Design, Manufacture, Supply, Installation, Testing and Commissioning of E&M works comprising of Electrical Sub Stations with HT and LT works, Ventilation and Air Conditioning Systems (VAC), Fire Detection Systems, Fire Suppression (Fire Fighting) Systems, Building Management System (BMS), EOT cranes, Air-Compressors including compressed air piping works and Plumbing Pumps for the Depot Buildings including OCC and at grade Aarey Station for "Mumbai Metro Line -3"

CONTRACT NO: MM 3-CBS-DEM-R

Pre Bid Queries

Sr. No.	Volume	Page No	Clause No	Tender Deccription	Query	Response
1					Please provide all drawings in Autocad format	The drawings in AUTOCAD format as available shall be provided after award of contract. Tender conditions prevail.
2					Please provide make list	Please refer Volume-3- Employer's Requirement, General Specification- Appendix - 28
3	Volume 1	8 of 151	Annexure-4	Minimum mandatory spares for DLP	We will be considering only single make for each rating of Switchgear or other items listed in Spares list. Please confirm	Spare parts shall be of same make which has been installed. Tender conditions prevail.
4	Volume 1	8 of 138	Detailed Design Consultant as Specialist Sub contractor for Design		We kindly request you to consider 1 depot and 1 metro station as a experience of detailed design consultant.	Tender conditions prevail.
5					We understand that disclosure of DDC and their name shall be proposed after award of job. Please confirm?	DDC name, Credential, etc.are to be submitted along with tender for evaluation as per eligibility criteria. Tender conditions prevail.
6	Volume 1	8 of 138	Detailed Design Consultant as Specialist Sub contractor for Design		Looking at the volumn of this job, we request you to kindly accept detailed design in our inhouse facility and same shall be reviewed by DDC. In that case DDC will not do any design however DDC will be fully responsible for complete design verification. Kindly accept and confirm.	Please refer Addendum 1 Sl No. 4.
7	Volume 1	8 of 138	Detailed Design Consultant as Specialist Sub contractor for Design		Few DDC consultants are working on some of the packages of Mumbai Metro. Can we deput same team for this package? Kinldy confirm.	There is no objection in engaging same DDC provided they meet the eligibility criteria. Tender conditions prevail.
8	Volume 4	72-79	Spare List for FAS and BMS system		Please confirm the BOQ line item wherein we can include the cost for spare list.	Rates in BOQ are inclusive of cost for all spares as per the lists in the Employer's Requirement.
9	Volume 1	1, 2 of 10	NIT / 1.1.2	Date & Submission of Tender is on 23.05.2018 upto 1800Hrs	Kindly extend bid submission date to 22.06.2018 upto 1800Hrs	Please refer Addendum 1 Sl No.1
10	Volume1	5 of 12	1.1.3.2 Minimum Eligibility Criteria	(vi) Detailed Design Consultant as Specialist Sub contractor for Design	This being BOQ based percentage rate tender; equipment / material rating, quantities etc are already designed and fixed. Hence, bidders scope shall be limited to Design Validation, Detail Engineering, Manufacture, supply, installation, testing and commissioning only. In view of this DDC (if required) scope shall be limited to design validation only.	Tender conditions prevail.
11	Volume 1	5 of 12	1.1.3.2 Minimum Eligibility Criteria	(vi) Detailed Design Consultant as Specialist Sub contractor for Design	Kindly confirm that if the bidder satisfies eligibility criteria for DDC, bidder can propose themselves as a DDC / Specialist contractor for Design.	Please refer Addendum 1 Sl No. 4
12	Volume 1	5 of 12	1.1.3.2 Minimum Eligibility Criteria	(vi) Detailed Design Consultant as Specialist Sub contractor for Design	There is a huge price implication to hire a DDC and there is no provision in the BOQ to quote for the cost of employing DDC. Cost for the same may not have been included in your estimate also.	BOQ rates are inclusive of DDC cost. Tender conditions prevail.
13	Volume 4	15 of 151	1.26. b. MAINTENANCE DURING DEFECTS LIABILITY PERIOD	Maintenance during Defects Liability Period : Contractor shall establish an office for the purpose with communication facility so as to facilitate communication for reporting failures and liaison with maintenance staff manning the stations round the clock.	Kindly confirm whether Space, Electricity & Water for office establishment in the station shall be provided by MMRCL.	The space shall be provided subject to availability as per Volume-3 - Employer's Requirement,General Specification, Clause no 17.7.1. For Electricity & Water please refer GCC Clause 4.18. Tender conditions prevail.
14	Volume I	4 of 12	Clause 1.1.3.2- Minimum Eligibilty criteria		We request you to kindly consider value of successfully completed portion of any ongoing work upto last date of submission for qaulification for work experience criteria	Tender conditions prevail.
15	Volume 1 of 6, Section-1	4 of 138	NIT		Revenue operation date: As per NIT Revenue operation date is 30 June 2021 and completion period of the work is 22 months (Including Monsoon Period). We presume completion of the work/handing over is not linked with revenue operation date. Please confirm.	Tender conditions prevail.

16	Volume 1 of 6, Section-1	4 of 138	Cl No-1.1.3.2 A. (iv)		Minimum Eligibility Criteria:: Design experience for the “Similar work(s)” referred by the Tenderers can be either part of scope of Similar work(s) itself or **client had given design for such work** or Bidder had engaged DDC separately for such work with the prior approval of the owner of the project. (Proof of Design experience is required to be submitted for all the works referred by the Bidder). As per above clause for Design Experience "client had given design for such work" can be considered. We presume experience of projects where BOQ is provided by client (considering design by client) with design validation in bidder's scope shall be acceptable. Please confirm. Also in this case please confirm what documents to be submitted as a proof of "Design by client".	Please refer Addendum 1 Sl No. 3
17				Type of Contract	Whether this project is design build Contract or a BOQ quantity based Contract. If it is design build contract then the Technical Specification and Quantity variation clause in the tender may contradict with current BOQ. Kindly clarify	It is a BOQ contract based on Preliminiary design (i.e.Part Design and Build Contract). DDC(s)will do detail Designing. Tender conditions Prevail.
18			Clause 1.1.3.1, (viii) (b)	"A non-Indian firm is permitted to tender only in a JV / consortium arrangement with any other Indian firm having minimum participation interest of 26% or their wholly owned Indian subsidiary registered in India under Companies Act- 1956/2013 with minimum 26% participation"	Our understanding on this clause - If non-indian firm participates in bid and executes the work with 100% Indian Subsidiary then QR credentials of only non-Indian parent firm shall be evaluated. Kindly confirm.	A non Indian firm has to form a JV / Consortium either with Indian subsidary or an Indian Firm having minimum participation of 26%. Please refer note "e" of Clause 1.1.3.2 Minium Eligibility Criteria, Vol 1. Tender conditions prevail.
19			Clause 1.1.3.2, B (iii) & (iv)	"Partners having less than 26% participation will be termed as non-substantial partner and will not be considered for evaluation which means that their financial soundness and work experience shall not be considered for evaluation of JV / Consortium"	This clause stands ambiguous with financial requirement if liquidity, Net worth, Turnover as it is mentioned that these clauses will be evaluated based on percentage participation of each member. If the partners are non-substantial will participation of less than 26%, then will their financial soundness be evaluated. Kindly Clarify.	Tender conditions prevail.
20			Clause 1.1.3.2, B (ii)	"Profit before Tax shall be Positive in at least 2 (two) year, out of the last five audited financial years"	Kindly mention the financial years	Tender conditions prevail.
21			Clause 1.1.3.2, B (iii)	"Net Worth of tenderer during last audited financial year shall be >Rs. 7.00 Crores"	"Net Worth of tenderer during last audited financial year shall be >Rs. 1% of the contract value"	Tender conditions prevail.
22			Clause 1.1.2	"Key Details: Completion period : 22 months (Including Monsoon Period)"	"Key Details: Completion period : 24 months (excluding Monsoon Period)"	Tender conditions prevail.
23			Clause 1.1.3.2; A	Work Experience in completed projects	If participated in JV then all JV partners have to meet technical QR of completed projects cumulatively or have to meet proportionately in the ratio of JV participation	Please refer note "e" of Clause 1.1.3.2 Minium Eligibility Criteria, Vol 1. Tender conditions prevail.
24			As mentioned in letter		Also,if the project is entirely based on design build basis, then our design team will need to work out the BOQ quantities for which the time left is insufficient. We hereby request you to kindly provide us sufficient time upto 15th July 2018 to work on the same and submit our best proposal for this reputed project.	Please refer Addendum No 1, Sl No 1
25	Volume 1	6 of 12	Volume 1 of 6	Liquidity	If the Banking reference letter more than 3 months old as on date of tender submission, If letter is valid it should be considered. Please Confirm.	Tender conditions prevail.
26	Volume 1	6 of 12	Volume 1 of 6	In case of JV	In case of JV either of the member can satisfy the Conditions. Please Confirm.	Tender conditions prevail.
27	Volume 1	7 of 12	Volume 1 of 6	Profitability	In case of JV, Profitability shall be calculated as per participation ration between members.	Tender conditions prevail.
28	Volume 2	8 of 62	2.3	Permits, Licenses or Approvals	With regards to payments for acquiring permits, approvals & license. It is proposed that, the employer shall be responsible to making payments towards permits, approvals & license wherever required, and the contractor shall provide due assistance in this respect. Please Confirm.	Tender conditions prevail.
29	Volume 2	10 of 62	4.2	4.2 Performance Security	In case, if execution time of the Contract gets extended, for the reasons not attributable to contractor and EOT approval letter issued by the employer to the contractor to extend the actual completion date, in that case all expenses / charges with respect to extension of Bank Guarantee, shall be borne by the employer only. Also the escalation and overrun cost incurred due to above reason shall be borne by employer only. Please confirm.	Tender conditions prevail.

30	Volume 2	14 of 62	4.5	Sub Contractor	As per condition it is mentioned that contractor shall not subcontract the whole of the works, but how much value / percentage of work can be sub contracted is not clarified. Please Confirm.	Please refer C 11.2 of Section 2 - ITT Vol 1 Tender conditions prevail.
31	Volume 2	20 of 62	4.25	Access Road and Way Leaves	We understand that this clause is applicable for Civil Contractor. Please confirm	Tender conditions prevail.
32	Volume 2	35 of 62	8.4	Extension of Time	In case of extension of time is granted by the employer and letter issued by the employer to the contractor to extend the actual completion date in that case all expenses / charges with respect to extension of Bank Guarantee, shall be borne by the employer only. Also the escalation and overrun cost incurred due to above reason shall be borne by employer only. Please confirm.	Tender conditions prevail.
33	Volume 2	36 of 62	8.5	Liquidated damage for Delay	LD to be imposed in case last key date delayed subject to EOT and not for intermediate key date. Please Confirm.	Refer Addendum 1, Sl No 12
34	Volume 2	38 of 62	9.2	Taking over Parts of the work	After issuance of Parts of the Taking over certificate by employer, insurance policy shall be reduced accordingly and after ROD Theft , damage and security shall not be covered by the contractor.	Tender conditions prevail.
35	Volume 2	39 of 62	10.9	Performance Certificate	Performance certificate shall be issued to the contractor upon completion of Defect Liability Period. If not issued by Employer ,the reason must be provided by the Employer 90 Days in advance so as to take necessary action Please confirm	Tender conditions prevail.
36	Volume 2	39 of 62	10.9	Performance Certificate	Part performance certificate to be issued in case of part DLP completion and proportionate PBG to release in part. Please confirm.	Tender conditions prevail.
37	Volume 2	40 of 62	11.2	Mobilization Advance	This referred clause states that 5% Mobilisation advance shall be paid to contractor in two installment as stated in SCC also. Mobilisation advance shall be paid to the contractor in ONE instalment against equal amount of Advance bank Guarantee. We request to give 10% mobilisation advance. Please confirm	Refer Addendum 1 Sl No 9
38	Volume 2	41 of 62	11.2.4	Recovery of Advances	Mobilisation advance shall be recovered from the contractor till the 100% contract value of contract proportionally till revised completion date as per EOT	Please refer GCC 11.2.4. Tender conditions prevail.
39	Volume 2	42 of 62	11.4	Application for Interim Certificates	Milestone achievement mentioned in cost center must be recorded for supply, installation, testing ,commissioning on running basis within limits of 7 days from the date of verbal or written intimation or else statement by contractor shall be accepted or certified. Pls confirm	Tender conditions prevail.
40	Volume 2	42 of 62	11.4	Application for Interim Certificates	The contractor shall submit more than one IPC and payment in a month. Pls confirm	Tender conditions prevail.
41	Volume 2	3 of 17	10 Sub Clause 4.5.2	Sub Contractor	Value of the sub contractor should be 50 million as there are n numbers of sub-contractors/ Suppliers. Accordingly the value should also be increased to 50 millions instead of 5 millions to obtain notice of no objection from Employer. Please amend this clause	Refer Addendum 1 Sl No. 6
42	Volume 2	5 of 17	16 Sub Clause 4.27	Security of Site	Security personnel, General Lighting for site work, electricity, water shall be provided by Civil Contractor. Please confirm	Tender conditions prevail.
43	Volume 2	7 of 17	19 Sub Clause 5.3.2	Delayed drawing or Instructions	Clause 5.3.2 (b) shall be applicable. Please confirm	Tender conditions prevail.
44	Volume 2	8 of 17	22 Sub Clause 7.8	Ownership of Plant & materials	Safe custody Bank Guarantee shall not be provided by Contractor only indenture bond shall be provided upto taking over certificate/ROD/Commercial uses whichever is earlier. Please confirm	Refer Addendum 1 Sl No 7
45	Volume 2	8 of 17	24 Sub Clause 9.1	Taking over certificate	Performance Bank Guarantee shall be released by the employer after issuance of Taking Over certificate proportionately. Also insurance policy shall be reduced accordingly after ROD. Theft, damage and security not covered by the contractor.	Tender conditions prevail.
46	Volume 2	8 of 17	25 Sub Clause 10	Defect Liability Period	DLP of complete system shall be commenced from the date of issuance of taking over certificate/Part taking over certificate / ROD / Commercial usage of system whichever is earlier. Please confirm Penalty to be imposed in case of complete system failure only for reason entirely attributed to the contractor . Please confirm	Tender conditions prevail.
47	Volume 2	10 of 17	28 Sub Clause 11.2.1	Mobilization Advance	10% advance to be paid in Single instalment immediately against submission of Advance Bank Guarantee of 100% from a commercial bank. Additional 5% payment is acceptable towards KD achievement of detailed design and submission without submission of Advance Bank Guarantee. Please confirm	Please refer Addendum 1, Sl No 9 .
48	Volume 2	10 of 17	31 Sub Clause 11.2.5	Interest in case of delay in repayment of advances	In case of Extension of time is available advance recovery to be extended without any interest. Please confirm	Tender conditions prevail.
49	Volume 2	11 of 17	35 Sub Clause 12.2	Contractrator's Variation	Any part of the work shall not be omitted or reduced by the Employer. Please confirm	Tender conditions prevail.

