



MUMBAI METRO RAIL CORPORATION LIMITED (MMRC)

(Joint Venture of Govt. of India and Govt. of Maharashtra)
 NaMTTRI Building, Behind MMRDA, Near Jetwan, Plot No. R-13, 'E' - Block,
 Bandra Kurla Complex, Bandra (East), Mumbai 400051, India.
 Telephone: +91-22-26597654, Fax: +91-22-26590150

Design, Manufacture, Supply, Installation, Testing and Commissioning of Tunnel Ventilation System & Environmental Control System between Aarey (including) to BKC (including) Stations; TVE Phase-1 (Package:15)

Date: 17th July, 2018]

Loan Agreement Number: [ID-P 233]

IFB Number: [MM3-CBS-TVE-Phase 1]

Addendum No: 3

Sr. No.	Description and Clause No.	Amendment
1	Part 4: Drawings Section X, Drawings	<p><u>Replace Station Environmental Control System Drawing</u></p> <p>DRAWING NO.: GCC-TVE-P00-0001-020_A0 DRAWING TITLE: WATER FLOW SCHEMATIC ENVIRONMENTAL CONTROL SYSTEM (SHEET 1 OF 2)</p> <p><u>With</u></p> <p>DRAWING NO.: GCC-TVE-P00-0001-020_A1 DRAWING TITLE: WATER FLOW SCHEMATIC ENVIRONMENTAL CONTROL SYSTEM (SHEET 1 OF 2)</p> <p>See Attachment No. 1 of TVE PHASE-1 Addendum No.3</p>
2	Part 4: Drawings Section X, Drawings	<p><u>Replace Station Environmental Control System Drawing</u></p> <p>DRAWING NO.: GCC-TVE-P00-0001-027_A0 DRAWING TITLE: ELECTRICAL SCHEMATIC DIAGRAM FOR CHILLER PLANT ROOM</p>

Sr. No.	Description and Clause No.	Amendment
		<p><u>With</u></p> <p>DRAWING NO.: GCC-TVE-P00-0001-027_A DRAWING TITLE: ELECTRICAL SCHEMATIC DIAGRAM FOR CHILLER PLANT ROOM</p> <p>See Attachment No. 2 of TVE PHASE-1 Addendum No.3</p>
3	Part 4: Drawings Section X, Drawings	<p><u>Replace Station Environmental Control System Drawing</u></p> <p>DRAWING NO.: GCC-TVE-P00-0001-026_A0 DRAWING TITLE: ELECTRICAL SCHEMATIC DIAGRAM FOR ECS</p> <p><u>With</u></p> <p>DRAWING NO.: GCC-TVE-P00-0001-026_A DRAWING TITLE: ELECTRICAL SCHEMATIC DIAGRAM FOR CHILLER PLANT ROOM</p> <p>See Attachment No. 3 of TVE PHASE-1 Addendum No.3</p>
4	Part 2: Employer’s Requirements, Section VI-B1, Technical Specifications for Environmental Control System Clause: 5.3.5 Page: 23 of 145	<p><u>Replace</u></p> <p>“Retail areas shall be provided with “Warm Shell” ECS except Sidhivinayak station Intermediate Level and retail in unpaid areas at both Cuffe Parade and BKC stations. The provisions shall include chilled water supply and return pipe connections with energy meter and motorized valves; and, fresh air supply duct terminated at the boundary of each retail zone under 200m². For retail zone larger than 200m², the “Warm Shell” provision shall be provided for every 200m². SCADA system shall log the usage of the cooling energy and report to MMRC for billing purpose. Chilled water shall be provided during revenue service hours.”</p> <p><u>With</u></p>

Sr. No.	Description and Clause No.	Amendment
		<p>“Retail areas shall be provided with “Warm Shell” ECS except Sidhivinayak station Intermediate Level. The provisions shall include chilled water supply and return pipe connections with energy meter and motorized valves; and, fresh air supply duct terminated at the boundary of each retail zone under 200m². For retail zone larger than 200m², the “Warm Shell” provision shall be provided for every 200m². SCADA system shall log the usage of the cooling energy and report to MMRC for billing purpose. Chilled water shall be provided during revenue service hours.”</p>
5	Part 4: Drawings Section X, Drawings	<p><u>Replace Station Ancillary Building Drawing</u></p> <p>DRAWING NO.: MM3-GC-AR-1081301-R0 DRAWING TITLE: PLAN/SECTION/ELEVATION</p> <p><u>With</u></p> <p>DRAWING NO.: MM3-GC-AR-1081301-R1 DRAWING TITLE: PLAN/SECTION/ELEVATION</p> <p>See Attachment No. 4 of TVE PHASE-1 Addendum No.3.</p>
6	Part 2: Employer’s Requirements, Section VI-B4, Technical Specifications for Electrical Clause: 2.3.3 Page: 5 of 165	<p><u>Replace Sub Clause</u></p> <p>“q. Electrical Panels shall be draw out type”.</p> <p><u>With</u></p> <p>“q. Electrical Panels shall be draw out type or fixed type”.</p>
7	Part 2: Employer’s Requirements, Section VI-B4, Technical Specifications for Electrical Clause: 5.3.2 Page: 44 of 165	<p><u>Replace Sub Clause f</u></p> <p>“f (vii). To enable the motor and starter to be completely isolated from the main supply and from all control supplies for inspection and repairs by means of draw out type unit for each starter circuit.”</p>

Sr. No.	Description and Clause No.	Amendment
		<p><u>With</u></p> <p>“f (vii). To enable the motor and starter to be completely isolated from the main supply and from all control supplies for inspection and repairs.”</p>
8	Part 2: Employer’s Requirements, Section VI-A, General Specifications including Appendices Appendix 8	<p><u>Delete</u></p> <p>“Appendix 8.”</p>
9	Part 2: Employer’s Requirements, Section VI-A, General Specifications including Appendices Chapter: 11	<p><u>Add Clause 11.4</u></p> <p>See Attachment No. 5 (Revised Chapter 11) of TVE PHASE-1 Addendum No.3.</p>
10	Part 4: Drawings Section X, Drawings	<p><u>Add Mid Ventilation Shaft (detail of TVE requirement):</u></p> <p>“Drawing Title: System Schematic Normal Operation Drawing No.: GCC-TVE-POO-0001-014-A0”</p> <p>See Attachment No. 6 of TVE PHASE-1 Addendum No.3.</p>
11	Part 2: Employer’s Requirements, Section VI-A, General Specifications including Appendices Appendix 23 Clause: 3 Page: 1 of 9	<p><u>Replace</u></p> <p>“CPM programming software used shall be latest version of Primavera Project Planning (P6) Program /Proliance /Project-wise. Scheduling software and relevant instruction manuals, licensed for use in connection with the contract, shall be provided by the Contractor according to the Employer’s specifications. The Contractor shall supply the Employer’s Representative with an original licensed copy, including manuals and approved training of the software and any subsequent versions thereof at no extra cost.”</p>

Sr. No.	Description and Clause No.	Amendment
		<p><u>With</u></p> <p>“CPM programming software shall be of Primavera Project Planning (P6) Program of the latest version. Scheduling software and relevant instruction manuals, licensed for use in connection with the contract, shall be provided by the Contractor according to the Employer’s specifications. The Contractor shall supply the Project Manager with an original two (2) licence, including manuals and approved training of the software and any subsequent versions thereof at no extra cost.”</p>
12	<p>Part 2: Employer’s Requirements, Section VI-A, General Specifications including Appendices Appendix 11 Clause: 9 Page: 7 of 15</p>	<p>Replace Last Two Sentence</p> <p>“The System Contractor shall supply original one (1) licence including manuals and approved training of all necessary software and any subsequent versions thereof at no extra cost. The software shall include but not limited to Revit/NavisWorks or equivalent.”</p> <p>With</p> <p>“The TVE Contractor shall supply original two (2) licences including manuals and approved training of all necessary software and any subsequent versions thereof at no extra cost. The software shall include but not limited to Revit & NavisWorks or equivalent.”</p>
13	<p>Part 4: Drawings Section X, Drawings</p>	<p><u>Replace following drawings of BKC station:</u></p> <p>UGC05-ARP-SBA-1000-001-A4-P UGC05-ARP-SBA-1100-001-A3-P UGC05-ARP-SBA-1200-001-A2-P UGC05-ARP-SBA-1300-001-A3-P UGC05-ARP-SBA-1400-001-A3-P UGC05-ARP-SBA-1500-001-A3-P UGC05-ARP-SBA-1600-001-A3-P UGC05-ARP-SBA-1600-011-A3-P UGC05-ARP-SBA-1600-012-A3-P</p>

Sr. No.	Description and Clause No.	Amendment																																																
		<p><u>With the following drawings of BKC station:</u></p> <p>UGC05-ARP-SBA-1000-001-A7-D UGC05-ARP-SBA-1100-001-A6-D UGC05-ARP-SBA-1200-001-A5-D UGC05-ARP-SBA-1300-001-A7-D UGC05-ARP-SBA-1400-001-A6-D UGC05-ARP-SBA-1500-001-A6-D UGC05-ARP-SBA-1600-001-A6-D UGC05-ARP-SBA-1600-011-A4-D UGC05-ARP-SBA-1600-012-A4-D</p> <p>Refer Attachment No. 7 of TVE PHASE-1 Addendum No.3.</p>																																																
14	Part 2: Employer’s Requirements, Section VI-B1, Technical Specifications for Environmental Control System Table: 6.1 Page: 36 of 145	<p><u>Replace Table 6.1: Air conditioning required rooms</u></p> <table border="1" data-bbox="674 858 2119 1374"> <thead> <tr> <th>S.NO.</th> <th>ROOM NAME</th> <th>Design Temp, °C</th> <th>Design Humidity, %</th> <th>No. of Persons</th> <th>Indicative Equipment Heat load (kW)</th> <th>Stand by</th> <th>24/7 Operation</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>Cash & Audit</td> <td>30</td> <td>55</td> <td>2</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>25</td> <td>Public area Concourse Level</td> <td>28</td> <td>60</td> <td>2m²/person</td> <td>To coordinate with system Contractors</td> <td>-</td> <td>-</td> </tr> <tr> <td>26</td> <td>Back of House corridors</td> <td>28</td> <td>60</td> <td>2</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>27</td> <td>Public area Platform Level</td> <td>27</td> <td>60</td> <td>1m²/person</td> <td>To coordinate with system Contractors</td> <td>-</td> <td>-</td> </tr> <tr> <td>28</td> <td>Public area Mezzanine level</td> <td>28</td> <td>60</td> <td>2m²/person</td> <td>To coordinate with system Contractors</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	S.NO.	ROOM NAME	Design Temp, °C	Design Humidity, %	No. of Persons	Indicative Equipment Heat load (kW)	Stand by	24/7 Operation	10	Cash & Audit	30	55	2	-	-	-	25	Public area Concourse Level	28	60	2m ² /person	To coordinate with system Contractors	-	-	26	Back of House corridors	28	60	2	-	-	-	27	Public area Platform Level	27	60	1m ² /person	To coordinate with system Contractors	-	-	28	Public area Mezzanine level	28	60	2m ² /person	To coordinate with system Contractors	-	-
S.NO.	ROOM NAME	Design Temp, °C	Design Humidity, %	No. of Persons	Indicative Equipment Heat load (kW)	Stand by	24/7 Operation																																											
10	Cash & Audit	30	55	2	-	-	-																																											
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27	Public area Platform Level	27	60	1m ² /person	To coordinate with system Contractors	-	-																																											
28	Public area Mezzanine level	28	60	2m ² /person	To coordinate with system Contractors	-	-																																											

Sr. No.	Description and Clause No.	Amendment					
		29	Subway	28	60	3m ² /person	To coordinate with system Contractors
<u>With Table 6.1: Air conditioning required rooms</u>							
S.NO.	ROOM NAME	Design Temp, °C	Design Humidity, %	No. of Persons	Indicative Equipment Heat load (kW)	Stand by	24/7 Operation
10	Cash & Audit	25	55	2	-	-	-
25	Public area Concourse Level	27	55	2m ² /person	To coordinate with system Contractors	-	-
26	Back of House corridors	27	55	2	-	-	-
27	Public area Platform Level	27	55	1m ² /person	To coordinate with system Contractors	-	-
28	Public area Mezzanine level	27	55	2m ² /person	To coordinate with system Contractors	-	-
29	Subway	28	N/A	3.5 m ² /person	To coordinate with system Contractors	-	-
<u>Add Following Rooms in Table 6.1</u>							
S.NO.	ROOM NAME	Design Temp, °C	Design Humidity, %	No. of Persons	Indicative Equipment Heat load (kW)	Stand by	24/7 Operation
39	BCC Staff	25	55	3.5	2	●	●

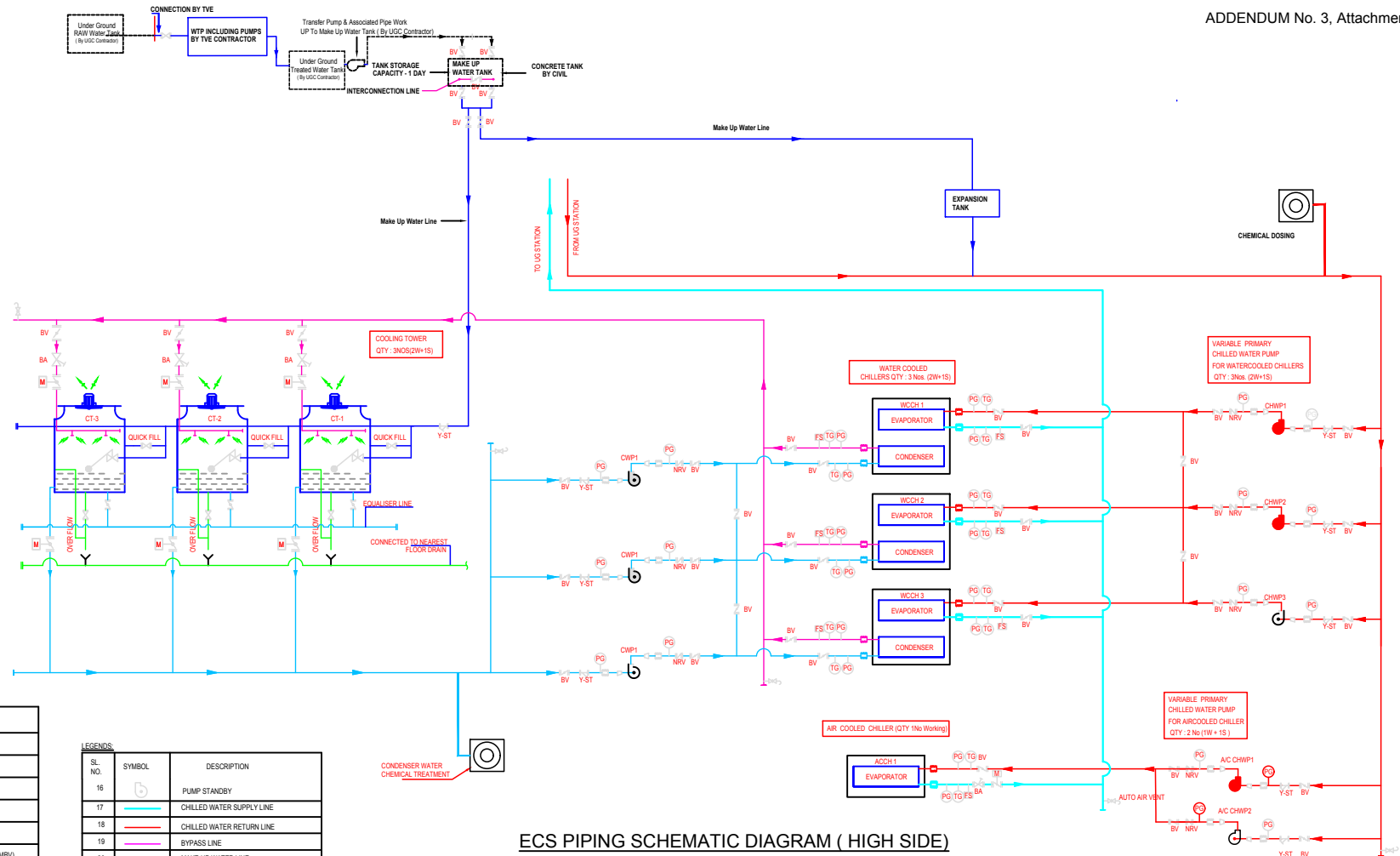
Sr. No.	Description and Clause No.	Amendment							
			Mess			m ² /person			
		40	BCC Corridor	25	55	2	-		
		41	Air Compressor Room	30	N/A	2	2	•	•
		42	UPSAF Room	30	N/A	2	2		
		43	TVS Switch Gear Room	30	N/A	2	4	•	•
		44	Retail Corridor	27	55	2m ² /person	To coordinate with system Contractors		
15	Part 2: Employer's Requirements, Section VI-B1, Technical Specifications for Environmental Control System Clause: 3.2.2 d Clause: 3.2.3 c Clause: 3.2.4 c Page: 15 of 145	<p><u>Replace</u> Clause: 3.2.2 d, Clause: 3.2.3 c , Clause: 3.2.4 c</p> <p>“Provision of all stations ECS equipment including provisions for local and remote control and monitoring to enable through the TVE SCADA and local control through Integrated Backup Panel (IBP) in case of failure of TVE SCADA at the station including necessary cabling works”.</p> <p><u>With</u></p> <p>“Provision of all stations ECS equipment including provisions for local and remote control and monitoring to enable through the TVE SCADA including necessary cabling works. Refer Part 2, Section- B3 for functional requirement of Control and Monitoring of ECS equipment.”</p>							
16	Part 2: Employer's Requirements, Section VI-B1, Technical Specifications for Environmental Control System Clause: 5.8.1 Page: 27 of 145	<p><u>Replace Sub clause f</u></p> <p>“The TVE SCADA's equipment shall enable control and monitoring the UG Station ECS in the SCR workstation. Human-Machine Interface (HMI) in the SCR shall be provided to allow operators to monitor and control the ECS equipment. From SCR workstation shall be possible to monitor the status and high level alarms of TVS through TVE SCADA. Moreover, Local Control Panel (LCP) or ECS control panel shall be able to operate the ECS equipment and control the closer as possible from the PLC which manage ECS equipment operation. The LCP or ECS control panel shall</p>							

Sr. No.	Description and Clause No.	Amendment
		<p>be installed on the PLC's cabinets or at a distance less than 2 metres.”</p> <p><u>With</u></p> <p>“The TVE SCADA system shall enable control and monitoring the UG Station ECS in the Station via TVE SCADA workstation in SCADA Room. Human-Machine Interface (HMI) in the station, including workstation/IBP/VCP/LCP, shall be provided to allow operators to monitor and control the ECS equipment. IBP in the SCR shall monitor the status of high level alarms of TVE equipment. Local Control Panel (LCP) shall be provided in each ECS equipment room (i.e. AHU and chiller rooms). The LCPs shall allow the control and monitoring functions of the ECS equipment in the respective room.”</p>
17	Part 2: Employer's Requirements, Section VI-B4, Technical Specifications for Electrical Clause: 9.2 Page: 64 of 65	<p><u>Replace Sub clause a</u></p> <p>“iii. All circuit protective conductors shall be of high conductivity hard drawn copper / GI.”</p> <p><u>With</u></p> <p>“iii. All circuit protective conductors shall be of high conductivity hard drawn copper.”</p>
18	Part 2: Employer's Requirements, Section VI-B1, Technical Specifications for Environmental Control System Clause: 6.2.15.3.11 Page: 122 of 145	<p><u>Replace following Para:</u></p> <p>The walls and ceiling of AHU and Chiller plant room shall be provided with fix resin bonded glass wool 50mm thick of density 32 kg/m³ for acoustic lining as per following specifications:</p> <p><u>With</u></p> <p>In order to achieve noise criteria under Part 2 -Employer's Requirements, acoustic lining may be required for walls and ceiling of AHU and Chiller plant room. In case it is required, the walls and ceiling of AHU and chiller plant room shall be provided with fix resin bonded glass wool 50mm thick of density 32 kg/m³ and installed as per following specifications:</p>
19	Part 2: Employer's Requirements, Section VI-B4, Technical	<p><u>Add sub clause 1.2.10</u></p>

Sr. No.	Description and Clause No.	Amendment
	Specifications for Electrical Clause: 1.2 Scope of Electrical Work Page: 1 of 65	The allowable voltage drop from TVE Switchgear till the end equipment shall be maximum 2%.
20	Bidding Documents, Part 1: Bidding Procedure Section IV–A : Bidding Forms,	Replace: Form of Bid Security (Bank Guarantee) With : Attachment No. 10 : Form of Bid Security (Bank Guarantee)
21	Bidding Documents, Part 1: Bidding Procedure Section IV–A : Bidding Forms,	Replace : Bid Form 7A : Pricing of Deviation With: Attachment No. 8 - Bid Form 7A : PRICING OF NONMATERIAL NONCONFORMITY
22	Bidding Documents, Part 1: Bidding Procedure Section IV–A : Bidding Forms,	Replace : Bid Form 7 : Statement of Deviation With: Attachment No. 9 - Bid Form 7 : Statement of Nonmaterial Nonconformity
23	Bidding Documents, Part 1: Bidding Procedure Section II : Bid Data Sheet,	Add: ITB 22.1: In addition to the original of the Bid, the number of copies to be submitted is two sets of copies and one electronic version (Word/ PDF on CD).

Place: Mumbai
Date: 17th July, 2018

Sd/-
(Smt. Ashwini Bhide, IAS)
Managing Director, MMRC



ECS PIPING SCHEMATIC DIAGRAM (HIGH SIDE)

NOTES :-
 1. CONTRACTOR SHALL PROVIDE ALL NECESSARY PLANT/EQUIPMENT, VALVES SPECIALITIES & ACCESSORIES AS PER EMPLOYER'S REQUIREMENTS. WHETHER SHOWN IN DIAGRAM OR NOT.

LEGENDS

SL. NO.	SYMBOL	DESCRIPTION
1	[Symbol]	BUTTERFLY VALVE (BV)
2	[Symbol]	BALANCING VALVE (BA)
3	[Symbol]	Y- STRAINER (Y-ST)
4	[Symbol]	NON-RETURN VALVE (NRV)
5	[Symbol]	GATE VALVE
6	[Symbol]	MOTORIZED BUTTERFLY VALVE (MBV)
7	[Symbol]	TEMPERATURE GAUGE
8	[Symbol]	PRESSURE GAUGE
9	[Symbol]	FLOW SWITCH
10	[Symbol]	FLOW METER
11	[Symbol]	AUTO AIR VENT
12	[Symbol]	DRAIN
13	[Symbol]	FLANGE CONNECTION
14	[Symbol]	BELLOW
15	[Symbol]	PUMP WORKING

LEGENDS

SL. NO.	SYMBOL	DESCRIPTION
16	[Symbol]	PUMP STANDBY
17	[Symbol]	CHILLED WATER SUPPLY LINE
18	[Symbol]	CHILLED WATER RETURN LINE
19	[Symbol]	BYPASS LINE
20	[Symbol]	MAKE-UP WATER LINE
21	[Symbol]	IN U/C CONTRACTORS SCOPE
22	[Symbol]	REDUCER / EXPANDER
23	[Symbol]	NOMINAL DIAMETER
24	[Symbol]	CWP CONDENSER WATER PUMP
25	[Symbol]	WORKING
26	[Symbol]	STANDBY
27	[Symbol]	COOLING TOWER
28	[Symbol]	WCH WATER COOLED CHILLER
29	[Symbol]	ACH AIR COOLED CHILLER

Tender Drawings
 Not to be used for construction



GENERAL CONSULTANCY SERVICES
 FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
 COLABA- BANDRA-SEEPZ

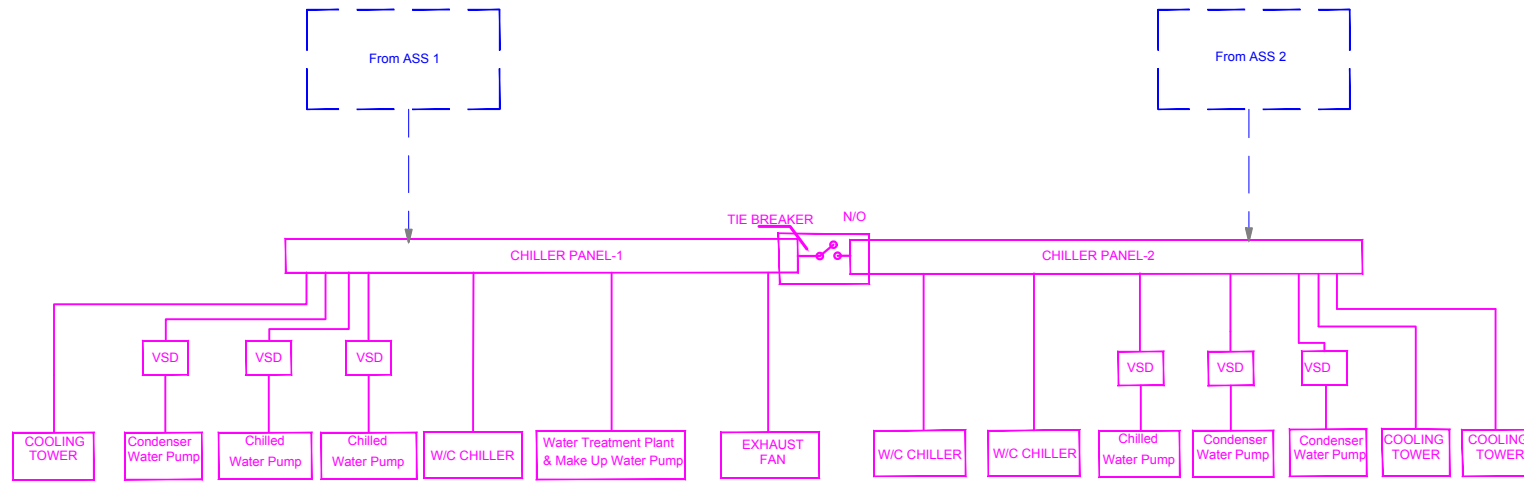
REV.	DATE	PREP.	APPROVED	DESCRIPTION
A1	09/08/18	AKS	NC	A/C CHILLER CHILLED WATER PUMP ADDED

NAME	SIGN
DRAWN BY	AKS
DESIGN BY	RAK
CHECKED BY	RAK
APPROVED BY	NC

PROJECT	STATION	DATE
MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	UNDERGROUND STATION	14-03-2018
TITLE	DRAWING TITLE	SCALE
STATION ENVIRONMENTAL CONTROL SYSTEM	WATER FLOW SCHEMATIC - ENVIRONMENTAL CONTROL SYSTEM (SHEET 1 OF 2)	NTS (A1)
DRAWING NO	GCC-TVE-P00-0001-020_A1	

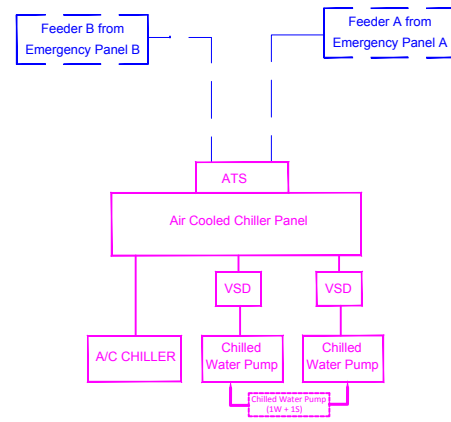


MUMBAI METRO LINE-3
 GENERAL CONSULTANT



A/C - Air Cooled Chiller
 W/C - Water Cooled Chiller

NOTE:
 - UNDER GROUND STATION & TUNNEL CONTRACTOR SCOPE
 - TVE CONTRACTOR SCOPE
 ECS EQUIPMENTS QTY AND CAPACITY SHALL BE AS PER DETAIL DESIGN



ECS ELECTRICAL SYSTEM SCHEMATIC DIAGRAM

Tender Drawings
 Not to be used for construction



GENERAL CONSULTANCY SERVICES
 FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
 COLABA- BANDRA-SEEPZ

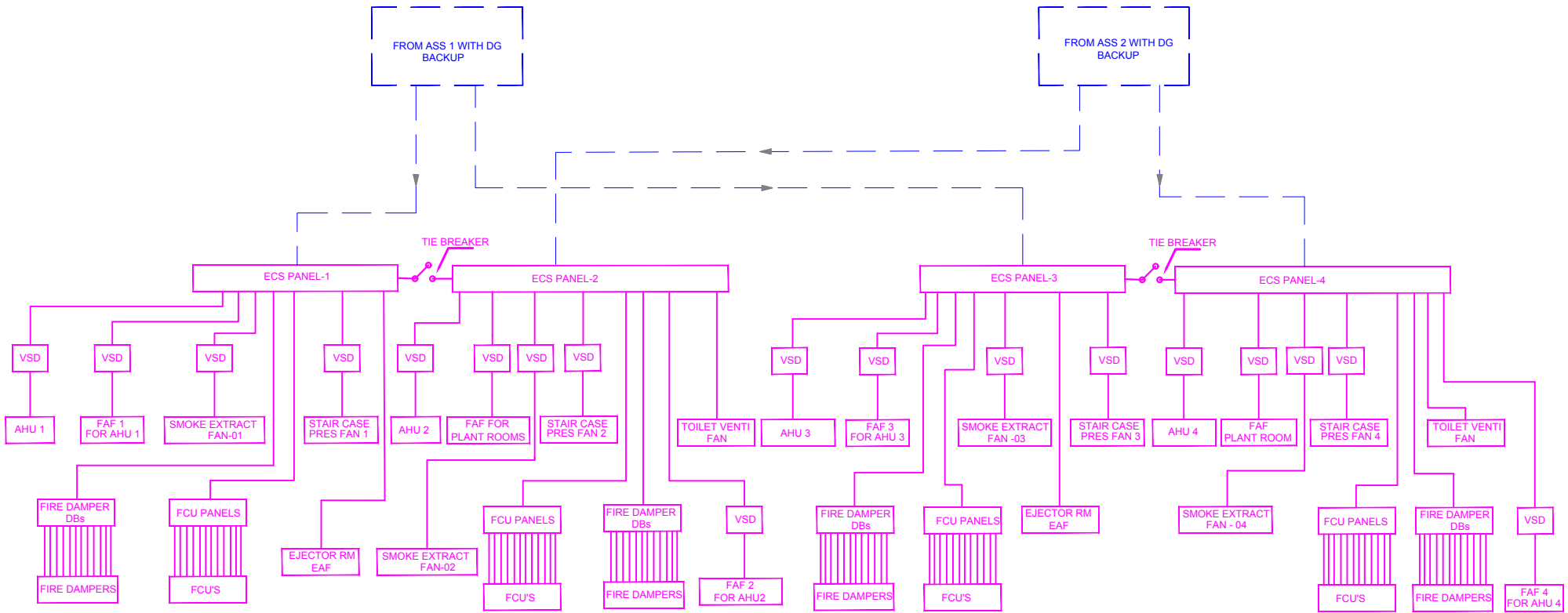
REV.	DATE	PREP.	APPROVED	DESCRIPTION
A1	08/06/18	AKS	NC	CHILLED WATER PUMP FOR A/C CHILLER ADDED

NAME	SIGN
DRAWN BY	AKS
DESIGN BY	RAK
CHECKED BY	RK
APPROVED BY	NC


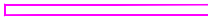
PROJECT	MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	STATION	ANCILLARY BUILDING/ UNDERGROUND PLANTROOM	DATE	08-02-2018
TITLE	STATION ENVIRONMENTAL CONTROL SYSTEM	DRAWING TITLE	ELECTRICAL SCHEMATIC DIAGRAM FOR CHILLER PLANT ROOM	SCALE	NTS (A1)
DRAWING NO	GCC-TVE-P00-0001-027_A1				



