

“Contract for Design, Manufacture, Supply, Installation, Testing And Commissioning of (A). Electrical and Mechanical (E&M) Including Hydraulics, Fire Safety Systems, UPS & DG Sets (B). Environmental Control System (ECS) and Building Management System (BMS) (C). Tunnel Ventilation System (TVS) and TVS - SCADA Works For Underground Stations, Intermediate Vent Shaft And Associated Tunnels Of East – West Corridor Of Ahmedabad Metro Rail Project – Phase I”

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IFB No: MEGA/UG/E&M-01 Dt: 18-04-2018

Sr. No.	Volume Reference	Clause Reference	Page No	Tender Condition	Tenderer's Query	Remark
1	Section III EQC	2.3.1	EQC-8	Financial Situation	While considering positive Net Worth of the tenderer, in case of JV, it is proposed that the Net Worth of all parties combined in proportion to their share shall satisfy the conditions. Please Confirm.	No Change. Tender Condition prevails.
2	Section VII General Condition	1.13	GC-13	Compliance with Law	Regarding payments for acquiring permits, approvals & license. We understand that the employer shall be responsible to making payments towards permits, approvals & license wherever required and the contractor shall provide due assistance in this respect. Please Confirm.	No Change. Tender Condition prevails.
3	Section VII General Condition	4.2	GC-19	Performance Security	In case, if execution time of the Contract gets extended, for the reasons not attributable to contractor and EOT approval letter issued by the employer to the contractor to extend the actual completion date, in that case all expenses / charges with respect to extension of Bank Guarantee shall be borne by the employer only. Also the escalation and overrun cost incurred due to above reason shall be borne by employer only. Please confirm.	No Change. Tender Condition prevails.
4	Section VII General Condition	4.4	GC-20	Sub-Contractors	As per the referred clause, contractor shall not subcontract the whole of the works. But how much value / percentage of work can be sub contracted is not clarified. Please Confirm.	Contractor to take prior approval of the Engineer as per Contract Conditions. No Change. Tender Condition prevails.
5	Section VII General Condition	4.8	GC-22	Safety Procedure	It is proposed that, the contractor shall comply with safety procedures attributable to the works assigned and awarded to contractor only and for its own workmen and work area in relation to i.e. task lighting, security guard for contractors own uninstalled works . For remaining areas which is not in the scope of the contractor, overall safety of works shall be provided by the Employer or other system wide contractor. Please confirm.	No change. Tender condition prevails.
6	Section VII General Condition	4.13	GC-24	Rights of way and facilities	Access route to site shall be provided to contractor by the Employer or other system wide contractor. In case of special requirement the same should also be provided. Please confirm.	No Change. Tender Condition prevails.
7	Section VII General Condition	4.15	GC-24	Access Route	Please confirm that the access routes shall remain available to the contractor till the work completion of his work and shall not be blocked / obstructed by others.	No Change. Tender Condition prevails.
8	Section VII General Condition	4.19	GC-26	Electricity, Water and Gas	The employer should provide electricity, water and gas for testing of equipments and work at site free of cost. Please confirm.	No Change. Tender Condition prevails.
9	Section VII General Condition	6.6	GC-33	Facilities for staff and labour	The contractor shall provide facilities to his personnel only and not for Employer's personnel. Please confirm.	No Change. Tender Condition prevails.
10	Section VII General Condition	6.7	GC-33	Health and Safety	The contractor shall appoint an Accident Prevention officer who shall visit the site whenever required and a safety in charge or supervisor shall be additionally appointed who shall be present at site all the time and shall comply with all the requirements for Health and Safety.	No Change. Tender Condition prevails.
11	Section VII General Condition	8.4	GC-41	Extension of Time for Completion	In addition to the other conditions an additional point shall also be included in relation to "Force Majeure" in this clause.	No Change. Tender Condition prevails.
12	Section VII General Condition	10.1	GC-46	Taking over of the works or sections	System shall be deemed to be taken over from the date earlier of (i) Completion of works as per contract conditions or (ii) Revenue Operation Date or (iii) commercial uses of system by employer or (iv) Commissioning of System as a whole or parts, whether taking over certificate is issued or not by the employer. Please confirm.	No Change. Tender Condition prevails.
13	Section VII General Condition	15.2	GC-65	Termination by the Employer	It is proposed that, before terminating or taking any action in this clause, the Employer shall give to the Contractor a reasonable opportunity to submit clarification.	No Change. Tender Condition prevails.
14	Section VII General Condition	18.1	GC-73	General requirement of Insurance	Insurance Policy shall be valid till issuance of Taking over Certificate. Please confirm	No change. Tender condition prevails.

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15	Section VII General Condition	18.2	GC-74	Insurance for Works and Contractors Equipment	Insurance Policy shall be valid till issuance of Taking over Certificate. Please confirm	No change. Tender condition prevails.
16	Section VII General Condition	18.3	GC-75	Insurance against injury to persons and damage to property	Insurance Policy shall be valid till issuance of Taking over Certificate. Please confirm	No change. Tender condition prevails.
17	Section VII General Condition	18.4	GC-76	Insurance for Contractors Personal	Insurance Policy shall be valid till issuance of Taking over Certificate. Please confirm	No change. Tender condition prevails.
18	Section VIII Particular Conditions	14.2(B)	PC-3	Repayment amortization rate of advance payment	The amortization rate as suggest in Particular Conditions is 25% of each interim bill, as this shall affect the cash flow at initial stage of the project, it is requested to keep as 15% instead. Please confirm.	No Change. Tender Condition prevails.
19	Section VI, Volume-1, PS, Part-A, E&M	CI A 2.1	E&M-3	Standards	Since all MCCB and ACB are with inbuilt micrologic release. Therefore IEC 60255/EN 60255 may not be required. Please confirm	This may be proposed by the Contractor during detailed design, with valid justification and supporting documents to the Engineer for his acceptance. No deviation from the Technical Specification allowed, without Engineer's approval. Tender condition prevails.
20	Section VI, Volume-1, PS, Part-A, E&M	CI A 2.1	E&M-3	Standards	As per genral practice, Capacitor shall be as per IEC 62053. Kindly confirm	Equivalent or better standard for this item may be proposed for Engineer's acceptance with valid justification during detailed design. No Change, Tender condition prevails.
21	Section VI, Volume-1, PS, Part-A, E&M	CI A 2.1	E&M-3	Standards	As per general practice, Meter Shall be as per IEC 62052. Kindly confirm	Equivalent or better standard for this item may be proposed for Engineer's acceptance with valid justification during detailed design. No Change, Tender condition prevails.
22	Section VI, Volume-1, PS, Part-A, E&M	CI A3.3 (3.1) & A3.6 (6.2)	E&M-8	Withstand Capacity of Switchboard	There are two type of withstand capacity mentioned in specification i.e. 70 kA for 1 sec. and 65 kA for 1 sec. Since the total discrimination has to be achieved. Please mention the which one is to be followed. Kindly confirm	70kA for 1 second may be presumed for switchboards, as a minimum. For Busbar also 70kA for 1 second at 415V, as a minimum. Contractor to interface with Power Supply Contractor for discrimination and fault calcaultions. No change, Tender condition prevails.
23	Section VI, Volume-1, PS, Part-A, E&M	CI A3.8 (9.1)	E&M-8	Terminal Blocks	For maintenance and service point of view terminal block made by melamine material are not reliable. Shall we propose polyamide instead of that. Please confirm.	No Change. Tender Condition prevails.
24	Section VI, Volume-1, PS, Part-A, E&M	CI A3.6 (6.10)	E&M-11	Busbars	As per Specification, the maximum temperature of the bus-bars and the bus connections shall not exceed 90°C. But the Temperature rise will be as per IEC Standards. Please confirm.	Refer to clause A3.6 (6.6). No Change. Tender condition prevails.
25	Section VI, Volume-1, PS, Part-A, E&M	CI A3.24.1	E&M-33	MCCB arrangement	As per specification the electrical panel are drawout type. We understand here that the ACB's are need to be provided with drawout arrangement other switchgear including MCCB's will with fixed arrangement. Please clarify	Contractor may propose type of MCCB, fixed or withdrawal type, with valid justification & supporting documents to the Engineer during detailed design for approval. No change, Tender conditions prevails.
26	Section VI, Volume-1, PS, Part-A, E&M	CI A3.3.(3.11) & A3.6 (6.7)	E&M-11	Busbars	Marking of the busbar shall be as per TTA Design , separate insulation cover may not be permitted as per TTA arrangement for busbar. Please clarify	No Change. Tender Condition prevails.
27	Section VI, Volume-1, PS, Part-A, E&M	CI A3.6 (6.4)	E&M-11	Busbars	Most of the Panel vendor provide LV Panel busbar arrangement as per their TTA Design with nut-bolts. Is it acceptable kindly confirm	No Change. Tender Condition prevails.
28	Section VI, Volume-1, PS, Part-A, E&M	CI A3.3 (3.11)	E&M-10	Low voltage Switchboards Cubicle Construction	We are considering 3.0 mm thick non-magnetic gland plates rather than 3.2 mm thick at the top and bottom. Please clarify.	No Change. Tender Condition prevails.
29	Section VI, Volume-1, PS, Part-A, E&M	CI A3.3 (3.14)	E&M-10	Connections in Panel	Cable shall be used for upto 160A MCCB, for MCCB's above 160A busbar shall be used as per industrial practice. Kindly confirm	No Change. Tender Condition prevails.
30	Section VI, Volume-1, PS, Part-A, E&M	CI A3.6 (6.8)	E&M-12	Busbars	With reference to clause switchgear shall be high conductivity copper busbar, having current rating not less than that of frame size of switchgear which they are connected. Matching rating of busbar and circuit breaker shall be provided as per type test. Kindly confirm	No Change. Tender Condition prevails.

