partial Acceptance Tests in accordance with accepted Acceptance Plan.</li> <li>5. Calibration of All meters and Sensors.</li> <li>6. Testing And Commissioning (including integrated testing &amp; commissioning) by using Integrated Station Management System (ISMS)</li> <li>7. Obtaining certificate of satisfactory completion of functional and safety tests and working of the Environment Control System (ECS) Equipment and accessories for Underground Stations and Integrated Station Management System (ISMS) Equipment and accessories for Underground and elevated Stations <ul style="list-style-type: none"> <li>• Completion of Integrated Testing and Commissioning at the Site;</li> <li>• Safety Certification, in the approved format, for Environment Control System (ECS) Equipment and accessories for Underground Stations and Integrated Station Management System (ISMS) Equipment and accessories for Underground and elevated Stations;</li> </ul> </li> <li>8. Detailed Safety Report including the safety features and safety standards of the Environment Control System (ECS) Equipment and accessories for Underground Stations and Integrated Station Management System (ISMS) Equipment and accessories for Underground and elevated Stations Systems.</li> <li>9. Service Trials.</li> <li>10. Guarantee Tests to obtain the operational acceptance Certificate.</li> <li>11. Demonstration of Performance of System / Equipment.</li> </ol> <p>Any other item(s) considered necessary to comply with the Scope of Works such as, but not limited to, Insurance, Annual Maintenance Contract and Maintenance during Defect Liability Period.</p>	<ul style="list-style-type: none"> <li>• Submission of Construction Plan, installation drawings, circuit diagrams for construction,</li> <li>• Submission of Validation test plan,</li> <li>• Pre-installation tests, inspection of equipment and Site preparations,</li> <li>• Complete fixing of piping/ducting etc, cabling and wiring of all ECS and ISMS Equipment and accessories for Underground Stations and associated tunnels in accordance with circuit and installation diagrams,</li> <li>• Installation of all ECS and ISMS Equipment and accessories for Underground Stations and associated tunnels including testing and commissioning,</li> <li>• DLP Requirement (Specified in detail elsewhere)</li> </ul> <p>Post installation tests at Employer's site including:</p> <ol style="list-style-type: none"> <li>1. Pre-power up checking, power up, customisation and configuration of equipment.</li> <li>2. Local functional test for all local Environment Control System (ECS) Equipment and Integrated Station Management System (ISMS) Equipment scenarios including degraded modes.</li> <li>3. Functional test.</li> <li>4. Partial Acceptance Tests in accordance with accepted Acceptance Plan.</li> <li>5. Calibration of All meters and Sensors.</li> <li>6. Testing And Commissioning (including integrated testing &amp; commissioning) by using Integrated Station Management System (ISMS)</li> <li>7. Obtaining certificate of satisfactory completion of functional and safety tests and working of the Environment Control System (ECS) Equipment and accessories for Underground Stations and Integrated Station Management System (ISMS) Equipment and accessories for Underground and elevated Stations <ul style="list-style-type: none"> <li>• Completion of Integrated Testing and Commissioning at the Site;</li> <li>• Safety Certification, in the approved format, for Environment Control System (ECS) Equipment and accessories for Underground Stations and Integrated Station Management System (ISMS) Equipment and accessories for Underground and elevated Stations;</li> </ul> </li> <li>8. Detailed Safety Report including the safety features and safety standards of the Environment Control System (ECS) Equipment and accessories for Underground Stations and Integrated Station Management System (ISMS) Equipment and accessories for Underground and elevated Stations Systems.</li> <li>9. Service Trials.</li> <li>10. Guarantee Tests to obtain the operational acceptance Certificate.</li> <li>11. Demonstration of Performance of System / Equipment.</li> </ol> <p>Any other item(s) considered necessary to comply with the Scope of Works such as, but not limited to, Insurance, Annual Maintenance Contract and Maintenance during Defect Liability Period.</p>

**ADDENDUM NO. 1: DESIGN VERIFICATION, DETAILED ENGINEERING, MANUFACTURE, SUPPLY, DELIVERY AND STORAGE AT SITE, LAYING, INSTALLATION, TESTING AND COMMISSIONING (INCLUDING INTEGRATED TESTING & COMMISSIONING), TRAINING OF PERSONNEL, DEMONSTRATION OF PERFORMANCE OF SYSTEM / EQUIPMENT & ANNUAL MAINTENANCE CONTRACT OF ENVIRONMENT CONTROL SYSTEM (ECS) & INTEGRATED STATION MAINTENANCE SYSTEM (ISMS) OF KOLKATA METRO EAST-WEST LINE PROJECT- PHASE I**