MUMBAI METRO LINE-3
 GENERAL CONSULTANT



ECS ELECTRICAL SYSTEM SCHEMATIC DIAGRAM

NOTE:
 - UNDER GROUND STATION & TUNNEL CONTRACTOR SCOPE
 - TVE CONTRACTOR SCOPE
 ECS EQUIPMENTS QTY AND CAPACITY SHALL BE AS PER DETAIL DESIGN

Tender Drawings
 Not to be used for construction



GENERAL CONSULTANCY SERVICES
 FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
 COLABA- BANDRA-SEEPZ

REV.	DATE	PREP.	APPROVED	DESCRIPTION	APPROVED BY
A1	08/06/18	AKS	NC	TIE BREAKER & FAF ADDED	

NAME	SIGN
DRAWN BY	AKS
DESIGN BY	RAK
CHECKED BY	RJK
APPROVED BY	NC

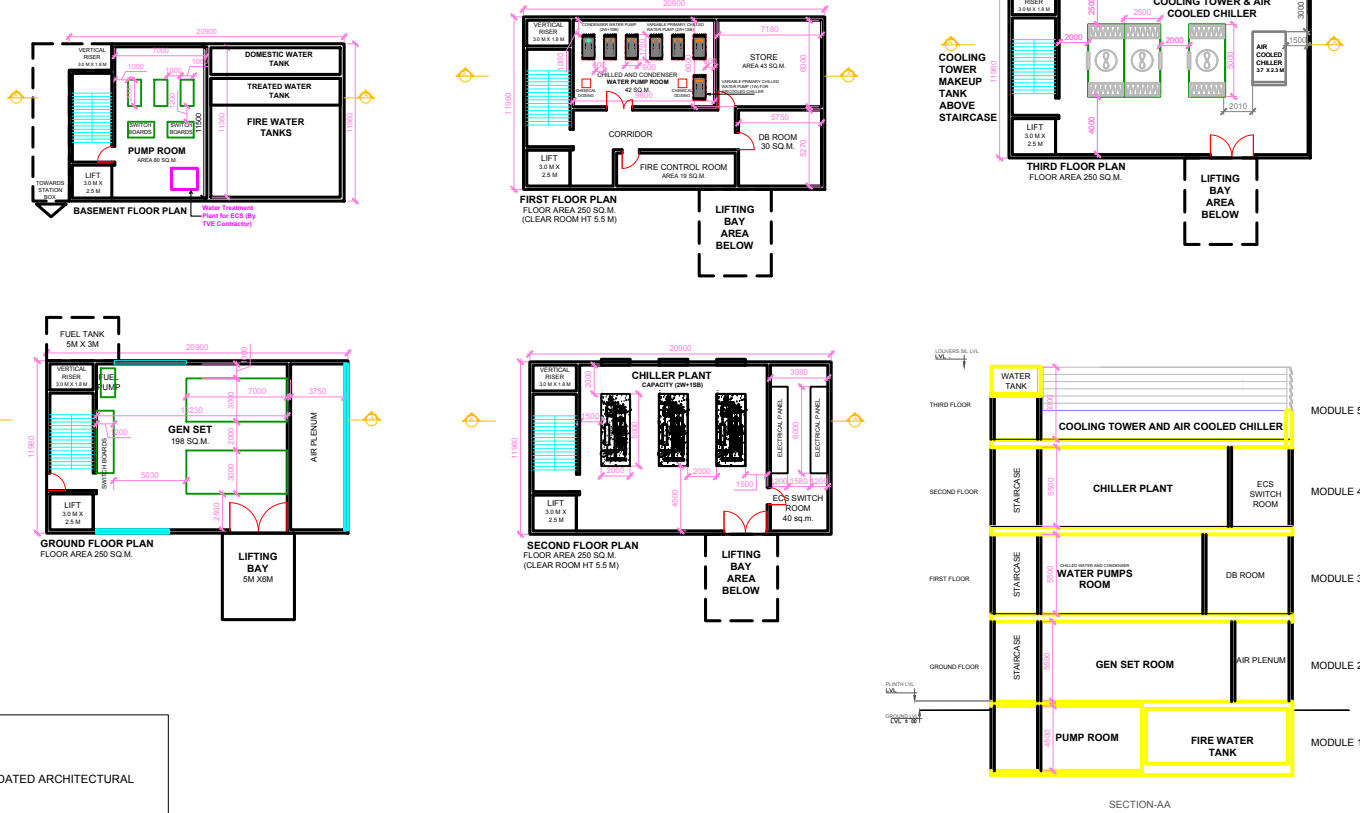
PROJECT	MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ
TITLE	STATION ENVIRONMENTAL CONTROL SYSTEM
DRAWING NO	GCC-TVE-P00-0001-026_A1

STATION	UNDERGROUND STATION	DATE	19-03-2018
DRAWING TITLE	ELECTRICAL SCHEMATIC DIAGRAM FOR ECS	SCALE	NTS (A1)



ADDENDUM 3, Attachment No. 4

S.NO.	STATION NAME	FLOORS	WATER COOLED CHILLER LOCATION
01.	CLIFFE PARADE	MODULE 2+5	CONCOURSE
02.	VIDHAN BHAWAN	MODULE 1+2+3+4+5	Top Of Box
03.	CHURCHGATE	MODULE 1+2+3+4+5	ANCILLARY BUILDING
04.	HUTATMA CHOWK	MODULE 2+5	MEZZANINE
05.	CST	MODULE 1+2+3+4+5	ANCILLARY BUILDING
06.	KALBADEVI	MODULE 1+2+3+4+5	ANCILLARY BUILDING
07.	GIRGAON	MODULE 1+2+3+5	MEZZANINE LEVEL
08.	GRANT ROAD	MODULE 2+3+5	ANCILLARY BUILDING
09.	MUMBAI CENTRAL	MODULE 1+2+3+4+5	ANCILLARY BUILDING
10.	MAHALAXMI	MODULE 1+2+3+4+5	ANCILLARY BUILDING
11.	SCIENCE MUSEUM	MODULE 5	ANCILLARY BUILDING
12.	ACHARYA ATREYA CHOWK	MODULE 1+2+3+4+5	ANCILLARY BUILDING
13.	WORLI	MODULE 1+2+3+4+5	ANCILLARY BUILDING
14.	SIDDHVINAYAK	MODULE 2+5	ANCILLARY BUILDING
15.	DADAR	MODULE 1+2+3+4+5	ANCILLARY BUILDING
16.	SHITLADEVI TEMPLE	MODULE 1+2+5	CONCOURSE
17.	DHARAVI	MODULE 1+2+3+4+5	ANCILLARY BUILDING
18.	BKC	MODULE 1+2+5	ANCILLARY BUILDING
19.	VIDYA NAGRI	MODULE 1+2+3+4+5	ANCILLARY BUILDING
20.	SANTACRUZ	MODULE 1+2+5	PLANT ROOM LEVEL
21.	CSIA (DOMESTIC)	AS PER TENDER DRAWING	CONCOURSE
22.	SAHAR ROAD	AS PER TENDER DRAWING	ANCILLARY BUILDING
23.	CSIA (INTERNATIONAL)	AS PER TENDER DRAWING	CONCOURSE
24.	MAROL NAKA	MODULE 1+2+5	ANCILLARY BUILDING
25.	MIDC	MODULE 1+2+3+4+5	ANCILLARY BUILDING
26.	SEEPZ	MODULE 1+2+3+4+5	ANCILLARY BUILDING



NOTE FOR TYPE OF ANCILLARY BLOCK:

THE ANCILLARY BUILDING SHOWN HERE IS ONLY FOR REPRESENTING SPACE ALLOCATION. REFER THE UPDATED ARCHITECTURAL PLAN FOR ACTUAL AREA

NOTES:

- ALL DIMENSIONS ARE IN MM AND LEVELS IN METERS UNLESS OTHERWISE STATED.
- THE DIMENSIONS SHOWN IN THIS DRAWING ARE INDICATIVE AND ARE SUBJECT TO THE SITE CONSTRAINTS AND OTHER PROJECT REQUIREMENTS. THE CONTRACTOR SHALL COMPLY WITH ALL THE CONTRACT STIPULATIONS, WHILE PROPOSING THE LAYOUT OF BUILDING /STRUCTURE HOUSING ANCILLARY FACILITIES .
- ALL DIMENSIONS ARE TO BE READ FROM THE DRAWING AND NOT MEASURED.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL, STRUCTURAL, PLUMBING & FIRE FIGHTING, ELECTRICAL ETC. DRAWINGS AND CONTRACT PROVISIONS.
- THE ARCHITECTURAL DRAWING SHOWN HERE ARE INDICATIVE AND IT'S THE CONTRACTOR'S RESPONSIBILITY TO FINALIZE THE DESIGN WITH ALL NECESSARY FUNCTION AND PERFORMANCE DULY COMPLYING WITH ALL THE CONTRACT STIPULATIONS.
- THE DETAILED DESIGN INCLUDING THE DRAINAGE ARRANGEMENTS SHALL BE DONE BY THE UG CONTRACTOR DULY COMPLYING WITH THE CONTRACT STIPULATIONS.

- THE CONTRACTOR SHALL REFER TO THE WORKS AREA DRAWINGS FOR INFORMATION ON PERMANENT AND TEMPORARY LAND SET BY THE EMPLOYER FOR HIS CLARIFICATION , DESIGN AND CONSTRUCTION (WORKS)
- THERE MAY BE SEVERAL LOCATIONS WHERE THE SPACE AVAILABLE AROUND THE STATION BUILDING/ STRUCTURES IS LIMITED (PLEASE REFER WORKS AREA DRAWINGS) AND THE UG CONTRACTOR SHALL CAREFULLY DESIGN HIS STREET LEVEL BUILDINGS/STRUCTURES ARRANGEMENT WITH DEEP CONSIDERATION OF PROTECTION AND SAFETY FOR PUBLIC AND ADJACENT PROPERTIES AND BUILDINGS (ESB) DURING THE CONSTRUCTION DULY COMPLYING ALL THE CONTRACT STIPULATION IN THIS REGARDS.
- THE UG CONTRACTOR SHALL PROPOSE/FIX ANY PART OF PROJECT BUILDING WITHIN THE INDICATED PERMANENT LAND TAKE BOUNDARY AND NO ALTERATION OF THE LAND TAKE LINE (BOTH PERMANENT AND TEMPORARY) SHALL BE CONSIDERED UNLESS OTHERWISE DIRECTED BY THE EMPLOYER.
- THE UG CONTRACTOR SHALL INTERFACE AND COORDINATE WITH INTERFACING CONTRACTORS (PROJECT CONTRACTORS) TO DEFINE ALL REQUIRED PLANNING, SPACE ALLOCATION, LAYOUT OF STRUCTURES/ BUILDINGS AND ALL SYSTEM REQUIREMENTS AND ACCOMMODATE THE REQUIREMENTS OF INTERFACING CONTRACTORS AND AS APPROVED BY THE ENGINEER.

- ALL CABLE ROUTES, DUCTS AND SHAFTS ETC. (FOR ALL UTILITIES AND SERVICES) ARE TO BE PROPOSED BY THE CONTRACTOR TO ARRANGE THE MOST FUNCTIONAL LAYOUT DULY INTERFACING AND COORDINATING WITH ALL THE INTERFACING CONTRACTORS (PROJECT CONTRACTORS).
- THE UG CONTRACTOR SHALL DESIGN AND PROPOSE BEST LANDSCAPE AND STREET FURNITURE ARRANGEMENT AS FAR AS IT IS APPROPRIATE AND THIS IS SUBJECT TO THE EMPLOYER'S APPROVAL.
- THE UG CONTRACTOR SHALL DESIGN GROUND LEVEL BUILDINGS PARTS AND FACILITIES WITH THE BEST APPEARANCES AND FINISH MATERIALS TO ATTAIN AESTHETIC AND PUBLIC COMFORT DULY COMPLYING ALL THE CONTRACT STIPULATIONS.
- THE UG CONTRACTOR SHALL DESIGN LIGHTING FIXTURE LAYOUTS TO MAKE THE BEST AMBIENCE CONDITION IN GROUND LEVEL FACILITIES AND LANDSCAPE ELEMENTS.
- THE UG CONTRACTOR TO DESIGN AND PROPOSE SIGNAGES SYSTEM THROUGH THE STATION TO MAXIMIZE PASSENGER COMFORT AND CONVENIENCE, AND OBTAIN THE ENGINEER'S APPROVAL.

- THESE DRAWINGS , DIMENSIONS , ARRANGEMENTS , MATERIALS AND FINISHES ETC. ARE INDICATIVE AND FOR INFORMATION ONLY.
- THESE DRAWING IS INDICATIVE AND SHALL BE READ IN CONJUNCTION WITH ALL THE CONTACT STIPULATIONS/SPECIFICATIONS.

ADDITIONAL NOTE :

- THE CAPACITY OF VARIOUS EQUIPMENTS/PLANT AND THEIR SIZE SHALL BE DETERMINED DURING DETAIL DESIGN STAGE DULY INTERFACING WITH THE CONCERN INTERFACING CONTRACTORS. THE CONTRACTOR SHALL NOT TAKE INTO ACCOUNT ANY INDICATIVE CAPACITY OR SIZE OF THE EQUIPMENT MENTIONED ANY WHERE ON THE TENDER DRAWING.
- THE EQUIPMENT/PLANT THAT ARE REQUIREMENT TO BE HOUSED IN THE ANCILLARY BLOCK/BUILDING AT THE GROUND AND THEIR REQUIREMENT SHALL BE PROVIDED DULY INTERFACING WITH THE CONCERN INTERFACING CONTRACTORS INCLUDING THE LAYOUT , CLEARANCES,DIMENSION , AREA , FINISHING ETC. AND AS APPROVED BY THE ENGINEER.

Tender Drawings
Not to be used for construction



GENERAL CONSULTANCY SERVICES
FOR MUMBAI METRO RAIL PROJECT, LINE NO. 3
COLABA- BANDRA-SEEPZ

REV.	DATE	PREP.	APPROVED	DESCRIPTION
A1	23/06/18	AKS	NC	NOTES REVISED

NAME	SIGN
DRAWN BY	AKS
DESIGN BY	RAK
CHECKED BY	RK
APPROVED BY	NC

PROJECT	STATION	DATE
MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	ANCILLARY BUILDING	13-04-2018
TITLE	DRAWING TITLE	SCALE
GENERAL ARRANGEMENT DRAWING	PLAN/SECTION/ELEVATION	1:250 (A1)
DRAWING NO	MM3-GC-AR-ANC-1081301-R1	



MUMBAI METRO LINE-3
GENERAL CONSULTANT

ATTACHMENT NO. 5 TO ADDENDUM NO.3

Chapter 11 – General Maintenance

11.1 General

- a) The Contractor shall be required to provide all manual related to maintenance and the operation of equipment supplied, tested and commissioned.

11.2 Preparation of Particular Management plans

The Contractor shall prepare the following management plans in accordance with EN13306 and submit them to the Project Manager for his review and concurrence in accordance with the requirements shown in the respective referred clauses:

- a) Operation Manual Plan,
- b) Training and Knowledge/Skill Transfer Plan,
- c) Maintenance Manual Plan;
- d) Spare Parts and Consumable Management Plan;
- e) Defect Liability Management Plan; and

11.3 Preparation of Operation and Maintenance Manual

- a) The Contractor shall prepare the Operation and Maintenance Manuals and submit to the PM for review. Upon issue of notice of no objection from the Project Manager, the contractor shall provide 6 (six) copies, in A4 size paper copies and 1 (electronic) soft copy to the Employer.

11.4 Tasks and Responsibilities in Maintenance

1 GENERAL

- 1.1** The Contractor shall train the Employer staff for proper maintenance works to be carried out on the Tunnel Ventilation System, Environmental Control System, SCADA and relevant works during the defect liability period.
- 1.2** Provide outline of maintenance and knowledge/skill transfer of each subsystem during DLP.

2 MAINTENANCE REQUIREMENTS

- 2.1** The Contractor shall investigate all failures, major failures, repetitive failures, design defects and provide all necessary corrective actions throughout the Contract period.
- 2.2** The Contractor shall investigate compatibility problems either from or to the systems of other Contract Packages and provide all necessary corrective actions throughout the DLP.

ATTACHMENT NO. 5 TO ADDENDUM NO.3

3 MAINTENANCE PLANNING

- 3.1** Maintenance Plan shall be prepared by the Contractor and submitted to the Employer for approval not later than six (6) months prior to Trial Run.
- 3.2** The maintenance plan shall comply with the maintenance requirements of the Design Codes and Standards and conform to the requirements of reliability, availability and maintainability of the Technical Specifications.
- 3.3** The Maintenance Plan shall describe the Contractor's proposed maintenance regime for scheduled and unscheduled maintenance, repair and service overhaul of the system, including, but not be limited to the followings;
- (1) Maintenance philosophy and approach,
 - (2) All necessary tasks for first line, second line, third line and corrective maintenance, and
 - (3) Frequency of scheduled maintenance task.
- 3.4** The Contractor shall include the following information on each maintenance task described in the Maintenance Plan;
- (1) The equipment, sub-systems covered in the task
 - (2) Step by step procedure to carry out the task
 - (3) Tools and test equipment list of each task
 - (4) Diagrams and flowcharts by illustration, if applicable
 - (5) Recovery procedures, if applicable
 - (6) Precautions the maintenance personnel shall follow
 - (7) Estimated duration and manpower required
- 3.5** In addition to the Maintenance Plan, the Contractor shall also submit an Annual Routine Maintenance Schedule to the Project Manager for review and shall indicate the schedule of maintenance tasks in a calendar year.
- 3.6** The Contractor shall undertake the necessary tasks in planning the maintenance activities to ensure that the reliability and the availability of the operating metro are upheld including but not limited to:
- (1) Preparation of detailed operational plan for the routine servicing of any equipment which requires such service. The plan shall ensure that all items in use receive maintenance within the required time cycle by suitably trained and qualified staff and under the personal safety regime appropriate to the location of the equipment being maintained.
 - (2) Preparation of a detailed staffing schedule for each and every different inspection, overhaul and repair activity. The plan shall also identify and quantify resources required by staff and groups of staff in terms of tools, tackle, personnel safety equipment, protective clothing, etc.
 - (3) Preparation of a detailed quality plan, covering all maintenance activities.
 - (4) Preparation of a computer based Stores Management Plan, which shall assist the management, ensuring a timely availability of spares, tools and consumable materials with a sufficient level of inventory.
 - (5) Setting in position a computerised defects and failure analysis and documentation system, based on FEMECA principles for all systems, sub- systems and components.

ATTACHMENT NO. 5 TO ADDENDUM NO.3

- (6) Setting in position a computerised maintenance management system to record maintenance history, to forecast replacement of consumables and documentation all systems, sub-systems and components.
- (7) Planning and supervision of ongoing training and re-training as required in the correct procedures using the training materials and courses supplied under the Contract.

4 SOFTWARE SUPPORT

4.1 General

- (1) The Contractor shall submit to the PM for review, the software support plan at least 90 days before commencement of the software installation.
- (2) The Contractor shall provide all changes, debugging, updates, modifications and upgrade of all the software developed or delivered for the system including data configuration tables if such changes are necessary and in order to maintain the normal operation and meet the requirements given in the Technical Specifications.
- (3) All changes and modifications of the software shall not degrade the performance or have adverse impacts of the system.
- (4) The Contractor shall maintain backup copies of all software developed or delivered for the System.
- (5) The Contractor shall ensure that all new versions are fully tested and validated and reviewed without objection by the Project Manager prior to loading into the system.
- (6) The Contractor shall provide training for the Employer's staff for use of new version, as and when incorporated.

4.2 Security obligations

Within fourteen (14) days of the installation of any software, which is developed or modified for this Contract, into the permanent works by the Contractor, the Contractor shall submit to the Project Manager for retention by the Employer two (2) backup copies of the software, which shall include, without limitation:

- (1) All source and executable code including all data configuration tables
- (2) All design documentation relating to the software
- (3) Any specified development tools required for maintenance of the software, including, but not limited to, editors, compilers and linkers.

5 TASK AND RESPONSIBILITY DURING DEFECTS LIABILITY PERIOD

5.1 General

The Contractor during the Defects Liability Period shall provide site/workshop repair services of all defective and faulty items of the system.

The Contractor shall provide to the Employer hands-on training and re-training as

ATTACHMENT NO. 5 TO ADDENDUM NO.3

required through respective OEMs on the operation and maintenance aspects of the equipment and systems.

The Contractor shall provide support and call-out services to the Employer as required for restoration of the System to normal operation in case of faults and defects are found.

The Contractor shall submit a manpower plan showing the Contractor's organization and committed resources level available for activities to be carried out within the Defects Liability Period.

The Contractor shall ensure all his staff who provide support shall be competent and with sufficient training in the responsible sub-system.

5.2 Workshop Repair

The Contractor shall collect and repair defective parts that are identified / removed from the system during maintenance.

The Contractor shall perform all necessary adjustments or alignments as to the repaired parts. The repair of defective parts can only be considered as completed and returned to stock or back to the system if the parts are tested and verified fit for use in the system.

The Contractor shall use only components that are equal to or higher than the specified original components in his repair activities.

The performance of the defective parts after repair shall not be degraded or deteriorated due to repairing

The maximum turnaround time for site / workshop repair shall be less than twenty eight (28) days. The turnaround time is started to count when the defective parts are removed from the system and ended when the parts are repaired and returned to stock or the system. Any extension of site / workshop repair time shall be agreed with the Employer.

5.3 Support and call-out services

The support and call-out services shall be available 24 hours per day and 7 days per week.

The Contractor shall provide sufficient number of competent and experienced staff for the support and call-out services.

The Contractor shall provide a list of staff for the support together with the contact mobile telephone numbers who can be contacted for support and call-out services.

Any changes in the call-out numbers and the staff for the support shall be notified to the Project Manager at least two weeks before such changes become effective.

The Contractor's staff shall be on site for maintenance support within one hour upon receiving the call-out request from Employer and shall proceed to perform corrective actions to restore the system to normal full operation.

The Contractor shall take every precaution to protect existing equipment from damage, and make good any damage caused.

5.4 Regular Maintenance Meeting

The Contractor shall attend the Regular Maintenance Meeting with the Employer /Project Manager to discuss the maintenance matters during the Defect Liability Period. The

ATTACHMENT NO. 5 TO ADDENDUM NO.3

dates and agenda of the meeting shall be agreed with the Employer /PM

- 5.5** Inventory Management and replenishment for sufficient level of inventory during DLP. Preparation of a computer based Stores Management Plan, which shall assist the management, ensuring a timely availability of spares, tools and consumable materials with a sufficient level of inventory.

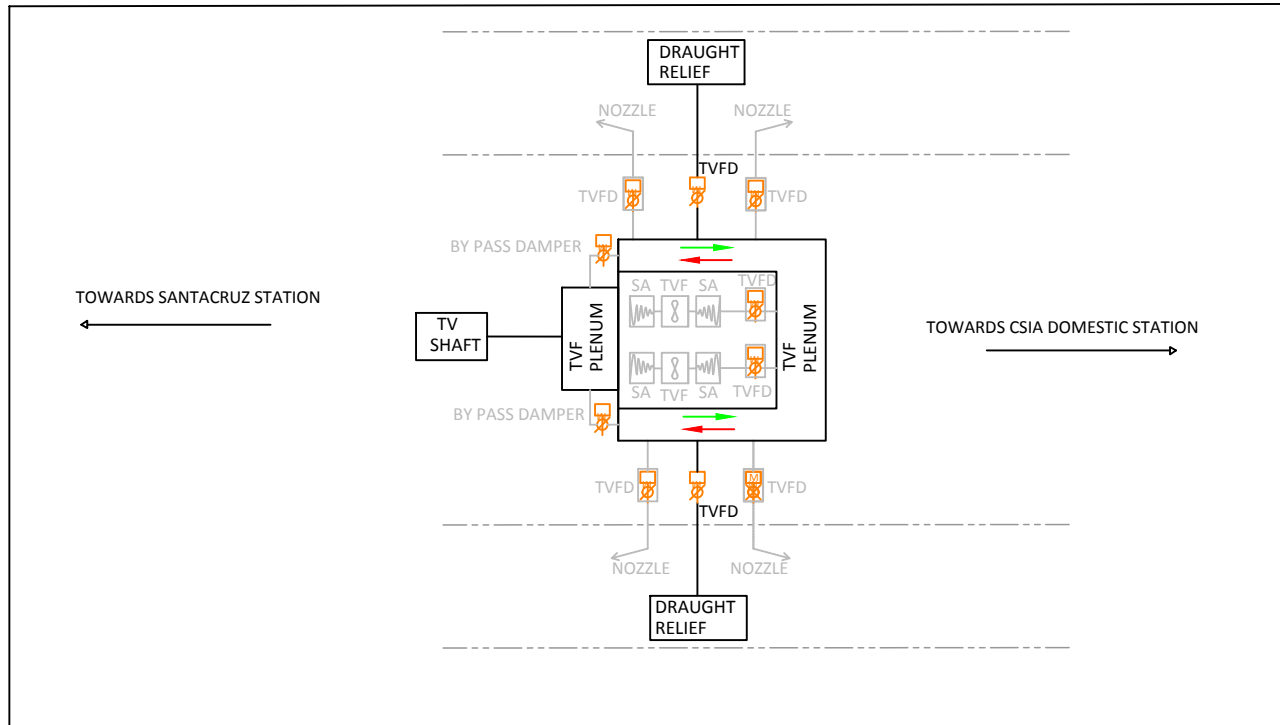
- 5.6** Maintain RAM during DLP: The maintenance plan shall comply with the maintenance requirements of the Design Codes and Standards and conform to the requirements of reliability, availability and maintainability of the Technical Specifications.

-- End of Chapter 11 --

NOTES:

1. TVF,S.A.,NOZZLE DAMPER, FID,NOZZLE & BY DAMPER SHALL BE INSTALLED IN FUTURE BY OTHERS.
2. DRAUGHT RELIEF DAMPERS WITH ALL CONTROLS SHALL BE PROVIDED BY TVE CONTRACTOR.
3. STRUCTURE CUTOUPS PROVIDED FOR DAMPERS/ FANS FOR FUTURE INSTALLATION SHALL BE COVERED WITH 6 mm G.I.SHEET. EXCEPT FOR BY PASS DAMPERS.
4. CONTROLS PHILOSOPHY FOR NORMAL, CONGESTION, EMERGENCY MODE WITH ALL IO POINTS SHALL BE CONSIDERED IN THE SCADA SYSTEM.

MID VENT SHAFT VENTILATION STRATEGY IN NORMAL MODE:



LEGEND:

- TVF - Tunnel Ventilation Fan
- SA - Sound Attenuator
- TVFD - Tunnel Ventilation Fan Damper
- DRD - Draught Relief Damper
- PSD - Platform Screen Door
- OTEF - Over Track Exhaust Fan
- TD - Trackway Damper
- UPAS - Under Platform Air Supply
- OTE - Over Track Exhaust
- UPASF - Under Platform Air Supply Fan
- OUTDOOR / FRESH AIR (Green Arrow)
- EXHAUST AIR (Red Arrow)
- CURRENT SCOPE OF WORK (Solid Line)
- FUTURE SCOPE OF WORK (Dashed Line)
- MOTORISED DAMPER OPEN (Orange Damper Icon)
- MOTORISED DAMPER CLOSED (Grey Damper Icon)
- TV Shaft - Tunnel Ventilation Shaft
- VE Shaft - Ventilation Exhaust Shaft
- VS Shaft - Ventilation Supply Shaft

Tender Drawings
Not to be used for construction



GENERAL CONSULTANCY SERVICES
FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
COLABA- BANDRA-SEEPZ

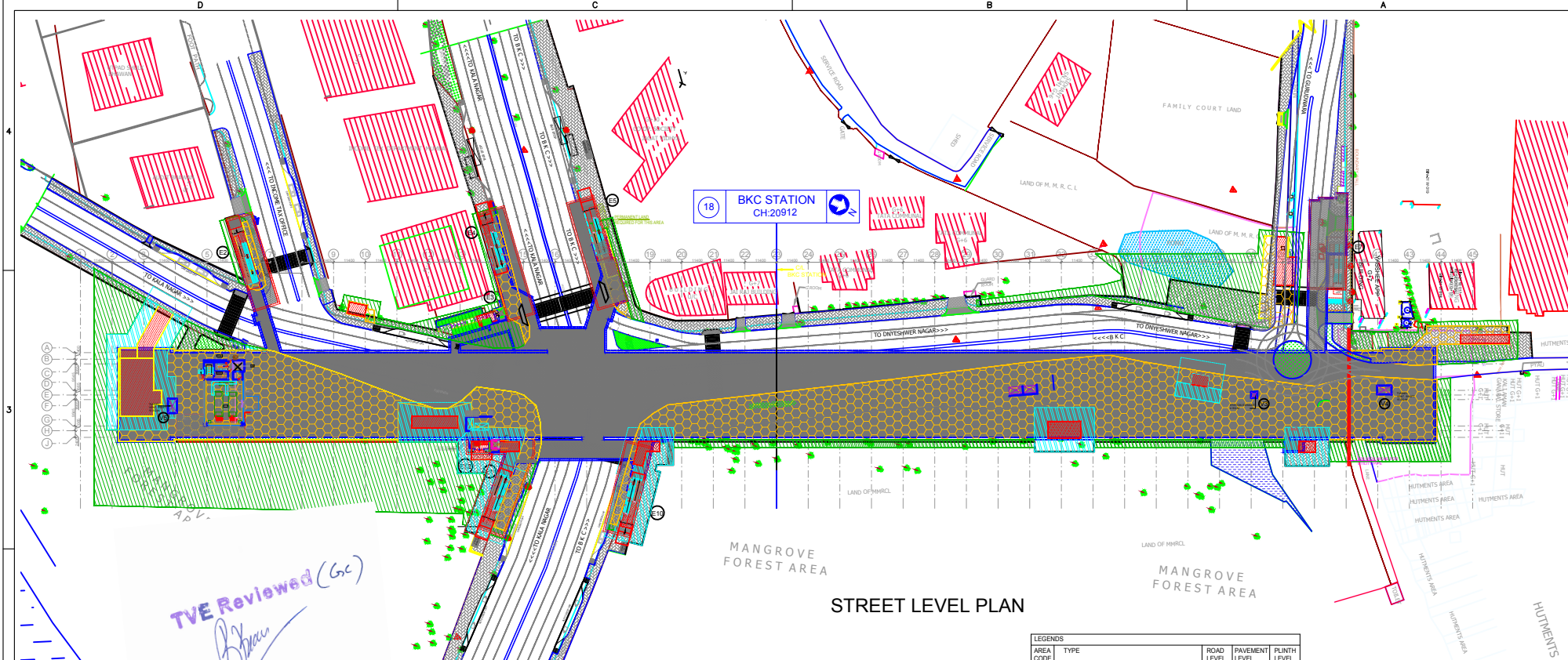
REV.	DATE	PREP.	APPROVED	DESCRIPTION

NAME	SIGN
DRAWN BY AKS	
DESIGN BY RAK	
CHECKED BY RK	
APPROVED BY NC	

PROJECT MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	STATION MID VENTILATION SHAFT	DATE 15-03-2018
TITLE TUNNEL VENTILATION SYSTEM	DRAWING TITLE SYSTEM SCHEMATIC - NORMAL OPERATION	SCALE NTS (A1)
DRAWING NO GCC-TVE-P00-0001-014_A0		



ADDENDUM No. 3, Attachment No. 7



STREET LEVEL PLAN

- NOTES:**
- ALL DIMENSIONS ARE IN MM AND LEVELS IN METERS UNLESS OTHERWISE STATED.
 - THE DIMENSIONS SHOWN IN THIS DRAWING ARE INDICATIVE AND ARE SUBJECT TO THE SITE CONSTRAINTS AND OTHER PROJECT REQUIREMENTS.
 - THE LEVEL OF TOP OF THE STATION BOX SHALL BE DETERMINED BASED ON STATION DESIGN TO BE CARRIED OUT AS PER THE CONTRACT STIPULATIONS AND AFTER ACTUAL UTILITY PROBE/INVESTIGATIONS DONE.
 - ALL DIMENSIONS ARE TO BE READ FROM THE DRAWING AND NOT TO BE MEASURED.
 - THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND CONTRACT PROVISIONS.
 - STREET MEDIAN AT NEW CENTRE OF ROAD TO BE RECOVERED TO MAKE LANES EVEN ON BOTH SIDES OF THE STREET AFTER DUE CONSULTATION TO THE HIGHWAYS DEPARTMENT/MMRC/MCGM AND OTHER RELEVANT AUTHORITIES OF MUMBAI.
 - AFTER FINALISATION OF PERMANENT LAND TAKE BOUNDARY BY THE EMPLOYER, NO ALTERATION OF THE LAND TAKE LINE (BOTH PERMANENT AND TEMPORARY) SHALL BE CONSIDERED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 - THESE DRAWINGS INDICATE THE ADDITIONAL PERMANENT LAND REQUIREMENT BEYOND PERMANENT LAND PROVIDED BY THE EMPLOYER.
 - WHERE THE SPACE AVAILABLE AROUND THE STATION BUILDING/ STRUCTURES IS LIMITED (REFER WORKS AREA DRAWINGS) STREET LEVEL BUILDINGS/STRUCTURES ARRANGEMENT SHALL BE DESIGNED WITH DEEP CONSIDERATION OF PROTECTION AND SAFETY FOR PUBLIC AND ADJACENT PROPERTIES AND BUILDINGS (EB) DURING THE CONSTRUCTION DULY COMPLYING ALL THE CONTRACT STIPULATION IN THIS REGARD.
 - ALL CORNERS PROJECTED IN PUBLIC SPACES SHALL BE EFFECTIVELY CHAMFERED FOR USER PROTECTION.
 - THIS DRAWING DOESN'T SHOW DETAILS/PROVISIONS OF DUCTS/UTILITIES/SERVICES ETC., THE PROVISIONS FOR WHICH SHALL BE MADE AS PER THE CONTRACT DULY INTERFACING WITH THE INTERFACING CONTRACTORS OF THE PROJECT (PROJECT CONTRACTORS)
 - THE LAND/SPACE, EARMARKED/AVAILABLE FOR ANCILLARY BUILDING/SERVICES AT THE GROUND LEVEL IS CURRENTLY AS GIVEN BY THE EMPLOYER AS THE TVS & CS CONTRACTORS ARE NOT AVAILABLE AT PRESENT.