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31	Section VI, Volume-1, PS, Part-A, E&M	CI A3.10 (10.2)	E&M-14	Internal and Control wiring of LV Panel	Internal and control wiring of LV Panel shall be provided with LSZH Cable. Please clarify	Please refer to clause no. A3.10 (10.4). No change, Tender condition prevails.
32	Section VI, Volume-1, PS, Part-A, E&M	CI A3.11 (11.14)	E&M-17	Display of Single meter.	Available range for ammeter and voltmeter is 3.5 Digit. We shall propose to use 3.5 digit meters upto 1999A and above 1999A 4.5 Digit meter is available. Please confirm.	No Change. Tender Condition prevails.
33	Section VI, Volume-1, PS, Part-A, E&M	CI A3.11 (11.4)	E&M-16	All meters shall be compatible to RS-485 connectivity	Only Energy meter is compatible with RS-485 to suit BMS .Other meters like ammeter, voltmeter etc are not compatible with RS-485.Please confirm.	No Change. Tender Condition prevails.
34	Section VI, Volume-1, PS, Part-A, E&M	CI A3.24(24.2)k	E&M-34	Rated ambient temperature of MCCB	Available range upto 400A are rated at 50 degree centigrade, above 400 A are rated at 40 degree centigrade. Kindly confirm	No Change. Tender Condition prevails.
35	Section VI, Volume-1, PS, Part-A, E&M	CI A3.18	E&M-64	Cable joints	Please confirm allowable number of joints for long cables above 300 mtr. Also please confirm the number of joints allowable for cables which shall be spliced at site during execution.	No cable joints shall be allowed unless approved in writing by the Engineer. No change, Tender condition prevails.
36	Section VI, Volume-1, PS, Part-A, E&M	CI A3.3	E&M-71	Cable Trays and Ladders (a)	Full wrap around cable tray has been mentioned in the specification. However, full wrap around cable tray may damage the insulation of cables during installation / laying. Please clarify.	Type of cable tray based on its usage application location may be decided during detailed design subject to its acceptance by the Engineer. No change, tender conditions prevails.
37	Section VI, Volume-1, PS, Part-B, ECS & BMS	A.27	230 of 591	F (d). Energy metering using special Energy Software with dashboard and customized reporting tools for MEGA stations.	Please confirm if Energy metering using special Energy Software with dashboard and customized reporting tools required only for equipments monitored & controlled under chiller plant manager system.	This may be decided during detailed design subject to approval by Engineer. Tender condition prevails.
38	Section VI, Volume-1, PS, Part-B, ECS & BMS	A.27.1	231 of 591	F (e). Automatic Alarm routing through e-mail and SMS to user	For SMS, Network connection to be provide by Client only. Please confirm?	Mobile number of the Employer may be shared, during detailed design by the Contractor. Tender condition prevails.
39	Section VI, Volume-1, PS, Part-B, ECS & BMS	A.27.2 .	231 of 591	B) The system (CPO) shall have a minimum controlling capacity of 10,000 physical points without upgrading the data server software or related hardware.	CPO software shall be capable but for 10000 physical points. However hardware shall be provided for actual points. Please confirm.	No Change. Tender Condition prevails.
40	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.1	240 of 591	The ECS equipment shall be monitored and operable from the local ECS panel and in the station control room and also monitoring of ECS plants working through some designated indications from the OCC through SCADA.	Please confirm if there is any requirement of Touch screen display control panel at each ECS PLC's.	Touch screen display control panel at each ECS PLC may be permitted, subject to its acceptance during detail design. Tender Conditions prevails.
41	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.1	240 of 591	The BMS is to be designed manufactured, supplied, installed, tested and commissioned by the Contractor and shall meet all performance and functional requirements of SIL-3 as defined in the Specification.	Please confirm if SIL-3 level PLC's to be considered for ECS, E&M and TVS SCADA system.	Kindly refer to clarification of pre-bid query Set-2, Sl. No.-15.
42	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.0.1	251 of 591	Communication channel between station to OCC and stations will be provided by Telecom Contractor.	Please confirm if VLAN for individual stations to be provided by system wide contractor to avoid data conflict & proper operation from OCC.	Clause is self explanatory. Only communication OFC channel shall be provided by Telecom Contractor. No Change. Tender condition prevails.