50	Volume 2	15 of 17	49 Additional Clause	Stage of Payment	Payment terms should be amend as:- (1)5% payment shall be release on submission of Design. (2) 55% Payment shall be released on submission of Deszpatch Documents. (3) 30% Payment Shall be released against supply of Material. (4) 5% Payment shall be released against Completion of Installation. (5) 5% Payment shall be released against Testing and Commissioning of material at site.	Refer Addendum 1 Sl No 11
51	Volume 2	16 of 17	54 Additional Clause	Nuisance	Contractor shall not be responsible for any unhygienic condition created by other system wide contractor.	Tender conditions prevail.
52					Scope of SEM, WOD to be clarified.	Tender conditions prevail.
53					All input data for design work at any stage to be provided to system contractor at time to time.	Tender conditions prevail.
54					If any changes in area of station & rooms then its considered as a variation. Please confirm.	Tender conditions prevail.
55					If scheme will be changed from the contract tender document at the time of detailed design then it will be considered variation. Please confirm.	Tender conditions prevail.
56					Please confirm given budgeted amount in tender document is inclusive of 12% GST or 18% GST.	BOQ rates are inclusive of all prevailing taxes including GST. Tender conditions prevail.
58	Volume 1	6 of 39	APPENDIX-1A - SCHEDULE OF KEY DATES	*LD shall be levied @ 0.5% of Contract value for per week delay	There are in total 23 Key dates given in Appendix - 1A. We request that the LD levied against any specific key date shall be paid back / reiumbursed to the contractor once the milestone is complete without affecting overall completion date i.e. 22 months.	Please refer Addendum 1, Sl No 12
59	Volume 2	10 of 17	28	Mobilisation advance	Kindly consider 10% advance against 5% mentioned in clause no. 28	Please refer Addendum 1, Sl No 9
60	Volume 2	15-16 of 17	49	Stage payment	As per stage payments given in the tender contractor will be paid only 80% of CV after physical completion of work. Remaining 20% i.e for Commissioning 15% (which is dependent on other agencies such as for integrated testing etc.) and cash retention 5% of CV shall be paid thereafter. In view of above we request you to accept following stage payment terms which are less onerous: A. 10 % Mobilisation advance. B. 75% against supply. C. 10% against installation & D. 5% against testing, commissioning & handover.	Please refer Addendum 1, Sl No 11
61	Volume 2	10 of 17	27	Sub Clause 11.1.3 Price Variation Prices quoted by the tenderer shall be fixed throughout the Tenderers performance of the contract and not subject to variation of any account except where specifically mentioned in the contract conditions along with the price variations formula to be made applicable.	As contract completion period is 22 months and commodity prices are very volatile, we request you to insert / introduce a price variation clause based on indices. This shall enable the bidder to bid aggressively and shall be just and beneficial to employer and contractor as well.	Please refer Addendum 1, Sl No 8
62	Volume 2	13 of 17	43	Additional Clause Retention Money Retention money equal to 6 percent of the amount due to the Contractor from each on account payment will be retained, so as to maintain a reserve in the hands of the Employer equal to 5 percent of the Contract Price. The Retention money shall be held by the Employer without obligation to invest them or account for interest thereon or to place them in a designated account. No interest of whatsoever nature and type will be payable by the Employer in respect of Retention monies. 50% of the Retention money shall become due to the Contractor on issue of the Taking Over Certificate of works in respective sections / corridors. The balance 50% of the retention money shall be released after the completion of Defects Liability period and issue of Performance Certificate by the Engineer.	As the contractor shall be submitting PBG of 10% of Contract price valid till the end of DLP, we request that there shall be no cash retention form RA bills. In case the above request is not acceptable we request that the contractor be allowed to submit a retention BG at the onset of the project in lieu of cash retention.	Please refer Addendum 1, Sl No 10
63	Volume 4	6 of 39	APPENDIX-1A - SCHEDULE OF KEY DATES	*LD shall be levied @ 0.5% of Contract value for per week delay	There are in total 23 Key dates given in Appendix - 1A. We request that the LD levied against any specific key date shall be paid back / reiumbursed to the contractor once the milestone is complete without affecting overall completion date i.e. 22 months.	Please refer Addendum 1, Sl No 12

64	Volume-2-Conditions of Contract & Contract Forms Section V – SCC	86 of 120			Price Variation : As prices for materials are varying - increasing , we request you to accept Price variation clause for material and labour. Please confirm.	Please refer Addendum 1, Sl No 8
65	Volume 6-Part-B DEP-LT	57 of 273	BOQ No. E05- INDOOR LIGHTING AND FANS Item No. 1.3	Supply, installation, testing and commissioning of 4', 28 W LED luminaire or superior as per approved make list. Luminaire should be suitable for surface mounting / suspended made of extruded aluminium housing and CRCA front frame. High efficiency covered luminiaire with opal diffuser. With minimum lumen output of 3250 lumens and efficacy > 60 Lm/W and CCT of 4000 K. Electronic driver should have a PF> 0.9 and THD < 25 %.	1) Please confirm type of Protection IP 54 or IP 20.	Please refer Addendum 1, Sl No 21
66	Volume 6-Part-B DEP-LT	55 of 273	BOQ No. E05	INDOOR LIGHTING AND FANS	All the fixtures we need to quote as per Lumens output or Lm/watt given. As there is descrepenacy in few item. Kindly clarify.	Part of detailed design and shall meet the area wise lux level requirements. Complaince shall be as per Volume-4, Technical Specifications, Section VI-B-Electrical -LT, Clause-2.14. for Light Fixture (Indoor and Outdoor area)
67	Volume 6-Part-D - STATION LT	244 of 273	E.05 - 1.01	Design, supply, installation, testing and commissioning of 4' 28 W LED luminaire similar or superior as per approved make list. Luminaire should be suitable for surface mounting/ suspended made of extruded aluminium housing and CRCA front frame. The product should be suitable for direct installation on RCC with accessories with option of being suspended. (TYPE A - PUBLIC AREA, Platform Area, ASS Room, Mesh Room, Security Room, EL UPS Room, Corridor, Store Area etc.)	Kindly provide the lumen output for this light fixture. Because that is not given for this particular item.	Part of detailed design and shall meet the area wise lux level requirements. Complaince shall be as per Volume-4, Technical Specifications, Section VI-B-Electrical -LT, Clause-2.14. for Light Fixture (Indoor and Outdoor area)
68	Volume 4	40 of 151	2.6.5 BUSBARS	Current density shall not be more than 1 amp per sq.mm	As per specification asked for current density 1A/sq.mm. generally this is applicable for Air insulated (conventional) type busduct. Because of this we need to quote for higher rating i.e. 6300A CU busduct. Which will be having very high cost implication. At he same time your provided estimates will not match with derated busduct. Please confirm.	Please refer Addendum 1, Sl No 14 The complete BUS-duct shall be complied with detailed submission as per Volume-6 Employer's Requirement, Preamble & Bill of Quantity, clause a1.4.6 serial no 6.
69	As per BOQ			33KV GIS - Type test reports.	As per the global guideline for all the OEMs that repeat type test shall not be performaed unless and until there is change in manufacturing design. So type test reports available with OEMs are old more than 5 years. Kindly accept.	Tender conditions prevail.
70	Volume 4	126 of 151	2.16.1.2 - XIII	Calibrated Day Services Tank minimum capacity of 990 litres for operation of DG sets. The tank shall be made out of 14 SWG thick MS sheets with all accessories such as oil level indicator, drain plugs, manhole and painting etc. complete as required by Indian Explosive Rules and Regulations.	Fuel tank capacities for 500, 625 & 1010 KVA are 750, 750 & 990 liters and the same shall be inbuild inside acoustic enclosure with all its standard accessories and which will be fabricated out of 2mm thick CRCA Sheet and any approval for the same not applicable hence not in our scope.Kindly Confirm?	In addition to the inbuild Fuel Tanks, External independent day Tank of 990 Ltrs per DG is under the scope of DEM-R Tender. Tender conditions prevail.
71	Volume 4	126 of 151	2.16.1.2 - XVII	Supply and fixing of hot air exhaust duct of 22 SWG GI sheet with DG canopy to remove hot air (if required).	We request you to provide DG room layout. Else length of the duct to be considered.	Please refer to Tender Architectural drawings in Volume-5 of the Tender Document
72	Volume 4	126 of 151	2.16.1.2 - B	Exhaust piping system including MS pipes, specials, bends, flanges and reducer's etc. connection to silencers and lagging the exhaust pipe as per specifications.	For 500KVA and 650 KVA DG Set we envisage standard exhaust piping of 6 meters with rockwool insulation. 50mm thick rockwool, 64kg/m3 density cladded with 24 SWG aluminium sheet. For 1010KVA we envisage 30 meter stack exhaust structure and steel. Please confirm.	BOQ rates are inclusive of all these items. Tender conditions prevail.
73	Volume 4	129 of 151	2.16.2.1 - Operating conditions	The Engine Alternator are to be installed at Aarey Depot/ Mumbai (Maharashtra) and shall be capable of working at any ambient temperature between 0oC and 50oC and relative humidity up to 100%.	The offered DG Set is designed for 40 deg ambient temprature. We would also like to bring your kind attention towards the estimated rate which you have given in tender documents which are at lower side.	Tender conditions prevail.
74				The DG et shall be suitable for continuous operation inside the acoustic enclosure under all ambient conditions up to 50 Deg c ambient temp with out any adverse effect of its performance.	The offered DG Set is designed for 40 deg ambient temprature. We would also like to bring your kind attention towards the estimated rate which you have given in tender documents which are at lower side.	Tender conditions prevail.
75				As per the CPCB guidelines the Chimney / Stack height has to be higher than the building height, therefore suitable Lightning protection system on the Exhaust pipe, duly approved by MMRC has to be provided.	Kindly clarify exhaust pipe routing weather it is passing through shaft or separate steel structure is to be considered for individual DG Set.? And also provide the building height.	It is part of detailed design submission, No objection from the Engineer and compliance to the statutory approvals shall be required. However no seperate steel structure is envisaged. Please refer to Tender Architectural drawings in Volume-5 of the Tender Document Tender conditions prevail.

76	Volume 4	129 of 151	2.16.1.3 - Approval of rating	f. The tests shall include the following minimum requirements. i. Verification of the suitability of the system, its efficiency, etc. ii. Performance testing of DG set for 8 hours. . iii. Capacity testing of the DG set. iv. Any additional testing as required as per relevant standards. v. Fuel consumption of the DG set. vi. Complete functional tests. vii. Testing of the Sound Acoustics enclosures. viii. Fault Simulation and testing of control & protection devices.	Individual Component of DG Set cannot be tested but reports for the same can be furnished. DG Set as a whole shall be tested at avaliable load.Kindly Confirm?	Testing for all rating DG testing shall be in the scope of the DEM- R Contractor as stipulated in Volume-4 Employer Requirement, Technical Specification, Section VI-B- Electrical -LT, Clause-2.16.2.12 Testing & Commissioning and in compliance to Volume-3 - Employer's Requirement, General Specification, Clause-9. Tender conditions prevail.
77	Volume 4	133 of 151	2.16.2.5 - Constructional features	1) STRUCTURE: Enclosure shall be made in modular design and can be dismantled/ assembled at site. It shall be made out of heavy gauge mild steel sections and reinforced with fabricated super structure, the supporting frame work shall be of 2.0 mm thickness. Outside covers & doors shall be fabricated in 2.0 mm thick CRCA sheet.	The offered DG set comes with Weather proof Acoustic enclosure and the same shall be fabricated out of 1.6mm thick CRCA Sheet.Kindly confirm?	Tender conditions prevail.
78	Volume 4	133 of 151	2.16.2.5 - Constructional features	6) EXHAUST OF ENGINE: The Engine Exhaust shall consist of suitable dia 'B' class M.S pipe (Insulated) along with smooth bends & supported. This pipe shall be suitably brought out at the top of enclosure with suitable arrangement at the outer end for preventing water to enter in pipe as required. The Exhaust Muffler with insertion loss of 25 dB shall be provided. For the Engine Exhaust detailed specifications as per clause 5.5. are to be complied.	DG Set comes with residential silencer. As per CPCB norms DG set upto 750 KVA shall have 75 db at 1 mtr distance in free field condition and DG set above 750 KVA shall have 25 db insertion losses.Kindly confirm?	Tender conditions prevail.
79	Volume 4	134 of 151	2.16.2.5.g. Safety systems	i. Governor The performance of the governor under load conditions shall be to Class A1 in accordance with BS 5514: Part 4 (ISO 3046).	For 500 KVA DG Set governor class is G3, for 625 KVA governor class is class G2 and for 1010 KVA governor class is A1, the same is as per ISO 3046 .Kindly confirm?	Tender conditions prevail.
80	Volume 4	Page 135 of 151	2.16.2.5.h. Engine Starting	i. The starting system shall comprise a 12/24 V heavy duty suitable capacity maintenance free high discharge lead acid battery, as required, and electric starting motor. The battery shall be sized to give not less than Ten consecutive starts of the engine at 0□C to 50□C. The starting system shall be complete with necessary relays, solenoid valves for fuel, control and indicating panels as specified and required.	The offered DG set comes with Lead acid Semi maintenance type of batteries sutiable for 3 nos. of consequtive starts. Kindly confirm?	Tender conditions prevail.
81	Volume 4	136 of 151	2.16.2.6.b. - Excitation system	i. The main exciter shall receive power from a permanent magnet generator through separate auxiliary windings on stator via Automatic Voltage regulator.	The offered Alternator is AREP Excited type. Kindly confirm.	Tender conditions prevail.
82	Volume 4	137 of 151	2.16.2.6.b. - Excitation system	iii. The excitation system and engine governor should be such that the alternator is capable of starting up induction motors having a starting kVA of not less than 1.8 times the alternator rated kVA.	Will be as per manufacturers standard. Kindly confirm.	Tender conditions prevail.
83	Volume 4	143 of 151	Enclosure details	Type: - Steel Fabricated double wall insulated panels	The same shall be fabricated out of CRCA Sheet. Kindly confirm.	CRCA sheet double wall insulated panels shall be considered on detailed submission as per Volume-6 Employer's Requirement, Preamble & Bill of Quantity, Clause a1.4.6 serial no 6. Tender conditions prevail.
84	Volume 4	138 of 151	2.16.2.9 BATTERY SYSTEM:	There shall be a 12/24V lead acid stationary battery with an AH capacity suitable for 10 (ten) cranking attempts of (10 seconds each) (suitable design to be submitted by the firm for each capacity of DG set and to be got approved from MMRC) plus all indicating lamps and alarm before the cell voltage goes down by 1.8V. Battery shall be complete with necessary angle iron stand and multi strand flexible copper leads. The battery charger in the AMF Panel shall be capable of floating the battery with quick and trickle charging facility to maintain a cell voltage of 2 Volts. The battery stand and the canopy failure should be provided with suitable safeguards against battery Acid.	The offered DG set comes with Lead acid Semi maintenance type of batteries sutiable for 3 nos. of consequtive starts and all other accessories and operations will be as per our standard.Kindly Confirm.	Tender conditions prevail.