CUTOUT SCHEDULE				
CUTOUT NUMBER	PURPOSE	SIZE (MM)	NO. OF CUTOUT	CUTOUT LOCATION
S01b	TUNNEL VENTILATION	3000x5000	-	FLOOR
S01c	TUNNEL VENTILATION	5000x3000	-	FLOOR
S03c	DTE EXHAUST	2500x4800	-	FLOOR
S03b	DTE EXHAUST	4800x2500	-	FLOOR
S02c	LIPS FRESH AIR	4800x2200	-	FLOOR
S05b	LIPS FRESH AIR	4800x2500	-	FLOOR
S07	STATION EXHAUST	2000x2000	-	FLOOR
PL05	PLUMBING CUTOUT	2200x1125	-	FLOOR
PL06	PLUMBING CUTOUT	2250x1020	-	FLOOR
PL07	PLUMBING CUTOUT	2550x1150	-	FLOOR
PL08	PLUMBING CUTOUT	900x2300	-	FLOOR
EL03	ELECTRICAL CUTOUT	3670x2200	-	FLOOR/CEILING

AREA CODE	TYPE	ROAD LEVEL	PAVEMENT LEVEL	PLINTH LEVEL
E1	EMERGENCY STAIRCASE (ST-25)	+3.605m	+3.755m	+4.955m
E2	ENTRY STRUCTURE (ST-01A & ES-01A)	+3.536m	+3.686m	+4.741m
E3	LIFT (L5) & EMERGENCY STAIRCASE (ST-02)	+3.691m	+3.914m	+4.814m
E4	ENTRY STRUCTURE (ST-03A & ES-02A)	+4.002m	+4.152m	+5.19m
E5	ENTRY STRUCTURE (ST-07A & ES-03A)	+4.002m	+4.152m	+5.19m
E6	EMERGENCY STAIRCASE (ST-11)	+3.60m	+3.71m	+4.61m
E7	ENTRY STRUCTURE (ES-8A & ST-12A)	+3.08m	+3.23m	+4.14m
	LIFT-L7	+3.08m	+3.23m	+4.13m
E9	EMERGENCY STAIRCASE (ST-14)	+3.153m	+3.303m	+4.203m
E10	ENTRY STRUCTURE (ES-13A & ST-19A)	+4.05m	+4.20m	+5.19m
E11	ENTRY STRUCTURE (ES-14A & ST-23A)	+4.05m	+4.20m	+5.19m
E12	EMERGENCY STAIRCASE (ST-24) & FIRMEN STAIRCASE (ST-20)	+4.05m	+4.20m	+5.19m
	LIFT-L6	+4.05m	+4.20m	+5.10m
V1	VENTILATION BLOCK	-	-	-
V2	VENTILATION BLOCK	-	-	-
V3	STATION EXHAUST SHAFT	-	-	-
V4	TUNNEL VENT SHAFT	-	-	-
V5	TUNNEL VENT SHAFT	-	-	-

LEGENDS

	FOOTPATH
	GREEN AREA
	TABLE TOP
	POND
	EXISTING LEVELS
	PROPOSED LEVELS

TREE LEGENDS

	TREES TO BE RETAINED
	TREES TO BE REMOVED

NOTE: FOR COORDINATES OF STATION BOX REFER DRAWING NO. UGC05-ARP-SBA-1000-003-A2.

<p>GENERAL CONSULTANCY SERVICES FOR MUMBAI METRO RAIL PROJECT, LINE No. 3 COLABA- BANDRA-SEEPZ</p>	<p>NAME</p> <p>SIGN</p>	<p>PROJECT</p> <p>MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ</p>	<p>STATION</p> <p>BANDRA (BKC) METRO STATION PLAN</p>	<p>DATE</p> <p>26-04-2018</p>
	<p>DRAWN BY</p> <p>DESIGN BY</p> <p>CHECKED BY</p>	<p>TITLE</p> <p>GENERAL ARRANGEMENT DRAWING</p>	<p>DRAWING TITLE</p> <p>BANDRA (BKC) METRO STATION PLAN STREET LEVEL PLAN WITH LAND PLAN</p>	<p>SCALE</p> <p>1:700</p>
	<p>APPROVED BY</p>	<p>DRAWING NO</p> <p>UGC05-ARP-SBA-1000-002-A7-D</p>	<p>Employer Drawings Not to be used for construction</p>	

REV.	DATE	PREP.	APPROVED	DESCRIPTION

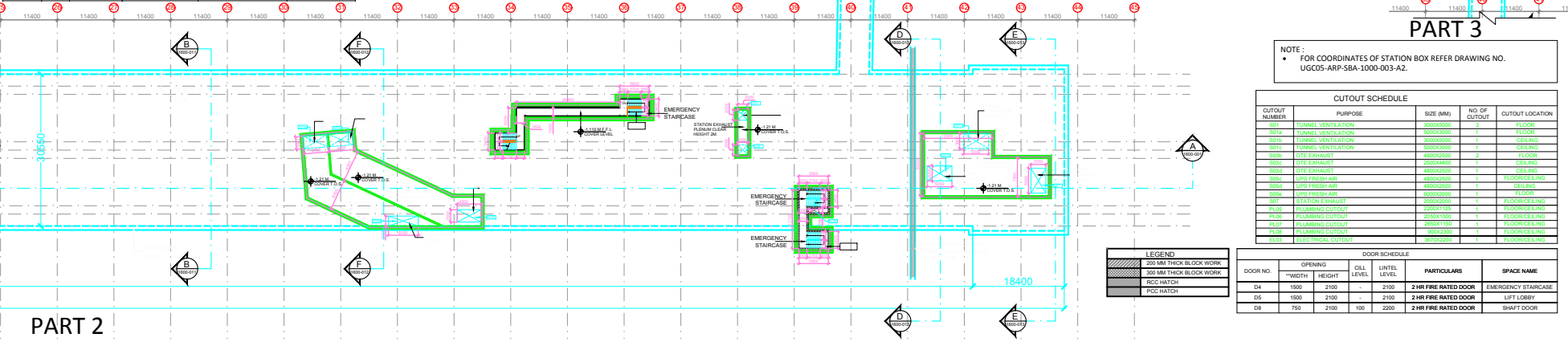
ADDENDUM No. 3, Attachment No. 7

Area Code	Escalator Number	Direction	Floor Served	Lower Working Level	Upper Working Level	Total Rise	With Internal Clear	Pit Depth	Pit Length
E04	ESC01	UP	Concourse to Cover	3347	4500	1153	1000	1850	6500
	ESC01A	UP	Concourse to Ground	3347	4500	1153	1000	NO PIT	6500
	ESC02	UP	Concourse to Ground	3347	4500	1153	1000	NO PIT	6500
	ESC03	UP	Concourse to Cover	3347	4500	1153	1000	1850	6500
	ESC03A	UP	Concourse to Ground	3347	4500	1153	1000	NO PIT	6500
E05	ESC08	UP	Concourse to Cover	3347	4500	1153	1000	1850	6500
	ESC08A	UP	Concourse to Ground	3347	4500	1153	1000	NO PIT	6500
E10	ESC13	UP	Concourse to Cover	3347	4500	1153	1000	1850	6500
	ESC13A	UP	Concourse to Ground	3347	4500	1153	1000	NO PIT	6500
E11	ESC14	UP	Concourse to Ground	3347	4500	1153	1000	NO PIT	6500
	ESC14A	UP	Concourse to Ground	3347	4500	1153	1000	NO PIT	6500

Area Code	Lift Number	Normal Strat. Size (Width x Depth)	Floor Served	Lower Landing Level	Upper Landing Level	Total Rise	Pit Depth	Head Room	Clear Door Opening	Hangin/gion Hanging
L03	L3	2000 x 2100	Concourse to Concourse	3347	3347	0	2250	2250	2100	None
L05	L5	2500 x 2100	Concourse to Concourse	3347	3347	0	2250	2250	2100	None
L07	L7	2500 x 2300	Concourse to Concourse	3347	3347	0	2250	2250	2100	None
L12	L12	2100 x 2100	Concourse to Concourse	3347	3347	0	2250	2250	2100	None
L13	L13	2000 x 2000	Concourse to Concourse	3347	3347	0	2250	2250	2100	None

STAIRCASE NUMBER	WIDTH	LOCATION	FUNCTION	FLOORS CATERED	REF. DRAWING NUMBER
ST-01	1800	B/W GRID 6 & 7	ENTRY STAIRCASE	CONCOURSE TO COVER LEVEL	UGC05-ARP-SBA-1700-001
ST-01A	1800	B/W GRID 6 & 7	ENTRY STAIRCASE	COVER TO PLINTH LEVEL	UGC05-ARP-SBA-1700-001
ST-02	1800	B/W GRID 14 & 15	EMERGENCY STAIRCASE	CONCOURSE TO PLINTH LEVEL	UGC05-ARP-SBA-1800-001
ST-03	1800	B/W GRID 14 & 15	ENTRY STAIRCASE	CONCOURSE TO COVER LEVEL	UGC05-ARP-SBA-1700-002
ST-03A	1800	B/W GRID 14 & 15	ENTRY STAIRCASE	COVER TO PLINTH LEVEL	UGC05-ARP-SBA-1700-002
ST-07	1800	B/W GRID 17 & 18	ENTRY STAIRCASE	CONCOURSE TO COVER LEVEL	UGC05-ARP-SBA-1700-011
ST-07A	1800	B/W GRID 17 & 18	ENTRY STAIRCASE	COVER TO PLINTH LEVEL	UGC05-ARP-SBA-1800-001
ST-11	1800	B/W GRID 34 & 37	EMERGENCY STAIRCASE	CONCOURSE TO PLINTH LEVEL	UGC05-ARP-SBA-1800-011
ST-12	3000	B/W GRID 40 & 41	ENTRY STAIRCASE	CONCOURSE TO COVER LEVEL	UGC05-ARP-SBA-1700-016

ST-12A	3000	B/W GRID 40 & 41	ENTRY STAIRCASE	COVER TO PLINTH LEVEL	UGC05-ARP-SBA-1700-016
ST-14	1800	B/W GRID 20 & 45	EMERGENCY STAIRCASE	CONCOURSE TO PLINTH LEVEL	UGC05-ARP-SBA-1800-016
ST-19	1800	B/W GRID 18 & 19	ENTRY STAIRCASE	CONCOURSE TO COVER LEVEL	UGC05-ARP-SBA-1700-021
ST-19A	1800	B/W GRID 18 & 19	ENTRY STAIRCASE	COVER TO PLINTH LEVEL	UGC05-ARP-SBA-1700-021
ST-20	1800	B/W GRID 18 & 19	EMERGENCY STAIRCASE	CONCOURSE TO PLINTH LEVEL	UGC05-ARP-SBA-1700-021
ST-21	1800	B/W GRID 18 & 19	ENTRY STAIRCASE	CONCOURSE TO COVER LEVEL	UGC05-ARP-SBA-1700-026
ST-21A	1800	B/W GRID 18 & 19	ENTRY STAIRCASE	COVER TO PLINTH LEVEL	UGC05-ARP-SBA-1700-026
ST-24	1800	B/W GRID 11 & 54	EMERGENCY STAIRCASE	CONCOURSE TO PLINTH LEVEL	UGC05-ARP-SBA-1800-026
ST-28	1800	B/W GRID 5 & 6	EMERGENCY STAIRCASE	CONCOURSE TO PLINTH LEVEL	UGC05-ARP-SBA-1800-031
ST-28	1400	B/W GRID 5 & 6	SERVICE STAIRCASE	RAMP ROOM TO TERRACE LEVEL	UGC05-ARP-SBA-1800-036



PART 2

PART 1
CONTINUE TO PART 3

PART 3

NOTE: FOR COORDINATES OF STATION BOX REFER DRAWING NO. UGC05-ARP-SBA-1000-003-A2.

CUTOUT NUMBER	PURPOSE	SIZE (MM)	NO. OF CUTOUT	CUTOUT LOCATION
S01	TUNNEL VENTILATION	3000X3000	3	FLOOR
S01A	TUNNEL VENTILATION	3000X3000	1	FLOOR
S01B	TUNNEL VENTILATION	3000X3000	1	CEILING
S01C	TUNNEL VENTILATION	3000X3000	1	CEILING
S02	OTE EXHAUST	4800X2000	2	FLOOR
S02C	OTE EXHAUST	2500X4000	1	CEILING
S03	OTE EXHAUST	4800X2000	1	CEILING
S04	UPFS FRESH AIR	4800X2000	1	FLOOR/CEILING
S05	UPFS FRESH AIR	4800X2000	1	CEILING
S05A	UPFS FRESH AIR	4000X2000	1	FLOOR
S07	STATION EXHAUST	2000X3000	1	FLOOR/CEILING
PL05	FLUMLING CUTOUT	2200X1200	1	FLOOR/CEILING
PL06	FLUMLING CUTOUT	2000X1000	1	FLOOR/CEILING
PL07	FLUMLING CUTOUT	2000X1100	1	FLOOR/CEILING
PL08	FLUMLING CUTOUT	3000X2000	1	FLOOR/CEILING
EL03	ELECTRICAL CUTOUT	3000X2000	1	FLOOR/CEILING

[Pattern]	200 MM THICK BLOCK WORK
[Pattern]	100 MM THICK BLOCK WORK
[Pattern]	PCG HATCH
[Pattern]	PCG HATCH

DOOR NO.	OPENING WIDTH	HEIGHT	LCLL LEVEL	UNTEL LEVEL	PARTICULARS	SPACE NAME
D4	1500	2100	-	2100	2 HR FIRE RATED DOOR	EMERGENCY STAIRCASE
D5	1500	2100	-	2100	2 HR FIRE RATED DOOR	LIFT LOBBY
D8	750	2100	100	2200	2 HR FIRE RATED DOOR	SHAFT DOOR

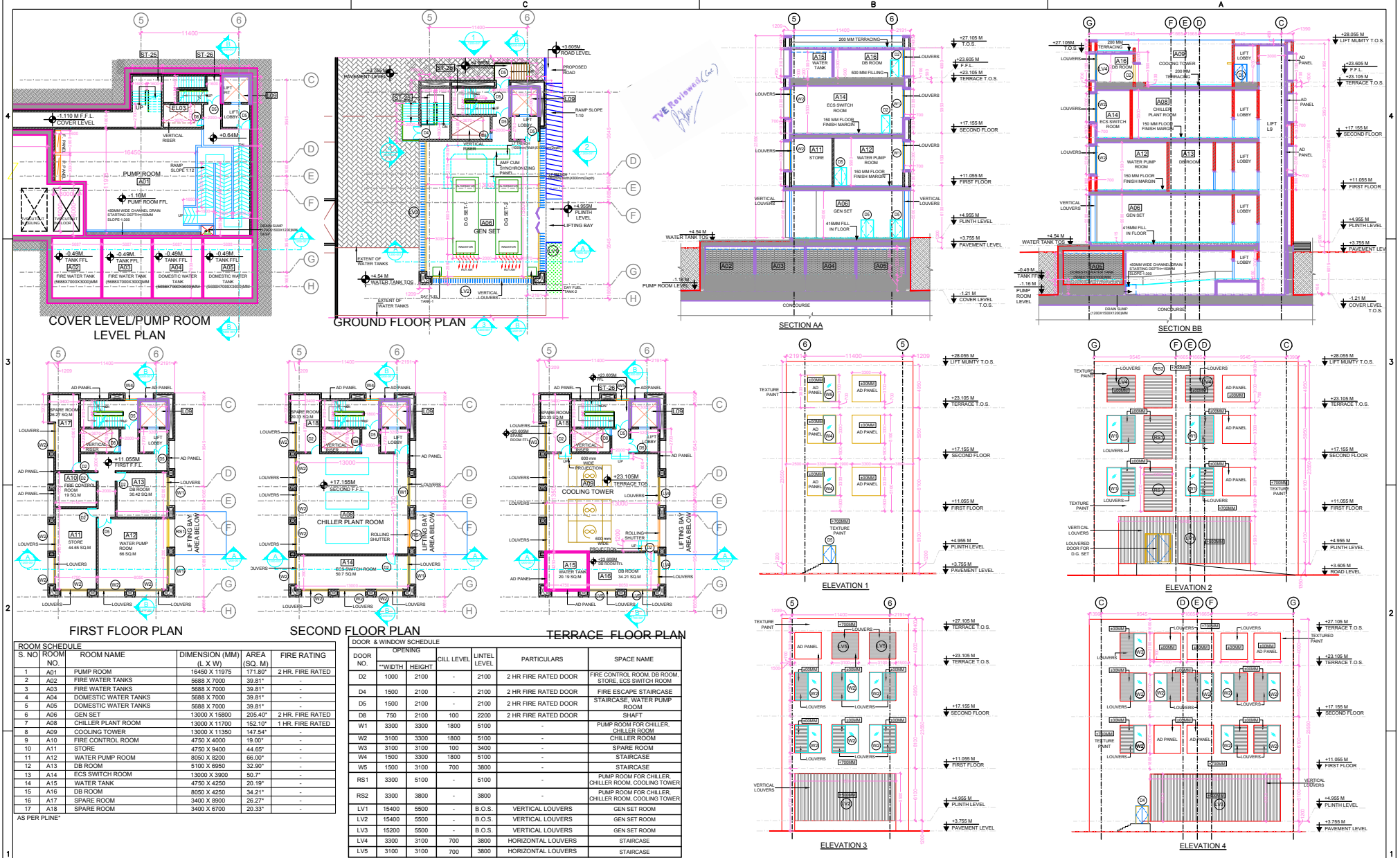
GENERAL CONSULTANCY SERVICES FOR MUMBAI METRO RAIL PROJECT, LINE No. 3 COLABA- BANDRA-SEEPZ

REV.	DATE	PREP.	APPROVED	DESCRIPTION

PROJECT	NAME	SIGN	PROJECT	STATION	DATE
MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ			MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	BANDRA (BKC) METRO STATION	26.04.18
GENERAL ARRANGEMENT DRAWING			GENERAL ARRANGEMENT DRAWING	COVER LEVEL PLAN	SCALE 1:400
DRAWING NO			UGC05-ARP-SBA-1100-001-A6-D		

Employer Drawings
Not to be used for construction

ADDENDUM No. 3, Attachment No. 7



TVE Revision (2)

S. NO	ROOM NO.	ROOM NAME	DIMENSION (MM) (L X W)	AREA (SQ. M)	FIRE RATING
1	A01	PUMP ROOM	16450 X 11975	171.807	2 HR. FIRE RATED
2	A02	FIRE WATER TANKS	5688 X 7000	39.811*	-
3	A03	FIRE WATER TANKS	5688 X 7000	39.811*	-
4	A04	DOMESTIC WATER TANKS	5688 X 7000	39.811*	-
5	A05	DOMESTIC WATER TANKS	5688 X 7000	39.811*	-
6	A06	GEN SET	13000 X 15800	205.407	2 HR. FIRE RATED
7	A08	CHILLER PLANT ROOM	13000 X 11700	152.107	1 HR. FIRE RATED
8	A09	COOLING TOWER	13000 X 11350	147.54*	-
9	A10	FIRE CONTROL ROOM	4750 X 4000	19.00*	-
10	A11	STORE	4750 X 8400	44.65*	-
11	A12	WATER PUMP ROOM	8050 X 8200	66.00*	-
12	A13	DB ROOM	5100 X 6950	32.90*	-
13	A14	ECS SWITCH ROOM	13000 X 3900	50.7*	-
14	A15	WATER TANK	4750 X 4250	20.19*	-
15	A16	DB ROOM	8050 X 8200	66.00*	-
16	A17	SPARE ROOM	3400 X 8900	26.27*	-
17	A18	SPARE ROOM	3400 X 6700	20.33*	-

AS PER LINE*

DOOR NO.	WIDTH	HEIGHT	CHILL LEVEL	LINTEL LEVEL	PARTICULARS	SPACE NAME
D2	1000	2100	-	2100	2 HR FIRE RATED DOOR	FIRE CONTROL ROOM, DB ROOM, STORE, ECS SWITCH ROOM
D4	1500	2100	-	2100	2 HR FIRE RATED DOOR	FIRE ESCAPE STAIRCASE
D5	1500	2100	-	2100	2 HR FIRE RATED DOOR	STAIRCASE, WATER PUMP ROOM
D8	750	2100	100	2200	2 HR FIRE RATED DOOR	SHAFT
W1	3300	3300	1800	5100	-	PUMP ROOM FOR CHILLER, CHILLER ROOM
W2	3100	3300	1800	5100	-	CHILLER ROOM
W3	3100	3100	100	3400	-	SPARE ROOM
W4	1500	3300	1800	5100	-	STAIRCASE
W5	1500	3100	700	3800	-	STAIRCASE
RS1	3300	5100	-	5100	-	PUMP ROOM FOR CHILLER, CHILLER ROOM, COOLING TOWER
RS2	3300	3800	-	3800	-	CHILLER ROOM, COOLING TOWER
LV1	15400	5500	-	B.O.S.	VERTICAL LOUVERS	GEN SET ROOM
LV2	15400	5500	-	B.O.S.	VERTICAL LOUVERS	GEN SET ROOM
LV3	15200	5500	-	B.O.S.	VERTICAL LOUVERS	GEN SET ROOM
LV4	3300	3100	700	3800	HORIZONTAL LOUVERS	STAIRCASE
LV5	3100	3100	700	3800	HORIZONTAL LOUVERS	STAIRCASE

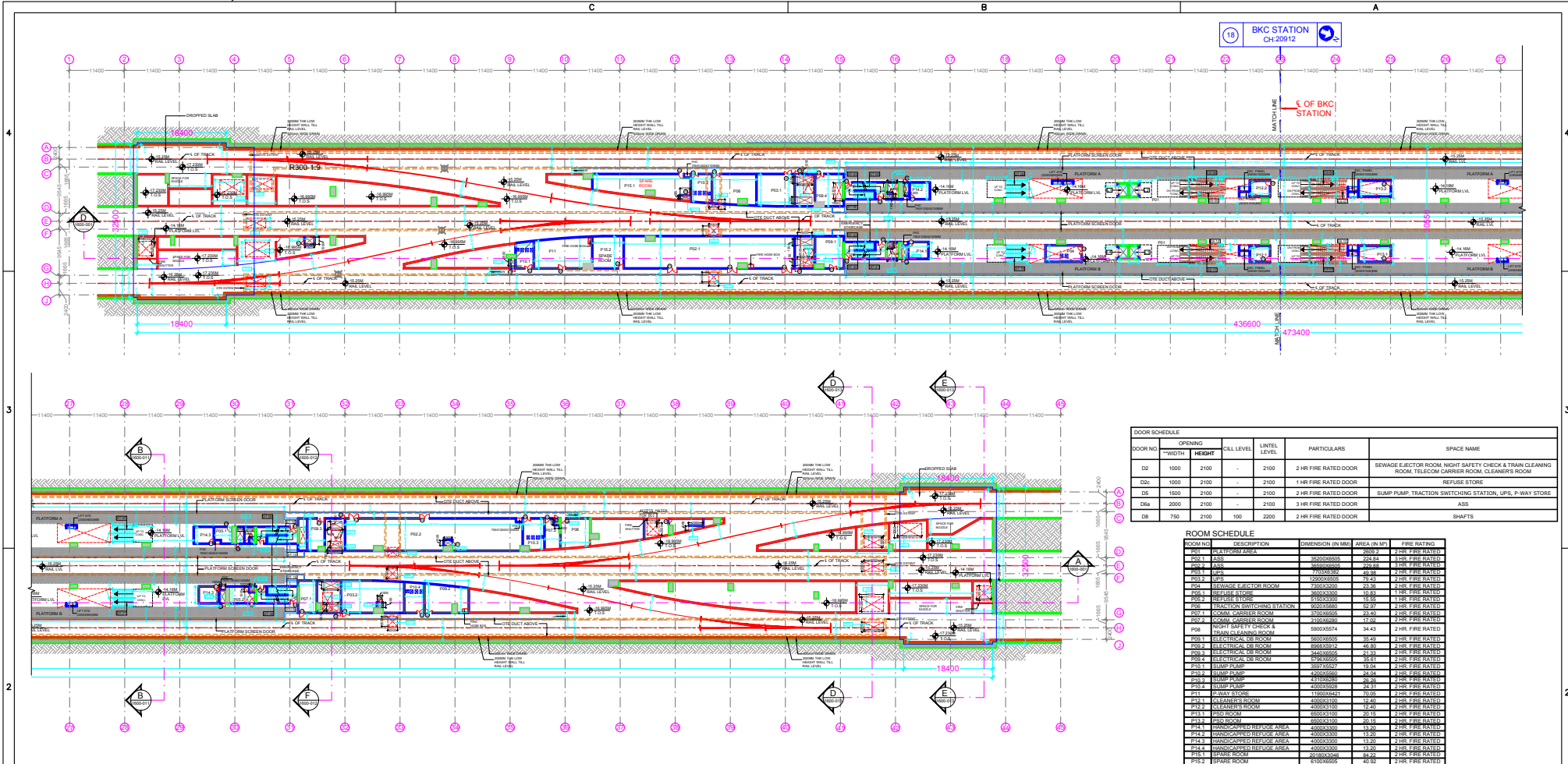
GENERAL CONSULTANCY SERVICES
FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
COLABA- BANDRA-SEEPZ

REV.	DATE	PREP.	APPROVED	DESCRIPTION

DRAWN BY	SIGN	PROJECT	MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	STATION	BANDRA (BKC) METRO STATION	DATE	19.05.2018
DESIGN BY		TITLE	GENERAL ARRANGEMENT DRAWING	DRAWING TITLE	ANCILLARY BUILDING PLANS, SECTIONS & ELEVATIONS	SCALE	1:200
CHECKED BY		DRAWING NO	UGC05-ARP-SBA-1200-001-A5-D				
APPROVED BY							

Employer Drawings
 Not to be used for construction

ADDENDUM No. 3, Attachment No. 7



DOOR NO.	OPENING	CELL LEVEL	LINTEL LEVEL	PARTICULARS	SPACE NAME
D2	1000 2100	-	2100	2 HR FIRE RATED DOOR	SEWAGE EJECTOR ROOM, NIGHT SAFETY CHECK & TRAIN CLEANING ROOM, TELECOM CARRIER ROOM, CLEANERS ROOM
D2c	1000 2100	-	2100	1 HR FIRE RATED DOOR	REFUSE STORE
D2d	1500 2100	-	2100	2 HR FIRE RATED DOOR	BUMP PUMP, TRACTION SWITCHING STATION, UPS, P-WAY STORE
D2a	2000 2100	-	2100	3 HR FIRE RATED DOOR	ASS
DB	750 2100	100	2200	2 HR FIRE RATED DOOR	SHAFTS

ROOM NO.	DESCRIPTION	DIMENSION (IN MM)	AREA (IN SQ M)	FIRE RATING
PR1	PLATFORM AREA	-	2007.2	2 HR FIRE RATED
PR2	ASS	3520X6500	228.41	2 HR FIRE RATED
PR3	ASS	3600X6500	234.00	2 HR FIRE RATED
PR4	ASS	700X500	35.00	2 HR FIRE RATED
PR5	UPS	1200X2500	30.00	2 HR FIRE RATED
PR6	SEWAGE EJECTOR ROOM	2000X2000	40.00	2 HR FIRE RATED
PR7	REFUSE STORE	6000X3000	18.00	1 HR FIRE RATED
PR8	TRACTION SWITCHING STATION	5100X3300	16.93	2 HR FIRE RATED
PR9	COMM. CARRIER ROOM	3700X2650	9.81	2 HR FIRE RATED
PR10	COMM. CARRIER ROOM	3700X2650	9.81	2 HR FIRE RATED
PR11	NIGHT SAFETY CHECK ROOM	3700X2650	9.81	2 HR FIRE RATED
PR12	TRAIN CLEANING ROOM	5800X5574	32.43	2 HR FIRE RATED
PR13	ELECTRICAL DB ROOM	6000X2000	12.00	2 HR FIRE RATED
PR14	ELECTRICAL DB ROOM	6000X2000	12.00	2 HR FIRE RATED
PR15	ELECTRICAL DB ROOM	3400X2650	9.02	2 HR FIRE RATED
PR16	ELECTRICAL DB ROOM	3400X2650	9.02	2 HR FIRE RATED
PR17	BUMP PUMP	3500X2500	8.75	2 HR FIRE RATED
PR18	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR19	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR20	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR21	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR22	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR23	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR24	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR25	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR26	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR27	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR28	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR29	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR30	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR31	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR32	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR33	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR34	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR35	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR36	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR37	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR38	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR39	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED
PR40	BUMP PUMP	2000X2000	4.00	2 HR FIRE RATED

LEGEND	DESCRIPTION
(Symbol)	200 MM THICK BLOCK WORK
(Symbol)	300 MM THICK BLOCK WORK
(Symbol)	PCB HATCH
(Symbol)	FIRE CURTAIN

LIFT SCHEDULE	
Area Code	Escalator Number
PR1	L1
PR1	L2
PR1	L3
PR1	L4

ESCALATOR SCHEDULE	
Area Code	Escalator Number
PR1	ESC01
PR1	ESC02
PR1	ESC03
PR1	ESC04
PR1	ESC05
PR1	ESC06
PR1	ESC07
PR1	ESC08
PR1	ESC09
PR1	ESC10
PR1	ESC11
PR1	ESC12