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43	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.0.1	251 of 591	The Works to be executed under the Contract also include the detailed design, development, manufacture, verification, delivery to site, installation, testing, station to OCC and stations will be provided by Telecom Contractor. commissioning (including integrated testing and commissioning) and technical support for a complete Integrated Supervisory Control System (ISCS) to fully integrate the control, monitoring, and supervision of Tunnel Ventilation System from OCC as well as from station level. The Equipment, CPU's, Modules, Sub Modules, Power Supplies, Local Control Panels, Servers, Work Stations, modems, Gateways, RTU/ Redundant Server, Printers, Local Area Network (LAN), Ethernet Hubs and Switches, Ventilation Control Panel (VCP), Cable containment and wiring systems,	Contractor shall provide the redundant server at SCR and data exchange at OCC will take place directly from local station PLC and if the BMS vendor is not able to achieve the same they need to provide the RTU at Station level. Kindly confirm.	E&M contractor is responsible for the Construction of all E&M, ECS and TVS works, its associated SCADA & BMS works as specified in Particular Specifications. No Change, Tender condition prevails.
44	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.05	259 of 591	A LAN in the station areas will provide a data link for all station equipment. This LAN will communicate with the OCC via the FOTS. The Designated contractor will only provide the main communication network and the Local Area Network (LAN) located in the OCC.	Designated contractor shall provide main communication link with 2 redundant port at each station & at OCC. Also designated contractor shall provide IP address for router for communication with OCC. Kindly confirm.	No Change. Tender Condition prevails.
45	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.06	260 of 591	All necessary equipments at OCC whether specified or not specified like work station, RTU/Redundant Server, Modems, Gateways, switches and other associated accessories including cables their containment arrangement necessary to provide for control, monitoring, and supervision of Tunnel Ventilation System from OCC as well as from station level and monitoring of ECS, PS and BS system from OCC.	Please confirm if monitoring of all equipment's of ECS, PS and BS system required from OCC. ?	Refer Technical Specifications. No Change. Tender condition prevails.
46	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.06	260 of 591	Work Stations in all the stations, PLCs, VCP, LCPs, Ethernet switches, Printers, Pressure Differential transducer, Temperature and Sensors, transducers and other equipment as required for efficient working of ISCS system.	Please confirm if LCP shall be of touch screen display type or hard wired push button type.	LCP with hard wired push button type may be permitted, subject to its acceptance during detail design. Tender Conditions prevails.
47	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.06	260 of 591	The contractor will be responsible for sealing with fire rated material of all openings left due to works covered under this Contract.	Sealing with fire rated material of all wall / floor openings left due to BMS works shall be in scope of civil or other system wide contractor, Please confirm.	No Change. Tender Condition prevails.
48	Section VI, Volume-1, PS, Part-B, ECS & BMS	1,13	263 of 591	EMC Conformance and certification.	EMC Conformance and certification applicable to PLC's only and not to other devices. Kindly confirm	No Change. Tender Condition prevails.

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49	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.14	263 of 591	Computer Simulation	All the testing will be carried out on the actual system installed at site and no other separate simulation will be provided. Kindly confirm?	No Change. Tender Condition prevails.
50	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.21	268 of 591	The BMS shall, as a minimum, incorporate the capability of Energy Management,	Please confirm if there is requirement of any additional software & hardware other than BMS software for energy management system?	No Change. Tender Condition prevails.
51	Section VI, Volume-1, PS, Part-B, ECS & BMS	1.21	268 of 591	The BMS shall, as a minimum, incorporate the capability of Energy Management,	Please confirm if only energy reports to generate by BMS Software.	No Change. Tender Condition prevails.
52	Section VI, Volume-1, PS, Part-B, ECS & BMS	4.02	275 of 591	Temperature monitoring will be provided by the Contractor as Linear Heat Detection cable system or equivalent in each running tunnel.	Please confirm if individual linear heat detector controller required at each station for linear heat detection system & only adjacent tunnel temperature to be monitored at each station.	Clause is self explanatory. No Change. Tender condition prevails.
53	Section VI, Volume-1, PS, Part-B, ECS & BMS	4.03	275 of 591	The E&M, TVS and ECS will normally be controlled and monitored from the OCC. At OCC, a Supervisory Communications and Data Acquisition System (SCADA), will control and monitor the E&M, ECS and TVS plant in each station ancillary building such that they are normally unattended locally.	Please confirm if E&M, TVS & ECS system is required to completely controlled & monitored from OCC.	No Change. Tender Condition prevails.
54	Section VI, Volume-1, PS, Part-B, ECS & BMS	4.06	277 of 591	To provide individual or group start/stop and indicate status of TVS equipment.	Please confirm if individual equipment command for controlling of TVS system required from OCC.	Refer Technical Specifications. No Change. Tender condition prevails.
55	Section VI, Volume-1, PS, Part-B, ECS & BMS	4.08	278 of 591	Manual operation of the individual TVFs, TBFs and TEFs from the OCC.	Please confirm if Manual operation of the individual TVFs, TBFs and TEFs required from the OCC.	Refer Technical Specifications. No Change. Tender condition prevails.
56	Section VI, Volume-1, PS, Part-B, ECS & BMS	4.1	280 of 591	PLC configurations shall be completely modular, DIN rail mounting, and compact in construction to ensure maximum optimisation of cabinet space without compromising environmental operating conditions.	Some Manufacturer providing Rack based PLC configuration only. Please accept.	No Change. Tender condition prevails
57	Section VI, Volume-1, PS, Part-B, ECS & BMS	4.1	280 of 591	The Power Supply Modules of the PLC platform should be able to source the Interrogation Power Supply directly from the Rack Power Supply.	For DIN rail mounting PLC configuration, interrogation power supply directly from the in-rack supply not feasible. Please confirm.	No Change. Tender condition prevails

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58	Section VI, Volume-1, PS, Part-B, ECS & BMS	4.12	281 of 591	<p>The processor shall as a minimum should have following on-board memory:</p> <ul style="list-style-type: none"> □ 2 × 2 Mbyte flash for the system and application program. □ 2 × 256 Kbyte SRAM with battery backup (for IO, markers, counters, timers and registers). □ 2 × 512 Kbyte SRAM for data-exchange with the other Control Processor. <p>The PLC processor will have a program execution speed of no less than 0.5 ms/k for bit instructions and 2 ms/k for a standard instruction in a typical program.</p>	Each system have there internal architecture complied and certified to SIL level/ some use flash as internal memory, which can be configured for specific function. Which manages more advance memory management. Hence we request to leave memory allocation to OEM's architecture with a minimum execution speed of 0.5 ms/k & maximum CPU load at any given time shall not be more then 60%. kindly confirm.	No Change. Tender condition prevails
59	Section VI, Volume-1, PS, Part-B, ECS & BMS	4,16	283 of 591	Options shall include a built-in display screen, memory cartridges, a real-time clock and communication adapters.	As this is monopolistic point so kindly remove the built in display screen.	No Change. Tender condition prevails
60	Section VI, Volume-1, PS, Part-B, ECS & BMS	5.1	286 of 591	The ECS equipment shall be monitored and operable from the local ECS panel, ventilation control panel in the station control room and also from the OCC through SCADA	Please confirm if ECS all equipments to be monitored & operable from VCP as well from OCC.	Refer Technical Specifications. No Change. Tender condition prevails.
61	Section VI, Volume-1, PS, Part-B, ECS & BMS	5.6	287 of 591	Two identically configured PLC processors are connected in a “Hot Standby” arrangement as “Master” and “Standby” so that when a component of the Master PLC Fails.	Please confirm if redundant PLC controller required for ECS, PS & BS systems.?	Redundant PLC controller is required, as per the requirements stipulated in particular specifications. No change, Tender condition prevails.
62	Section VI, Volume-1, PS, Part-B, ECS & BMS	5.8	288 of 591	Each TVS PLC outstation has two 24Vdc power supplies arranged in a redundant configuration. These power supplies are used for powering up the processors and I/O modules.	Please confirm if redundant power supplies to be required only for TVS PLC's.?	Redundant Power supply is required only for complete SCADA system as per the requirements stipulated in particular specifications. No change, Tender condition prevails.
63	Section VI, Volume-1, PS, Part-B, ECS & BMS	5.9	289 of 591	If a network link fails, the system shall have inbuilt programs within the processors which will generate fault bits available to workstation and OCC.	Kindly clarify the requirement ?	Refer Technical Specifications. No Change. Tender condition prevails.
64	Section VI, Volume-1, PS, Part-B, ECS & BMS	6.05	294 of 591	Temperature sensors / Linear Heat Detection Cable on each track throughout the tunnels shall be installed at pre-determined distances (with maximum gap of 30 Mtrs) from station ends.	Please confirm if sensor to used in tunnel or linear heat detection system to use?	Linear heat detection system may be permitted, subject to its acceptance during detail design. Tender condition prevails.