85	Volume 4	Page 139 of 151	2.16.2.12 TESTING & COMMISSIONING:-	Each DG set shall be run for a minimum period of 30 minutes continuously on no load. On satisfactory completion of the no-load run the set shall be run for a period of 6.5 hours at 100% full load and followed by 60 minutes operation at 10% overload. All consumables including fuel, lubricating oil and load banks required for commissioning the set shall be supplied by the contractor. Test readings together with a hourly log of the running test shall be furnished.	It is very difficult to arrange such a high capacity load bank at site. So we request you to accept DG testing at factory in presence of your authorized representative. Please confirm.	Confirmed. Tender Conditions Prevail.
86	Volume 4	139 of 151	2.16.2.12 TESTING & COMMISSIONING:-	i.Performance test at site shall include (but not limited to) the following test acceptance criteria:	DG Set as a package can be tested, no individual testing of any DG set component is in our scope. Kindly confirm?	Testing for all rating DG testing shall be in the scope of the DEM- R contractor as stipulated in Volume-4 Employer Requirement, Technical Specification, Section VI-B- Electrical -LT, Clause-2.16.2.12 Testing & Commissioning and in compliance to Volume-3 - Employer's Requirement, General Specification, Clause-9. Tender conditions prevail.
87	Volume 4	144 of 151	AMF Panel	ENCLOSURE IP 54 (IEC)	The offered Enclosure will be IP 42. Kindly confirm?	Tender conditions prevail.
88	Volume 6	5 of 273	PART-A - Depot Substation & HT works - A.3 - A.1.3.1	Design, supply, installation, testing and commissioning of 33 KV, 1C per phase x 120 Sq. mm XLPE Copper cable Earthed armoured HT cable in cable trenches with cover complete as required.	Here it is mentioned that installation cost is to be considered but separate line item (A.1.3.2) for the same is also given. Kindly confirm whether we have to consider the installation cost against this item?	Please refer Addendum 1, Sl No 20 No, Installation & Laying charges shall be as per A.1.3.2.
89	Volume 6	47 of 273	E.03-2	Cable Supply and Laying (Fire Survival)	Kindly provide technical specifications for FS cables	Compliance shall be as per the code mentioned therein. Tender conditions prevail.
90	Volume 6	61 of 273	E.06-1-Street Light Poles	9.0 meter hot dipped galvanised Octagonal with single & Double overhang arm & with foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications.	Kindly confirm whether the pole is single arm or double arm?	Please refer Addendum 1, Sl No. 22
91	Volume 6	5 of 273	A.3 - A.1.3.3	Supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for cables mentioned under A.1.3.1 complete and combined as required. Cable termination shall be inner cone plug in type in accordance with EN 50181.	As per the OEMs requirement touchproof terminations are required for GIS switchgear. Kinldy provide separate line item for the same.	For all the product particulars compliance shall be in line with the Volume-3, Appendix-28, Vendor Approval Process and as per Volume-6, Preamble, clause a.1.4.6 Serial no 6. for obtaining No Objection from the Engineer. Tender conditions prevail.
92	Volume 6		E.01-M V SWITCHGEAR	General	Kindly confirm the type of protection for MCCB?	MCCB's Protection compliance shall be as per Volume-4; Technical Specification, Clause 2.1.3 - MCCBs. Tender conditions prevail.
93	Volume-6 - Part-B - DEP - VAC System	91 of 273	2	Outdoor Unit	Please clarify type of compressor for outdoor units shall be inverter or digital scroll, as BOQ mentions both.	It shall be Inverter scroll compressor.
94	Volume-6 - Part-B - DEP - VAC System	91 of 273	2	special acryl percoated heat exchanger	Heat exchangers shall be quoted with standard blue film coating. Please confirm	Tender conditions prevail.
95	Volume-6 - Part-B - DEP - VAC System	93 of 273	5	After completion of work wall and floor shall be repaired and brought to its original finish	Request you to exclude the same our scope and keep it in civil contractors scope.	Tender conditions prevail.
96	Volume-6 - Part-C : C.03 - OCC	178 of 273	1	Chiller Plant Manager	Please provide the IO Summary for Plant manager	It is part of detailed design.
97	Volume-6 - Part-C : C.03 - OCC	179 of 273	2.1	Primary chilled water pump with VFD	requesting you to clarify the scope of Harmonic distortion across VFD as source level	Please refer Clause 3.2.6 of Volume-4, Section VI-C. and Clause No 1.4 Standards, IEEE 519 Recommended Practices and Requirements for Harmonic Control in Electric Power Systems.
98	Volume-6 - Part-C : C.03 - OCC	179 of 273	1C - Cooling Tower	FRP Vertical induced draft counter flow/ Cross Flow type CTI Certified Cooling Tower	In technical specifications is mentioning only for crossflow cooling towers. Please clarify counterflow cooling towers as mentioned in BOQ are also acceptable	Bidder may consider BOQ Description.
99	Volume-6 - Part-C : C.03 - OCC	180 of 273	2.2 - Pump	Inertia base with associated civil work confirming to technical specification	We request you to keep the civil works, foundation in civil contractors scope. We shall only provide the equipment foundation details.	Tender conditions prevail.

100	Volume-6 - Part-c : C.03 - OCC	181 of 273	2.3 - Pump head	Pump head specified on the Drawings and / or Equipment Schedules are for guidance and information only and are calculated based on assumed equipment pressure drops. The exact pump head based on the pipe run and the offered equipment shall be carefully checked and re-calculated for each pump before ordering the equipment. Calculation shall be submitted for approval. No modification to the piping system shall be allowed without prior approval. Any additional cost for the modification of the system (pumps, motors, switchgears, cables, panel boards, switchboards, etc.) from that indicated in BOQ, necessary to Meet the specified duties, special conditions and the offered equipment shall be provided at no extra cost to the Employer.	This is BOQ based tender, at this stage we are quoting as per the quantities, capacities and static pressure given in the BOQ. We confirm that the all the calculations regarding static pressure shall be done during engineering stage before ordering the equipment. However any additional cost for the modification of the system (pumps, motors, switchgears, cables, panel boards, witchboards, etc.) from that indicated in BOQ, necessary to meet the specified duties, special conditions and the offered equipment shall be compensated accordingly.	Tender conditions prevail.
101	Volume-6 - Part-c : C.03 - OCC	183 of 273	1.1	Chilled water Insulation	Request you to provide the nitrile rubber insulation thickness for pipes	Please refer Addendum 1 Sl No. 23
102	Volume-6 - Part--C : C.03 - OCC	190 of 273	3	Chemical Dosing System	In BOQ it is mentioned as optional item however quantity is 1 SET. Please clarify.	Depending upon raw water quality, either water treatment plant (provided separately in BOQ) or dosing system shall be provided.
103	Volume-6 - Part-c : C.03 - OCC	193 of 273	H.04 - 1	GI Sheet metal Duct	Please accept ducting with TDF flanges	Part of detailed design. To comply with codes and standards mentioned in Volume 4, Clause No 1.4 (Standards), Clause No . 3.2.11.3.1
104	Volume-6 - Part-C : C.03 - OCC	195 of 273	4	Acoustic Lining for ducts	Please specify the thickness of Acoustic Lining for ducts	Refer Technical Specification Clause No. 3.2.20.3.8
105	VOLUME-6 - PART-C : C.03 - OCC	195 of 273	6	Aluminium Cladding	Please specify the gauge thickness of AL cladding. Also as per tender specification Exposed piping and valves insulation shall be covered with 26 gauge GI sheet cladding. Please clarify.	Aluminium cladding shall be provided as per BOQ. Thickness shall be proposed by Contractor, however minimum thickness shall be 24G.
106	Volume-4- Section VI-C- VAC	11 of 138	2.2.2 a	VAC - 2.2 Scope of Work - c. Provision of Associated Electrical power supply and distribution system including earthing from Main VAC Distribution panel to all VAC equipment including Main Distribution Panels, Motor control centre, VSD, Local control panel and smoke control panel.	Please confirm whether the same is covered in the electrical section to avoid duplication. Also requesting you to confirm the scope of electrical works for HVAC equipments. i.e. Electrical Control Panels and Electrical Cabling	DEM-R tender includes all works. Kindly refer to Scope of Work.
107	Volume-4- Section VI-C- VAC	12 of 138	2.2.6	The scope of work includes the supply of spares, special tools, and test equipments.	Please provide the list of spares to include the same.	Refer Volume 4, Section VI-B Clause 1.26.
108	Volume-4- Section VI-C- VAC	13 of 138	2.4.4 Other Works	All matters not explicitly mentioned but are necessary for the completion of the Works shall be deemed included. The Contractor shall provide all materials and fittings to perform any work	We shall include all the items provided as per BOQ and scope of work to complete the VAC system only. Any extra arising item due to changes in design, drawing shall be have techno commercial implications.	Tender conditions prevail.
109	Volume-4- Section VI-C- VAC	13 of 138	3.1.12 Fire Stopping	a Fire stopping: Unused slots, sleeves and other penetrations in floors, walls or other general construction shall be closed and sealed with a fire stopping material that has been issued Notice of no objection from Engineer.	Request you to exclude the same our scope and keep it in civil contractors scope or if in our scope we request you to add the BOQ line item.	Tender conditions prevail.
110	Volume-4- Section VI-C- VAC	19 of 138	3.1.14.2.7 First Article Inspection(FAI)	1) FAI shall be performed by the Contractor and the Employer and the ENGINEER shall attend FAI on all major equipment items or sub-systems identified by the ENGINEER including wherever the Type Testing was considered incomplete or deficient in some minor respect.	Request you to identify the all the major equipments for factory inspection will be applicable.	Tender conditions prevail.
111	Volume-4- Section VI-C- VAC	44 of 138	3.2.2.3. Technical and installation requirements - i Accessories	Each air-handling unit shall be complete with the following accessories: • Stem type thermometers at coil inlet and outlet, with thermo well. • Pressure gauge with cock at inlet & outlet of the coil, with tubing and gauge cocks. • Butterfly valves at inlet & Outlet of the coil and balancing valve at outlet of coil. • Two way motorised valve • Y type strainer	These accessories are BOQ items and hence we need not include the same in AHU price. Please confirm.	The Technical Specifications in Volume 4 and 6 to be read in conjunction with BOQ, for complete execution.
112	Volume-4- Section VI-C- VAC	52 of 138	3.2.4.3.1 (b)	Each unit shall have a rotary twin- screw compressor	Please accept chiller Single screw compressor also. Single screw compressor has a balanced compression mechanism which eliminates the screw rotor load in both radial and axial directions and results in bearing life 3-4 times greater than twin screw compressor.	Plaese refer Addendum 1, Sl No. 15.
113	Volume-4- Section VI-C- VAC	56 of 138	3.2.4.3.1 (k)	A variable speed drive shall be factory installed on the Chiller.	Please also accept water cooled screw chillers with Free standing Variable Frequency Drive	Tender conditions prevail.