STAIRCASE SCHEDULE	
STAIRCASE NUMBER	DESCRIPTION
ST-04	BW GRD 15 & 16
ST-05	BW GRD 15 & 16
ST-06	BW GRD 15 & 16
ST-08	BW GRD 27 & 29
ST-09	BW GRD 30 & 31
ST-10	BW GRD 30 & 31
ST-15	BW GRD 30 & 31
ST-16	BW GRD 30 & 31
ST-17	BW GRD 27 & 29
ST-18	BW GRD 15 & 16
ST-21	BW GRD 15 & 16
ST-22	BW GRD 15 & 16

CUTOUT SCHEDULE	
CUTOUT NUMBER	DESCRIPTION
CUT-01	RELIEF
CUT-02	PIPE
CUT-03	ACCESS HATCH
CUT-04	ESG SUPPLY
CUT-05	ESG SUPPLY
CUT-06	ESG SUPPLY
CUT-07	ESG SUPPLY
CUT-08	ESG SUPPLY
CUT-09	ESG SUPPLY
CUT-10	ESG SUPPLY
CUT-11	ESG SUPPLY
CUT-12	ESG SUPPLY
CUT-13	ESG SUPPLY
CUT-14	ESG SUPPLY
CUT-15	ESG SUPPLY
CUT-16	ESG SUPPLY
CUT-17	ESG SUPPLY
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CUT-19	ESG SUPPLY
CUT-20	ESG SUPPLY
CUT-21	ESG SUPPLY
CUT-22	ESG SUPPLY
CUT-23	ESG SUPPLY
CUT-24	ESG SUPPLY
CUT-25	ESG SUPPLY
CUT-26	ESG SUPPLY
CUT-27	ESG SUPPLY
CUT-28	ESG SUPPLY
CUT-29	ESG SUPPLY
CUT-30	ESG SUPPLY

TVE Reviewed (Gr)
[Signature]

GENERAL CONSULTANCY SERVICES
FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
COLABA- BANDRA-SEEPZ

REV.	DATE	PREP.	APPROVED	DESCRIPTION

PROJECT	STATION	DATE
MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	BANDRA (BKC) METRO STATION	26.04.18

TITLE	DRAWING TITLE	SCALE
GENERAL ARRANGEMENT DRAWING	PLATFORM LEVEL PLAN	1:400

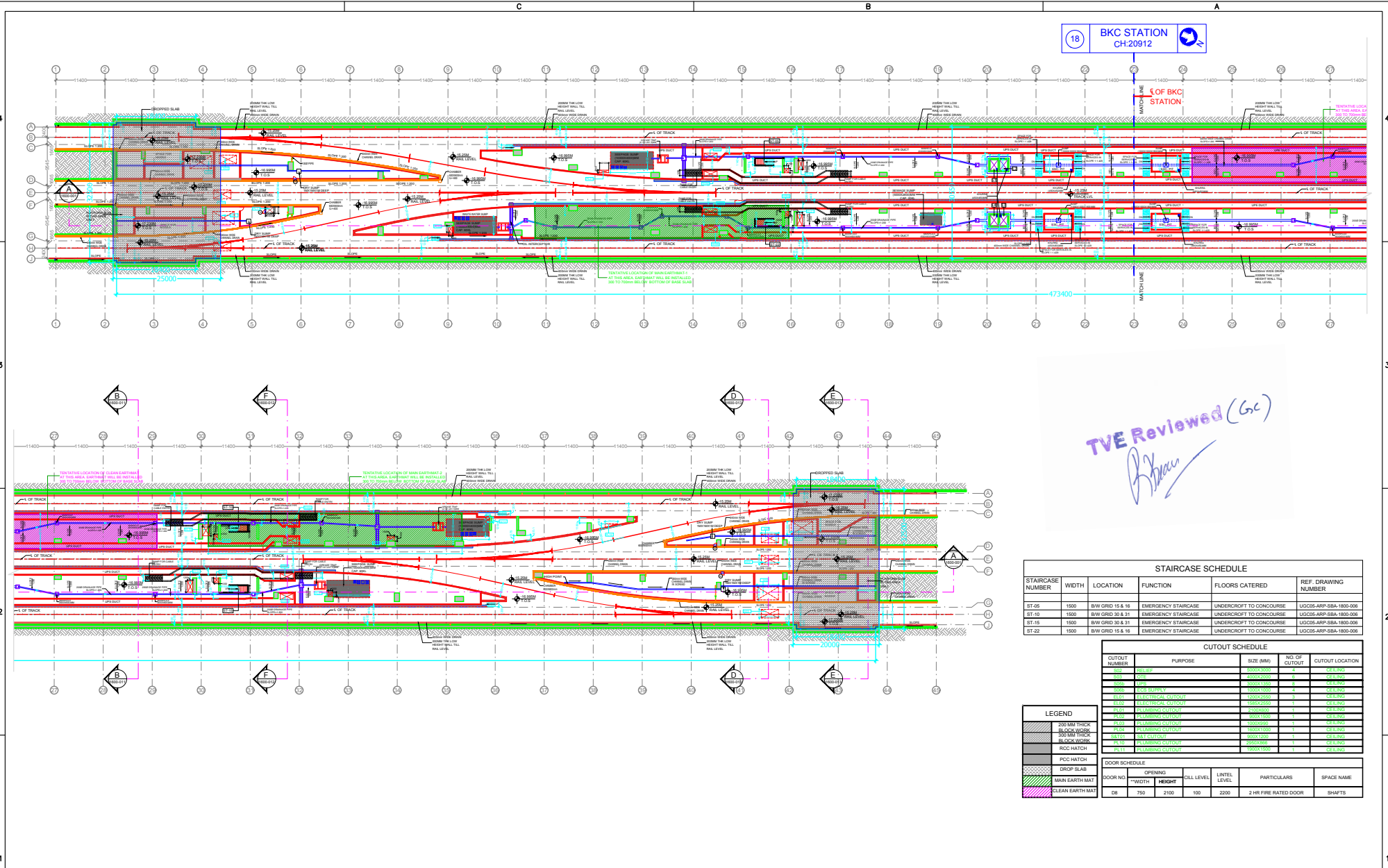
Employer Drawings
Not to be used for construction



NAME	SIGN
DRAWN BY	
DESIGN BY	
CHECKED BY	
APPROVED BY	

DRAWING NO. UG05-ARP-SBA-1400-001-A6-D

ADDENDUM No. 3, Attachment No. 7



STAIRCASE SCHEDULE					
STAIRCASE NUMBER	WIDTH	LOCATION	FUNCTION	FLOORS CATERED	REF. DRAWING NUMBER
ST-05	1500	B/W GRID 15 & 16	EMERGENCY STAIRCASE	UNDERCROFT TO CONCOURSE	UGC05-ARP-SBA-1800-006
ST-15	1500	B/W GRID 30 & 31	EMERGENCY STAIRCASE	UNDERCROFT TO CONCOURSE	UGC05-ARP-SBA-1800-006
ST-15	1500	B/W GRID 30 & 31	EMERGENCY STAIRCASE	UNDERCROFT TO CONCOURSE	UGC05-ARP-SBA-1800-006
ST-22	1500	B/W GRID 15 & 16	EMERGENCY STAIRCASE	UNDERCROFT TO CONCOURSE	UGC05-ARP-SBA-1800-006

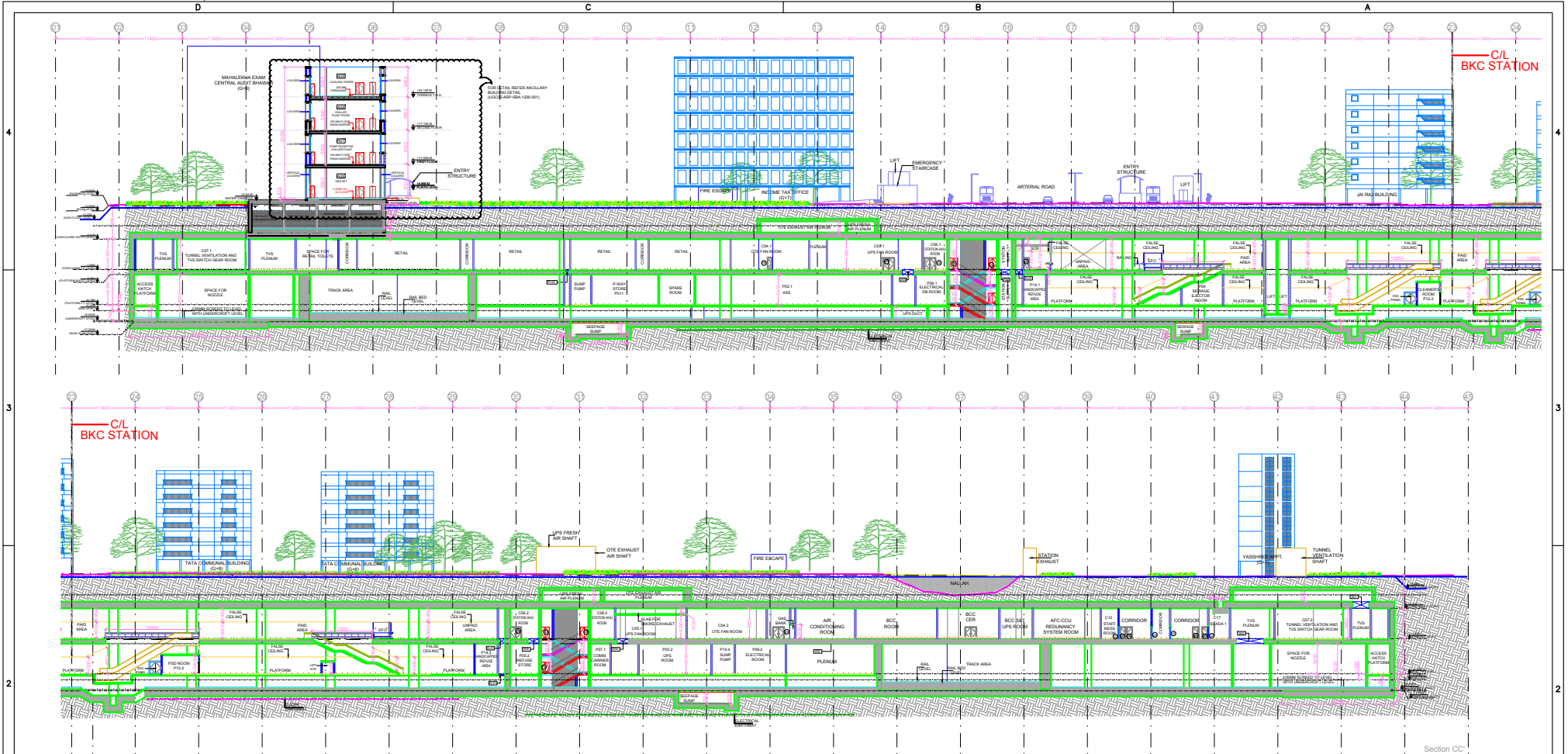
CUTOUT SCHEDULE					
CUTOUT NUMBER	PURPOSE	SIZE (MM)	NO. OF CUTOUT	CUTOUT LOCATION	
S01	RELIEF	200X200	2	CE-4.00	
S02	DRIP	200X200	2	CE-4.00	
S03	DRIP	200X200	2	CE-4.00	
S04	WBS SUPPLY	100X100	2	CE-4.00	
E01	ELECTRICAL CUTOUT	200X200	1	CE-4.00	
E02	ELECTRICAL CUTOUT	125X250	1	CE-4.00	
P01	PLUMBING CUTOUT	200X200	1	CE-4.00	
P02	PLUMBING CUTOUT	200X200	1	CE-4.00	
P03	PLUMBING CUTOUT	100X200	1	CE-4.00	
P04	PLUMBING CUTOUT	100X200	1	CE-4.00	
S010	WATER CUTOUT	200X200	1	CE-4.00	
P010	PLUMBING CUTOUT	200X200	1	CE-4.00	
P011	PLUMBING CUTOUT	100X150	1	CE-4.00	

LEGEND	
[Pattern]	200 MM THICK BLOCK WORK
[Pattern]	300MM THICK BLOCK WORK
[Pattern]	ROD HATCH
[Pattern]	PCD HATCH
[Pattern]	DRIP SLAB
[Pattern]	MAIN EARTH MAT
[Pattern]	CLEAN EARTH MAT

DOOR SCHEDULE						
DOOR NO.	OPENING		DILL LEVEL	UNTL LEVEL	PARTICULARS	SPACE NAME
	WIDTH	HEIGHT				
D8	750	2100	100	2200	2 HR FIRE RATED DOOR	SHAFTS

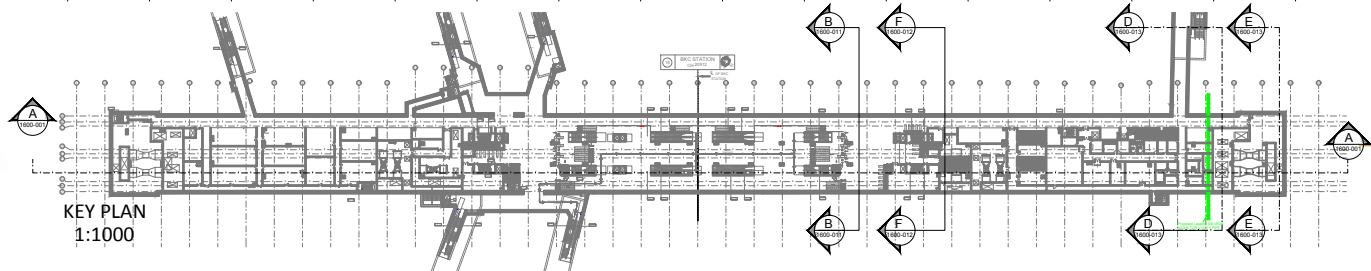
<p>GENERAL CONSULTANCY SERVICES FOR MUMBAI METRO RAIL PROJECT, LINE No. 3 COLABA- BANDRA-SEEPZ</p>	NAME	SIGN	PROJECT	MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	STATION	BANDRA (BKC) METRO STATION	DATE	26.04.2018
	DRAWN BY		TITLE	GENERAL ARRANGEMENT DRAWING	DRAWING TITLE	UNDERCROFT LEVEL PLAN	SCALE	1:400
	DESIGN BY		DRAWING NO.	UGC05-ARP-SBA-1500-001-A6-D	<p>Employer Drawings Not to be used for construction</p>			
	CHECKED BY							
APPROVED BY								

ADDENDUM No. 3, Attachment No. 7



SECTION AA'

TVE Reviewed (Sec)
[Signature]



KEY PLAN
1:1000



GENERAL CONSULTANCY SERVICES
FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
COLABA- BANDRA-SEEPZ

REV.	DATE	PREP.	APPROVED	DESCRIPTION

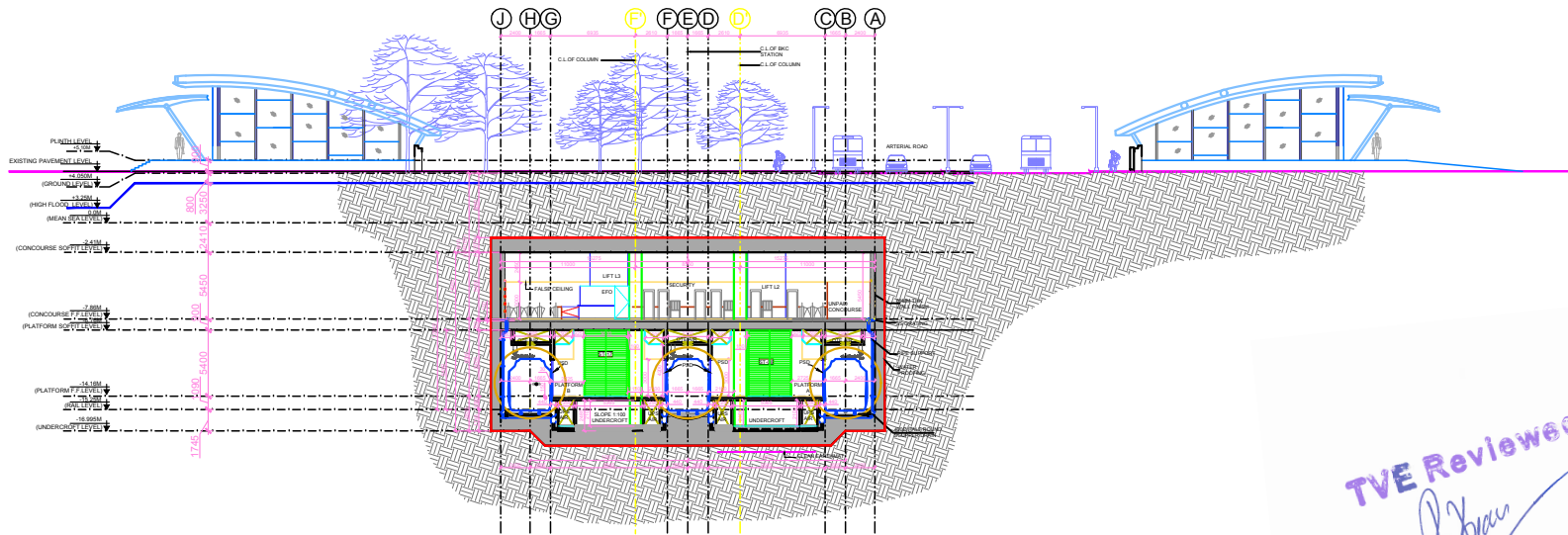
NAME	SIGN

PROJECT	MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ
TITLE	GENERAL ARRANGEMENT DRAWING
DRAWING NO	UGC05-ARP-SBA-1600-001-A6-D

STATION	BANDRA (BKC) METRO STATION
DRAWING TITLE	CROSS SECTION FF

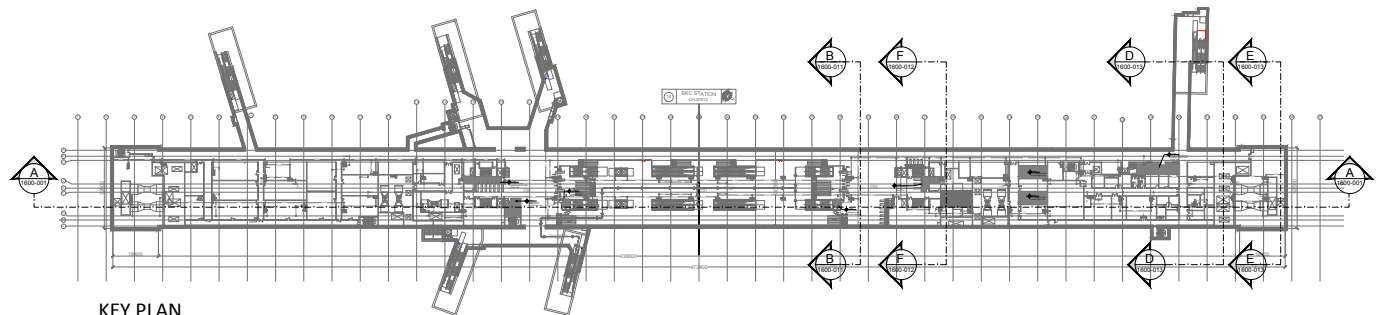
DATE	30.04.2018
SCALE	1:300

Employer Drawings
Not to be used for construction



SECTION BB'

TVE Reviewed (Gc)
[Signature]



KEY PLAN
 1:1000



GENERAL CONSULTANCY SERVICES
 FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
 COLABA-BANDRA-SEEPZ

REV.	DATE	PREP.	APPROVED	DESCRIPTION

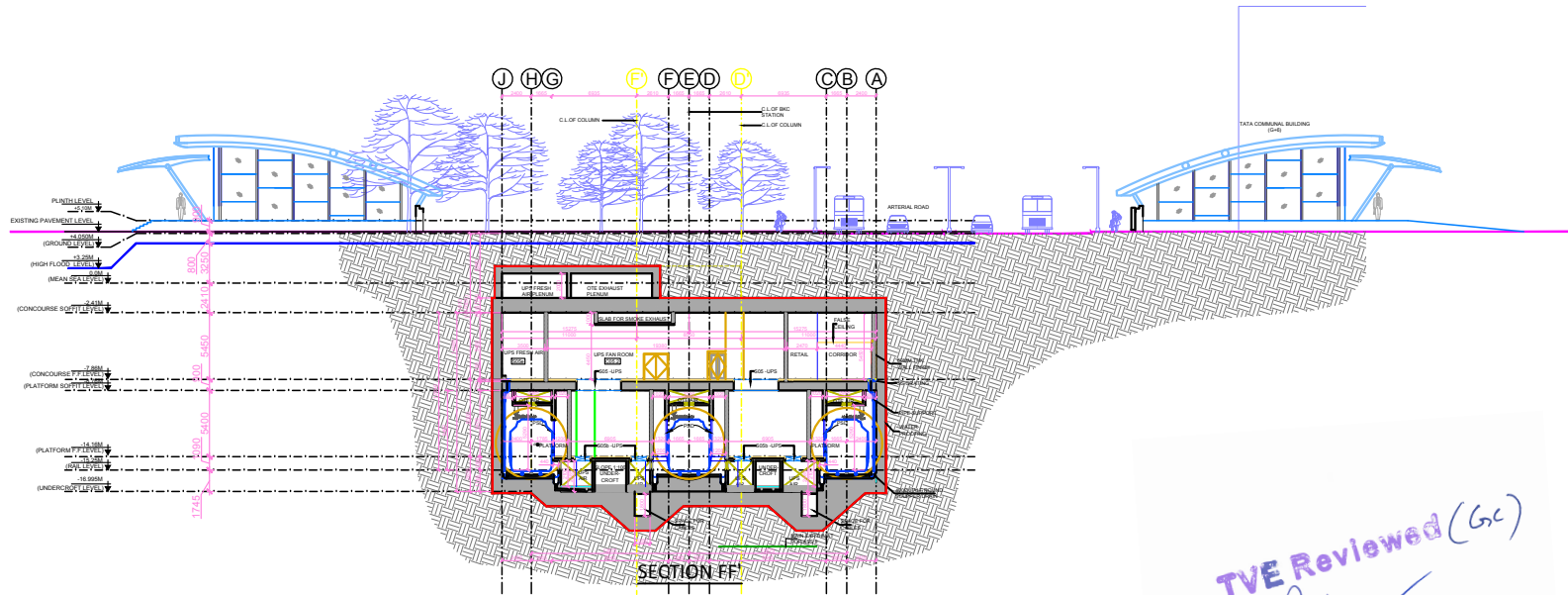
NAME	SIGN
DRAWN BY	
DESIGN BY	
CHECKED BY	
APPROVED BY	

PROJECT	MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ
TITLE	GENERAL ARRANGEMENT DRAWING
DRAWING NO.	UGC05-ARP-SBA-1600-011-A4-D

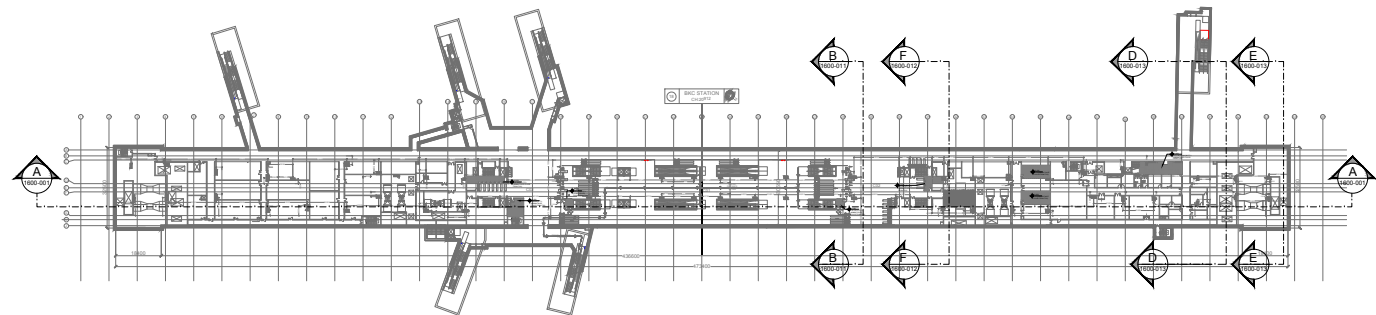
STATION	BANDRA (BKC) METRO STATION
DRAWING TITLE	UNDERCROFT LEVEL PLAN

DATE	30.04.2018
SCALE	1:200

Employer Drawings
 Not to be used for construction



TVE Reviewed (Gc)
[Signature]



GENERAL CONSULTANCY SERVICES
 FOR MUMBAI METRO RAIL PROJECT, LINE No. 3
 COLABA- BANDRA-SEEPZ

REV.	DATE	PREP.	APPROVED	DESCRIPTION

NAME	SIGN
DRAWN BY	
DESIGN BY	
CHECKED BY	
APPROVED BY	

PROJECT	MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ
TITLE	GENERAL ARRANGEMENT DRAWING
DRAWING NO	UGC05-ARP-SBA-1600-012-A4-D

STATION	BANDRA (BKC) METRO STATION
DRAWING TITLE	CROSS SECTION FF

DATE	30.04.2018
SCALE	1:200

Employer Drawings
 Not to be used for construction

BID FORM 7A: PRICING OF NONMATERIAL NONCONFORMITY

Item	Nonconformity as Proposed in Bid Form 7	Key date affected by Nonconformity, if any	Price Increase or Decrease as a result of the withdrawal of Nonconformity	
			Foreign Currency	Indian Currency
TOTAL				

ATTENTION: THIS FORM HAS TO BE INCLUDED ONLY IN THE PRICE BID ENVELOPE.

NOTES:

1. The Bidder shall show every key date that will be affected by each nonconformity, included in his Financial Package.

We hereby confirm that the nonconformity shall be treated as NULL and stand withdrawn if not accepted by the Employer.

We hereby confirm that except for the nonconformity noted in this bid form our offer is fully **AND TRULY COMPLIANT.**

Authorized Signatory
[Insert name of signatory; title]

BID FORM 7: STATEMENT OF NONMATERIAL NONCONFORMITY

<u>CHAPTER NUMBER</u>	<u>CLAUSE NUMBER</u>	<u>DETAILS OF NONCONFORMITY</u>	<u>REMARKS EXPLAINING THE BENEFITS TO THE EMPLOYER IF HE ELECTS TO ACCEPT THE NONCONFORMITY</u>

Notes:

1. Where there are no nonconformities, the statement should be returned duly signed with an endorsement indicating 'no nonconformity'.
2. In case this bid form is not submitted, it will be construed that the bidder has not proposed any nonconformity from the bid documents and will provide all equipment as per the technical specifications.

We hereby confirm that the pricing of the above nonconformity has been given in bid FORM 7A.

We hereby confirm that the nonconformity in our proposal shall be treated as null and void and stand withdrawn, if not accepted by the employer.

We hereby confirm that except for the nonconformity noted in this form, our offer is fully and truly compliant.

Authorized Signatory
[Insert name of signatory; title]

Attachment No. 10 to Addendum No.3

Form of Bid Security (Bank Guarantee)

(To be stamped in accordance with the Stamp Act of the Country of Issuing Bank)

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: Mumbai Metro Rail Corporation Ltd. (MMRC) NaMTTRI Building, Plot No. R-13, 'E'- Block, Bandra Kurla Complex, Bandra (East), Mumbai 400051, India

IFB No.: [MM3-CBS-TVE (Phase 1)]

Date: [*insert date of issue*]

BID GUARANTEE No.: [*insert guarantee reference number*]

Guarantor: [*insert name and address of place of issue, unless indicated in the letterhead*]

We have been informed that [*insert name of the Bidder, which in the case of a joint venture shall be the name of the joint venture (whether legally constituted or prospective) or the names of all members thereof*] (hereinafter called “the -Applicant”) has submitted or will submit to the Beneficiary its Bid (hereinafter called “the Bid”) for the execution of *Tunnel Ventilation and Environmental Control system works including design, manufacture, supply, installation, testing, commissioning* for Mumbai Metro Line 3 (Colaba – Bandra – SEEPZ) Project under Loan Agreement No. [ID-P233].

Furthermore, we understand that, according to the Beneficiary’s conditions, Bids must be supported by a bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of [*insert amount in words, (insert amount in figures)*] upon receipt by us of the Beneficiary’s complying demand, supported by the Beneficiary’s statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- (a) has withdrawn its Bid during the period of Bid validity set forth in the Applicant’s Letter of Bid (hereinafter called “the Bid Validity Period”), or any extension thereto provided by the Applicant;
- or
- (b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) fails to execute the Contract Agreement, or (ii) fails to furnish the Performance Security, in accordance with the Instructions to Bidders of the Beneficiary’s Bidding Documents.

This guarantee will expire and shall be returned to the Applicant: (a) if the Applicant is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Applicant and the Performance Security issued to the Beneficiary in relation to such Contract Agreement; or (b) if the Applicant is not the successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the bidding process; or (ii) twenty-eight (28) days after the end of the Bid Validity Period.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

“This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758 (or subsequent ICC Publications)”

[Signature]

Below is NOT the part of BG Format

Note for information of the **'Bidder'**:

- 1) The terms **'Bidder'** and **'Applicant'** have been used interchangeably in the above **Form of Bid Security (Bank Guarantee)** meaning the same as the **'Bidder'** (as stated in the ITB 4). The term **'Applicant'** shall not to be construed as the **applicant** who has approached the Bank for issuing Bank Guarantee(s).
- 2) The **'Bidder'** shall be careful while getting the Bank Guarantee(s) prepared from their Bankers as any default in the correctness of BG as per the BG requirements shall lead to rejection.