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65	Section VI, Volume-1, PS, Part-B, ECS & BMS	7.2	295 of 591	The Contractor shall provide a complete fire-detection & alarm system including provisions for monitoring and control through a fire panel at station control room and OCC.	Please confirm if only Fire alarm zones to monitor in SCR & OCC or each device monitoring required at SCR & OCC?	Refer Technical Specifications. No Change. Tender condition prevails.
66	Section VI, Volume-1, PS, Part-C, TVS & SCADA	V00.5.7.2.	378 of 591	To monitor the activation of the push buttons or switches on the VCP, SCP and LCP and execute priority control.	Kindly confirm that SCP will be VCP.?	SCP is related to smoke control, and through VCP, mode operation may be assigned for fan operation in case of smoke detection. VCP has all the functioning of SCP. No change, Tender conditions prevails.
67	Section VI, Volume-1, PS, Part-C, TVS & SCADA	Section V08	451 of 591	The control unit shall have the capability to be interfaced via an Ethernet link or USB for interface to a PC and Modbus over Ethernet (Modbus TCP) for a site control system. The PC shall include programs / licensed software for displaying real time zone temperatures.	Please confirm if seprate workstation & software to be used to display Linear heat detection system data.	Separate workstation and software envisaged in particular specifications. During detailed design, it may be discussed for suitable configuration. No change, Tender conditions prevails.
68	Section VI, Volume-1, PS, Part-C, TVS & SCADA	1.1	454 of 591	The Integrated Supervisory Control System (ISCS) is to be designed manufactured, supplied, installed, tested and commissioned by the Contractor and shall meet all performance and functional requirements of SIL-3 as defined in the Specification.	Please confirm if SIL-3 level PLC's to consider for ECS, E&M and TVS SCADA system.	Kindly Refer to Sr. No. 41 above.
69	Section VI, Volume-1, PS, Part-C, TVS & SCADA	1.2	455 of 591	to implement the control, monitoring, and supervision as required at the Operational Control Centre (OCC) for the TVS, ECS and E&M works as well as lifts & Escalators and AFC System installed for underground stations and associated tunnel.	Please confirm if all equipments of TVS, ECS & E&M works as well as lifts & Escalators and AFC System to fully monitor & control from the OCC.	The list of equipments to be monitored & controlled through OCC are specified in Employer's Requirements. During detailed design, Contractor to discuss & interface with other contractors for complete integrated SCADA & BMS managment systems. No change, Tender condition prevails.
70	Section VI, Volume-1, PS, Part-C, TVS & SCADA	4,2	462 of 591	The Contractor may have to interface with the other local and statutory authorities for completing all the works as per Contract. The Contractor shall be responsible for obtaining any “clearances or certificates” from local authorities, if necessary, to make the SCADA and BMS system fully functional and operational as per the Contract.	Obtaining any clearance or certification from local authorities involves considerable cost implications which in any case cost to employer and therefore cost associated with Liasioning and obtaining permit/approval shall be sole responsibility of employer. however contractor shall provide reasonable assistance to the employer. Kindly confirm?	This is under scope of UG E&M Contractor. Tender Condition prevails.
71	Section VI, Volume-1, PS, Part-C, TVS & SCADA	3.2	470 of 591	The interface between SCADA and fire detection & suppression system shall be in the Interface Cabinet in the Station Control Room incorporated into this control cabinet.	Please confirm SCADA interface with fire alarm system is through Fire relay module for Fire Zone information only.?	Refer Technical Specifications. No Change. Tender condition prevails.
72	Section VI, Volume-1, PS, Part-C, TVS & SCADA	4.2	479 of 591	Any equipment without field failure data shall have its failure rate determined strictly in accordance with MIL-HBK-217F for its appropriate operating environment.	Please confirm if MIL-HDBK-217F standard to follow ?	No Change. Tender condition prevails

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73	Section VI, Volume-1, PS, Part-C, TVS & SCADA	4.3.1	480 OF 591	The complete SCADA system shall be designed to meet 99.99% hardware availability.	for Hardware availability, only PLC's hardware to consider for calculation. Please confirm.	Refer Technical Specifications. No Change. Tender condition prevails.
74	Section VI, Volume-1, PS, Part-C, TVS & SCADA	4.8.2	485 OF 591	In order to ensure data integrity, all software files contained within terminal unit equipment shall be able to be up-loaded to the Operations Control Centre and Back-up Control Centre for back-up storage as part of a master file.	Please confirm if there is Backup control center other then OCC and having different physical location from OCC?	BCC envisaged in MEGA project. Tender condition prevails.
75	Section VI, Volume-1, PS, Part-C, TVS & SCADA	5.1	508 of 591	In particular the design and positioning of the mimic displays within the OCC shall be such that the information of interest to each operator is visible from their normal position.	Kindly clarify the requirement to display on mimic display?	This may be decided during detailed design. Tender condition prevails.
76	Section VI, Volume-1, PS, Part-C, TVS & SCADA	5.4	515 of 591	Local Sequential Controller (LSC) by the Contractor shall be provided in the TVS equipment room of each station to maintain the normal operation of the TVS at the station	Please confirm if LSC shall be Touch screen display type and mounted on TVS PLC only to operate TVS modes only?	Touch screen display control panel envisaged for LSC as specified in particular specifications. This may be decided during detailed design stage. No change, Tender conditions prevails.
77	Section VI, Volume-1, PS, Part-C, TVS & SCADA	APPENDIX – C	542 of 591	The enclosed list is only illustrative. Contractor to develop his own I/O list based on this and submit to the Engineer for obtaining NoNO.	Please confirm if IO points of equipments to be consider as per provided IO summary only?	No change. Tender condition prevails.
78	Section VI, Volume-1, PS, Part-A, E&M	7.4	485 of 507	A separate cable tray, trunking or conduit shall be provided for fire alarm cables and 20% spare capacity shall be provided in cable trays/ trunking. All cable containment shall be of hot dipped galvanized iron (GI) material.	Cable Tray & Trunking or conduit not required for FS armoured cable, it should be on saddle. Please confirm?	No change. Tender condition prevails.
79	Section VI, Volume-1, PS, Part-A, E&M	3.16	487 of 507	Response indicator of LED type shall be provided for above false ceiling and below false floor detectors and these shall be mounted outside/ inside the rooms wherever asked for by the contractor/Engineer for indication of fire through detector in the room. The design & colour shall be as per the standard.	Response indicator is used only for indication (by glowing LED) of Fire alarm of non-accessible area. Please confirm if Local manufacturer (other then OEM) with good product quality can be used?	No change. Tender condition prevails.
80	Section VI, Volume-1, PS, Part-A, E&M	CI 1.3.1	E&M Scope 6	Earthing system	As per tender scope of work, we suppose that earthing connection of signalling and telecom room need to be provided at one place, further designated contractor will provide earthing connectivity. Kindly confirm	This is part of Contractor interfacing activity. Tender condition prevails.
81	Section VI, Volume-1, PS, Part-A, E&M	CI 1.3.1	E&M Scope 6	Cable containment for other system wide contractor	As per tender scope of work, we suppose that cable containment need to be considered only for our system, other system wide contractors shall provide containment for their sytem. Kindly confirm	No change. Tender condition prevails.
82	Section VI, Volume-1, PS, Part-A, E&M	CI G.1	E&M-122	Conduit and wire	Whether we can use conduit and wire for lighting as well as power circuit, or lighting bus trunking is compulsory. Kindly confirm	No Change. Tender condition prevails.
83	Section VI, Voiume-2,	SCHEMATICS		ECS-TV SLD	Detailed ECS-TV SLD for electrical. Kindly provide.	This is Contractor scope of works. Refer Tender drawings. Tender condition prevails.