SI No.	Points for Consideration	Original Clause	Addendum Clause
46.	Vol 3 (Part 1), Technical Specification, Cooling Tower, 15.3.3.1	The fan assembly shall be statically and dynamically balanced.	The fan assembly shall be statically balanced at the factory as an assembly to minimize vibration.
47.	Vol 3 (Part 1), Technical Specification, Cooling Tower, 15.3.4.5	b) Drift rate shall be not exceed than 0.002% (tested to CTI or approved bodies) of the circulated water rate.	b) Drift rate shall not be exceed than 0.005% (tested to CTI or approved bodies) of the circulated water rate.
48.	Vol 3 (Part 1), Technical Specification, Water Circulating Pump, 14.4.3.1	Impeller shall be bronze or gun metal, double suction, enclosed type, hydraulically balanced and passages smooth-finished for minimum friction and maximum efficiency.	Impeller shall be bronze or gun metal, single suction, enclosed type, hydraulically balanced and passages smooth-finished for minimum friction and maximum efficiency.
49.	Vol 3 (Part 1), Technical Specification, Water Cooled Chillers –Screw Compressors, 11.3.7.3	The chilling units shall be delivered with pre-charged refrigerant from the manufacturing premises. The refrigerant shall not be charged at site.	Deleted.
50.	Vol 1, Form of Tender, Appendix 1, Contract Condition	14. Penalty for failure leading to total stoppage of train operation during the DLP and AMC periods; for such delay /stoppage for more than 1 hr. Equivalent to the amount of loss of revenue for the period.	Deleted.
51.	Vol 1, Form of Tender, Appendix 1, Contract Condition	13. Penalty for Not Maintaining Equipment During AMC (SCC Clauses 41 and 46) 0.01 % of the Contract Price excluding spares.	13. Penalty for Not Maintaining Equipment During DLP & AMC. A penalty of Rs. 20,000/- per hour will be imposed if major equipment or any complete system is not working for more than 24 hours, during DLP and AMC period.
52.	Vol 3 (Part 1), Technical Specification, Fire Rated Ductwork, 17.3.8.4	All necessary supports, and other accessories required for the complete installation of fire rated ductwork, Sealant, Gasket, including additional material for fire stopping at wall/ceiling penetration, shall be supplied by the same manufacturer as the fire rated duct material and shall be assembled in accordance with all the manufacturer's recommendation regarding all aspects of construction and installation shall be certified by the manufacturer.	All necessary supports, and other accessories (excluding Rockwool insulation, Fire Paint etc.) required for the complete installation of fire rated ductwork, Sealant, Gasket, including additional material for fire stopping at wall/ceiling penetration, shall be supplied by the same manufacturer as the fire rated duct material and shall be assembled in accordance with all the manufacturer's recommendation regarding all aspects of construction and installation shall be certified by the manufacturer.
53.	Vol 3 (Part 1), Technical Specification, Fan Coil Unit, 19.3.4.4	Each drain pan shall be fitted with an insulated drain pipe which shall be connected via suitable runs correctly laid to fall to the drainage system. Drain pans shall have copper male connectors for connection to the condensate drainpipes. The frame and drain pipe should be of SS-316.	Each drain pan shall be fitted with an insulated drain pipe which shall be connected via suitable runs correctly laid to fall to the drainage system. Drain pans shall have copper male connectors for connection to the condensate drainpipes. The frame should be of SS-316.
54.	Vol 3 (Part 1), Technical Specification, Fan	Each drain pan shall be fitted with an insulated drain pipe which shall be connected via suitable runs correctly laid to fall to the drainage system. Drain pans shall have copper male connectors for connection to the condensate drainpipes. The frame and drain pipe should be of SS-316.	Each drain pan shall be fitted with an insulated drain pipe which shall be connected via suitable runs correctly laid to fall to the drainage system. Drain pans shall have copper male connectors for connection to the condensate drainpipes. The frame should be of SS-316.

**ADDENDUM NO. 1: DESIGN VERIFICATION, DETAILED ENGINEERING, MANUFACTURE, SUPPLY, DELIVERY AND STORAGE AT SITE, LAYING, INSTALLATION, TESTING AND COMMISSIONING (INCLUDING INTEGRATED TESTING & COMMISSIONING), TRAINING OF PERSONNEL, DEMONSTRATION OF PERFORMANCE OF SYSTEM / EQUIPMENT & ANNUAL MAINTENANCE CONTRACT OF ENVIRONMENT CONTROL SYSTEM (ECS) & INTEGRATED STATION MAINTENANCE SYSTEM (ISMS) OF KOLKATA METRO EAST-WEST LINE PROJECT- PHASE I**

<b>Sl No.</b>	<b>Points for Consideration</b>	<b>Original Clause</b>	<b>Addendum Clause</b>
	Coil Unit, 19.3.4.4		
55.	NIT point 5, Key details	<b>Replies to Queries from Bidders</b> 19 <sup>th</sup> May 2017	<b>Replies to Queries from Bidders</b> 14 <sup>th</sup> July 2017
56.	NIT point 5, Key details	<b>Date &amp; Time of Submission of Tender</b> 15.00 Hours on 19th June 2017	<b>Date &amp; Time of Submission of Tender</b> 15.00 Hours on 14 <sup>th</sup> Aug 2017
57.	NIT point 5, Key details	<b>Date &amp; Time of Opening of Tender</b> 15.30 Hours on 19th June 2017	<b>Date &amp; Time of Opening of Tender</b> 15.30 Hours on 14 <sup>th</sup> Aug 2017

P Chakraborty

Chief Electrical Engineer, KMRCL