MUMBAI METRO RAIL CORPORATION LIMITED

Mumbai Metro Line-3 Project

Response to Bidders Queries (Set-1) for IFB No. MM3-CBS-TVE (PHASE 1)

Design, Manufacture, Supply, Installation, Testing and Commissioning of Tunnel Ventilation System & Environmental Control System - Package: 15 (PHASE-1)

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
CONTRACTS & FINANCE QUERIES						
1	PART-1 & SECTION-III	1.1.1	4,5 of 20	Project Organisation & Key Personnel	Please confirm whether proposed key personnel shall be on direct pay roll of the contractor.	Bid conditions prevail. It is the responsibility of the Bidder to ensure that the proposed key personell are avilable for deployment during execution of the project.
2					Also, confirm whether the proposed key personnel can be changed before the start of execution of contract in case of successful bid.	Bid conditions prevail. Proposed key personell may be changed only if the replacement offered by the Bidder is acceptable to the Employer.
3	PART-1 & SECTION-III	1.1.1 & 1.1.2	4,5 of 20	DDC & IDA	We understand if the contractor have in house capabilities for design having key personnel as per the requirements in referred Clause and are pre-qualified based on internal capabilities. In that case contractor is not bound to engage external DDC agency. Please confirm.	Bid conditions prevail. Confirmed
4					Please confirm if the IDA can be on employment roll of the contractor who shall directly report to Employer having relevant experience as desired in referred Clause. Please confirm whether the details of IDA can be submitted after the award of the contract.	Bid conditions prevail.
5	PART-1 & SECTION-IV-A	Bid Form 22 & 23	35 to 54 of 76	Bid Forms	Please confirm whether Bid Form 22 & 23 can be provided for multiple suppliers per equipment as finalization of supplier can only be confirmed during project execution stage.	Bid conditions prevail. Yes, there can be multiple suppliers for the same equipment.
6					Also, please confirm that any supplier whose referred bid form is not submitted at bidding stage can be considered during project execution stage. Therefore, contractor shall be free to choose the supplier.	Bid conditions prevail. Yes, additional suppliers can be added by the Contractor with prior permission of Project Manager / Employer.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
7	PART-1 & SECTION-IV-B	1.6	11 of 74	Quantity Variation	We understand from the referred Clause that no variation whether (-)ve or (+)ve will be considered for variation in lump sum price. In line with this Clause, further please confirm even in the quantity of any item under Schedule 1 to Schedule 5 becomes zero during the design finalization, payment shall be made to the contractor.	Bid conditions prevail.
8					2nd Paragraph - In case of change in scope, key dates & prices shall be mutually agreed. Please confirm.	Bid conditions prevail.
9	PART-1 & SECTION-IV-B	Schedule 1 to 7		Pricing Documents	Please confirm if any item which is quoted in Schedule -1 i.e. items supplied from Abroad can be purchased from within the employer's country during the execution of project.	Bid conditions prevail. In such case Contractor shall have to raise "Change Request" which shall be subject to the Employer's Approval and shall be dealt as per Contract's Provisions.
10					Please confirm if price of any item is quoted in foreign currency under Schedule 1 to Schedule 5 but procured / sourced from within the employer's country. Payment shall be made in quoted foreign currency.	
11					If the above is not acceptable, in that case payment will be made in currency of purchase irrespective of quoted currency. Rate of exchange used shall be as on date of purchase of such items. Please Confirm.	
12	PART-1 & SECTION-IV-B	5 Notes 1.1	62 of 67	Percentage for Schedule-4	As per the referred note, total quoted amount in Schedule-4 shall be minimum 30% of the grand summary. In this connection, it is to mention that such limit shall not be applied as the quoted price under all schedules shall be balanced in order to meet the project cash flow requirement for better control of the project. Therefore this clause is not acceptable and bidders should be free to decide the percentage which shall be calculated on actual basis and quoted accordingly.	Bid conditions prevail.
13					Following Terms of Payment is Required for Effective Execution of the Project: 1) 10% advance against Advance Bank Guarantee 2) 10% on Design Works (Schedule - 3) 3) 75% on Supply (Schedule - 1 & 2) 4) 2.5% on Installation & 2.5% on Testing and Commissioning (Schedule - 4) Kindly Confirm.	Bid conditions prevail. Not accepted.
14	PART-3 & SECTION-IX	Appendix -2	10 of 28	Table - 1	The given Coefficient for each factor is not in line with the actual factor. Therefore, please change the factors as per following so as to enable to accurately execute price adjustment (if required) Fixed-5% Labour-25% Steel-40% Copper-30% Fuel-5%. Please Confirm.	Bid conditions prevail. Not accepted.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
15	PART-1 & SECTION-IV-B	4.1 & 4.2	62 of 67	Schedule -4	As per Schedule-4 of Pricing Document, item 4.1 & 4.2. Contractor can only claim for Installation, Testing, Integrated Testing and Commissioning , Operational Acceptance of Facilities etc in single lot after completion of all activities. Same is not acceptable as all these activities are spread across in terms of time which will sufficiently impair contractor performance / cash inflow. Therefore the same shall be further divided as per items in Schedule -1 & Schedule -2 and shall be pro-rata basis. Kindly Confirm.	Bid conditions prevail. The payment can be released on pro-rata basis subject to Employer approving a breakup of Schedule 4, proposed by contractor and found acceptable, post award of work.
16	PART-1 & SECTION-IV-B	1.2.4	5 of 74	Deemed Export	We understand that the project is covered under deemed export benefit. In this regard please confirm the list of documents required for availing such benefit. However, contractor can submit following documents :- For Imported Items 1.Copy Bill of Lading 2.Foreign supplier Invoice. 3.Foreign material packing List. 4.Copy of Bill of Entry. 5.Certificate of Origin. Also, overall responsibility to avail deemed export benefit shall be of the employer whereas contractor shall be responsible for submission of above mentioned documents. Further we request to let us know if any other documents are required apart from the one that are mentioned above at this stage. Also let us know the procedure for availing the same. Contractor would not be responsible for any discrepancies arising due to non-arrangement of documents on account of amendments/revisions in procedures claiming of deemed export benefits.	Bid conditions prevail. Please go through Clause no. 1.2.4 carefully. Deemed Export benefits are not available to the Project at present. Deemed Export benefits if and when available to the project, shall be passed on to the Employer in totality.
17	PART-1 & SECTION-IV-B	1.2.4	5 of 74	Deemed Export	If the item is quoted in foreign currency but procured through dealership network from within the country (India) then deemed export benefit shall not be reimbursed / passed to the Employer, if any. Please confirm.	Bid conditions prevail. Deemed Export benefits if and when available to the project shall be passed on to the Employer in totality.
18	PART-1 & SECTION-IV-B	1.2	2 of 74	Contract Price : High Seas Sales	Please confirm whether High Seas Sales is applicable in the contract.	All transfer of property in any material of equipment is at the work site as prescribed.
19	PART-1 & SECTION-IV-B	1.2.7	6 of 74	Concessional benefits for Project Import	We request to kindly detail the procedure for availing concessional benefits for Project Imports.	Bid conditions prevail. For all the exemptions, procedures, taxes applicable bidder to check with their legal/ tax consultant before bidding and responsibilities solely lies on bidder only and not on the Employer.
20	PART-1 & SECTION-IV-B	1.2.6	6 of 74	Record of Taxes & Duties	If the item is quoted in foreign currency but procured through dealership network from within the country (India) then record of custom duties shall not be possible. However we shall maintain record of applicable GST. Please confirm.	Bid conditions prevail. If Bidders is buying within From Employer's Country it shall be quoted in Schedule 2 in INR Currency.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
21	PART-1 & SECTION-III	1.1.3	6 of 20	Construction Equipment's	Please confirm if necessary construction equipment's required as per referred Clause can be hired / rented on requirement basis during the execution of contract.	Bid conditions prevail. Bid Form 5 clearly specifies that the construction equipment can be owned , rented or leased etc.Refer also to para 1.1.3(b) regarding availability of equipments.
22	PART-1 & SECTION-IV-B		8 65 of 68	Schedule-6	Amount of Taxes / Duties / Levies provided in Schedule-6 shall be indicative only, which is for the purpose of defining the ceiling limit. However, any refund applicable shall be on the basis of actual tax / duties / levies incurred by the contractor.	Bid conditions prevail. Purpose of breakdown of Bidder's fixed Lump Sum Price in the Appendix A-Grand Summary (Rev '2') to the Schedule No.6." is only for Variation Purpose.
23	PART-1 & SECTION-IV-B	1.3.3	7 of 44	Schedule-3	As per the referred Clause, we understand that the SES simulation of the works as applicable shall be carried out with SES software of any other equivalent software.	Bid conditions prevail.
24					If equivalent software is permitted to be used for simulations. Please confirm if there is any criteria on which authentication of software will be evaluated.	
25	PART-1 & SECTION-IV-B			Schedule -1 & 2	In case item is quoted in Foreign Currency in Schedule - 1 & procured from within the country (India) and vice versa in case of Schedule - 2. Payments to the contractor shall be made as per items quoted in respective Schedules. Please confirm.	Duplicate Query. Already replied at S.No 9 to 11.
26	PART-2 & SECTION-VI A	9.2.7	103 of 190	FAI	Please confirm whether Employer will bear it's cost for boarding, lodging & travel during FAI. Please confirm.	Refer Part 3, Section VII, Clause GC 23.2.Bid conditions prevail.
27	PART-1 & SECTION-III	2.3.3	14 of 20	Financial Resources	Please confirm whether Bank Letter provided during Pre Qualification Stage shall suffice the requirements of the referred Clause.	Not Relevant
28	PART-1 & SECTION-III	1.2.3	8 of 20	Sub Contractor/ manufacturer	Sub Contractors/ Manufacturer details can be submitted after award of the Contract. Please Confirm.	Bid conditions prevail. Bid has to be complete in all respects as prescribed in the Bid Document.
29	PART-1 & SECTION-III	Qualification 2.3.1	13 of 20	Financial Situation	It is proposed that, while considering positive Net Worth,any one of the member or consortium/Joint Venture either of the member can satisfy the condition. Please Confirm.	Bid conditions prevail.
30	PART-1 & SECTION-III	Qualification 2.3.1	13 of 20	Financial Situation	Please confirm if Provisional Balance Sheet of 2017-18 shall be acceptable or not. Audited balance sheet shall be provided after the award of contract.	Bid conditions prevail. Only Audited Balance Sheets shall be acceptable.
31	PART-1 & SECTION-III	Qualification 2.3.2	13 of 20	Average Annual Turnover	It is proposed that, while considering the Average Construction Turnover, any one of the member or consortium/Joint Venture can satisfy this condition. Please Confirm.	Bid conditions prevail.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
32	PART-1 & SECTION-III	Qualification 2.3.3	14 of 20	Financial Resources	It is proposed that, while considering the Average Construction Turnover, any one of the member or consortium/Joint Venture can satisfy this condition. Please Confirm.	Bid conditions prevail.
33	PART-1 & SECTION-III	Qualification 2.4.1	17 of 20	General Construction Experience	It is proposed that, while considering the Average Construction Turnover, any one of the member or consortium/Joint Venture can satisfy this condition. Please Confirm.	Bid conditions prevail.
34	PART-3 & SECTION-IX	Apendix-3 Insurance Requirement	13 of 28	Cargo Insurance	Cargo Insurance shall be provided till delivery of major Equipments. Please confirm.	Bid conditions prevail.
35	PART-3 & SECTION-IX	Apendix-3 Insurance Requirement	13 of 28	Installation all Risk	Installation all risk shall be provided till Completion or ROD whichever is earlier. During defect liability Period We shall provide Fire and Burgulary Insurance. Please confirm.	Bid conditions prevail.
36	PART-3 & SECTION-IX	Apendix-3 Insurance Requirement	14 of 28	Third Party Liability	The insurance shall cover for Rs 0.8 million for any one incident no of incident can not be unlimited. Please confirm the Value.	Bid conditions prevail.
37	PART-3 & SECTION-IX	Apendix-3 Insurance Requirement	14 of 28	Automobile Liability Insurance	We shall provide the insurance of that vehicles being used for the execution purpose. Please confirm.	Bid conditions prevail.
38	PART-3 & SECTION-IX	Apendix-3 Insurance Requirement	14 of 28	Employer Liability	There are three types of liability of Employer 1. Workmen Compensation 2. Group Personal Accidental. 3. Group Medical Insurance. We shall provide Workmen compensation policy. Please clarify/ Confirm.	Bid conditions prevail.
39	PART-1 & SECTION-III	1.1.1	05 of 20	Project Organization and Key Personnel	Health Safety (Accident Prevention Manager) - total work experience mentioned as 10 Years including 4 yrs experience in similar works. Whereas under 18.22.2 the required experience is mentioned as 15 yrs Please confirm.	The more stringent requirement shall be followed
40	Part 1 IV-B	1.2.4	5 of 74	Deemed Export Benefits	As you have specified the deemed exports benefits are available for the subject project, request you to confirm with relevant details.	Bid Conditions Prevail Deemed Export benefits are not available as on date. We have mentioned in 1.2.4 of Section IV-B Part I,"The Bidder shall be solely responsible for claiming and availing all deemed export benefits if available during the currency of Contract.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
41	Part 1 IV-B	1.2.7	6 of 74	Concessional Benefits for Project Imports	As you have specified the concessional benefits for project imports are available for the subject project, request you to confirm with relevant details.	Bid conditions prevail. For Project Import Benefit, please refer to Clause 1.2.7 of Part 1 Section IV-B. For all the exemptions, taxes applicabilities bidder had to check with their legal / tax consultant before bidding and responsibilities solely lies on bidder only and not on the Employer.
42	Part 1 IV-B	Price Schedule	68 of 74	Schedule 4	As in ECS & TVS Scope of works, we have major equipments & hence, major material cost, the percentage of schedule 4 shall not exceed 12 to 15% of total contract value. Request you to kindly amend % limit for schedule 4.	Bid conditions prevail.
43	Part 1 I	ITB 24.1	5 of 6	Bid Submission	Request to extend the bid submission date to Sept' 10, 2018 from July' 10, 2018	Bid conditions prevail.
44	Part 1 Section III - Evaluation and Qualification Criteria	2.3.1 - Financial Performance	Page 13 of 20	As the minimum requirement, a Bidder's net worth calculated as the difference between total assets and total liabilities should be positive.	If there is loss in any of 2 years during the tenure of last five financial years, however the company's net worth is positive, whether the same is acceptable. Please clarify.	Bid conditions prevail. Networth positive for all 5 years is the minimum requirement to assess current financial soundness and prospective long term profitability.
45	Part 1 Section III - Evaluation and Qualification Criteria	2.4.2 (a) - Specific Experience	Page 17 of 20	A minimum number of two (2) similar contracts (note (ii) below) that have been satisfactorily and substantially completed (note (iii) below) as a prime contractor (single entity or JV member) for ten years between 1st January 2008 and 31st December 2017. The similarity shall be defined as "A single contract with Air conditioning system of minimum capacity 2000 TR for a MRT/Railways/Airport/Port/etc. project and/or Tunnel ventilation system 2.5 km Tunnel for MRT/Railways/Highways"	We presume that under etc. shall include Big Hotel, Mall, Commercial offers and Industrial sector project. Please confirm	Bid conditions prevail. All such facilities as are meant for congregation / passage etc. of large number of people are covered under this provision.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
46	Section III - Evaluation and Qualification Criteria	2.4.2 (b) - Specific Experience	Page 18 of 20	For the above or other contracts executed during the period stipulated in 2.4.2(a) above, a minimum construction experience as prime contractor, management contractor (note (i) below), or sub-contractor, in the following key activities – Detailed Engineering, Manufacture, Supply, Installation, testing and commissioning of large infrastructure projects/U/G works completed in last 10 years of any of the following values –(a) Environment Control Systems – One (1) work of USD 13.6 million & above, or Two (2) works of USD 8.5 million & above each, or three (3) works of USD 6.8 million & above each (b) Tunnel Ventilation System - One (1) work of 4.00 km Tunnel & above, or Two (2) works of 2.5 km Tunnel & above each, or three (3) works 1.5 km Tunnel & above each for MRT/Railways/Highways.	Here we can show different projects for ECS and TVS works separately? Also the project value should be consolidated project value including related BMS, electrical works or only for ECS works. Please confirm.	Bid conditions prevail. Project may be same or different. All activities mentioned in the details can be covered by arriving at the value of the works.
47	Section III - Evaluation and Qualification Criteria	2.4.2 (b) - Specific Experience	Page 18 of 20	(b) Tunnel Ventilation System - One (1) work of 4.00 km Tunnel & above, or Two (2) works of 2.5 km Tunnel & above each, or three (3) works 1.5 km Tunnel & above each for MRT/Railways/Highways.	Please clarify whether tunnel length is for twin tunnel or single tunnel.	Bid conditions prevail. Tunnel length is for the actual linear excavation.
48	Section III - Evaluation and Qualification Criteria	2.4.2 (b) - Specific Experience	Page 18 of 20	(b) Tunnel Ventilation System - One (1) work of 4.00 km Tunnel & above, or Two (2) works of 2.5 km Tunnel & above each, or three (3) works 1.5 km Tunnel & above each for MRT/Railways/Highways.	For the projects executed as JV, would the tunnel distance be divided as JV partner percentage participation in the execution. Please clarify.	Bid conditions prevail. Bid Document clearly specifies that for JV work , only the share of the Bidder as the JV Partner in the executed work will be taken.
49	Section III - Evaluation and Qualification Criteria	2.4.2 (b) - Specific Experience	Page 18 of 20	(b) Tunnel Ventilation System - One (1) work of 4.00 km Tunnel & above, or Two (2) works of 2.5 km Tunnel & above each, or three (3) works 1.5 km Tunnel & above each for MRT/Railways/Highways.	In case of consortium we understand that Three (3) works of 1.5Km can be spilt up between consortium members. For example two (2) works from one party and one (1) work from other party is acceptable. Kindly confirm.	Bid conditions prevail. All members of the JV/Consortium taken together must meet requirement. Project may be from any member if it meets requirement.
50	Section III - Evaluation and Qualification Criteria	2.4.2 (b) - Specific Experience	Page 18 of 20	specialist Subcontractor	Please advise if we are proposing a specialist subcontractor for the key activities mentioned, what all supporting documents need to be submitted during bidding stage.	Bid conditions prevail. All documents that establish the party's expereince along with the party's authorization/commitment to participate as a sub-contractor as per Bid Form 24 SUB 1.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
51	Section III - Evaluation and Qualification Criteria	2.4.2 (b) - Specific Experience	Page 18 of 20	(b) Tunnel Ventilation System - One (1) work of 4.00 km Tunnel & above, or Two (2) works of 2.5 km Tunnel & above each, or three (3) works 1.5 km Tunnel & above each for MRT/Railways/Highways.	In line with the U/G Metro projects executed in India we request you to revise the specific experience project values as mentioned below. This will also facilitate healthier competition with more participation from India firms. Tunnel Ventilation System - One (1) work of 3.00 km Tunnel & above, or Two (2) works of 2 km Tunnel & above each, or three (3) works 1 km Tunnel & above each for MRT/Railways/Highways.	Bid conditions prevail. Not accepted.
52	Section IV-A - Bidding Forms	Bid forms	Page 35-54 of 76	Bid Form 22A to 23K - Evidence of previous service history (including client's certificate)	As all sub vendors have worked under Main contractor, they are unable to produce the satisfactory performance certificate from client/agency responsible for performance monitoring of system. We request you to accept the PO placed by main contractor on them for the item and self certification by vendor.	Bid conditions prevail.
53	Section IV-A	Page 65 of 76	Form of Bid Security (Bank Guarantee)	Bank Notwithstanding clause for bank guarantee	Please note bank will add their standard Notwithstanding clause at the end "Notwithstanding anything contained hereinabove; A. Our liability under this guarantee shall not exceed Rs. EMD BG Amount B. This bank guarantee shall be valid up to BG Validity Date C. We are liable to pay the guarantee amount under this bank Guarantee only and only if you serve upon us, a written claim or demand along with the original bank guarantee on or before BG Validity Date " Request you to accept the same	Accepted.
54	Section VIII - Particular Conditions of Contract	PC 27.10	Page 8 of 9	TVS and ECS Equipment failure During Defects Liability Period: If major TVS and/or ECS equipment is kept out of service causing the TVS and/or ECS system to become inoperable or compromised, Employer may impose a penalty of INR 100,000 and INR 50,000 per each such case for TVS and ECS equipment respectively	Request you to identify/define major equipment.	Bid conditions prevail. Any equipment, the non-operation of which causes the TVS/ECS system to become inoperable or technically compromised is a major equipment.
55	Section VIII - Particular Conditions of Contract	PC.8.1	Page 5 of 9	The Contractor shall commence work on the Facilities within seven (7) days from the Effective Date for determining Time for Completion as specified in the Contract Agreement.	Request you to define effective date.	Bid conditions prevail. Please refer to Section IX Contract agreement Article 3, read along with Section VII GC 1.1

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
56	Section VIII - Particular Conditions of Contract	PC 45.1	Page 9 of 9	The DB shall consist of one sole member. MD/MMRCL shall be the authority for the appointment of Dispute Board (DB). It shall be appointed in consultation with the Contractor within 28 days after the Effective Date. The Employer will provide names of three short listed persons found suitable for working as DB after taking into consideration suggestions made by the Contractor, if any. The Contractor may select one of the members to be appointed as the sole member of the DB. The said short-list shall be provided after the Contract is awarded.”	Request you to consider clauses of Ar & Conciliation Act 1996 should be applicable	Bid Conditions Prevail Arbitration is a separate and subsequent mode of dispute resolution. DAB is a dispute avoidance mechanism concurrent with Project execution. It is a Pre-arbitration activity.
57	Section VIII - Particular Conditions of Contract	PC.45.2	Page 9 of 9	Appointment (if not agreed) to be made by International Federation of Consulting Engineers (FIDIC) or a person appointed by the President of FIDIC.	Request you to consider clauses of Arbitration & Conciliation Act 1996 should be applicable	Bid conditions prevail. Arbitration is a separate and subsequent mode of dispute resolution. DAB is a dispute avoidance mechanism concurrent with Project execution. It is a Pre-arbitration activity.
58	Part 1			The deadline for bid submission	We shall be needing at least 2 months extension for the submission of bid from the date of receipt of replies to the queries.	Refer Addendum No.2
59		General		MMRC Bank details	Following details of MMRCL bank a/c requested for preparation of the EMD BG: Bank Name: A/c Number: Type: Address: IFSC Code: BSR Code: SWIFT Code: MICR Code:	Bid Conditions Prevail. Bank Details are not required for EMD BG.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
60		Section II - Bid Data Sheet - Preparation of Bids,point 11.2	3 of 6	Preparation of Bids	<p>Envelope 1-Has Technical Bid -Initial Filter –PQ Documents (a) to (f)- where (a) to (e) is clear but point (f) Documentary evidence in accordance with ITB 15 is not clear. We assume that point f covers : Index, Forms -Form 13 ELI-1, Form 14 ELI-2, Form 15 CON: Historic Contract Non performance[1 to 3], Form 16 FIN1, Form 17 FIN-2, Form 18 FIR-1,Form 19 FIR-2, Form 20 FIR-3, Bid Capacity, Form 30 EXP 1, Form 31 EXP 2(a), Form 32 EXP 2(a).Envelope 2-Has Technical Bid documents with Letter of Bid[Tech],documents (g) to (k). We assume that point (g) covers Form 24 Sub(2) . Point (h) covers Form 1, Form 2 PER-1, Form 3 PER-2, Form 4,Form 5,Form 6,Form 7,Form 7A,Form 9,Form 10,Form 11,Form 12, Form 25,Form 26,Form 27, Form 28,Form 29 point (i)covers Form 22 A to I, Form 23 A to K. point (j) covers Form 24 Sub(1) point (k) covers any other left out documents.</p> <p>Clear list of documents to be enclosed in Envelope 1, Envelope 2 is required Format for Power of attorney [point d of Technical Bid -Initial Filter –PQ Documents] is not available in the tender, we assume that our standard format can be used for preparing POA for this Bid .</p>	<p>Bid Conditions Prevail. Please refer BDS -ITB 11.2</p> <p>Please refer ITB 11.2</p> <p>Bidder can submit their own standard format for POA.</p>
61		Section 1 Instruction To Bidder,point 22[Downloaded from JICA Website]	19	Format & Signing of Bid - 1 original of Technical bid and 1 original of price Bid and copies as mentioned in BDS to be submitted.	<p>As per ITB -1 Original Tech Bid and 1 copy of Tech Bid in separate envelopes,1 Original Price Bid and 1 copy of Price Bid in separate envelopes,and all the above 4 envelopes in 1 outer envelop . As per latest tender documents dated May 2018-Section II - Bid Data Sheet,page 3 -We have to prepare 3 envelopes viz Env.-1(Technical Bid -Initial Filter –PQ Documents), Env.- 2(“Technical Bid – Other Documents”), Env.3 (Pricing documents) in Original and copy. We assume that submission of Tender will be as: 1 Original of [Env.-1(Technical Bid -Initial Filter –PQ Documents), Env.- 2(“Technical Bid – Other Documents”), Env.3 (Pricing documents)] and one copy of the same. No.of copies to be submitted is not mentioned in BDS</p>	<p>Please Refer Addendum 3.</p>

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
62		Section 1 Instruction To Bidder, point 22[Downloaded from JICA Website]	20	Submission Sealing & Marking of Bids	As per ITB -1 Original Tech Bid and 1 copy of Tech Bid in separate envelopes, 1 Original Price Bid and 1 copy of Price Bid in separate envelopes, and all the above 4 envelopes in 1 outer envelop : with outer and inner envelopes with warning as per ITB. As per latest tender documents dated May 2018-Section II - Bid Data Sheet, page 3 - We assume that we have to prepare 3 envelopes viz Env.-1(Technical Bid -Initial Filter –PQ Documents) 1 Original & 1 Copy in different envelopes with warning " NOT TO BE OPENED BEFORE DATE AND TIME OF OPENING OF Technical Bid -Initial Filter –PQ Documents ENVELOP] . Env.-2("Technical Bid – Other Documents") 1 original and 1 copy in different envelopes with warning " NOT TO BE OPENED UNTIL ADVISED BY THE EMPLOYER " . Env.3 (Pricing documents) in 1 Original and 1 copy in different envelopes with warning " NOT TO BE OPENED UNTIL ADVISED BY THE EMPLOYER " . All the inner envelopes to be enclosed in 1 outer envelop with warning " NOT TO BE OPENED BEFORE DATE AND TIME OF OPENING OF Technical Bid -Initial Filter –PQ Documents ENVELOP] .	Please Refer Addendum 3.
63		3.TVE Part 1 Section II	3 of 8	Contract Phase 1 includes OCC and BCC TVE SCADA System and integration, coordination and interface of whole Line and Control and monitoring functions in the OCC/BCC.	We request client to define the scope and definite time line for this work. Bidder presumes that material and labour required for integration of Phase II work and/at OCC & BCC will be in the scope of respective phase 2 contractors scope. Phase I contractor's scope will be limited to the co-ordination with other /Interfacing contractor for this work only. Also, If there is a delay from Phase II contractors, Phase I contractor should be duly compensated for the increased expenditure for maintaining extended presence at site. Also our final payments should not be withheld for delays in phase 2 activities.	Bid conditions prevail Scope of TVE SCADA defined in Section VI-B, Part B2 & B3
64		Bid Form 17 FIN-2: Average Annual Turnover Bid Form 16 FIN-1: Financial Performance Bid Form 20 FIR-3: Financial Data	33 of 76	Bid Form 17 FIN-2 Requires construction Turnover, Bid Form 16 FIN-1 Requires Financial Performance and Bid Form 20 FIR-3 requires " Total value of works done as per audited financial statements "	Since, The requirement of Bid Form 17 FIN-2 and Bid Form 20 FIR-3 is the same, Bidder requests clarity on what data is exactly required in Bid Form 20 FIR-3 which is different from 17 FIN-2.	Bid Conditions Prevail 1. Bid Form 16--Requires Annual Turnover in the respective Financial Year 2. Bid Form 17 -- Requires Construction Turnover on the basis of Payments Received in the respective Financial Year 3. Bid Form 20-Requires Total Values of Work Done in the respective Financial Year
65		5.TVE Part 1 Section IV-A	66 of 76	Form of Bid Security (Bid Bond)	Referred form is not applicable. Please clarify	Bid Conditions prevail. The option of submitting Bid Security as a bond (Different from a bank guarantee for which there is a separate Bid Form) from a financial institution is not available.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
66	General. Bid submission date			10th July 2018	Since this is a very large Design and Build tender, the techno-commercial clarifications given by you will have impact on design and cost of equipment/materials. We require minimum 2 months time to prepare a competitive bid and submit after receiving your clarifications. Please extend bid submission due date accordingly.	Please Refer Addendum 2.
TECHNICAL QUERIES						
1	PART-2 & SECTION-VI A	9.2.7	103 of 190	FAI	Please confirm whether Employer will bear its cost for boarding, lodging & travel during FAI. Please confirm.	Bid conditions prevail. Refer Part 3, Section VII, Clause GC 23.2
2	PART-2 & SECTION-VI-A	Appendix -1		Schedule of Key Dates	Please confirm if the contract completion date is extended for reasons not attributable to Contractor. In that case, the contractor shall be entitled to extension of time with cost implication. Therefore cost incurred during extended period shall be deemed to be compensated by Employer.	Bid conditions prevail.
3	PART-2 & SECTION-VI A	13	125 of 190	Spare Part	For the purpose of uniformity in price bid of various bidders, provide a list of minimum recommended spares. Please provide.	Bid conditions prevail. (Recommended spare parts are specific to bidder's design and not part of the evaluation.)
4	PART-2 & SECTION-VI A	13	125 of 190	Consumable	We understand the spares parts does not include operational consumable like water, fuel, chemicals etc.	Bid conditions prevail. (All consumables needed for operation of system shall be provided by Contractor).
5	PART-2 & SECTION-VI A	15.4	135 of 190	Contractor's Site Facility	We request Employer to kindly make available 500 Sq.Mtr. Space for Site Office & Site Store at respective stations.	Bid conditions prevail. (Please refer Clause 3.2 of Appendix 19, Part 2, Section VI-A).
6	PART-2 & SECTION-VI A	15.4	135 of 190	Contractor's Site Facility	We request Employer to kindly make available 10000 Sq.Mtr. Space for Central Store & Yard at location nearby to the site.	Please refer response of query at Sr. No. 5.
7	PART-2 & SECTION-VI A	16.6	139 of 190	ISA	We understand cost of ISA shall not be in scope of Contractor. Please Confirm.	Confirmed.
8	PART-2 & SECTION-VI A	17	140 of 190	Work Site	If access to site is such that, non-standard and other special arrangements are to be made in order to carry out works like lifting, shifting, installation etc. Employer shall compensate for extra cost incurred by Contractor.	Bid conditions prevail. (No extra cost shall be compensated by the Employer).
9	PART-2 & SECTION-VI A	17.3	140 of 190	Site Services	Facilities like water & electricity shall be provided by Civil Contractor. Unit rates for water and electricity to be provided at pre-bid stage or else standard government rates shall be considered. Please confirm.	Bid conditions prevail. (Please refer Clause 17.8.9 of Part 2, Section VI-A and Appendix 19 of Part 2, Section VI-A).

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
10	PART-2 & SECTION-VI A	17.3	140 of 190	Site Services	Facilities like water, temporary drainage, sewage disposal etc shall be provided by Civil Contractor free of cost. Please Confirm.	Bid conditions prevail. Also refer response of query at Sr. No. 9 above.
11	PART-2 & SECTION-VI A	17.4	140 of 190	Site Cleanliness	Cleanliness of work area shall be in scope of Contractor. However overall cleanliness of site shall be in scope of Civil / Main Contractor. Please Confirm.	Confirmed.
12	PART-2 & SECTION-VI A	17.5	140 of 190	Prevention of Mosquito Breeding	Facilities required for Prevention of Mosquito Breeding shall be provided by Civil Contractor. Please Confirm.	Bid conditions prevail. (Prevention of mosquitos breeding shall be done as mentioned under Clause 17.5 of Part 2, Section VI-A)
13	PART-2 & SECTION-VI A	18.17	157 of 190	OHS&E Manpower	The professionals and support staff mentioned under 11 Heads (Table 1) is typically for Civil Contractor. We as 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.	Bid conditions prevail. (OHS & E requirements are given under Table -1 of Chapter 18 of Part 2, Section - VI A).
14	PART-2 & SECTION-VI A	18.23.1	160 of 190	OHS&E Induction Training	We propose, 96 Hrs training for the Staff/ Engineers and Supervisors by an External Agency. The Workers/ Employees /Sub-contractor shall be imparted 4hrs induction training on 1st day followed by regular in-house training sessions by staff/ engineers covering various aspects of OHS&E	Bid Conditions Prevail.
15	PART-2 & SECTION-VI A	18.23.5	161 of 190	ID card	After the 4hrs induction training to the workers/employees/Sub-contractor "INDUCTED" sticker shall be pasted on their helmet and they shall be issued permanent ID card	Bid Conditions Prevail.
16	PART-2 & SECTION-VI A	18.24.2 & 3	161 of 190	Training Implementation Plan & Training Matrix	No training Matrix found. MMRC to provide training matrix for making 'Training Implementation Plan'	MMRC will provide the Training Matrix
17	PART-2 & SECTION-VI A	18.43	169 of 190	Prescribed format of Monthly Audit Report (MARS)	There is no format for the Monthly Audit Rating Score. Please provide.	Monthly Audit Report format shall be provided post award of work.
18	PART-2 & SECTION-VI B4	LOT-2 Cl B.2.3.6.(H)	6 of 65	Busbar Phase identification	Busbars shall be coloured with fire retardant LSZH paint for phase identification. That means there is no requirement of fire retardant sleeves in that case. Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
19	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.8.(A)	7 of 65	Terminal Blocks	For maintenance and service point of view terminal block made melamine material was not reliable.Shall we propose polyamide instead of that.Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
20	PART-2 & SECTION-VI B4	LOT-2 CI A.2.3.9 (D)	8 of 65	Size of Control Cabling	Shall we use 1.5 sq.mm core wire instead of 2.5 sq.mm in control cabling.Please confirm	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
21	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.9 (E)	8 of 65	Material for ferrule	Shall we use ferrule made of PVC material in place of LSZH material.LSZH ferrule is not easily available in the market. Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
22	PART-2 & SECTION-VI B4	LOT-2 CI A.3.3.2.17	31 of 65	Cable jonts	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 stolen at site during execution.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
23	PART-2 & SECTION-VI B4	LOT-2 CI B.4.3.3	34 of 65	Cable Trays and Ladders;point 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.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
24	PART-2 & SECTION-VI B4	LOT-2 CI B.4.3.3 (D-V)	36 of 65	Cable Ladders-Additional General Requirement	Hot dipped galvanized clamps,bolts shall not easy to install.Shall we use Electro tinned clamps,bolts. Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
25	PART-2 & SECTION-VI B4	LOT-2 CI B.4.3.6 (A)	39 of 65	Conduit and Accessories- General point(X)	Pulling of wire shall be easy in inspection type conduit bends,elbows and tees.Shall we use the same.Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
26	PART-2 & SECTION-VI B4	LOT-2 CI B.4.3.6 (B)	41 of 65	Cast in Conduits/Concealed conduits point(a)	Shall we use M.S type of conduit as a concealed conduit. Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
27	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.3 (O)	5 of 65	Low voltage Switchboards Cubicle Construction	We have consider 3.0 mm thick non-magnetic gland plates rather than 3.2 mm thick at the top and bottom.Please clarify.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
28	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.3 (P)	5 of 65	Low voltage Switchboards Cubicle Construction	Upto 250A Copper flexible wire shall be used for linking and above 250A Insulated copper busbar shall be used. Size of busbar/wire shall be as per our standard and current rating of switchgear.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
29	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.6 (K)	7 of 65	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.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
30	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.8 (B)	7 of 65	Plain and spring washers, nuts and lockouts shall be electro-tinned	As per Standard Design, we have used 8.8G HT,MS Fastners which are Zn Coated and Hexavalent yellow passivated, these bolts & nuts are capable of withstanding 30Nm torque required on the busbar joints.Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.