114	Volume-4-Section VI-C-VAC	62 of 138	3.2.5.3 - b	The pump efficiency shall be 80% minimum.	Pump efficiency shall be as manufacturer selection standard. For Primary and Condenser water pumps > 75% and for makeup water pumps it shall be > 50%	Tender conditions prevail.
115	Volume-4-Section VI-C-VAC	66 of 138	3.2.7.3 - C	The fan assembly shall be statically and dynamically balanced.	Since fans are running at low speed, they are only statically balanced and not dynamically balanced.	Tender conditions prevail.
116	Volume-4-Section VI-C-VAC	67 of 138	3.2.7.3 - d Ladder	Handrails shall be provided along the perimeter of the cooling tower cells.	Handrails not envisaged for the proposed cooling towers as per manufacture standard.	Tender conditions prevail.
117	Volume-4-Section VI-C-VAC	67 of 138	3.2.7.3 -e	The noise emanating from the Cooling towers, Chiller plant etc. shall meet the requirements of Maharashtra Pollution Control Board.	Expected noise level from the proposed cooling tower is 85 dBA @ 1M distance,	Tender conditions prevail.
118	Volume-4-Section VI-C-VAC	93 of 138	3.2.18.3.1 Description - b	All fans with nominal rating above 7.5 kW shall have a minimum efficiency of 80%.	Fan total efficiency shall be as per the selection available & it may be less than 80%	Tender conditions prevail.
119	Volume 6		Laser-Based Absolute Smoke Detection system with single inlet aspiration detector for Up to 250 m2 (2500 sq. ft.) coverage; Wide sensitivity range - 0.025%–20% obs/m; 3 alarm levels ; High efficiency aspirator; Clean air barrier optics protection; Easy to replace dual stage filter; 3 Nos of inbuilt potential free relay outputs;supports linear pipe length of 25m or branched pipe up to 30m; supports 10 Nos of EN54 Class A sampling points, AutoLearn for automatic setup of alarm threshold, Referencing & Event log; . Approvals-UL, ULC, FM, ActivFire, VdS, CE , EN54-20. **VESDA Laser Focus Detector with display - VLF 250 (SER,TER,UPS & UPS & EM ROOM)**		Selling price for the Vesda system is mising in the . Please confirm the same.	Please refer Addendum 1 Sl No. 24
120	Volume 6		BMS SYSTEM HVAC IO LIST FOR DEPOT AND STATION BUILDING		Please confirm the IO list for HVAC system as listed below. 1) Fans (Exhaust, Tube, Axial, Propeller, Duct inline, JET fan, VAN axial, pressurixzation) 2) hiwall split unit, cassate unit FCU, AHU, VAHU, CAHU, TFA 3)Chiller,primary pump,chemical dosing system,cooling tower,condensing and makeup water tank ,PAC, scrubber, 4)MCVD, CO-2, SMFD, RMFD 5)flow switch, Level Switch, temperature and CO-2 sensor. (Please confirm any other system which need to be taken into integration with PLC)	Tender conditions prevail. IO summary works is covered under detailed design scope and shall be based on similar Metro Depot & Station Application.
121	Volume 6		BMS SYSTEM PLUMBING AND FIRE FIGHTING IO LIST FOR DEPOT AND STATION BUILDING		Please confirm the IO list for Plumbing and firefighting system as listed below. 1) Sewage pump, Overhead tank, Dewatering Pump, tranfer pump, monoblock pump, non portable water supply pump, level switch, sump pump. 2) Compressor, Jockey Pump, Main Pump.	Tender conditions prevail. IO summary works is covered under detailed design scope and shall be based on similar Metro Depot & Station Application.
122	Volume 6		BMS SYSTEM ELECTRICAL IO LIST FOR DEPOT AND STATION BUILDING		Please confirm the IO list for Electrical system as listed below. 1)ESSENTIAL HVAC PANEL INCOMER1 -250 AMP,HT panel,LT panel, power,lighting ,dg,plc based amf panel, 2) MAIN DISTRIBUTION BOARD incomer and outgoing ,feeder,acs,mccb ,metering.	Tender conditions prevail. IO summary works is covered under detailed design scope and shall be based on similar Metro Depot & Station Application.

123	Volume 6		Designing, Supplying, Installing, Testing and Commissioning of single phase, 50Hz single/double sided LED Emergency Exit Signage board coloured in green/red with built in battery backup minimum 2hrs.		Please confirm the Make list for this	Product shall be technical specification compliant and for all the product make particulars compliance shall be in line with the Volume-3, Appendix-28, Vendor Approval Process and as per Volume-6, Preamble, clause a.1.4.6 Serial no 6. for obtaining Approval from the Engineer.
124	Volume 6		General		Please share Schematic and Autocad layout for FAS, BMS and VEASD system.	Kindly refer Volume-5, Tender Drawing for further detailing. Autocad drawing shall be shared with the successful bidder.
125	Section VI – B		Fire Depo F 02 - 1.11	Design, supplying and fixing of hose cabinet fabricated from of size 900 mm x 600 mm x 450 mm made of **3 mm aluminium sheet** with 6 mm thick glazed glass doors i/c necessary locking arrangement suitable to accommodate external hydrant with butter fly valve, 2 Nos.15 mtr. Long Hose pipe, 1 No. branch pipe, mounted on wall OR raised brick platform 600mm in height built in brick masonary in cement mortat 1:5, 12mm thick plaster on all sides and finished with existing/ proposed external finish & duly painted with Post office red externally and white internally with synthetic enamel paint completein all respect, for external hydrants, as required.	Pls reconfirm MOC of cabinet. Generally it ay be MS/ SS/ FRP.	Tender conditions prevail.
126	Section VI – B		Fire Depo F 02 - 1.1 and 1.19	*** Providing, laying, jointing and testing in trenches the following sizes of G.I. class `C' (heavy class) pipes conforming to IS:3589 & IS:1239 with accessories like fittings including tees, elbows, reducers, flanges, rubber gaskets, GI nuts, bolts and washers and providing protection to embedded G.I. pipes and fittings by applying pypkote primer (@ 100 gm/sqm) thereafter wrapping 4 mm thick pypkote (AW 4 mm) protection coating by thermo fusion process. Overlap shall be maintained at 15 mm. The application process shall be strictly according to manufacturer's specification, inclusing necessary excavation trenches and refilling as required. (For under ground works) *** Providing and laying non-pressure NP2 class (light duty) R.C.C pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc.complete.	Pls provide separate line item for Excavation as the excavation line item is separate in the station BOQ. Also provide type of soil/ rock. Pls provide thickness of bed	Escavation is part of BOQ item. Sl No 3.2 is independent stand alone item in case there is need of variation in excavation. Also provide type of soil/ rock. Pls provide thickness of bed - It is part of Detail Design.
127	Section VI – B		Fire Depo F 03 - 2.3	System Indication & Control Unit (SICU) integrated panel for indicating the Health and operational status of the system, complete with ports to interface pressure switch, Audio visual Alarm unit, and output to FACP and BMS/ SCADA System including all necessary accessories.	Pls provide separate line item for Cabling	Cost of cabling works already included under F.01.
128	Section VI – D		F.02 FIRE HYDRANT SYSTEM - 1 ump	1 Design, supply, installation testing and commissioning of fire pumps, electrically driven generally as specified and shown in equipment schedule complete with:The pump heads specified on the Drawings and / or Equipment Schedules are for guidance and information only and are calculated based on assumed equipment pressure drops. The exact pump head based on the pipe run and the offered equipment shall be carefully checked and re-calculated for each pump before ordering the equipment. Calculation shall be submitted for approval. No modification to the piping system shall be allowed without prior approval. Any additional cost for the modification of the system (pumps, motors, switchgears, cables, panel boards, switchboards, etc.) necessary to meet the specified duties, special conditions and the offered equipment shall be provided at no extra cost to the Employer.	As being the item rate contract. This caluse is not applicable. Kindly clarify.	Tender conditions prevail , However will be evaluated during detail design stage, contractual conditions and as per approval of engineer.
129	Section VI – D		Fire STN F 1.3	ii) First aid hose reel with 25 mm dia, 45 m long Reinforced Rubber Lined (RRL) as per IS 12585 rubber hose, ball valve, piping and 7-8 mm nozzle as required	Pls confirm nozzle moc - SS/ GM	Plaese refer Vol4 Section VI E, Clause 3.3.2
130	Section VI – D		Fire STN F 3 - 3.3	Design, supply,fixing, testing and commisioning of Butterfly Valves PN 16,with Bronze/Gunmetal seat duly ISI marked with nuts bolts ,washers , Gaskets conforming to IS 13095 of Following size as required .	Pls confirm operation of BFV - Gear / lever operated for the size of valves above 100 mm dia.	Plaese refer addendum 1, Sl No 16
131	Section VI – D		Fire STN F 3 - 3.3.10	100 mm dia gun metal / ss Draw Out connection with foot valve for Fire Brigade.	Pls confirm moc - SS/ GM	Plaese refer addendum 1, Sl No 26

132	Section VI – D		Fire STN F 4	Providing, fixing, testing and comissioning of UL listed Pendent/Upright type sprinkler head rated at 68 degree centigrade.	Pls confirm response type - quick/ standard	Part of detailed design which shall be based on area of application and type of room occupancey.
133	General				Pls provide separate line item for Core cut, fire sealant and GI sleeves.	Cost of these works is all inclusive.
134	General				Pls confirm precedence of document- Boq, Technical specification , Dwgs	Tender conditions prevail. Please refer SCC Clause No 1.5
135	General				Please provide the approved make list.	Please refer, Volume-3- Employer's Requirement, General Specification- Appendix - 28
136	General				Please provide all drawings in Autocad format	The drawings in AUTOCAD format as available shall be provided after award of contract
137	Volume 4		2.6.5 & 2.6.2	Current density shall not be more than 1 amp per sq.mm Each busbar shall be individually insulated by means of 4 layers of glass mica and polyester insulation to give minimum class F (bus temperature 155 Deg C) insulation. IEC 61439-4 : Bus trunking systems	As per IEC 61439 Part 1 and 6 standards, the design and 3rd Party certification / calculation of Busduct system is as per Short Circuit and Temperature rise requirements.Bus bar design is based on temperature rise calculation. As per clause clause 2.6.5 : Busbars - Current density shall not be more than 1 amp per sq.mm. If busbars are designed with this current density the rating of busbar shall rise in range of 5000 A to 6400 A Above given clauses for busbar sizing are contradictory and any one of the above can prevail. Further, your estimate is based on IEC 61439. If given current density is followed the rate of busdut shall be almost double of your estimated cost. Kindly confirm.	Please refer Addendum 1 Sl No. 14
138	Volume 4		2.6.2	Current Rating : 3200 Amps 3P +100% N+ 50% integral	Vendors have clarified that the Busduct enclosure shall act as an 50% integral body earth. Kindly confirm acceptance.	Tender conditions prevail ,. Refer Clause No 2.6.4 - Current Rating
139	Volume 4		2.6.4	Temperature rise : 50ºC above 45º C ambient. Design data in support of temperature rise being within permissible limits shall be furnished along with the tender.	Temperature rise shall be as per IEC 61439 Part 1 & 6. Design data in support of the same shall be submitted. Kindly confirm.	Tender conditions prevail ,
140	Volume 4		2.6.5	Current density shall not be more than 1 amp per sq.mm Each busbar shall be individually insulated by means of 4 layers of glass mica and polyester insulation to give minimum class F (bus temperature 155 Deg C) insulation.	Layers and material of insulation varies for vendor design / product. However requirement of class F insulation shall be complied. Kindly confirm.	Please refer Addendum 1 Sl No. 14.
141	Volume 4		2.16.2.4	e. Engine Exhaust	Kindly provide the height to be considered for DG exhaust piping. Kindly provided DG location / building height / drawings for DG exhaust piping and support structure calaculation. We request for a separate item for above in the BOQ.	Please refer to Tender Architectural drawings in Volume-5 of the Tender Document.
142	Volume 4		7.1.2.10	Transformer Cubicle : The door shall be provided with a mechanical system interlock, to ensure that it is possible to open the door only when the protection circuit breakers on the HV side as well as LV side of the transformer are in 'Open' position. Transformer door shall be reverse interlocked, that is, if the Transformer door is opened, Circuit breaker (HT & LT) on either side of Transformer shall trip automatically.	OEM / vendors are unable to provide mechanical interlock. However electrical reverse interlock provision is possible. Kindly confirm.	Tender conditions prevail.
143	Volume 6		E.01 M V SWITCHGEAR	Design, supply, installation, testing & commissioning of front operated front access cubical type indoor duty floor / wall / recess/ surface mounting, totally enclosed dust and vermin proof (minimum protection IP 54) panels with neoprene gaskets, fabricated from CRCA sheet steel of thickness not less than 2mm in general and load bearing members with 2.5mm and shall be folded and braced as necessary to provide a rigid support for all components with powder coated finish (minimum thickness 50 micron) suitable for 415 volts 3 phase 4 wire 50 Hz system to withstand symmetrical fault level of 50 kA for ASS - I & ASS - II at 415 V, including interconnections, bonding to earth etc. and flush doors conforming to relevant IEC/IS (viz. IEC 61439, IS 8623 etc.) standard including the earth leakage protection complete as per specification & drawings as required and as given below. All internal wiring in the panels shall be carried out using FRLS wires.	As a standard manufacturing practice, we request you to accept all load bearing members of the panel fabricated of 2 mm CRCA sheet steel and non-load bearing members of 1.6 mm thick. Kindly confirm.	Tender conditions prevail.