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84	GENERAL			Voltage drop	As per specification no voltage drop has been specified, therefore for cable calculation As per standard practice we have considered 5% voltage drop till the end equipment. Kindly confirm	Based on IEC and IE rules. No change. Tender condition prevails.
85	Section VI, Volume-1, PS, Part-A, E&M	N.3- 1.15	252	Technical and Installation requirement	Kindly confirm the range of pipe sizes for which grooved, Screw or Butt welded fittings are required.	Kindly refer to clarification of pre-bid query Set-2, Sl.No.-72
86	Section VI, Volume-1, PS, Part-A, E&M	O.1- 1.1	267	Pipe Ancillaries	In this section monitored butterfly valve not mentioned so please confirm whether it is required or not.	Correct, required based on Contractor's detailed design.
87	Section VI, Volume-1, PS, Part-A, E&M	R.1-1.1	289	Pumps of Water supply/ Water Treatment	Please clarify, Pump foundation of fire pumps & hydraulic pumps will be in civil scope.	Refer interface matrix. Tender condition prevails.
88	Section VI, Volume-1, PS, Part-A, E&M	T.1-1.1	306	Pumps for fire Protection	Please confirm the fire pump operation is required with external control logic kit or it should be operated by pressure switch only.	Refer Technical Specifications. No Change. Tender condition prevails.
89	Section VI, Volume-1, PS, Part-A, E&M	W.3-3.3-3.4	347	Fire Hydrant and Hose Reel System	For shut off nozzle, please confirm whether stainless steel can be use in place of Brass due to theft issue and working properties of both material are same.	Refer Technical Specifications. No Change. Tender condition prevails.
90	Section VI, Volume-1, PS, Part-A, E&M	3.8	349	Fire Hydrant and Hose Reel System	For orifice plate, please confirm whether stainless steel can be use in place of Brass due to theft issue and working properties of both material are same.	Refer Technical Specifications. No Change. Tender condition prevails.
91	Section VI, Volume-1, PS, Part-A, E&M	X.1- 1.1-4.6	350-353	Fire Hydrant and Hose Reel System	Please confirm whether motorised butterfly valve is required for sprinkler / MVW Spray system or not. What is the scheme for opertaions.	Refer Technical Specifications. No Change. Tender condition prevails.
92	Section VI, Volume-1, PS, Part-A, E&M	X.1- 1.1-4.6	354	Fire Service Equipment	Please provide the list of Portable Fire Extinguisher Room wise.	Refer Technical Specifications. No Change. Tender condition prevails.
93	Section VI, Volume-1, PS, Part-A, E&M	Z.1-1.1-3.17	366-373	Automatic Inert gas flooding	Please confirm the rooms and area required for clean gas flooding system.	Refer Technical Specifications. No Change. Tender condition prevails.
94	Section VI, Volume-1, PS, Part-A, E&M	Z.1-1.1-3.17	366-373	Automatic Inert gas flooding	Please confirm whether clean gas control system/ panel required for all rooms separately or can provide combined system for multiple Room.	This may be decided during detail design based on valid justification, and subject to its acceptance by the Engineer. No change, Tender conditions prevails.
95	Section VI, Volume-1, PS, Part-A, E&M	Z.1-1.1-3.17	366-373	Automatic Inert gas flooding	Please confirm whether clean gas control panel required for all rooms separately or can control by FACP.	Refer item 94. No change, Tender conditions prevails.
96	Section VI, Volume-1, PS, Part-A, E&M	AA.1	374	Fire Alarm and Detection system	Pl. confirm that Normal Fire Survival cable (with Mica Tap) are required for Fire Alarm System.	Refer Technical Specifications. No Change. Tender condition prevails.
97	Section VI, Volume-1, PS, Part-A, E&M	AA.1-1.3	374	Fire Alarm and Detection system	We had considered only NO/ NC contract of FACP for other system wide contractor like PA, Telecom, AFC etc. Pl. clarify.	Refer Technical Specifications. No Change. Tender condition prevails.
98	Section VI, Volume-1, PS, Part-A, E&M	AB.0-1.1-3.17	366-373	Automatic Inert gas flooding	Please confirm panel flooding are required for each and every panel or for some selected panel.	Normally it is required in selected panels. Refer to clause AB.0 (1.3).
99	Reference documents, Design basis Report	5.2.1	17		As per DBR, Fire pump, remote point pressure mentioned minimum 4 bar and maximum 7 bar. So kindly confirm the exact pressure for pump rating selection.	Refer Technical Specifications. No Change. Tender condition prevails.

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100	General				Kindly clarify the Fire hose cabinet is in civil scope and FHC door is in E&M scope. If some where whole portable FHC with door required. It will be in scope of Civil Contractor.	This is part of Contractor detailed design and approval by the Engineer. Tender condition prevails.
101	Section VI, Volume-2, Tender Drawing		14	Typical plumbing schematic system	For station without direct water supply from municipal public mains, a water tank with sufficient storage capacity shall be provided to supply water to the cooling tower tank, portable water tank and Fire tank as per our understanding it will be in civil scope.	Municipal public main water supply may be provided for all UG stations, subject to its availability. Borewell water shall be provided as per PS. No change, Tender condition prevails.
102	Section VI, Volume-2, Tender Drawing		14	Typical plumbing schematic system	The connect to dry water tank one each side without going pneumatic chamber installed at outlet. Water treatment for waste water system. Borewell pump backup whether it is Civil scope or E&M scope. Please clarify.	Tender drawings are for illustrative purpose only. Tender condition prevails.
103	Section VI, Volume-2, Tender Drawing		14	Typical plumbing schematic system	Stray current insulation pit, cooling tower treatment tank & Fire tank with puddle flanges as per our understanding it is in civil scope.	Tender drawings are for illustrative purpose only. Tender condition prevails.
104	Section VI, Volume-2, Tender Drawing		15	Typical pump & Tank layout	Fire storage station cleaning tank, water tank, drinking water tank as per our understanding it is in civil scope.	Tender drawings are for illustrative purpose only. Tender condition prevails.
105	Section VI, Volume-2, Tender Drawing		17	Typical sewage-drainage schematic in station	Pipe connection to municipal sewer is in civil scope, as per our understanding.	Tender drawings are for illustrative purpose only. Tender condition prevails.
106	Section VI, Volume-2, Tender Drawing		21	Typical Fire hydrant and sprinkler system schematic in station.	Please clarify for our understanding, to sprinkler areas in borewell back up and scope.	Tender drawings are for illustrative purpose only. Tender condition prevails.
107	Section VI, Volume-2, Tender Drawing			Station Air conditioning Air flow schematics and Chilled & Chilled & Condenser water schematic	As per air flow schematics 2 no's AHU's are shown at each end of station whereas as per chilled & condenser water schematics 3 nos. AHU's are shown at each end please clarify.	Tender drawings are for illustrative purpose only. Tender condition prevails.
108	Section VI, Volume-2, Tender Drawing			Chilled & Chilled & Condenser water schematic	In Chilled & condenser water schematic, no provision of Air separator is shown, please confirm the requirement for the same.	Tender drawings are for illustrative purpose only. Tender condition prevails.
109	Section VI, Volume-2, Tender Drawing			Chilled & Chilled & Condenser water schematic	Provide schematics with Air Cooled Chiller system arrangement with Air Cooled to water cooled system by pass arrangement.	Tender drawings are for illustrative purpose only. Tender condition prevails.
110	Section VI, Volume-2, Tender Drawing			Chilled & Chilled & Condenser water schematic	Confirm the requirements of Bleed off valves.	Tender drawings are for illustrative purpose only. Tender condition prevails.
111	Section VI, Volume-2, Tender Drawing			Chilled & Chilled & Condenser water schematic	Rooms chilled water piping scheme is not mentioned, please provide the scheme.	Tender drawings are for illustrative purpose only. Tender condition prevails.
112	Section VI, Volume-2, Tender Drawing			Station Air conditioning Air flow schematics	Return air scheme is not clear from drawings for concourse and platform. Please provide Schematics with return air scheme in both open and close mode.	Tender drawings are for illustrative purpose only. Tender condition prevails.
113	Section VI, Volume-2, Tender Drawing			Station Air conditioning Air flow schematics	No return air Fans are showing as per schematic diagram, Please clarify the requirements.	Tender drawings are for illustrative purpose only. Tender condition prevails.
114	Section VI, Volume-2, Tender Drawing			Station Air conditioning Air flow schematics	No fresh Air fans are showing in schematics, please confirm the requirement.	Tender drawings are for illustrative purpose only. Tender condition prevails.
115	Section VI, Volume-2, Tender Drawing		8 of 106	BMS - TENDER DRAWING	Rail Temperature, SISMIC & intrusion sensor equipment shown under UG E&M contractor scope. Please confirm these equipment or sensors to provide by system wide contractor and only monitoring to done by SCADA system provide by UG E&M contractor.	Tender drawings are for illustrative purpose only. Tender condition prevails.
116	Section VI, Volume-2, Tender Drawing		10 of 106	BMS - TENDER DRAWING	#6 no's SIL-3 PLC shown for ECS, Electrical & BS services. Please confirm if same quantity of PLC's to used for mentioned system.	Tender drawings are for illustrative purpose only. Tender condition prevails.