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31	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.10 (N)	9 of 65	Display of Single meter.	Available range for ammeter and voltmet is 3.5 Digit. We shall propose to use 3.5 digit meters.Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
32	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.22 (IX)	15 of 65	Category for MCCB shall be A or B.	Utility category for MCCB shall be A.Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
33	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.3 (M)	5 of 65	Shrouds at the busbar joints and cable terminations. All insulation materials shall be low smoke halogen free.	As per already Type Tested Assemblies of Switchboard, all busbar in Switchboard shall be Bare Copper and no shrouding on the busbar joints and cable termination. Switchboards with insulated Sleeves on Busbars has not Pre Type Tested.Hence the cost attributed for New Type test of Switchboards with this arrangement shall be charged extra at actual.Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
34	PART-2 & SECTION-VI B4	LOT-2 CI B.3.3.24 (B)	17 of 65	CTs shall have a short-time current rating of not less than 56 kA for 3 seconds on primary side.	As per IS-2705, CT's short-time current rating shall be 25 times of primary side current, that comes around 62.5kA for 1 sec for incomer breaker.Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
35	PART-2 & SECTION-VI B4	LOT-2 CI B.3.3.22 (B - J)	17 of 65	Electrical Endurance of 10000 operations cycle	Electrical Endurance of 10000 operations is not possible for rating upto 630A for any vendor, kindly reduce it to 5000 operation upto 630A & 8000 operation upto 250A MCCB's.Please confirm.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
36	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.3 (E)	5 of 65	Low voltage Switchboards Cubicle Construction	Panels required are welded type only,kindly approve Bolted design also,as it gives lot of modularity or ease of future expansions as against of welded design.	Bid conditions prevail.. There is no LOT 2 in this bid. However, the relevant bid condition in this document remains unchanged.
37	Eletrical Schematic for ECS			Type of starter	Starter not shown for Ejector room EAF, kindly confirm the type of starter.	Bid conditions prevail. (D & B contract - Contractor shall propose starter following the specifications)
38	Eletrical Schematic for ECS			Type of starter	Please confirm the type of starter for Fire damper Panel and FCU Panel	Bid Conditions Prevail (Please Refer Clause 5.3.2 of Part - 2 Sec VI- B4
39	Eletrical Schematic for ECS			Type of starter	Please confirm the type of starter for Toilet ventilation fan	Bid conditions prevail. (D & B contract - Contractor shall propose starter following the specifications)
40	Eletrical Schematic for ECS			Capaciotr Panel	Capacitor Panel for ECS 1& 2 not shown in the schematic. Kindly provide details for the same.	Bid conditions prevail. (D & B contract - Contractor shall include if required as per design)

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
41	Eletrical Schematic for ECS			Air Compressor	Air compressor to be provided in TVS Panel 1& 2 but not shown in Schematic. Kindly provide details for the same	Bid conditions prevail. (Detail Design Consultant shall submit the detail drawings).
42	Eletrical Schematic for TVS			TVS Damper	Feeder for TVS Damper not shown in schematic. Kindly provide details for the same	Bid conditions prevail. (Detail Design Consultant shall submit the detail drawings).
43	Eletrical Schematic for TVS			Type of starter	VSD has been shown for TVF fans in TVS Schematic, Kindly confirm can we use soft starter instead of VSD.	Bid conditions prevail. (VFD is required as per technical specifications)
44	Eletrical Schematic for ECS			Air cooled and Water cooled chiller, cooling tower	As per Schematic for Air cooled and Water Cooled chiller and cooling tower type of atarter not provided, Kindly provide the details for the same.	Bid conditions prevail. (D & B contract -contractor to provide starter following the specifications)
45	Eletrical Schematic for TVS			TVS Panel	Please clarify whether single Panel are required for TVS Panel -1 & 2, and TVS Panel 3& 4 with buscoupler or Two different Panels are required with tie cable arrangement for TVS -1&2 and TVS-3&4.	Bid Conditions Prevail (Two different Panels required as per schematic dwg)
46	Eletrical Schematic for TVS			Dual Supply	As per schematic drawing dual feed is shown from ASS-1& 2 for TVS-1 & 2 Panel. As per our knowledge, provision for dual power supply are not kept in Underground station & Tunnel contractor scope of work as per their contract. Please clarify who will provide cable and feeder for the second supply. Please clarify	Bid Conditions Prevail. Scope delineation is clearly shown in drawings (Please refer dwg no. - GCC-TVE-P00-0001-012_A0 of Part 4 Section X)
47	Eletrical Schematic for ECS			Dual Supply	As per schematic drawing dual feed is shown from ASS-1& 2 for ECS-1 & 2 Panel. As per our knowledge, provision for dual power supply are not kept in Underground station & Tunnel contractor scope of work as per their contract. Please clarify who will provide cable and feeder for the second supply. Please clarify	Bid Conditions Prevail. Scope delineation is clearly shown in drawings (Please refer dwg no. - GCC-TVE-P00-0001-026_A0 GCC-TVE-P00-0001-027_A0 of Part 4 Section X)
48	PART-2 & SECTION-VI A	GS17.11.1	145 of 190	Work Train	We understand that work train is referred to Manually operated Train Trolley required during lifting, shifting and installation of project. However, if any Rolling Stock is required during testing & commissioning of ventilation system, same shall be arranged by Employer. Please Confirm.	Confirmed.
49	PART-2 & SECTION-VI B1	ECS- 1.5	11 OF 145	Clause 1.5.4 Priority of documents	With respect to precedence of documents in case of discrepancies. Replies to pre-bid queries shall be inserted prior to technical specification including addendum. Please Confirm.	Bid Conditions Prevail.. The pre bid queries do not have separate priority . The precedence of main Section as per priority given under Part 3, Section IX.
50	PART-2 & SECTION-VI B1	ECS- 4.6.1	20 OF 145	Staircase Pressurization	As per this clause only fireman stair case will be pressurized. Please confirm if passenger exit staircase is provided at any station, same shall also be pressurized.	Bid conditions prevail. (Emergency egress staircases of the station and firemen access stairs shall be pressurized).

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
51	PART-2 & SECTION-VI B1	ECS- 4.6.1	20 OF 145	Smoke detector shall be provided in supply air duct which will detect the presence of smoke in supply air duct and trip the AHU.	clarify the scope of smoke detectors.	Bid Conditions Prevail (Under the Scope of TVE Contractor)
52	PART-2 & SECTION-VI B1	ECS- 4.6.1	19 OF 145	Smoke extraction from platform and mezzanrie level public area shall be done through the fire rated supply air which is connected to OTEF.	We understand from the referred clause, that during fire scenario at platform & mezzanine level, OTE fan will work as a smoke extraction fan for platform level. However, under normal operations this OTE fan will work as exhaust for Rolling Stock Air COnditioning Outdoor units & Breaking system of train. In view of the above, please confirm the operation philosophy of OTE fans under comined requirements & elaborate the mode of operations.	During eventuality of fire incident at platform/mezzanine, OTE fan will perform function of Smoke extraction from platform /mezzanine .
53	PART-2 & SECTION-VI B1	ECS- 4.6.1	19 OF 145	Separate fire rated smoke extraction duct shall be provided for station offices system electrical and equipment rooms which is connected to OTEF.	We understand from the referred clause, that during fire scenario at rooms at platform, concourse & mezzanine level, OTE fan will work as a smoke extraction fan for platform, concourse & mezzanine level. However, under normal operations this OTE fan will work as exhaust for Rolling Stock Air COnditioning Outdoor units & Breaking system of train. In view of the above, please confirm the operation philosophy of OTE fans under comined requirements & elaborate the mode of operations.	Please refer response of query at Sr. No. 52.
54	PART-2 & SECTION-VI B1	ECS-5.2.2	22 OF 145	Normal mode part of the public area air shall be taken as return air which shall be picked through the return air grilles/ diffusers.the retrun air reaches the AHU room.	We understand from the referred clause that return air shall ne non-ducted. Please confirm.	Confirmed
55	PART-2 & SECTION-VI B1	ECS-5.2.2	21 OF 169		If return air is through false ceiling, then all commons walls between public area & AHU room shall be upto false ceiling level. In this way, fire compartmentaions shall not be possible. Please Confirm.	Return air openings shall be provided with fire dampers as to be finally decided during detailed design.
56	PART-2 & SECTION-VI B1	ECS-5.2.2	21 OF 169	Normal mode part of the public area air shall be taken as return air which shall be picked through the return air grilles/ diffusers.the retrun air reaches the AHU room.	As per our understanding no return air ducting will be used for return air. As per NFPA-130 chapter 5 (5.2.3.2.5), all public area shall have a fire separation from non-public area. So return air duct will be required for fire separation. Kindly Confirm	Please refer response of query at Sr. No. 55.
57	PART-2 & SECTION-VI B1	ECS-5.2.2	22 OF 145	Emergency mode.The overtrack ehaust fan shall be used.In case of fire extraction of smoke in the platform and mezzanerie levels.	Under Emergency Mode, we understand from the referred clause, that during fire scenario at platform & mezzanine level, OTE fan will work as a smoke extraction fan for platform level. However, under normal operations this OTE fan will work as exhaust for Rolling Stock Air COnditioning Outdoor units & Breaking system of train. In view of the above, please confirm the operation philosophy of OTE fans under comined requirements & elaborate the mode of operations.	Please refer response of query at Sr. No. 52.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
58	PART-2 & SECTION-VI B1	ECS-5.2.2	22 OF 145	Smoke extraction for station officers,Ancillary room and Back of house corridor done by separate fire rated duct which is connected to the OTEF'S.	Under Emergency Mode, we understand from the referred clause, that during fire scenario at rooms at platform, concourse & mezzanine level, OTE fan will work as a smoke extraction fan for platform, concourse & mezzanine level. However, under normal operations this OTE fan will work as exhaust for Rolling Stock Air COnditioning Outdoor units & Breaking system of train. In view of the above, please confirm the operation philosophy of OTE fans under combined requirements & elaborate the mode of operations.	Bid conditions prevail. (Please refer Drg no GCC-TV-P00-0001-022_A0 which indicates that smoke extraction from plant rooms of Concourse will also be through OTEF.)
59	PART-2 & SECTION-VI B1	ECS-5.3.1	22 OF 145	The make up water tank for the cooling tower shall be provided by civil contractor.	We understand that the make up water tank including piping & ancillaries works upto cooling tower shall be provided by civil contractor. Please confirm.	Refer Addendum No. 3 : Attachment No. 1.
60	PART-2 & SECTION-VI B1	ECS-5.3.1	22 OF 145	The make up water pumps shall be located in the pump room.	The make up water pump will be used only for expansion tank make up. It is not applicable for cooling tower. Please confirm.	Bid conditions prevail. (Please refer Appendix 19, Part 2, Section VI-A for interface with UGC).
61	PART-2 & SECTION-VI B1	ECS-5.3.2	23 OF 145	volume control damper shall be provided to control the amount of supply air to various zones.	In this contract the supply air duct is used as a smoke extraction duct in case of fire at concourse level, platform level & mezzanine level. Whereas requirement of volume control damper is mentioned in the referred clause and the same is non-fire rated. Therefore, it is not possible to install the non-fire rated accessories in fire rated ducts. Please confirm.	All accessories in the fire rated duct shall be fire rated.
62	PART-2 & SECTION-VI B1	ECS-5.4.3	24 OF 145	Under ground plant rooms : All plant rooms inside underground station like transformer room, electrical rooms, UPS rooms, signalling room, SCADA, Communication rooms, Chiller plant rooms,TVS equipment rooms,fire pump rooms,except the open type fan rooms shall be provided with air conditioning.	We understand from the referred clause that Elecrical Rooms, Chiller Plant Rooms, TVS Room, Fire Pump Rooms etc are required to be air conditioned with duty and standby FCU's. Whereas, in other metro rail project in India respective rooms are ventilated rooms and not air conditioned. Please confirm the same as the same shall have major impact in heat load calculations & associated cost including operational costs.	Bid conditions prevail. (This has been planned considering local climatic conditions of Mumbai).

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
63	PART-2 & SECTION-VI B1	ECS -5.5.2	24 OF 145	Filter cleaning room	As per our understanding the filter cleaning room will be provided by civil contractor & provision for water connection and drain connection to be provided by other system wide contractor. Please confirm.	Confirmed.
64	PART-2 & SECTION-VI B1	ECS -5.5.3	23 OF 169	The air cooled chiller (1no. working) shall be located on the roof of ancillary building.	We understand from the referred clause, no standby air cooled chiller are required. Please clarify.	Confirmed.
65	PART-2 & SECTION-VI B1	ECS-6.1.11	32 OF 145	Fire stopping a) fire stopping : Unused slots,sleeves and other general construction shall be closed and sealed with a fire stopping material.	We understand wall opening, sleeves in floor and slab including finishing to be done by civil contractor. Please confirm.	Bid conditions prevail. (All openings in wall, floor or slab shall be provided by Civil Contractor as per TVE Contractor's requirement as given under Appendix 19 of Part 2 Section- VI A.However, finishing work as required shall be done by the TVE Contractor as per Clause 6.1.11 of Part 2 Section VI B1).
66	PART-2 & SECTION-VI B1	ECS - 6.1.11	31 OF 169	Future slots	As per our understanding this work to be done by civil contractor.Please confirm.	Bid conditions prevail.
67	PART-2 & SECTION-VI B1	ECS -6.2.1.2	32 OF 169	Design parameters	Ambient temp of Mumbai as per ISHRAE-35 deg DB,wherever as per specification it is taken 33.9 deg. C. Please confirm.	Bid conditions prevail. (Please refer Clause no. 1.5.6 of Part 2 Section - VI B1).
68	PART-2 & SECTION-VI B1	ECS -6.2.1.2	32 OF 169	Design parameters	Kindly provide details such as Wall thickness , Slab thickness, Concrete Grading, Slab Weight, Glass details & type for heat load calculations. This requirement is mandatory for correct evaluation. Kindly provide.	a. External walls are concrete walls. Density of concrete is 25KN/m2. Please refer to Architectural Auto CAD drawings for wall thickness. b Slab will be concrete slab. Details will be provided during detail design stage are under preparation by Civil design build contractors. However, density of concrete is 25KN/m2. c. Glazing shall comply with requirements of BS 6262. d. Toughened glass shall be float type conforming to BS 952, clear or body tinted as required, flat and parallel surfaces, provide a clear and undistorted vision and shall have a minimum thickness of 12mm.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
69	PART-2 & SECTION-VI B1	ECS-6.2.1.2	36 OF 145	Air conditioning of ASS & electrical Rooms	Rooms like ASS and Electrical rooms to be air conditioned with FCU's as per table 6.1. General practice does not allow water piping in electrical panel room. Please confirm.	Bid conditions prevail. (Water piping is allowed wherever necessary and its extent should be restricted by proper design detail)
70	PART-2 & SECTION-VI B1	ECS-6.2.1.2	33 OF 145	Design parameters	Is there any specific criteria for grilles/diffusers outlet velocity required. Please confirm.	This is part of D&B Design as per codes and standards and to be prepared by Contractor
71	PART-2 & SECTION-VI B1	ECS-6.2.1.3.f	33 OF 145	Design population	As per specifications, occupancy in public area seems very high which will increase heat load. Please this will be the final criteria for occupancy.	Bid conditions prevail.
72	PART-2 & SECTION-VI B1	ECS-6.2.1.3	33 OF 145		Given design inputs are final or it will be changed at the time of detail design. Any change in design criteria shall form basis for price variations.	Bid conditions prevail.
73	PART-2 & SECTION-VI B1	ECS-6.2.1.3-I(ii)	36 OF 145	Station public area	Please clarify return air path from platform area to AHU room.	Return air path from platform area to AHU room shall be through large openings of Staircase & escalators.
74	PART-2 & SECTION-VI B1	ECS-6.2.1.3-I(iii)	34 OF 145	Station back of house corridor: The station back of house shall be normally air conditioned from the public area AHU.	As per this clause the back of house corridor also air conditioned from public area AHU. The back of house corridor is non-paid area so it will be air conditioned or ventilation. If it will be air conditioned, the energy consumption will be high. Please confirm.	Bid conditions prevail. (Please refer Table 6.1 of Part 2, Section - VI B1 along with Addendum No. 3 : S. No. 14).
75	PART-2 & SECTION-VI B1	ECS-6.2.1.3-I(iii)	36 OF 145	In case of fire the smoke shall be extracted through the plant room smoke extract duct which is connected to OTEF.	As per this clause, during fire scenario in back of house corridor, the OTE fan will be act as a smoke extraction fan. If at the same time the train is standing at the track, then which philosophy will be activated. Please clarify.	Please refer response of query at Sr. No. 52. Sufficient capacity in OTE fans. D&B contractor to substantiate by calculations.
76	PART-2 & SECTION-VI B1	ECS- 6.2 table 6.1	36 -38 OF 145		The no.of persons, equipment heat load & number of rooms given in this table are final or it will be changed at the time of detail design. Any change in design criteria shall form basis for price variations.	Refer Addendum No. 3 : S. No. 14

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
77	PART-2 & SECTION-VI B1	ECS-Table 6.1	36-37 OF 145		As per table 6.1.The standby FCU required for 24X7 operation. Please confirm, whether standby FCU are required in configuration as N+1 or N+N i.e. N working + 1 Standby of N working + N Standby.	Bid conditions prevail. (Standby FCU required in configuration N+1).
78	PART-2 & SECTION-VI B1	ECS-6.2 table 6.1	36-37 OF 145	Table 6.1	The no.of persons, equipment heat load & number of rooms given in this table are final or it will be changed at the time of detail design. Any change in design criteria shall form basis for price variations.	Refer to Response at S. No. 76.
79	PART-2 & SECTION-VI B1	ECS-6.2.1.4.1.b	36 OF 169	Ventilation fans	Please confirm independent ventilation fans are required or ventilation requirement can be merged with common fan units. Please confirm.	Bid conditions prevail. (This is to be finalised during detailed design stage being a DB contract).
80	PART-2 & SECTION-VI B1	ECS-6.2.1.4.1	38 OF 145	Auxiliary room ventilation system: The plant room located above ground in the ancillary building shall be provided negative air pressure. When the room temperature reaches more than 5 degree celsius of the ambient temperature.	As per design parameter, 2% criteria is suggested. If we will take the 2% criteria & consider the DB temperature of 33.9 degrees as ambient temperature then during peak temperature, temp of the 5 deg C. Above not maintained. Please confirm.	Bid conditions prevail. (2% criteria is applicable for air conditioning system).
81	PART-2 & SECTION-VI B1	ECS-6.2.1.5	38 OF 145	Volume controle dampers for Supply ducts	As AHU ducts are fire rated so volume control damper which is to be used for proper air distribution shall be fire rated or non fire rated. Please confirm.	Please refer response of query at Sr.No.61.
82	PART-2 & SECTION-VI B2	TVS-3.2.2	13 of 104	Fire rated enclosure for control cables	Please clarify the area where fire rated enclosure required for control cables and types of enclosure.	This is to be finalised during detailed design stage being DB contract.
83	PART-2 & SECTION-VI B2	TVS-3.3.1.1	13 of 104		ECS & TVS contractor shall provide details for preperation of CSD by others. Please confirm.	Bid conditions prevail. (Refer Appendix 19 of Part 2, Section VI-A).

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
84	PART-2 & SECTION-VI B2	TVS-3.3.1.2	14 of 104		The lifting hook for equipment to be provided by TVS contractor or by civil contractor. Please confirm.	Bid conditions prevail. (Refer Appendix 19 of Part 2, Section VI-A).
85	PART-2 & SECTION-VI B2	TVS-3.4.1.3	16 of 104	The latest version of SES or IDA Tunnel software of simulation	The simulation will be done with SES or IDA tunnel software or any other simulation software of updated version. These are the updated softwares so no accreditation is required for this. Please confirm.	Bid conditions prevail. (The simulation shall be carried out for the whole MML-3 using latest version of SES or IDA Tunnel software).
86	PART-2 & SECTION-VI B2	TVS-3.4.1.5	16 of 104	The infiltration & ex-filtration airflow rates from PSD shall be analysed.	For the infiltration & ex-filtration airflow rates, the PSD data to be provided by the client.	Please also refer Clause 3.4.1.8 (i) of Part 2, Section VI-B2.
87	PART-2 & SECTION-VI B2	TVS-3.4.2.2	17 of 104	Preliminary Design	For working of drawing & calculation, the whole civil data to be provided to system contractor by civil or client. Please confirm.	Bid conditions prevail. (Refer Appendix 19 of Part 2, Section VI-A).
88	PART-2 & SECTION-VI B2	TVS-3.6.1	22 of 104	Scope of Work of Supply	Minor civil works like grouting of equipment, cutting & finishing of opening in brick walls-up to which sizes. Please confirm.	Bid conditions prevail. (Refer Appendix 19 of Part 2, Section VI-A).
89	PART-2 & SECTION-VI B2	TVS-4.2.6	24 of 104	a)The total heat release rate for a train shall be minimum 15 MW, the actual value shall be considered from Rolling stock contractor.	Please confirm the actual value of heat release rate	FHRR shall be finalised during detailed design in consultaion with Rolling stock contractor as well as Fire expert.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
90	PART-2 & SECTION-VI B2	TVS-4.2.7	25 of 104	a) According to the last data provided by the Rolling stock contractor, the maximum heat load from the train air conditioning (A/C) system (including power consumption of A/C auxillaries) is expected to be 820 KW for an 8 car train. However actual data shall be confirmed from rolling stock contractor.	Please confirm the actual data for the same.	To be finalised during detailed design.
91	PART-2 & SECTION-VI B2	TVS-4.2.12	25 of 104	Emergency noise. Diurnal period + 5DBA (7AM TO 11PM) Nocturnal period +3DBA	Please confirm the emergent noise in diurnal & nocturnal period.	Already specified in the Clause.
92	PART-2 & SECTION-VI B2					Already specified in the Clause.
93	PART-2 & SECTION-VI B2	TVS-4.2.12	25 of 104		The given noise criteria is for nearest property. If it is for any specific distance to the ustane.Please clarify.	Already specified in the Clause.
94	PART-2 & SECTION-VI B2	TVS-5.1.2	34 of 104	The piston-action of moving trains will create a natural flow of air in the tunnel in the direction of train movement. When trains accelerate out of the stations, they will also drive air into the tunnel network via the open tunnel ventilation shafts or the opposite bound tunnel. The pressure relief of the tunnels will share a common TV shaft.	As per schematic layout the DRD plenum is a common chamber for both tunnel where the piston pressure of air will be diverted from one tunnel to other tunnel.It may be possible that temperature of this air will be more than the outdoor air because as per specification, the average tunnel temperature of 40 degree celsius inside the tunnel & outdoor temperature as per specification is 33 degree celsius. Please confirm the draught relief air will be exhausted to atmosphere or it will be diverted to other tunnel.	Bid conditions prevail.
95	PART-2 & SECTION-VI B2	TVS-5.1.3	34 of 104	Normal Operating Conditions	The OTE duct & UPE duct to be RCC or metallic and it will be provided by civil contractor. Please confirm.	Confirmed. (RCC duct shall be provided by civil contractor).

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
96	PART-2 & SECTION-VI B2	TVS-5.1.5	34 of 104	The OTE system shall be able to operate at flow rates lower than its maximum capacity to suit the operational requirements.	Please clarify the operational requirement of the OTE system.	Please refer response of query at Sr. No. 52.
97	PART-2 & SECTION-VI B2	TVS-5.2.7	35 of 104	The expected number of tunnel booster fan is around 4 set from per bore & per ramp with a nominal thrust of 1000N perform.	It means 4 jet fans to be provided on one side of ramp. That means two nos. in up tunnel & 2 nos. in down tunnel at the ramp. Please confirm.	Bid conditions prevail. Further, it is to be finalised during design stage based on simulation study.
98	PART-2 & SECTION-VI B2	TVS-5.3	35 of 104	Congestion operation mode	Please specify the congestion operation mode will be considered for one train or two train in the same tunnel.	One train.
99	PART-2 & SECTION-VI B2	TVS-5.4	36 of 104	Emergency condition	Please specify that the emergency operation mode will be considered for one train or two train in the same tunnel.	One train.
100	PART-2 & SECTION-VI B2	TVS-5.4.6	37 of 104	Emergency condition	UPSAP fan will be fire rated or non-fire rated. Please clarify.	Non fire rated.
101	PART-2 & SECTION-VI B2	TVS-5.4.6	37 of 104	Emergency condition	Please clarify the total heat release rate for a train fire at trackway.	Refer response no.90. Train FHRR already indicated in bid documents. Final actual value to be ascertained from RS contractor
102	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-020_A0 water flow schematic (sheet 01 of 02).	As per schematic drawing the CHW pipe header for water cooled chiller & air cooled chiller are same. Air cooled chiller will be used only for 24X7 technical room at the non revenue hours & air cooled capacity will be very less than the water cooled chiller. When only air cooled system will run the water will flow in same piping then velocity of water will be very low. May be below 1FPS also. It may be possible system will not get proper flow at the endpoint. Please confirm whether common pipe will run for both system or piping system will be separate for both system (Water cooled & Air cooled).	Both systems are acceptable subject to functional performance as per bid, being proven during detailed design.
103	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-021_A0 water flow schematic.(sheet 02 of 02)	As per drawing all individual FCUs tapping taken from main header, No sub header provided for FCU to make up the grouping of FCUs for easy maintenance. If we will take the FCU tapping from main header & any leakage or any other maintenance required in the FCU tapping then whole system will shutdown. Please confirm.	Bid conditions prevail. (Final piping reticulation to be prepared during design by D&B contractor and subject to approval).

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
104	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-021_A0 water schematic.(sheet 02 of 02)	As per schematic drawing the CHW pipe header for water cooled chiller & air cooled chiller are same. Air cooled chiller will be used only for 24X7 technical room at the non revenue hours & air cooled capacity will be very less than the water cooled chiller.When only air cooled system will run the water will flow in same piping then velocity of water will be very low.May be below 1FPS also. It may be possible system will not get proper flow at the endpoint.Please confirm whether common pipe will run for both system or piping system will be separate for both system (Water cooled & Air cooled).	Please refer response of query at Sr. No. 103.
105	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-021_A0 water schematic.(sheet 02 of 02)	As per schematic drawing the A.C.plant room,ASS room,Electrical room,Subway,Electrical D.B room,TVS room,Fire pump room are air conditioned with fan coil units.Wherever in other metro like DMRC,JMRC,CMRC these rooms are ventilated,please confirm.In this contract these rooms will be air conditioned or ventilated.If these rooms are air conditioned,the energy consumption will be high.	Bid conditions prevail. Inside conditions to be provided.
106	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-022_A0 typical air flow schematic for ECS (sheet 01 of 02)	As per schematic diagram only supply air ducting shown for supply air from AHU to areas at concourse & platform. No return air duct shown in the schematic diagram.What will be the path of return air from public areas to AHU room.By return air ducting or through false ceiling, please clarify.	Bid Conditions prevail. (Please refer response of query at Sr. No. 55).
107	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-022_A0 typical air flow schematic for ECS (sheet 01 of 02)	As per schematic diagram the fire damper is shown in fire rated duct.It shall be motorised fire & smoke damper, please confirm.	Bid conditions prevail. (This is to be decided during detailed design stage).
108	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-023_A0 typical air flow schematic for ECS (sheet 02 of 02)	As per schematic diagram only supply air ducting shown for supply air from AHU to area's at concourse & platform no return air duct shown in the schematic diagram.What will be the path of return air from public area to AHU room.BY return air ducting or through F/C,Please clarify.	Please refer response of query at Sr. No. 55.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
109	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-023_A0 typical air flow schematic for ECS (sheet 02 of 02)	As per schematic diagram the fire rated duct connected to the OTEF to remove the smoke from rooms in case of fire & same OTEF connected with OTE also to remove the train A/C outdoor units heat & breaking system heat.If the same time the train is at the station track then which philosophy will be activated.Please clarify.	Please refer response of query at Sr. No. 52.
110	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-023_A0 typical air flow schematic for ECS (sheet 02 of 02)	As per schematic diagram the platform supply air duct connected to the OTEF to extract the smoke from platform level in case of fire at platform level and same OTEF connected to the OTE also.If at the same time the train is at the station track then which philosophy will be activated, please clarify.	Please refer response of query at Sr. No. 52.
111	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-023_A0 typical air flow schematic for ECS (sheet 02 of 02)	As per schematic diagram the fire damper is shown in fire rated duct.It shall be motorised fire & smoke damper, please confirm.	Bid Conditions prevail. (Being D&B contract, to be decided during detailed design stage).
112	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-024_A0 typical ECS equipment details.	As per drawing the vibration isolators are shown in the ceiling suspended pipes. As per normal practice,the vibration isolators are not required in the ceiling suspended pipes because the flexible bellows are installed in suction & discharge of the pumps for absorbing the vibrations, please confirm.	Bid Conditions prevail. (To be decided during detailed design stage).
113	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-025_A0 typical VRF schematic layout.	As per drawing the VRF is using in elevated station mid vent shaft. The VRF required only for technical rooms for elevated station or required for public area also, please confirm.If possible, please share a room list & Area which requires the air conditioning through VRF.	Bid conditions prevail. (Please refer Part 2, Section VI-B1).
114	PART-4 & SECTION-XI			Drawing no:GCC-TVE-P00-0001-020_A0 water flow schematic (sheet 01 of 02).	As per schematic diagram provision of air separator for removing the air from system is not provided. Whether it is required or not, please confirm.	Bid conditions prevail. (Provision of Air Separator is not required).
115	PART-4 & SECTION-XI				Please clarify the requirement of air cooled & VRF,which station required air cooled & which station required VRF.	Bid conditions prevail. (Please refer Part 2, Section VI-B1).
116	PART-4 & SECTION-XI				As per schematic diagram,no return air duct shown.It means the return air above F/C.& All walls between public area & non-public area will be upto F/ceiling.Where as per NEPA-130,chapter-5(5.2.3.2.5) all public area shall have a fire separation from non-public area.Please confirm.Whether return air duct required or not.	Please refer response of query at Sr. No. 55.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
117	PART-4 & SECTION-XI				As per schematic diagram,no return air duct shown.It means the AHU rooms are open return system in open return air system the AHU room & Back off house heat will also added in heat load,which will be increased the energy consumption.Please confirm return air duct required or open system will be ok.	Please refer response of query at Sr. No. 55.
118	PART-4 & SECTION-XI	GCC-TVE-P000-0001-20_A0		Water Flow Schematic-ECS(sheet 1 of 2)	Provision of air and dirt separator not shown. Please confirm the requirement.	Bid Conditions Prevail.
119	PART-4 & SECTION-XI	GCC-TVE-P000-0001-20_A0		Water Flow Schematic-ECS(sheet 1 of 2)	Bleed off system for condenser water system not shown in drawing schematic, please clarify the requirements.	Bid conditions prevail. (Detail Design Consultant shall submit the detail drawings showing all requirements of the system).
120	PART-4 & SECTION-XI	GCC-TVE-P000-0001-20_A0		Water Flow Schematic-ECS(sheet 1 of 2)	As per schematic diagram only one no. ACC shown, no standby arrangement provided. Please confirm the requirement.	Bid conditions prevail. Only one air cooled chiller.
121	PART-4 & SECTION-XI	GCC-TVE-P000-0001-20_A0		Water Flow Schematic-ECS(sheet 1 of 2)	In schematic only one no. ACC Pump shown it is only one or one working one standby, please clarify.	Refer Sr. no. 1,2 of Addendum-3 (It shall be one working and one standby)
122	PART-4 & SECTION-XI	GCC-TVE-P000-0001-21_A0		Water Flow Schematic-ECS(sheet 1 of 2 & 2 of 2)	In piping schematic of low side shown that there are false ceiling in all rooms but as per general procedure like TVF plant room, ASS room and other plant room are without false ceiling , please confirm.	TVE plant rooms and ASS room are without false ceiling. Refer approved architectural drawings during design stage.
123	PART-4 & SECTION-XI	GCC-TVE-P000-0001-21_A0		Water Flow Schematic-ECS(sheet 1 of 2 & 2 of 2)	Inline fan for fresh air to rooms will run only in fire mode or in normal mode also. Please clarify.	Bid conditions prevail. (Please refer Part 2, Section VI-B1, Clause 3 & 4 on Scope of Work and Performance Requirements).
124	PART-4 & SECTION-XI	Generals		Space for equipments in rooms	Space required for installation of separate SEF fan for concourse smoke extraction, fresh air fan. As per layout there is no space available for installation of these fans. Please provide the space.	Fans are to be ceiling mounted.
125	PART-4 & SECTION-XI	Generals		Fire extraction for AHU, OTE & UPSF rooms	AHU, OTEF & UPSF room required fire extraction or not,Please clarify.	Bid Conditions prevail. (To be decided during detailed design stage).
126	PART-4 & SECTION-XI			Lifting eyes	Provisions of hooks:To be provided by civil contractor. Please confirm.	Bid conditions prevail. (Part refer Appendix 19 of Part 2, Section VI-A).