144	Volume 6		E.02 DISTRIBUTION BOARDS	Supply, installation, testing & commissioning of front operated front access cubical type indoor duty dead front wall / recess/ surface mounting, totally enclosed dust and vermin proof (minimum protection IP 54) panels with foamed-in neoprene gasketted hinged doors, fabricated from 2 mm thick CRCA with powder coated finish suitable for 415 V, 3- phase, 4 wire, 50 Hz system including suitably rated insulated copper busbars, interconnections, neutral bus bar assembly, phase segregating barriers, LED indicating lamps for incoming feeders,15% spare space for future expansion, knockouts and gland plates for entry of cables and conduits, all internal wiring using high temperature range as per IS 694 FRPVC wires, independant terminals for each phase, earthing terminals and including the cost of providing Master key lock on the door and pad locking facility on door as well as at incomer, bonding to earth etc. complete as per specification, drawings as required and as under:	As a standard manufacturing practice, we request you to accept all load bearing members of the panel fabricated of 2 mm CRCA sheet steel and non-load bearing members of 1.6 mm thick. Kindly confirm.	Tender conditions prevail ,
145	Volume 6		E.03 DISTRIBUTION CABLES	BOQ Sr. No. 1 & 2	It is very difficult to calculate / count termination quantity from the available data. We request that cable termination to be paid seperately as a separate item in the BOQ. Similarly we also request for a separate item for laying cables in ground (buried) cables.	Tender conditions prevail.
146	Volume 6		E.04 CONDUIT WIRING	BOQ Sr. No. 1, 2 & 3	BOQ Sr. No. 1 is for point wiring inclusive of modular switch sockets and Industrial socket outlets. BOQ Sr. No. 2 contains huge quantity of modular switch sockets and Industrial socket outlets. BOQ Sr. No. 3 is for conduiting. We persume that BOQ Sr. No. 3 conduiting work shall be done for BOQ Sr. No. 3, but wires / cables are missing.	The BOQ Costing for conduit wiring is all inclusive.
147	Volume 6		E.04 CONDUIT WIRING - 2.4 to 2.6	……...GI enclosure with IP 56 protection rating with all mounting & fixing accessories, terminations & Cable glands for cable entry with separately lockable facility complete as required.	GI enclosure with locking arrangement is a tailor / custom made item which none of the approved makes provide. Kindly confirm whether CRCA (with locking arrangement) / Polycarbonate (without locking arrangement) enclosure can be considered instead of GI.	Tender conditions prevail.
148	Volume 6		E.10 COMPACT SANDWICH TYPE BUS DUCT	Busduct enclosure 14 SWG sheet steel clad	Requesting to accept 16 SWG sheet steel / Al. enclosure as manufactures provide enclosure as per their standard manufacturing practice.	Tender conditions prevail.
149	Volume 6		E.12 DG SET WITH PLC BASED AMF PANEL	630 KVA D.G. SET	Requesting to accept 600 / 625 KVA DG set as 630 KVA engine rating is not in product range of majority of vendors.	Please refer Addendum 1, Sl No 27 Other DG capacities are also acceptable derived after the approval of Detailed Design and Electrical Load Sheet calculations. The final DG capacity in kVA derived shall be put for No Objection of the Engineer.
150	Volume 6		3 Bus Trunking	Lighting Bus Trunking : Fault Level Withstand Capacity of 2.5 kA min for 0.1 Sec (Icw) and 9.6 kA (Ipk).	Approved OEM / vendors can provide short circuit current withstand capacity of 2 kA min for 0.1 sec (Icw) instead of 2.5 kA min for 0.1 sec (Icw) and 3kA pk instead of 9.6kA pk. Kindly confirm.	Tender conditions prevail. The approved OEM / Vendor mentioned are Indicative hence alternate OEM's / Vendors can be proposed. For techncial compliance other OEM / Vendors shall be proposed for approval process as per Appendix-28.
151				Foundation for GIS panel,Transformer, High Mast, Poles and other equipments	Kindly confirm that all major civil work like foundations, shaft / wall closing etc shall be done by civil agency and E&M contractor has to provide necessary drawings / details.	Tender conditions prevail , Please refer to Appendix-19 for Interface works and Volume-4 Employer Requirement Technical Specification Section VI-B- Electrical -LT, Clause-1.16
152				List of Makes	List of approved makes is not provided. Kindly provide.	For compliance please refer to Volume 3, Employer's Requirement, General specification , Appendix-28, Indicative list of manufactures /suppliers/makes for E&M works
153				Query & clarification	The above given queries are applicable to Part A, B, C & D and reply / clarifications shall be applicable respectively.	The above responses are applicable for all the works and complete [DEM-R] Tender.
154			Depot Fire BOQ: F.02 - 1.8	Providing & fixing Stainless steel cabinet (to enclose FB connection,draw off connection & for external hydrants) fabricated from 16 g sheet with full front glass door and locking arrangement duly painted with one coat of primer and two or more coats of synthetic enamel paint of approved make and shade and suitably mounted on a raised masonry platform as required (Approx 0.75m x 0.6m x 0.25m)	Instead of mounting the cabinet on masonary platform we propose to mount it on 4 nos MS angle (40 x 40 x 8) supports grouted in floor and duly coated.	Tender conditions prevail.

155			Depot Fire BOQ: F.02 - 1.18	Providing and laying non-pressure NP2 class (light duty) R.C.C pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc.complete. -250 mm dia. R.C.C pipe	Kindly confirm whether excavation is to be considered for laying RCC pipes or it shall be in civil scope.	Tender conditions prevail. Excavation is included in laying of RCC pipes.
156			Depot Fire BOQ: F.02 - 1.19	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all-round R.C.C pipes including bed concrete as per standard design.	Kindly confirm the thickness of concrete.	Part of detailed design.
157			Depot Fire BOQ: F.02 - 1.20.2	Providing & fixing brass quartzoid sprinklers (UL approved) of 15 mm dia size, suitable for sustaining the pressure on the seat & water hammer effect. The type & temperature rating shall be as follows :	Kindly bifurcate the quantity of sprinklers for Pendant type & Upright type.	Part of detailed design.
158			Depot Fire BOQ: F.02 - 1.21	Providing and fixing inspector's test assembly complete with test value, sight glass sectional drain valve union with corrosion resistant orifice all complete	Kindly provide the size of the valve.	Part of detailed design.
159			Depot Fire BOQ: F.02 - 1.25	Providing and fixing 200 mm & 80 mm Y TYPE strainer with bronze perforated sheet basket including rubber gasket, flanges, nuts, bolts and washers, complete as required.	Volume 4 - Clause 2.13 calls for Y Strainer with Stainless steel wire mesh. Kindly confirm	Tender conditions prevail.
160			Depot Plumbing BOQ: 7	Providing and fixing Transistorised liquid level controllers with low voltage relays and seamless steel probes and PVC shroud, including necessary wiring and conduiting from probes to display panel/motor control panels and to provide Audible Alarm for low level for each underground tank. (The cost of all required cabling from probes to motor control panels to be including in the rates).	Kindly provide the length of cable & conduit.	Part of detailed design. This is to be estimated from depot lay out and Architectural drawings.
161			Station Fire BOQ: F.02 - 1.3	iii) 63 mm synthetic synthetic hoses (UL Listed) with 63 mm instantaneous SS coupling, IS marked- 15 m x 2 lengths with suitable arrangement of connecting the hose pipe with coupling as required.	Can we consider non UL listed Synthetic hose as per IS 636 Type A instead of UL listed ?	Tender conditions prevail.
162			Volume 4 : Fire Protection System ;Clause 1.5 & 1.10	PUMP FOUNDATION: Foundation of pumps in Fire Pump rooms should be of considerable height so that these are not submerged in case of overflow.	Kindly confirm construction of Foundation for Fire & Plumbing pumps shall be in Civil scope or Contrator scope. We propose it be in civil scope. Contractor shall provide the GA drawings as per the manufacturer standard.	Please refer to Appendix-19 for Interface works and Volume-4 Employer Requirement Technical Specification Section VI-B- Electrical -LT, Clause-1.16
163			Volume 4 : Fire Protection System ;Clause 2.10	The Ball Valve shall be made from die cast brass and tested to 14 Kg/cm2 pressure. The valve shall be internally threaded to receive pipe connections. The Ball shall be made from brass and machined to perfect round shape and subsequently chrome plated. The seat of the valve body- bonnet gasket and gland packing shall be of Teflon.	The BOQ calls for Gun Metal MOC Ball valve and technical specs define Cast brass. Kindly confirm	Please refer Addendum 1, Sl No 19.
164			BOQ : Depot Fire & OCC Fire	Hydrant/ Landing valve & Hose reel drum	The BOQ does not have line item for Internal & External Landing valve & Hose Reel drum.	Tender conditions prevail.
165	Volume 6	97 of 273	BOQ Part B Depot & OCC BMS system		We request you to kindly share the IO summary for Scada estimation.	Tender conditions prevail. IO summary works is covered under detailed design scope and shall be based on similar Metro Depot & Station Application.
166	Volume 6	266 of 273	BOQ Part D Arrey Station BMS system			Tender conditions prevail. IO summary works is covered under detailed design scope and shall be based on similar Metro Depot & Station Application.
167	Volume 4 of 6,Section VI-A-Electrical -HT & Volume-6-Preamble and BOQ ,Depot Substation & HT works-A.1 - GIS	36 of 54 & 4 of 273	7.2.6.10, 7.2.6.11 , 7.5.2 & BOQ-S No-A.1		33 KV GIS : Please provide CT ratio ,CT class for protection & metering, the protections required in the relay, relay protocol.	Part of Detail Detail Design, shall be in compliance with Vol 4, Section VI A and No Objection by the Engineer.
168	Volume 4 of 6,Section VI-A-Electrical -HT & Volume-6-Preamble and BOQ ,Depot Substation & HT works-A.1 - GIS	37 of 54 & 4 of 273	7.2.6.11 & BOQ-S No-A.1		33 KV GIS : As per technical specifications PT panel and PT ratios are specified whereas .as per Volume 6 BOQ, it is not mentioned about PT Panel, Please confirm the actual requirement of PT panel.Also please confirm if the same is bus or line connected.	BOQ item description to be read in conjunction and compliance with Technical Specifications mentioned in Vol IV. Rates are all inclusive. It shall be Bus connected.

169	Volume-4 - Section VI-B-Electrical -LT, & BOQ-S No-E.03-1 Distribution Cables	46 of 151 & 45 of 273	2.8.4 & BOQ-S No-E.03-1		MV Cables: As per technical specifications including 25 sqmm MV cables are considered as copper where as per BOQ-Note-1, 25 sqmm and above cables are considered as Aluminium. Please confirm actual requirement.	Please refer Addendum 1 Sl no. 18.
170	Volume-4 - Section VI-B-Electrical -LT, & BOQ-S No-E.03-1 Distribution Cables	46 of 151 & 45 of 273	2.8.4 & BOQ-S No-E.03-1		MV Cables: As per technical specifications MV cables are mentioned as FRLSH,where as per BOQ-E03-1,All MV cables are mentioned as FRLS. Please confirm actual requirement.	Please refer Addendum 1 Sl no. 18.
171	Volume 4 of 6,Section VI-B-Electrical -LT	53 of 151	2.8.15(iii)		MV Cables-Testing: As per technical specification,Type test of each type of cable is required whichi is not feasible.We request you to accept type test certificate of similar type of cables. Please confirm.	Tender conditions prevail.
172	Vol-6-BOQ	45 of 273	BOQ-S No-E.03-1		LT Power Cable termination : Please provide termination quantity of LT power cables.	Part of Detail Detail Design and No objection by the Engineer.
173	Volume-4-Section VI-B-Electrical LT & Volume-6 BOQ	25 of 151 & 109 of 273	2.1.3 & BOQ.S.No-E.01-1(o)		MV Switchgear : As per BOQ specifications of Volume-6, 4P(4 Pole) MCCB's are provided with earth fault protection along with S/C and O/C. However for TP (3 pole) MCCB's, BOQ has not specified whether earth fault protection to be considered or not. Please confirm.	Irrespective of number of poles Earth fault protection shall be inbuilt feature of MCCB. Protection scheme shall not be negotiated for equipment and personal safety. Applicable for all parts of BOQ.
174	Volume-6 BOQ	16 of 273			MV Switchgear-Metering : We presume Digital meter (MFM) with RS-485 is not required for each out going feeder of LV Switch boards. Please confirm.	BOQ descriptions are self explanatory for Incoming and Outgoing feeders. Tender conditions prevail.
175	Volume 4 - Section VI-B-Electrical -LT & Volume 6,BOQ-E.01-MV Switchgear	35 of 151 & 13 of 273	Cn No-2.4.4 & BOQ-E.01.1(q)		Current Transformer : As per BOQ , All internal wiring to be FRLS, where as per technical specification wiring for CT shall be LSZH PVC insulated wires. Please confirm actual requirement.	Tender conditions prevail. All internal wiring to be FRLS.
176	Volume-4-Section VI-B- Electrical -LT	34 of 154	2.6.5		Busduct : As per "Vol-6-BOQ-Preamble" 3200 amps Compact Sandwich Bus Duct, Current density below 1A is not possible to provide by approved makes of **"Appendix 28-Makes"** All vendors are confirming current desity 2.6 Amps/Sqmm instead of 1 Amps/Sqmm for 3200 Amps. Please approve.	Please refer Addendum 1, Sl No 14.
177	Volume 4 of 6, Section VI-B-Electrical -LT	27 of 151	Cl No-2.2.4		Constructional Features: As per type tested design sheet thickness is 2 mm CRCA. Request to accept 2 mm CRCA for all sections.	Tender conditions prevail
178	Volume 4 of 6, Section VI-B-Electrical -LT	28 of 151 & 19 of 154	Cl No-2.2.6 & Cl No- 2.2.2		Switchboard Compartmentalization: As per technical specifications clause No. 2.2.2 Switch board configuration: The switchboards shall be provided with 15% spare space to accommodate possible future additional switchgear.where as per Clause No-2.2.6, 25% spare cubicles/space shall be provided. As per BOQ Overall Space provision shall be @ 25% for future expansion, Please clarify actual spare/space provision requirement.	Details mentioned in Volume-4, Section-VI-B, Clause-2.2.6 and Volume-6 shall prevail.
179	Volume 4 of 6, Section VI-B-Electrical -LT	20 of 154	Cl No-2.2.4		Constructional Features : As per BOQ, Number of Outgoing ACB/MCCB feeders are specified.Where as per technical specification 25% more feeders to be added,We presume BOQ quantity provided is including 25% more feeders. Please confirm.	Confirmed for now and shall be detailed under detailed design stage and put for No objection of Engineer.
180	Volume 4 of 6, Section VI-B-Electrical -LT	29 of 151	Cl No-2.2.7		Switchboard Busbars: We presume the Ambient temarature is 50 degree C. Please confirm.	Refer Addendum 1, Sl no 17.