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117	Section VI, Volume-2, Tender Drawing		10 of 106	BMS - TENDER DRAWING	#2 no's SCADA workstation for ECS, Elect & BS service shown in Schematic drawing, Please confirm if TVS SCADA to consider in these system only or to consider seprate as shown in TVS SCADA system schematic (Page 11 of 106)	Tender drawings are for illustrative purpose only. Tender condition prevails.
118	Section VI, Volume-1, PS, Part-B, ECS & BMS	A00.8.1.5	ECS 10	The station shall be air-conditioned with the help of air handling units, located in each ECS plant rooms. The concourse and the platform will be served by these AHUs. The fresh air for station shall be provided by axial fans located 1 each in each ECS plant room. The ancillary rooms shall be air conditioned with fan coil units as detailed elsewhere. Fresh air for these areas shall be provided through Centrifugal fan air units.	Which Rooms in Ancillary Buildings to be air conditioned with FCU, please provide station wise list.	Please refer to thermal calculation report. During detailed design, Contractor to interface and furnish his proposal with valid justification to the Engineer for his approval. Tender condition prevails.
119	Section VI, Volume-1, PS, Part-B, ECS & BMS	A00.8.1.7.	ECS 11	Ancillary area ventilation system (AVS)	Chiller Plant Rooms & Fire Pump Rooms to be ventilated or Air conditioned, Please Clarify.	Chiller plant room & Fire pump room to be ventilated, as per Contractor's detailed design and subject to its acceptance by the Engineer.
120	Section VI, Volume-1, PS, Part-B, ECS & BMS	A00.8.1.8.	ECS-11	The TES consists of Trackway Exhaust Fans (TEF) connected to ducts running over the track, if OTE is proposed, or fire rated duct running at the platform level with branch connected to the track side above the PSD's downstand and under the platform. This system under normal circumstances functions as the return air system for the AHU again. In case of fire or smoke these fans will also be utilised for extracting the smoke from Platform. Smoke extraction from the concourse will be through the Smoke extract fans.	If stations are with Full height PSD's, then how Return Air will be taken from OTE & under platform and what will be the scheme for return air from Concourse & Platform level., this scheme is not clear please clarify the scheme.	Kindly refer to clarification of Pre-bid query Set-1, Sl. No. 15, 19.
121	Section VI, Volume-1, PS, Part-B, ECS & BMS	A00.8.1.7.	ECS-11	The ventilation system consists of the following:	Provide the philosophy for undercroft ventilation.	Bidder to propose suitable design philosophy for undercroft ventilation during detailed design for Engineer's approval. Tender condition prevails.
122	Section VI, Volume-1, PS, Part-B, ECS & BMS	Section A04	ECS 62	Section A04: Air Cooled Chillers with Scroll Compressors	Please confirm standby requirements for Air cooled chiller for Cooling in revenue hours	Water cooled chiller are envisaged during revenue hours and air cooled chiller during non revenue hours..
123	Section VI, Volume-1, PS, Part-B, ECS & BMS	Section A04	ECS 62	Section A04: Air Cooled Chillers with Scroll Compressors	Please provide the list of Critical rooms for which 24 X 7 Air conditioning required, also please clarify whether standby arrangements are required or not.	Please refer to detail given in Employer's Requirements and reference document for list of critical rooms. Refer to sl.no. 122 above. Tender conditons prevails
124	Executive summary			Executive summary report, SN 3 to addendum-1 dated 19-06-2018- Table 13 to table 17	As per given tables AHU's are used for Air conditioning of E & M rooms of both side, offices & BOH, SCR, & IT/signal rooms. Please clarify the requirements of Standby arrangements in critical rooms.	Kindly refer to clarification given in Sl. No. 122 above.
125	Reference documents, Design basis Report	5.1.2		Outside Temperatures	As per DBR, summer DBT & WBT are given 41 Deg C & 22.8 Deg C respectively and Monsoon DBT & WBT are given 38.2 & 26.1 Deg C, however as per Executive Summary Report, SN 3 to Addendum-1 Dated 19-06-2018 Page 10 of 14 Data used in calculation for HAP for summer DBT & WBT are given 42.2 Deg C & 23.3 Deg C and monsoon DBT & WBT not given. Please clarify what are the final design conditions.	Refer data given in Executive Summary. For equipment sizing, monsoon data may not be required. Tender conditions prevails.