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
127	PART-4 & SECTION-XI			As per drawing no.: GCC-TVE-P00-0001-004_A0-Ventilation strategy in congestion mode.	As per schematic diagram,in the congestion mode, the tunnel ventilation fan is pushing the air in both tunnel and from other side of tunnel, the tunnel ventilation fan pulling the air also from both tunnel.Please clarify.The TVS will be designed for double tunnel congestion system or single tunnel congestion system because it will effect on TVS capacity.	As already given in the referred drg, the TVS shall be designed for double congestion.
128	PART-4 & SECTION-XI			As per drawing no.: GCC-TVF-P00-0001-004_A0-Ventilation strategy in congestion mode	As per note marked on drawing all OTEF'S will be running at reduced speed. It means in congestion mode the UPSAF's will run at full speed or only OTEF'S will run at reduced speed.Please clarify.	D&B contractor shall carry out simulation studies and operational speed of fans shall be decided based on report
129	PART-4 & SECTION-XI			As per drawing no.:GCC-TVF-P00-0001-006_A0-Ventilation strategy in crossover fire case-1:	As per schematic layout no booster fan is located at crossover for boosting the air into the tunnel.Please clarify the philosophy without booster fan at crossover. How to achieve the critical velocity in tunnel.	Bid conditions prevail. (Critical velocity shall be achieved by saccardo nozzle, subject to detailed designer proposal).
130	PART-4 & SECTION-XI			As per drawing no:GCC-TVF-P00-0001-007_AO-Ventilation strategy in crossover fire case-2:	As per schematic layout no booster fan is located at crossover for boosting the air into the tunnel.Please clarify the philosophy without booster fan at crossover. How to achieve the critical velocity in tunnel.	Please refer response of query at Sr. No. 129. Design studies to be done by D&B contractor and arrive at solutions meeting requirements.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
131	PART-4 & SECTION-XI			As per drawing no.:GCC-TVF-P00-0001-009_A0-Ventilation strategy for overrun emergency operation case-2:	As per schematic layout the booster fan is showing in overrun/stabling area, as per our understanding the booster fan will be installed in both tunnel of overrun/stabling area.Please clarify	This is to be finalised during detailed design stage being DB contract.
132	PART-4 & SECTION-XI			As per drawing no:GCC-AAO-AAO-SCC-1609-201_A0	Design of open plenum with the requirement of 24X7 operation of the system under consideration, frequent maintenance as per manufacturer's recommendation may be necessary for trouble free operation & the same may not be viable under proposed system.	One Track will remain under operation for 24x7 Hrs. Frequent maintenance of Over Track Exhaust Fans (OTEFs) serving the other track shall be possible and there will be no problem in maintenance of one OTEF even if other OTEF is in running condition.
133	PART-4 & SECTION-XI			As per drg. No. GCC-TVE-P00-0001-008_A0	No booster fan is used in crossover, without booster fan, how to achieve the critical velocity in tunnel. Please clarify.	Please refer response of query at Sr. No. 129.
134	PART-4 & SECTION-XI			As per drawing GCC-TVE-p00-0001-011-AO congestion ventilation strategy for typical tunnel,Crossover tunnels,Portal tunnels,BKC siding CASE-I, BKC siding CASE-II	As per schematic drawing the train congestion is showing in both up & down tunnel, please clarify.In congestion system, the double tunnel congestion system will be considered or single tunnel congestion system will be considered.	Consider double congestion.
135	PART-4 & SECTION-XI			As per GCC-TVE-P00-0001-013_AO	As per the layout sectional details, the nozzle is coming upto the track level.It may come at slab level & as per layout it will be obstructed at DRD for Draught Relief. Please clarify.	This is subject to design and to be finalised during detailed design stage being DB contract.
136	PART-4 & SECTION-XI			As per drawing no.: GCC-TVE-P00-0001-003_A0-Ventilation strategy in normal mode	As per note at the drawing the all OTEF'S & UPSAF'S will be running at reduced speed.It means that in normal mode the OTEF's & UPSAF'S are running at reduced speed.Please clarify when these fans will run at its full capacity.	Please refer response of query at Sr. No. 128.
137	PART-4 & SECTION-XI			As per drawing no.: GCC-TVE-P00-0001-004_A0-Ventilation strategy in congestion mode.	As per schematic diagram,in the congestion mode, the tunnel ventilation fan is pushing the air in both tunnel and from other side of tunnel, the tunnel ventilation fan pulling the air also from both tunnel.Please clarify.The TVS will be designed for double tunnel congestion system or single tunnel congestion system because it will effect on TVS capacity.	Please refer response of query at Sr. No. 127.
138	PART-4 & SECTION-XI			As per drawing no.: GCC-TVF-P00-0001-004_A0-Ventilation strategy in congestion mode	As per note marked on drawing all OTEF'S will be running at reduced speed. It means in congestion mode the UPSAF's will run at full speed or only OTEF'S will run at reduced speed.Please clarify.	Please refer response of query at Sr. No. 128.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
139	PART-4 & SECTION-XI			As per drawing no.:GCC-TVF-P00-0001-006_A0-Ventilation strategy in crossover fire case-1:	As per schematic layout no booster fan is located at crossover for boosting the air into the tunnel.Please clarify the philosophy without booster fan at crossover. How to achieve the critical velocity in tunnel.	Please refer response of query at Sr. No. 129.
140	PART-4 & SECTION-XI			As per drawing no. :GCC-TVF-P00-0001-006_A0 & GCC-TVF-P00-0001-007_A0-Ventilation strategy in crossover fire case-1 & case-2:	As per schematic diagram.TheOTEFS&UPASF'S are in switched off in fire emergency at crossover.Please clarify, How many stations OTEFS & UPASF'S fans will be switched off.	Bid conditions prevail. (This is to be decided during detailed design stage being a DB contract. Submit simulation study).
141	PART-4 & SECTION-XI			As per drawing no.:GCC-TVF-P00-0001-009_A0-Ventilation strategy for overrun emergency operation case-2:	As per schematic layout the booster fan is showing in overrun/stabling area, as per our understanding the booster fan will be installed in both tunnel of overrun/stabling area.Please clarify	Please refer response of query at Sr. No. 131.
142	PART-4 & SECTION-XI			As per drawing no.:GCC-TVF-P00-0001-010_A0-Ventilation strategy for trackway fire with station smoke exhaust off	As per schematic layout when the fire in a train at trackway the OTEFS are switched off, both side TVF are on in exhaust mode. UPSAF is in on mode, wherein as per technical specification CLAUSE 5.4.6. , the UPSAF fan is switched off. Which strategy will be implemented. Please clarify.	Drawing and specs both mention that UPSAFs switched off strategy will be implemented.
143	PART-4 & SECTION-XI			As per drawing no:GCC-TVF-P00-0001-010_A0-Ventilation strategy for trackway fire with station smoke exhaust on	As per schematic layout when the fire occurred in a train at trackway the OTEFS fan and TVF fan in on mode.Wherever as per technical specification CLAUSE 5.4.6. , the OTEF and UPASF fan is shown in off mode, only TVF fan is running in on mode. Please clarify the ventilation strategy for trackway fire mode.	Repeat query. Bid Conditions Prevail (Refer clause 5.4.6 of Part 2, Section VI B2) Also refer response at point 143
144	PART-4 & SECTION-XI			As per GCC-TVE-P00-0001-003_A0-Ventilation strategy in normal mode	As per schematic layout the draught relief damper is joined with TVF plenum to outdoor opening.Wherever as per typical station layout the draught relief damper is very difficult to connect with outdoor opening or it will be separate opening to atmosphere.Please clarify.	It is not difficult to connect with outdoor opening. Refer the arch drawings and follow the concept during design stage, this being D&B contract.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
145	PART-4 & SECTION-XI				All types of civil work related to ECS,TVS system like foundation of equipment,drain sumps,drain channel,structural supports of equipment, floor & wall opening & their finishing to be provided by civil contractor. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part-2, Section VI-A).
146	PART-4 & SECTION-XI				As per layout, the nozzle cutout size seems to be on smaller side. It may be increased as per fan capacity. Actual size will be worked after award of contract.	Elaborate with calculations and studies on the cutout size, after award of contract.
147	PART-4 & SECTION-XI			Drg. No. GCC-TVE-POO-0001-003-AO-Ventilation strategy in normal mode	As per schematic drawing the plenum chamber of both TVF is common so the double tunnel congestion system cannot achieve. Please confirm.	In order to achieve double congestion mode, both TVFs shall run in the same direction. Fully achievable.
148	PART-4 & SECTION-XI				As per architectural layout drawing, the draught relief shaft size seem to be on smaller side, it may be of bigger size. Actual working will be done after award of contract.	Follow response no.146.
149	PART-4 & SECTION-XI				Purpose of OTE opening showing in the TVF plenum is not clarified. Please clarify the philosophy of the same.	Opening is to extract trackway smoke during trackway fire.
150	PART-4 & SECTION-XI				OTEF room design of open plenum-with the requirement of 24x7 operation of the system under consideration, frequent maintenance as per manufacturer recommendation may be necessary for trouble free operation and the same may not be viable under proposed system configuration.	Please refer response of query at Sr. No. 132.
151	PART-4 & SECTION-XI				No standby to under platform supply fan considered-with the requirement of 24x7 operation of the system under consideration, frequent maintenance as per manufacturer recommendation may be necessary for trouble free operation and the same may not be viable under proposed system configuration.	UPAS Fan on each side provides air to both tracks, hence if one fan is under miantenance, the other fan continues to supply both tracks.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
152	INTERFACE DRAWINGS		1 of 1	GCC-TVE-P00-0001-041_A0 TVE Scada-Model, TUNNEL VENTILATION AND ENVIRONMENTAL CONTROL SYSTEM SCADA DRAWING	From drawing it is clear that M&E SCADA is not part of TVE SCADA works of this contract. Kindly confirm.	Confirmed.
153	INTERFACE DRAWINGS		1 of 1	GCC-TVE-P00-0001-041_A0 TVE Scada-Model, TUNNEL VENTILATION AND ENVIRONMENTAL CONTROL SYSTEM SCADA DRAWING	RTUs are not shown on the drawing. We understand that these are not required as station level SCADA equipment can easily communicate directly with OCC SCADA equipment through FOTS backbone. Kindly Confirm	Bid Conditions Prevail. (Please refer Part-2, Section VI-B3)
154	Generals				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.	Confirmed.
155	Generals			Equipment foundation	All RCC & masonry foundation and structural steel supports for equipment to be provided by civil contractor. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
156	Generals				All opening & cutout in wall, floor & slabs & their finishes to be done by civil contractor. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
157	Generals				Water for flushing of the system to be provided by the other system contractor.Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
158	Generals				Treated water & power for system testing & commissioning to be provided by other system contractor. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
159	Generals				Scope of CSD drawing to be clarified.	Please refer response of query at S.No. 83.
160	Generals				Scope of SEM, WOD to be clarified.	Bid conditions prevail. (Please refer Part 2, Section VI-A esp. Appendix 19)
161	Generals				All input data for design work at any stage to be provided to system contractor at time to time.	Bid conditions prevail. (Please refer Part 2, Section VI-A esp. Appendix 19)
162	Generals			Cladding	Fire sealing of opening in wall, floor, slab, sleeves & unused slots & other general construction to be done by civil contractor, after installation.Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
163	Generals				In this contract, the supply air duct using as a smoke extraction duct in case of fire at concourse, platform & mezzanine level & all ducts are fire rated, what fire rating required in grilles & diffusers. Please confirm.	Bid conditions prevail. (Fire rating shall be as per Clause 6.2.10.3.4 of Part 2, Section VI-B1).
164	Generals				Retail area will be A/C , Non-A/C space. Please confirm A/C required from station AHU or individual fan coil unit.	Bid Conditions Prevail (Refer Part 2, Section VI B1)
165	Generals				Subway will be A/C, Non-A/C or ventilated.Please clarify.	Bid conditions prevail (Refer clause no. 4.4.5 of Part 2 section VI-B1) Subways are A/C
166	Generals				At some station separate chiller plant room is provided for retail area, standby chiller required for retail area. Eg. Siddhi Vinayak station, please clarify.	Refer Sr. no. 4 of Addendum-3

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
167	Generals				At Array station, the basement parking and space for future development/parking will be ventilated or not. Please clarify.	Requirement shown in drwg for future development & parking is not in the scope of this contract.
168	Generals				If any changes in area of station/tunnel & rooms then its considered as a variation.Please confirm.	Bid conditions prevail.
169	Generals				At Array station, air conditioning required at platform & concourse level also, or only techical rooms will be air conditioned. If only some rooms are air conditioned then please provide the list of rooms which are to be air conditioned.	ECS services shall cover the technical rooms and offices on platform and concourse level.
170	Generals			Earthing of equipment	G.I. earthing will be used or copper earthing. Please clarify.	Refer Addenum No. 3 : S. No 17.
171	Generals				MET in each plant room near the equipment to be provided by E & M. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
172	Generals				Power socket for single phase equipment to be provided by E&M or others. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
173	Generals				Main incomer cables for ECS equipment panels to be provided by E&M. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
174	Generals				If scheme will be changed from the contract tender document at the time of detailed design then it will be considered variation. Please confirm.	Bid conditions prevail.
175	GENERAL				OTE & UPS duct to be provided by others.Please confirm.	Repeat query. Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
176	GENERAL				Support of TVF, OTEF & UPSF and any type of foundation or support of equipment wil be provided by others. Please confirm.	Bid conditions prevail. (Please refer all bid documents including Appendix 19 of Part 2, Section VI-A).
177	GENERAL				Earthing of equipment will be of GI or Copper. Please confirm.	Please refer response of query at Sr. No. 170.
178	GENERAL				Mounting bracket for LHD & Booster fan power cable in tunnel to be provided by others. Please confirm.	

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
179	GENERAL				Scope of CSD to be clarified.	Bid conditions prevail. (Please refer VI-A including its Appendix 19)
180	GENERAL				Scope of SEM to be clarified.	
181	GENERAL			Interface drawing	means contractor will prepare the drawing only for there scope of contract. Please confirm.	
182	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.	
183	GENERAL			TRAIN DATA	<p>Kindly provide following Train data.</p> <p>GENERAL DATA</p> <ol style="list-style-type: none"> 1.Design maximum outside air temperature (Dry bulb) 2.Design maximum outside air temperature (Wet bulb) 3. Amplitude of annual temperature fluctuation 4. Maximum average tunnel temperature 5. Design hour 6. Design temperature for cooling at night 7. Train operating speed 8. Design peak hour operating headway 9. Train dwell time at station. 10. Congested scenario (trains stopped for more than 3 minutes in tunnel) 11. Fire emergency scenario (tunnel and station) <ul style="list-style-type: none"> -Number of trains stopped inside tunnel during congested operation. -Number of trains stopped inside tunnel during fire emergency operation <p>TRAIN DATA required</p> <ol style="list-style-type: none"> 1. Total length of train 2. Train frontal cross-section area 3. Train frontal cross-section perimeter 4. No. of cars per train 5. No. of powered car per train 6. Operating acceleration time 7. Operating deacceleration time 8. Regenerative braking effectiveness 9. Train air-conditioning (A/C) arrangement 10. Number of passengers inside the train 11. Overall skin friction coefficient 12. Average sensible heat rejection from auxilliary systems for an empty car 13. Average passenger weight 14. Average empty train weight 	Please refer Part 2 Section VI-A Appendix 12. Other details will be provided during design stage.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
					15. Average total train weight 16. No. of motors per powered car 17. Wheel diameter 18. Gear ratio 19. Supply voltage 20. Motor terminal voltage at base speed 21. Traction motor efficiency 22. Chopper/Inverter efficiency 23. Traction motor curves 24. Train operating speed 25. Train dwell time at station 26. Design heat release of train fire 27. Radiation 28. OTE 29. UPE 30. Internal car design condition 31. No. of A/C unit per car 32. No. of fan per condenser unit 33. Condenser fan volume flow rate 34. Condenser air flow exit velocity 35. Heat output per condenser unit 36. Heat transmission through train walls 37. A/C unit unload temperature and cut-off temperature CIVIL ENGINEERING DATA (ACCORDING TO ENGINEERING DRAWINGS) 1. Underground tunnel section 2. Tunnel cross sections 3. Steady state heat source along the tunnel 4. Deep sink temperature of soil 5. Initial tunnel wall temperature (worst case)	
184	GENERAL				Incomer of ECS & TVS panel to be provided by others. Please confirm.	Repeat query. Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
185	GENERAL				MET for earthing of equipment of ECS/TVS to be provided by others in each plant room. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
186	GENERAL				Clean earth to be provided by others near the equipment. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
187	GENERAL				Earthing of the booster fan in tunnel to be provided by other upto booster fan. Please confirm.	Bid conditions prevail. (Please refer Appendix 19 of Part 2, Section VI-A).
188	GENERAL				Please provide the outline design criteria.	Query is incomplete

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
189	GENERAL				Headway & dwell time to be confirmed in peak hours and non-peak hours.	Bid conditions prevail. (Please refer Chapter 5, Appendix 12 of Part 2, Section VI-A).
190	GENERAL				Train will be formed of either 6 car (extendable to 8 cars at a later date) or 8 cars, 140m or 180m length and 3.2m wide. It means the system will be design as per 8 cars data. Please confirm.	Confirmed.(System will be designed as per 8 cars data).
191	GENERAL				As per general specification the maximum operator speed through station platform shall be limited to 70kmph & at all other location 85kmph, subject to speed restriction, the design speed is set with 95kmph. It means the TVS design will be as per 95kmph. Please confirm.	Bid conditions prevail.
192	GENERAL				If any changes in area of station or tunnel then its considered as a variation. Please confirm.	Bid conditions prevail.
193	GENERAL				Manual damper required at suction of AHU or not, please clarify.	This is to be finalised during detailed design stage being DB contract.
194	GENERAL				Manual damper at suction of ventilation fan required or not.	This is to be finalised during detailed design stage being DB contract.
195	GENERAL				If any area or design will be revised from tender drawing then it will be considered as a variation.Please confirm	Refer to response of query at Sr. No. 192.
196	GENERAL				Please clarify the requirement of pipe cladding.	Bid conditions prevail. (Please refer Part 2, Section VI-B)
197	GENERAL				Please provide the permissible velocity in vent shafts.	Bid conditions prevail. (Please refer Part 2, Section VI-B)
198	GENERAL				Noise criteria required.	Bid conditions prevail. (Please refer Part 2, Section VI-B)
199	GENERAL				Please share DBR data.	Bid conditions prevail. (DBR data shall be shared with the successful Bidder).
200	GENERAL				Architectural layouts with sections,tunnel alignment drawings,tunnel sections,niche locations drawings for booster fans & anu other drawings pertaining to ECS& TVS work,please provide	Successful Bidder shall work in coordination with Civil Contract Architect for the location of booster fan and niche sizes. Design drawings are in scope of D&B contractor.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
201	GENERAL				All types of civil work related to ECS & TVS system like foundation of equipment, drain sumps, drain channel, structural supports of equipment, floor & wall opening & their finishing to be provided by civil contractor. Please confirm.	Bid conditions prevail. (Please refer VI-A including Appendix 19 of Part 2)
202	GENERAL				As per layout, the nozzle cutout size seems to be on smaller side. It may be increased as per fan capacity. Actual size will be worked after award of contract. Please confirm.	Repeat query. Please refer to response of query at Sr. No. 146.
203	GENERAL				Please confirm whether Cooling dumping air required in tunnel.	Bid conditions prevail. (Cooling dumping air is not required in tunnel).
204	GENERAL				Since the design in scope of contractor, final requirements of TVS fans capacities shall be calculated during detailed design stage of the prject. However, can you please confirm if there is any minimum requirement of fan capacity. Please confirm.	This is to be finalised during detailed design stage being DB contract.
205	GENERAL				TVS Nozzle (Saccardo) nozzle shall be provided as per requirement worked out during detailed design and the provision of TVS Nozzle (Saccardo) shall not be considered mandatory. Please confirm.	Bid conditions prevail. Elaborate with detailed calculations and studies post award of contract.
206	GENERAL				Please provide the permissible velocity in vent shafts.	Please refer to response of query at Sr. No. 197.
207	GENERAL				With layouts it is not clear that niches are top niche or side niche.	Query not relevant for bidding purpose. To be finally decided during detailed design stage in co-ordination with civil contractor.
208	GENERAL				Please provide DBR data.	Please refer response of query at Sr. No. 199.
209	GENERAL				Please confirm if OTE fan is 1 working + 1 stanby or 2 working. Please confirm.	1 working + 1 Standby, but in normal mode both fans are working at reduced speed to save energy.
210	GENERAL				Architectural layouts with sections,tunnel alignment drawings,tunnel sections,niche locations drawings for booster fans & anu other drawings pertaining to ECS& TVS work,please provide	Successful Bidder shall work in coordination with Civil Contract Architect for the location of booster fan and niche sizes. Design drawings are in scope of D&B contractor for TVE
211	GENERAL				Contractor shall be free to choose the supplier which meets the project technical requirements. Supplier can be of any country. Indian makes to be promoted in view of "Make in India" drive. Please confirm.	Bid Conditions Prevail. (Please refer clause no. 1.2.3 of Part - 1, Section III)

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
212	PART-2 & SECTION-VI B1	ECS- 6.2.2.2 (a)	42 of 145	AHU- Quality Control	In addition to ARI & EuroVent, IS Standards shall also be acceptable. Kindly Confirm.	Please refer Clause no. 1.4 of Part 2, Section VI-B1.
213	PART-2 & SECTION-VI B1	ECS- 6.2.2.3 (a) & (d)	44 & 45 of 145	AHU- Drain Pan	MOC : Drain Pan of AHU shall be Stainless steel & rust free,However insulation provision/type on this drain pan will be as per Manufacturer's Standard.Kindly Confirm.	Bid conditions prevail.
214	PART-2 & SECTION-VI B1	ECS- 6.2.2.3 (a) & (d)	44 & 45 of 145	AHU- Drain Pan	The drain pan will be of (SS-316) but the connection and the drain pipe will be PVC type. Kindly confirm.	Bid conditions prevail. (Drain connection shall be SS 316 however drain pipe shall be G.I. as per Clause no. 6.2.8.3.1.d of Part 2, Section VI - B1).
215	PART-2 & SECTION-VI B1	ECS-6.2.3.3- e	45 of 145	Coil & Filter housing	As per clause, all filter frame shall of SS-304 and be epoxy painted. But if it is SS-304 then there is no need to provide epoxy paint on the same. Plz confirm	Bid conditions prevail.
216	PART-2 & SECTION-VI B1	ECS- 6.2.2.3 (g)	45 of 145	AHU- Enclosure	Sandwich panels shall be bolted from <i>inside or outside</i> for 50mm thick insulation as per manufacturing practices. Kindly confirm.	Bid conditions prevail.
217	PART-2 & SECTION-VI B1	ECS- 6.2.2.3 (g)	45 of 145	AHU- Enclosure	Instead of grooves in the extruded section, profile lips shall be acceptable as per manufacturing standards of various vendors. Kindly confirm.	Bid conditions prevail.
218	PART-2 & SECTION-VI B1	6.2.2.3-k	47 of 145	AHU- Fin spacing	As per clause, Fins spacing shall be 11 to 13 fins per inch. But workable fin spacing would be 10fpi as it will also help in reducing the chances of coil chocking.Kindly Confirm	Bid conditions prevail.
219	PART-2 & SECTION-VI B1	ECS- 6.2.2.4 (b)	47 of 145	AHU- Cooling Coil testing	Checking for bonding of fins to tubes should be Mechanical/Hudraullically expansion process or as manufacturer standard.Kindly Confirm	Bid conditions prevail.
220	PART-2 & SECTION-VI B1	ECS- 6.2.3.3.2 (a)	50 of 145	FCU- Tube Thickness	As per manufacturer 9.52mm thick copper tube is applicable and shall be provided instead of 10mm thick copper tube. Kindly confirm.	Bid conditions prevail.
221	PART-2 & SECTION-VI B1	ECS- 6.2.3.3.2 (b)	50 of 145	FCU- Al Fin Thickness	As per manufacturer 0.105mm thick Aluminum fins is applicable and shall be provided instead of 0.15mm thick Al Fin. Kindly confirm.	Bid conditions prevail.
222	PART-2 & SECTION-VI B1	ECS- 6.2.3.3.4-c	50 of 145	FCU Secondary Drain Pan	Secondary drain pan should be provided depending upon Access of the space on site. Please confirm.	Bid conditions prevail.
223	PART-2 & SECTION-VI B1	ECS- 6.2.3.3 (d)	51 of 145	FCU- Fans with Low-Med-High	Please confirm at what speed of fan the selection/capacity of FCU shall be rated. Kindly clarify.	Bid conditions prevail. (Please refer Clause 6.2.3.3.7 of Part 2, Section VI- B1). Equipment design and selection to be done during DD.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
224	PART-2 & SECTION-VI B1	ECS- 6.2.3.3.7	51 of 145	FCU Noise Control	Please confirm what distance noise level is to be measured for FCU room.	Bid conditions prevail. (Please refer Clause no. 6.2.3.3.3 b of Part 2, Section VI- B1).
225	PART-2 & SECTION-VI B1	ECS- 6.2.3.3.8	52 of 145	FCU- Valves	Fan coil unit valves shall be factory fitted limited to ball valve with and without strainers. Kindly confirm	Please refer Part 4, Section XI, Drg No. - GCC-TVE-P00-0001-024_A0 Typical connection detail for FCU.
226	PART-2 & SECTION-VI B1	ECS- 6.2.4.3.1 (d)	55 of 145	Chiller- Condenser Test Pressure	As per manufacturers Shell side shall be tested at test pressure exceeding 21 kg/cm ² . Kindly confirm.	Bid conditions prevail.
227	PART-2 & SECTION-VI B1	ECS- 6.2.4.3.1 (e)	56 of 145	Chiller- Insulation	As some of the manufacturer recommend the insulation to be done at site due possibility of damage to this insulation during transportation. So kindly change this clause to as per manufacturer standard.	Bid conditions prevail.
228	PART-2 & SECTION-VI B1	ECS- 6.2.4.3.1 (e)	56 of 145	Chiller- Anti Fouling Device	Please specify the make of Anti Fouling device as all chiller manufacturers doesn't provide Anti Fouling device. Kindly confirm.	Bid conditions prevail.
229	PART-2 & SECTION-VI B1	ECS- 6.2.4.3.1 (f)	56 of 145	Chiller- Oil Recovery Unit	Oil recovery units shall be as per latest manufacturing standards of the manufacturer. Kindly confirm.	Bid conditions prevail. Submit details of equipment that satisfy functional and performance requirements
230	PART-2 & SECTION-VI B1	ECS- 6.2.4.3.1 (g)	56 of 145	Chiller- Control Panel	As per the referred clause multi colour display control panel is mentioned. Please waive off this clause as all reputed manufacturer do not provide multi colour display. Please confirm.	Bid conditions prevail.
231	PART-2 & SECTION-VI B1	ECS- 6.2.4.3.1 (h)	57 of 145	Refrigerant piping-Pre Charged Refrigerent	As per the referred clause of pre charged refrigerent from manufacturing premises. Please change this clause to as per manufacturing standard as some of the manufacturer don't recomend this practice some times gas leakage occurs during the time of transporting or at the time of shifting these chillers at respective sites. Please confirm.	To be finally decided during detailed design.
232	PART-2 & SECTION-VI B1	ECS- 6.2.4.3.2 (a)	59 of 145	Magnetic Centrifugal Chiller- Capacity General	Capacities of magnetic centrifugal chillers shall vary +/- 5% as per manufacturing standard which shall be acceptable to employer. Please confirm.	Bid conditions prevail.
233	PART-2 & SECTION-VI B1	ECS- 6.2.5.4	63 of 145	Air Cooled Chiller- Refrigerant	Kindly confirm whether R407C being Zero ODP Environmental friendly refrigerant shall be acceptable.	To be finally decided during detailed design.
234	PART-2 & SECTION-VI B1	ECS- 6.2.5.4.1	64 of 145	Air Cooled Chiller- Shell & Tube	As some of the manufacturer recommend Braze plate type and multi-pass type arrangement so request you to kindly consider the both type of arrangements for these air cooled chillers i.e Shell & tube /Braze plate type arrangements.	Bid conditions prevail. (The type of arrangement shall be as given under the Technical Specification for the work).