181	Volume 4 of 6, Section VI-B-Electrical -LT	21 of 155	Cl No-2.2.7		Switchboard Busbars : As per technical specification,type tested design PVC heat srincable sleeving is not possible, we request you to please exclude it.	Tender conditions prevail.
182	Volume 6 of 6,BOQ-E.05	57 of 273	BOQ S.No-E.05-1.3		Indoor Lighting and Fans : Design, supply, installation, testing and commissioning of 4', 28 W LED luminaire or superior as per approved make list. Luminaire should be suitable for surface mounting/suspended made of extruded aluminium housing and CRCA front frame. High efficiency covered luminiaire with opal diffuser. With minimum lumen output of 3250 lumens and efficacy > 60 Lm/W and CCT of 4000 K. Electronic driver should have a PF> 0.9 and THD < 25 %. Please provide IP protection for this light fixture.	Please refer Addendum 1, Sl No 21. IP Protection compliance shall be as per Volume-4; Technical Specification Clause 2.14.5 LED lights Technical Requirement sub clause b). v.
183	Volume 6 of 6,BOQ-E.07	57 of 273	BOQ S.No-E.07-1.2		Protective Earthing system-Earth Mat : As per BOQ description of 30 mm dia copper rod is specified. Please confirm whether it is made of pure copper or MS rod coated with 250 microns of copper coating.	Material shall be made of pure copper and in compliance with Volume-4 Employer Requirement, Technical Specification, Section VI-B- Electrical -LT Clause 2.10.2 Tender conditions prevail.
184	Volume 6 of 6,BOQ-E.07	62 of 273	BOQ S.No-E.07-1.4		Protective Earthing system : Maintenance free earthing As per BOQ description of copper bonded (25mmX 3Mtr) electrode is specified. Please confirm whether it is made of pure copper or Ms rod coated with 250 micron of copper coating.	Clause Reference mentioned does not match with the query . Material shall be made of pure copper and in compliance with Volume-4 Employer's Requirement, Technical Specification, Section VI-B- Electrical -LT Clause 2.10.2.
185	Volume 3 of 6, Employers requirement-Appendix 28 (revised)-R3				Makes of Material : We propose following additional make ABB. Please approve.	Proposal for approval shall comply with Vendor Approval Procedure mentioned in Volume-3, Employer's Requirement, General Requirement; Appendix-28.
186	VOLUME-4	115 of 151	Technical Specification for UPS system	VRLA Battery System	Please confirm exact backup time of each UPS system	Please refer BOQ description. Tender conditions prevail.
187	VOLUME-4	117 of 151	Technical Specification for UPS system	Operating temperature is mentioned 45 degree	UPS is designed at 40 degrees. Please confirm.	Tender conditions prevail.
188	GENERAL			Equipment foundation	All RCC & masonary foundation and structural steel supports for equipment to be provided by civil contractor. Please confirm.	Please refer to Appendix-19 for Interface works and Volume-4 Employer's Requirement,Technical Specification Section VI-B- Electrical -LT, Clause-1.16
189	GENERAL				All opening & cutout in wall, floor & slabs & their finishes to be done by civil contractor. Please confirm.	Please refer to Appendix-19 for Interface works and Volume-4 Employer's Requirement, Technical Specification Section VI-B- Electrical -LT, Clause-1.16
190	GENERAL				Water for flushing of the system to be provided by the other system contractor. Please confirm.	Please refer to Appendix-19 for Interface works.
191	GENERAL			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.	Fire sealing of openings under E&M works are covered under DEM-R Tender scope of work.
192	Schedule of Electrical Bill Of Quantity			Supply, installation, testing & commissioning of front operated front access cubical type indoor duty floor / wall / recess/ surface mounting, totally enclosed dust and vermin proof (minimum protection IP 54) panels with neoprene gaskets, fabricated from 2 mm thick CRCA sheets with powder coated finish (minimum thickness 50 micron) suitable for 415 volts 3 phase 4 wire 50 Hz system to withstand symmetrical fault level of 65 kA for ASS - I & ASS- II at 415 V, including interconnections, bonding to earth etc. and flush doors conforming to relevant IEC/IS (viz. IEC 61439, IS 8623 etc.) standard including the earth leakage protection complete as per specification & drawings as required and as given below. All internal wiring in the panels shall be carried out using FRLS wires.	Panels shall comply IEC61349 or IS 8623 standard. Please clarify. If it is as per IS:8623,what will be form of seperation 3b or 4b.	Compliance shall be as per Volume-4, Employer's Requirement,Technical Specification, Section VI-B- Electrical -LT, Clause - 2.2 LT Panels – PCC/ MCC/ Sub Distribution Panel.

193	Volume - 4		Section VI-B- Electrical -LT	k) Protection : The true RMS sensing microprocessor based communication upgradeable numerical release with intrinsic RS 485 port for communication by open protocol shall be provided on circuit breaker for offering protection against overload (long time) with adjustable time delay, short circuit (short time) with intentional delay, earth fault protections with intentional time delay & instantaneous protection all with adjustable settings. There shall be LED / LCD display for showing the actual value percentage loading in each phase built in the trip unit. The release shall have an LED/LCD display to show RMS current in all three phases, neutral (4 pole),all energy & power parameters including Maximum demand.	In Schedule of Electrical Bill Of Quantity, RS485 Port is not asked in any ACB. Not any metering parameters asked, only LSIG protection asked in Outgoing ACB. So BOQ and specifications are not matching. Please conform actual requirement.	RS 485 port for communication by open protocol shall be provided on Air Circuit Breakers. Details mentioned in Volume-6 is also to be complied in line to the the technical specifications as mentioned in Volume-4.
194	Volume - 4		Section VI-B- Electrical -LT	q) Earth fault protection shall be inbuilt feature of MCCB. For TP MCCBs external Neutral CT shall be provided to avoid nuisance tripping due to unbalance loads.	In Schedule of Electrical Bill Of Quantity, MCCB asked only with variable overcurrent and short circuit releases. No MCCB available in market which has inbuilt feature for Earth fault protection. If Earth fault protection is required than MCCB with variable overcurrent, short circuit and Earth fault releases has to be selected. please clarify.	MCCB selection shall be done according to Volume-4 Employer's Requirement, Technical Specification, Section VI-B- Electrical -LT, Clause 2.1.3. Tender conditions prevail.
195	Schedule of Electrical Bill Of Quantity			All internal wiring to be FRLS	As per clause No. 2.4.4 of Volume 4, Section VI-B- Electrical -LT : Wiring for CT shall be copper conductor LSZH PVC insulated wires, please clarify actual requirement.	Tender conditions prevail. All internal wiring to be FRLS.
196	Volume - 4		Section VI-B- Electrical -LT	k) Switchboard panels and cubicles shall be fabricated with CRCA sheet steel of thickness not less than 2mm in general and load bearing members with 2.5mm and shall be folded and braced as necessary to provide a rigid support for all components. The doors and covers shall be fabricated from CRCA sheet steel of thickness not less than 2mm. Joints of any kind in sheet metal shall be seam welded and all welding slag ground off and welding pits wiped smooth with plumber metal.	As per type tested design sheet thickness is 2 mm CRCA. Request to accept all sheet 2 mm CRCA.	Tender conditions prevail.
197	Volume - 4		Section VI-B- Electrical -LT	k) 25% spare cubicles/ space shall be provided in all switchboards to cater for future use.	As per clause No. 2.2.2 of Volume 4, Section VI-B- Electrical -LT SWITCH BOARD CONFIGURATION : The switchboards shall be of adequate size with a provision of 15% spare space toaccommodate possible future additional switchgear. Please confirm actual requirement.	Details mentioned in Volume-4, Section-VI-B, Clause-2.2.6 and Volume-6 shall prevail.
198	Volume - 4		Section VI-B- Electrical -LT	g) The Main distribution panels and sub-main distribution panels are floor standing, meta- clad in Form 4b type with separation panels. These switchboards are designed and manufactured in accordance with IEC61439 standard with IP54 protection. All switchboards shall be 25% spare circuit breakers providing for future loads installation.	Number of Outgoing ACB/MCCB is clarified in BOQ, so please please confirm whether 25% more feeders to be added over BOQ quantities written in Switchboard BOQ.	The BOQ price is including the cost of 25% future spare requirements. The quantity of spare feeders is to be added as part of detailed design. Tender conditions prevail.
199	Volume - 4		Section VI-B- Electrical -LT	b) Bus bars shall be insulated with head shrunk PVC sleeving of 1.1KV grade and bus bar joints provided with clip-on shrouds.	As per type tested design PVC heat srincable sleeving is not possible, request to delete it.	For all the product particulars compliance shall be in line with the Volume-3, Appendix-28, Vendor Approval Process and as per Volume-6, Preamble, clause a.1.4.6 Serial no 6. for obtaining No Objection from the Engineer.
200	Volume - 4		Section VI-B- Electrical -LT	e) The switchboard shall be designed for use in high ambient temperature and humid tropical conditions as specified. Ease of inspections, cleaning and repair while maintaining continuity of operation shall be provided in the design.	Ambient temperature and limited of Temeperature rise is not defined in tender, kinldy clarify.	Compliance shall be in reference to Volume-4 Employer's Requirement, Technical Specification, Section VI-B- Electrical -LT, Clause 2.2.4 Constructional feature for (LT Panels – PCC/ MCC/ Sub Distribution Panel)
201	Schedule of Electrical Bill Of Quantity			q) The panel shall be fitted with fire trace tube system. Scheme of fire trace tube system shall be got approved by Engineer before proceeding with manufacturing and assembly.	Is fire trace tube fitting is in scope of Switchboard manufacturer or only space provision to be made by switchboard manufacturer.	Fitting of fire trace tube in switchboard is in under the scope of DEM-R tender works. This shall be got No Objection by Engineer as per Volume-6, Preamble, Clause a.1.4.6 Serial no 6.
202				BMS System	Input Output Data sheet not available for BMS System in tender documents. Kindly confirm that it is a part of design portion. If not, please provide the same.	Tender conditions prevail.

MUMBAI METRO RAIL CORPORATION LIMITED

(A JV company of Govt. of India and Govt. of Maharashtra)

5th Floor, A -Wing, Old MMRDA Building, Bandra-Kurla Complex, Bandra (E), Mumbai - 400 051.

MMRC e-Tendering portal: www.tenderwizard.com/MMRC

Website: www.mmrcl.com

Invitation of Bid For "Design, Manufacture, Supply, Installation, Testing and Commissioning of E&M works comprising of Electrical Sub Stations with HT and LT works, Ventilation and Air Conditioning Systems (VAC), Fire Detection Systems, Fire Suppression (Fire Fighting) Systems, Building Management System (BMS), EOT cranes, Air-Compressors including compressed air piping works and Plumbing Pumps for the Depot Buildings including OCC and at grade Aarey Station for Mumbai Metro Line 3"

Date:15th May 2018

Contract No: MM3-CBS-DEM-R

Addendum No: 1

Sr. No	Reference Clause no. and Description	Existing content to be deleted	To be replaced as
1	Volume1, Section 1, NIT Clause 1.1.2 Key Details, Page 1 & 2 of 12	Approximate Cost of work = INR62,20,09,291/ **Tender documents on sale**: From 09-04-2018 to 22-05-2018 (up to 18:00 Hrs) on e-tendering website www.tenderwizard.com/MMRC Tender Documents can be downloaded for reference purpose from the e-Tendering Portal www.tenderwizard.com/MMRC. Interested Tenderers have to make	**Approximate Cost of work = INR62,32,70,796/** **Tender documents on sale**: **From 09-04-2018 to 06-06-2018 (up to 18:00 Hrs)** on e-tendering website www.tenderwizard.com/MMRC Tender Documents can be downloaded for reference purpose from the e-Tendering Portal www.tenderwizard.com/MMRC**.** Interested Tenderers have to make online payment of Tender Fee using online

<table>
<tr><th>Sr. No</th><th>Reference Clause no. and Description</th><th>Existing content to be deleted</th><th>To be replaced as</th></tr>
<tr><td></td><td></td><td><table>
<tr><td></td><td>online payment of Tender Fee using online payment gateway during bid preparation through Debit Card/Credit Card/Net-Banking. Tender Fee receipt can be system generated during bid preparation by the Tenderer. For further information on this regard Tenderers are advised to contact on 01149424365</td></tr>
<tr><td>Date & time of Submission of Tender</td><td>23-05-2018 up to 1800 Hrs</td></tr>
<tr><td>Date & time of opening of Tender (Tender Security + Technical)</td><td>24-05-2018 from 1100 Hrs</td></tr>
</table></td><td><table>
<tr><td></td><td>payment gateway during bid preparation through Debit Card/Credit Card/Net-Banking. Tender Fee receipt can be system generated during bid preparation by the Tenderer. For further information on this regard Tenderers are advised to contact on 01149424365</td></tr>
<tr><td>Date & time of Submission of Tender</td><td>07-06-2018 up to 1800 Hrs</td></tr>
<tr><td>Date & time of opening of Tender (Tender Security + Technical)</td><td>08-06-2018 from 1100 Hrs</td></tr>
</table></td></tr>
<tr><td>2</td><td>Volume1, Section 1, NIT Clause 1.1.3.1 Eligible Applicants(x): Page 4 of 12</td><td>The Tenderer shall have a MOU with a Detailed Design Consultant(s) having requisite Design Experience as stipulated in Minimum Eligibility Criteria in 1.1.3.2, who on award of the Contract, shall carry out detailed design as per the scope of design in the tender documents</td><td>The Tenderer shall have a MOU with a Detailed Design Consultant(s) having requisite Design Experience as stipulated in Minimum Eligibility Criteria in 1.1.3.2(vi),who on award of the Contract, shall carry out detailed design/verification of design if the tenderer himself is having requisite Design Experience as stipulated in Minimum Eligibility Criteria in 1.1.3.2(vi).</td></tr>
</table>