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126	Reference documents, Design basis Report	5.1.5		Outside Air Requirements for Concourse Level	As per DBR, outside air required for Station Concourse is 4.1 Lps/person + 0.3 Lps/sq.m whereas as per space input data(Thermal Calculation) used in calculation out side air requirement is 8.5 Lps/person + 0.3 Lps/ Sq.m .Please clarify which conditions to be followed for design calculations.	Data is given for concourse area and BOH area. Tender conditions prevails.
127	Reference documents, Design basis Report	5.1.5		Heat Gain - sensible/latent	As per DBR, sensible and latent load per person is 80 W for platform and concourse public areas, whereas as per data used in space input data (Thermal Calculation) it is given as, sensible load is 82.1 Watt/person & latent load 79.1 watt/person, Please clarify.	Thermal calculation report data will prevail. Tender conditions prevails.
128	Reference documents, Design basis Report	5.1..3		Indoor Design conditions	TVS room to be ventilated or air conditioned please clarify.	TVS room will be ventilated. Tender condition prevails.
129	Reference documents, Design basis Report	5.1..4		Occupancy estimate for VAC calculations	Please specify the occupancy criteria for BOH areas.	In thermal calculation report, relevant data given may be referred. It is also interfacing issue discussed during detailed design.
130	Reference documents, Design basis Report	5.1..3 & 5.1.5		Indoor Design conditions & ventilation	As per table indoor design conditions Electrical LV rooms, E&M rooms, UPS battery Rooms to be air conditioned, whereas as per ventilation clause ASS/YTSS, UPS Battery , LV rooms Pump rooms to be ventilated, please clarify these rooms to be air conditioned or to be ventilated.	Electrical DB room, Pump room to be ventilated. ASS/TSS, UPS Battery room air-conditioning and ventilation requirements to be decided during detailed design & interfacing activities of E&M Contractor subject to its acceptance by Engineer. Tender condition prevails.
131	Reference documents, Design basis Report			Space input Data	As per space input data (Thermal Calculation), Sewage ejector Rooms, Spare Rooms, ECS Rooms, Staff lockers male & female, Cleaners room, Store Room, seepage sump room, Emergency and service stairs to be air conditioned. Kindly confirm these rooms to be air conditioned or to be ventilated.	Sewage ejector rooms, seepage sump room, emergency and service stairs not to be air-conditioned. Tender Conditions prevails.
132	Reference documents, Design basis Report			Space input Data	As per space data input (Thermal Calculation) used in Air conditioning calculation for staff mess room, occupancy is given 4.32 sqm/ person but in DBR no such criteria is mentioned, please clarify.	This is part of contractor's interfacing activity during detailed design and approval by Engineer. Tender condition prevails.
133	Reference documents, Design basis Report	5.1.5		Heat Gain - sensible/latent for offices & Rooms	As per DBR, sensible and latent load per person for offices is 75 W /person and 55 w/person respectively and for E&M rooms it is given as 80w/person & 140 w/person, whereas as per Space input t data (Thermal Calculation) used for calculations values for sensible and latent loads are 71.8 W/person & 60.1 W/person respectively and these values are common for all rooms, please clarify.	Data mentioned in thermal calculation report may be referred. However this is the part of contractor interfacing activity with designated contractors subject to Contractor's design Approval by Engineer.
134	General				If scheme will be changed from the contract tender document at the time of detailed design then it will be considered variation. Please confirm.	Not Acceptable. This is a design and built contract. No Change, Tender conditions prevails.
135	General				OTE & UPE duct to be provided by others. Please confirm.	Kindly refer to clarification of Pre-bid query Set-1, Sl. No. 54.
136	General				All minor & major civil works like equipments related plinths, pockets, insertion plates, floor, slabs opening supports, RCC foundation, opening & their finishing, structure support, hooks & other related to civil work in civil contractor scope, please confirm.	Refer Interface table, civil works to be performed by Civil contractor specified as in scope of Civil Contractor. E&M contractor is responsible for preparation of design and provision of any special inserts on or before finish of construction activity as part of interfacing with civil contractor. Any defects / repair works, etc. in sizing & finishing etc. in civil related work will be the responsibility of E&M contractor. Closing of oversized openings, in structural and blockwork walls as well as in slabs, after installation of E&M systems, is in the scope of E&M Contractor, refer particular specifications. No change, Tender conditions prevails.
137	General				Please clarify the requirement of pipe cladding.	Please refer to Section A07 (page no. ECS 95).
138	General				Drain points for Air conditioning system to be provided by Civil, Please confirm	It is an interface issue. E&M contractor to interface with designated contractor to ensure that work is complete. Tender conditions prevails.

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139	General				For water tap in equipment rooms for cleaning the filter & other a/c system & drain point for termination the FCU/AHU/Chiller Plant room /TVS rooms to be provided by others Please confirm.	It is an interface issue. E&M contractor to interface with designated contractor to ensure that work is complete. Tender conditions prevails.
140	General				All RCC & masonry foundation and structural steel supports for equipment to be provided by civil contractor. Please confirm.	Kindly refer to Sl. No. 136 above.
141	General				All opening & cut-out in wall, floor & slabs & their finishes to be done by civil contractor. Please confirm.	Kindly refer to Sl. No. 136 above.
142	General				Water for flushing of the system to be provided by the other system contractor. Please confirm.	Please refer to Chapter 22 at GS-181.
143	General				Fire sealing of opening in wall, floor, slab, sleeves & unused slots & other general construction to be done by civil contractor, after installation. Please confirm.	It is an interface issue. E&M contractor to interface with designated contractor to ensure that work is complete. Tender conditions prevails.
144	Executive summary report, SN 3 to addendum-1 dated 19-06-2018		2 Of 14	Executive summary report, SN 3 to addendum-1 dated 19-06-2018-Page no. 2 of 14	As per Executive summary it is given that in normal mode total 8 nos. fans of capacity 150000 CMH will be used or in emergency and congestion mode 8 nos. fans of capacity 300000 CMH will be used whereas as per SES conclusion Clause 9 Page no. 53 in normal mode air flow required is 150000 CMH and in emergency and congested mode air flow required is 300000 CMH, by this we understand that total nos. of fans at each station are either 8 nos. having capacity 150000 CMH per station or 4 nos. fans having capacity of 300000 CMH per station. Please clarify.	Please refer to clarification issued in Set 5, Sl. No. 2.
145	Reference documents SES report	SES- Clause 7.2.3		In emergency operation PSD installed-TVF's have however to be equiped with fans providing 300000 CMH therefore there is no need to install also jet fans.	As per our understanding there are no jet fans required at ramp and in tunnel, Please confirm.	Refer Executive summary. Jet fans may not be required at ramp and in bored tunnel area, however, E&M Contractor to ensure that the functionality and performance of TVS system are not compromised under his scope of works. Tender conditions prevails.
146	Reference documents SES report	SES- Clause 8.4		.Nozzle have not been taken into account due to space constraint	Whereas as per Drawings tunnel ventilation system air flow schematics - page 27 supply nozzles are shown, as per our understanding there are no nozzle will be used in this project due to space constraint please confirm	Nozzles are not envisaged, refer executive summary. However, Contractor may propose the complete TVS system with / without nozzles subject to acceptance of the same by the Engineer based on site space constraints. Tender condition prevails.
147	Reference documents SES report	SES- Clause 8.1.2 -..		Tunnel Motorized dampers	As per this clause in emergency scenario total air flow required is 400000 CMH air flow and damper selection will be as per 200000 but as per executive summary dated 19-06-2018 fans air flow in emergency scenario are either 1500000 or 300000 CMH , so dampers selection shall be accordingly, please confirm.	Damper selection will be based on Fan capacity. No change, Tender condition prevails.
148	Reference documents DBR	DBR-6.1.6		Air conditioning system strategy -.. Platform will be designed to have 100 % fresh air.	If taking 100 % fresh air then 100 % supplied air to be exhaust from platform level, for this separate fans to be considered for exhaust from platform level. Please confirm	This strategy not to be followed. Tender condition prevails.