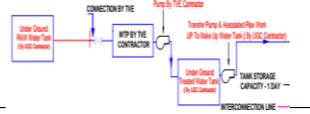
S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
235	PART-2 & SECTION-VI B1	ECS- 6.2.5.4.1	64 of 145	Air Cooled Chiller- Insulation	As some of the manufacturer recommend the insulation to be done at site due possibility of damage to this insulation during transportation.So kindly change this clause to as per manufacturer standerd.	Bid conditions prevail.
236	PART-2 & SECTION-VI B1	ECS- 6.2.5.4.3	64 of 145	Air Cooled Chiller- Compressor Oil	Compressor oil are selected as per Refrigerant. Therefore mineral oil may not be applicable for all refrigerant. Kindly confirm.	To be finally decided during detailed design.
237	PART-2 & SECTION-VI B1	ECS- 6.2.5.4.7	65 of 145	Air Cooled Chiller- Control Panel	Programmable set points, display data, etc of control panel may slightly vary from manufacturer to manufacturer. Therefore manuaacter shall be free to supply the standard control panel as per industrial practice. Kindly clarify.	Bid conditions prevail. (Programmable set points, display data, etc of control panel shall be as per technical specification for the work given under Part 2, Section VI-B1).
238	PART-2 & SECTION-VI B1	ECS- 6.2.6.2	67 of 145	Water Circulating Piumps-Minimum Efficency.	Kindly confim the minimum capacity of pumps as this may vary from manufacturer to manufacturer 65-70%	Bid conditions prevail. (Minimum efficency shall be 80% as per Clause 6.2.6.3 b).
239	PART-2 & SECTION-VI B1	ECS- 6.2.6.3.1 (c)	69 of 145	Pumps- AFD	Please confirm whether IP-54 enclosure for AFD will be acceptable instead of NEMA-1	Bid conditions prevail.
240	PART-2 & SECTION-VI B1	ECS- 6.2.7.3 -c	73 of 145	Cooling Tower- Motor	If twin speed motor is applicable, EFF-1 motor classification is not valid. No motor manufacturer provides the same. Please clarify.	Bid Conditions prevail. (As per technical specification twin speed motor is not envisaged, hence the Bidder's query is not relevant).
241	PART-2 & SECTION-VI B1	ECS- 6.2.7.3 (e)	73 of 145	Cooling Tower- Noise Criteria	Kindly provide the permissible noice limit of the equipment.Also if the noice level is meet during the test then Acooutic works shall not be required. Also, we suggest noise shall be measured atleast at a distance of 3Mtr from the equipment. Please clarify and confirm.	Bid conditions prevail. (The permissible noise level and its measurement shall be as per technical specification and relevant local codes).
242	PART-2 & SECTION-VI B1	ECS-6.2.8.3.1	75 of 145	Condenser Water piping material	As per specifications condenser water piping required is of GI but in other Metros like DMRC & JMRC MS pipe is being used. So please confirm which material will be used.	Bid conditions prevail. (Irrelevant to quote other metros)
243	PART-2 & SECTION-VI B1	ECS- 6.2.8.3.7(i)	77 of 145	Piping Installation- Sleeves	Sleeves as required in walls and floors shall be provided by civil as per Final Approved SEM Drawing of DDC. Please confirm.	Please refer response of query at Sr. No. 65.
244	PART-2 & SECTION-VI B1	ECS-6.2.10.3.12	95 of 145	Fire rating of supply grilles & diffuser	Grills/diffusers connected to AHU supply ducts should be fire rated or non fire rated. Please confirm.	Please refer response of query at Sr. No. 61.
245	PART-2 & SECTION-VI B1	ECS-6.2.10.3.12	95 of 145	Fire rating of supply grilles & diffuser	OBSS dampers for air flow controlling in grilles are non fire rated so there is a possibilty it will get melt during smoke extraction through same grilles and may cause hindrance in extraction can run the separate smoke extract duct. Please confirm.	Please refer response of query at Sr. No. 61. (Submit details of design post award of work)

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
246	PART-2 & SECTION-VI B1	ECS- 6.2.11.3 (B)	98 of 145	Pipe insulstion:Thermal insulation material for pipe insulation shall be closed cell elasotomeric EPDM rubber of fire retardent.	As per this clause the closed all elastomeric EPDM rubber insulation will be used for pipe insulation.Wherever other merto like DMRC,JMRC,the same will be rockwool insulation for underground station,Please confirm.	Bid conditions prevail. (Query not clear)
247	PART-2 & SECTION-VI B1	ECS- 6.2.10.3.4 (d)	90 of 145	Fire Rated Duct Work	Supply of accessories like fire paint, rockwool, sealant, gasket etc is not possible from single vendor. However installation & manufacturing of fire rated duct system certification shall be provided includng all fire rated components as a whole. Same process was followed in previous DMRC projects. Please confirm.	Bid conditions prevail. (Supply of all accessories shall be as specified under Clause 6.2.10.3.4.d of the Technical Specification Part 2, Section VI- B1).
248	PART-2 & SECTION-VI B1	ECS- 6.2.10.3.5 (e)	91 of 145	MOD	The actuator of damper will be of different manufacturer as it is an operating part of damper which is to be fixed outside. We have provided the same for our past projects. Please confirm.	To be finalised during detailed design stage.
249	PART-2 & SECTION-VI B1	ECS- 6.2.10.3.6	91 of 145	UL Standard -Motorised Smoke & Fire Damper	Please confirm UL 555 S Class-II and III shall also be acceptable.	Bid conditions prevail.
250	PART-2 & SECTION-VI B1	ECS-6.2.10.3.12 (a)	94 of 145	Grilles & diffusers-standard	As per clause, Grilles & diffusers shall be designed and rated in accordance with ASHRAE 32-7, but can it be as per ANSI/ASHRAE 70-2006. plz confirm	ASHRAE 70 (latest version) is acceptable
251	PART-2 & SECTION-VI B1	ECS-6.2.10.3.14 (a)	95 of 145	Grilles & diffusers-free area	As per clause, grilles & diffusers shall have a minimum of 80% free area, but as per manufacturer's standard it can vary between 65% to 80%.Kindly Confirm	This is to be finalised during detailed design stage being DB contract. Submit all details for approval post award of contract.
252	PART-2 & SECTION-VI B1	ECS-6.2.10.3.12 (d)	94 of 145	Grilles & diffusers	As per clause, inside of all components and surfaces of all grilles and diffusers shall be painted matt black. But the same is not required as the product will be powder coated hence can't be painted in two different colours.Kindly Confirm	Bid conditions prevail. (The work shall be carried out to the Specification as mentioned under Clause 6.2.10.2.12.d of Part 2, Section VI -B1).
253	PART-2 & SECTION-VI B1	ECS- 6.2.13.1	102 of 145	Fans- General	If during static claculation and fans selection during project stage any change in fan capacity is required. It shall form new item. Kindly confirm.	Bid conditions prevail. (It is D&B contract and all responsibility for proper design lies with the contractor)
254	PART-2 & SECTION-VI B1	ECS- 6.2.13.1	102 of 145	Fans- General	Kindly confirm wether centrifugal fans are acceptable for ventilation pourpose.Kindly confirm	To be finalised during detailed design stage.
255	PART-2 & SECTION-VI B1	ECS- 6.2.13.3.1 (a)	102 of 145	Fans- Efficiency	Fans with nominal rating above 7.5 kW shall have a minimum efficiency of 60% as per manufacturer. Kindly confirm.	Bid Conditions prevail.
256	PART-2 & SECTION-VI B1	ECS- 6.2.13.3.1 (e)	103 of 145	Fans- Lifting Eye	In case of Axial Fans lifting eye is not applicale instead flanges fro lifting shall be provided. Kindly confirm.	This is to be finalised during detailed design stage being DB contract. Submit all details for approval post award of contract.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
257	PART-2 & SECTION-VI B1	ECS- 6.2.13.3.2 (a)	104 of 145	Fans- Impeller (Propeller)	Shaft material and Anti Rust coating shall be as per manufacturers standards. Kindly confirm.	Bid conditions prevail.
258	PART-2 & SECTION-VI B1	ECS- 6.2.13.3.3 (b)	104 of 145	Fans- Casing	Terminal boxes shall be fitted with screws and fastners and may not be welded as per manufacturers standards. Kindly confirm.	Bid conditions prevail.
259	PART-2 & SECTION-VI B1	ECS- 6.2.13.3.3 (c)	104 of 145	Fans- Impeller	Thrust bearing are not part of all manufacturers design and instead they provide B3 Footed mounting or as plicable. Kindly confirm.	Bid conditions prevail. (This is to be confirmed during detailed design stage).
260	PART-2 & SECTION-VI B1	ECS-6.2.14.3.1- (c)	107 of 145	Control Valve body	Valve body shall be cast iron instead of Cast steel. Plz confirm	Bid conditions prevail.
261	PART-2 & SECTION-VI B1	ECS-6.2.15.1	115 of 145	Requirements of Sound attenuator	Please clarify the rquirements of Sound attenuator for emergency fans like Smoke extraction fans and Stair case pressurise fans	Bid conditions prevail. (Please refer Table of Clause 6.2.15.1.h of Part 2 Section VI - B1). Sound attenuation is required.
262	Section 2 VI B	3.1.4 - General Scope of Work		Scope of Work	We assume that given design population in employer requirement is final irrespective of any station. Any variation in occupancy will change the equipment capacity and it shall be considered as extra.	Bid conditions prevail.
263	Section 2 VI B	3.1.4 - General Scope of Work		Scope of Work	Following Rooms are not provided in any of the stations : Smoke Extraction Fan for Concourse Level Toilet Exhaust System for 2 different toilets at 2 different locations away from each other For Staircase Pressurisation, kindly advise staircases to be considered with location of fan room	Bid conditions prevail. Firemen staircases and fire escape staircases to be considered.
264	Section 2 VI B	3.1.4 - General Scope of Work		Scope of Work	Room sizes can be verified, after actual selection of equipments, during detail engineering post award of work	Bid conditions prevail.
265	Section 2 VI B	3.1.4 - General Scope of Work		Scope of Work	Shaft sizes shall be vetted based on actual airflow/equipment selection, during detail engineering post award of work	Bid conditions prevail.
266	Section V1-B3	OCC/BCC		At various places in the TVE SCADA specification OCC/BCC is mentioned.	We understand that BCC shall be the replica of OCC. All TVE SCADA equipment supplied at OCC shall also be supplied at BCC. Kindly Confirm.	Bid conditions prevail.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
267	Section V1-B3	5.4 Maintainability Requirements	16 of 54	5.4.2 The service life of the TVE SCADA shall not be less than 15 years.	Because of rapid changes in electronics industry these days PC suppliers do not provide lifecycle support for more than 2-3 years. We understand that Service life support shall be provided in form of repair/replacement/upgradation of equipments on chargeable basis. Kindly Confirm	Bid conditions prevail.
268	Section V1-B3	5.9 OCC/BCC Control Facilities	19 of 54	Necessary furniture	Furniture at SCR/ Plant room at Stations and at OCC/BCC for placing Server, Workstation, Printers, VDUs etc. shall be provided by MMRCL. Kindly Confirm	Bid conditions prevail.
269	Section V1-B3	5.12 Historical Data Storage and Software Backup	21 of 54	5.12.1 A bulk data storage system with removable storage media cartridges shall be provided at the OCC/BCC for backing-up all operational and used configurable software and for historical storage of database records.	Usually the data should be stored for a period of 6months. Please let know for how much time the data should be stored?	This is to be finalised during detailed design stage being DB contract.
270	Section V1-B3	5.15 Software Development	22 of 54	Software licenses	MMRCL has not mentioned requirement of Laptops installed with necessary software licenses as programming terminals, which shall be procured for modification/addition/rectification of application software developed for the project during AMC and beyond. We suggest two nos. of such laptops for ECS/TVS along with software shall be procured. Kindly confirm.	Bid conditions prevail.
271	Section V1-B4	2.3.3 Low Voltage Switchboard Cubicle Construction	5 of 65	d. The switchgear shall be considered in the fully drawn out condition for this purpose q. Electrical Panel shall be draw out type	Kindly approve construction of panel shall be single front fixed type, as for draw out (d/o) panel : i) Maintenance is complex & high because of number of joints, droppers at rear side which requires specialized / trained operator. ii) As compare to d/o panel fixed type panels are compact in size. It will solve space restriction. iii) Due to temperature variation emerging from uneven contact pressure at male-female contacts and there can be permanent erosion & no further corrective action possible iv) The cost of the draw out panels are 2.5 times more as compared to fixed type. v) Power consumption & hot spot are more in case of D/O panels. vi) In d/o type panel current rating is limited to 160A or 50KW feeder over & above none of manufacturer provide feeder in d/o version.	Refer Addendum No.3 Sr. No. 6 & 7
272	Section V1-B4	2.3.3 Low Voltage Switchboard Cubicle Construction	5 of 65	d. The switchgear shall be considered in the fully drawn out condition for this purpose q. Electrical Panel shall be draw out type	We request you to accept TTA / PTTA panels as per IEC 61439. Kindly accept panels fixed type panels with only ACBs as drawout type. Your requirement as stated in specifications is for draw out type panel and switchgear, which are normally used in steel / power / nuclear industries.All Metro installations are with fixed type panels & switchgears	Refer Addendum No.3 Sr. No. 6 & 7
273	DRAWINGS			Drawings provided in PDF format	Request you to provide all the drawings in Autocad format, this being design & build requirement	Bidders may collect CAD drawings from MMRC office

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
274	VI A	Appendix 19 - 3.2	5 of 77	Site Co-Ordination & Attendance	Provision of Temporary Electrical and Water supply shall be in the scope of the civil contractor and the same shall be provided to the contractor at no additional cost.	Bid conditions prevail.
275	VI B	3.1.4 - General Scope of Work	13 of 145	The Contractor shall be responsible for system sizing and shall submit all calculations and basis adopted for consent of the Project Manager. Where computer software are used for designing, complete print out of all steps involving detailed designing should be submitted to ensure complete understanding by the Project Manager. The software shall be made available to the Project Manager. The contractor shall also confirm the general adequacy of the space requirements within voids or service ducts, openings, main routes etc.	The step by step print out of the software can be provided but the entire software cannot be provided as these are licensed softwares and need continuous upgrades etc.	Bid conditions prevail.
276	VI B	4.10 - General Scope of Work	21 of 145	Safety Requirements 4.10.7 All UG Station ECS equipment shall be protected from damage or reliability degradation due to vibration, shock and other atmospheric conditions.	Safety requirement for ECS / TVS equipment does not include provision for seismic protection. Please confirm	Bid conditions prevail.
277	Part			Minor civil works like grouting of equipment, cutting and finishing good openings in brick walls.	Minor civil works and the civil & structural foundations of all ECS & TVS equipments shall be in civil contractor's scope of work. Please confirm.	Bid conditions prevail.
278	Section VI-B1 – Technical Specifications - ECS	I Description of Air-conditioning system. i Offices, plantrooms and subway.	Page 36 of 145	The short subways (up to approx. 25M) shall be air-conditioned by extension of Concourse AHU systems or by FCUs as the case may be. Longer subways (more than 25M) shall be air conditioned by floor mounted AHUs or FCUs located within the subways. Contractor shall submit the design for acceptance of Engineer.	Please confirm whether separate AHU needs to considered for longer subway (more than 25M)	Bid Conditions Prevail (Please refer clause no 6.2.1.3 (I)of Part 2-VI-B1)
279	Section VI-B1 – Technical Specifications - ECS	6.2.1.6 Control and Monitoring of Smoke Control System	Page 40 of 145	For long subways, separate smoke extraction shall be provided. The smoke extraction system can also be connected to the concourse smoke exhaust system via a separate branch with smoke fire rated damper which allows smoke extraction in the subway. For short subways, it shall be considered as part of the concourse and the smoke exhaust will be provided by the concourse smoke exhaust systems. The contractor shall prove the efficiency/adequacy of smoke management system (Both long and short subways) with the help of CFD analysis/modelling	Please confirm whether separate Smoke extraction fans (1W+1S) needs to be considered for long subway (more than 25M)	Bid Conditions Prevail (Please refer clause no 6.2.1.5 of Part 2-VI-B1)

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
280	Section VI-B1 – Technical Specifications - ECS	6.2.2.3 Technical and installation requirements	Page 45 of 145	f Heat pipe heat exchanger (Deleted)	Please confirm Heat Pipe or Heat recovery unit needs to be considered to maintain the RH in station public area.	Bid Conditions Prevail
281	Section VI-B1 – Technical Specifications - ECS	6.2.4 Water cooled Chillers	Page 52 of 145	b. Magnetic Levitation Chillers shall be provided for the following stations of Phase 1: BKC, CSIA International, Sahar Road. Other stations shall be provided with screw chillers as per specification.	Please clarify what is the criteria for selection of magnetic levitation chillers for these stations. We request you to go with normal screw chillers with VFD for all stations to optimize on the cost.	Bid Conditions Prevail
282	Drawings	1. Water flow schematic - Environmental Control System (Sheet 1 of 2)	GCC-TVE-P00-0001-020_A0		Please confirm Water treatment plant needs to be considered in this contract. If yes, Please include the specification for the Water Treatment plant.	Bid Conditions Prevail Water treatment plant is in TVE scope. Refer Part 2-VI-B1 for specification
283	Drawings	All Dwg Mid-Vent Shaft		TVF equipment's and associated dampers	Please confirm the TVF equipment's and associated dampers needs to be considered in MID Building. Please provide the TVS schematic for the MID-Vent Building.	Bid conditions prevail Refer Clause 5.5 of VI- B2. Also refer serial no. 10 of Addendum 3.
284	Drawings	00. AAREY Depot _ Station		ECS services in AREY Depot _ Station	Please confirm the extent of services to be considered in Aarey station like Basement parking ventilation, air-conditioning provision for retail area.	Bid Conditions prevail Basement parking ventilation not part of scope AC for retail not part of scope
285	Section VI-B3 - Technical Specification - SCADA	1.1 General	Page 1 of 54	Station SCADA system shall communicate with the OCC/BCC TVE SCADA system which will be provided by `Phase 1 contractor via the Communication Backbone Network (CBN) provided by the Telecommunication Contract. Phase 1 contractor shall responsible for integration, coordination and interface of Phase 2 TVE control and monitoring functions in the OCC/BCC	Please confirm the OCC/BCC Scada needs to be considered in this contract. 	Bid conditions prevail. Read the specification carefully.
286	VI-B2	General		2.P2.S.VI-B2.TVS Phase 1	Please confirm the provision of OTE and UPE duct not a part of this contract.	Bid conditions prevail. UPAS and OTE duct shall be provided by UG contractor
287	Section VI-B1 – Technical Specifications - ECS	6.2.5.4.4 Compressor Motor	Page 65 of 145	Temperature sensor shall be provided in motor winding to protect the motor for high temperature rise.	Thermistor shall be provided for protection against high winding temperature. Please confirm	Bid conditions prevail.
288	Section VI-B1 – Technical Specifications - ECS	6.2.5.4.4 Compressor Motor	Page 65 of 145	The starter for the motor shall be automatic Soft type with tapings to limit starting current, within 2 times the full load current.	For Scroll Chillers, as a standard OEMs are providing DOL starter, request you to accept this also.	Bid conditions prevail.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
289	Part-4 Drawings	General		AutoCAD drawings	Please provide all drawings in AUTOCAD format. Also please share 3D models if available.	Bidders may collect CAD drawings from MMRC office
290	Part 2 & Section V1-B1	6.2.1.6	47 of 151	Control and Monitoring of Smoke Control System	We understand separate smoke panel is not required as IBP is already available in SCR. Please confirm.	Bid conditions prevail. Smoke control panel shall be provided if required by local code.
291	Part 2 & Section V1-B1	3.2.d	20 of 151	Scope of Work	We understand only Modes operation is to done from IBP and equipment monitoring & control is through TVE SCADA from SCR. Please confirm.	Refer Addendum No.3, serial no.15
292	Part 2 & Section V1-B1	5.3.3	29 of 151	Function of AC System for Station Public and Ancillary/Office Rooms	We understand that FCU operation shall be through theromstat as stand alone unit. Further, Individual FCU monitoring & controlled is not required from TVE SCADA. Please confirm.	Bid conditions prevail. (All TVE quipment shall be controlled and monitored through TVE SCADA).
293	Part 2 & Section V1-B1	5.8.f	33 of 151	Function of Control and Monitoring System for UG Station ECS	We understand Local Control Panel (LCP) / ECS Control Panel shall be VCP and the same shall be installed on respective RHS & LHS PLC's in SCADA room, i.e. total 2 Nos VCP. Please confirm.	Refer Addendum No.3, serial no.16. Also refer SCADA drawing No.P00-0001-041 of the bid document. VCP and LCP are different panels.
294	Part 2 & Section V1-B1	5.8.f	33 of 151	Function of Control and Monitoring System for UG Station ECS	We understand Local Control Panel (LCP) / ECS control panel shall operate ECS modes only and indivisual control/monitoring of equipments is not provided. Please confirm.	Refer serial no.16 of Addendum No.3. Also refer SCADA drawing No.P00-0001-041 of the bid document
295	Part 2 & Section V1-B2	3.5.3.n	26 of 109	RAMS analysis including safety certification of SIL level of SCADA systems.	We understand that SIL certification shall be applicable for BMS PLC's, IBP & VCP's only. Please confirm.	Bid conditions prevail. Confirmed.
296	Part 2 & Section V1-B3	1.1.3	6 of 59	Phase 1 contractor shall responsible for integration, coordination and interface of Phase 2 TVE control and monitoring functions in the OCC/BCC.	Phase 2 TVE Contractor shall make data available to the OCC as per suggestions provided by Phase 1 contractor. Any hardware or software (IBP) required for such communication at individual station level shall be made available by respective contractors. Also if any testing is required at stations of Phase 2 for establishing communication with OCC SCADA. The same shall be carried out by respective contractors. Please confirm.	Bid conditions prevail. Confirmed.
297	Part 2 & Section V1-B3	1.1.4	6 of 59	Phase 2 Contractor(s) shall provide full supports to Phase 1 Contractor to enable Phase 1 Contractor to commission the OCC/BCC SCADA system.	Please confirm Phase 2 TVE data for integration by Phase 1 contractor shall be available in MODBUS TCP/IP format for interface in the OCC/BCC.	Bid conditions prevail. It is part of coordination with phase 2 contractors during design stage.
298	Part 2 & Section V1-B3	1.1.5	6 of 59	The Phase 1 contractor shall also provide MMS in OCC / BCC. Phase 2 Contractor(s) shall co-ordinate & provide all necessary data & information to Phase 1 Contractor.	Please confirm if there is any requiement for specfic software with server other then SCADA software at OCC for MMS.	Bid conditions prevail. Contractor shall provide all software to meet requirements in Chapter 9.
299	Part 2 & Section V1-B3	5.7	21 of 59	The equipment shall derive its required power from the source provided by the Contractor at stations and OCC/BCC.	UPS Power supply for all BMS equipement to provide by other system wide contractor. Please confirm.	Bid conditions prevail. Please refer Appendix 19 of Part 2, Section VI-A

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
300	Part 2 & Section V1-B3	5.23.1	39 of 59	For maintenance purpose, 2 notebook computers shall be provided.	Please confirm if 2 notebook is required for whole Lot.	Bid conditions prevail. Confirmed, 2 (two) notebooks are required for this contract.
301	Part 2 & Section V1-B3	6.3.2	44 of 59	The Contractor shall determine the necessary inter processor links and data transfer protocols.	Please confirm data interface with other contractors shall be over Modbus TCP/IP.	Bid conditions prevail. It is part of coordination with phase 2 contractors
302	Part 2 & Section V1-B3	7.1	48 of 59	Civil Works	Sealing of wall opening shall be in the scope of Civil contractor. Please confirm.	Bid conditions prevail
303	Part 2 & Section V1-B4	3.3.2.19.iv	35 of 68	Screened Signal and Control Cables	For SCADA system 2.5 sqmm conductor cable for termination & maintenance shall be difficult. Please confirm if 1.5sqmm conductor size cable for SCADA can be considered.	Bid conditions prevail.
304	Part 2 & Section V1-B4	5.3.2.xi	49 of 68	Local Motor Control Panel (LMCP)	For motors with VFD, any control of open/close from panel shall not be required since the function shall be available in VFD. Please confirm.	Bid conditions prevail
305	Part 2 & Section V1-B4	7	57 of 68	Variable Speed Drives	We understand that THD calculation will be in scope of contractor. Any other filter/equipments are not consider for THD monitoring, control & improvement. Please clarify.	Bid conditions prevail. Please refer to clause 7.2 of Part 2 Section VI-B4.
306	Part 2 & Section V1-B4	9.2.iii	67 of 68	All circuit protective conductors shall be of high conductivity hard drawn copper / GI.	Please confirm if GI earthing is required for all equipments.	Refer Addendum No.3, serial no.17
307	Interface Drawings	GCC-TVE-P00-0001-041_A0 TVE Scada-Model	1 of 1	Tunnel Ventilation and Environmental Control System SCADA Drawing	At station level, 1 TVE SCADA Server & 1 TVE SCADA Workstation is required at SCR to monitor & control the equipments under this contract. Please confirm.	Bid conditions prevail.
308	Interface Drawings	GCC-TVE-P00-0001-041_A0 TVE Scada-Model	1 of 1	Tunnel Ventilation and Environmental Control System SCADA Drawing	At OCC/BCC Only 2 SCADA Server, 2 Scada Workstation, 1 Maintenance Management Server with 1 workstation and 1 IBP is to be considered as per referred drawing. Please confirm.	Bid conditions prevail.
309	Interface Drawings	GCC-TVE-P00-0001-041_A0 TVE Scada-Model	1 of 1	Tunnel Ventilation and Environmental Control System SCADA Drawing	We understand that M&E SCADA is not part of TVE SCADA works of this contract. Kindly confirm.	Bid conditions prevail. Confirmed.
310	Interface Drawings	GCC-TVE-P00-0001-041_A0 TVE Scada-Model	1 of 1	Tunnel Ventilation and Environmental Control System SCADA Drawing	RTUs are not shown in the drawing. We understand that these are not required as station level SCADA equipment can easily communicate directly with OCC SCADA equipment through FOTS backbone. Kindly Confirm	Bid Conditions Prevail. (Please refer Part-2, Section VI-B3)

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
311	PART-4 & SECTION-XI	GCC-TVE-P00-0001-022_A0	1 of 2	Typical Air Flow Schematic for ECS	We understand that in case of fire and during smoke extraction, make up air shall be provided from either of 2 ways detailed below:- (1) Providing Motorized Fire Damper in wall to operate during smoke extraction of respective room under fire and draw make up air from corridor/public area. or (2) Provide common Fresh Air Fan and ducting for all rooms (provided with smoke extraction system) wherein fan selection shall be based on single largest room size. COnsidering fire in 1 room at a time. Please confirm as the same shall have heavy impact in cost estimation.	Smoke cleansing system shall be used after <i>incident of fire to cleanse</i> the smoke from rooms. Every room shall be provided with normally closed fire dampers. Fresh air is required in the rooms for air airconditioning purpose, not for make up in case of fire.
312	PART-4 & SECTION-XI	GCC-TVE-P00-0001-022_A0	1 of 2	Typical Air Flow Schematic for ECS	Quantity of Fresh air fans for AHU shall be finalized as per the actual requirement irrespective of quantity of fans as mentioned in drawings. Please confirm.	Bid Conditions Prevail (One Fresh air fan required for each AHU)
313	PART-2 & SECTION-VI B1	ECS -6.2.15	116 of 145	Noise Criteria - Sound Attenuators for Emergency Fans like SEF & SPF	Please confirm if the Sound Attenuators are required for SEF & SPF.	Bid Conditions prevail. (Please refer Clause 6.2.15 Part 2 Section VI-B1)
314	PART-2 & SECTION-VI B1	ECS -2.3 & 6.2.1.2	12 & 33 of 145	Design parameters -Table	We understand that the heat load calculations shall be based on outside ambient air conditions referred in table under clause 6.2.1.2. Accordingly equipments shall be selected for achieving desired inside conditions based on referred outside conditions. Please confirm the requirement.	Bid conditions prevail. Confirmed.
315	PART-2 & SECTION-VI B1	ECS - 6.2.15.3.11	122 of 145	Acoustic Lining/ Treatment of Equipment Rooms:	As per the referred clause, acoustic treatment of the respective rooms is required. However, there is no BOQ head wherein cost of acoustic lining could be quoted. Please confirm the requirement and incorporate cost head for acoustic lining in BOQ since the same is substantial amount.	Refer Addendum 3, serial no.18
316	PART-2 & SECTION-VI B2	TVS-6.2.3	48 of 104	Technical and Installation Requirements	Please confirm whether UPSAF Fans are Fire Rated for 250 Deg C @ 2 Hrs. or Non Fire Rated.	Bid conditions prevail. Non Fire Rated.
317	PART-2 & SECTION-VI B1	ECS -6.2.1.2	32 OF 145	Design parameters -Table 6.1	We understand given loads are combined lighting and equipment's for BCC, BCC CER, BCC IMR, BCC Security, BCC NMS & BCC AFC CCU.Please confirm.	Bid conditions prevail. Confirmed.
318	PART-4 & SECTION-XI			As per drawing no.- UGC05-ARP-SBA-1300-001-A3-P	Some rooms near BCC rooms have no details. Please confirm whether these rooms are to be air conditioned or to be ventilated or no services required.	Refer Addendum 3, serial no.14

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
319	PART-2 & SECTION-VI B1	ECS -6.2.1.2	36 OF 145	Design parameters -Table 6.1	Requirement of Air Conditioning on 24x7 basis in rooms are not required as per our understanding. The same is unnecessary and increasing the capacity of Air Cooled Chillers. Please confirm the requirements.	Bid conditions prevail.
320	PART-2 & SECTION-VI B1	ECS -6.2.1.2	33 & 37 OF 145	Design parameters -Table 6.1	Contradiction in inside design conditions for Table 6.1 Sr. No. 25, 26, 27, 28 & 29 with respect to inside design conditions mentoned in Table on Page No. 33 of 145. Please confirm.	Refer Addendum 3, serial no.14
321	PART-2 & SECTION-VI B4	LOT-2 CI B.3.3.2.7	25 of 65	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. In 5% we have considered 2% from transformer to our MCC incomer. Kindly confirm	Refer Addendum 3, serial no.19
322	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.1.(n)	3 of 65	Spare feeder	As per the technical specification, 25% spare space is required in LV Panels. There is no mention of spare feeder as per specification. Whether to consider spare feeders or not. Kindly clarify and if yes kindly mention the percentage of spare feeders to be considered.	Bid conditions prevail.
323	PART-2 & SECTION-VI B4	LOT-2 CI B.9.2	64 of 65	Earthing material	As per the technical specification both Copper and GI earthing strip has been provided. Can we use GI earthing. Kindly confirm.	Refer Addendum No.3, serial no.17
324	PART-2 & SECTION-VI B4	LOT-2 CI B.2.3.3 (q)	5 of 65	MCCB arrangement	As per sspecification 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	Refer Addendum no.3, serial no.6
325		1080137- Emergency Operation For Siding Tracks at BKC		1 Ventilation Scenario 2	Bidder presumes The fans/Dampers on the RHS of the station are that of BKC station and not of a separate Mid-vent tunnel.	Bid conditions prevail. Confirmed. Also refer BKC drawings as per Addendum 3, serial no.13
326		FPI-UGC06-SK- SC1-3210-001 UGC06-ARP- SSR-4209-004- K-D		1 Subway for CSIA Domestic and Sahar Road	Bidder presumes that Subways for CSIA Domestic and Sahar Road needs no HVAC provision.Kindly confirm.	Bid conditions prevail. HVAC shall be provided for subways.

S. No.	PART & SECTION REFERENCE	Clause REFERENCE	PAGE NO	Clause DESCRIPTION	CLARIFICATIONS SOUGHT	MMRC RESPONSE
327		All Dwg Mid-Vent Shaft	6 of 6	TVS fan for Mid-vent shaft	Bidder requires confirmation that no TV fans,TV Dampers,TV sound attenuators needs to be considered for Mid-vent shaft.	<p>Bid conditions prevail Refer Clause 5.5 of VI- B2. Also refer serial no. 10 of Addendum 3.</p>