Sr. No	Reference Clause no. and Description	Existing content to be deleted	To be replaced as
3	Volume1, Section 1, NIT Clause 1.1.3.2 Minimum Eligibility Criteria (A- iv): Page 5 of 12	Design experience for the "Similar work(s)" referred by the Tenderers can be either part of scope of Similar work(s) itself or client had given design for such work or Bidder had engaged DDC separately for such work with the prior approval of the owner of the project. (Proof of Design experience is required to be submitted for all the works referred by the Bidder)	Design experience for the "Similar work(s)" referred by the Tenderers can be either part of scope of Similar work(s) itself or client had given design for such work or Bidder had engaged DDC separately for such work with the prior approval of the owner of the project. (Proof of Design experience is required to be submitted for all the works referred by the Bidder **except for the works in which the client had given design).**
4	Volume1, Section 1, NIT Clause 1.1.3.2 Minimum Eligibility Criteria (A- vi): Page 5 of 12	**Detailed Design Consultant as Specialist Sub contractor for Design** The Detailed Design Consultant(s) of the Tenderer must have experience of detailed design of E & M works of 2 metro stations and one metro depot, and also 2 no. of 11 KV & above HT GIS works (Sub-Station, Distribution Works and Cables installation system) of Metro Station/ Mass Rapid Transit System/ Commercial Buildings / Official Buildings/ Railway Stations/ Airport/ Hospital buildings / Industrial establishment during the period between 1st April 2008 to 31st March 2018. The design experience of E & M Works of 2 metro stations and one metro depot together must include design of VAC and Fire Protection System Components. If the above DDC does not have the detailed design experience of 11 KV and above HT GIS works (Sub-Station, Distribution Works and Cables installation system), then the tenderer can propose another DDC having requisite experience for detailed design of 11 KV & above HT GIS works (Sub-Station, Distribution Works and Cables installation system).	**Detailed Design Consultant(DDC) as Specialist Sub contractor for Design/Verification** The Detailed Design Consultant(s) of the Tenderer must have experience of detailed design of E & M works of 2 metro stations and one metro depot, and also 2 no. of 11 KV & above HT GIS works (Sub-Station, Distribution Works and Cables installation system) of Metro Station/ Mass Rapid Transit System/ Commercial Buildings / Official Buildings/ Railway Stations/ Airport/ Hospital buildings / Industrial establishment during the period between 1st April 2008 to 31st March 2018. The design experience of E & M Works of 2 metro stations and one metro depot together must include design of VAC and Fire Protection System Components. If the above DDC does not have the detailed design experience of 11 KV and above HT GIS works (Sub-Station, Distribution Works and Cables installation system), then the tenderer can propose another DDC having requisite experience for detailed design of 11 KV & above HT GIS works (Sub-Station, Distribution Works and Cables installation system). **In case the Tenderer himself fulfils above minimum eligibility criteria then DDC(s) qualified as above shall carry out verification of Design while Tenderer himself takes over the role and responsibilities**

Sr. No	Reference Clause no. and Description	Existing content to be deleted	To be replaced as
			of DDC(s) as specified in the Tender Documents.
5	Volume-2- Conditions of Contract & Contract Forms Section V – SCC Sub- Clause. 4.2.4 Guarantees, Warranties & Undertakings Page 2 of 17(First Paragraph)	The forms of Performance Guarantee, Parent Company Undertaking, Parent Company Guarantee, Contractor's Warranty, Sub-Contractor's Warranty, Advance Payment Guarantee, Indemnity Bond **and Safe Custody Guarantee** shall be in the formats given in the Schedules 2, 3, 4, 5, 6, 7, 8 and 9 respectively to these Special Conditions of Contract. All these Guarantees and Undertakings should be submitted before signing of the contract agreement except Sub Contractor's Warranty, Advance Payment Bank Guarantee, Indemnity Bond **and Safe Custody Bank Guarantee** which will be required as per Contract Conditions. Even if not described or stated in the Employer's Requirements and the Contractor's Technical Proposals, the Contractor shall carry out and complete the design of the Works, including the selection of specifications for the kind and standard of Plant, Materials and workmanship to be used therein..	The forms of Performance Guarantee, Parent Company Undertaking, Parent Company Guarantee, Contractor's Warranty, Sub-Contractor's Warranty, Advance Payment Guarantee and Indemnity Bond shall be in the formats given in the Schedules 2, 3, 4, 5, 6 and 7 respectively to these Special Conditions of Contract. All these Guarantees and Undertakings should be submitted before signing of the contract agreement except Sub Contractor's Warranty, Advance Payment Bank Guarantee and Indemnity Bond which will be required as per Contract Conditions. Even if not described or stated in the Employer's Requirements and the Contractor's Technical Proposals, the Contractor shall carry out and complete the design of the Works, including the selection of specifications for the kind and standard of Plant, Materials and workmanship to be used therein.
6	Volume-2- Conditions of Contract & Contract Forms Section V – SCC Sub-Clause 4.5.2 Sub-Contractors Page 3 of 17(Second Paragraph)	For major sub-contracts (each costing over Rs Five Million), it will be obligatory on the part of the Contractor to obtain consent of the Engineer. The Engineer will give his consent after assessing and satisfying himself of the capability, experience and equipment resources of the sub-contractor. In case the Engineer intends to withhold his consent, he should inform the Contractor within 21 days to enable him to make alternative arrangements to fulfil his programme.	For major sub-contracts (each costing over **Rs Ten Million**), it will be obligatory on the part of the Contractor to obtain consent of the Engineer. The Engineer will give his consent after assessing and satisfying himself of the capability, experience and equipment resources of the sub-contractor. In case the Engineer intends to withhold his consent, he should inform the Contractor within 21 days to enable him to make alternative arrangements to fulfil his programme.

Sr. No	Reference Clause no. and Description	Existing content to be deleted	To be replaced as
7	Volume-2- Conditions of Contract & Contract Forms Section V – SCC Sub-Clause 7.8 Ownership of Plant and Materials Page 8 of 17	The plant, goods & material not finally taken over as per GCC Clause 9 but payment against which have been made in part or full against Indemnity Bond/ **Safe Custody Bank Guarantee** will remain under the contractor's custody. The contractor shall be responsible for its safety and will bear all the risks till taken over by the employer.	The plant, goods & material not finally taken over as per GCC Clause 9 but payment against which have been made in part or full against Indemnity Bond will remain under the Contractor's custody. The Contractor shall be responsible for its safety and will bear all the risks till taken over by the Employer.
8	Volume-2- Conditions of Contract & Contract Forms Section V SCC – Sub Clause 11.1.3 Price Variation Page 10 of 17	Prices quoted by the tenderer shall be fixed throughout the Tenderers performance of the contract and not subject to variation of any account except where specifically mentioned in the contract conditions along with the price variations formula to be made applicable.	As per Attachment 1 to Addendum 1
9	Volume-2- Conditions of Contract & Contract Forms Section V SCC – Sub Clause 11.2.1 Mobilisation Advance Page 10 of 17	Mobilisation advance shall be equal to 5% of the contract value. The advance shall be paid in two instalments of 2.5% each. In Design & Build Contracts, the second instalment will be paid after approval of Definitive design and acceptance of prototype test. In case of BOQ contracts, the second instalment will be paid after satisfactory utilization of earlier instalment for the contract after achieving the key date of detail engineering & submittal of technical proposal of major equipments. Incidentally this also forms a key date against which there is no provision of separate payment. Technical proposal of equipments is submitted after the contractor has generally firmed up the equipment & vendor. Mobilisation Advance shall be paid against acceptable Bank Guarantee of 110% of the advance taken by the contractor, from a Scheduled Commercial Bank	Mobilisation advance shall be equal to **10%** of the contract value. The advance shall be paid in two instalments of **5%** each. **The second instalment will be paid after approval of Definitive design** Mobilisation Advance shall be paid against acceptable Bank Guarantee of 110% of the advance taken by the contractor, from a Scheduled Commercial Bank (Including Scheduled Commercial Foreign Bank) in India. In case of advance, the contractor, once the 50% of advance has been recovered, shall have a onetime option to reduce the Bank Guarantee for the mobilisation advance by the amount recovered

<table>
<tr><th>Sr. No</th><th>Reference Clause no. and Description</th><th>Existing content to be deleted</th><th>To be replaced as</th></tr>
<tr><td></td><td></td><td>(Including Scheduled Commercial Foreign Bank) in India.
In case of advance, the contractor, once the 50% of advance has been recovered, shall have a onetime option to reduce the Bank Guarantee for the mobilisation advance by the amount recovered.</td><td></td></tr>
<tr><td>10</td><td>Volume-2- Conditions of Contract & Contract Forms Section V – SCC Additional Clause Retention Money Page 13 of 17</td><td>Retention money equal to 6 percent of the amount due to the Contractor from each on account payment will be retained, so as to maintain a reserve in the hands of the Employer equal to 5 percent of the Contract Price. The Retention money shall be held by the Employer without obligation to invest them or account for interest thereon or to place them in a designated account. No interest of whatsoever nature and type will be payable by the Employer in respect of Retention monies. 50% of the Retention money shall become due to the Contractor on issue of the Taking Over Certificate of works in respective sections/corridors. The balance 50% of the retention money shall be released after the completion of Defects Liability period and issue of Performance Certificate by the Engineer.</td><td>Deleted</td></tr>
<tr><td>11</td><td>Volume-2- Conditions of Contract & Contract Forms Section V – SCC Additional Clause Stage Payment Page 15 of 17</td><td>
<table>
<tr><td colspan="3">For all the BOQ items the following percentages of the agreed rate for the item, shall be paid as stage payments:</td></tr>
<tr><td>B. Supply</td><td>On delivery and acceptance at site</td><td>55%</td></tr>
<tr><td>C. Installation</td><td>On installation and acceptance</td><td>25%</td></tr>
</table>
</td><td>
<table>
<tr><td colspan="3">For all the BOQ items the following percentages of the agreed rate for the item, shall be paid as stage payments:</td></tr>
<tr><td>B. Supply</td><td>On delivery and acceptance at site</td><td>65%</td></tr>
<tr><td>C. Installation</td><td>On installation and acceptance</td><td>15%</td></tr>
</table>
</td></tr>
</table>

Sr. No	Reference Clause no. and Description	Existing content to be deleted	To be replaced as
12	Volume-3- Employer's Requirement General Specification- Appendix -1 Key Dates & Access Dates		Add the following in 'Notes': 4) The Key dates No. KD8, 9,12,13,14,15,16,17 and18 are Minor Key dates and Key Date KD1, 2, 3, 4, 5, 6, 7, 10, 11, 19, 20, 21, 22 and 23 are Major Key Dates. Any imposition of Liquidated Damage (LD) on account of delay in accomplishing Minor Key Date may be waived and LD amount if deducted will be returned (without interest) provided Contractor is able to accomplish subsequent Major Key Date (as per Key Dates). Project Manager's decision in this regard shall be final and binding to the Contractor.
13	Volume-3 - Employer's Requirement General Specification Appendix-19 System Interface Management	N12. Indicative Interface Sheet for Depot E&M (DEM) and Depot Finishing Work (DFW) Under Finalisation…	Add N12. Indicative Interface Sheet for Depot E&M (DEM) and Depot Finishing Work (DFW) As per Attachment 2 to Addendum 1
14	Volume 4, Page 40 of 151, 2.6.5 Busbars	Current density shall not be more than 1 amp per sq.mm Each bus bar shall be individually insulated by means of 4 layers of glass mica and polyester insulation to give minimum class F (bus temperature 155 Deg C) insulation.	Current density shall in compliance to IEC 61439. Each bus bar shall be individually insulated to give minimum class F (bus temperature 155 Deg C) insulation.
15	Volume-4- Section VI-C-VAC, Page 52 of 138, 3.2.4.3.1 (b) ii	Each unit shall have a rotary twin-screw compressor serviceable bolted semi-hermetic type.	Each unit shall have a rotary **Single or** twin- screw compressor serviceable bolted semi-hermetic type.
16	Volume-4 Employer Requirement Technical Specification Section VI-E-Fire Suppression, Clause No 2.5, Page 12 of 60		**Add:** iv. Valves up to and including DN150 shall be lever operated and valves in excess of DN150 shall be provided with gear operation.

Sr. No	Reference Clause no. and Description	Existing content to be deleted	To be replaced as
17	Volume 4 of 6, Section VI-B- Electrical –LT, Clause No-2.2.7, 29 of 151	h) The bus bar shall have sufficient cross sectional area to continuously conduct rated full load current for operation in 500 degree centigrade ambient temperature and for limit temperature rise within the requirements of IEC-61439- 1. The current carrying capacity of the bus bar shall be of the bare bus bar rating confirming to IEC-61439-1	h) The bus bar shall have sufficient cross sectional area to continuously conduct rated full load current for operation in 50 degree centigrade ambient temperature and for limit temperature rise within the requirements of IEC-61439- 1. The current carrying capacity of the bus bar shall be of the bare bus bar rating confirming to IEC-61439-1
18	Volume-4 Employer's Requirement Technical Specification Section VI-B- Electrical –LT, Clause No 2.8.4 MV Cables	a) MV Cables below and upto 25sqmm shall be copper and for sizes above 25sqmm shall be Aluminium/ Copper conductor FRLSH, XLPE, insulated, PVC sheathed steel armoured with an outer protective sheath of flame retardant low smoke low halogen (FRLSH) confirming to IS 1554/7098	a) MV Cables below and up-to **16sqmm** shall be copper and for sizes including and above 16sqmm shall be Aluminium/ Copper conductor FRLS, XLPE, insulated, PVC sheathed steel armoured with an outer protective sheath of flame retardant low smoke low halogen (FRLSH) confirming to IS 1554/7098.
19	Volume-4 Employer's Requirement Technical Specification Section VI-E-Fire Suppression Clause No 2.10. Ball Valve	The Ball Valve shall be made from die cast brass and tested to 14 Kg/cm2 pressure. The valve shall be internally threaded to receive pipe connections. The Ball shall be made from brass and machined to perfect round shape and subsequently chrome plated. The seat of the valve body- bonnet gasket and gland packing shall be of Teflon.	The Ball Valve shall be made from **Gun metal** and tested to 14 Kg/cm2 pressure. The valve shall be internally threaded to receive pipe connections. The Ball shall be made from SS and machined to perfect round shape. The seat of the valve body- bonnet gasket and gland packing shall be of Teflon.
20	Volume 6, Page 5 of 273, Part-A - Depot Substation & HT works - A.3 - A.1.3.1	A1.3.1 Design, supply, **installation,** testing and commissioning of 33 KV, 1C per phase x 120 Sq. mm XLPE Copper cable Earthed armoured HT cable in cable trenches with cover complete as required. A1.3.2 Laying of item under A.1.3 in trench, duct banks, etc.as required.	A 1.3.1 Design, supply, testing and commissioning of 33 KV, 1C per phase x 120 Sq. mm XLPE Copper cable Earthed armoured HT cable in cable trenches with cover complete as required. A1.3.2 **Installation** and Laying of item under A.1.3 in trench, duct banks, etc.as required.