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149	Reference documents DBR	DBR-6.1.6		Air conditioning system strategy	Return air scheme for concourse level is not clear, Please confirm return air path will be through ducts or from through false ceiling(non ductable).	At present, ECS plant rooms are placed at station ends and return air envisaged through ducting. During detailed design, Contractor to propose dedicated AHU installation for concourse supply with return air ducting, such proposal may be reviewed by Engineer subject to submission of valid justification for the same and conformation of the provisions provided in relevant applicable standards without compromising the safety to the public. Separate smoke exhale fire rated duct conforming to PS may be provided. Such proposal is subject to approval by Engineer. No change, Tender conditions prevails. At present, ECS plant rooms are placed at station ends and return air envisaged through ducting. During detailed design, in case Contractor propose dedicated AHU installation in concourse public area for concourse supply, then such proposal may be reviewed by Engineer subject to submission of valid justification for the same and conformation of the provisions provided in relevant applicable standards without compromising the safety to the public. In such case, the return air to the AHU may be proposed without ducting. However smoke extraction shall be provided using fire rated duct conforming to PS. Such proposal is subject to approval by Engineer. No change, Tender conditions prevails.
150	Reference documents SES report	SES- Clause 8.1.2 -..		Tunnel Motorised dampers	Please confirm in Tunnel ventilation dampers actuators will be Pneumatic type or electrical type.	Refer Technical Specifications. No Change. Tender condition prevails.
151	Reference documents DBR	DBR-5.1.3 & 6.1.7		Indoor Conditions, general exhaust air system	As per clause 5.1.3 UPS battery rooms to be maintained at 24 +/- 1 Deg whereas as per clause 6.1.7 mechanical exhaust is required in the UPS battery rooms, Please clarify this room to be ventilated or to be air conditioned.	Refer Technical Specifications. No Change. Tender condition prevails.
152	Reference documents DBR	DBR-7.4.4.3.2		Emergency mode with train fire in tunnel	As per this clause 75 CMS & 100 CMS fans are used but as per executive summary 41.66 CMS & 83.33 CMS fans are used, please clarify which fans to be considered.	Refer Executive Summary. Contractor to verify and propose suitable design proposal during detailed design for Engineer's approval with valid justifications. Tender condition prevails.
153	Reference documents DBR	DBR-6.1.5		Chiller plant design- The chillers and related plant equipments will be 10 - 15 % additional capacity for future provisions. Standby chillers will be included for a non- interrupt operation of the station.	Please confirm The requirements of standby chiller for station.	Please refer to Executive summary issued in Addendum-1. Tender condition prevails.
154	Executive summary report, SN 3 to addendum- 1 dated 19-06-2018	Addendum	2 Of 14	Active fans which Provide an air flow of 150000 CMH and 200000 CMH each	When the air flow requirements in normal conditions is 150000 CMH and in emergency & congested scenario is 300000 CMH, please clarify in which conditions 200000 CMH air flow required.	Our system is with PSD, Accordingly fan selection will be made, subject to Engineer's approval. Tender conditions prevails.
155	Reference documents DBR	6.1.6		back of house areas will be provided with fan coil unit with treated outdoor air from dedicated fresh air handling units.	Please confirm whether dedicated treated fresh arrangement is required for BOH rooms or not.	This is part of contractor's detailed design and approval by the Engineer. Input parameters issued for reference only. Tender condition prevails.

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156	Reference documents DBR	6.1.6		back of house areas will be provided with fan coil unit with treated outdoor air from dedicated fresh air handling units.	Treated fresh air required in BOH areas is for all rooms or only man equipped rooms, please provide the list of rooms required fresh air.	This is part of contractor's detailed design and approval by the Engineer. Input parameters issued for reference only. Tender condition prevails.
157	Reference documents DBR	6.1.6		General -...UPS and Battery rooms will have dedicated FCU with 100% back up of DX cooling units for emergency.	Please confirm the requirements of standby units, it will be N+1 or N+N.	(N+1) to be followed. Tender conditions prevails.
158	Reference documents DBR	DBR-7.4.7		Recommendations and further steps - Change from Basis to Developed Reference Design (e.g. incorporating results from SES studies, replacement of concrete OTE with fire rated metallic duct suspended from ceiling connected to TEF with fire rated damper, which will be operating only during emergency conditions)	Please Clarify whether OTE will be of concrete or metallic, OTE duct will be in Civil scope.	Kindly refer to clarification of Pre-bid Query Set-1, Sl. No. 54.
159					As per our understanding there are no undersupply fans used in this projects.	No undersupply fans are envisaged. Tender condition prevails.
160	Section VI , Vol-1 PS, Part B- ECS & BMS	A14.3.12	ECS 168	Acoustic Lining of Equipment Rooms	Please confirm the requirements of acoustic lining of AHU rooms.	Refer Technical Specifications. No Change. Tender condition prevails.
161				Bidders query response -Extract air from the OTE and UPE will Not act as return air for AHU in Open system mode. We are using the full height PSD in underground stations.	If OTE & UPE will not act as return air for AHU in Open system, then what scheme will be followed in closed system.	Plantroom system based on space provisions, with full height PSD installed at platform will be basis of detail design by the Contractor, subject to its acceptance by the Engineer. Tender conditions prevails.
162	Section VI , Vol-1 PS, Part B- ECS & BMS	A 21.3	ECS 177	Water treatment for Condenser water systems	Sleeves for Cooling Tower makeup with isolation valves from treated up water tank to be provided by civil contractor.	Kindly refer to clarification of Pre-bid query Set-1, Sl. No. 39.
163	Executive summary report, SN 3 to addendum- 1 dated 19-06-2018		8 Of 14	Table 5- general assumptions and input data	In given table - 5 Tunnel Temperatures is given 35 Deg C & maximum operating temperature in normal conditions is 46 Deg C, which temperature to be maintained in normal condition. Please clarify.	Kindly refer to clarification of Pre-bid query Set-2, Sl. No. 63.
164	Executive summary report, SN 3 to addendum- 1 dated 19-06-2018 & Reference documents DBR	5.1		Environment Control System (ECS) or Ventilation and Air conditioning (VAC) System :- For chillers, water cooled type / air cooled type chillers shall be selected based on the required cooling load. Chillers shall be provided in N duty configuration with 25% spare capacity.	As per DBR clause 5.1, 25 % spare capacity is required for chillers, please clarify that equipments capacities given in executive summary includes this 25 % spare capacity or not. Please confirm	Kindly refer to clarification of Pre-bid query Set-1, Sl. no. 58.

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165	Section VI, Volume-2, SHEM	MEGA/SHE/GI/001	SHE 138	Minimum Manpower Requirements of the Organization bases on contract value	The professionals and support staff mentioned under GI/SHE/GI/001 (Minimum manpower requirements Table) is typically for Civil Contractor. We as E&M, ECS &TVS contractor recommend professionals for 6 Heads and Visiting Doctor/ Health Officer and 1 safety steward in each shift at each site. This is as per our experience with the similar work in other metro projects. Please confirm as the same shall be important to effectively bid for the project. Also, OSHE staff shall be deputed as per the project requirement and not for entire course of contract. Please Confirm	No Change. Tender condition prevails.
166	Section VI, Volume-1, General Specification	15.4	GS - 144	The Contractor's Site Accommodation	We request Employer to kindly make available 500 Sq. Mtr. Space for Site Office & Site Store at respective stations.	No Change. Tender condition prevails.
167	Section III EQC	1.1.1	EQC - 2	PERSONNEL	The personnel mentioned in Sr. No. 6- 14 required for Individual site or for the oval all project. Kindly clarify.	No Change. Tender condition prevails.
168	Section VII General Condition	4.8	GC-22	Safety Procedure	It is proposed that, the contractor shall comply with safety procedures attributable to the works assigned and awarded to contractor only and for its own workmen and work area in relation to i.e. light, guard, watchmen, etc. For remaining areas which is not in the scope of the contractor, overall safety of works shall be provided by the Employer only. Please confirm.	No Change. Tender condition prevails.
169	Section VII General Condition	4.13	GC-24	Rights of way and facilities	Access route to site shall be provided to contractor by the Employer. In case of special requirement the same should also be provided. Please confirm.	No Change. Tender condition prevails.
170	Section VII General Condition	4.15	GC-24	Access Route	In this regard please confirm that even after having satisfied on base date the access routes shall remain available to the contractor till the work completion of his work and shall not be blocked / obstructed by the reason not attributable to contractor.	No Change. Tender condition prevails.
171	Section VII General Condition	4.19	GC-26	Electricity, Water and Gas	The employer should provide electricity, water and gas for testing of equipments and work at site free of cost. Please confirm.	No Change. Tender condition prevails.
172	Section VII General Condition	6.6	GC-33	Facilities for staff and labour	The contractor shall provide facilities to his personnel only and not for Employer's personnel. Please confirm.	No Change. Tender condition prevails.
173	Section VII General Condition	6.7	GC-33	Health and Safety	The contractor shall appoint an Accident Prevention officer who shall visit the site whenever required and a safety in charge or supervisor shall be additionally appointed who shall be present at site all the time and shall comply with all the requirements for Health and Safety.	No Change. Tender condition prevails.