Sr. No	Reference Clause no. and Description	Existing content to be deleted	To be replaced as
21	Volume 6-Part-B DEP-LT Page 57 of 273 BOQ No. E05- Indoor Lighting And Fans Item No. 1.3	Design, supply, installation, testing and commissioning of 4', 28 W LED luminaire or superior as per approved make list. Luminaire should be suitable for surface mounting/suspended made of extruded aluminium housing and CRCA front frame. High efficiency covered luminiaire with opal diffuser. With minimum lumen output of 3250 lumens and efficacy > 60 Lm/W and CCT of 4000 K. Electronic driver should have a PF> 0.9 and THD < 25 %.	Design, supply, installation, testing and commissioning of 4', 28 W LED luminaire or superior as per approved make list. Luminaire should be suitable for surface mounting/suspended made of extruded aluminium housing and CRCA front frame. High efficiency covered luminiaire with opal diffuser. With minimum lumen output of 3250 lumens and efficacy > 60 Lm/W and CCT of 4000 K. Electronic driver should have a PF> 0.9 and THD < 25 %. **Fixture shall be IP 20.**
22	Volume 6, Page 61 of 273, E.06-1-Street Light Poles	9.0 meter hot dipped galvanised Octagonal with **single &** Double overhang arm & with foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications.	9.0 meter hot dipped galvanised Octagonal with double overhang arm & with foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications. **(In case during Detail Design there is requirement of single overhang arm then 10% less rate over double arm rate provided in BOQ shall be paid.)**
23	Volume-6 - Part-C : C.03 – OCC, Page 183 of 273, Clause No. 1.1	Design, Supply. Installation, testing and commissioning of MS C class Chilled water piping complete with companion flanges, nuts, bolts, gaskets fittings supports etc. as required and as per specifications and drawings including all necessary civil work Duly Insulated (Nitrile Rubber) as per specifications.	Design, Supply. Installation, testing and commissioning of MS C class Chilled water piping complete with companion flanges, nuts, bolts, gaskets fittings supports etc. as required and as per specifications and drawings including all necessary civil work Duly Insulated (Nitrile Rubber) as per specifications. Nitrile rubber insulation thickness of pipe shall be part of Detail Design however subject to minimum thickness as follows:- 1. 20mm upto 65 mm dia pipe- 19 mm insulation. 2. 66mm upto 250 mm dia pipe- 25 mm insulation.

<table>
<tr><th>Sr. No</th><th>Reference Clause no. and Description</th><th>Existing content to be deleted</th><th>To be replaced as</th></tr>
<tr><td>24</td><td>Volume-6 Preamble and BOQ, Part-D - Station Fire Protection System, F.10 Vesda System For SER, TER, SCR, S&T UPS And E&M UPS Room</td><td>(Blank)

Page 1 of 273 Part D
Total 8,24,93,509/</td><td>Unit Price (Rs) - 2,52,301.00
Total Amount (Rs) - 12,61,505.00

Page 1 of 273 Part D
Total 8,37,55,014/-</td></tr>
<tr><td>25</td><td>Volume-6 Percentage Rate Tender Form (Envelop B1) Page xxii</td><td><table><tr><th>Sr. No.</th><th>Description</th><th>Bid Estimated Amount (Rs.)</th><th>Quoted % (Percentage)</th></tr><tr><td></td><td></td><td>62,20,09,291/- (Rupees Sixty Two crores Twenty lakhs Nine Thousand and Two Hundred Ninety One only)</td><td></td></tr></table></td><td><table><tr><th>Sr. No.</th><th>Description</th><th>Bid Estimated Amount (Rs.)</th><th>Quoted % (Percentage)</th></tr><tr><td></td><td></td><td>62,32,70,796/- (Rupees Sixty Two crores Thirty two lakhs Seventy Thousand and Seven Hundred Ninety Six only)</td><td></td></tr></table></td></tr>
<tr><td>26</td><td>Volume-6 Preamble and BOQ, Section VI – D, Fire STN F 3 - 3.3.10,</td><td>100 mm dia gun metal / ss Draw Out connection with foot valve for Fire Brigade.</td><td>100 mm dia gun metal Draw Out connection with foot valve for Fire Brigade.</td></tr>
<tr><td>27</td><td>Volume-6 Preamble and BOQ, Part-B DEP-LT, Sl No 12.1,</td><td>630 KVA D.G. SET (Including PLC Based AMF Panel)
Design, supply, erection, testing and commissioning of floor mounted totally enclosed sheet steel AMF Panel with PLC suitable for automatic operation of 630 kVA DG set and equipped with automatic gas flooding using linear heat sensing tube type fire trace system or equivalent. The panel shall be suitable for 415 V, 3 phase, 4 wire system, Copper bus bars designation labels as per</td><td>630 +/- 5% KVA D.G. SET (Including PLC Based AMF Panel)
Design, supply, erection, testing and commissioning of floor mounted totally enclosed sheet steel AMF Panel with PLC suitable for automatic operation of 630 +/- 5% kVA DG set and equipped with automatic gas flooding using linear heat sensing tube type fire trace system or equivalent. The panel shall be suitable for 415 V, 3 phase, 4 wire system, Copper</td></tr>
</table>

Sr. No	Reference Clause no. and Description	Existing content to be deleted	To be replaced as
		requirement, continuous earth bus, cable clamping supports, panel illuminating lamps, cable gland plates for incoming and outgoing feeders as per details below:	bus bars designation labels as per requirement, continuous earth bus, cable clamping supports, panel illuminating lamps, cable gland plates for incoming and outgoing feeders as per details below:
28	Volume-2- Conditions of Contract & Contract Forms Section V – SCC Contract forms	Schedule 2: PARENT COMPANY UNDERTAKING (Refer Clause 7 of SCC) Schedule 3: PARENT COMPANY GUARANTEE (Refer Clause 7 of SCC) Schedule 4: CONTRACTORS WARRANTY (Refer Clause 7 of SCC) Schedule 5: SUB-CONTRACTORS/VENDORS WARRANTY (Refer Clause 7 of SCC) Schedule 6: FORM OF BANK GUARANTEE (Refer Clause 26 of SCC) Schedule 7:INDENTURE FOR STAGE PAYMENT (Refer Clause 46 of SCC)	Schedule 2: PARENT COMPANY UNDERTAKING (Refer Clause **9)** of SCC) Schedule 3: PARENT COMPANY GUARANTEE (Refer Clause **9)** of SCC) Schedule 4: CONTRACTORS WARRANTY (Refer Clause **9)** of SCC) Schedule 5: SUB-CONTRACTORS/VENDORS WARRANTY (Refer Clause **9)** of SCC) Schedule 6: FORM OF BANK GUARANTEE (Refer Clause **28)** of SCC) Schedule 7:INDENTURE FOR STAGE PAYMENT (Refer Clause **48)** of SCC)

Clause 11.1.3 – Adjustment in Contract Price

1. **Adjustment in Contract Price**:

Prices payable to the Contractor, in accordance with the Contract, shall be subject to adjustment during performance of the Contract to reflect changes in the cost of labour and material components and other inputs to the Works, in accordance with the following formula:

$$P1= Po \times [a + b(L1/Lo) + c(S1/So) + d(C1/Co) + e(A1/Ao)+ f(F1/Fo)] – Po$$

Where:

"P1" is the adjustment amount payable to the contractor

"Po" is Contract Price (Base price) of Interim Payment Certificate under consideration

"a" is a fixed coefficient as specified in the Table 1 below, representing the nonadjustable portion in contractual payments;

"b", "c", "d", "e" and "f" are coefficients representing the estimated proportion of each cost element (labour, steel, copper, aluminium and fuel respectively) in the Facilities or sections thereof, as specified in the Table 1 below.

"L1", "S1", "C1", "A1"and "F1" the applicable cost indices (labour, steel, copper, aluminium and fuel respectively) on the date of adjustment, determined from the Named / Published Source of Index referred to in the Table 2 below, applicable to each cost element; and

"Lo", "So", "Co", "Ao" and "Fo" are the base cost indices (labour, steel, copper, aluminium and fuel respectively) or reference prices corresponding to the above cost elements at the Base date, determined from the Named / Published Source of Index referred to in the Table 2.

Table 1. Coefficients for Each Factor for Payment.

Coefficient Currency	Fixed (a)	Labour (b)	Steel (c)	Copper (d)	Aluminium (e)	Fuel (f)	Weightings Total
Indian Rupees	0.30	0.20	0.15	0.15	0.15	0.05	1.00

Table 2. Indices for Each Factor for Payment.

Index for: (factor)	**Currency of payment**	**Named / Published Source of Index**	**Base Value on Base Date – The date twenty-eight (28) days prior to the Bid submission date.**
Labour (L)	Indian Rupees	Basic Consumer Price Index Number for Industrial Workers, Mumbai (Base Year 2001= 100) published by Ministry of Labour & Employment, Labour Bureau, Gov. of India	*
Steel (S)	Indian Rupees	Basic Wholesale Price Index of Mild Steel - Flat Products (Base Year 2011-12 = 100) as published by Office of the Economic Adviser, Ministry of Commerce and Industry, Government of India,	*
Copper (C.)	Indian Rupees	Basic Wholesale Price Index of Copper Wire (Base Year 2011-12 = 100) as published by Office of the Economic Adviser, Ministry of Commerce and Industry, Government of India,	*
Aluminium (A)	Indian Rupees	Basic Wholesale Price Index of Aluminium Metal (Base Year 2011-12 = 100) as published by Office of the Economic Adviser, Ministry of Commerce and Industry, Government of India,	*
Fuel (F)	Indian Rupees	Basic Wholesale Price Index of Fuel & Power (Base Year 2011-12 = 100) as published by Office of the Economic Adviser, Ministry of Commerce and Industry, Government of India,	*

***** To be completed by Bidder.

Notes;

a) The Bidder must complete Table 2 by specifying indices with published source for labour and copper and aluminium for payment.

b) The Base Date shall be the date twenty-eight (28) days prior to the Bid submission deadline. Current indices or prices shall be those prevailing on the day 28 days prior to the last day of the period to which a particular Interim Payment Certificate is related. If at any time the current indices are not available, provisional indices as determined by the Project Manager will be used,

c) The responsibility for arranging copies of the labour and material indices, from the Reserve Bank of India, to be delivered to the Employer and the Project Manager on a monthly basis, shall rest with the Contractor.

2. Conditions Applicable To Adjustment in Contract Price

a) No price increase will be allowed beyond the original delivery date unless covered by an extension of time awarded by the Employer under the terms of the Contract. No price increase will be allowed for periods of delay for which the Contractor is responsible. The Employer will, however, be entitled to any price decrease occurring during such periods of delay;

b) No price adjustment shall be payable on the portion of the Contract Price paid to the Contractor as an advance payment.

c) The Price Adjustment Clause above shall not be applicable to any extra item of works, not included in the BOQ, and for which the rates are fixed separately under GC Clause 12.

N12. Indicative Interface Sheet for Depot E&M (DEM) and Depot Finishing Work (DFW)

Mumbai Metro Interface Sheet	**Contract A**	**DEM**	**Contract B**	**DFW**	***Rev # :*** ***Date:***	***A1*** ***05/04/2018***
Approved by *:*	**Depot Electrical and Mechanical Contract (DEM)** Lead Contract		**DFW (Depot Finishing Work)** Participating Contract		First issue:	
GC issued by :						
Checked by :						

Interface description brief / Key elements (time schedule, physical, functional, ...) :

1.General Interface details between the Depot Electrical and Mechanical Systems (DEM) and Depot Finishing Work (DFW)

Contract A (DEM*)*	**DESIGN STAGE**	Contract B (DFW*)*
DEM/DFW-01: Shall Design the E&M details like Power points, Cable tray, Cable routing, Conduits, Fire hydrant, Fire Suppression, Fire Alarm Panels, VAC etc., and provide details to contract B for False Ceiling and Furniture Layout design.		**DEM/DFW-01:** Contract B shall suitably design and develop the Reflected celling plan and Furniture Layout provide to contact A after incorporating the E&M details.
DEM/DFW-02: Shall submit to Contract-B the cable routing details to enable Contract-B the sealing of wall and cut-out openings with Fire proof sealing Materials		**DEM/DFW-02:** Shall incorporate in design the Contract-A requirements for wall and cut-out openings with Fire proof sealing Materials
DEM/DFW-03: Shall submit the Cable trench details to Contract-B		**DEM/DFW-03:** Shall design the Cable trenches & Covers.

Contract A (DEM*)*	**CONSTRUCTION / INSTALLATION STAGE**	Contract B (DFW*)*
DEM/DFW-04: Shall monitor and verify the finishing in E&M services like Power points, Cable tray, Cable routing & Conduits, Fire hydrant, Fire Suppression, Fire Alarm Panels, VAC,etc., technical design requirements are met during the construction / installation stage.		**DEM/DFW-04:** Shall furnishing of Contract-A Technical Requirements
DEM/ DFW-05: Shall complete the E&M construction / installation works and coordinate with Contract B for fire sealing & Finishing works in Cut-out & wall penetration.		**DEM/ DFW-05:** Shall complete and obtain clearance from Contract-A for the Construction / Installation works executed.
DEM/ DFW-06: Shall coordinate with Contract B for the construction of cable trenches & installation of Cable trench covers.		**DEM/ DFW-06:** Shall complete the construction of cable trenches & installation of Cable trench covers
Contract A (DEM*)*	**TEST & COMMISSIONING STAGE**	Contract B (DFW*)*
DEM/ DFW-07: Contract-A shall submit to Contract-B the testing and commissioning requirements for the items mentioned under Design, Construction / Installation Stages.		**DEM/ DFW-07:** Contract-B shall comply and assist Contract-A with the testing and commissioning requirements for the items mentioned under Design, Construction / Installation Stages.
Contract A (DEM*)*	**MAINTENANCE STAGE**	Contract B (DFW*)*
DEM/ DFW-08: Contract-A shall jointly prepare with Contract-B the Maintenance Manual for future Operation and Maintenance.		**DEM/DFW-08:** Contract-B shall jointly prepare with Contract-A the Maintenance Manual for future Operation and Maintenance.